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Local Health Department activities to address health disparities: What do public health practitioners view as impactful?

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by

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Approval Page

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Abstract

Local Health Department activities to address health disparities: What do public health practitioners view as impactful?

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July 14, 2021

Under the direction of Collins O. Airhihenbuwa, PhD

Objective: Local health departments (LHDs) serve as the primary implementer of efforts to prevent, reduce, and eliminate health disparities. Previous research examined the factors that influence the strategies and disease outcomes of health disparity work by LHDs, but little is known about the perception of impact of these strategies. The purpose of this study is twofold: 1) to identify activities from a pre-identified list of nine that current chronic disease personnel perceive as most impactful and 2) identify leader, organization, or external factors that contribute to a local health department's utilizing the activities perceived as most impactful.
Methods: LHDs identified by the National Association of County and City Health Officials (NACCHO) were asked to respond to an online cross-sectional questionnaire. Preferred respondents were those who worked in chronic disease prevention. Respondents were asked to select activities viewed as most impactful in addressing health disparities from those that appeared in the 2016 NACCHO Profile of Local Health Departments (Profile). The selection of activities was summed and the top three informed the creation of a variable to conduct regression analysis on a total of 16 leader, organization, and external variables found in the 2016 Profile.
Study Population: 482 LHDs selected by NACCHO to complete a bonus module in the 2016 Profile which inquired about activities to address health disparities.
Measure: The completion of all three of the activities viewed most impactful activities to address health disparities.
Results: 133 individuals from 105 LHD selected the following activities as most impactful: supporting community efforts to change the causes of health disparities; prioritizing resources and programs specifically for the reduction in health disparities; and describing health disparities in your jurisdiction using data. Activities completed as reflected in the Profile indicate that LHDs consistently utilized the first and third activity. Less than half of the time (44%), LHDs indicated that they prioritized resources and programs for the reduction in health disparities. There was no leader characteristic associated with the completion of the three activities. Organization and external characteristics associated with completing these three activities was participation in alcohol and other drug policy advocacy (p <0.0001), population size (p = 0.04), and jurisdiction type (p < 0.0001).

Conclusions: There is possible misalignment in activities conducted by LHDs to address health disparities and what practitioners feel would be beneficial. Organizational characteristics appear to be more important than leader characteristics in influencing use of perceived impactful activities to address health disparities. The most modifiable of these characteristics is the participation in alcohol and other drug and chronic disease (ATOD/CD) policy advocacy. LHDs leader should seek to understand staff perception the need for targeted resource allocation and increase capacity in ATOD/CD policy participation to address health disparities.

Table of Contents

List of Tables

List of Figures

Chapter 1 Introduction

Background

Local health departments (LHDs) are part of a large multifaceted web of governmental, private, and voluntary organizations that work to promote and protect American citizens' health. Each department works to varying degrees to develop and implement policy, assess information on the health the community, and ensure that appropriate public health services are provided [1]. However, the ultimate responsibility for the conditions that allow citizens to live their healthiest lives is shared amongst local, state, and federal governments [1]. The public health system under the control of governments in the United States is comprised of about 2800 local health departments , 51 state health departments (includes the District of Columbia), and 574 federally recognized American Indian and Alaska Native tribal public health agencies [2,3].

According to the National Association of County and City Health Officials (NACCHO), a LHD is "an administrative or service unit of local or state government, concerned with health, and carrying some responsibility for the health of a jurisdiction smaller than the state"[2]. Each of the 2800 LHD jurisdictions cover a single city (i.e. Long Beach, CA); a single county (i.e. Fulton County, GA); a city-county consolidation (i.e. Jacksonville, FL); or some other combination, such a multi-county or multi-city agency (i.e. Stutsman District, ND)[4,5]. The composition and size of LHDs have changed over time resulting in complications with data trends in the number of LHDs in a state. For example, in 2005 Georgia had 159 county level LHDs, but by 2019, these

had been consolidated into 18 health districts. Conversely, Kentucky had 55 LHDs in 2005 and this figure increased to 60 by 2019 [4,6] .

In 1988, The Institute of Medicine's (IOM)(now the National Academy of Medicine) report titled *The Future of Public Health*, asserted that "local health departments are the "front line of public health agencies." [7] This could not be any truer than in the current COVID-19 pandemic with LHD's bearing the initial brunt of the tracking of cases, hospitalizations, and deaths. The report called for increased capabilities and a requirement of accountability for all agencies of public health [8]. Ultimately, the authors concluded that with no clear definition nor mission for public health in general, practitioners were weighed down by the demands of "safety net clinical care" and not prepared to deal with emerging threats [7,8,1]. This assessment by the IOM spurred the development of the 10 Essential Public Health Services (10 EPHS) Framework released in 1994.

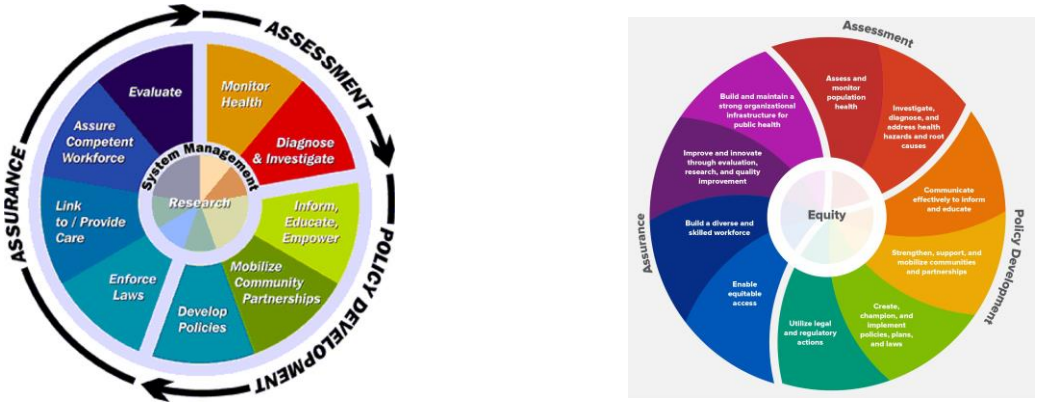


Figure 1: Original 10 EPHS and Updated 10 EPHS

Developers of the framework included representatives from Association of State and Territorial Health Officials (ASTHO), NACCHO, IOM, Association of Schools of Public Health (now Association of Schools and Programs of Public Health), the Public Health Foundation, the Public Health Service, and National Association of State Alcohol and Drug Abuse Directors[9].

This framework currently serves as the basis for nearly all public health performance measures that have been developed since its release, including the basis for domains of the Public Health Accreditation Board [10].

A 2020 update to this framework sought to align it with "current and future of public health practice" with an overarching emphasis on equity, more precisely, health equity [11]. Health equity means that "every person has the opportunity to attain his or her full health potential and no one is disadvantaged from achieving this potential because of social position or other socially determined circumstances" [12]. The new vision was brought to life by a more diverse group of experts that included members from seven professional associations, five foundations, three public health schools, three local health departments, and a smattering of individuals from the federal government, the tech industry, nonprofits and a lay person. These experts embedded action-oriented language that refers more to overall *health* and less about a clinical health issue or a problem[10].

One such example of this shift to a new vision and language can be seen by looking at the second service/skill (as listed on the CDC website). The original framework states that a public health agency should "Diagnose and investigate health problems and health hazards in the community"[11]. Nowhere in this language is the expectation or responsibility for the agency to do anything with the investigated and diagnosed problem. The current iteration of this service states that public health agencies should "Investigate, diagnose and *address* health problems and hazards affecting the population" (italics added by this author) [11]. Similarly, the update reflects a higher expectation in the legal realm with public health agencies expected to "create, champion and implement laws" in lieu of merely enforcing those that already existed as listed in the original framework.

There have been many methods of assessing the performance of LHDs based on the framework services. The primary source of data that provides insight into the who, what, and the how of more than 2,800 LHDs in the US comes from the NAACHO. Approximately every three years since 1989, NACCHO has produced the National Profile of Local Health Departments what is referred herein as the "Profile". The Profile represents the greatest and most reliable source of information on LHDs staffing, funding, activities and governance [13]. The survey questions may vary from year to year and have fluctuating levels of participation from LHDs. Despite this, the wealth of data in the Profile permits repeated analysis of changes in structure, function and resources over time.

Rationale for Dissertation and Conceptual Model

In recent years there has been an ever-increasing understanding of health equity, of viable strategies to address disparities, of documenting strategies used and of understanding the roles of the myriad of players who can positively impact the health of a community. Specifically, some have looked at the link between LHDs organizational characteristics and their impact on advancing health equity activities and morbidity. One study explored the association of resources (financial and human) and their impact on changes in the Health Rankings of the state where the LHDs were located[14]. Another study examined the relationship between use of information systems, expenditures, and accreditation and activities to address health disparities[15]. Yet another study compared the characteristics of the LHDs' leader to their engagement on activities to address health disparities [16]. These prior works and the wealth of data that exists in the Profile allows for further examination of the connection between specific LHD organizational factors and their relationship to activities to address disparities. The Profile, however, does not capture

qualitative assessments of activities used to address health disparities and their perceived impact(s) by those who work at these agencies.[16,17]

The conceptual model for this dissertation is a modification of the framework developed by Yang and Bekemeier as shown in Figure 2[16]. Their model was a second iteration of an earlier conceptual framework developed by Handler et al to measure public health system performance of entire systems, specific agencies, or individual programs[18,19]. In this original framework, Handler et al begin with the context of macro environment exerting some influence on the public health system. The system begins with a mission of the organization based on core functions that require various structural resources to perform the 10 EPHS and to meet the outcomes of the agency[18]. These outcomes are measures of effectiveness, efficiency, and equity[18]. The macro context is comprised of the social, economic, and political factors in which the public health system is situated. This macro context accounts for the various forces operating in society at any point in time; the needs of the community proximate to and around the health department as well as factors that might exert pressure on the health department directly or indirectly such as the changes in the direct medical care system[18]. This larger environment is meant to demonstrate the interaction of LHDs and the community surrounding them. In the Yang and Bekemeier model, this larger environment is represented by Level 2, the state and specifically, context factors reflected in Level 1 related to various populations. A key difference in the newer Yang and Bekemeier framework is the exclusion of the public health mission and purpose which were included in the Handler framework. The outputs/activities box shown in Figure 2 for Yang and Bekemeier can be viewed as an approximation of the "process" included in the Handler framework. Wherein Handler views process as the 10 EPHS, the Yang and Bekemeier framework reflects just one: the completion of a community health assessment, "monitor health

status to identify community health problems." Alignment of other aspects of the two framework include: the structural capacity(resources) comprised of human resources (shown as workforce resources), organizational resources (shown as LHD organization), and fiscal resources (shown as per capita expenditure).

Although Yang and Bekemeier framework is newer, it was necessary to modify for this dissertation due to the absence of data in the Profile selected. For example, there is a need to evaluate other macro contextual factors which are more in line with Handler framework in addition to exploration of additional processes, resources and outcome.

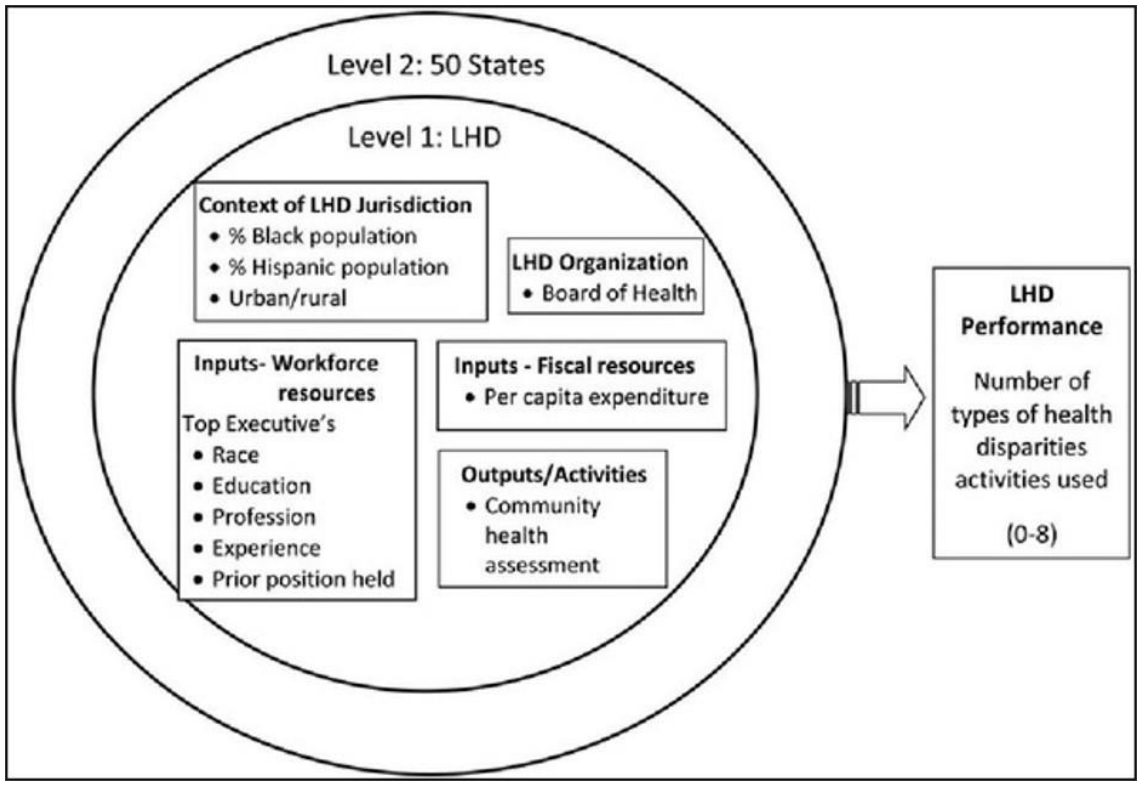


Figure 2: Yang and Bekemeir Framework

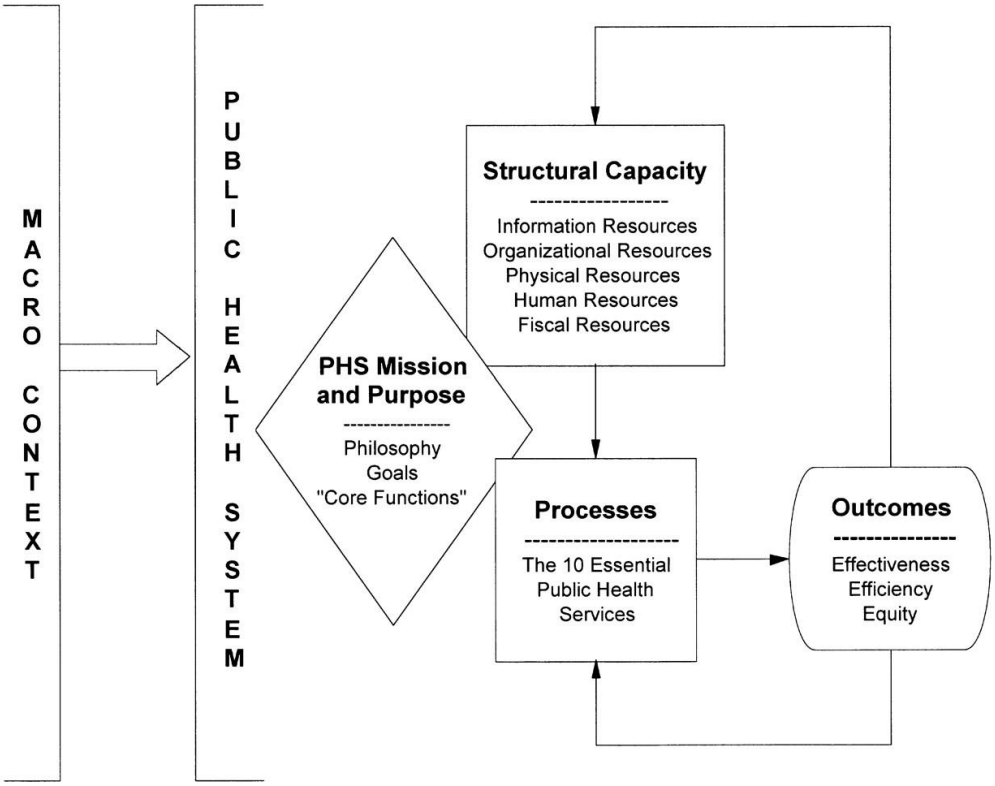


Figure 3: Handler et al Conceptual Framework

Research Question

The conceptual model for this dissertation seeks to explore the question: ***which factors from the 2016 NACCHO data can be recognized as influencing use of activities that staff view as the most impactful to address health disparities***?

Public Health Significance

Research on the connections between leader, organization, and external characteristics linked to use of activities to address health disparities can inform LHDs most salient and accessible levers to address disparities in their communities. This exploratory research identified perceptions of impactful activities to address health disparities and could contribute to our understanding of conditions related to use of activities viewed as most impactful amongst current LHD staff. By uncovering activities viewed as most impactful, this information could inform a method for NACCHO to weigh future responses to their health disparity questions based on perceived impact. Additionally, the experiential evidence that lives in the minds of public health practitioners in the field is not often tapped into and shared, yet necessary to reduce the time lag between awareness that public health interventions to reduce disparities work and the broader implementation of these interventions.

Chapter 2 Literature Review

Defining health disparities and health equity

The term *health disparity* originated in the US about 1990 and was meant to relay more than the textbook definition of the 'disparity' which boils down to a difference or variation [20]. Health disparity is not merely a health difference, some differences are expected, some are positive, some are negative. In the context that it came into use, *health disparity* was meant to connote "worse health among socially disadvantaged people and, in particular, members of disadvantaged racial/ethnic groups and economically disadvantaged people within any racial/ethnic group" [20]. A 2003 report by IOM consolidated data from more than 100 research studies, testimonies from experts, and focus groups determined that racial/ethnic disparities are ever present in the US health care system [21].

A related term, *health inequity* implies a state of unfair health, one which is always undesirable. [17,22]. The earliest use of either term in articles catalogued in PubMed was in a 1982 article entitled *Black Health Inequities and the American Health Care System* by Rice and Jones. The article focused on the lack of Black physicians and other health care professionals in decision making roles and postulated that an increase in the number of these physicians would improve the health outcomes of Black Americans. The authors discussed the challenges of legal authority in defining the true boundaries of a community. These communities may be the city, county, or neighborhood that may overlap. This can still be the case today when a disadvantaged community doesn't neatly fit into the physical jurisdiction of a health department. The last term

of importance here is *health equity* which means all member of society can "attain his or her full health potential" and no one is "disadvantaged from achieving this potential because of social position or other socially determined circumstances" [12]. Conceptually, health disparities are the measures used to gauge movement towards health equity [23].

The CDC's Healthy People Initiative sets 10-year national science-based objectives to improve the health of American citizens. One of the two overarching goals of The Healthy People 2010 initiative was to "eliminate disparities among segments of the population; including differences that occur by sex, race or ethnicity, education, or income, disability, geographic location or sexual orientation[24]." Healthy People 2020 included a section on the social determinants of health (SDOH) with an overarching goal to "achieve health equity, eliminate disparities, and improve the health of all groups" [25]. This goal was retained and included in the current Healthy People 2030 with greater clarity in defining health disparity: "a particular type of health difference that is closely linked to social, economic and/or environmental disadvantage[25]." This continuous inclusion of this goal in the nationally recognized benchmark sets the stage and foundation on which LHDs base their work on health disparity.

Health Disparity Activity and the LHD

Listed below is a summary of the literature on the characteristics of LHDs and performance assessed primarily by completion of 10 EPHS or in specific cases, the completion of activities to address health disparities as defined by in Profile assessments from 2005-2016. There was no health disparities question in the 2010 Profile. When the question was included, the same definition of health disparities was used each year. It was defined as "differences in

health status that occur among population groups[2,6,26,27]." The first eight activities appeared in 2005 and 2008. The ninth activity first appeared in the 2013 Profile. These activities in the are:

- *describing health disparities in your jurisdiction using data*
- *conducting original research that links health disparities to differences in social or environmental conditions*
- *educating elected or appointed officials about health disparities and their causes*
- *training your workforce on health disparities and their causes*
- *recruiting workforce from communities adversely impacted by health disparities*
- *prioritizing resources and programs specifically for the reduction in health disparities*
- *taking public policy positions on health disparities (through testimony, written statements, media, etc.)*
- *supporting community efforts to change the causes of health disparities*
- *offering staff training in cultural/linguistic competency*

The degree to which LHDs conducted these activities fluctuate over the years and in captured in the table below.

Activities Conducted by LHDs[2,17]	2005	2008	2013	2016
1) Describing health disparities in your jurisdiction	54.9%	51.5%	57.2%	61%
2) Conducting original research that links health disparities to differences in social or environmental conditions	11.5%	11.2%	10.9%	12%
3) Educating elected or appointed officials about health disparities and their causes	55.5%	45.6%	44%	52%
4) Training your workforce on health disparities and their causes	51.4%	49.7%	48.1%	51%
5) Offering staff training in cultural/linguistic	NA	NA	47.3%	51%
6) Recruiting workforce from communities adversely impacted by health disparities	25.8%	20.1%	48.1%	24%
7) Prioritizing resources and programs specifically for the reduction in health disparities	50.2%	39.7%	17.8%	39%

8) Taking public policy positions on health disparities (through testimony, written statements, media. Etc)	27.7%	20.2%	33.6%	16%
9) Supporting community efforts to change the causes of health disparities	62.3%	58.4%	15.8%	63%
None of the above	20.9%	22%	16%	14%

Leader Characteristics

In the conceptual frameworks presented earlier in this dissertation, the structural capacity of the organization was linked to human resources as they are tied to the LHDs ability to adhere to its mission and produce desired outcomes. Leaders exert significant influence over their organizations in determining funding allocations, staffing levels and setting the tone, vision and direction for the entire agency[28,29]. The influence of the leader could have a positive, negative, or neutral impact on the ability (or desire) of the LHD take on tasks with the intent of reducing health disparities. Outcomes related to specific leader characteristics could be evaluated based on the agencies completion of activities (a process measure) or an actual reduction in disparities in the community (an outcome measure).

Extensive literature exists on the organizational assessment of leaders to determine the most sought-after character traits, skills, education and experience. Early assessments of what makes a good leader, dating back to the late 1800s, posited that leaders are "born" and therefore possess distinct personal characteristics that make them a leader while more recent leadership assessment focus on their degree of charisma[30]. Qualitative assessments of leaders published in the 1930s focused on *The Functions of the Executive* and noting that leaders must balance the goals of the agency with that of the needs of the workers and the those who maintained the balance would fare better [31]. In recent years, Heiftez and Linsky reviewed leaders in the public

sector and emphasized that leadership is less about vison and more about motivating staff to focus on solving challenging problems [32]. Be it innate capacity, managerial skill, or charismatic persuasion defining what make a good leader; leaders must possess a base level of technical knowledge of the functions of the organizations they lead.

To solve the challenging public health issues of the day, specific education and experience could provide the necessary leadership tools for this task, yet research on the public health leaders is often tied to the execution of the 10 EPHS or specific disease outcomes[1,33]. Research on public health leadership education is mixed. In one study, having a masters or undergraduate degree is positively tied to performance of six of the 10 EPHS while a specific public health education or certification was negatively associated with nearly all EPHS [33]. Nursing education has been positively link to five of the 10 EPHS as well as the reduction in black-white mortality health disparities and clinical education in general was linked to the completion or more activities to address health disparities[16,28].

For fixed characteristics like gender and race/ethnicity the literature is inconclusive. Female leaders have been shown to positively impact five of the 10 EPHS, but no effect on conducting activities to address health disparities[16,28,34,35]. Yang and Bekemeier found no association between the leader's race/ethnicity and number of health disparity activities of the LHD, while Olivas et al. (2020) found the number of activities used decreased when the leader was non-white [16,36].

Leader tenure has begun to shift downward with the wave of baby boomer retirements. Between 2008 and 2013, top executives at health departments had held the positions for almost nine years, by 2018, this was down to seven and a half years and more than a quarter being in those positions for no more than two years [37]. In some instances, shorter tenure meant more

health disparities activities were conducted[16]. The same study found a linear relationship between the number of health disparities activities and the leader's education; more education aligned with more activities (2013). Depending on the size of the LHD, the organization may have a health executive as well as a health officer. In some cases, one or both may not be full-time employees. The leader's fulltime status has been linked to an increased number of health disparities activities [38]. This literature is quite limited and the findings are inconclusive to establish a directional relationship.

A diverse workforce and leadership have been shown to better serve diverse populations by having a greater understanding of the contextual considerations that impact health behavior such as culture and environment[39]. Diversity in leadership in the private sector has been linked to above average positive financial returns, a measure that when applied to public health could yield better health outcomes (reduction in disparities).[40] Related to leaders with a public health education, schools and programs of public health must cover the foundational domains and core competency curriculum requirements of understanding the 'how and what' of health disparities in order to maintain their accreditation[41]. Additionally, previous research that linked clinical education of the leader to the utilization of more activities to address health disparities lacks strong evidence that such leadership is sustainable in the absence of other external influences. The authors years of professional experience and anecdotal observations of leader characteristics as described above suggests that more activities used to address health disparity are likely to be found with leaders of color and leaders having a specific public health education.

Legal Authority

The legal authority of a LHD is delegated to the organization by their local jurisdiction or the state [7]. In some instances, the local authority is granted through what is known

as the Dillion Rule -allowing local jurisdictions to exert authority over areas that are explicitly delegated to them by the state. In other instances, local jurisdictions follow the "home rule" which is the authority granted by the state's constitution or statute to establish a local government structure[42]. This delegation of power varies across the US and the scope of the authority is determined by its organizational structure. These structures are centralized (all LHDs are units of the state government), decentralized (LHDs are administered by local governments), mixed (some LHDS are led by the state and others by the local jurisdiction), or shared (all LHDs are governed by local and state officials) [42]. In the 2016 Profile 77% of respondents were governed locally/decentralized, followed by state/centralized authority at almost 16%, and 7.5% shared (includes mixed structures). The authority structure of the LHD will determine the breath, depth, and desire to address health disparities. Political affiliation of the state leader is of greater importance in centralized structures where the governor's political ideology will determine funding, allowable use of funding, and overall strategy to address disparities. Jurisdictions with more conservative leanings were found to be less involved in public health accreditation a process that has been linked to addressing disparities[43].

Local Board of Health (LBOH)

Embedded in these structures may exist a local board of health that is "authorized to promulgate public health ordinances or health codes or other species of rules and regulations relating to public health"[44]. These local boards can be appointed or elected, advisory or have the power to enact new rules and regulations[42]. The presence of local boards of health have been shown to be strong indicators of LHD performance as well as influential in the policy and decision making of the LHD leader in several studies [33,34,45]. Qualitative research from the early 1980s showed that leaders of LHDs viewed the influence of the local board of health as

important in decentralized, shared and mixed structures, while those with centralized structures place greater importance on state level priorities [46]. In a separate study, however, the author did not find a positive association between the presence of a local boards and LHD performance of the 10 EPHS after controlling for other variables in their model [47].

In 2016, three-quarters of all health departments were governed by a local board of health with this being especially true of small or decentralized LHDs [2]. A systematic review of research on LHD structures indicates that organizational structure exert some influence on the performance of a LHD, but there is no universal directionality of this influence [1]. Methods and tools used for assessing performance varied, but were often based on the capacity to deliver the 10 EPHS [1,14]. For the completion of the activities to address disparities as described by NACCHO, the presence of a board however, was not been found to influence the number of health disparities activities performed at a LHD [16]. The influence of the LBOH is likely tied to method in which the members are selected. These members can be appointed or elected which means that the latter group would be subject to both internal and external forces and their desires to address health disparities.

Community Health Assessments (CHA)

CHAs are generally carried out as a collaborative effort with several public health serving agencies. Their purpose is to document, examine, and benchmark health status and trends; leading to selection of priorities, evaluation, programs and policies that match the needs of the community served [48]. The Patient Protection and Affordability Act of 2010 (ACA) required that tax-exempt hospitals conduct a community needs assessment every 2-3 years[49,50]. In some instances, LHDs also have hospitals under their umbrella[51]. LHDs who collaborated with tax-exempt hospitals were more likely to have a local board of health and tended to be larger[52]. One

study found that more than half of the LHDs collaborated with hospitals to complete a CHA and 60% of those also played a role in the implementation plan for the CHA[53]. Another found the distinction that larger LHDs were more likely to collaborate with hospitals – a requirement of national accreditation [54]. Various studies have found positive links to the percentage of funding from state and local sources, presence of a local board of health, local governance and the presence of an epidemiologist with the recent completion of a CHA [55,56]. Those who completed a CHA in the past three years were also shown to utilize more health disparity activities as were LHDs that were nationally accredited [15,16]. Completion of a CHA means that the LHD has concrete information on the health of the community which will likely prompt action to address gaps in health outcomes.

Policy making and advocacy

The use of legislative and agency specific policy to modify systems and structures is an effective tool to address a myriad of health issues. According to the CDC, policy via laws led to seven of the ten greatest public health achievement in the 20th century and public health practitioners must recognize the impact on and the impact of law or policies health disparities [57]. Commentary on the impact of laws on health is robust particularly as reflections on the lead up to and implementation of the Affordable Care Act [58,59]. The widely recognized County Health Rankings model begins with policies driving health factors which in turn produce health outcomes[60].

Successful participation in policy making and advocacy by LHDs is often tied to larger population size of the jurisdiction or state [61–64]. Research also reflects a bidirectionality of policy advocacy: the state policy influences the local government policy and vice versa, indicating that local policy can and does influence national policy by shifting policy in several states (an

example of diffusion of an innovation) [64,65]. These researchers found a strong relationship between state population size and advocacy at the federal level for tobacco control and prevention, obesity, and emergency preparedness. Policy efforts on land use and active transportation were positively linked to jurisdictions with populations over 500K and tied to LHDs with community health improvement plans [61]. Rural areas are less likely to perform local policy activities relative to urban jurisdictions, but were often active in state level advocacy efforts [64,65]. A study of 454 LHDs found policy activity was positively associated with policy adoption for land use, tobacco control and prevention, indoor air quality, and nutrition and physical activity and overall levels of policy activity being correlated with policy adoption [65]. Guidance on advancing policy dictates that health practitioners directly engage policy makers [66].

The literature suggests that a reasonable assumption could be made on the positive effect of policy engagement and addressing health disparities. Particularly for tobacco policy, those that address flavored tobacco products were found to cover a greater percentage of historically disadvantaged communities which in turn could reduce disparities in tobacco related diseases[67]

Geography

Geographic variations in morbidity and mortality have been widening since the late 1960s and while there have been decreases in overall mortality, the US is still behind other western nations and the gap is increasing[68]. These regional variations may be attributed to healthcare access, utilization, behavior, environmental hazards, regional behaviors, or disease prevention and control[69–71]. These differences are present in both diagnosed disease as well as the perceptions of health. Using the 2014 Behavioral Risk Factor Surveillance System, researches noted that adults 65 and older in the South census region reported the highest percentage of individuals endorsing the poor perception of health, the highest number of days in

poor physical and mental health, and the lowest reports of physical health[72]. The Midwest had the highest reported obesity rate[72]. One study of the distribution of cancers in the US between 2010-2014 found that of the 3.3 million new tobacco affiliated cancers the lowest cancer rates were found in the West census region[73]. For particular cancers like colon and rectal cancers that disproportionately impact African Americans, rates were highest in the Midwest. While cervical cancers effecting those who are biologically female, rates were highest in the South census region[73]. In another, researchers evaluated the racial and ethnic difference in prostate cancers between 2012-2015 found rates highest in the Northeast census region for Hispanic and African American men[74]. Similarly, they found that while the incidence rates were lowest in the West census region, deaths were highest[74]. Assessments often reflect that the highest mortalities tend to occur in the South census region comprised of states south of the Mason-Dixon line and with the inclusion of Oklahoma and Texas[68,75]. No research linking the census region to the number and type of health disparities activities was found. Lay understanding the historical context surrounding LHDs located in the South implies that these agencies will likely perform fewer activities to address health disparities even in the presence of greater need.

Population size

Several studies using various methods to estimate the predictors of performance for LHDs indicated that the size of the jurisdiction was the strongest predictor of LHD performance and that larger jurisdictions performed better than smaller ones. [1,76]. Two exemptions to this association were that LHDs in metropolitan areas was not associated with performance [35,47]. In rural areas with a LHD that covers many counties, LHDs were found to perform best when the counties had similar disease rates, geography, and socioeconomic status [77]. Population size has been linked to increased participation in health disparities activities [17]. Urban jurisdictions,

particularly those with larger Black or Hispanic populations (both in the agency and the community) were more likely to perform more health disparities activities [16,17,38]. While not specifically looking at discrete health disparity activities, interviews with staff and leaders of regional health departments in Nebraska found the size of the vulnerable population in the jurisdiction to weigh heavily toward the resource allocation in the jurisdictions [29]

Governance

Governing structures are either centralized (all LHDs are units of the state government), decentralized (LHDs are administered by local governments), mixed (some LHDS are led by the state and others by the local jurisdiction), or shared (all LHDs are governed by local and state officials) [42]. In the 2016 Profile survey respondents were governed mostly locally/decentralized (77%), state/centralized authority (almost 16%), and shared (includes mixed structures) (7.5%).

Political affiliation

The beliefs and attitudes that make up a state's political culture can play a role in how a LHD may decide or decide not to undertakes efforts to advance health equity particularly if the LHD is part of a state-led (centralized) system. In recent years, states have trended towards Republican leadership while large cities and other local jurisdictions generally Democratic leadership[78]. This difference in political trends have created a policy tensions that ultimately leads to conflict over strategies, funding, and messaging of approaches including those used to address health disparities[78]. This tension mostly of ideology over needs continues to present itself during the COVID-19 pandemic with States and localities in conflict over how, when, and by who public health strategies should be employed to protect vulnerable populations. In Atlanta, for example, where more than 72% of Fulton County residents voted democratic in the 2020

presidential election, the city mayor was sued by the Republican governor over her policy to require face coverings in public places to reduce transmission of the virus[79,80].

LHD employee perceptions

Research on the perceptions of employees related to addressing health disparities was presented in the literature using related terminology akin to SDOH, public health 3.0, health equity and racism. The 2017 Public Health Workforce Interest and Needs Survey (PH WINS), a cross-sectional survey of more than 40,000 public health workers captured reflections on LHD employee awareness of approaches to address SDOH and their perceptions about actions LHDs should take. More than half of the employees felt that their agencies should be involved activities that involve cross-sector collaborations to advance health equity (the conceptual approach of Public Health 3.0) with this belief being stronger amongst those with public health degrees, more education or are Black or African American[81,82]. This same study found that those at multi-county jurisdiction LHDs were more than three times as likely to believe that their organization should be very involved in efforts affecting health equity. A team of researchers desiring to understand the LHD role in responding to the housing foreclosure crisis found that of employees at 159 LHDs, nearly 29% believed LHDs should "focus on environmental health and safety related to housing" and just 18 % felt the LHD should "address social factors that affect health, such and foreclosure and housing[83]."

The role of racism in gaps in health outcomes was noted in the IOM report which concluded that inequities in healthcare were tied to institutional racism[21,84]. One study evaluated anti-racism training at a LHD and found that those who perceived additional (optional) training as relevant to their work and needed were those aware of population shifts in their community[84]. Taken together, the literature suggests that a high number of employees at LHD desire to have

their agencies address the drivers of disparities in their communities, but variability exists on what approaches should be taken.

Chapter 3 Methods

The purpose of this exploratory study is to 1) understand which activities are perceived as most impactful by chronic disease prevention practitioners at local health departments 2) compare activities perceived as impactful by practitioners to those used by LHDs and 3) determine which variables are associated with LHDs utilizing the activities perceived as impactful. This approach seeks to gather the experiential evidence from LHD practitioners that is rooted in the accumulation of their varied experiences, skills, and comprehension of the nature of the work at a LHD[85].

Rationale: Eliminating health disparities has been a goal in Healthy People 2010, 2020, and 2030[25,86]. Because of this, there has been a growing interest in evaluating strategies and understanding where pressure could be applied to have greater impact on health disparities. LHDs serve a critical role in the overall governmental public health system and have much greater proximity to the citizenry than the federal government. Current data that exists on the functioning of LHDs allows for further examination of the connection between specific LHD organizational variables and their relationship to activities to address disparities. To date, there has not been an exploration of the perceived impact(s) of the various types of activities (as defined by NACCHO) used at LHDs by those who work at these agencies[16,17]. Understanding the perceptions of staff at LHDs about the efforts undertaken by their organization may inform the literature on effective strategies to address health disparities. To provide this insight, chronic disease prevention staff at LHDs were selected as the community of interest for the following reasons 1) the author's prior experience working in LHD chronic disease prevention including the use of population based strategies 2) the more than $3 trillion expenditure on health care in 2019 for treatment and management of chronic disease in the US and 3) addressing disparities in

chronic condition will likely have the largest overall impact on the improvement of health in the US population[87,88].

Study Design: Primary and secondary data were used to conduct this exploratory research study. Primary data was collected from chronic disease prevention professionals via an online survey developed by the author. A request to complete the survey was sent via email to a pre-defined selection of local health departments. The 2016 NACCHO Profile, US Census designation, and a Ballotpedia listing of party affiliation provided secondary data. Details of the data used, and the tool are provided below followed by the approach to analysis. The 2016 NACCHO Profile was selected for the focus of this dissertation because it is the most recent survey data available containing the question on health disparities activities. A direct year to year comparison of activities completed and perceptions of staff was not possible due to the absence of data on staff perceptions and the discontinuation of the health disparities question in the NACCHO Profile assessments. This study was reviewed by the Georgia State University Institutional Review Board and deemed exempt.

A. Description of the data sources

Primary data collection

Primary data collection consisted of distribution of a six-question assessment tool developed by the author and provided to public health practitioners. It serves the purpose of capturing experiential evidence of practitioners at local health departments and their perception of which activities are most impactful to address health disparities.

Participants. The study population was LHD employees who currently work in chronic disease prevention and intervention departments. This group was selected because of the author's

professional working experience in this content area as opposed to a subordination of other types of employees whose work also seeks to reduce health disparities. The group selected were current employees at the 482 LHDs who received Module 2 of the 2016 Profile (secondary data) in which LHDs were asked to detail the number and type of activities used to address health disparities. Inclusion criterion was current work in chronic disease prevention and intervention. Depending on the size of the LHD, these employees may be line staff, team/department leaders and in some cases, the executive of the agency.

Recruitment. Before the survey was distributed, it was piloted with 7 staff of local health departments in Georgia and California for face validity and the evaluation of completion time. The two states were those where the author had most recently worked in LHDs and thus staff could be easily accessed. There were no modifications to the survey following pilot testing. An email was sent to the point of contact at the 482 LHDs who were asked to complete Module 2 of the 2016 Profile. The contact information for the LHD was taken from the LHD Directory housed on the NACCHO website (https://www.naccho.org/membership/lhd-directory). This directory provided the name, mailing address, phone number email and website (if applicable). The contact for the agency listed was generally an executive or an administrator. The email invitation requested that the survey be forwarded to the appropriate person who worked in chronic disease prevention. In instances where an email address was not listed or was found to be undeliverable, an internet search was conducted to locate an alternate contact.

Questionnaire. The six-question online survey was developed by the author based on the 2016 NACCHO Profile assessment by extracting the single question used to measure the number and type activities to address health disparities coupled with validated location and educational demographic inquiries. The latter validated questions were taken from the Qualtrics

XM Survey libray[89]. The survey asked the participants to respond to three demographic questions: name and location of their health department and the highest level of education the respondent has attained. There were four broad education groups (Associates, Bachelors, Masters, Doctorate) used in the secondary data that were included in this questionnaire. A fourth question was an option for respondents who attained a masters or doctoral degree which prompted the respondent to identify degree type. The fifth question ask participants to select three of the nine activities they felt were most impactful. The final question was an open-ended response wherein the respondent provided an example of an impactful activity or strategy employed at their LHD.

Data Collection Period. Survey responses were captured in the Qualtics XM platform between March 23-April 23, 2021.

Secondary Data Sources

NACCHO Profile

NACCHO has conducted the Profile approximately every three years from 1989 through 2019 [13]. The survey is conducted to capture and document all aspects of LHD functioning including leadership, workforce, financial resources, and activities with the expressed intent of documenting the most accurate view of the practice and infrastructure of LHDs in the U.S. Two organizations fund the dissemination and analysis of the Profile. The Centers for Disease Control and Prevention (CDC) has funded the assessment since its inception, while the Robert Wood Johnson Foundation began its support in 2008. In 2016, there were 2,533 agencies that were classified as LHD defined as "an administrative or service unit of local or state government, concerned with health, and carrying some responsibility for the health of a jurisdiction smaller than the state"[2]. LHDs in forty-eight of the fifty states were selected to participate in the 2016

survey. The two states that have historically been excluded were Rhode Island and Hawaii due to not having local units below the state level[2]. Hawaii was added to the Profile for the first time in 2019. The Profile included survey design weights to account for disproportionate responses rates. These weights were provided with the data and used in this analysis. The NACCHO Profile does not capture information on the functioning of the federally recognized tribal public health agencies.

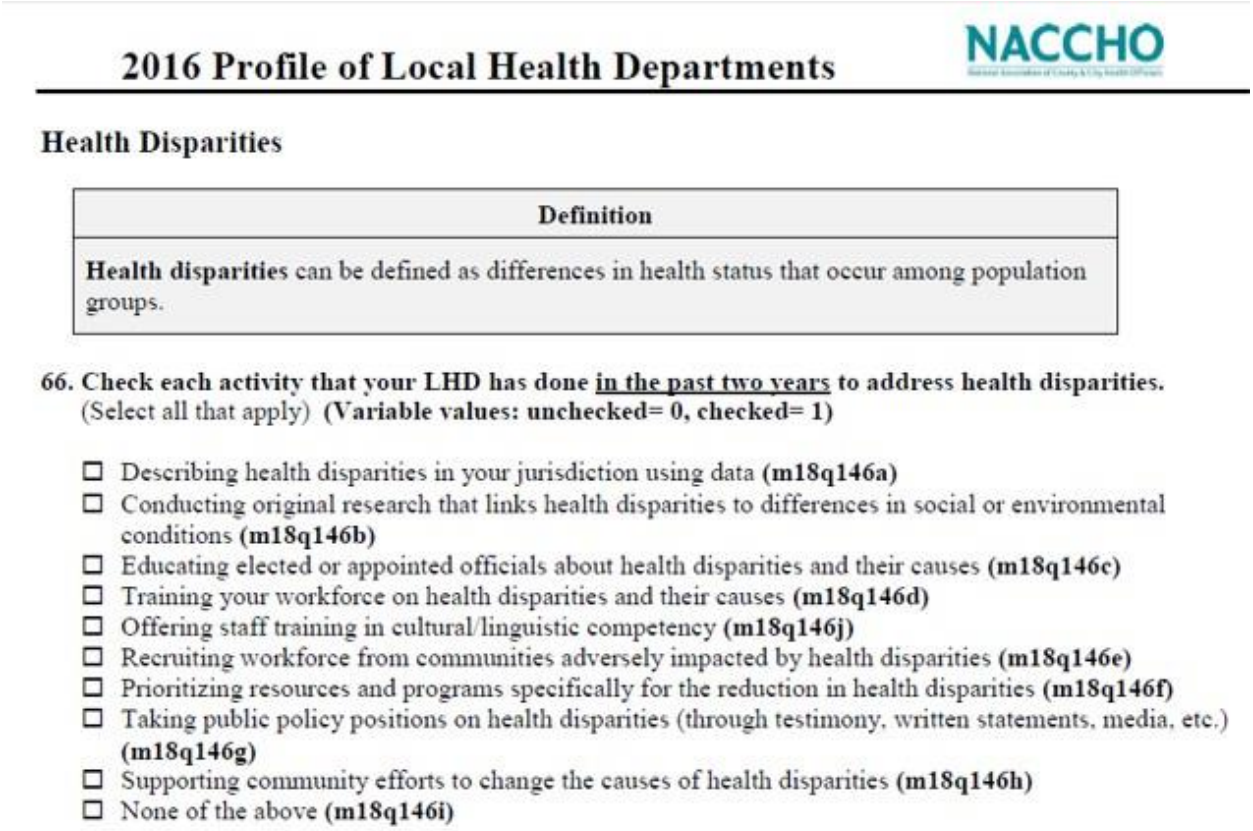
The response rates for this self-administered assessment varied by state and jurisdiction size. The response rate by jurisdiction size is shown in Table 1 below. Fifteen states and Washington DC had a response rate of 100%. Other states, except for Massachusetts and Indiana LHDs, had a response rate above 60% resulting in an overall response rate of 76%. There were three possible variations of the survey: a Core survey only, the Core survey plus Module 1 or the Core survey plus Module 2. A process of stratified random sampling was used to determine which LHDs received either of the modules[90]. The variable of interest was housed in Module 2 and those selected to receive the module was N=482. The response rate for Module 2 was 97%.

Table 1: Response Rate for 2016 NACCHO Profile

Population Served	#LHDs in the Study Population	#LHD Respondents	Response Rate
<25,000	1,304	691	67%
25,000-49,999	527	418	79%
50,000-99,999	384	308	80%
100,000-249,999	304	262	86%
250,000-499,999	141	122	87%
500,000-999,999	96	86	90%
1,000,000	47	43	91%
TOTAL	2533	1930	76%

Figure 4 displays the definition, question, and nine response items as they were presented to the LHDs.

Figure 4: NACCHO Module 2 Health Disparity Question



2016 Profile of Local Health Departments NACCHO

Health Disparities

Definition
Health disparities can be defined as differences in health status that occur among population groups.

66. Check each activity that your LHD has done <u>in the past two years</u> to address health disparities. (Select all that apply) **(Variable values: unchecked= 0, checked= 1)**

- ☐ Describing health disparities in your jurisdiction using data **(m18q146a)**
- ☐ Conducting original research that links health disparities to differences in social or environmental conditions **(m18q146b)**
- ☐ Educating elected or appointed officials about health disparities and their causes **(m18q146c)**
- ☐ Training your workforce on health disparities and their causes **(m18q146d)**
- ☐ Offering staff training in cultural/linguistic competency **(m18q146j)**
- ☐ Recruiting workforce from communities adversely impacted by health disparities **(m18q146e)**
- ☐ Prioritizing resources and programs specifically for the reduction in health disparities **(m18q146f)**
- ☐ Taking public policy positions on health disparities (through testimony, written statements, media, etc.) **(m18q146g)**
- ☐ Supporting community efforts to change the causes of health disparities **(m18q146h)**
- ☐ None of the above **(m18q146i)**

This dataset was provided by Dr. Sergey Sotnikov, in the Center for State, Tribal, Local, and Territorial Support at the CDC through and user agreement that was made available to the author during a doctoral level practicum at the CDC.

US Census Bureau

The US Census Bureau is the largest statistical agency in the federal government and provides various data on the US population including population estimates and regional designations[91,92]. This data was publicly available and used to group location of LHDs by Census region.

Ballotpedia

Ballotpedia is a 501(c)3 charitable nonprofit organization that produces an online encyclopedia of information pertaining to US politics and elections including election results and political party affiliation[93]. This data source was selected based on ease of use and provided a listing of the name and party affiliation of the governor for each state at the time during the time period the Profile was administered.

B. Independent Variables

LHD inputs were selected from the secondary datasets. Variables that prior research has shown to be associated with LHDs performance and an increased number of health disparities activities or health outcome were included in this analysis and are detailed below. Policy related variables, census region, local board of health authority, and political party of the state leader were selected and included for analysis to examine new associations.

LHD Executive Education (NACCHO Profile)

The executive is defined by NACCHO as "the highest-ranking employee with administrative and managerial authority at the level of your LHD. In certain cases, this might be

the director of a regional or district office." LHDs reported all educational degrees acquired by the executive. There were 18 possible named degrees in four broad education groups with a write-in option at each level. This included two named Associates degrees, three named Bachelors degrees, five named Masters degrees, and eight named Doctoral degrees. The reference group for this variable are leaders with Bachelors degrees. This group was selected because it was the lowest degree in public health that is currently awarded at accredited schools and programs of public health. Leader education provided details that allowed for the comparison by education type, public health education and clinical education. The reference group for these variables are leaders whose education was not public health or not clinical. These groups were selected because they were expected to be highest in frequency.

LHD Executive Race (NACCHO Profile)

LHDs reported the identified race of the executive. The options provided were not mutually exclusive. There were six options: American Indian or Alaskan Native, Asian, Black or African American, Native Hawaiian or Other Pacific Islander, some other race, and White. Ethnicity was reported in a separate question and not used in this dissertation to reduce the complexity of analysis resulting from the multiple response selection of the race and the expectation of unstable statistical results. Prior Profile results reflect low counts for the Hispanic/not Hispanic identifier: 2% or less from 2005-2013[26,27,94]. The reference group for this variable are leaders that do not identify as a person of color. This group was selected because it was expected to be in highest frequency.

LHD Executive Gender (NACCHO Profile)

LHDs responded to a binary option for gender: female or male. The reference group for this variable are leaders that identify as male. This group was selected because of prior research selecting this group as the reference group.

LHD Executive Age (NACCHO Profile)

LHDs reported the age of the executive in a whole number at the time of the survey.

LHD Executive Years of Service (NACCHO Profile)

LHDs provide the date that the top executive assumed the position. This dissertation is concerned with tenure greater than two years as inquiry into activities conducted to address health disparities is time bound asking "in the past two years". The reference group for this variable are leaders with 20 or more years of service. This group was selected because of prior research using this group as the reference group.

Governing Board and Authority (NACCHO Profile)

LHDs reported (YES or NO) on whether the agency was overseen by a Board of Health and if YES, the LHD selected the range of authorities the board has. This dissertation is concerned with the selection of any of the following authorities: *adopt public health regulations; advise LHD or elected officials on policies, programs, and budgets; set policies, goals, and priorities that guide the LHD.* The reference group for this variable are LHDs who reported no to all of these authorities. This group was selected because it was expected to be in highest frequency.

Community Health Assessment and Planning (NACCHO Profile)

LHDs reported if the agency completed a community health assessment. A YES response was associated with a timeframe (within 3 years; >3 years but <5 years; 5+ years). A NO

response was either NO or NO with plans to do so in the next year. This dissertation in concerned with the response *YES, within the last 3 years.* The reference group for this variable are LHDs who reported no to this activity. This group was selected because it was expected to be in highest frequency.

LHD Policy Variables (NACCHO Profile)

LHDs responded to a series of questions on policymaking and advocacy. This first was to provide indication of which activities were undertaken in the past two years. There were twenty stated options, an *other* response, and a *none* response. This dissertation is concerned with the selection of the *chronic disease/obesity or tobacco, alcohol, or other drugs* options. The reference group for this variable are LHDs who reported no to these activities. This group was selected because it was expected to be in highest frequency.

Jurisdiction population (NACCHO Profile)

LHDs were not asked to provide the jurisdiction population. NACCHO previously recorded the 2014 US Census estimates and provided this information as an additional variable in the dataset. The reference group for this variable are LHDs in the small population (<50K) category. This group was selected because it was expected to be in highest frequency.

US Census Region (Census)

LHDs were not asked to provide the US Census Region that they belonged to. The 2010 Census Regions and Divisions of the United States map was used for this purpose. The reference group for this variable are LHDs located in the South census region. This group was selected because it was expected to be in highest frequency due the higher number of states that occupied this region.

Jurisdiction type (NACCHO Profile)

LHDs were not asked to provide the jurisdiction type (city, county, city-county, multi-city, multi-county). This information was previously recorded by NACCHO and provided as an additional variable in the dataset. The reference group for this variable are County-level LHDs. This group was selected because it was expected to be in highest frequency.

Governance category (NACCHO Profile)

LHDs were not asked to provide the level of governance (local, state or mixed). This information was previously recorded by NACCHO and provided as an additional variable in the dataset. The reference group for this variable are LHDs that are locally controlled. This group was selected because it was expected to be in highest frequency.

Party (Ballotpedia)

LHDs were not asked to provide the party affiliation of the governor of their state. A Ballotpedia listing of US governors that were in office as the end of the survey period (April 30, 2016) was used for this purpose. Democratic and Independent governors were coded the same. The reference group for this variable are LHDs located in states with Republican governors. This group was selected because it was expected to be in highest frequency.

C. Dependent Variable (NACCHO Profile)

The completion of the three perceived impactful activities to address health disparities was the primary outcome of interest with a sub outcome of the total number of activities completed. The list of nine activities were presented in identical order in both the primary and secondary data. Their inclusion in the primary data served to inform the grouping of the activities

in the Profile. These were presented as they were presented in the Profile as reflected in Figure 4. These activities included:

- *describing health disparities in your jurisdiction using data;*
- *conducting original research that links health disparities to differences in social or environmental conditions;*
- *educating elected or appointed officials about health disparities and their causes;*
- *training your workforce on health disparities and their causes ; offering staff training in cultural/linguistic competency;*
- *recruiting workforce from communities adversely impacted by health disparities; prioritizing resources and programs specifically for the reduction in health disparities;*
- *taking public policy positions on health disparities (through testimony, written statements, media, etc.);*
- *supporting community efforts to change the causes of health disparities*

D. Data Analysis

The primary data collected from LHD staff was captured and summed in Qualtrics XM. For each of the nine activities, frequencies were calculated for overall selection and selection as a most impactful strategy. The three most impactful strategies selected by staff were used as the basis to create a dichotomous variable in the Profile dataset in SAS. Other variables in this dataset were collected for descriptive purposes. Some variables were dichotomized. For example, highest level of education was dichotomized into public health education (MPH, DrPH =1) and non-public health education (all others =0).

The Profile data were analyzed using SAS software (version 9.4). Inclusion criteria was that the LHD responded to the question of interest and the unit of analysis is the local health department. The Profile used a randomized stratified sampling method to include survey weights to account for disproportionate responses from various types and sizes LHDs. To analyze this complex survey design specialized procedures in SAS were required. These procedures were *proc surveymeans*, *proc surveygreq*, *proc surveyreg*, and *proc surveylogistic*. Responding LHD's from the primary data collection were matched to their agency in the Profile. The three activities selected as most impactful were grouped where a yes response indicated that the LHD completed all three activities. The population total variable (continuous) was recoded into three groups: small, medium, and large to align with previous reporting used by NACCHO. Table 2 reflects these changes.

Table 2: Population Size Groups for NACCHO Profile respondents

Jurisdiction population (c0population)	Group designation
Under 50,000 residents	Small
50,000 – 500,000 residents	Medium
Over 500,00 residents	Large

Several variable responses were operationalized and characterized as dichotomous to align with prior research and application in analysis. These include leader public health education, leader clinical degree, and leader's race. Others were dichotomized to answer the research question in this dissertation. These include the type of local board of health authority, policy activity, alcohol, tobacco or other drug (ATOD) policy activity, and community health assessment in the past three years. Finally, leader highest education and years of service were grouped to align with prior research. To create years of service, responses indicating the

organizational start date of the leader was subtracted from the last date of data collection 4/30/2016. Table 3 reflects these changes.

Table 3: Independent Variable Transformation

Variable	Transformation
LHD executive education	public health education or not (BSPH, BPHA, MPH, MSHS, DrPH, Phd)
LHD executive highest education	Non reported or by specific degree
LHD executive clinical education	clinical degree (MD, DO, MSN, DNP, DVM, BSN) or not
LHD race	self-identified person of color or not
LHD Tenure [1]	under 5 yrs 5-9 yrs 10-14 yrs 15-19 yrs 20+ yrs
LBH authority	yes to two selected authorities or no
Community Health Assessment	yes in the past three years or no
Policy activity	yes to any activity or no
Policy type	yes to selection of chronic disease/obesity OR alcohol, tobacco, other drug or no

A US Census Region[92] variable was created in both the primary data and the Profile based on the state where the LHD is located. Table 4 reflects the region designations.

Table 4: US Census Regions

US Census Region	States included
Region 1: Northeast	ME, NH, VT, NY, PA, NJ, CT, RI, MA
Region 2: Midwest	ND, SD, NE, KS, MO, IA, MN, WI, IL, IN, OH, MI

[1] Tenure of two years or less was excluded from the analysis. Questions were asked "…in the past two years" thus a new executive would have not likely influenced any of the activities questioned.

Region 3: South	DE, VA, WV, MD, KY, NC, SC, TN, GA, FL, AL, MS, AR, LA, TX, OK
Region 4: West	MT, ID, WY, CO, NM, AZ, UT, NV, CA, OR, WA, AK, HI

Table 5: Research Questions

Research Questions	Analytic Approach
1) Are LHDs conducting all three of the activities that are viewed as impactful	Descriptive, frequencies
3) Are there individual variables that contribute to the difference in the mean number of health disparities activities conducted at LHDs in this sample?	Bivariate logistic regression

A multi-variable model was considered for this research, but not utilized. The sample size was small and failed to meet the assumption of little to no multi-collinearity. Methods to address these challenges would be to increase sample size (not possible) or to remove potentially correlated variables (not desired). This exploratory process sought to assess crude relationships and not make predictions.

Bivariate logistic regression modeled the relationship between the completion of the variable representing the top three impactful activities and each of the independent variables for the LHD's who provided responses for the online questionnaire and the Profile. Each bivariate logistic regression model produced odds ratios (ORs) with 95% confidence intervals for each of the independent variables explored. Weighted analysis was used to calculate the mean and standard deviation due to the complex survey design of the Profile and the assumption that the data was not normally distributed. These calculations were performed in SAS. Statistical significance for rejecting the null hypothesis was set at p value below 0.05 and these results are bolded in the results.

Chapter 4 Results

The results of this research are presented in two sections. Section I provides descriptive statistics of the LHD leader, organization, and activities used to address health disparities. This section also contains the mean number of activities to address health disparities completed by variable: leader characteristic, organization characteristic, and external characteristic. Section II provides results of bivariate logistic regression reflecting the odds ratio for the association of individual variables and the completion of all three activities deemed most impactful.

482 LHDs identified by NACCHO were contacted to complete the survey for primary data collection. There were two instances where an email for the point of contact could not be identified and in seven instances, the LHD name changed (i.e consolidated into a larger region or city department absorbed by the county). In these cases, emails were sent to the successor agency. A total of 489 initial emails were sent and 780 follow-up requests within two weeks of the initial email. LHDs were not restricted in the number of responses, thus 133 responses from 109 LHDs in 35 states were submitted. Nine LHDs provided two responses. The first response was used for the tally of the perceived impactful activities. One LHD provided six responses. For this response, the most frequent activities selected were used as response for this LHD.

In the Profile, 482 LHDs received Module 2 and 469 in 45 states responded to the health disparity activity question. There was a single LHD in the city county jurisdiction category that was removed from this analysis for the purpose of simplification. This jurisdiction type is unique in the US and only occurs in the state of Virginia. The brought to total of LHDs in the Profile to 468.

There were three LHDs who completed the survey for this dissertation, but who did not respond to the Profile Module 2 assessment and thus removed from the analysis. The final

sample size for analysis was 105 LHDs. The remaining 363 local health departments in the Profile are reflected only in the next section for the purpose of comparison.

Section I: Descriptive statistics of the LHD, leader, and strategies used to address health disparities

LHD demographics

Informal comparisons of the Profile were not subject to statistical analysis but revealed that the distribution of organizational and external variables evaluated in this dissertation were similar amongst the LHDs who responded to the questionnaire and those who did not. Of the ten categories of variables reviewed, seven were virtually identical in distribution. The difference between the two samples lies in the distribution of LHD's by region, governance category, and the presence of a local board of health. In both groups there was a heavy concentration of local health departments located in the South and the Midwest, making up more than 70% of all LHDs in both cases. However, for those who responded to the primary data collection portion (responding LHDs), half were located in the Midwest whereas in the non-responding group only 35% were located in the Midwest. Also, for the responding LHDs more than 80% were governed locally (i.e., decentralized) whereas in the non-responding group 70% were governed locally. Lastly, there was a 5% difference in the percentage of LHDs that were overseen by local boards of health. Surprisingly, greater than 95% of LHDs in both groups reported participating in policy advocacy work. The political party affiliation of the governors of the states was added to the Profile. The majority of states were Republican-led during the time of the Profile assessment with one independent in the sample that was coded as a Democrat. Table 6 displays all organization and external characteristics of the LHDs that responded to Module 2 of the Profile.

Table 6: Comparison of the frequency of independent variable characteristic for LHD

Characteristic		Responding n (%)	Non-responding n (%)
Local Board of Health			
	Yes	68 (67)	222 (64)
	No	35 (33)	132 (36)
Local Board of Health Authority			
	Yes	38 (59)	147 (66)
	No	29 (41)	74 (34)
Community Health Assessment			
	Yes	64 (58)	224 (60)
	No	41 (42)	128 (40)
Policy			
	Yes	102 (97)	319 (92)
	No	3 (3)	28 (8)
ATOD/CD policy			
	Yes	57 (47)	172 (46)
	No	48 (53)	175 (54)
US Census Region			
	Northeast	19 (18)	62 (17)
	Midwest	48 (50)	120 (35)
	South	24 (22)	131 (36)
	West	14 10)	50 (12)
Population			
	Small (<50K)	45 (56)	184 (62)
	Medium (50-500K)	41 (36)	137 (33)
	Large (>500K)	19 (8)	42 (5)
Jurisdiction Type			
	City	9 (10)	47 (14)
	County	78 (75)	265 (74)
	Multi-City	6 (6)	14 (4)
	Multi-County	12 (9)	37 (8)
Governance			
	Local	86 (81)	243 (67)
	State	12 (12)	86 (24)
	Mixed	7 (7)	34 (8)
Party[1]			
	Democrat	39 (36)	128 (34)
	Republican	66 (64)	235 (66)

[1] This count does not represent the number of leaders. Party represents the party of the leader of the state where the LHD is located, so there is overlap within states.

LHD Leader

There were no inquiries about the current leader in the primary data collection. The average age of the leader in the responding LHDs at the time of the 2016 Profile was 52 and their tenure was just under 8 years. Fifty percent of leaders possessed a Master's degree and 9% had doctoral degrees. 32% of the leaders were trained in public health and 92% did not identify as a person of color and most were female.

Health Disparity Strategies

For each of the nine activities listed in the Profile, 6% of LHDs reported not using any given activity. Thus, 94% of the local health departments completed at least one activity to address health disparities. The activities reported as used most often by local health department were *describing health disparities in your jurisdiction using data* (71%) and *supporting community efforts to change the causes of health disparities (67%)*. In the 2021 survey, the top three activities selected as most impactful, in order, were 1) *supporting community efforts to change the causes of health disparities 2) prioritizing resources and programs specifically for the reduction in health disparities* and 3) *describing health disparities in your jurisdiction using data.* Comparing the activities viewed as most impactful to the activities that were completed in 2016; there was overlap with the first and third ranked activity, but not the second - *prioritizing resources and programs specifically for the reduction in health disparities.* Table 7 reflects these comparisons with the activities selected as most impactful highlighted.

Table 7: Activities used by LHDs to address health disparities

Activities to Address Health Disparities	Responding n (%)
1) Describing health disparities in your jurisdiction using data	**79 (71)**
2) Conducting original research that links health disparities to differences in social or environmental conditions	19 (15)
3) Educating elected or appointed officials about health disparities and their causes	61 (53)
4) Training your workforce on health disparities and their causes	**70 (62)**
5) Offering staff training in cultural/linguistic competency	63 (55)
6) Recruiting workforce from communities adversely impacted by health disparities	30 (27)
7) Prioritizing resources and programs specifically for the reduction in health disparities	50 (44)
8) Taking public policy positions on health disparities (through testimony, written statements, media. Etc)	23 (17)
9) Supporting community efforts to change the causes of health disparities	**75 (67)**
None of the above	5 (6)

Sixty-six respondents to the primary data collection provided descriptions of strategies used at their agency that they viewed as impactful. About 10% of the examples provided described strategies that reflected efforts targeted at an individual such as education, counseling or clinical interventions. The remaining majority discussed strategies aimed at policy, systems, and environmental changes. No additional analysis was conducted.

Comparison of mean activities completed by independent variable

The overall mean number of activities to address health disparities reported by LHDs in 2016 was M=4.11. There were 16 independent variables representing leader, organizational, and external characteristics assessed in this analysis. Tables 8 through 10 display the results of

weighted analysis to compare the mean number of activities conducted by characteristic and the results of *t tests* to determine statistical significance between the respective groups.

There was a linear relationship between the leader's education and the mean number of activities completed. The leadership characteristic had the highest mean number of activities completed, were leaders with doctoral degrees having a mean of 5.32. There was a statistically significant difference in the mean number of activities completed relative to the time that the leader had been at the agency. Leaders who had been at the agency from 10 to 14 years had the highest mean in this group, while leaders who had been at the organization for twenty or more years had the lowest.

The organizational characteristic with the highest number of health disparities activities completed, were LHD's who participated in ATOD/CD policy advocacy. There were statistically significant differences in the mean number of activities completed by LHDs who participated in any policy advocacy, as well as those who participated in ATOD/CD policy relative to the organizations that did not. Any policy advocacy effort was the result of the selection of one or more of the 20 provided options in the Profile. The statistical significance of those who participated in any policy advocacy is not reliable or stable due to the small number of LHDs who did not participate in any policy (n=3).

The external variable with the highest average of health disparities activities completed, was large population where M = 5.88. Across the external characteristics, there was a statistically significant difference between the mean number of activities completed by census region, population group, and jurisdiction type. The standard deviation for all variables was close in value to actual mean due to the maximum number of activities being 9. The overall mean

number of activities completed was 4.11 resulting in a standard deviation that essentially one-sided due to the overwhelming positive skew of the data.

Table 8:Mean number of activities completed by responding LHDs by leader characteristic

Characteristic	n (%)	Mean ± SD	*p* value
Education			
PH degree			
Yes	36 (32)	4.59±4.78	0.21
No	64 (68)	3.94±5.57	
Clinical Degree			
Yes	27 (28)	3.88±5.48	0.50
No	73 (71)	4.26±5.28	
Highest Degree			
No reported degree/no degree	5 (5)	3.54±4.37	
Associates	5 (5)	3.34±5.12	0.20
Bachelors	26 (31)	3.6±6.79	
Masters	54 (50)	4.36±4.72	
Doctorate	15 (9)	5.32±4.00	
Race			
Self-Identified Person of Color	8 (7)	4.40±5.65	0.79
Self-identified non Person of Color	92 (93)	4.12±5.37	
Binary Gender			
Female	65 (66)	3.96±5.55	0.32
Male	39 (34)	4.46±4.76	
Tenure			
Less than 5 years	17 (20)	4.75±4.50	
5-9 years	19 (32)	4.32±6.30	**0.02**
10-14 years	11 (19)	5.14±3.76	
15-19 years	7 (11)	3.54±7.31	
20+ years	10 (18)	2.45±4.65	

Table 9: Mean number of activities completed by responding LHDs by organizational characteristic

Characteristic		n (%)	Mean ± SD	*p* value
Local Board of Health				
	Yes	68 (67)	4.41±4.94	0.06
	No	35 (33)	3.43±5.66	
Local Board of Health Authority				
	Yes	38 (59)	4.22±5.35	0.33
	No	29 (41)	4.74±4.04	
Community Health Assessment				
	Yes	64 (58)	4.39±4.90	0.20
	No	41 (42)	3.73±5.74	
Policy				
	Yes	3 (3)	4.20±5.17	**0.03**
	No	102 (97)	1.66±6.06	
ATOD/CD policy				
	Yes	57 (47)	5.24±5.24	**<0.00**
	No	48 (53)	3.12±5.28	

Table 10: Mean number of activities completed by responding LHDs by external characteristic

Characteristic		n (%)	Mean ± SD	*p* value
US Census Region				
	Northeast	19 (18)	2.82±4.78	
	Midwest	48 (50)	4.08±5.73	**0.01**
	South	24 (22)	4.76±4.24	
	West	14 10)	5.16±4.45	
Population				
	Small (<50K)	45 (56)	3.36±5.97	**0.00**
	Medium (50-500K)	41 (36)	4.86±4.26	
	Large (>500K)	19 (8)	5.88±3.27	
Jurisdiction Type				
	City	9 (10)	1.71±4.34	
	County	78 (75)	4.30±5.12	**<0.00**
	Multi-City	6 (6)	3.38±3.88	
	Multi-County	12 (9)	5.84±3.80	
Governance				
	Local	86 (81)	4.03±5.51	0.14
	State	12 (12)	5.01±3.86	
	Mixed	7 (7)	3.58±3.68	
Party				
	Democrat	39 (36)	4.10±5.34	0.09
	Republican	66 (64)	4.12±5.26	

Section II: Odds Ratios

Bivariate logistic regression analysis was used to produce odds ratio for independent variables that may be associated with the completion of the activities. In 2016, an average of six activities were completed by LHDs who had completed all three activities perceived as impactful in the primary data collection (M=6.52). No leader characteristic was deemed statistically significant in the analysis. The confidence intervals for the tenure variable for each grouping were wide due to the low number of LHDs who provide start date of the leader resulting in low precision for this estimate. Results for this analysis is displayed in Table 11.

Table 11: Odds Ratio for Completion of all Impactful Activities by leader characteristic of responding LHDs

Characteristic		OR	95% CI	*p* value
Education				
PH degree				
	Yes	1.32	0.53-3.27	0.54
	No	Ref		
Clinical Degree				
	Yes	0.72	0.28-2.02	0.53
	No	Ref		
Highest Degree				
	No reported degree/no degree	0.98	0.12-8.50	0.84
	Associates	0.49	0.04-5.51	
	Bachelors	Ref		
	Masters	0.89	0.32-2.50	
	Doctorate	1.73	0.42-7.14	
Race				
	Self-Identified Person of Color	0.84	0.16-4.46	0.84
	Self-identified non Person of Color	Ref		
Binary Gender				
	Female	0.68	0.28-1.64	0.38
	Male	Ref		
Tenure				
	Less than 5 years	5.19	0.44-60.98	0.76
	5-9 years	3.40	0.39-49.16	
	10-14 years	3.32	0.24-45.86	
	15-19 years	4.95	0.33-74.942	
	20+ years	Ref		

Two organizational characteristics were statistically different from their reference groups for completing the perceived impactful activities. Those that participated in any policy advocacy as well as those participating in ATOD/CD policy advocacy were 3.8 times as likely to complete the three perceived impactful activities. An odds ratio estimate was unable to be produced for the policy characteristic in the responding LHD group as a result of the low number of LHDs who did not participate in any policy advocacy (n=3). These results are provided in Tables 12.

Table 12: Odds Ratio for Completion of all Impactful Activities for responding LHDs by Organization Characteristic

Characteristic		OR	95% CI	*p* value
Local Board of Health				
	Yes	1.23	0.48-3.14	0.67
	No	Ref		
Local Board of Health Authority				
	Yes	0.45	0.15-1.36	0.15
	No	Ref		
Community Health Assessment				
	Yes	0.78	0.33-1.87	0.58
	No	Ref		
Policy[a]				
	Yes	NA	NA	**<0.00**
	No	Ref		
ATOD/CD policy				
	Yes	3.80	1.55-9.33	**0.00**
	No	Ref		

[a] estimates are unstable for this calculation, due to the small number of LHDs not participating in any policy activity (n=3)

Population size and jurisdiction type were deemed to be statistically significant results in the analysis. Particularly, the odds of completing the three activities at a LHD serving a population over 500,000 was at least three times as large as the odds for a health department serving a population under 50,000. The odds of centralized LHDs (state governed) completing the impactful activities were 0.5 times the odds of decentralized LHDs completing the three activities perceived as impactful. Quasi-complete separation occurs for the jurisdiction type variable. This occurs when the dependent variable separates to some degree from the independent variable leading to an inability to estimate maximum likelihood *even with a statistically significant result*. These results are displayed in Table 13.

Table 13: Odds Ratio for Completion of all Impactful Activities at responding LHDs by external characteristic

Characteristic		OR	95% CI	*p* value
Population				
	Small (<50K)	Ref		**0.04**
	Medium (50-500K)	1.47	0.58-3.73	
	Large (>500K)	3.26	1.03-10.30	
Census Region				
	Northeast	0.44	0.11-1.86	0.53
	Midwest	1.11	0.37-3.33	
	South	Ref		
	West	1.19	0.28-5.08	
Jurisdiction Type[a]				
	City	NA	NA	**<0.0001**
	County	Ref		
	Multi-City	0.74	0.12-4.77	
	Multi-County	2.75	0.70-10.84	
Governance				
	Local	Ref		0.68
	State	0.54	0.12-2.43	
	Mixed	1.23	0.23-6.54	
Party				
	Democrat	0.81	0.33-1.98	0.64
	Republican	Ref		

[a] the results for this variable reflect quasi-complete separation of the model

Chapter 5 Discussion

The primary purpose of this dissertation was to determine which of the NACCHO defined activities to address health disparities LHD chronic disease prevention staff perceived as most impactful; and which variables from the 2016 NACCHO data may influence the use of these activities. Of the activities described in the NACCHO Profile, staff at a sample of LHDs viewed the following activities as most impactful (in order): 1) *supporting community efforts to change the causes of health disparities 2) prioritizing resources and programs specifically for the reduction in health disparities* and 3) *describing health disparities in your jurisdiction using data*. Of these activities, LHDs in the 2016 Profile most frequently performed the first and third ranked activities, and far less often the second. Less than half (44%) of local health departments said that they prioritized funding specifically to reduce health disparities compared to the 61% of staff who believe that this type of action was impactful.

Previous associations of variables linked with completion of health disparity activities include leaders with advanced degrees, leaders with clinical degrees, fulltime status of the leader, completion of community health assessment, high percentage of minority resident population and urban designation[15,16,38]. This analysis identified variables with possible association with completing the three selected activities. These variables are participation in any policy activity, participation in ATOD/CD policy advocacy, large population size, and multi-county jurisdiction. These new associations of individual characteristics of the LHD and a particular subset of health disparities activities in the Profile adds to the literature on the LHD performance.

Leadership Variables

Leadership variables in this analysis showed varying levels of significance in logistic regression, with no characteristic being statistically significant for completing the three activities perceived as most impactful. The mean number of activities was greater for leaders with public health degrees relative to those without (4.59 vs 3.94) but not statistically different. The result is not at all surprising, but it is surprising that previous researchers found that a public health education was not beneficial and at worst, detrimental to addressing health disparities[28,34]. Those results run contrary to conventional wisdom. Those trained in public health should be in the best position to lead public health agencies despite education not equating to leadership capacity. In this sample, the number of leaders without public health education dwarfed those that did. The prior negative association of public health education and performance to address health disparities could be a result of a small numbers of leaders with public health degrees. This analysis did not find a negative association with completing the activities to address health disparities nor the three activities perceived as impactful.

While the number of female leaders outnumber that of males in this research, there was no association found between gender and utilizing the three impactful strategies to address health disparities. Nor was there a statistical difference in the overall number of activities completed. As found in previous research, there was a statistical difference in the number of activities completed when compared by the leaders years of service[16]. Leaders with fewer years of service completed more activities to address health disparities at every level less than 20 years. This was an expansion of the finding by Yang and Bekemeier who only found this in leaders with less than five years of service at the agency. These leaders completed more activities on average, but

there was no statistical difference between any of the groups in completing the three activities perceived as most impactful to address health disparities.

The concept of Public Health 3.0 focuses on addressing the social determinants of health in order to improve equity- which requires a reduction in health disparities[8]. The benefit of public health education findings here supports the results of the 2017 Public Health WINS survey that found that for five of the seven public health 3.0 activities individuals having a public health degree where associated with greater odds of perceived involvement with those five activities[82] . While not explicitly about the leader the same assessment found that more than 40% of surveyed employees knew nothing about Health in all Policies, and 19.5-24.8% of employees felt that their agency should not be involved in strategies affecting the economy, built environment, housing, or transportation[82]. These views do not align with the 57% of employees who felts that their agency should be very involved in affecting health equity, revealing a clear gap in comprehension.[82] Those without public health degrees had significantly lower odds of being part of the 57%, as mentioned earlier[82]. This is especially important to note, given that nearly 90% of respondents did not have a public health degree[82]. Leader and employee understanding how strategies to address root causes of inequity is fundamental to an organization's ability to advance health equity[95].

In previous research, LHDs with a higher percentage of minority employees or surrounding minority population have been shown to be related to a higher number of activities used to address health disparities, but there is little research about the impact of race of the leader on these activities[16,38]. Similar to Yang and Bekemeier, this analysis found no statistically significant relationship between the leader's self-reported race and the number of health disparity activities completed. Too, the odds ratio for completing the three activities perceived as

impactful was less than one for leaders who identified as a person of color. Olivas found a similar result when comparing racial identification to the racial segregation index and concluded that this could be the result of historical placement of leaders of color in less resourced agencies that may have to "conform to the influencing forces of the larger white majority population[36]."

In the LHDs used in this analysis, less than 10% of the leaders identified as a person of color (n=8) a percentage not representative of the broader population. This phenomenon is not limited to public health. Direct health care leadership is woefully lacking as well. A 2015 survey found that while people of color make up 32% of hospital patients these group only make up 19% of midlevel and first level managers, 14% of hospital boards and a paltry 11% of executive leadership. A third of these leaders were concentrated in large metropolitan areas like Chicago, Philadelphia, New York, and Los Angeles[40].

By 2050, it is estimated that the majority of the population in the United States will be persons of color[96]. Thus, it only makes sense that those tasked with leading agencies to protect the health of the population actually look like the population they serve. A diverse workforce and leadership have been shown to better serve diverse populations by having a greater understanding of the contextual considerations that impact health behavior such as culture and environment[39]. Diversity in leadership in the private sector has been linked to above average positive financial returns, a measure that when applied to public health could yield better health outcomes and a reduction in health disparities[40].

Unlike prior research, this analysis show no association with clinical degrees and completion of activities[16,28]. The previous researchers asserted that clinical leaders likely had transferrable skills that allows them the to address the 10 public health essential skills and by proxy, address health disparities[16,97]. The former Health Officer in Alameda County California, Tony Iton, had

expressed concern about the "medical model" of physician training being a hurdle to addressing underlying causes of health disparities a sentiment shared by the author[98].

In the state of Georgia the District Health director (LHD leader) must be a licensed physician[99]. If a clinical credential is a prerequisite for leadership in LHD, this could mean that the jurisdiction has the capacity to pay a higher wage, and thus their activities to address health disparities could actually be tied to financial resources and not the clinical education of the leader. Several researchers have found positive connections between per capita spending and LHD performance or health outcomes [15–17,47,55]. This along with population size are reliable proxies for overall capacity. The NACCHO Profile used for this analysis had limited and incomplete data on financial resources to assess connections between per capita spending and health disparity addressing activities. Presumably, a positive connection would have been uncovered had this facet been evaluated.

Organizational Variables

Local Boards of Health

This research did not find statistically significant relationships with the completion of the top three most impactful activities relative to the presence of a Local Board of Health (LBOH) nor the selected authorities of these bodies. The research on the directional impact of LBOHs are inconclusive. Several studies have found a positive association with the presence of a local board of health and performance, use of a state specific health equity index, and obesity prevention[33,45,100–103]. Shah and Sheahan found an association with the board and LHDs completing activities to address health disparities while Yang and Bekemeier did not[16,17]. Bhandari et al as well as Mays found a negative association with the presence of a local board of health and the ability of a LHD to provide the 10 ESPHS[34,47]. However, there was a caveat to

Bhandari's findings. The research team identified a positive impact of the board of health on seven of the ten services when the board had policy-making authority[34]. This research hypothesized that three specific authorities of LBOH would impact the number of activities in general and the perceived impactful activities specifically, however found no association. One possible explanation for this is that the authorities of the local Board of Health matter less relative than how the board was comprised. In some areas, the local Board of Health is an appointed group and in others they are elected.

Community Health Assessment

As discussed in the literature review, CHAs are collaborative efforts to document, examine, and benchmark health status and trends; leading to selection of priorities, evaluation, programs and policies that match the needs of the community served [48]. The process of conducting and then reporting on the health of a community highlights the areas of greatest need in a community which in turn encourages efforts to address health disparities. It would seem logical to see the connection between the completion of a community health needs assessment and completion of activities to address health disparities. As found in prior studies, LHDs who completed a CHA completed more health disparity activities on average than those who had not completed a CHA[16,17]. This result, however, was not statistically significant nor were the odds of completing the three impactful activities more likely at local health department who completed community health assessments. Reponses in the primary data collection captured this. One LHD explained that after reviewing their youth data, found the terminology of "family planning" to discourage LGBTQ youth from seeking services. LGBTQ youth are known to have increased risk of suicide and substance often tied to stigma which reduces health seeking behaviors[104]. To address this, the LHD changed the reference point of their services by rebranding the programs

as “reproductive health”, reduced the use of gendered language and included visual cues of acceptance and treatment of sexual minorities. This action demonstrates how information from a health assessment can be used to address disparate health outcomes in populations.

Policy Participation

Participation in any policy activity and policy specific to alcohol, tobacco, and chronic disease translated into more activities and the LHDs odds of using the activities that staff perceived as impactful. The use of legislative and agency-specific policies to modify systems and structures is an effective tool to address many health issues. According to the CDC, public health policy/laws led to seven of the ten greatest public health achievements in the 20th century[95]. Commentary on the effects of laws on health is robust, particularly reflections on the lead-up to and implementation of the Affordable Care Act[58,59].

Public health policy is cost effective and efficient especially for small communities who lack the benefits of economies of scale to provide individualized interventions. Using tobacco prevention policy as an example, it is far more cost effective to restrict the areas where person is allowed to smoke than to provide individual cessation counseling and pharmacology. However, knowing that policy options are the appropriate approach to take is very different from knowing how to do it. While there is a consensus that public health professionals need to understand and be able to advance policy, there is limited training available to them[105]. A 2015 systematic review found that most of the literature on public health policy was targeted to medical and nursing personnel and not public health[105]. While training and exposure don't necessarily equate to action it is curious that most literature did not speak to the political savviness needed specifically for public health personnel.

The ability of a health department personnel to participate in policy work is often tied to the funding stream and any stipulations bound to them. Chronic diseases like diabetes, heart disease, and hypertension are the main cause of death and disability globally[106]. Funding for chronic disease prevention programs often comes from federal or state categorical funding[2] allocations. This funding, while important, limits a LHD's ability and flexibility to methodically assess the health needs of the community by requiring funding on direct services[107]. Less stringent funding models would allow for greater participation in policy efforts while addressing the SDOH instead the direct service activities common in categorically funded program.

Lastly research also reflects bidirectionality of policy advocacy: the state policy influences the local government policy and vice versa, an indication that local policy can and does influence national policy by shifting it in several states[64,65]. The city of Belmont CA was the first locality in the world to prohibit smoking in multi-unit residence in 2007[108]. The US Department of Housing and Urban Development followed suit in 2016[109]. Needham Massachusetts was the first locality to raise the tobacco purchase age to 21 in 2005, next came New York City in 2013 followed by several other cities in the nation. Hawaii became the first state to pass such a law in 2015, but a federal law wasn't enacted until 2019[110].

[2] **Categorical funding** means financial support from state and federal governments that is targeted for particular categories of students, special programs, or special purposes. This support is in addition to school district or area education agency general purpose revenue, is beyond the basic educational program, and most often has restrictions on its use. Where categorical funding requires a local match, that local match also is considered to be categorical funding. Categorical funding includes both grants in aid and budgetary allocations. Although grants in aid and budgetary allocations are both categorical funding, they are defined separately to distinguish unique characteristics of each type of categorical funding.

External Variables

Census Region

There was a statistically significant difference in the mean number of activities completed by Census Region. However, there was no statistically significant association found for the odds of completing the perceived impactful activities. Regional differences in health outcomes are well noted. For example, from May to August 2020, 45.7% of COVID-19 deaths occurred in the South[111]. Between 2003-2014 the South and the Midwest had the highest prevalence of vaccine-type HPV in women contributing to disparities in HPV related cancers[112]. Residents in the southern region of United States tend to have lower incomes, lower levels of education, and higher rates of obesity and smoking which all are contributors to poor health[113,114]. One curious result was the lower odds ratio of LHD's in the Northeast for completing the perceived impactful activities relative to the South and this region completing the fewest overall average number of activities by census group.

Politically left leanings of the state could be at play. It is often thought that California, particularly, or the West in general is home to the most liberal states in the nation. Of the top 10 liberal states according to Gallup, 6 of them are in the Northeast[115]. According to Sharecare's Community Well-Being Index 4 of the 5 healthiest states in 2020 were located in the Northeast (Massachusetts, Hawaii, New Jersey, Maryland, New York)[116,117]. One explanation for the Northeast LHDs not fairing so well is the presence of statewide policies to address the drivers of disparities resulting in fewer efforts that need to be taken on by the LHD. The top 5 healthiest states each had cigarette excise taxes greater than two dollars, had expanded Medicaid and had minimum wages over $8 as of 2017[118]. In contrast, Georgia's excise tax is a mere $0.37, it has

not expanded Medicaid, and the minimum wage is $5.15 sharing the spot for lowest minimum wage in the nation with Wyoming[118].

Population

Large population was associated with the completion of three impactful strategies to address health disparities and had the highest overall mean number of activities completed for any of the 16 variables. Assessments of LHDs completion of the 10 Essential Public Health Services (proxy for performance) consistently show the positive influence of population size in the jurisdiction. As the size of the population served increases, so does performance[1,17,76,100]. Even on a single state scale, population was a predictor of use of a Health Equity Index that allowed LHDs to better understand the social determinants of health with jurisdictions with that were more diverse and less financially stable being most interested[101]. The distribution of population is an indicator as well. Olivas et al (2016) found that local health departments in communities with greater segregation between people color and those not of color performed more activities to address health disparities.[36] Population is not a modifiable condition for local health department, instead it just provides the positive or negative conditions for their work

Jurisdiction Type

LHD's that served multi county areas had a significantly greater overall mean number of activities completed relative to the other jurisdiction types. This group also had an almost three times the odds of completing the perceived impactful activities relative to single county jurisdictions. Humphreys et al (2018) found in an analysis of two states that jurisdictions that shared or combined resources invested more per capita on healthy food access activities and offered more community health programs[119]. A population threshold of 100,000 has been shown to yield the most efficient use of per capita spending (economies of scale) for LHDs; but more

than three quarters of LHDs nationally and more than half in this analysis serve populations less than this[2,120–122]. This consolidation of efforts, resources, and manpower likely explains the use of more strategies.

Governance Type

Differences in governmental structure often drives the ratio of funding that flows to LHDs from local, state, or federal sources and outside grants. Decentralized LHDs or more likely to get a larger portion of their budget from local sources than centralized ones and this plays a role in how the funds may be used to address health disparities. There was insufficient data in the Profile to compare the ratio of funding by source. However, this is an area that should be explored greater in the Profile. Greater percentages of funding from categorical sources at LHDs coupled with potential reduction of public health powers (discussed below) could substantially hamper the efforts of LHDs to address health disparities.

In the analysis, there were 12 LHDs who were governed by a centralized or state-led governance structure. All agencies were in states that were Republican led, thus a comparison mean number of activities by party of state leader could not be performed. There was a higher average number of activities completed by LHDs that were in centralized structures, but the odds of completing the three perceived impactful activities was about half that for LHDs in centralized states compared to the odds of those that were decentralized.

"A major reason we don't reduce disparities is the different ideological treatment of outcome" – Nobel Laureate Amartya Sen

Political Determinant

Party affiliation was included because public health is political and the political leanings of elected officials tend to influence how they value (or not) efforts to advance health equity and LHD staff need to be able to assess the political climate[43,123]. This research study found no difference in the mean number of activities completed by LHDs to address health disparities by political party of the state leader.

Political leanings also impact public support of strategies to curb the rate disease incidence. Early in the COVID-19 pandemic public opinion polls showed that those who had more left leaning ideologies were less likely to view limitations on international travel to the US as essential and more likely to view all other restriction policies as essential compared to survey respondents who held right leaning ideologies who viewed travel restrictions necessary and all others unnecessary[124]. The COVID-19 pandemic has shown the public the political nature of public health, yet public health has always been inherently political. There are externalities associated with the behavior of individuals. Poor health behaviors such as alcohol and tobacco use not only impact the user but also the broader community and place both health non-health related strains on society[106]. Civil and criminal litigations, public safety resources, safety net services, bystander injury, and property damage just to name a few. But we do not all see the value in using policy and laws to restrict the behaviors of a few for the benefit of many. Nor using these strategies to rebalance society to address inequities. Difference in values and thus understanding will ultimately impact willingness to take on certain actions to address health disparities (ie. policy). According to Kingdon, a political scientist, not only must there be a consensus that there is a problem that needs a policy solution but there almost also must be a

political window of opportunity and reasonable agreement that the policy will mitigate the problem[125].

Limitations

This study has several limitations. First the NACCHO Profile is a secondary cross sectional data source reflecting a snapshot in time. The nature of this data means that causation cannot be determined because it lacks temporal order. Second, the data contained in the Profile is self-reported and has not been separately verified. Additionally, the individual or individuals who completed the survey on behalf of the local health department could have varying degrees of understandings of the activities that take place at the health department as well as varying understanding of health disparities. The respondents from each LHD could have been made of any number of staff, leaders, and executives with various levels of understandings of the functioning of the agency. Third, the information provided on health disparities lacks details on the scope and effectiveness of the activities taken on by the local health department, thus the results reflect conducting the activities and not the outcome of the activities. Also, there was no detail in the Profile to provide context about policies that were already in place to address health disparities that may influence what activities the LHD takes on. Fourth, population continues to be the strongest indicator of whether local health departments participate in activities to address health disparities. Population is completely outside of the control of the local health department. Fifth the primary data collection included individual responses from staff at 109 LHDs which may not be representative chronic disease professionals at all LHDs. Lastly, because of the exploratory nature of the primary data collection, results serve a broader purpose of informing future work as opposed to predictive modeling.

Personal Reflections

The primary data collection for this analysis was fielded in early 2021, a year into the worldwide COVID-19 pandemic. The public health practitioners responding to the questionnaire on behalf of the LHD likely had quite different mindsets than they would have had at the time the Profile assessment was conducted. This point likely matters very little. This analysis was not dependent on reflections of staff who were at LHDs in 2016. It simply inquired about what practitioners thought LHDs agencies in general should do, then looked to at the most recent and readily available data to see if there was agreement with the *should* and the *actual*. While the chance of the selection of *prioritizing resources and programs specifically for the reduction in health disparities* as a percveived impactful strategy in prior years was possible, the influence of the shifts in the collective mindset of Americans cannot be discounted. 2020 was a tumultuous year with economic uncertainty situated in widespread and critical scrutiny of the cultural and political institutions in the country and how these impact people of color. This awareness means that there likely more individuals who believe direct, specific, and financial steps must be taken to counter the inequities hardwired into the structure of this country. The experiential and subjective opinions of local health department employees is not well represented in in the literature and it was with this mindset that this data was collected.

80% of the LHDs in the sample were decentralized allowing for greater flexibility of strategies used to address health disparities, be they those that NACCHO inquired about or otherwise. Decentralization is both a benefit and a drawback to quickly responding to public health crises. In the San Francisco Bay area, a group of local health departments imposed stay at home restrictions will have well ahead of the state of California and the rest of the nation at the

beginning of the pandemic. The speed at which they were able to do this was related to their decentralized structure which allowed for a local health officer to issue stay at home orders without awaiting instruction from the Governor. However, the unequal application of stay-at-home orders across the country caused confusion, frustration, and rebellion leading to low adherence to many safety measures including the use of masks in public spaces.

At the time of this writing, there were several efforts to limit the authority of public health officials. Several state legislatures are proposing limitations on Governor's abilities to declare public health emergencies; limit the power of State Health Officers; remove expressed authority to issue vaccination requirements; exclude epidemic and pandemic from the definition of state emergency; allow the legislature to end an emergency order[126]. These current efforts and prior use of pre-emption laws may restrict LHDs or local governments from taking steps to advance health equity. Examples of this include the state of Georgia's efforts to prevent localities from creating laws that required residents to wear masks in public during the COVID-19 pandemic (reducing exposure for all, but most importantly those at high risk of infection) and the state of Alabama crafting laws that prevented localities from imposing increased minimum wage requirements (a strategy to reduce economic inequity).[78]

These evolving authorities may create changes in the governance structure of LHDs with powers of decentralized LHDs being reduced and with them – fewer use of strategies to address health disparities.

Conclusion

This study adds to the literature on variables that are associated with LHDs participating in activities to address health disparities. The results have varying degrees of alignment with

prior research linking particular leadership characteristics, population, and community health assessment completion while adding insight about regional participation, topic specific policy activities, and perceptions of public health practitioners which may allow for future survey weights of Profile responses. Participation in policy advocacy for alcohol, tobacco, and other drugs appears to be the most salient activity that a local health department can take on to address health disparities. Training on navigating the political landscape must be included in graduate curriculum and ongoing training of LHD staff. Policy level interventions can have far reaching impacts on population health and local health departments can play a key role in the development and passage of policies aimed at reducing health disparities. Local health department could be encouraged and supported to take on these activities through statewide policy requirements, flexible funding mechanisms, and incentives.

The Profile data used in this study included the option for and LHDs to indicate that new policies were passed for ATOD or chronic disease, but not space for explanation. These policies have the potential to range from indoor/outdoor smoking restrictions to alcohol diversion programs, to product labeling to product prohibition. Each of which have differential impacts and effectiveness at mitigating health disparities. Qualitative data to accompany Profile responses as well as independent verification of some activities will add to the understanding of actions and results of policy advocacy. The following are recommendation for NACCHO informed by this research.

Recommendations for NACCHO

- Include the health disparities question explored in this dissertation in all future surveys
- Amend or expand the health disparities question to add narrative descriptions of activities used to explore the degree and outcome of LHDs efforts to address health disparities

- Amend or expand the health disparities question to include space to capture existing local and statewide policies that aim to address health disparities
- Include open field text to capture line staff perceptions about current LHD work to address health disparities
- Apply weighting to each of the nine health disparities activities to allow for comparison of overall impact

Future Research Opportunities

- Thematic and content analysis of descriptions of impactful activities provided in the primary data
- Multivariable analysis to tease apart strongest associations of independent variables and number of activities conducted
- Nesting of LHDs capturing and detailing potential influence of statewide policies that aim to address health disparities

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Appendix A

LHD Health Disparity Activity Prioritization Questionnaire

What is the name of your local health department (i.e. Apple County HD)?

OPEN TEXT

In which state is your health department located?

DROPDOWN MENU

What is the highest level of education that you have completed?

- Associates
- Bachelors
- Masters
- Doctorate

{Branching logic}

Display this question if What is the highest level of education you completed? = Masters

What type of Masters degree do you have?

- MPH MPH
- Other Other

Display this question if What is the highest level of education you completed? = Doctorate

What type of Doctorate do you have?

- DrPH DrPH
- PhD PhD
- MD MD

DO DO

Other Other

The below is a list of activities that local health departments are asked to respond to about the agency's participation in health equity/disparity work in their jurisdiction. Of the 9, please identify the 3 activities you believe are most impactful in addressing health disparities.

Describing health disparities in your jurisdiction using data

Conducting original research that links health disparities to differences in social or environmental conditions

Educating elected or appointed officials about health disparities and their causes

Training your workforce on health disparities and their causes

Offering staff training in cultural/linguistic competency

Recruiting workforce from communities adversely impacted by health disparities

Prioritizing resources and programs specifically for the reduction in health disparities

Taking public policy positions on health disparities (through testimony, written statements, media, etc

Supporting community efforts to change the causes of health disparities

Please provide an example of an IMPACTFUL activity or strategy your health department has used to address health disparities. Please provide as much detail as possible on the activity or strategy and the result.

OPEN TEXT

Appendix B

NACCHO National Profile of Local Health Departments (Profile)

To access the 2016 Profile questionnaire or dataset, visit the ICPSR website at:

https://www.icpsr.umich.edu/web/ICPSR/studies/37145