PUBLIC HEALTH GOVERNANCE TO ADVANCE PUBLIC HEALTH 3.0: INTERROGATING THE STRATEGIES AND GOVERNANCE STRUCTURES OF LOCAL GOVERNMENTAL HEALTH DEPARTMENTS IN NORTH CAROLINA AND ACROSS THE COUNTRY

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ABSTRACT

Karl Timothy Johnson: Public Health Governance to Advance Public Health 3.0: Interrogating the Strategies and Structures of Local Governmental Health Departments to Address the Social Determinants of Health in North Carolina and Across the Country
(Under the direction of Kristen Hassmiller Lich)

Background: The Public Health 3.0 (PH3.0) framework emphasizes the role that public health should have in addressing social determinants of health (SDOH). The local health department (LHD), as the principal governmental authority within local public health, has often been identified as the primary agency to address SDOH. However, the local and state governance arrangements within which an LHD operates strongly influence their capacity for strategies aimed at SDOH. Local boards of health (BOH) have a particularly powerful influence on the decision-making capacity of LHDs; different arrangements and functionality of BOHs may in turn influence an LHD's work to advance PH3.0.

Objective: To advance to goals of PH3.0, this dissertation sought to analyze the strategies by which LHDs have addressed SDOH as well as the local governance arrangements that may shape those strategies.

Methods: First, I performed latent class analysis with nationally representative data on LHD activity to identify common profiles of LHD involvement with policy development, followed by logistic regression to estimate how local BOH functionality impacts the likelihood of inhabiting different profiles. Second, I reviewed recent Community Health Improvement Plans from LHDs across the country to analyze the characteristics of strategies addressing SDOH described in such plans. Finally, I conducted semi-structured interviews with LHD directors and BOH members from across North Carolina to assess how variations in their governance arrangement impacted their work in the community.

Results: I found the BOH is a core though often underutilized institution to enable the LHD to improve and expand its role in addressing SDOH, whether through directly proposing and passing local public health rules or through partnership engagement with other local community organizations. Variations in local governance models substantially impact this ability, however, with appointed BOHs composed of medical professionals who are comfortable exercising oversight and authority being the most likely to aid the LHD in addressing SDOH in the community.

Contribution and Significance: To advance community health and eliminate health disparities, local public health departments must address the SDOH. This research may support LHDs to better address SDOH in their community by improving their local governance arrangements and the relationships therein.

To my wife Emily Rose—my biggest advocate, closest confidant, and best friend in the world. I cannot thank you enough for your tireless support and encouragement.

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immeasurably true. I have also had the pleasure of living and growing within a great community of friends at St. Thomas More Catholic Church, including the men of STM's Young Adult Men's group who have been a source of delight and reprieve for me every Monday evening for the last four years.

My parents and family have been instrumental throughout my entire educational career, including my time as a PhD student. I have them to thank for challenging me to take my education seriously from a young age, and for supporting me from afar when I began graduate school. I hope and pray that I can provide a similar set of educational opportunities for my own children.

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PREFACE

During the final week of my senior year at Johns Hopkins University (2018), I stumbled upon a short article about Public Health 3.0 in the Johns Hopkins Bloomberg School of Public Health Magazine. In the article, current Dean Ellen J. MacKenzie recounted a conversation she had in the late 1990s with a prior dean, Al Sommer. She writes: "The problem with public health, he [Al Sommer] said, is that it has no boundaries. He argued that public health has been its own worst enemy by taking responsibility for everything that impacts health, even if the major social and economic determinants of health such as income and education are beyond our control."

Over the last four years I've found myself constantly intrigued and challenged by Sommer's central critique: public health "has no boundaries." A profession without boundaries is hardly a profession at all. And a profession that takes responsibility for forces outside its control is not likely going to be a profession for too long. As a student of public health and an aspiring public health professional, what does this critique imply for me? Public Health 3.0, as dean MacKenzie articulates, is a clear response to this challenge – the social determinants of health are *not* outside the boundary of public health, as they impact the very thing public health exist to protect: the health of communities. And yet, the limited experience I have with local public health practitioners tells me that the "story on the ground" is likely more complicated than the aspirations of the movement. Public health *does* have its boundaries, if only because real public health practitioners with limited resources and within politically constrained environments must decide between competing priorities—this may include work on social determinants of health, though it may not. The scope of this boundary, as it is drawn and re-drawn within thousands of

local public health systems across our country, has been my central professional curiosity. The following research is my meager contribution to the conversation I first encountered four years ago.

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LIST OF ABBREVIATIONS

BOCC	Board of County Commissioners
BOH	Board of Health
CHIP	Community Health Improvement Plan
CHA	Community Health Assessment
CHS Board	Consolidated Human Services Board
CHSA	Consolidated Health and Human Services Agency
LCA	Latent Class Analysis
LHD	Local Health Department
PH3.0	Public Health 3.0
SDOH	Social Determinants of Health
SHRA	State Human Resources Act

CHAPTER 1: PROBLEM BACKGROUND AND RESEARCH OPPORTUNITY

Recent Evolutions in Public Health

At the time of this writing, the Spring of 2023, the COVID-19 pandemic emergency response is all but over in the United States. Across the country, access to vaccines is available to all who desire it and mandates on mask wearing—certainly the most public sign of the pandemic's endurance—have been lifted. The trauma of events that proceeded throughout the crisis still linger. Not only were public health professionals publicly harassed and sometimes violently threatened during the pandemic, but policy makers across the country have approved dozens of new laws that have curtailed the legal powers of local and state public healthagencies.[1] Based on this description alone, it would seem as though public health has been weakened since March of 2020.

The events of COVID-19 have come during a dynamic time in the history of public health and medicine in our country. Throughout the 21st century, the structure and responsibilities of healthcare in the United States have evolved considerably.[2] The 2010 Affordable Care Act, the largest healthcare-related legislation of the modern era, ushered in a new era of healthcare access and focus on preventive services. The last two decades have also been witness to national pushes for payment reform within the healthcare system (focused on value-based and population managed care) and well as closer ties between healthcare and public health. As the population of the United States becomes older and the prevalence of noncommunicable chronic diseases (physical *and* mental) increase, community health priorities have also evolved. In response to changing population demographics, new structures of healthcare delivery and financing, and increasingly complex "wicked problems" in society, the structure and orientation of public health in the United States has likewise been evolving.

Public Health 3.0

Released by the Department of Health and Human Services in 2016, the Public Health 3.0 (PH3.0) framework has, for instance, encouraged the collaborative capacity of public health across health and non-health sectors to address the social, physical, and economic conditions that impact health equity.[3] According to the original authors of PH3.0, evolving from Public Health 2.0 to Public Health 3.0 was motivated by two key observations. Firstly, while the mix of strategies that the profession of public health advanced during the 20th century were successful in addressing a wide range of public health issues (smoking rates, life expectancy, healthcare access, etc.), gross health disparities remain, especially across race and socioeconomic status. Secondly, these disparities persist largely due to forces beyond the reach of healthcare and traditional public health arenas: the social determinants of health (SDOH) (e.g., education, housing, transportation, and economic development). As such, if public health professionals wish to secure health and safety for all members of society, it must address these upstream determinants. The concern to address SDOH within public health is not wholly new, though the PH3.0 framework makes especially clear for a modern audience the motivations for this work and several practical implications of addressing SDOH.[i]

The core motivations of PH3.0 align with the growing role that the value of health equity has become for public health practice (evidenced, in part, by the updated 10 essential services of public health, in which the value of equity is intended to inform the execution of all 10 services[ii]). However, the authors of PH3.0 note that addressing SDOH require "community-based interventions beyond healthcare," thereby emphasizing the collaborative, cross-sector nature of PH3.0. To successfully address SDOH and improve health equity, public health must increasingly work with more non-traditional

[i] Braveman, P., & Gottlieb, L. (2014). The social determinants of health: it's time to consider the causes of the causes. *Public health reports*, *129*(1_suppl2), 19-31.

[ii] https://www.cdc.gov/publichealthgateway/publichealthservices/essentialhealthservices.html

partners. To achieve the goals of PH3.0, authors of the framework propose five recommendations : (1) advance the role of a "Chief Health Strategist" to work across sectors to address SDOH; (2) further develop structured, cross-sector partnerships; (3) improve the design and uptake of public health accreditation; (4) facilitate access to timely, reliable, granular and actionable data; and (5) ensure that funding for public health is sustainable as well as blended and braided from many different funding streams.

The Role of Local Health Departments

The term "local public health" describes the collective activities of multiple agencies, entities and sectors working to improve the public's health within regions, districts, counties and cities across the United States. The services provided and the distribution of these services across different localities varies widely. To provide such services, the local public health landscape is populated with multiple and diverse organizations: private health systems, community-based organizations, faith groups, federally funded health centers, governmental authorities, and more.[4] For these reasons, local public health has been described as a "complex system,"[5] defined by multiple, interconnected components (e.g., relationships between different organizations), rich heterogeneity (e.g., diverse community contexts), dynamic complexity (e.g., rapidly changing needs and institutional landscape), and information uncertainty (e.g., complex forces of disease origin and spread).

The role of Local Health Departments (LHDs), as the principle governmental authority within local public health, has been central to recent evolutions in public health and will continue to be so. As acknowledged by the opening lines of PH3.0, "Although many sectors play key roles, governmental public health is an essential component."[3] Indeed, while the National Institute of Medicine defines public health as "what we, *as a society*, do *collectively* to assure the conditions in which people can be healthy,"[6] (my emphasizes added) the focus of PH3.0 is primarily on the roles and capacities of local

governmental public health. But even before frameworks such as PH3.0, LHDs often operated through convening and coordinating diverse organizations to address complex public health issues.[7–9] For this reason and others, it is natural to identify LHDs as the principal agency to advance the collaborative capacity of public health and to implement health concerns across sectors, including addressing SDOH.[iii] More to the point, the PH3.0 framework has explicitly encouraged LHDs to adopt the role of "Chief Health Strategist" within their community, tasked with working alongside "all relevant partners" to address SDOH. LHDs have been tasked with steering a broader set of actors toward the goals of community health, including those that have not historically worked with public health.

The Role of Policymaking in Public Health

In parallel with the PH3.0 framework, there has been a growing recognition that *policy decisions* made outside the health sector impact many determinants of health.[10] Decisions such as the design of new public transportation routes or new public housing developments impact the health of communities. The Health in All Policies (HiAP) approach has embodied this newly appreciated reality. HiAP seeks a "change in the systems that determine how policy decisions are made and implemented by local, state, and federal government agencies to ensure that policy decisions have beneficial or neutral impacts on the determinants of health."[11] The goal of HiAP operates at every level and across every sector. Throughout this approach, a broad definition of "policy" is often emphasized, one that includes any "agreement on issues, goals, or a course of action by the people with power to carry it out and enforce it."[12] Grounded in its concern to address SDOH outside traditional public health settings, the work of HiAP has also been intimately associated with the advancement of health equity at the local level.[13] The National Association of County and City Health Officials (NACCHO) has supported the HiAP

[iii] https://www.naccho.org/uploads/downloadable-resources/Operational-Definition-of-a-Functional-Local-Health-Department.pdf

approach, and has identified LHDs as the best agency to implement the concerns of HiAP at the local level.[iv]

The proposed work of LHDs to address SDOH is a natural extension of their historical role within the broader category of what the "10 Essential Services of Public Health" ("10 Essential Services") categorizes as "policy development." When the 10 Essential Services was first released in 1994, policy development was established as one of three core functions of public health (along with "assurance" and "assessment").[14] As described within the 10 Essential Services, four unique policy development sub-activities fall within the broad categories of: (1) communicate effectively to inform and educate; (2) strengthen, support, and mobilize communities and partnerships; (3) create, champion, and implement policies, plans, and laws; and (4) utilize legal and regulatory actions. In a similar spirit, NACCHO has articulated several broad strategies by which LHDs can implement HiAP, ranging from developing and structuring cross-sector relationships to implementing accountability structures.[v] Across the country, additional resources have also been developed to articulate the different policy-related strategies by which LHDs can address SDOH and the goals of PH3.0 and HiAP (**Appendix 1**). Given its ability to shape the behavior of multiple individuals and organizations, policy development is one of the clearest mechanisms by which LHDs can advance health equity.

Recognizing the power that policy has for public health, a considerable amount of attention has recently been given to the policy making abilities of LHDs. For instance, in 2013 the Institute of Medicine encouraged government agencies to familiarize themselves with the toolbox of public health legal and

[iv] https://www.naccho.org/uploads/downloadable-resources/12-01-Health-in-All-Policies.pdf

[v] https://www.naccho.org/uploads/downloadable-resources/Programs/Community-Health/factsheet_hiap_dec2014-1.pdf

policy interventions at their disposal.[15] As updated in 2021, "policy development"[vi] is one of the few domains in the Core Competencies for Public Health Professionals by the Council on Linkages Between Academia and Public Health Practice.[16] The de Beaumont Foundation and National Consortium for Public Health Workforce Development have also identified "policy engagement" among a handful of strategic skills needed by public health professionals.[vii] When the authors of PH3.0 write that "the public health workforce must acquire and strengthen its knowledge base, skills, and tools to meet the evolving challenges to population health," skills associated with policy development are certainly included in that list.

Challenges to Policymaking in Public Health

Local governmental public health practitioners face several challenges in advancing their role within policy development. In 2008, Thomas Frieden – then director of the CDC – lamented that many governmental public health agencies had failed to implement effective policies and programs to currently prevent health problems.[17] Findings from the first Public Health Workforce Interests and Needs Survey (PH WINS), the only nationally representative data source of the governmental public workforce, demonstrates several workforce challenges associated with policymaking in public health. While the two most recent versions (2021, 2017) addressed policymaking in limited ways, several questions from the 2014 study directly assess the perceived important of policy development skills and awareness of HiAP.[viii] Survey results from 2014 demonstrated that while over 70% of respondents identified "influencing policy development" as important to their work, nearly one-third did not consider themselves up to the

[vi] http://www.phf.org/resourcestools/Documents/Core_Competencies_for_Public_Health_Professionals_2021October.pdf

[vii] https://debeaumont.org/wp-content/uploads/2019/04/Building-Skills-for-a-More-Strategic-Public-Health-Workforce.pdf

[viii] https://debeaumont.org/ph-wins/ph-wins-2014/

task.[18] Relatedly, while nearly 80% of respondents emphasized the *importance* of understanding the relationship between a new policy and many types of public health problems, 60% felt as though they did not have this understanding. Just over half of respondents were aware of HiAP in 2014, and this number decreased to just 35% in the 2017 PH WINS survey.[ix] Additionally, interviews in the last decade with LHD leaders from the "Big City Health Departments" about the needs, barriers, and opportunities for policy advancement have identified the administrative burdens of local bureaucracy to be a major challenge, making it challenging to hire staff with the right skills or accept the right funding streams to advance policy work.[19] And yet, along with funding for public health activities and helping to implement the affordable care act, these leaders identified HiAP as one of the three major priorities in the coming years.

Public Health Governance

An LHD's strategic decision-making is constrained by its surrounding context, including but not limited to their governance arrangement—the institutions within which decisions are made, including the institutions that determine who is responsible for making those decisions. It is an LHD's governance arrangement that determines how much decision-making authority is dispersed through the system in which the LHD operates (including the local, state, and national scope of that operation). Just as the levels of workforce staffing and the diversity of funding streams are decisions made by those with governing authority, the decision to advance work addressing SDOH is a choice made by one or more individuals within this arrangement. One cannot talk about work on the SDOH without talking about the decision-making structures in which that work takes place.

[ix] https://debeaumont.org/wp-content/uploads/2019/04/PH-WINS-2017.pdf

An LHD's formal governance arrangement is largely defined by the relationship it has with its local governing entity. As described by the National Public Health Performance Standards Program, a governing entity is:

> "The individual, board, council, commission or other body with legal authority over the public health functions of a jurisdiction of local government; or region, or district or reservation as established by state, territorial, or tribal constitution or statute, or by local charter, bylaw, or ordinance as authorized by state, territorial, tribal, constitution or statute."[x]

The various powers and authorities such governing entities contain constitute many of the "rules of the game" within which LHDs make their decisions, for policy development and other strategies. As such, while LHDs across the country are often statutorily obliged to ensure a consistent set of public health services (policy development and otherwise), the availability and implementation of strategies to secure these services vary widely depending on the local, state, and national governance layers through which LHDs are authorized and empowered to conduct their work. Recognizing the role governing entities have in LHD decision making, the most recent (2022) national voluntary public health accreditation standards contains several "requirements related to a variety of entities that play a governance role."[xi] Prior versions of national accreditation standards included an entire domain dedicated to the ability of the LHD to "maintain capacity to engage the public health governing entity."[xii]

Research on Public Health Governance

In the last few decades, there has been increasing interest in the influence of governance on the behavior of LHDs. Several literature reviews[xiii] have explicitly identified a need for additional research on

[x] https://www.cdc.gov/az/g.html

[xi] https://phaboard.org/wp-content/uploads/Standards-Measures-Initial-Accreditation-Version-2022.pdf

[xii] https://www.phaboard.org/wp-content/uploads/2019/01/PHAB-Standards-Overview-Version-1.5.pdf

[xiii] National Coordinating Center for Public Health Services and Systems Research: A Summary of PHSSR Systematic Reviews Commissioned by the Robert Wood Johnson Foundation. Lexington, KY: National Coordinating Center for Public Health Services and Systems Research. 2010.

the association between governance arrangement and LHD activity.[20] The authors of PH3.0 even acknowledge that "the basic foundational structure of local governmental public health may itself be a barrier to efficient and cost-effective coordination at the local level."[3] Studies on the influence of governance on LHD decision-making are recognized as valuable for providing benchmarks to public health agency staff to compare service activity and resources among similar governance arrangements, and for understanding how such arrangements create opportunities and constraints in policy development and administration.[21]

Since its inception in 2003, the field of Public Health Systems and Services Research (PHSSR) has been at the frontier of examining the relationship between governance and public health performance.[xiv] The field first emerged "to produce the evidence needed to address critical uncertainties about how best to organize, finance, and deliver effective public health strategies to all Americans."[22] A recent synthesis of evidence produced from PHSSR-affiliated studies found that "governance structures and inter-organizational relationships" play powerful roles in both the availability and quality of public health services.[xv] However, the most recent grants to support PHSSR-affiliated work seem to have expired in 2015. PHSSR-affiliated work is now housed at the Systems for Action Research program at the Colorado School of Public Health and focuses much more on cross sector collaboration and the integration of health and social service systems than governance arrangements.[xvi] However, several questions at the intersection of governance and local public health system performance remained unanswered. When published in 2012, the PHSSR's national research agenda included several questions pertaining to "public

[xiv] Prior topics addressed by PHSSR have included the public health workforce, public health system structure and performance, system boundary and size, public health agency organization and governance, interorganizational relationships and partnerships, performance measurement, quality improvement, and accreditation, and social determinants of health and health disparities.

[xv] www.publichealthsystems.org/research/research-agenda

[xvi] https://systemsforaction.org/

health agency organization and governance," such as the relationship between the performance (efficiency and outcomes) of local public health systems and the "structures, powers, and functions of local and state boards of health," the "legal powers and duties of governmental public health agencies," and the "decision-making structures and administrative relationships with other government agencies."[22] To this author's knowledge there has not been a rigorous and sustained attempt to continue researching these questions since they were published. Similarly, a 2012 systematic review of studies on the structure of local and state public health agencies in the United States identified few studies that explicitly considered the relationship between the variety of organizational structures for public health at the local and regional level and the delivery of public health services.[23] Of note, one study identified in the review used national longitudinal data on local public health agencies (1998-2006) to create a typology of public health delivery systems (including but not limited to LHDs) based on the three characteristics of differentiation, integration, and centrality, finding that highly differentiated public health systems often provide more comprehensive services than other models.[24] However, others have found that LHDs with more organizational control had higher performance of practices compared to those within decentralized or mixed structures,[25,26] though similar studies have identified higher performance to be associated with mixed or hybrid organizational structures.[27,28] No qualitative work has been done to further examine the mechanisms by which these associations may emerge.

Equity-based Governance

Lastly, public health leaders have become increasingly sensitive to the importance of centering equity in organizational decision-making. For instance, The Collective Impact model by which many LHDs conduct community health assessments and perform community-wide strategic planning has, ideally, equity at its core.[29] This includes authentic community engagement to ensure that low-income communities and communities of color have equal power in decision-making when it comes to planning,

implementing, and governing initiatives. Sometimes this practice is referred to as "shared power," and it emphasizes the democratization of decision-making to include and elevate the voice of communities most impacted by health inequities.[xvii] At its most extreme, the goal of equity-based governance is to move from a place in which communities are completely ignored at the decision-making table to a place in which they are deferred to, given their ownership over the decision-making process.[30] Functionally, many public health leaders advocate for the development of permanent equity-centered governance structures. These may include health equity advisory councils to provide equity-focused recommendations to local public health leaders or the development of health equity collaboratives consisting of multiple partners in the community working to strictly advance the value of health equity. Such additional governance structures became especially important during COVID-19, given the drastically inequitable ways in which the pandemic impacted communities. As just one example, in western North Carolina, the Buncombe County COVID-19 Health Equity Collaborative was developed to ensure that decisions about testing and vaccination sites were made with community members and partners with equity clearly in mind, as opposed to surveying the community more generally or setting up a service site without any community engagement.[31] Given the historical abuses and instances of discrimination against Black, Asian, Hispanic, Native American, and Alaskan Native populations in the United States, often equity-centered governance in public health is emphasized to address the intersection of structural racism and health disparities.[xviii] While equity-centered governance structures often exist beyond what is legally required for the LHD, across the country—and especially during the COVID-19 pandemic—they have come to play an increasingly important role in deciding how governmental public health advances community health, especially work on SDOH.

[xvii] https://humanimpact.org/wp-content/uploads/2021/05/NACCHO-Exchange-Winter-2021-Shifting-and-Sharing-Power.pdf

[xviii] https://www.apha.org/policies-and-advocacy/public-health-policy-statements/policy-database/2021/01/13/structural-racism-is-a-public-health-crisis

Variations in Public Health Governance

The importance of studying the association between governance and LHD behavior becomes clearer when one appreciates the rich heterogeneity of public health governance arrangements across the country. Indeed, the total number of governance arrangements for public health agencies across the country is still unknown.[32] Within the United States one may identify variations in governance at the state, local, and intra-local level. In what follows, a more detailed description of governance variations at each level is provided, with special attention given to local boards of health and governance arrangements available within North Carolina.

An established typology of state-local public health relationships in the United States describes systems that are either centralized (n=8), decentralized (n=25), largely decentralized (n=2), largely centralized (n=6), shared (n=3), largely shared (n=1), and mixed (n=5).[xix] Across this spectrum, the legal authorities and staffing of LHDs vary significantly across the dimensions of budget development, issuing orders, appointing officials, and levying taxes. Applying this taxonomy to national data from 2009 and 2010, it has been shown that centralized states have more personnel, higher total expenditures, and provide a greater number of clinical services per capita compared to decentralized states.[21] However, to my knowledge no additional empirical studies have applied this state-local taxonomy to measures of local public health behavior and performance in the last 10 years. This lack of research is particularly striking given what disparities in policy development activity have been shown to exist between different arrangements. Based on NACCHO's 2019 Profile Survey results, LHDs within centralized public health systems report being generally less likely to develop new or revise existing ordinances than those within locally governed systems (given that public health policy and rule-making authority exists primarily with

[xix] https://www.cdc.gov/publichealthgateway/sitesgovernance/index.html

the state health department or state legislature), and likewise less likely to work on SDOH-related policy areas (e.g., land use, climate change, safe housing, healthcare access).[xx]

As will be discussed further, additional variation in governance authority exists at the local level. To carry out their public health roles and responsibilities, over 70% of LHDs across the country are governed by one or more governing entities, often designated as a local board of health (BOH). The primary purpose of the BOH is to serve as a link between the LHD, the community, and elected officials. In response to the growing interest in governing entities within public health, the National Association of Local Boards of Health (NALBOH), the sole organizing entity for BOH across the country, worked with the CDC to identify and establish six core governance functions that BOH play in their relationship with the LHD: policy development, resource stewardship, partner engagement, continuous improvement, legal authority, and oversight.[xxi] Research on the range of governance functions adopted by BOH across the country has supported and further articulated the activities represented within each of these governance functions.[32] Their function in policy development, for instance, includes the ability to "lead and contribute to the development of policies that protect, promote, and improve public health while ensuring that the agency and its components remain consistent with the laws and rules (local, state, and federal) to which it is subject." Given the combination of their legal and oversight power, most of an LHD's policy development activity must either be initiated or approved by the BOH. This authority has been emphasized, for instance, in the role that BOH have in assisting LHDs to address obesity: "The board of health is often the entity legally responsible for developing and adopting public health policies, whereas the health department and health officer are responsible for instituting programs and services to support those policies."[33] To study the LHD's role in policy development, one must therefore focus, at

[xx] https://www.naccho.org/uploads/downloadable-resources/Programs/Public-Health-Infrastructure/NACCHO_2019_Profile_final.pdf

[xxi] https://cdn.ymaws.com/naBOH.site-ym.com/resource/resmgr/Docs/Governance_Functions.pdf

least in part, on the ways in which the BOH empowers or inhibits the LHD from pursuing its policy development goals. This focus is especially important given that BOH across the country do not satisfy all six governance functions to the same degree. Results from the 2019 NACCHO Profile Survey, scholars demonstrate that BOH are, in general, much more active with oversight and policy development than activities like partnership engagement. When surveyed more in-depth across these functions in 2015, BOH again scored high on oversight and policy development but low on the domains of partnership engagement, though considerable variation across all six functions was identified.[34] Most importantly, variations in BOH activity may have substantial impacts on population health outcomes. Using a national taxonomy of public health governance based on, in part, the empowerment and composition of BOH, preliminary studies have shown that positive local health outcomes are associated with an empowered board composed of an equal combination of health professionals and elected officials.[35]

Given the authority they have over LHD decision-making, the variations with which they exercise that authority, and their demonstrated role in impacting population health outcomes, there has been heightened interest in studying the influence of BOH within public health scholarship. Several studies have noted BOH to be an underappreciated and misunderstood institution within public health research.[33,34] For instance, it is common across prior studies of local public health governance for the BOH to be just one of many potential explanatory variables of LHD behavior, with minimal conceptualization of the specific mechanisms by which BOH presence impacts behavior. Prior quantitative analyses of BOH influence have also been limited by dichotomous variables that identify merely the presence or absence of a BOH, which fails to reflect the aforementioned variation in BOH activity and structure across the country. The presence of a BOH has also been demonstrated to be a consistent predictor of local public health system performance on essential services,[36] scholarship on how variations in BOH structure and capacity impact that performance is limited. Moreover, with the ramifications of local public health policy making becoming more politicized, the influence of BOH may

be becoming more pronounced. In many regions, districts, counties, and cities across the country, the BOH serves as the main liaison between the LHD and elected officials. It is also not uncommon for elected officials to be the sole members of the BOH. Depending on their arrangement and governance capabilities, the BOH may either distance public health policy development from political dynamics or further integrate the two.

Research Opportunity

There is broad consensus that successfully implementing the goals of PH3.0 must take sustainable, multi-sector initiatives.[37] The COVID-19 pandemic has both advanced and challenged the collaborative, cross-sector orientation of public health. The pandemic has also further exposed disparities within our local public health systems and the need for coordination around the SDOH,[38] as well as heighted hesitancy toward the ability of LHDs to address this work. While the prescriptive role for each of the diverse organizations within local public health is a subject of debate, the LHD—as the principle governmental authority over local public health—will be centrally involved.[39,40] To better inform the discussion about what that involvement may look like, it is helpful to study the strategies by which LHDs already address the SDOH. Whereas broad strategies for this work have been prescribed, relatively little work has been conducted on the characteristics of those strategies or the governance arrangements in which they are assembled. I can analyze the different levels of institutions within which LHDs exist that constrain or facilitate their ability to advance strategies associated with SDOH. At the national level, this includes the aforementioned variations in state-local public health governance arrangements. At the state level, I can interrogate the heterogeneity of legal governance arrangements available for local public health in North Carolina to understand the costs and benefits of these alternatives for advancing the PH3.0 agenda.

Prior studies on LHDs and Policy Development

Several studies on the involvement of LHDs in specific policy arenas are instructive for proposed research at this intersection. In 2010, Pomeranz considered the unique authority that state and local health departments have to address obesity.[41] Their analysis outlined several different strategies available in this space, such as collaborating and educating cross-sector initiatives on the economic and health consequences of obesity (in the explicit spirit of HiAP) and creating incentive programs and land-use regulations. In the same year, Schwarte and colleagues surveyed LHDs in California about the various strategies by which they sought to change nutrition and physical activity environments for obesity prevention, such as increasing community awareness (most used) to providing financial resources (least used);[42] the assembly of strategies was compared across LHD size and funding source. In a different policy arena, Lemon and colleagues used key informant interviews to analyze the strategies available for LHDs to engage in land use and transportation policy processes that promote active transportation, finding 10 such capabilities; these ranged from minimal resource activities like reviewing plans to intensive resource activities such as providing funding support.[43] Most recently, Schaff and Dorfman surveyed LHD directors across the country to assess the strategies by which they addressed the national foreclosure crisis during the COVID-19 pandemic, including meeting with other public agencies to discuss and plan responses to the foreclosure crisis (most commonly used) and analyzing local lending patterns in communities affected by the foreclosure crisis (least commonly used).[44]

These studies demonstrate the value of research on current LHDs strategies to influence specific policy arenas. However, across all such studies, there has yet to be a comprehensive analysis (i.e., spanning multiple contexts across the country *and* multiple policy arenas) of current LHD involvement across diverse arenas, including a comprehensive description of strategies by which LHDs may pursue this involvement and an explicit emphasis on the influence of governance arrangement. Prior work in this space is either primarily prescriptive, limited to a single policy area, unconcerned with the unique

strategies of involvement, or presents an assembly of strategies that is not organized for robust generalizability or theoretical speculation.

Moreover, comprehensive empirical studies on the policymaking activity of LHDs have been limited to primarily descriptive statistics of activity across different policy arenas and variation in activity across the size and rurality of the LHD's jurisdiction.[19,45] For instance, most recently structural equation modeling has been used to estimate the impact of state size and rurality on such activity, finding that local policy development was most prevalent in less rural states.[46] Prior studies have also been limited to data collected before 2014, thus not accounting for the last decade's evolutions in public health, including the implementation of the ACA, the start of PH3.0, and the further advancement of HiAP in the United States. Scholarship on LHD strategies to address SDOH is also largely prescriptive;[xxii,xxiii] the empirical literature at this intersection is limited to quantitative analyses using what are now outdated datasets[40] or qualitative analyses with relatively small sample sizes,[39] [xxiv,xxv] often presenting "best-case" models within specific states. Important limitations exist within prior scholarship on local public health governance as well. Much of the PHSSR research to date lacks a clear unifying theoretical framework through which to conduct its analyses and organize their results. Limited theory has been articulated about how multi-level decision-making arrangements impact public health organization and performance, as well as how public health organizations may need to be modified based on key public health goods they are charged to produce.

[xxii] https://phaboard.org/wp-content/uploads/2019/01/HIP-Paper-Final.pdf

[xxiii] https://www.nasdoh.org/wp-content/uploads/2020/09/NASDOH_Public-Health-Social-Need_v4.pdf

[xxiv] https://communityengagementinstitute.org/Documents/CPHI_Report_LHDs_Leading_to_Address_SDOH_2020.pdf

[xxv] https://www.naccho.org/uploads/downloadable-resources/Rural-Health-SDOH-July-2019_FINAL.pdf

Central Research Opportunity

To inform further discussions about what LHD involvement in PH3.0 may look like, one should study the strategies by which LHDs are already involved in addressing SDOH, especially policy-based strategies, as well as the governance arrangements in which that involvement is determined. By doing so, one may understand the dimensions of governance by which LHDs are best equipped to develop strategies concerned with SDOH, thus advancing the goals of PH3.0. The proposed research agenda outlined in the following Aims is a small step toward taking advantage of this opportunity.

Overview of Research Agenda and Framework

My dissertation research proceeds through three Aims, using a mix of methods and datasets. First, in Aim 1 I will perform latent class analysis with data from the 2019 NACCHO Profile Study (a secondary, nationally representative dataset on LHD policymaking and advocacy activity) to identify the common profiles of LHD involvement with policy development, including SDOH-related policy arenas. Once profiles have been established and characterized, I will use multinomial logistic regression to estimate how variations in governance arrangements impact the likelihood an LHD inhabits each profile. Next, in Aim 2 I will review the most recent Community Health Improvement Plans (CHIPs) from LHDs across the country to examine the major SDOH domains prioritized in such plans and the strategies described to work on those domains. The resulting distribution of strategies will be analyzed to determine whether patterns exist across different SDOH domains, including patterns in the precise mechanisms by which communities have proposed to address different SDOH. Finally, in Aim 3 I will conduct semi-structured interviews with LHD directors and BOH members from across North Carolina to assess the general relationship between the LHD and the BOH, as well as how dimensions of their unique governance arrangement impact policy development and SDOH-focused strategies. **Table 1.1** presents the basic research design across all three Aims.

Significance and Contribution of Research

Knowledge generated through this research can be used to advance more policies that improve the health of local communities in several ways. Firstly, results of this research may be used to inform gaps in policy areas within which LHDs are not active, including sectors and partners that should be more engaged to advance PH3.0 goals. Identifying these areas is important for identifying the diversity of skills that public health practitioners need to accomplish policy development goals. Secondly, this study will help to identify commonly used strategies for addressing SDOH, thereby supporting LHDs to become aware of new strategies and be better decision-makers with the strategies they already wield. Finally, analyzing the impact of governance arrangements on the role of LHD in addressing SDOH may assist in advocating for governance arrangements that enable LHD to wield new, better strategies and to work on a broader portfolio of policy-related work. Indeed, within public health it is not often appreciated that an agency's governance arrangement is an important level of decision-making that informs the outcome of LHD policy development behavior. To call attention to this relationship, the proposed research seeks to formally interrogate the organizational structures by which PH3.0 goals can be delivered, and therefore identify the dimensions of governance that are most suitable to the goals of PH3.0. The importance of this interrogation cannot be understated. To adapt to the increasingly complex mix of public health goods that must be delivered within an increasingly complex landscape of organizations within the local public health economy, LHDs must become more fluent in the language of institutional design. This fluency begins with the recognition that institutions are not fixed within the public health decision-making frame but are a choice that can be interrogated and re-examined (albeit a choice usually legislated to be made by county elected officials). Too often public health practitioners limit themselves to considering the operational improvements needed to execute their goals, without giving enough attention to the institutional arrangements at higher levels of decision-making that may also need to be adapted. One of the primary goals of this research is to reinvigorate this conversation within public

health. There may be an opportunity to one day develop a framework to help public health practitioners understand the various dimensions of institutional design that are relevant to a distinct set of public health goods—a framework through which to evaluate the costs and benefits associated with different institutional arrangements. The findings from this research may contribute to the future development of that framework. Findings from this research may prompt public health practitioners and policy makers to reimagine what the state regulations of public health should look like to achieve the goals of PH3.0, including specific limitations that must be adapted within the current statutes and regulations.

Tables and Figures

Table 1.1: Overview of Research Agenda

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Aim Sequence	**Central Research Question**	**Dataset**	**Methods of Analysis**
Aim 1	What are the different profiles by which LHDs are involved with local policy development, and how does variation in local board of health governance activity impact profile assignment?	NACCHO Profile Survey (2019)	Latent Class Analysis, followed by Multinomial Logistic Regression
Aim 2	What are the specific SDOH domains that LHDs hope to work on and the strategies by which LHDs propose to conduct that work?	Most recent Community Health Improvement Plans (CHIPs) from LHDs across the country	Traditional qualitative content analysis, guided by qualitative codebook
Aim 3	What influence does variations in local governance configurations have on the ability of LHDs to advance their work, including policy development and activities addressing SDOH?	LHD directors and BOH members from across North Carolina	Conventional content analysis to derive themes from the interview transcripts

CHAPTER 2: INVESTIGATING THE ROLE OF LOCAL BOARD OF HEALTH GOVERNANCE ON LOCAL HEALTH DEPARTMENT POLICYMAKING BEHAVIOR

Introduction

The role of local governmental health departments (LHDs) in advancing policy development has been critical to conversations about the identity of public health since the 1988 release of the Institute of Medicine's report on the Future of Public Health, in which "Policy Development" is defined as one of three core public health functions.[47] Modern resources continue to highlight its importance: "policy development" is identified as core competency for public health professionals by the 2021 Council on Linkages Between Academia and Public Health Practice.[48,49] The activity of policy development within public health is often defined broadly, from the development and implementation of polices by and for the LHD to the mobilization of community partners and educating the public and elected officials on policies impacting community health. For instance, the de Beaumont Foundation and National Consortium for Public Health Workforce Development has recently identified "policy engagement"—the practice of building relationships with legislators around public health issues—as a strategic skill needed by public health professionals.[50] The role of LHDs in policy development is especially expanded by the Health in All Policies (HiAP) approach, which explicitly seeks "to ensure that policy decisions have beneficial or neutral impacts on the determinants of health."[51] Grounded in the approach's concern with policies addressing social determinants of health (SDOH), work associated with HiAP has been linked to the advancement of health equity at the local level.[13] The National Association of County and City Health Officials (NACCHO) has endorsed the HiAP approach, and has identified LHDs as the best type of agency to implement the concerns of HiAP at the local level. Several localities across the country have already passed resolutions in support of HiAP.[52]

To carry out their public health roles and responsibilities, over 70% of LHDs across the country are governed by a local board of health (BOH). Given their legal and oversight power, most of an LHD's policy development activity must either be initiated or approved by the BOH.[33] While the role of the BOH has received increased attention since the 1990s,[53] several recent studies have described BOH as an underappreciated institution within public health research.[34] The presence of a BOH has proven to be a consistent predictor of local public health system performance on essential services,[36] but research has only begun to show how variations in BOH structure and capacity impact that performance. Prior to 2015, quantitative analyses of the influence of BOH on LHD behavior have been limited by dichotomous variables that identify the mere presence or absence of a BOH,[36,54–57] which fails to reflect the wide variation in BOH activity and has led to mixed results.[34]

In 2012, the National Association of Local Board of Health's (NALBOH) identified six governance functions of BOH: Continuous Improvement, Legal Authority, Oversight, Partner Engagement, Policy Development, and Resource Stewardship.[58] In 2015, NACCHO surveyed BOH across the country to assess how active they were across these six functions.[59] Studies using these data have demonstrated how performance across individual functions as well as overall governance activity are predictive of an LHD's completion of community health assessments, strategic plans, and voluntary accreditation.[60–64] However, scholars have yet to study how BOH governance may relate to the specific activity of local policy development, despite the various mechanisms by which BOH involvement across each function may contribute to such activity. For example, BOH may link the LHD to partners in the community which help co-design policies, advocate on behalf of the LHD to elected officials for the passage of policies, or secure the funding needed to enforce or implement policies, among other possible mechanisms. While other contextual factors have been shown to influence LHD policy development activity (population size and workforce capacity being the most cited[65–67]), the role of the BOH is an unexplored yet possibly critical component.

Given the variety of areas in which LHDs can develop policy, we hypothesized that there are different groupings of LHD policy activity. These groupings may be defined, at least in part, by the different policy areas that LHDs have chosen to address. Whereas some LHDs may be marginally active with or completely absent from policymaking, others may have an active role in advancing policy focused on traditional public health arenas, while still others may also focus on advancing policy associated with SDOH. If distinct groupings of policymaking behavior are identified among LHDs, variations in BOH governance activity may be used to, in part, explain these distinctions. Using nationally representative data on LHD policy making activity, the goal of this study is to use latent class analysis to determine whether different groupings of LHD involvement in policy development exist and, if so, to estimate whether there is an association between an LHD's involvement with policy development and the governance activity of its BOH.

Methods

Data

Since 2010, the NACCHO Profile Study ("Profile Study") has been released every three years using a similar (though evolving) set of survey questions pertaining to LHD structure and activity. These surveys represent the most comprehensive assessment of LHDs across the country as each wave of the Profile Study is disseminated to more than 2000 LHDs. All data used for this analysis came from the 2019 wave of the Profile Study. Starting in 2019, Profile Study respondents are not only asked about the presence or absence of a BOH (which is asked in all prior versions of the Profile Study), but, if an BOH is present, they are asked about the BOH's range of legal authorities and the BOH's activity across NALBOH six functions of governance. Given our focus on BOH governance activity, we only included LHDs that indicated the presence of a BOH.

Latent Class Analysis

Latent Class Analysis (LCA), a form of finite mixture modeling, was used to identify different groupings ("classes") of LHD involvement with policy development. The primary assumption underlying this approach is that membership in unobserved, latent classes can explain variation with respect to a set of observed, "indicator" variables.[68] A total of 16 binary indicator variables were constructed for each LHD based on their response to questions regarding, (1) their involvement in 16 different policy or advocacy activities in the last 2 years ("policy and advocacy activity") and, (2) areas in which a new local public health ordinance or regulation was adopted or substantively revised in the last 2 years ("regulatory activity"). For each of the policy areas assessed in the Profile Study, a positive "Yes" value was assigned if the LHD responded that they had *either* been actively involved in policy and advocacy activity *or* had adopted or substantively revised a new local public health ordinance or regulation in that area. A negative "No" response was assigned if the LHD responded negatively to both. We combined responses across these two questions because very few LHDs had any involvement with regulatory activity, and we sought to assess an LHD's policymaking behavior as parsimoniously as possible.

We assessed model fit after first estimating a 1-class LCA model, which served as a comparative baseline. We then increased the number (k) of classes by one, examining whether the addition of each class resulted in substantive and statistically superior model fit. Statistical criteria included information criteria (Akaike information criterion, Bayesian Information Criterion [BIC], Adjusted BIC), likelihood ratio tests (Vuong-Lo-Mendell-Rubin adjusted likelihood ratio tests [VLMR-LRT], Bootstrapped likelihood ratio tests [bLRT]), model entropy, average posterior probabilities (AvePP), and smallest group size per class. For a more detailed explanation of how statistical criteria were evaluated, including the thresholds we considered to be acceptable for each criterion, see **Appendix 2.1**. Once the best model fit was identified, posterior probabilities were used to assign LHDs to their most likely class. Once class designations were assigned to each LHD, individual classes were labeled and interpreted based on conditional probabilities

across each class. LCA was conducted using Mplus (Version 6.11). Data management prior to conducting the LCA was done using Stata 17 software (StataCorp, 2021).

Analyzing Governance Associations

After identifying classes of policymaking behavior, we first evaluated the distribution of BOH legal authorities and governance activity among LHDs in each class, given the hypothesized impact that BOH legal authority and governance activity has on LHD policymaking. The goal of this descriptive analysis was to determine whether, across policy classes, greater variation existed in the scope of authority granted to the BOH or the governance activity of the BOH. Next, we conducted multinomial logistic regression (MLN) using Stata software to estimate how classes were associated with BOH governance activity, controlling for other core features of LHD structure and function. Our main dependent variable was the LHD's designated policymaking class, and the main independent variable was its BOH's activity across each of the six BOH governance functions (expressed by a set of six binary variables, each corresponding to one of the six dimensions of governance assessed in the Profile Study). To control for an LHD's background context, we controlled for state-local governance arrangement (local, state, and mixed), population size, workforce capacity (total FTE), whether the LHD was consolidated with human services, and whether it was part of an environmental health agency. We also controlled for the overall scope of authority possessed by an BOH, approximated by a continuous variable (range: 0-10) in which each of the ten powers that the BOH has "final authority to do," as assessed by the Profile Study, contributed one point. A sensitivity analysis was conducted in which BOH authority was constructed as ten separate binary (yes or no) variables. Across all MLNs, standard errors were clustered at the state level and statistical weights were applied to account for response bias. Differences in the conditional probabilities of indicator variables across classes as well as associations estimated within MLN model parameters were determined to be statistically significant if they met the 0.05 level for

alpha. LHDs were dropped from our sample if they had *any* missing values across indicator or control variables.

Results

Sample Distribution

In 2019, 61% of LHDs that received the Profile Study core questionnaire completed the survey (n= 1,496). Of this sample, roughly 70% (n=1,047) indicated the presence of a BOH. After dropping observations with missing values, our final sample was composed of 1,003 LHDs. **Table 2.1** outlines the major characteristics of LHDs for the entire final sample as well as across major population categories. Compared to national averages, LHDs with decentralized governance models (80%) were over-represented in the survey, reflecting the reality that decentralized models are more likely to have BOH. Most LHDs in our sample operated as standalone health departments, while one-fifth of the sample was composed of LHDs operating within consolidated health and human service agencies (20%) or as a separate entity from an environmental health department (22%). The average scope of BOH authority, constructed on a 10-point scale, was 5.27 (SD: 2.41), with the three most common authorities being the only three that directly concern policy development: adopting public health regulations (73%); setting policies, goals, and priorities that guide the LHD (75%); and advising the LHD or elected officials on policies, programs, and budgets (78%). Across our entire sample, the three most common governance functions that BOH exercised were Oversight (75%), Legal Authority (67%), and Policy Development (66%); all governance functions were indicated as present in at least 45% of the LHDs in our sample. Total FTEs varied proportionally with the population size served.

Results of Latent Class Analysis

We assessed model fit across different class solutions based on a combination of substantive and statistical criteria. Turning to the 5-class model, BIC scores (our leading statistical indicator) continued to enlarge, eliminating the 5 and 6 class model from consideration. Although the 4-class model had the lowest BIC of all classes, it failed to pass our threshold for VLMR-LRT. Compared to the 4-class model, the 3-class model also had substantially better entropy and AvePP (**Appendix 2.2**), as the AvePP values for the 2nd class of the 4-class model was below our threshold. We noted distinctions of possible interest when assessing policymaking regarding environmental health-related areas among the 4-class solution, which we describe further in **Appendix 2.3**. However, after examining conditional probabilities to determine what substantive policymaking differences existed between the two classes, the 3-class solution was determined to be most appropriate given its overall performance across all statistical indicators as well as its ease of interpretation and theoretical plausibility.

Within our 3-class model, we assigned LHDs to their most likely class. About half of LHDs were assigned to "Class 2" (n=530), with roughly a quarter being assigned to "Class 1" (n=254) or "Class 3" (n=219). **Figure 2.1** presents the conditional probability of policymaking activity in each of the 16 policy areas based on class assignment. Among those in Class 1, labeled as the "Limited Class," the predicted level of activity is less than 10% with most policy areas (excluding "Tobacco, Alcohol, and other Drugs," which most LHDs were active in). LHDs in Class 2, labeled as the "Average Class," are characterized by predicted involvement roughly equal to the sample average across each policy area. LHDs in Class 3, labeled as the "Expanded Class," are characterized by high involvement across all policy areas, and especially those areas commonly designated as SDOH: safe and healthy housing, funding for access to healthcare, climate change, land use planning, and injury and violence prevention. For most policy areas, the Expanded Class has between 1-3 times the level of expected involvement compared to the Average

Class; however, this ratio increases to 3-5 times when one considers only SDOH-related policy areas (**Appendix 2.4**).

Association between Policy Classes and Governance Characteristics

Among LHDs in our sample, we assessed whether BOH activity across different governance functions and the scope of BOH authority varied across our three policy involvement classes. Compared to those in the Limited Class, LHDs in the Average Class were more likely to have BOH continuously involved with legal authority, resource stewardship, and partner engagement. And compared to LHDs in the Average Class, LHDs in the Expanded Class were more likely to have BOH continuously involved with continuous improvement, oversight, partner engagement, and policy development (**Figure 2.2**). Differences between classes across the ten BOH legal authorities were less pronounced. Compared to the Limited Class, LHDs in the Average Class were more likely to have BOH that can fire or hire the agency head and set/impose fees. Compared to the Average Class, LHDs in the Expanded Class were more likely to have BOH that advise the LHD or elected officials on policies and to set policies, goals, and priorities that guide the LHD (**Figure 2.3**).

We ran multinomial logistic regression models to estimate the association between an LHD's class assignment and the governance activity of its BOH. Given the ordinal nature of our identified classes, we ran two separate models: one with the Limited Class as the reference class (to identify factors associated with moving from the Limited to the Average Class), and one with the Average Class as the reference class (to identify factors associated with moving from the Average to the Expanded Class). Within the fully adjusted model, having a BOH continuously exercising their legal authority was associated with a 49% increased chance that LHDs would be designated to the Average Class, compared to being in the Limited Class ($p<0.05$); having a BOH continuously active with partnership engagement was associated with an 90% more likely chance that LHDs would be designated to the Expanded Class,

compared to being in the Average Class ($p<0.01$). Across both referent cases no other governance functions were estimated to be statistically significant. Results from our unrestricted and partially adjusted model were similar to the fully adjusted model, though effect sizes were generally smaller (**Table 2.2**).

As a supplemental analysis, we considered results of the full model output from the fully adjusted model (**Appendix 2.5**). We estimated that being in a decentralized or shared governance state (compared to a centralized governance state) was strongly associated with an increased chance (>200%) that LHDs would be designated to the Average Class, compared to being in the Limited Class ($p<0.01$). We also estimated that an increase of 10 FTEs is associated with a 4% increased chance that LHDs would be designated to the Expanded Class, compared to being in the Average Class ($p<0.01$).

As a sensitivity analysis, we considered whether the influence of BOH governance activity on class designation would differ if we incorporated each of the ten BOH authorities as a separate variable in the model. When doing so, primary model outcomes did not substantially change, and only two BOH authorities (the ability to hire or fire the agency head, the ability to impose taxes for public health) were independently statistically significant. All 10 BOH authorities were, however, jointly statistically significant ($p<0.01$) and had positive influence on the percent chance an LHD would be designated to the Average (compared to Limited) or Expanded (compared to Average) class. (**Appendix 2.6**).

Discussion

Within approaches such as cHiAP, there has been an increasing push for LHDs to be involved in policy development, especially policy development that extends beyond traditional public health areas. This study sought to interrogate whether classes of LHDs defined by their policymaking activity exist and whether class designation is associated with the governance activity of the LHD's BOH.

In general, establishing classes of organizations gives insights into the types of activities that different classifications of organizations tend to perform together, how these classes have evolved over time or are influenced by local context, and how these classes perform best in which contexts.[24] In the context of public health, this approach has been used to study classes of public health preparedness units,[69] community-wide strategies to promote physical activities,[70] the service activities of LHDs,[71] and patterns of LHD collaborations.[7] No prior study has attempted to classify LHDs based on their policymaking activity. Our results demonstrate that there are distinct classes of policymaking behavior among LHDs across the country. This includes a class of LHDs (roughly a quarter of our sample) that actively pursues policy development not only among traditional public health areas, but especially those characteristically described as SDOH. LHDs from this class best represent the goals of the HiAP approach. This finding aligns closely with results from the PH WINS survey, in which 35% of respondents were aware of HiAP in 2017.[72] If the goals of HiAP are to be realized for all members of the population, not just those served by the quarter of Expanded Class members we identified, additional research is needed to identify the internal characteristics and external features of the LHD that enable them to evolve from a Limited to Average, and Average to Expanded policy making activity.

Recent data from the 2019 NACCHO Profile Survey allowed us to interrogate this association across the six major domains of BOH governance. Our study was the first to use these data to estimate the association between LHD policymaking activity and BOH governance activity. Our findings further emphasize the reality that not all BOH are the same, and that more active BOH can have a major influence on the ability of LHDs to advance policy. Notably, the influence of BOH governance activity on LHD policy-making activity held after controlling for the baseline level of authority given to the BOH, suggesting that *how* BOH use their authority is equally if not more than important than *how much* authority BOH have. This finding is especially important given the threats to public health's legal authority following the COVID-19 pandemic.[73] This is not to say that BOH authority is negligible: while

individual BOH authorities were not identified as influential, they were estimated to be *jointly* significant. LHDs that had BOH with authority in policy development-related domains were also most common in our Expanded Class. However, our results also suggest that for LHDs to advance expanded SDOH-related policy areas, their BOH must know how to become active in partner engagement, a function that a BOH reasonably undertakes regardless of what authority the BOH is granted. This findingaligns well with 2015 survey data on the limited prevalence but powerful influence of BOH serving as linkages between the LHD and hospitals and other local government agencies.[74] In our study, the influence of the BOH's role in partner engagement held even when controlling for the workforce capacity, population size, and state governance structure of the LHD, demonstrating that the positive influence of BOH engagement of partners to advance expanded policy development can manifest anywhere across the country. Most BOH are composed of members from across a range of health and non-health related professional disciplines. Further research is needed to identify the mechanisms by BOH utilize their membership and authorities to enable cross-sector, SDOH-related policymaking behavior.

Given the nature of our data we were not able to identify the precise mechanisms by which BOH governance activity advances LHD policy involvement. However, this quantitative finding aligns with the results of interviews conducted in the last decade with LHD leaders from the "Big City Health Departments" about the needs, barriers, and opportunities for policy advancement, which have identified the administrative burdens of local bureaucracy to be a major challenge to hiring staff with the right skills or to accessing the right funding streams to advance policy work.[19] Qualitative studies are needed to verify the ways in which BOH members may be engaged in helping LHDs navigate these administrative burdens, or to otherwise enable the LHD to work with partners to develop expanded policy in their jurisdictions, regardless of how much authority they have been granted.

There are several notable limitations to this study. Firstly, the Profile Study did not generate a 100% response rate among those to whom the survey was disseminated, leading to selection bias

among those who were included. Moreover, within the questions on advocacy and regulatory activity, the policy areas are not described in detail (e.g., work on "climate change" may be interpreted broadly), allowing for response bias among LHDs that have interpreted the question differently. Likewise, the policymaking behavior of an LHD was limited to the 16 policy areas included in the Profile Study; these did not include all traditional public health policy areas (e.g., maternal and child health) nor all SDOH (e.g., transportation, education, and employment). The data used for this analysis were also collected before the COVID-19 pandemic began, which may challenge the generalizability of these findings to post-COVID-19 priorities and models of governance, especially given the increased threat to public health's legal authority during the pandemic. We encourage similar studies on the relationship between BOH governance and LHD policymaking activity once the 2022 wave of the Profile Study is released. Other challenges concern various analytical limitations associated with conducting LCA. Chief among these challenges is the fact that LCA is an imperfect science that depends on probabilistic assignment of observations to identified classes, such that proper class assignment is not assured. However, the entropy value of our final model fit, a standardized index of model-based classification accuracy, surpassed established thresholds. Moreover, while LCA incorporates information from a range of statistical criteria, there is substantial dependency on qualitative assessment of identified groupings while enumerating classes, opening the door for biases on behalf of the research team when characterizing potential class assignments.[75] Ultimately, due to the cross-sectional nature of our data the associations identified in this study cannot be described as causal. There may be a bidirectional relationship between the policy-related activity of the BOH and the policy-related behavior of LHD staff. Further research should be conducted to explore whether the influence of LHD staff on the BOH of the influence of the BOH on LHD staff is more influential for the overall policymaking activity of the LHD.

Conclusion

Given the increasing emphasis on the policy development activity of local governmental public health, this study sought to identify groupings of policymaking behavior among LHDs across the country. Using nationally representative data on LHD activity, we found a distinct groups of policymaking behavior, including a quarter of LHDs that are highly active in traditional and SDOH-related policy areas. We also found that groupings of policymaking behavior, as indicated by class designation, is strongly associated with the BOH's governance activity. Given the challenges to public health authority following the COVID-19 pandemic, our results suggest that a renewed interest should be placed on the structure and functioning of the BOH, a key institution that can both advocate on behalf of the LHD for needed resources and, as demonstrated by our analyses, work with other partners in the community to advance policy development to address the upstream causes of health and disease. Current BOH members should receive additional training on the execution of these governance functionalities, and new BOH members should be selected based on how well their background prepares them for this work. Additionally, while current Public Health Accreditation Board standards require LHDs to document the ways in which they interact with the BOH (e.g., providing information, encouraging engagement), future versions should assess the governance activity of the BOH directly and comprehensively.

Tables and Figures

Table 2.1: Sample Characteristics

Table 2.1: NACCHO Profile Sample Characteristics

Table 2.1: NACCHO Profile Sample Characteristics				
		Size of Population Served		
	Total Sample (n=1,003) Mean (SD)	Less than 50,000 (n=575) Mean (SD)	50,000-499,999 (n=370) Mean (SD)	500,000+ (n=58) Mean (SD)
Population Size	129,280 (386,798)	22,263 (13,021)	140,290 (100,046)	1,119,991 (1,203,527)
Total FTE	55.25 (239.03)	13.6 (18.3)	60.3 (60.9)	435.8 (901.1)
State Governance Category				
State	0.13	0.14	0.13	0.88
Local	0.80	0.80	0.8	0.12
Shared	0.068	0.06	0.07	0
Agency Structure				
Separate Environmental Health Department	0.22 (0.45)	0.25 (0.48)	0.18 (0.4)	0.12 (0.33)
Consolidated with Health and Human Services	0.2 (0.42)	0.19 (0.44)	0.21 (0.4)	0.19 (0.4)
LBoH Governance Functions				
Continuous Improvement	0.49 (0.5)	0.48 (0.5)	0.52 (0.5)	0.52 (0.5)
Legal Authority	0.67 (0.47)	0.59 (0.49)	0.65 (0.48)	0.67 (0.47)
Oversight	0.75 (0.43)	0.73 (0.44)	0.78 (0.41)	0.76 (0.43)
Partner Engagement	0.48 (0.5)	0.41 (0.49)	0.58 (0.49)	0.5 (0.5)
Policy Development	0.66 (0.47)	0.63 (0.48)	0.71 (0.45)	0.71 (0.46)
Resource Stewardship	0.48 (0.5)	0.41 (0.49)	0.56 (0.5)	0.64 (0.48)
LBoH Authorities				
Advise LHD or elected officials on policies, programs, and budgets	0.78 (0.41)	0.78 (0.41)	0.77 (0.42)	0.81 (0.4)
Approve the LHD budget	0.69 (0.46)	0.72 (0.45)	0.64 (0.48)	0.64 (0.48)
Adopt public health regulations	0.73 (0.44)	0.73 (0.45)	0.73 (0.44)	0.79 (0.41)
Hire or fire agency head	0.62 (0.48)	0.64 (0.48)	0.6 (0.49)	0.59 (0.5)
Impose or enforce quarantine or isolation orders	0.48 (0.5)	0.52 (0.5)	0.4 (0.49)	0.5 (0.5)
Impose taxes for public health	0.21 (0.4)	0.22 (0.41)	0.19 (0.39)	0.21 (0.41)
Request a public health levy	0.35 (0.48)	0.41 (0.49)	0.27 (0.44)	0.22 (0.42)
Set policies, goals, and priorities that guide the LHD	0.75 (0.43)	0.77 (0.42)	0.72 (0.45)	0.76 (0.43)
Set and impose fees	0.66 (0.47)	0.65 (0.48)	0.65 (0.48)	0.79 (0.41)

Table 2.2 Governance Function Outcomes of Multinomial Logistic Regression

Table 2.2: Governance Function Outcomes of Multinomial Logistic Regression

Table 2.2: Governance Function Outcomes of Multinomial Logistic Regression			
	Unadjusted Model	*Partially Adjusted Model*	*Fully Adjusted Model*
	Relative Risk Ratio (SE)	Relative Risk Ratio (SE)	Relative Risk Ratio (SE)
Class 2 – Average Policy Involvement (Baseline: Class 1, Limited Policy Involvement)			
Continuous Improvement	1.04 (0.17)	1.08 (0.19)	1.10 (0.19)
Legal Authority	1.69** (0.30)	1.50* (0.29)	1.49* (0.29)
Oversight	1.23 (0.25)	1.05 (0.24)	1.05 (0.24)
Partner Engagement	0.89 (0.14)	0.96 (0.16)	0.96 (0.16)
Policy Development	1.41 (0.26)	1.24 (0.23)	1.21 (0.22)
Resource Stewardship	0.95 (0.16)	0.93 (0.18)	0.93 (0.18)
Class 3 – Expanded Policy Involvement (Baseline: Class 2, Average Policy Involvement)			
Continuous Improvement	1.06 (0.27)	1.10 (0.30)	1.13 (0.30)
Legal Authority	1.21 (0.26)	1.11 (0.23)	1.11 (0.22)
Oversight	1.12 (0.28)	1.05 (0.27)	1.05 (0.27)
Partner Engagement	1.84** (0.38)	1.90** (0.40)	1.90** (0.41)
Policy Development	1.05 (0.26)	0.97 (0.24)	0.95 (0.23)
Resource Stewardship	1.14 (0.28)	1.00 (0.25)	1.00 (0.25)

Notes:

- SE = Standard Error
- All coefficients are expressed in relative risk ratios to facilitate model interpretation.
- * = Coefficients that are statistically significant at the 0.05 level for alpha**.**
- ** = Coefficients that are statistically significant at the 0.01 level for alpha**.**
- Unadjusted model: Only considers the influence of BOH governance activity on class assignment.
- Partially Adjusted Model: Controls for an LHD's state governance structure, population size, total workforce capacity, and the overall authority of the BOH.
- Fully Adjusted Model: Partial model controls as well as the LHD's agency structure (consolidated health and human services agency, separate from environmental health department).

Figure 2.1 Estimated Policy Involvement Across Three Class Solution

Figure 2.1 Estimated Policy Involvement Across Three Class Solution

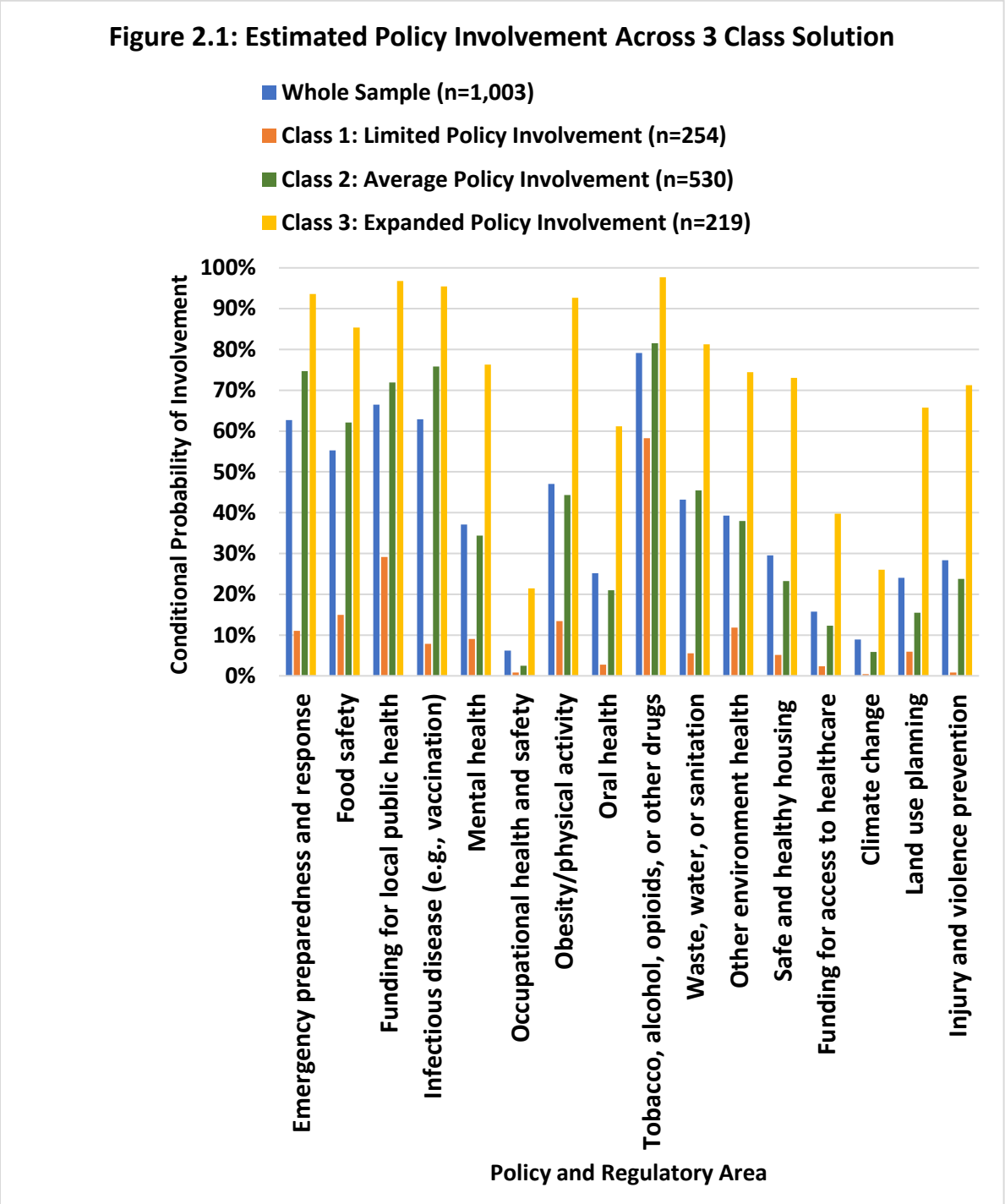
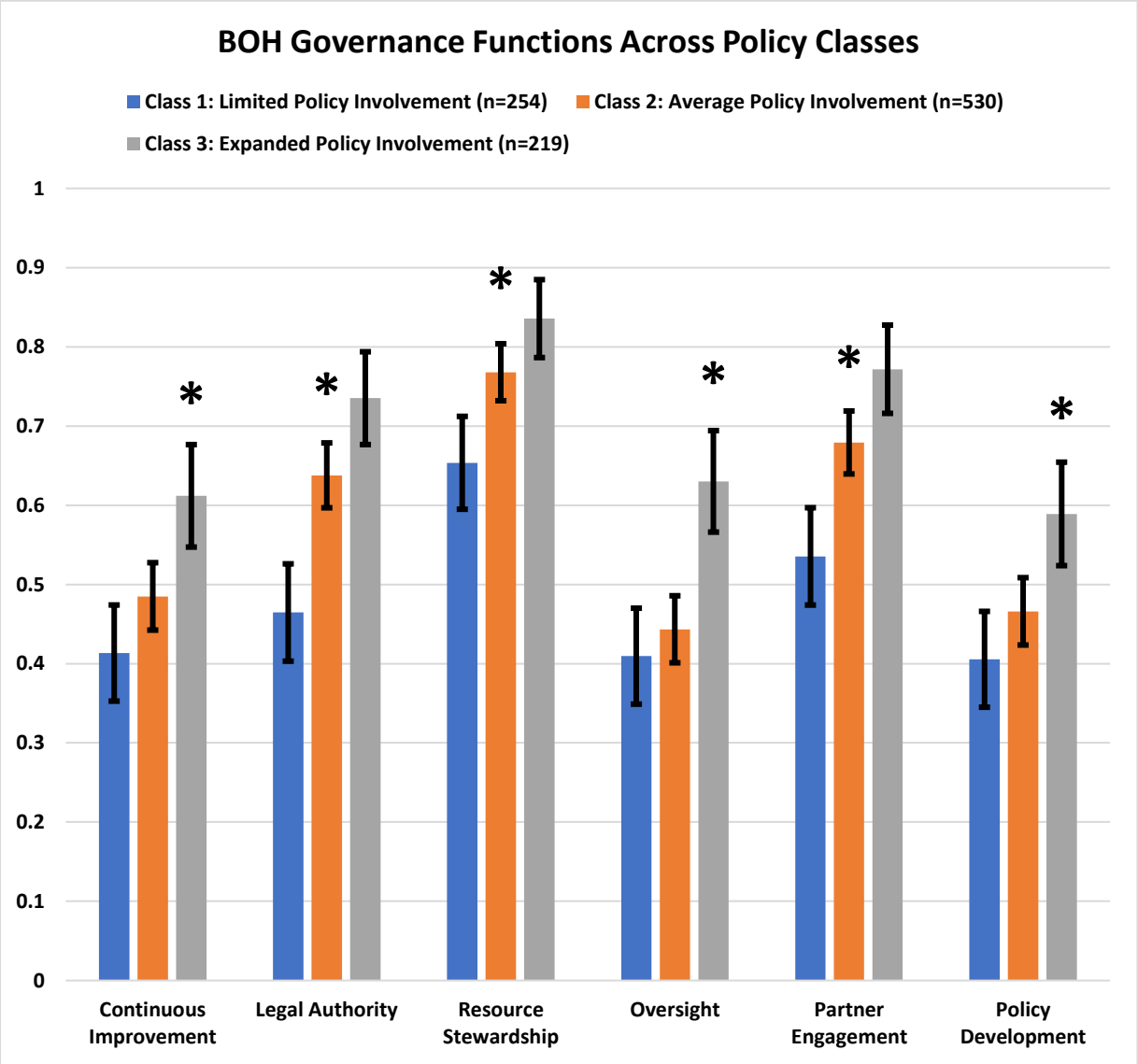


Figure 2.2: Average BOH Governance Functions Across Policy Classes

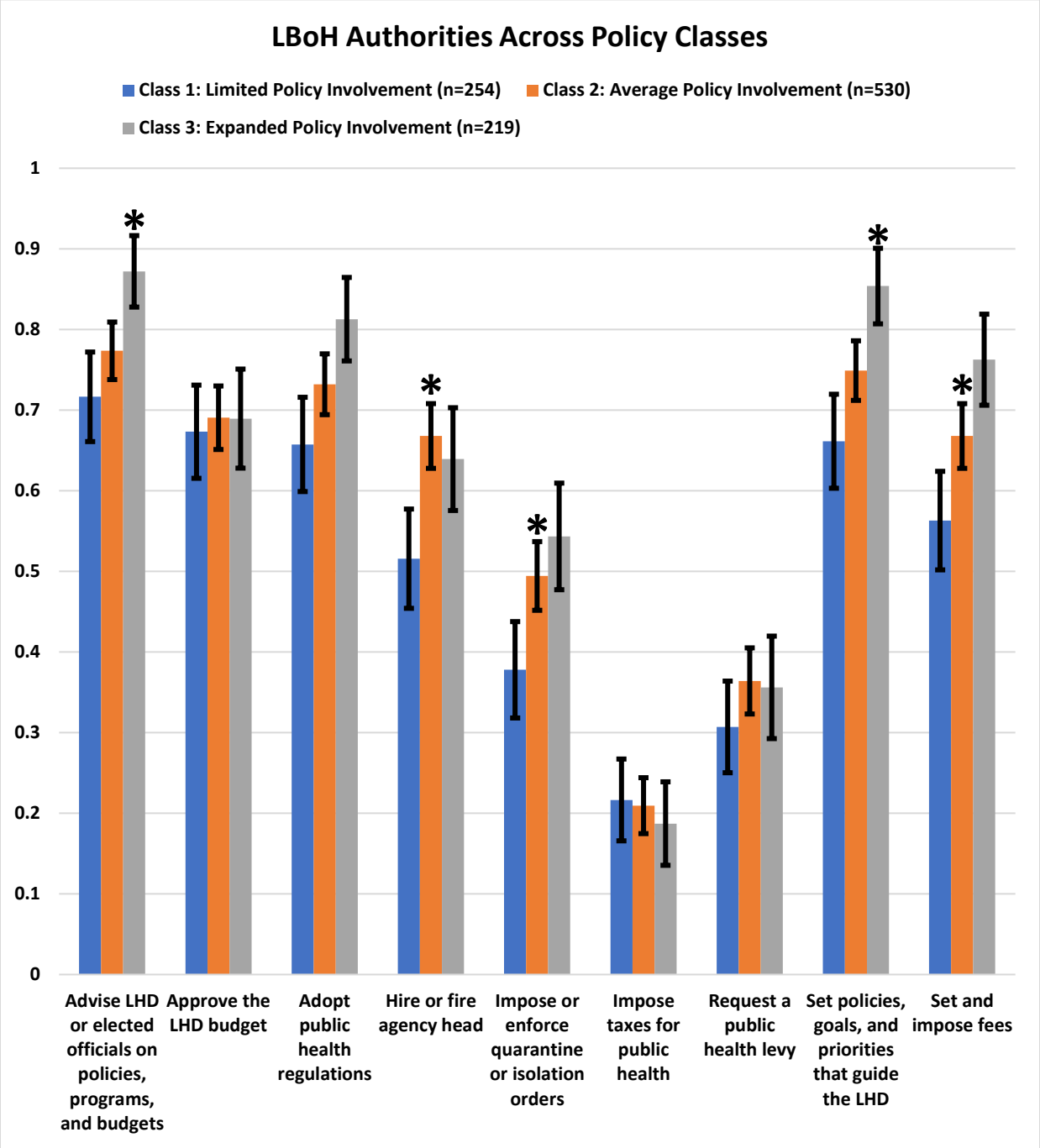
Figure 2.2: Average BOH Governance Functions Across Policy Classes



*= Statistically significant difference in estimated value compared to the class immediately below at the 0.05 level for alpha.

Figure 2.3: Average BOH Authorities Across Policy Classes

Figure 2.3: Average BOH Authorities Across Policy Classes



*= Statistically significant difference in estimated value compared to the class immediately below at the 0.05 level for alpha.

CHAPTER 3: LOCAL PUBLIC HEALTH STRATEGIES FOR ADDRESSING SOCIAL DETERMINANTS OF HEALTH -- ANALYSIS OF RECENT COMMUNITY HEALTH IMPROVEMENT PLANS

Introduction

Since its release in 2016, the widely adopted Public Health 3.0 (PH3.0) framework has promoted public health to address the various social determinants of health (SDOH) that impact health equity.[3] The authors of PH3.0 note that addressing SDOH requires "community-based interventions beyond healthcare," thereby emphasizing the collaborative, cross-sector nature of PH3.0. The role of Local Health Departments (LHDs), as the principle governmental authority within local public health, has been noted as key to this work. As acknowledged by the authors of PH3.0, "Although many sectors play key roles, governmental public health is an essential component." LHDs are encouraged to adopt the role of "Chief Health Strategist" within their communities and to work alongside "all relevant partners" to address SDOH.

Several public health scholars and advocacy organizations have promulgated a unique role for local public health in addressing SDOH. These include identifying social needs within the community, advocating for policy change, and promoting evidence-based practices.[xxvi] Additionally, the National Association of County and City Health Officials (NACCHO) has identified several unique ways in which LHDs can address SDOH: developing multi-sector partnerships, leveraging leadership to drive the implementation of SDOH principles, engaging community members, using data to track SDOH measures,

[xxvi] https://www.nasdoh.org/wp-content/uploads/2020/09/NASDOH_Public-Health-Social-Need_v4.pdf

and leading community-wide strategic planning.[xxvii] However, despite the abundance of proposed strategies and guiding frameworks, there is very little documentation on how LHDs are currently addressing SDOH. The empirical literature often presents "best-case" models within individual states,[xxviii] is limited to specific SDOH (e.g., housing,[44] land use and active transportation policies[43]), or concerns overarching areas of SDOH-related work and not specific strategies.[76] There is no comprehensive study of the range of strategies LHDs have proposed or adopted to address SDOH. Identifying specific strategies is important to understanding both the range of SDOH currently being addressed and the unique approaches (e.g., policies, programming, training) that communities have proposed to address them.

Since 2011, the national Public Health Accreditation Board (PHAB) has required LHDs to submit a Community Health Improvement Plan (CHIP) for voluntary accreditation. CHIPs are defined as "a long-term, systematic effort to address public health problems on the basis of the results of community health assessment activities and the community health improvement process."[xxix] CHIPs are the largest set of published documents on the involvement of LHDs in their communities. The CHIP development process has been shown to involve a wider array of partners than other types of LHD partnerships, and therefore emphasizes the cross-sector collaborations that PH3.0 encourages.[77] Moreover, the PHAB Standards and Measures explicitly maintain that CHIPs "must include consideration of addressing social determinants of health."[xxx] Accordingly, the strategies proposed in CHIPs represent a comprehensive dataset to study the strategies that local public health (included but not limited to LHDs) has proposed to

[xxvii] https://www.naccho.org/uploads/downloadable-resources/Rural-Health-SDOH-July-2019_FINAL.pdf

[xxviii] https://www.naccho.org/uploads/downloadable-resources/Rural-Health-SDOH-July-2019_FINAL.pdf

[xxix] http://www.phaboard.org/wp- content/uploads/FINAL_PHAB-Acronyms-and-Glossary-of-Terms-Version-1.5.pdf

[xxx] https://phaboard.org/wp-content/uploads/SM-Version-1.5-Board-adopted-FINAL-01-24-2014.docx.pdf

address SDOH. Previous studies have used CHIPs at the national level to study outcome measures from Healthy People 2020,[78] strategies to address healthy eating and physical activity,[79] the impact of accreditation on community collaborative assessments,[80] and the nature of CHIP objectives.[81] Scholars have yet to use this dataset to examine the strategies LHDs use to address SDOH.

Using the most recent, publicly accessible CHIPs from communities across the country, this study seeks to identify the range of SDOH that LHDs and their community partners have proposed to address and the strategies they have proposed to pursue this work.

Methods

Data sources

As of March 9, 2022, a total of 357 agencies have achieved accreditation through PHAB (covering over 90% of the country's population) (https://phaboard.org/who-is-accredited/). We identified the most recent CHIPs that have been produced by accredited LHDs across the country. Following common practice,[76,81] we began by accessing the list of agencies that are currently accredited by PHAB and excluded CHIPs that have been produced by state health departments as well as tribal health departments, as these agencies function more similar to state health departments (given their independent, sovereign status). We also excluded offices of Vital Records and of Health Statistics and army health departments, given their unique mission and agency structures. Next, we reviewed LHD websites from among our final list to identify and access any CHIPs that proposed plans to begin in 2020 or later. We selected this cutoff date for feasibility of sample size and to capture a range of strategies before and after the COVID-19 pandemic began (strategies that were proposed to start in 2020 were likely identified and published before March 2020). Prior studies using these data have also been limited to CHIPs published before 2018.[76,82] When a CHIP could not be easily identified online, we directly

contacted staff at the LHD to inquire further. If the CHIP could not be accessed online or through direct contact (limited to two attempts), no further attempts were made.

To characterize the background context in which the LHD and its partners work, we collected information on the state-local governance structure and the size of the population served for each CHIP in our final sample. We compared these data with results from the 2019 NACCHO Profile Survey—the most recent national survey of LHD characteristics—to assess the representativeness of our sample.

Data Extraction

All CHIPs are required to document the strategies by which the LHD and its partners propose to address identified health priority areas. For identification purposes, these strategies were defined as the most granular intervention described within the CHIP, often subsumed under "goals" or "objectives" that outline the population indicators or performance measures that the LHD and its partners seek to improve through the strategy. For each CHIP included in our final sample, we used Microsoft Excel to extract the exact text for all strategies identified in the CHIP, including, whenever available, the health priority, goal and/or objective associated with the strategy.

Codebook Development and Application

A standardized codebook was developed to analyze the SDOH-related strategies identified in each CHIP. Our codebook was initially developed based on the SDOH-related objectives outlined in Healthy People 2030 (HP2030), due to its emphasis on addressing SDOH and the role it has in setting national priorities for public health. While Healthy People 2020 has often been used to guide the development of qualitative codebooks when analyzing national CHIPs,[78,81,83,84] no study has yet analyzed these documents using the framework outlined by HP2030, which, unlike Healthy People 2020, contains a group of objectives specific to SDOH. The final codebook was developed through an interactive process as additional CHIPs were reviewed. With each new CHIP, additional codes were added or edited until the

codebook was able to collectively capture data from all new CHIP strategies. The codebook evolved to include major SDOH domains, following the five place-based domains identified by HP2030, as well as minor SDOH domains, following the specific objective areas associated with each place-based domain, which were subsumed under the major domains. Our final list of major SDOH domains included the following ten: Economic Stability; Food Insecurity and Access to Healthy Food; Education Access and Quality; Healthcare Access; Safe Housing; Affordable Housing; Neighborhood Infrastructure; Safety, Crime, and Violence Prevention; Social Support and Community Context; Discrimination, Prejudice and Stigma (Table 1). For each major SDOH domain, we established an "other or non-specific" minor domain code to capture SDOH-related strategies that either did not match one of the identified minor domains or was described in an overly general way. For our final codebook, see **Appendix 3.1**.

We coded all SDOH strategies across the CHIPs included in our sample to identify the major and minor SDOH domains that each strategy best matched. Coding was done through Microsoft Excel and was conducted by two independent coders. Both coders (Coder #1 and Coder #2) began by coding all 80 CHIPs using the final SDOH codebook. Next, Coder #1 and Coder #2 met to resolve all disagreements (using the codebook definitions as a guide) that were identified between their code applications. While Kappa coefficients above 0.80 traditionally reflect strong agreement,[85] we sought perfect agreement (i.e., a Kappa coefficient of 1.0) between the two coders to achieve a maximal degree of alignment for our coding process.

While the development of our codebook included a description of topics included within each minor domain, the variation in strategies extended beyond the detail outlined in our minor code descriptions. Based on these details, we sought to identify the mechanism of strategies identified within each minor domain, including whether such mechanisms varied by SDOH. To do so, we first identified the range of unique strategies included within each SDOH minor domain, regardless of the number of times the strategy was documented across all CHIPs. Both coders then jointly categorized each strategy

as primarily matching one of the following six strategic mechanisms: policy changes; systems changes; environmental changes; programs and events; trainings and education; and assessments. While the former three mechanisms were derived from literature on the Policy-Systems-Environmental Changes (PSE) approach to public health interventions,[86] [xxxi] the later three were inductively identified among strategies that did not fit any of the PSE-mechanisms (**Appendix 3.2**). We included a final category for strategies that did not clearly match any of these six mechanisms.

Analytic Approach

Our analytic approach addressed three related investigations. Firstly, we evaluated the distribution and characteristics of CHIPs in our sample by the number of different SDOH major domains they addressed with at least one strategy. Secondly, we evaluated how often each SDOH domain was addressed by each CHIP, assessing the distribution of CHIPs containing one or more strategy in each major domain, and noting minor SDOH domain presence across CHIPs. Frequency analyses were also used to examine whether this distribution varied across jurisdiction size for each CHIP, given the established association between jurisdiction size and LHD decision-making activity.[45,46] For each of these analyses, Fisher's exact test of independence was used to estimate whether significant differences exist across jurisdiction sizes in the percentage of CHIPs that addressed each SDOH domain. All statistical analyses were determined to be significant at the 0.05 level for anLHD. Lastly, conventional qualitative content analysis was used to describe the distribution of each strategic mechanism across SDOH major and minor domains.

[xxxi] https://www.ruralhealthinfo.org/toolkits/health-promotion/2/strategies/policy-systems-environmental

Results

CHIP characteristics

After identifying accredited LHDs and accessing available documents, 80 CHIPs were included in this analysis. Fifty-four of the CHIPs were intended to be implemented starting in 2020, 16 in 2021, and nine in 2022. Among the original list of 357 accredited agencies, we excluded five tribal health departments, two army-based health departments, 40 state health departments, and four offices of vital records and health statistics. Among the accredited LHDs that met our inclusion criteria, 23 did not have an accessible CHIP, six had the same CHIP as another LHD, and 197 were published before 2020 (see **Appendix 3.3**). Compared to data from the 2019 NACCHO profile survey, our sample was composed of health departments serving a larger population, more often from decentralized states, and over-represented the Midwest and Western regions of the country (all major regions of the country were represented by at least 1 CHIP) (**Appendix 3.4**). A disproportionate number (31%) of CHIPs came from Ohio, likely due to a law that required all LHDs in Ohio to apply for accreditation by 2018 and to become accredited by 2020 (the only state in the country with such a mandate) (**Appendix 3.5**).[xxxii] **Appendix 3.6** presents a sensitivity analysis where we compare differences between Ohio CHIPs and the rest of our sample.

Characterizing CHIPs based on SDOH Involvement

Among the 80 CHIPs included in this analysis, only three did not include strategies to address SDOH in any way and only five addressed a single major SDOH domain. More than half our sample (n=49) addressed at least four of the nine major SDOH domains, and nearly a quarter of our sample (n=19) addressed seven or more (**Figure 3.1**).

[xxxii] https://odh.ohio.gov/about-us/local-health-departments/accreditation

Table 3.1 outlines the percentage of CHIPs that addressed each of the SDOH domains through at least one strategy, with major and minor domains listed in order of prevalence. The most common major SDOH domain addressed across all CHIPs was Healthcare Access (90% of all CHIPs). CHIPs were roughly 1.5 times more likely to address Healthcare Access than Food Insecurity and Access to Healthy Food (65%), Neighborhood Infrastructure (61%), or Affordable Housing (65%), and they were 3-4 times more likely to address Healthcare Access than Safe Housing (23%), Education Access and Quality (31%), or Economic Stability (24%). Frequency analyses revealed no statistically significant differences across the three population categories we considered (i.e., <50,000; 50,000-499,999; >500,000) for each of the ten major SDOH domains. Notably, the percentage of CHIPs addressing Affordable Housing was generally negatively correlated with population size, whereas those addressing Safe Housing was generally positively correlated with population size. While there were no statistically significant differences in the likelihood of addressing any of the major SDOH domain between CHIPs beginning in 2020 compared to those beginning in 2021 or 2022, later CHIPs were more likely to have strategies addressing Social Support and Community Context as well as Safety, Crime and Violent Prevention than earlier CHIPs (**Appendix 3.4**). In a sensitivity analysis, we found that CHIPs from Ohio had a smaller percentage of CHIPs (indicated by a decrease in overall prevalence of 50% or more) addressing Neighborhood Infrastructure and Economic Stability than CHIPs from all other states, though overall rankings of SDOH major domains were similar (**Appendix 3.6**).

Within each major SDOH domain, we observed further variation in the minor domains represented. Most strategies for addressing Healthcare Access concerned healthcare integration and coordination (70% of CHIPs) and among those strategies seeking to increase provider availability, a much greater proportion focused on the number (36%) and location (30%) of providers as opposed to their schedule (e.g., hours and days of operation) (6%). Likewise, strategies addressing the linguistic competency of providers were half as common as those addressing cultural competency (13% vs 25%).

Strategies addressing education access and quality more often addressed early childhood education (24%) than later stages of education, such as high school (5%), vocational training programs (8%), or university and college (3%). When addressing affordable housing, more CHIPs addressed homelessness (23%) or the integration of human services into affordable housing settings (25%) than land use policies like zoning (14%) and land trusts (5%). To address economic stability, roughly a fifth of all CHIPs included strategies regarding accessing employment (19%), with much fewer addressing "auxiliary" financial supports such as tax credits (3%), financial literacy (3%), and savings (3%). Strategies targeting discrimination, prejudice and stigma were slightly more likely to address stigma around mental health (18%) than they were to address racism (13%) or sexism and discrimination toward LGBTQ individuals (8%).

Characterizing SDOH Domains based on Strategy Mechanism

We documented each unique strategy identified across all 67 minor SDOH domains as most closely representing one of the following six strategic mechanisms: Policy Change; Systems Change, Environmental Change; Program and Events; Training and Education; and Assessment (see Appendix 6 for all identified strategies). Across all major domains, a few strategies concerned policy changes and a handful focused on improving systems or developing the built environment. Of policies that were proposed, most concerned expanding funding or changing eligibility requirements for welfare-related social goods (i.e., expanding the minimum wage, expanding health insurance, expanded SNAP benefits). Instead of focusing on policy change, most strategies focused on the provision of services directly through events and programming or the education of the general public and professionals on health-related topics. Across all major domains, CHIPs consistently proposed strategies to collect and assess SDOH-related data. **Table 3.2** presents a list of commonly identified strategies along with representative examples across each strategic mechanism.

While each major domain included at least one strategy across all six strategic mechanisms, notable patterns were observed within each domain. Strategies regarding food insecurity and access to healthy food were predominantly geared toward events and programming (e.g., expanding access to food pantries and farmers markets), whereas strategies addressing Discrimination, Prejudice, and Stigma focused primarily on training and awareness (e.g., implicit bias training). Economic Stability broadly addressed strategies to collocate employment assistance with other social services, policies to improve wages, or programs to increase career readiness and awareness. Social Support and Community Context was primarily addressed through events and programs intended to bring people in the community together or improve referral systems between different social services. Improvements to Neighborhood Infrastructure broadly fell into two categories: environmental changes to improve the accessibility and quality of active transportation opportunities and events to encourage active transportation in the community. In what follows, we further describe the strategies and their mechanisms within each minor SDOH domain (all minor domain titles are underlined).

Healthcare Access

Multiple strategies aimed to improve <u>healthcare integration and coordination</u>, including those that focused on decreasing wait times, improving the continuum of care, developing and streamlining referral systems, increasing the number of patient-centered primary care homes, and integrating different types of healthcare (oral, behavioral, substance-abuse, etc.) with each other through co-location or the creation of "Community Wellness Hubs." In addition, many strategies placed emphasis on enhancing provider coordination with other health and social services, such as co-prescribing Naloxone to patients. Healthcare integration was also encouraged through strategies encouraging programs and education for Medication Assisted Treatment (MAT). In addition, there was an emphasis on increasing the availability of <u>preventive screening and testing</u>, whether that be through environmental changes (mobile testing/screening sites or introducing testing sites in community clinics, jails, and non-traditional

settings) or assessments (collecting data on screening rates for specific conditions). Multiple strategies focused on promoting training for providers and the general community to increase the amount of people available to conduct preventive screening and testing.

Strategies that targeted health insurance coverage aimed to expand comprehensive health/dental coverage through policy changes (e.g., advocating for Medicaid expansion, sustainable reimbursement rates, decreased eligibility barriers), system changes (e.g., increasing enrollment rates for both private and public insurance programs, working with traditional health workers to connect populations to insurance), or general public insurance education. Most strategies regarding home visiting programs (i.e., visits on behalf of nurses or other health professionals to a patient's home) focused on assessing and collecting baseline data for home visiting programs and implementing/streamlining home visiting programs through more efficient referral networks, an increased number of home visits, and general community education. To promote the use of telemedicine/telehealth, strategies focused on large-scale system changes, such as using telehealth for behavioral/oral health/tobacco cessation services. Most strategies to improve patient health literacy revolved around trainings to community-based organizations (CBOs), health system navigators, healthcare providers, and to the public about the importance of consistent, inclusive, and culturally-informed health education materials. Improving the public's access to health workers (such as community health workers, doulas, and peer support specialists) was done through the development of peer support programs, community health workers trainings and programs, increased peer certification training, and the creation of a regional doula network. Lastly, non-specific healthcare strategies were mainly concerned with decreasing the cost of care, accessing generic healthcare "resources", healthcare resource referral networks, decreasing wait times, and access to Naloxone. There were also multiple environmental change strategies such as implementing a patient access center, increasing condom dispensers in non-traditional locations, and creating a tobacco cessation county-wide resource guide.

Multiple strategies focused on improving provider availability, through either increasing the number of providers, improving the schedule of providers, or optimizing the location of providers. Increasing the number of providers was done through expanding their scope of practice (e.g., training to provide buprenorphine), developing healthcare workforce pipelines, increasing the number of rural health providers, and physician campaigns. Improving provider schedules was mainly done through system changes such as expanding appointments to weekends or evenings and working to ensure a providers next available appointment is under seven days. Lastly, strategies that optimized provider's locations were geared towards increasing mobile or school-based health clinics, encouraging providers to practice in rural or underserved areas, and collecting baseline data of provider ratios.

Several strategies addressed inclusive and accessible healthcare by increasing provider linguistic and/or cultural competency. Similar strategies were used for both linguistic and cultural competency, including a large focus on education and cultural humility/linguistic competency training curricula in school-based, community-based, and health-based settings. The introduction and optimization of translation services, hiring population-representative providers, and environmental changes (e.g., handouts, signs, and instructions available in multiple languages) were also highlighted as strategies to improve provider linguistic competency. Policies such as required holistic comprehensive cultural competency training and monthly diversity awareness opportunities were proposed strategies to improve providers cultural competency.

Food Insecurity and Access to Healthy Food

Multiple strategies were proposed to improve government food assistance programs (primarily SNAPthe Supplemental Nutrition Assistance Program, known as SNAP), including expanding the range of benefits through policy reforms, educating the public about program eligibility and where to use their benefits (e.g., "Good Food Here" programs to inform which private grocers accepted SNAP), environmental changes such as collocating enrollment in such programs with other social services, as

well as organizational policies to expand the modes of receiving and spending benefits (e.g., increasing the number of stores that accepted SNAP, implementing "double SNAP bucks" programs, accepting SNAP online). Other strategies sought to expand vegetable and nutrition prescription programs in more locations, such as farmers markets, federally qualified health centers, and other local healthcare organizations.

A handful of strategies were geared toward expanding or improving the sustainability of community gardens (e.g., securing master gardeners, expanding partnerships with schools and senior meals), especially in food desert areas. Relatedly, other strategies focused on distributing information about the locations and supplies of community gardens or educational programming about how to garden. To address food insecurity and improve access to healthy food, several strategies proposed to increase the accessibility of farmers markets through programmatic expansion (e.g., expanding the number of sites, expanding weekly schedules, ensuring that the markets operate year-round) or changes to neighborhood transportation (e.g., ensuring consistent transportation options and developing mobile food markets where transportation options weren't possible). Many CHIPs advocated for more farmers markets to update their policies to accept SNAP.

Several CHIPs proposed strategies to expand the sites in which individuals are screened for food insecurity (primarily healthcare organizations, but also convenience stores and schools). Other CHIPs proposed conducting major assessments of the levels of food insecurity in the community. A subset of strategies was particularly focused on addressing food insecurity and healthy eating among children. These primarily included strategies to expand the amount of food available for children through programs (e.g., backpack programs), local policy changes (e.g., modifications to the summer meal service program for children), or education (e.g., ensuring that all students are aware of food resources in the community). Other strategies focused primarily on increasing the amount of healthy food options for children, primarily through programs (e.g., the development of school vegetable gardens,

implementation of healthy meal programs within schools), or in one case, developing policies to limit advertisement of unhealthy food to children.

Other strategies sought to expand the number of health options in private food outlets. These included strategies about expanding programming to support healthier options in corner or convenience stores (e.g., "Healthy Food Retail" initiative) and implementing new policies within restaurants (e.g., healthier meal options for children's meals, healthier menu entrée initiatives), as well as one strategy about providing technical assistance on how to source food from local farmers. A limited number of policies were proposed in the context of private food outlets, including those targeting food reclamation and tax deductions for food donations. Others proposed healthy food audits of corner stores and school meals. A limited number of strategies proposed bringing in new grocery stores to the community, though specific mechanisms were not identified. Likewise, other strategies sought to improve organizational policies regarding the range of healthy options available in food pantries, including an increase in the number of pantries offering fresh food, those implementing nutritional guidelines, and those offering a broader range of culturally-inclusive foods. Many sought to raise awareness of the availability of food pantries or use food pantries as sites to provide education about healthy eating.

Several strategies sought to improve access to healthy food through system-wide planning initiatives, such as the establishment of food access coalitions, the development of comprehensive food plans, improvements to food supply chains to reduce waste, and coordination among food system partners. A handful of strategies aimed to better assess and disseminate information about the availability of healthy food options in the community (e.g., publishing a food environment map).

Neighborhood Infrastructure

CHIP strategies that addressed internet access focused on increased affordability and awareness of its importance, as well as assessing gaps in coverage. In the context of environmental quality, most strategies were policies pertaining to air or water quality. While strategies dedicated to air quality

focused primarily on vehicle-related pollution around housing and schools (e.g., idle free zones at schools, expanding fuel-efficient and electric vehicles) others addressed burn policies and developing better measurement systems. Strategies addressing water quality primarily focused on testing for various environmental chemicals (e.g., PFAS, nitrates, nitrites), disposal of environmental contaminants, and septic testing. A limited set of strategies sought to build awareness about the importance of climate change.

Several CHIPs addressed the need to expand access to transportation for various goods and services in the community. While the precise mechanism was often unclear, this included the generic expansion of access to public transportation (e.g., expanding the schedule of public transit, increasing affordability), as well as ensuring that transportation options existed to connect individuals to particular goods (e.g., healthcare visits, grocery stores, farmers markets) with a few strategies emphasizing private transportation options to do so (e.g., Lyft™, UberHealth™). Other strategies focused on conducting assessments and developing resource guides to inform residents of all their transportation options.

To improve recreation areas and active transportation, several CHIPs proposed strategies regarding expanded programming and development of the built environment. Several well-documented active transportation programs were frequently proposed, including "Complete Streets" and "Safe Routes to School" initiatives (e.g., walking school buses, Park n' Walk programs, Snow Angels). Several strategies focused on increasing awareness, coverage, and affordability of bike share programs, while many focused on developing green spaces and trails in the community (e.g., extending trail networks, expanding greenway systems, ensuring new housing has walkable areas, creating downtown walking routes and dog parks). Other strategies focused primarily on improving the safety (e.g., installing curb cuts, pedestrian crosswalk signs) or quality (e.g., installing exercise stations on trails) of green spaces and trails. Many strategies focused primarily on one-off events to encourage active transportation, such as

bike rodeos and “Walk N’ Roll to School” days. A handful of strategies sought to build awareness about resources for active transportation (e.g., trail maps).

Affordable Housing

Most of the strategies targeting affordable housing centered on addressing homelessness, which includes encampments and general housing instability. These strategies aim to increase collaboration between health and housing systems by improving relationships, increasing the percentage of people in Housing First programs, and conducting environmental scans to properly assess persons living without safe, stable housing. Very few CHIPs focused on housing and land trusts, and those that were focused on targeted programs to acquire, hold, manage property for affordable housing purposes (i.e., land banks). A moderate number of strategies were specifically focused on youth homelessness, whether that be through programs that increased graduation rates, general systems to help identify youth living without safe, stable housing, or practices in youth services delivery informed by “Adverse Childhood Experiences” (e.g., childhood exposure to violence, substance abuse). Co-location of health services within affordable housing complexes and collaborations with health/law/substance abuse services were the main strategies that focused on integrating human and health services. Additional strategies included programs to house those with mental health difficulties, permanent supportive housing, and the provision of housing to those transitioning from the hospital. The few strategies that were proposed for low-income housing tax credits revolved around advocacy for low-income tax credits. Policies to address affordable housing largely concerned zoning and land use planning, including advocating for policy changes to single dwelling units. Additional strategies included advocating for roadway and urban design standards, information campaigns for inclusive city planning, and strategies for amending local jurisdiction zoning ordinances. Other CHIPs that broadly aimed to increase affordable housing included supporting policies that prevented abuse of power from landlords and protected tenants' rights, Habitat for Humanity, increasing screening for housing accessibility and establishing a removing housing barrier

fund, campaigns for housing justice specifically for people of color, and educational programs about renting houses.

Social Support and Community Context

Regarding civic participation and community engagement, many strategies addressed some mechanism to involve members of the community more intentionally into decision-making processes, formally through policies to add them to governance bodies (e.g., advisory councils) and informally through events such as community forums. Of note, there were no strategies addressing civic engagement in the context of political institutions such as joining political organizations, running for office, or voting. A handful of CHIPs proposed strategies to improve social integration and social cohesion by addressing social isolation, though almost exclusively among older adults, whether through programming that connected older adults with each other (e.g., library discussion groups) or with other members of the community (e.g., connecting them with youth mentees). Other CHIPs proposed strategies to improve childcare provision, whether by addressing its affordability through policies (e.g., through subsidies or vouchers), the training of childcare providers, the ability to access childcare by collocating it with other services, or the development of childcare networks (e.g., support groups among caregivers). A few strategies were proposed to improve family support by connecting families to each other through additional programs (e.g., support groups for infant feeding, parent networks, play groups) or connecting families to community resources (e.g., home visiting, cribs).

Discrimination, Prejudice, and Stigma

Most strategies addressing discrimination, prejudice, or stigma were concerned with eliminating stigma associated with mental health and/or substance abuse. A very wide range of strategies was proposed to do so, including workplace policies, development of task forces and committees to address mental health stigma, system-wide integration of primary and behavioral healthcare, and promoting formal trainings among professionals and the general public (e.g., “Mental Health First Aid”), along with

a wide array of messaging and communications campaigns (e.g., sharing education films, resource guides, social media messaging, public service announcements). While no strategies were proposed that explicitly addressed sexism, as small handful of strategies proposed trainings for both parents and healthcare providers to better understand LGBTQ+ related issues, with one strategy proposing the maintenance of an LGBTQ+ advisory council. Alternatively, several strategies sought to address racism through policies to incorporate BIPOC community members within community governance structures (e.g., committees, coalitions). Additionally, other strategies sought to address racism through trainings to ensure that organizational processes centered racial equity (e.g., conducting Health and Race Equity Impact Assessments). Beyond specific forms of discrimination or prejudice, many strategies proposed training with organizations and individuals on implicit bias and cultural humility, especially among healthcare providers and employers, and for the general public. Other strategies proposed a greater awareness of nondiscrimination policies in the workforce and community, as well as expanding cultural competency serving non-majority cultures (e.g., translational services for non-English speakers).

Safe Housing

To improve the safety of housing, a handful of strategies centered around radon mitigation (e.g., promoting a radon testing kit program, increasing the proportion of homes with a radon mitigation system, and general advocacy for radon testing). Strategies to address housing heat stress mainly aimed to spread advocacy about cooling costs, educate community leaders about heat stress and climate change, and gather housing data to examine the extent of heat stress throughout communities. More CHIPs primarily focused on lead hazards, whether that be through policy changes (e.g., public disclosures of lead hazards and enforcement of the federal renovation, repair, and painting rule), lead paint remediation programs, or the creation of lead awareness task forces. Strategies that addressed housing rehabilitation mostly aimed to create programs and campaigns about home ownership and repair mentorship. Additional housing rehabilitation strategies include assessing available home ownership and

grant opportunities and partnerships and establishing a veterans' leadership team. The few strategies targeted at weatherization included identifying and obtaining new funding sources for weatherization and creating a weatherization implementation program. Other strategies for safe housing including advocating for smoke-free policies in housing areas, supporting the implementation of rental registries, community forums, and healthy homes trainings. In addition, many strategies focused on assessing home and community safety and current rental requirements.

Education Access and Quality

A limited number of strategies sought to improve literacy and language through home-based (e.g., encouraging parents to read more to their kids) or school-based (e.g., after school programs) programming. Many strategies addressed early childhood education (ECE). While a few strategies proposed policies to provide greater access to ECE, and several others focused on improving the interactions between ECE and other systems (e.g., incorporating mental health providers, connecting to home visiting programs), the majority of strategies focused on workforce sustainability and development through policies that would increase workforce pay or encourage ECE practitioners to achieve licensing or complete training programs (e.g., "Rooted in Relationships," "Circle of Security"). A few strategies focused on assessing ECE enrollment numbers or quality (e.g., kindergarten readiness assessments). Beyond ECE, limited strategies addressed secondary education, the majority of which merely sought to build awareness of vocational training programs; no strategies addressed accessing university or colleges in a substantive way. Likewise, the limited number of strategies focused on K-12 schooling primarily concerned programs to improve graduation rates (e.g., housing programs for youth living without safe, stable housing, 9th grade retention initiatives), while a handful of others focused on the integration of mental healthcare within high school settings (e.g., peer suicide prevention groups, presentations on mental health).

Economic Stability

Several strategies addressed tax assistance and accessing tax credits, though this was exclusively focused on increasing awareness of the Earned Income Tax Credit (e.g., in clinical settings). Likewise, there were a few strategies aimed at improving financial literacy among those in disadvantaged populations and schools with economic development programs such as "Bridges Out of Poverty," "Getting Ahead," and "R-Rules." In the context of economic stability, most strategies concerned accessing employment. These included several strategies about the collocation of employment assistance resources within other commonly frequented sites—housing developments, the library, childcare services, health service visits. Other strategies sought to improve career exposure (e.g., career fairs) and pathway or pipeline programs, including several strategies focused specifically on healthcare careers (especially those in behavioral health). A few strategies focused on training employers to be more culturally competent, including policies and education programs aimed at hiring and retaining those with a history of substance abuse. Likewise, several strategies focused on increasing income by policies to increase the minimum wage or otherwise ensuring that employers provide a living wage. A few strategies focused on financial savings, including one which focused on accessing a select number of asset-development programs (e.g., Individual Development Accounts (IDA) and Child Savings Accounts (CSA)).

Safety, Crime, and Violence Prevention

Several strategies were proposed in the context of criminal justice reform. Many of these strategies sought to improve the relationship between the community and law enforcement through programming (e.g., "walk as one" nights). Other strategies focused primarily on reforming systems by which the criminal justice system handles those with mental illness and/or substance abuse, both at the point of encounter and when these individuals transition back to society. Such strategies included the expansion of crisis intervention training, the establishment of co-responder models, immediate

screening and referral for mental illness among those confronted by law enforcement, diversion courts, expanded Medication-Assisted Treatment (MAT) access in jails, and training law enforcement using various mental health related curricula (e.g., the Police Assisted Addiction and Recovery Initiative, the Columbia suicide scale, and drug recognition). Many proposed strategies sought to improve how youth were treated by the criminal justice system, including programming directed toward wraparound services in juvenile courts, policies regarding lessening fines for youth, and expanding restorative justice models. Among the other Safety, Crime, and Violence prevention strategies proposed, a handful of strategies addressed gun violence in the community (e.g., through access to illegal firearms). While limited specificity was provided, other strategies focused on preventing forms of domestic abuse, primarily intimate partner violence and child abuse (e.g., screening for IPV in clinical settings, programming with high school-aged males). There was one mention of the need to address racial equity in the context of community violence, through precise strategies to do so were not detailed.

Discussion

Through examining recently submitted CHIPs from LHDs and their partners across the country, this study sought to identify the range of strategies by which local communities have proposed to address SDOH. The CHIPs submitted during our time period of observation were written at a time when public health had been increasingly encouraged to work with partners in the community to address SDOH, especially through frameworks such as PH3.0.

Despite their importance in community health improvement, little has been written about what, exactly, should be considered a SDOH. There are a limited number of frameworks that identify categories of SDOH, the most commonly cited being the five domains presented by HP2030 and a similar six

domain framework by the Kaiser Family Fund (KFF).[xxxiii] Neither framework, however, provides a conceptual justification for their domains. A common definition of SDOH, the one adopted by HP2030, is "the conditions in the environments where people are born, live, learn, work, play, worship, and age that affect a wide range of health, functioning, and quality-of-life outcomes and risks."[xxxiv] Our findings challenge this broad definition in two respects. Firstly, compared to both HP2030 and KFF, we documented ten conceptually distinct SDOH domains, suggesting that, at the very least, there are multiple iterations by which SDOH can be categorized. While building off HP2030, the development of our codebook was primarily inductive insofar as it sought to develop a mutually exclusive but collectively exhaustive set of codes for the strategies we identified in our data. To our knowledge this is the first naturally representative, inductive approach to categorizing SDOH (though this approach is naturally limited to the data included in our sample). A strictly theoretical approach to SDOH categorization may result in different outcomes.

PHAB requires that strategies documented with CHIPs be "evidence-based, practice-based, or promising practices or may be innovative to meet the needs of the community,"[xxxv] and yet there are relatively few resources on evidence-based strategies for addressing SDOH. For instance, the only evidence-based strategies by which HP2030 proposes to address food insecurity are through the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) and The National School Lunch Program (NSLP),, both of which are national, government run programs. There are several instances in which our minor domains go beyond those included in HP2030 or included strategies beyond those identified by HP2030. For instance, we identified several community-based solutions to food insecurity, including community gardens, farmers markets, and local nutrition prescription programs. Across all the

[xxxiii] https://www.kff.org/racial-equity-and-health-policy/issue-brief/beyond-health-care-the-role-of-social-determinants-in-promoting-health-and-health-equity/

[xxxiv] https://health.gov/healthypeople/priority-areas/social-determinants-health

[xxxv] https://phaboard.org/wp-content/uploads/SM-Version-1.5-Board-adopted-FINAL-01-24-2014.docx.pdf

major SDOH domains considered in this analysis, our results present an expanded set of strategies to be further evaluated and potentially added to the list of evidence-based practices to address SDOH.

Resources on the role of public health in addressing SDOH, including PH3.0, tend to list all social determinants together as a single category, with the implicit assumption that all determinants are both equally consequential to health and equally feasible for public health to address. The results of this study suggest that this presentation may not reflect reality. While nearly all the CHIPs in our sample included some consideration for addressing SDOH, wide variations in representation were observed: roughly every CHIP addressed Healthcare Access, two thirds of CHIPs addressed Food Insecurity, Neighborhood Infrastructure, and Affordable Housing, and roughly a quarter to a half of CHIPs addressed our remaining major SDOH domains. The structure of this representation may even suggest a loose typology in which, in general, "social goods" (e.g., healthcare, food, housing) are more likely to be addressed than "social processes" (e.g., discrimination, violence, social support). This may be especially the case for goods more directly related to healthcare, sinceacross each major SDOH domain, strategies were more often proposed in the context of healthcare settings. Workforce development strategies primarily emphasized careers in healthcare, transportation initiatives often referred to access to healthcare visits, food insecurity screenings were typically proposed in the context of clinical settings, and the form of discrimination most commonly addressed was stigma around mental health and substance abuse. This pattern may be a particularly important finding, given that the benefits of social goods are generally more individually received than those of social processes, which may also have a broader impact beyond health. At the furthest extreme, the "political determinants of health" (e.g., voting, elections, political parties)[87]—perhaps the most fundamental of social processes—were not considered by any of the CHIPs we analyzed in this study. Likewise, while many healthcare and public health professional associations

have deemed structural racism a "root cause" of health inequities,[xxxvi,xxxvii,xxxviii] only a tenth of all CHIPs proposed strategies which explicitly addressed racism in their communities. However, addressing SDOH is traditionally associated with the elimination of health disparities, especially among racial/ethnic minorities communities, such that many of the strategies proposed may in fact combat racism even if this was not explicitly stated.[88] Relatedly, many of the strategies identified were not proposed with nuanced geographic granularity (e.g., census tracts, neighborhood-level populations), though their implementation may ultimately be done within specific, more narrowly defined localities, including racial/ethnic minority communities.

The methodological approach and scope of our analysis limit our ability to speculate on the factors leading to this prioritization. Notably, we did find that SDOH distributions did not consistently vary by population size, a finding that broadly aligns with Sreedhara and colleagues 2017 study of CHIPs which also found that the likelihood of having any strategy focused on active transportation was not associated with population size or the structure of the LHD.[83] The limited correlation between population size and SDOH involvement suggest that factors beyond LHD capacity and urbanicity (for which population size is a proxy), like the culture or the political orientation of a community, may be more demonstrative. This is the first attempt to consider, at a national level, the range of LHD involvement in addressing SDOH. Further work needs to be done to assess how this involvement varies across other characteristics of the community, such as its demographic makeup, political orientation, and epidemiologic trends. Qualitative research is needed to understand the processes by which communities

[xxxvi] https://www.apha.org/topics-and-issues/health-equity/racism-and-health/racism-declarations

[xxxvii] https://www.aap.org/en/news-room/news-releases/aap/2022/american-academy-of-pediatrics-calls-for-elimination-of-race-based-medicine/

[xxxviii] https://www.aha.org/2021-07-14-statement-racism-public-health-issue

prioritize addressing SDOH within health coalitions, including the prioritization of one SDOH over another.

Moreover, our study suggests that the mechanisms by which SDOH are addressed vary considerably. This finding echoes the message of Friedman's Health Impact Pyramid, in which public health strategies are described as ranging from those that address "socioeconomic factors" (which have the biggest impact at the population level but are hardest to implement) to those that address individual "counseling and education" (which have the least impact at the population level but are easiest to implement). The challenge of moving from the "top" to the "bottom" of the pyramid persists: in general, CHIPs in our sample were less likely to propose policies regarding SDOH than strategies such as programs and events or education and training. These findings also align well with recent work from the discipline of public administration on the different "policy instruments" governments and other organizations may leverage to influence change.[89,90] For instance, the commonly cited "NATO" framework distinguishes between instruments that lean on an organization's "Nodality" (the property of information-interconnectedness), "Authority" (the possession of legal or official power), "Treasure" (the command of a stock of freely exchangeable assets), or "Organization" (the direct possession of a stock of manpower, buildings, and equipment).[91,92] According to this literature, not only do organizations vary in their capacity to implement these different instruments, but each instrument reflects cultural dimensions along which organizations, especially government agencies, wish to interact with others,[93] as well as behavioral assumptions of individuals interacting with the instrument.[94] For instance, different instruments have been noted to align with different political "modes" of governance (i.e., those that are more hierarchical, market, legal, or network oriented).[95–97] We encourage more research on the alignment between theoretical scholarship on policy instruments and the applied work of public health professionals, including an empirical mapping of the types of strategies we identified in this analysis with the various typologies that scholars of public administration have identified for such instruments. As

demonstrated in other applied fields (e.g., urban design[98]), this mapping may help public health practitioners develop a better sense for the political and cultural values associated with each strategy as well as the proper context for implementation.

Limitations

There were several noted limitations of this analysis, similar to those identified in prior CHIP-based analyses.[76,79] Most of these limitations correspond to the kinds of strategies included within CHIPs. Firstly, the strategies outlined within CHIPs are proposed strategies, and as such do not describe the actual work conducted by LHDs and their partners. There may be important differences between those strategies that are proposed and those that are ultimately implemented. Additionally, strategies outlined in CHIPs represent a limited set of strategies that have been proposed to respond to specific priority areas that were identified by CHA/CHNAs. As such, they do not include strategies that are not as immediately affiliated to CHA/CHNAs, likely including many that are more routinely practiced by the LHD (and therefore "go without saying"). Because of this, the absence of a strategy neither implies that it is not a priority in the community nor that there is not something already being implemented. However, the priorities identified in CHIPs are, by definition, those that communities have identified as worthy of special attention. As such, while CHIPs may be biased away from strategies already occurring, they are arguably biased toward the very health priority areas, including SDOH, that most reflect the central public health concerns of the community. Likewise, the absence or low representation of a certain strategy may simply reflect the absence of the specific health need that would have prompted its consideration, and not outright disregard for the strategy. Furthermore, given that CHIPs are produced on cycles of 3-5 years, the most recent CHIPs for many LHDs will be those that were developed before COVID-19. This is especially the case given that CHIP development may have been delayed due to COVID-19, and therefore the development of a post-COVID CHIP may not occur until during or after data

collection has begun. When additional time has passed, further research could be conducted on the variation in strategies that LHDs have planned to address before and after COVID-19. Finally, the text of a strategy outlined within each CHIP may not contain the whole of specific actions to be implemented through that strategy, though this text does reflect the clearest focus of the strategy.

Conclusion

By closely examining the range of SDOH-related strategies proposed within recent CHIPs across the country, this study sought to characterize the distribution of SDOH that LHDs and their communities have proposed to work on, as well as the range of strategies by which they have proposed to address them. The results of this study clearly demonstrate that not all SDOH are addressed equally by LHDs. Across the major SDOH domains identified in our analysis, there is significant variation along at least two dimensions: firstly, in the likelihood that a CHIP addresses the domain and, secondly, in the mechanism by which each domain is addressed. This finding fills in a gap within the literature on the role of public health in addressing SDOH, which rarely characterizes how this role may vary across SDOH domain. Practically, the list of strategies we documented from the 80 CHIPs included in our sample may serve as the basis for strategies that other communities may wish to consider when addressing SDOH. This list goes well beyond the list of identified evidence-based practices that HP2030 documents, demonstrating the unique, varied, and constantly evolving mechanisms by which LHDs and their partners have proposed to improve community health.

Tables and Figures

Figure 3.1: Distribution of the number of SDOH Domains Address by CHIPs

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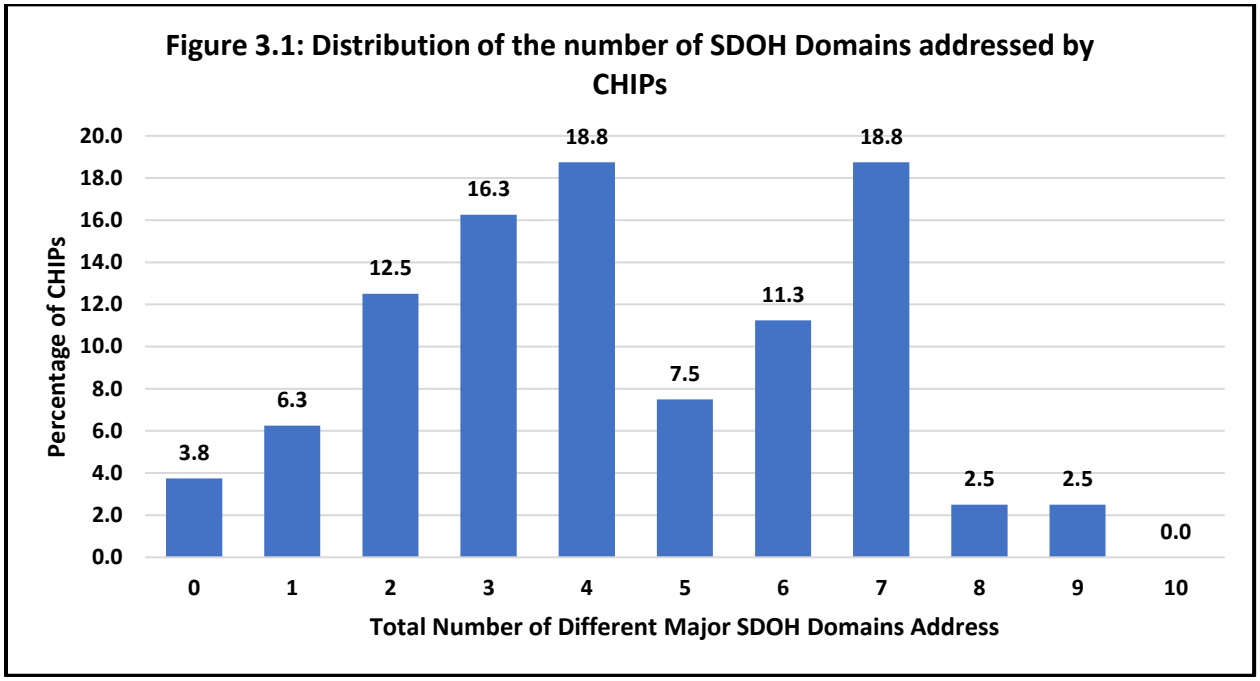

Table 3.1: Distribution of SDOH Strategies across Population Size

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Major SDOH Domain	**Minor SDOH Domain**	**Percent of CHIPs with at least 1 strategy per SDOH domain**				
		Full Sample (n=80)	**<50,000 (n=13)**	**50,000-499,999 (n=55)**	**>500,000 (n=12)**	**P value***
Healthcare Access	***Any Healthcare Access***	**90%**	**92%**	**89%**	**92%**	**0.921**
	Healthcare integration and coordination	70%	62%	69%	83%	
	Preventive screening and testing	38%	31%	40%	33%	
	Provider availability -- *Number* of Providers	36%	15%	40%	42%	
	Provider availability -- *Location* of Providers	30%	15%	27%	58%	
	Health insurance coverage	25%	23%	24%	33%	
	Telemedicine	25%	31%	24%	25%	
	Provider *cultural* competency	25%	8%	29%	25%	
	Access through traditional health workers	25%	8%	25%	42%	

	Home visiting	20%	23%	24%	0%	
	Patient health literacy	21%	8%	22%	33%	
	Provider *linguistic* competency	13%	8%	13%	17%	
	Provider availability -- *Schedule* of Providers	6%	0%	7%	8%	
	Other or non-specific healthcare access	64%	54%	64%	75%	
Food Insecurity and Access to Healthy Food	***Any Food Insecurity and Access to Healthy Food***	***65%***	***69%***	***64%***	***67%***	**0.922**
	Food and nutrition assistance programs	33%	31%	36%	17%	
	Farmers Markets	23%	23%	18%	42%	
	Community Gardens	18%	8%	18%	25%	
	Expanding Healthy Options in Private Food Outlets	15%	23%	13%	17%	
	Youth food insecurity programs	11%	15%	9%	17%	
	Expanding Fresh Produce in Food Pantries	10%	0%	9%	25%	
	Vegetable and Nutrition Prescription Programs	8%	15%	7%	0%	
	Food Insecurity Screening	8%	0%	7%	17%	
	Other or non-specific Food insecurity and Access to Healthy Food	45%	62%	44%	33%	
Neighborhood Infrastructure	***Any Neighborhood Infrastructure***	***61%***	***62%***	***56%***	***83%***	**0.221**
	Developing recreation areas and active transportation	41%	23%	40%	67%	
	Expanded access to transportation for goods and services	28%	46%	22%	33%	
	Environmental Quality	25%	23%	22%	42%	
	Complete Streets	9%	15%	4%	25%	
	Developing safe routes to school	9%	15%	5%	17%	
	Internet Access	8%	0%	7%	17%	
	Other or non-specific neighborhood infrastructure	10%	8%	9%	17%	
Affordable Housing	***Any Affordable Housing***	***58%***	***62%***	***62%***	***33%***	**0.185**
	Integrating affordable housing and human services	25%	38%	27%	0%	
	Addressing adult homelessness	23%	31%	22%	17%	
	Zoning and land use planning	14%	8%	13%	25%	
	Housing and land trusts	5%	0%	7%	0%	
	Youth homelessness	5%	23%	0%	8%	
	Low-income housing tax credits	3%	15%	0%	0%	
	Other or non-specific affordable housing	41%	23%	47%	33%	
Social Support and	***Any Social Support and Community Context***	***43%***	***31%***	***47%***	***33%***	**0.437**
	Childcare	30%	31%	29%	33%	

Community Context	Civic participation and community engagement	20%	8%	24%	17%	
	Social integration and social cohesion	13%	0%	16%	8%	
	Family Supports	11%	15%	11%	8%	
Discrimination, Prejudice, and Stigma	***Any Discrimination, Prejudice, and Stigma***	***31%***	***23%***	***29%***	***50%***	**0.288**
	Stigma about mental health and substance abuse	18%	8%	18%	25%	
	Racism	13%	0%	11%	33%	
	Sexism and LGBTQ+ discrimination	8%	0%	9%	8%	
	Other or non-specific Discrimination, Prejudice, and Stigma	14%	15%	13%	17%	
Safe Housing	***Any Safe Housing***	***23%***	***8%***	***22%***	***42%***	**0.124**
	Housing rehabilitation	6%	8%	5%	8%	
	Lead hazards	5%	0%	4%	17%	
	Radon mitigation	3%	0%	2%	8%	
	Housing heat stress	3%	0%	2%	8%	
	Weatherization	3%	0%	4%	0%	
	Other or non-specific safe housing	16%	0%	18%	25%	
Education Access and Quality	***Any Education Access and Quality***	***31%***	***46%***	***25%***	***42%***	**0.245**
	Early childhood (pre-K) education	24%	31%	22%	25%	
	Vocational training (Trade schools, tech centers)	8%	0%	11%	0%	
	K-12 education (e.g., local public schools)	5%	15%	4%	0%	
	Literacy and language	5%	0%	7%	0%	
	Higher education (university, college)	3%	0%	4%	0%	
	Other or non-specific education access and quality	8%	8%	5%	17%	
Safety, Crime, and Violence Prevention	***Any Safety, Crime and Violence Prevention***	***40%***	***46%***	***40%***	***33%***	**0.808**
	Criminal Justice Reform	21%	23%	20%	25%	
	Safety (non-crime-related)	10%	8%	9%	17%	
	Crisis Intervention Training	8%	15%	7%	0%	
	Other or non-specific Safety, Crime, and Violence Prevention	19%	23%	18%	17%	
Economic Stability	***Any Economic Stability***	***24%***	***15%***	***24%***	***33%***	**0.574**
	Employment	19%	15%	18%	25%	
	Income (wage/salary)	6%	8%	4%	17%	
	Tax assistance and accessing tax credits	3%	0%	4%	0%	
	Financial literacy	3%	0%	2%	8%	
	Savings	3%	8%	2%	0%	

	Other or non-specific economic stability	10%	8%	9%	17%	

*Based on Pearson Chi-squared test.

Table 3.2: Commonly identified strategies across each strategic mechanism

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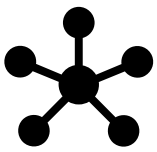
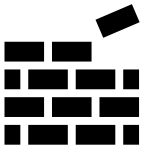
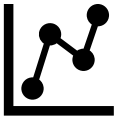
Strategic Mechanism	**Common strategies**	**Illustrative Example(s)**
Policy changes 	Policies to expand benefits of current programs	Higher minimum wage, expanded FMLA, increasing the range of culturally inclusive foods in food pantries
	Policies to increase access to public benefits by… a) Policies to ensure greater availability of public goods b) Increasing the affordability of goods c) Increasing eligibility criteria for public goods d) Increasing the locations of goods e) Increasing the timely availability of goods f) Increasing the modalities of receiving public benefits g) Increase where benefits an be used (e.g., EBT at farmer's markets)	a) zoning and land use planning for affordable housing b) subsidizing internet access c) Medicaid expansion d) increasing mobile or school-based health clinics, increasing transportation options to farmers markets e) expanding appointments to weekends or evenings f) accepting SNAP online
	Policies to improve the quality and safety of social goods	Safety regulations in homes (e.g., routine radon testing), soil safety regulations to support urban agriculture, implementing nutritional guidelines in food pantries, idle free zones at schools
	Adjusting tax benefits	Tax deductions for food donations
System change 	Development of multi-partner task forces and system-wide planning initiatives	Community task forces to address mental health stigma, development of comprehensive food plans
	Improving internal governance policies	Development of LGBTQ+ advisory councils
	Creating partnerships and the integration of referral systems	Referral systems between law enforcement and mental health, improving the interactions between early childhood education and other systems

Environmental Change 	Production of new infrastructure	New greenway systems, new affordable housing developments
	Improvement of old infrastructure	Improving safety of bike routes
	Physical collocation of resources	Integrating public housing and social services, incorporating nutrition prescriptions at pharmacies, hosting financial literacy classes during medical visits
Programs/Events 	One-off events to encourage healthy behavior	Bike rodeos and "Walk N' Roll to School" days
	Expanding preventative screening sites	Screening for Intimate Partner Violence in clinical settings
	Direct provision of goods	Mobile farmers markets, provision of food through food pantries, expanding internet access
	Financially incentivizing health behavior	Community-wide competitions to encourage physical activity
	Programming to bring people together	"Walk as one" nights with policy officers and community members, library discussion groups for elderly community members
Trainings and Education 	Promotion of health behavior	Encouraging parents to read more to their kids
	Educating the public about SDOH-related issues	Building awareness about climate change
	Educating the public on eligibility for public benefits	Low-income housing tax credits, EITC
	Educating the public on where to use public benefits	"Good Food Here" programs to inform which private grocers accepted SNAP
	Distributing information on community resources	Information on park trail systems, locations of food pantries, publishing a food environment map
	Training healthcare workers	Buprenorphine training for physicians to response to substance abuse episodes
	Social media campaigns to address health issues	Media campaigns to address mental health stigma
	General education of healthcare professionals on SDOH topics	Cultural humility training within healthcare settings, educating physicians on how to address food insecurity in the clinic
	Professional development outside of healthcare	Training law enforcement on mental health related curricula, training for early childhood providers
	Conducting health-equity related assessments	Health and Race Equity Impact Assessments

Assessments 	Assessing SDOH-related burden in the community	Conducting environmental scans to properly assess the homeless population, assessing need for more food pantries
	Evaluating SDOH-related program effectiveness	Evaluating WIC enrollment rates/barriers
	SDOH-related screening tool development/dissemination	Food insecurity screening
	Resource guide/toolkit development/mapping	Creating and disseminating maps of trail systems
	SDOH-related measurement development	Developing new indicators of social cohesion

CHAPTER 4: THE IMPACT OF VARIATIONS IN LOCAL HEALTH DEPARTMENT ORGANIZATION AND GOVERNANCE STRUCTURE: A QUALITATIVE STUDY IN NORTH CAROLINA

Introduction

Across the country, local governmental health departments ("LHDs") are tasked with providing or ensuring essential public services for citizens in their jurisdiction. The flexibility each LHD has to secure those services is, however, influenced by its governance model—the layered set of institutions that determine who is responsible for making which decisions for an LHD's operations. While entities governing LHDs exist at the state and federal level, the most direct influence of governance occurs through the LHD's relationship with its local governing entity (especially so in decentralized public health systems), often referred to as the local board of health (BOH). Across the country, BOH vary widely in their composition (whether they are composed of elected officials, appointed health professionals, community members, or some combination), legal capacity (their statutory authorities to make policies for the LHD and its jurisdiction), and level of oversight (whether they are strictly advisory or have governance responsibilities).[xxxix] Recent quantitative analyses have established consistent associations between variations in BOH structure and function and LHD performance across core services and community health outcomes,[35] prompting interest in qualitative research to better understand the mechanisms by which such associations emerge.[xl]

[xxxix] https://www.naccho.org/resources/lhd-research/national-profile-of-local-boards-of-health

[xl] https://systemsforaction.org/sites/default/files/Local%20Boards%20of%20Health%20--%20Evidence%20Brief.pdf

Local Public Health Governance in North Carolina

Under the North Carolina ("NC") General Statutes, every county must have an LHD, a Local Health Director ("Director"), and a governing BOH.[xli] The exact organizational and governance structure of these components can vary.[xlii] Traditionally, LHDs are single county health departments ("CHDs"), in which services are delivered to a single county, with governance provided by an appointed, county specific BOH ("Standalone BOH"). A CHD may also be governed by the board of county commissioners ("BOCC"). Individual counties may also form Consolidated Human Services Agencies ("CHSAs"), in which multiple county human services functions or departments (including, but not limited to, the CHD and the department of social services, "DSS") are consolidated into a single county agency. CHSAs may be governed directly by a BOCC or by an appointed consolidated human services (CHS) board, which must include members from a wide range of human services backgrounds. In lieu of forming a single-county LHD, counties may opt to form a multi-county District Health Department (DHD) that provides services for the residents of all counties in the district. DHDs are governed by a District BOH, composed of members from each of the constitutive counties. Unlike CHSAs and CHDs, DHDs are legally deemed "public authorities" and are therefore responsible for their own budget and financial management, separate from their constituent counties. Lastly, counties may opt to form a Public Health Authority (PHA) that is entirely removed from county management, though none currently exist in NC.[xliii] Collectively, the organizational structure (CHD, CHSA, DHD, or PHA) and governance structure (Appointed Standalone BOH, BOCC as Standalone BOH, Appointed CHS Board, BOCC as CHS Board, or District BOH) constitute the LHD's "configuration." Across all governance structures, the BOH must include at least one

[xli] https://www.ncleg.net/enactedlegislation/statutes/html/bychapter/chapter_130a.html
[xlii] https://www.sog.unc.edu/sites/default/files/course_materials/CMG%2038_PublicHealth_1.pdf

[xliii] An additional configuration, a public hospital authority, is allowable by a law that only applies to one county. For more information: https://www.sog.unc.edu/resources/faqs/how-does-public-health-authority-compare-public-hospital-authority-operates-cabarrus-county

county commissioner (a District BOH must include a commissioner from each county in the district).[xliv] In general, the powers and duties of BOH include adopting local public health rules, adjudicating disputes regarding those rules, making policy for the LHD, imposing fees for local public health services, and satisfying state accreditation requirements, though the specific powers and responsibilities vary slightly based on the LHD's configuration.[xlv]

In 2012, the NC General Assembly passed a law (Session Law 2012-126) that substantially modified the availability and structure of LHD configurations across the state.[xlvi] Firstly, it removed the population threshold for the formation of CHSAs (previously limited to a few LHDs serving a population size of 425,000 or more), while slightly modifying the composition and duties of CHS boards. Secondly, it allowed BOCCs to assume the powers and duties of a Standalone BOH or CHS board (thus forming "Commissioner CHS Boards" or "Commissioner Standalone BOH," collectively referred to as "Commissioner BOH"). The law included a caveat that, when assuming direct control of a Standalone BOH or CHS board, the BOCC must form an advisory committee that reflects the statutorily mandated membership composition of a Standalone BOH, despite the committee having no legal authority to exercise most of the powers or duties of a BOH. Lastly, the 2012 law allowed CHSAs to remove LHD employees from the State Personnel Act (now the State Human Resources Act, "SHRA") and place them solely under county personnel policies, which, among other consequences, increased the flexibility of position descriptions and salary ranges while eliminating the appeal rights and termination protections provided to employees by the State Human Resources Act.[xlvii] (**Appendix 4.1** outlines key terms and acronyms used in this study)

[xliv] https://www.sog.unc.edu/resources/microsites/nc-public-health-systems-research/additional-legal-qa

[xlv] https://humanservices.sog.unc.edu/wp-content/uploads/sites/2372/2022/09/06.-Moore-7-Boards-of-Health-in-NC-rev.-Mar.-2018.pdf

[xlvi] https://www.ncleg.net/EnactedLegislation/SessionLaws/PDF/2011-2012/SL2012-126.pdf

[xlvii] https://canons.sog.unc.edu/2012/05/consolidated-human-services-agencies/

The configurations now available in North Carolina represent three distinct forms of restructuring when compared to a CHD with an Appointed Standalone BOH: *organizational* restructuring (i.e., CHSAs), *jurisdictional* restructuring (i.e., DHDs), and *governance* restructuring (i.e., Commissioner BOH). In one way or another, each form of restructuring merges or integrates decision-making bodies or decision-making processes for the LHD, ultimately shifting the power dynamics for the LHD-BOH relationship and, therefore, the prioritization of public health in the community. **Figure 4.1** outlines the current variations in LHD configurations across North Carolina.

Research Question

In advance of the changing legislation in 2012, scholars at the University of North Carolina School of Government interviewed local and state public health leaders on the perceived strengths and challenges of each configuration, finding major differences across financing, workforce, service delivery, and management.[99] However, since the study's publication in 2013 (the "2013 Report") there has been a substantial proliferation in the number of CHSAs and Commissioner BOH.[xlviii] While much of the state's population is still served by CHDs with an Appointed Standalone BOH (41%), 50% of the state's population is now served by CHSAs and 23% are served by LHDs with a Commissioner BOH (**Appendix 4.2**). At the time of the 2013 Report, stakeholders from only two LHDs could comment on the lived experience of tradeoffs associated with operating within a CHSA or Commissioner BOH model. The authors of the 2013 Report recognized this limitation when the report was published and explicitly encouraged similar research once additional counties had changed their models. The proliferation over the last 10 years of different configurations for public health in North Carolina provides a natural opportunity to study how variations in BOH structure and function impact LHDs operations.

[xlviii] https://canons.sog.unc.edu/2022/03/north-carolinas-changing-landscape-of-public-health-and-social-services-governance-and-agency-structures-where-are-we-now/

Methods

To collect data for this analysis, we conducted a set of semi-structured interviews with Directors and their BOH members across the state of North Carolina. We used purposive sampling to identify individuals working within different configurations and health departments serving a range of population sizes within each model. Our sample of interviewees consisted of 19 Directors and 16 BOH members. Apart from CHDs with Commissioner BOH, we interviewed at least one Director and BOH member from each configuration. We also interviewed at least one representative for an LHD in the upper and lower 50th percentile of population size served by each model. In **Table 4.1**, we compare our sample distribution with the distribution of configurations across North Carolina.

We developed an interview guide for all semi-structured interviews that included questions about the overall relationship between the LHD and the BOH (i.e., strengths, challenges, opportunities for growth), the impact of each of the three forms of restructuring (i.e., jurisdictional, organizational, and governance) on the work of the LHD, and the variation in local public health configurations across the state (**Appendix 4.3**). As a secondary analysis, we also asked interviewees about the impact of local and state governance on BOH policy development and how the LHD worked to address social determinants of health. The same questions were asked of all interviewees, regardless of position or configuration.

We employed conventional content analysis to derive themes from interview transcripts.[100] Using an inductive, iterative approach, we first outlined a preliminary codebook derived from the interview guide. Additional codes emerged as we analyzed a small, random sample (n=4) of transcripts; new codes were added as data encountered did not fit an existing code until no further codes were needed (**Appendix 4.4**). We used ATLAS.ti qualitative analysis software (Version 23.0.6) to apply codes to each of the transcripts. To ensure reliability and comprehensiveness of coding, application of codes was done by two independent coders. Once independent coding was completed, interrater reliability, assessed by the percent agreement between codes, was measured to assess coding reliability. We

assessed the percent agreement using MAXQDA 2022 software, (VERVI Software, 2021). Percent agreements above 80% traditionally reflect strong agreement.[85] After coding all transcripts, the percent agreement between the two coders was evaluated to be 72%. Coders then met to resolve coding disagreements until the percent agreement for each individual code was above 80%, resulting in an overall percent agreement of 82%. To derive themes from our interviews, transcript segments associated with each code were separately analyzed to identify patterns of interviewee commentary within that code.

Results

BOH Engagement and Opportunities for Improvement

The overall influence of the BOH varied considerably across different configurations. While the distribution of activity varied by configuration, examples of weak and strong BOH were present in every model. Weak BOH with limited activity were marked by poor attendance at meetings, passive reception of reports on LHD programming, and a conceptualization of the BOH's role as limited to voting on items identified by state statutes and reviewing the LHDs policies and budgets as minimally required for LHD accreditation. Alternatively, strong BOH were often defined by their capacity to fulfill three core identities on behalf of the LHD: an advisor (to LHD staff and leadership), a bridge (between the LHD and the community), and an advocate (on behalf of the LHD to county officials). **Table 4.2** outlines characteristics of these three identities as described by our interviewees. Most BOH were much more likely to demonstrate advisor characteristics than those of an advocate or bridge.

> "We could do our work without the Board of Health. I hate to say that…I'm not saying they don't add value, they do add a perspective that's helpful. They give us some connections that are helpful. But there's nothing that we do that I can unequivocally say, because we have a board of health, we're able to do it better." (Director, CHD, Appointed Board)

> “The bare minimum of their requirements, they are doing that…I guess if you look at Board of Health responsibilities, their administrative stuff, they do that hands down no problem. The advocacy piece…I think there is interest and a lack of understanding about how much and what they can do.” (Director, CHD, Appointed Board)

> “Unless we have to vote on something, we're more of a sounding board.” (BOH Member (Commissioner), CHSA, Appointed Board)

Interviewees identified opportunities for BOH improvement. Several Directors emphasized the need to better educate their BOH on LHD programs and the scope of their legal mandates. Likewise, Directors and BOH members desired additional direction on the responsibilities of BOH (e.g., how to best evaluate the LHD director). Many Directors also desired several changes to BOH composition, primarily the addition of categories of membership that are not currently mandated by law: non-voting young people, mental health professionals, emergency management leaders, nutritionists, non-allopathic health professionals, and more community participants. Likewise, Directors expressed a desire for additional training on how to best assemble BOH by identifying members with a genuine interest in public health and ensuring authentic community representation across all member positions.

> “That's also the health director's responsibility to make sure that you build a team that functions as more than just a sounding board, to build a team that has an interest in public health and wants to help you with your health department. It also depends on how much control that health director wants to have and how much they want to share. You know, do they want to share that authority, or do they want [a] board that is just going to sit there and sign the blank check of ‘Yeah, that sounds great.’” (Director, CHD, Commissioner BOH)

> “I think there needs to be some alignment made that allows for public health or even requires for board of health members to be involved in some of the activities at the ground level…We don't know who the [LHD] employees are. We don't know what services they offer. We just came to the meeting. I think there needs to be some requirement, but also some room made for Board of Health members to go in and observe, uh, some of the day-to-day functions of the, of the local health department.” (BOH Member (Commissioner), CHD, Appointed Board)

> “My understanding of what the board's empowered to do, it's not clear. It is clear about, there's certain things we have to vote on, like the budget. Or we have to evaluate the health director…But if there's policies that we're supposed to help develop, I don't know what those are.” (BOH Member (Commissioner), CHD Appointed Board)

Local Public Health Policy Development

One of the core powers of the BOH is its ability to make administrative policies for the LHD and local public health rules that have the force of law within the LHD's jurisdiction. Whereas administrative policies were described as routinely examined (annually or during accreditation cycles), most Directors and BOH members were not active with local public health rulemaking. Barriers to rulemaking did not often concern the technical knowledge needed to make rules, but rather, the political, organizational, or cultural environment necessary for their adoption. BOH members commonly sensed that there is no need for rulemaking, believed that the BOCC has already been sufficiently active with ordinance development (especially in larger, more urban areas), or concluded that there is not enough space given for discussions about rulemaking during BOH meetings. Directors described a very different set of barriers to local rulemaking. Specifically, Directors were concerned about the lack of political will among the community or BOCC for local rules, the existence of state preemption that made the bar for adopting certain local rules exceptionally high,[xlix] and the lack of jurisdiction over possible policy areas. Some Directors also described a preference for working alongside community members as opposed to exercising their legal authority. While not a barrier to rulemaking per se, several interviewees noted instances in which county commissioners were surprised to discover that BOH (in Appointed BOH models) could make local rules without the full approval of the BOCC.

> "The biggest challenge is the state preemptions on local power…So in many cases, that threshold to demonstrate the utility or need for a local rule has to be sort of an emergent hazard, imminent hazard or something that is a high priority issue that can only be governed locally, or that only applies locally." (Director, CHSA, Commissioner BOH)

> "The culture of our board has never been one that has wanted to take up an issue and create a rule about it. They've wanted to work more collectively in the community to push the issue forward or to push it forward at the state level, but they've not wanted to be out in front necessarily in terms of making a rule." (Director, CHD, Appointed Board)

[xlix] Per General Statutes 130A-39(b), local public health rules must be more stringent than any statewide rules covering the same topic, and the BOH must determine that a more stringent rule is needed to protect local public health.

> "I think it's just some hesitancy on the board to feel confident that we are in a position to make recommendations. And that's where I've got to come up with something as chair to get a better development of the board members themselves and a better understanding of what our role is." (BOH Member, CHD, Appointed Board)

> "We haven't stood up a whole lot of additional board of health rules. I think most of it is covered under state mandate or sometimes the county would rather prefer an ordinance because they don't want to get into the business of trying to tell the city of X and Y what to do, which a broader board of health rule would cause." (Director, CHD, Appointed Board)

As described by interviewees, most new policies (administrative LHD policies or local public health rules) are presented by LHD staff and only rarely originate from the BOH. While the adoption of administrative policies does not typically require BOCC approval, the enactment of local rules is almost always done with the BOCC's blessing—even when not legally required—due to funding needs for rule implementation and enforcement.

> "If they do any sort of significant policy change, it will come back to the board of county commissioners to approve, unless it's like day-to-day operations type policy of the Board of Health." (BOH Member (Commissioner), CHD, Appointed Board)

Most Directors and BOH members did not believe local rulemaking influences state policymaking, with notable exceptions for those from major urban areas. However, across all types of LHDs, there were Directors and BOH members who expressed interest in local rulemaking serving as a "pilot" or "best practice" for state-wide policy adoption. Alternatively, several noted the helpful role that state policies can play in providing "cover" for public health policies that would be harder to pass at the local level.

> "I think that local public health, at the county level, has the ability to almost pilot those policy initiatives to where, the things that go really well could be highlighted for state legislators and state policy makers. And then the things that don't go well or areas where we skin our knees and getting it done can be avoided." (Director, CHSA, Appointed Board)

While North Carolina has a decentralized model of public health governance, the state legislature and Division of Public Health have considerable influence in LHD decision-making. Of all policy areas, interviewees most often discussed how environmental health (often onsite wastewater policies) is

regulated at the state level. Interviewees claimed that such regulations are overly complex, strict, and insensitive to the range of property development needs across different counties. Aside from the state's policies regarding environmental health, much more emphasis was placed on state funding for public health. Nearly all Directors discussed the need to increase the flexibility of state funding, update minimum financial commitments from BOCCs, and remove excessive reporting and auditing requirements for funding awards. More broadly, interviewees consistently expressed a desire for state leaders to improve its understanding of differences between counties and how these differences complicate their ability to implement state policy and mandates (especially for rural, small, poorer counties). However, a handful of Directors emphasized how much better the state-local relationship was in NC compared to prior states in which they had worked.

> "From a smaller county…I really think policy making…they really should see what we do day-to-day. I think sometimes laws are made and money's thrown at that law or role or program, and [state leaders] don't understand what it's really going to take to run that well." (Director, CHSA, Commissioner BOH)

> "I don't think the state is responsive to what we say at the local level. They will make a dictate and will say, well this is usually about administration, and they'll make a dictate and not consider the impact on the county level. Every time the state makes a rule, it generally requires more manpower, more assets to promulgate it." (BOH Member (Commissioner), CHSA, Appointed Board)

> "I think there are some areas where of course statewide policy makes the most sense and the state really should adopt or adapt the policies for the benefit of the whole. But I also think there needs to be a level of input gathering so that the state policies agenda is…that you're going to have a situation where this state is the primary player when it comes to this passing state policy, public policy that relates to public health. I think it's important that we have a say in sort of how that that agenda is shaped." (Director, CHSA, Commissioner BOH)

> "Instead of it being this dialogue where the state says, 'Hey, here's the federal money we have,' (because mostly it's not state money we're getting, it's federal money), 'This is what the CDC wants to see it invested in. What are your ideas? Here's the priorities.' There's no dialogue about that. It's like a black curtain with secret sauce behind it. And we have to ask a lot of questions." (Director, CHD, Appointed Board)

> "But I think the fact that I have the outside experience of like, at least here, we know who to call. If we disagree with something, we have a person to talk to. You wouldn't think it would

ever not be like that, but living in a state where it wasn't like that, it's like…as long as they're willing to hear us out, I'll work with them." (Director, CHSA, Appointed Board)

The Role of BOCC in BOH Governance

Many interviewees commented on the role of the BOCC in local public health governance. Commissioner representatives on the BOH consistently sensed that the LHD is merely implementing state policies, as opposed to developing their own, locally designed programming. In turn, Directors expressed frustrations when their BOCCs did not appreciate what state mandates demand of LHDs, especially the limited and/or constrained funding provided by the state to fulfill those mandates. This frustration was often discussed in parallel with the recognition that BOCCs often have the final say in governance matters pertaining to LHDs (even among those with an appointed BOH), given their "power of the purse" to finance LHD programming.

"It makes it incredibly hard when you're following federal mandates…and your commissioners are saying, no, I don't think I want you to." (Director, CHD, Elected Board)

"I'm always professional and making sure everybody's voice and opinion is heard. But when it comes down to the end of the day, I'm probably doing what the commissioners want." (Director, CHD, Appointed Board)

There were critical but varied roles for commissioner representative(s) on the BOH. In some cases, the commissioner representative served as an advocate for the LHD to the BOCC and acted as the sole bridge between the BOCC and BOH/LHD. In other cases, the commissioner representative served to limit BOH activity due to their awareness of BOCC dynamics (e.g., political windows of opportunity and funding constraints). In general, Directors felt that the commissioner representative on the BOH was a sufficient alternative to full governance restructuring.

"We're just an advisory board. We're not to give [the LHD director] policies, we're just to make sure that he gets the best advice from us and make sure he's in compliance with the state directives, which really directs his program for the most part." (BOH Member (Commissioner), CHSA, Appointed Board)

Addressing SDOH

Most interviewees were aware of the importance of addressing SDOH in order to improve population health/health equity. Several interviewees even mentioned that SDOH was not a new concept, but a core function of traditional public health. Most participants thought LHDs should be more involved in addressing SDOHs in their communities, however they disagreed on the exact role that LHDs should play in this regard. Many participants perceived there were limits to the extent to which LHDs can directly impact the structural factors affecting SDOH, and therefore saw a role for the LHD to provide data on community needs, advocate for action as an influencer, and act as a convenor and partnership builder. Furthermore, some participants also saw community outreach and education, and to a lesser extent, evaluation, as potential roles for LHDs in the SDOH space. General barriers to LHD involvement in SDOH included restricted funding and staffing constraints and excessive reporting requirements.

> "I think it probably looks a little different for each [SDOH] area, and can look a little different in each community. I don't think we always need to be the driver and the convener. Sometimes we are the ones who just provide some of the information and the data and the background. But I think historically we have been a big driver of a lot of these things. But there are roadblocks and so we need other individuals to kind of help us be the driver because there are larger mitigation issues, larger funding issues that simply we just don't have the resource and access. Now I do think we need to start some of those conversations and then empower others to help us facilitate." (Director, DHD, Appointed Board)

> "I think the struggle is that most of the money we get in public health is earmarked for certain specific tasks. It's for diabetes…but not that ground level work that will maybe prevent diabetes." (Director, CHSA, Appointed Board)

Interviewees also commented on which LHD configuration was best suited to address SDOH, with many indicating that CHSAs would be ideal as they structurally promote inter-agency collaboration (especially with social services) and can facilitate the implementation of "no wrong door" policies. Likewise, many participants perceived that Commissioner BOH often lacked the technical skills necessary to lead action on SDOH and that politics could become an impediment to LHD work in this space. However, some interviewees recognized that BOCCs ultimately control the "purse strings" and that their buy in is essential for funding SDOH work. Other interviewees believed that successfully addressing

SDOH is ultimately all about forming strong, local partnerships and that LHDs can form these relationships regardless of the configuration they operate within.

> "I do see there being an opportunity to [address SDOH] in that consolidated way. If you've got single leadership over both departments, you can really communicate that goal of how you look at social determinants and doing that across the social services and public health realms and doing it in a consistent way. I think that that definitely is a plus. I do think that local public health, we do it all day long. We can do that effectively as a single county health department, but I think it is sometimes difficult communicating that to your social services partners, to other partners in the community, getting everybody on the same page looking at those social determinants of health." (Director, CHD, Appointed Board)

Challenges and Opportunities of Governance Variation

Interviewees noted several benefits to the variation in configurations across the state. Chief among these benefits was the ability for local communities to identify the model that they perceived to work best for them (i.e., local political autonomy), especially given the state's geographic heterogeneity. Notably, while interviewees consistently praised the flexibility this variation gives smaller, rural counties to form district health departments, no explicit support was given for how such variation enables other forms of restructuring. Some interviewees did, however, emphasize how variation in configurations provides the opportunity for trial and error and shared learning among LHDs. Interviewees also expressed interest in learning about the tradeoffs between models, with some expressing agnosticism about which model is best or whether and how model variations have a demonstrable impact on LHD operations. Commissioner BOH members, especially those in CHD models, were often surprised to learn about variations across the state, especially the prevalence of CHSAs.

> "I don't necessarily see it as a bad thing that the way that the public health is structured within those counties is not the same everywhere. But I think it would be great if we all could kind of had the opportunity to look at each other's models and see what's working and see what's not, so that other counties could adopt improvements, or ways of governance that might be even better than what they're currently doing." (BOH Member, CHD, Appointed Board)

Interviewees also noted challenges created by variations in LHD configuration. Directors described how variation in governance structures complicated their ability to coordinate and share best

practices and protocols among other LHDs across the state (especially during moments of crisis), given differences in political pressures and delegated authorities across models. Interviewees also described difficulties for the state to manage across such variation, including the establishment of fair performance benchmarks, funding streams, and implementation of policies. Others noted the reality that changes in governance can also be made by BOCCs for "the wrong reasons" (e.g., the desire to terminate LHD or DSS Directors) and that there is little guidance on how to make what are often long-term decisions about these models.

> "It's hard sometimes to relate to what counterparts are going through if they're consolidated or if they are a part of a multi-county jurisdiction. They have different pressures; they have different perspectives. When you start talking about an issue, sometimes it gets very complex because everybody's got a different perspective about it. It affects them in a different way." (Director, CHD, Appointed Board)

Tradeoffs and Decision-making between LHD Configurations

We asked interviewees about what they perceived as the strengths and weaknesses of each configuration, regardless of their current model. In general, Directors were more informed about such tradeoffs than BOH members. **Table 4.3** outlines common interviewee responses to this question, along with examples of competing perspectives.

Several tradeoffs centered on how each model prioritized county resources and the attention given to public health. Commissioner BOH enabled more efficient access to the funding and policymaking authority of the BOCC when the goals of the LHD and BOCC aligned but created a risk of LHD decision-making becoming influenced by local politics. DHD directors enjoyed how their model allowed for some independence from county management, though they noted the limited levels of county funding allocated for their work. Directors within CHSAs appreciated how at times their structure enabled better integration of resources between social services and public health, but many expressed frustrations over how CHS board meetings became dominated by the concerns of other human services (often social services) and how being overseen by a CHSA director or county manager (as opposed to the

BOH) further removed them from a more direct relationship with the BOCC and the opportunities that presents to voice their perspective to BOCC members.

> "I think that sometimes public health can get buried under the social services piece, right? You think about social services at the end of the day, that they're protecting vulnerable people, and they're having to do some really difficult things. And that can overshadow some of the preventative work and programming that public health needs to do and should do in the community." (Director, CHD, Appointed Board)

Population size was also consistently discussed when considering alternative models, especially among county commissioners. For example, BOCCs from smaller counties found it more feasible for them to govern the LHD (two of the four CHDs with Commissioner BOH in NC have less than 20,000 citizens). Alternatively, BOCCs from larger counties found it more important to have closer oversight of the LHD and DSS through forming a CHSA (eight of the ten largest counties by population size in NC are CHSAs). Many interviewees recommended that smaller counties form DHDs, including Directors from such counties.

Many strengths and weaknesses of each configuration were interrelated. Often, either side reflected a different management preference among Directors and BOH members, marked by the degree of interaction between one or more governing entities. Whereas some Directors appreciated more direct access to the BOCC in Commissioner BOH, others preferred how an appointed BOH protected them from local politics. Whereas some Directors appreciated having a multidisciplinary appointed BOH to report to and utilize as a sounding board and advocate, others were content or even appreciated the institution's absence, given what they perceived as the appointed BOH limited utility and the time it took to manage BOH relationships. Likewise, whereas some county commissioners thought that appointed BOH oversight of the LHD provided a sufficient level of public accountability, others speculated that having more direct county control—whether through a CHSA and/or Commissioner BOH models—was necessary.

Interviewees identified several conditions in which the implementation of each model would more likely be successful for advancing the mission of public health (**Table 4.4**). Most of these conditions

emphasized improvements to one or more relationships between the various entities involved in governance, with a consistent emphasis on constant, transparent communication, and training to learn about the constraints and resources available for each entity.

While examples of successful implementation were identified across each model, organizational and governance restructuring were consistently noted as challenging to implement. Directors indicated that managing LHD operations within CHSAs was unwieldy, that the additional human service divisions (especially social services) often made it challenging to sufficiently focus on public health concerns, and that meaningful integration of human services was challenging. Likewise, most interviewees perceived BOCC models to be too sensitive to political demands and BOCC members to be incapable, due to lack of time or expertise, of effectively governing the LHD. In general, both Commissioner BOH and CHSA models were characterized as structurally distracting from the singular focus on public health that CHDs and DHDs are more likely to provide, despite what benefits CHSAs and Commissioner BOH models may also provide. Several Directors went so far as to propose the elimination of CHSAs and Commissioner BOH in North Carolina. Notably, no member of a CHD with an Appointed BOH or DHD expressed major complaints about working within their model.

> "When we had a Board of Health, we met with them monthly, and it was an hour to an hour and a half meeting…We got to sit and discuss lots of issues and everybody got to verbalize what they wanted to verbalize. Now we go to the county commissioners' meetings quarterly and they do the county meeting and then they do the consolidated meeting. I feel like we're at the end, and whether it's been a good meeting or a bad meeting, we're at the end and it's just, we do our spiel." (Director, CHSA, Elected Board)

These critiques align with commentary on what interviewees generally perceived as the original impetus for the 2012 Law; namely, instances in which county management wished to terminate the LHD or DSS director but could not do so under the traditional CHD model (notably, hiring/terminating the Director was considered by BOH members to be one of their most important authorities). Likewise, interviewees suggested that many BOCCs formed CHSAs because it allowed them to alter personnel policies for the

LHD and DSS, given that CHSA formation allowed LHD and DSS staff to be placed under county personnel policies. In either case, the perceived intent of the BOCCs was not to improve service delivery through the meaningful integration of human services (via CHSAs) or the exercise of improved governance over LHD programming (in Commissioner BOH models). To this end, some Directors remarked that if there were other mechanisms for BOCCs to address personnel issues or if these issues never existed, organizational or governance restructuring would not have occurred. Less frequently, interviewees perceived that BOCCs pursued organizational restructuring to decrease the size of government or to save the county money, although no Director confirmed that CHSAs have in fact saved money. One interviewee noted that the LHD is one of the highest revenue generating departments of local government, which may have further prompted interest among the BOCC for closer management of its operations.

> "The early days of consolidation were typically done for two reasons. It was either done, one to prove, you know, I'm shrinking government, or it was an opportunity to get rid of the health director or social services director." (Director, CHSA, Appointed Board)

> "I think there's a piece of the Board of Health that is laid out in general statute that is hard for a board of health to actually do, which that's really the budget pieces and the personnel pieces. These are professionals acting in their other day-to-day operations. They don't necessarily know enough about the operations at the county level and how to make those decisions. So I think if you were able to peel those pieces out, that would be very, very helpful. Because I think that in a lot of ways is why some counties have elected to shift the Board of Health to the Board of Commissioners because they wanted to retain that ability to make the budgetary decisions as well as make the personnel related to decisions. Our board of commissioners oftentimes is not interested in making any of the other…They really just don't want to be bothered with it unless it has to be a rule making policy decision. For lack of a better word, they just really don't care. They'd rather the advisory board had the authority to make those calls and to do those things, to do all the obligations related to accreditation. However, the way it's outlined currently, that's not a possibility. It's either all or nothing." (Director, CHD, Elected Board)

> "For those of us who have been successful in preventing consolidation…it's because we were able to let the county commission know you have the power, that no one's trying to usurp your authority. We have to rely on you for our fiduciary responsibilities. We have to rely on you for our finances. There's nothing we can do without your blessing. So, for those of us who have been savvy enough to convey that, we've been so much better." (Director, CHD, Appointed Board)

Discussion

The North Carolina General Statutes establish the responsibilities and powers of BOH. However, these statutes do not reflect the reality of BOH activity, including potential gaps between what BOH are empowered to do by law and what they perform in practice. This study used qualitative interviews to examine the lived experience of BOH members and Directors regarding the role of BOH in North Carolina under different configurations. The lessons derived from this analysis may be applicable to BOH-LHD relationships elsewhere in the country.

Prior qualitative research on BOH performance is limited to a small study of BOH members in Georgia that found minimal engagement of the BOH with the community, limited training on the role of the BOH, an emphasis on county commissioner relationships, a heavy focus on regulations concerned with environmental health, and substantial confusion about public health oversight between local and state government.[101] Our study confirms these findings in North Carolina, suggesting that similar challenges may also be present in other states. Building off of recent quantitative research on BOH around the country, our findings also emphasize the wide variability in BOH performance, further emphasizing the limitations inherent in quantitative studies that examine the mere presence or absence of BOH.[34] The BOH-LHD relationship can be a strong institution for advancing local public health, but it demands structural conditions as well as personal buy-in from both BOH members and LHD leadership. These conditions were not often present among LHDs in our sample. While a handful of Directors considered BOH invaluable to the work of the LHD, most argued that their BOH served, at best, as a "sounding board," despite being empowered to take a more active role.

Our interview findings also indicate a critical distinction between the existence of BOH powers and the resources needed to effectively exercise those powers. Statutes outlining key governance powers of the BOH cannot be exercised without other local entities providing key empowering resources. For instance, while the BOH is statutorily empowered to adopt local public health rules, our

results suggest that this power is effectively shared with or transferred to the BOCC, as sufficient funding from the BOCC is needed to implement most new rules. Likewise, North Carolina law requires a diverse range of professionals to be represented on each appointed BOH—in part, so that these professionals may provide guidance on LHD decision-making. However, if BOH members are not adequately trained or informed of BOH responsibilities and the operations of the LHD (e.g., during their onboarding or continuing education opportunities), they cannot effectively provide such guidance. Similarly, BOH have the power to hire, terminate, and evaluate the Director. BOH members identified this as a critically important role but a role that some BOH members felt uncomfortable exercising due to the limited number of resources they had on how to perform this role effectively.

Where such empowering resources are not available across all LHDs in North Carolina, the execution of these BOH powers becomes a product of local priorities: BOCCs can individually determine which local public health rules to fund, and individual Directors determine how much time to spend educating and empowering their BOH. Inequities in the levels of individual involvement are likely to occur, especially in more resource-constrained counties. Given the instrumental role BOH may have in local public health and their duty to uphold various statutory responsibilities, it is essential to educate and empower all those involved in local public health governance on how to better their ability to uphold those responsibilities. Within North Carolina, training for new BOH members as well as ongoing training (provided at least once during an accreditation cycle) is required to satisfy state accreditation requirements for LHDs.[l] However, the majority of this training focuses on educating new or current BOH members on the legal powers and responsibilities of BOH (e.g., how to adopt local public health rules). Based on the results of this study, additional training should be provided (to both BOH members and LHD leaders) on the skills and best practices associated with BOH going beyond the "bare minimum"

[l] https://sph.unc.edu/nciph/boh-train/

required for accreditation and becoming a strong advocate, advisor, and bridge for the LHD. Given the dynamic pace in which public health challenges evolve and the turnover rate of BOH members, ongoing training should be given more frequently than accreditation cycles. Additionally, given the influence of county commissioners on local public health governance, additional, targeted training should be given to all members of Commissioner BOH and county commissioner representatives on Appointed BOH (ideally in partnership with the North Carolina Association of County Commissioners), especially regarding the financial and legal constraints within which LHDs in North Carolina currently operate.

While the most prevalent LHD configuration (in North Carolina and across the country) is a CHD governed by an Appointed Standalone BOH,[102] three distinct forms of restructuring are possible—*organizational* restructuring, *jurisdictional* restructuring, and *governance* restructuring. Each form of restructuring has recently received attention outside of North Carolina.

In response to an increasing scope of LHD services and paralleled by steadily diminishing revenue streams and funding from local, state, and federal governments, several scholars and public health practitioners have advocated for the "horizontal governance" of LHDs through *jurisdictional restructuring* (i.e., forming DHDs in North Carolina).[103] This call for jurisdictional restructuring is particularly pronounced for smaller LHDs. The main argument, which is supported by substantial empirical evidence,[104–106] asserts that returns to scale can be achieved for various core public health services. The cost savings from jurisdictional restructuring come from primary sources: gains of efficiency in administrative expenses, consolidation of fixed-cost capital expenses, and staff attrition. Several empirical studies have confirmed that in the years following consolidation, even in the immediate first year, substantial net savings can be experienced. One study even identified a population limit of 100,000 before which diminishing returns to this scaling effect can be realized;[104] others have shown that negative performance standards due to increased scale aren't realized until 500,000.[28] While the leading argument for jurisdictional consolidation is often economic, others have suggested that service delivery

may be improved, too, though empirical evidence is mixed. Since 2012, the "Center for Sharing Public Health Services" (https://phsharing.org/) has provided resources for LHDs who wish to consider cross-jurisdictional sharing as a method to increase "the effectiveness, efficiency, and equity of access to and delivery of public health services." Scholars note that the challenges to jurisdictional restructuring are primarily two-fold: firstly, not all LHDs equally benefit from jurisdictional restructuring,[107] and, secondly, restructuring may bring about complexities in authority and reporting relationships.[28] In the face of such challenges, other public health practitioners have advocated that as alternative to full jurisdictional restructuring, smaller, less resourced LHDs should contract with larger LHDs to deliver services that are both resource intense and can scale well.[106] Literature on "Interjurisdictional Sharing" therefore identifies a range of partnerships, ranging from as-need assistance, to service-related arrangements, to shared programs or functions, to regionalization or consolidation.

Likewise, in recent years there has been an increasing interest in *organizational restructuring* that leads to the integration of healthcare, social services, and public health. This is interest is especially strong among those who advocate for a "no wrong door" standard for when community members attempt to access any given human service. This shift is evidenced in part by the Robert Wood Johnson Foundation's "Systems for Action" research program, launched in 2015, which explicitly seeks to examine this integration.[li] However, most studies in this program focus on how to best integrate social services within healthcare systems, with very little research conducted on the integration of public health and social services.[lii]

While limited research has been conducted on instances in which local elected officials assume the roles and responsibilities of BOH (*governance consolidation*),[61] the last several years has witnessed

[li] systemsforaction.org

[lii] https://systemsforaction.org/sites/default/files/RWJF%20S4A%20Research%20Agenda%20PDF%2007.25.19.pdf

increasing attention on the intersection between public health and politics more broadly. Dialogue regarding this intersection addresses a range of issues: how political actors influence public health authority, the impact of political ideology on public health messaging, the influence of politics on policies that impact health, or even the prospect of having public health officials pursue political office.[108] Across all these issues, there exists a spectrum between those who advocate for a limited and neutral role of public health officials in politics[109] and those who advocate for a stronger, expanded, and more explicit engagement between the two,[110,111] given the inevitable impact that politics has on population health outcomes.[112]

The recent proliferation in LHD configurations across North Carolina allowed us to examine tradeoffs across each of these three forms of restructuring, including their impact on the LHD-BOH relationship. Given the overlapping research questions, we encourage our results to be reviewed in concert with and as a continuation of results from the 2013 Report. Stakeholder interviews and focus groups from the 2013 Report emphasized the importance of strong leadership across all configurations, the importance of shared understanding among all decision-makers, a desire among county officials for a more active role in public health management, a desire from public health practitioners for the role of an appointed BOH in public health governance, and the possibilities of a district health department and CHSA saving county management money. The findings from our analysis largely confirm those identified by the 2013 Report. However, while the 2013 Report outlined *possible* tradeoffs for each model, this study demonstrates how those tradeoffs have manifested in North Carolina public health governance over the last ten years. Examining these tradeoffs is especially important among CHSAs and Commissioner BOH models, given the scarcity of both models during the 2013 Report's drafting.

The authors of the 2013 Report noted a fear among their interviewees that politics would control the LHD agenda within Commissioner BOH models and that the BOCC would not be capable of fulfilling the BOH's responsibilities. The results of our study largely confirm both fears. Commissioner

BOH models were described as overly focused on financial stewardship, liable to make decisions based on political pressures, and likely to largely relegate the majority of their BOH responsibilities to their advisory committee (a weakened institution compared to the BOH). Many directors noted that the influence of political pressures on public health decisions was especially challenging during the COVID-19 pandemic, a moment of crisis between public health and politics that could not have fully been anticipated in when research for the 2013 Report was conducted. However, a small handful of Directors noted that Commissioner BOH models are not entirely negative for the LHD, especially during seasons in which the LHD's programming does not seriously conflict with the political interests of the BOCC. During such seasons of "peacetime," Commissioner BOH can enable more efficient decisions and greater access to resources, with its advisory committee exercising the best "advisor" qualities of an appointed BOH.

Taken together, our findings on the effects of CHSAs and Commissioner BOH reflect the "form dictates function" governance paradigm: with the loss of an appointed BOH composed of medical professionals who are strictly concerned with overseeing and guiding the LHD regarding its public health responsibilities, the LHD becomes structurally less concerned with and less empowered to respond to public health needs in the community. While this shift *may* come at the benefit of increased accountability to elected officials or marginally improved integration of human services, it rarely maintains or improves the performance of public health service delivery. Moreover, one of the main perceived drivers of the 2012 Law—the desire to remove LHD employees from the SHRA—has largely been confirmed: nearly every county that has formed a CHSA in the last decade has removed the CHSA employees from the coverage of the SHRA.[liii] However, given the challenges associated with CHSAs, these data point to an alternative policy solution. Instead of only allowing counties with CHSAs to remove social services and public health employees from the coverage of the SHRA, the North Carolina General

[liii] https://humanservices.sog.unc.edu/visualization-all/

Assembly could allow all DSS and LHD employees to be exempt from the SHRA so long as counties comply with the federal merit personnel standards with respect to these employees (as is currently required for CHSAs[liv]). This change would help to ensure that counties create CHSAs for the purpose of integrating human services or improving public health service delivery, as opposed to the mostly unrelated concern of changing personnel policies and procedures.[lv]

The challenges of successfully delivering public health services in a variety of different configurations highlight the importance of adaptive leadership skills for Directors. At its core, adaptive leadership is the ability to respond to complex organizational challenges that demand constant learning, and in which the locus of work concerns building and fostering relationships among stakeholders with competing priorities, as opposed to solving technical problems through the use of expert authority.[113] Central to the practice of adaptive leadership is the process of "getting off the dance floor" and taking a step back "on the balcony." From the balcony, so it goes, one can more clearly see the patterns of behavior happening "on the ground"—the routine practices, good and bad, that all organizations can fall into. In the context of LHD leadership, moving to the balcony implies taking the time needed to consider how the LHDs organization's structure, culture, and default interpretations are responding to adaptive challenges.

Results from this study indicate the need for LHD leaders to consider the ways in which their configuration establishes the priorities and responsibilities of key stakeholders involved in local public

[liv] G.S. 153A-77(d)

[lv] Counties can also apply for personnel policies traditionally covered through SHRA to be covered under county policies so long as those county policies are approved to be "substantially equivalent" (see G.S. 126-11). This option is available regardless of CHSA status. However, this process does not exempt county employees from *all* aspects of SHRA (which is only possible within a CHSA) and must be applied for and approved in a very piece-meal fashion. Additionally, policies deemed to be "substantially equivalent" must be routinely monitored, unlike county personnel policies within a CHSA. In general, achieving the same level of flexibility regarding county personnel policies that are possible within a CHSA would be a much more onerous process if done through "substantially equivalent" applications. Currently, only 11 counties have a component of their personnel policies determined to be "substantially equivalent," testifying to the burden of this process. For more on options for county personnel policies within and outside CHSAs, see: https://www.sog.unc.edu/sites/default/files/reports/SSLB%2049.pdf

health governance (e.g., BOCCs, county managers, BOH members), as well as how and when to advocate for changes to their current model or improvements within the model. Adaptive leadership is especially needed in under-resourced or managerially constrained contexts. For instance, we learned that the difficulty of successfully implementing CHSAs is less about the technical integration of personnel and budgets than the integration of key relationships, processes, and cultural beliefs within the organization—a classic adaptive leadership challenge. Likewise, successfully managing across the multiple counties within a DHD demands constant communication and reappraisal of each of the constituent counties' priorities and needs. Indeed, across all models, interviewees consistently emphasized that successful governance demands maintaining strong relationships across all governing bodies, with special attention given to open, active communication. In the context of public health governance, this must include communication about the nature of local public health—its mission and the legal statutes that guide it. Ultimately, an LHD's configuration is indicative of the "status quo" that adaptive leadership must continually critique. Given the ambient character of governance, it is essential for adaptive leaders to, at times, "get off the dance floor" and conceptually remove themselves from their current models to examine "from the balcony" the structure, culture, and default interpretations their LHD configurations enable. Informed by the scholarship of Heifetz, Grashow and Linsky on adaptive leadership success, creating spaces in which Directors can more routinely discuss or learn about variations in their configuration is essential for ensuring public health services are delivered efficiently and equitably regardless of an LHD's configuration.

The challenges identified within forms of governance restructuring also reflect the difficulties that emerge when Directors must work with local elected officials to deliver critical public health goods and services. Scholars of public administration have long studied whether and how public managers balance political involvement and administrative neutrality.[114] Classically referred to as the "politics-administration dichotomy," this challenge is defined by striking a balance between the managerial

competence of appointed bureaucrats and their accountability to elected representatives. In the case of LHDs, this manifests in tensions between the scientifically minded direction of LHD leadership with the political agenda of the BOCC (especially in Commissioner BOH models). As outlined in recent public administration scholarship, current emphasis is placed on a *complementary* relationship between the two roles: elected officials must respect the competence and commitment of appointed administrators (i.e., LHD leadership) and managers must be accountable to the political goals of their elected officials, thereby avoiding political dominance or bureaucratic autonomy.[115] To maintain complementarity, an emphasis is placed on ongoing interaction, reciprocal influence, and mutual deference, including opportunities for administrators to shape policy and for elected officials to oversee implementation.

Lastly, findings from our interviews confirm the economic interest in jurisdictional restructuring, especially among smaller, rural LHDs. Jurisdictional restructuring due to differences in LHD resource capacity was one of the most consistent arguments made for having flexibility to choose different configurations at the local level. However, along with cost savings, Director interviewees emphasized potential benefits of the semi-independence of DHDs from county-level governance. While many Directors who were not in DHDs thought it would be challenging to manage across county lines, this was not a major concern for Directors who had been operating in a DHD. Our results further confirm the political and cultural challenges to jurisdictional restructuring, as many BOCC members we interviewed seemed unwilling to give up local control and suggested that the benefits of jurisdictional restructuring could achieved without fully becoming a DHD. (This sentiment was similar in kind to the belief among directors that the benefits associated with integrating human services within CHSAs could be achieved without full organizational restructuring.) Notably, while the number of CHSAs and Commissioner BOH has proliferated in the last 10 years in North Carolina, no new DHDs have formed, reflecting the strength of this resistance to giving up local control. And yet, the commissioner representatives from district BOH we interviewed did not express a concern about having lost oversight or autonomy. The policy

implication of these results aligns with those that have been offered in prior studies: state and federal governments should consider further encouraging (e.g., through subsidizing upfront expenses) the formation of DHDs among rural, sparsely populated counties where there is strong cultural and geographic fit, while using anecdotal evidence from established DHDs on the reality of what DHD formation implies for BOCC oversight and Director managerial responsibilities.

Limitations

There are several limitations to this analysis, most of which concern our sampling frame. We did not interview county managers, who play a critical role in local public health governance, though the role of county managers was often discussed among interviewees. County managers are especially influential within CHSAs, given their role in hiring and terminating the CHSA Director, and within LHDs with Commissioner BOH, given the close relationship between county managers and BOCCs. While the role of county managers was often discussed among interviewees, given the identified importance of this role for local public health governance, future studies should consider interviewing county managers directly. Likewise, while we sought representation across each configuration, we were not able to contact and interview county commissioners from CHDs with Commissioner BOH (in one instance the LHD director was not comfortable with them being interviewed, in all other instances they were not reachable after several contact attempts). However, we were able to interview county commissioners from CHSAs governed by Commissioner BOH, as well as county commissioners from other models. We also asked each county commissioner we interviewed about their thoughts on forming Commissioner BOH.

Additionally, this analysis was limited to public health governance within North Carolina, which may not translate to other states, especially those with centralized governance structures in which LHDs are more closely governed by agencies at the state level and in which the role of BOH may be limited or entirely absent. Likewise, the degree of authority and responsibility of BOH in other states varies, which will necessarily shift the activities they most often participate in with the LHD. Additional studies should

more closely consider how variations in such authorities and responsibilities shift the nature of the BOH-LHD relationship. Our own results on the limited role of advisory committees within Commissioner BOH suggest that the degree of legal authority given to the BOH has a profound impact on their level of engagement.

Lastly, we did not control or purposively sample for how long a Director or BOH member had served in their position, as well as whether or not they had served in other LHD configurations, despite how either of these background characteristics may impact an interviewee's knowledge about the strengths and weaknesses of the BOH-LHD relationship or working within different configurations. We also noted a substantial number of competing perspectives across interviewees in our sample, in part due to the reality that most interviewees had only worked within their current model, and therefore could only speculate about the strengths and challenges of other models. When reporting our results, we tried to make clear whether the perspective shared was from one with or without immediate experience of the configuration type.

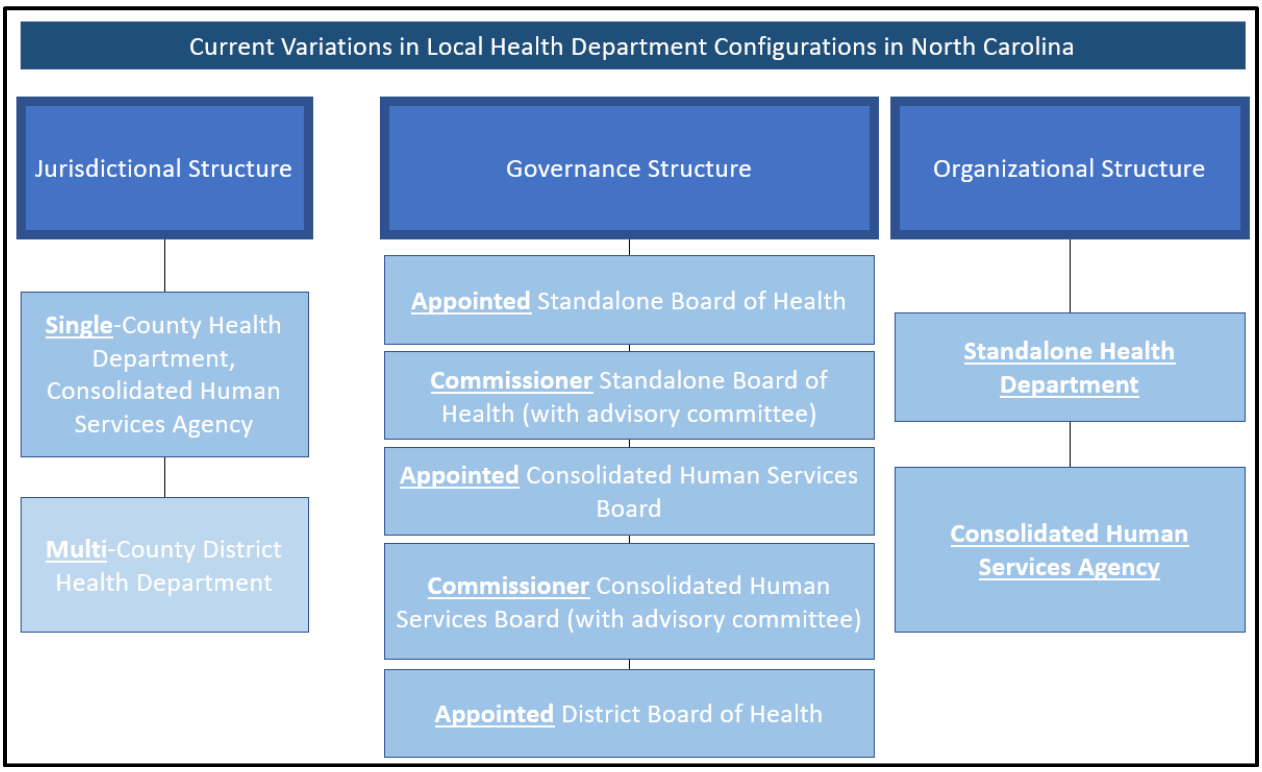
Conclusion

While LHDs across the country are often statutorily required to provide or ensure a consistent set of public health services, their ability to secure these services varies widely depending on the local, state, and national governance structures through which they are authorized and empowered to conduct their work. Considering this reality, scholarship has increasingly focused on the importance of governance for public health decision-making, particularly emphasizing the role of the BOH. This study sought to interrogate how variations in local public health governance structures across North Carolina impact LHD operations, including the strength of the BOH-LHD relationship. We found that the BOH is largely an underappreciated and underutilized institution across the state, even though it has the capacity to provide "invaluable support" to the LHD. We also found that variations in local restructuring —

organizational, jurisdictional, governance—strongly shape the LHD-BOH relationship, either by further empowering their activity or distracting them with concerns of other agencies or local political dynamics. When considering changes to local public health organization and governance, local practitioners and policymakers should consider how such changes will shift this relationship before making what is often a long-term solution for public health service delivery in the community. Given the most updated results from the recent proliferation of various organization and governance models across North Carolina, current BOCCs, BOH, and Directors should reconsider whether governance shifts that may have happened several years ago reflect what is best now for community health in their locality. Such reconsideration should include an evaluation of their current performance as it relates to their full statutory roles and implement a quality improvement process with clear measurables that will drive an improvement in the public's health. At the state level, members of the state legislature should consider statutory changes which would allow for LHDs to follow county personnel policies without the need to form CHSAs.

Tables and Figures

Figure 4.1: Current Variations in LHD Configurations across North Carolina



Note: This figure does not include different configurations available for Public Health Authorities, as no LHD is currently (as of May 2023) configured as a PHA in North Carolina.

Table 4.1: Interviewee Distribution

Table 4.1: Distribution of North Carolina Governance Models and Interviewee Sample

Table 1: Distribution of North Carolina LHD Configurations and Interviewee Sample			
LHD Configuration	*Number of LHDs in North Carolina (% of Total)*	*Interviewee Sample*	
		Directors	*BOH Board members*
District Health Department	6 (7%)	3	1
County Health Department with Appointed BOH	48 (56%)	6	9
County Health Department with Commissioner BOH	4 (5%)	2	0
CHSA with Appointed CHS Board	15 (18%)	5	5
CHSA with Commissioner CHS Board	12 (14%)	3	1
Total		19	16

Notes on Abbreviations:

- LHD = Local Health Department
- BOH = Board of Health
- CHSA = Consolidated Human Services Agency
- CHS Board = Consolidated Human Services Board
- Director = Local Health Department director

Table 4.2: Characteristics of Strong Boards of Health

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Characteristic Identity of BOH	*Primary Audience*	*Core Activities*	Motivating Quote
Advocate	Board of County Commissioners (in Adivosry Committees and Appointed BOH models), others in local government	• Serving as an advocate on behalf of the LHD to the BOCC, especially in the context of budget proposals and policy recommendations. • Speaking up for the LHD when conflicts occur between the LHD and BOCC (e.g., writing letters to BOCC to support LHD programming).	"When you have those types of people at your side around you supporting you, speaking on your behalf, it is very helpful. It clears some hurdles with elected officials as well...So if you basically get into a situation that if these people [are] for it and they're speaking on your behalf, it puts you that much further down the road." (Director, CHD, Appointed Board)
Bridge	Community members and partner organizations	• Participating in community-facing events put on by the LHD. • Coordinating with other community organizations on strategic planning and referrals with the LHD. • Providing additional "ears to the ground" to understand and relay community and other health professional needs to the LHD.	"[The BOH] has been really good at taking my ideas and trying to coordinate some things with the hospital. So, we're working more as a team in the community than two separate entities." (Director, CHD, Appointed Board)
Advisor	LHD staff and leadership	• Providing diverse professional perspectives on LHD programming and policy development. • Broadening conversations beyond narrow LHD programmatic areas to larger health-related issues. • Avoiding overstepping their governance authority and getting too involved in day-to-day operations. • Being proactive in their recommendations and advice, as opposed to waiting for the Director to bring topics to them.	"In terms of the way that the board is made up per general statutes…These are folks who [have] decades of experience in their craft, so they're able to provide that expertise." (Director, CHD, Appointed Board)

Table 4.3: Strengths, Challenges and Competing Perspectives on each Local Public Health Governance Model

Table 4.3: Strengths, Challenges and Competing Perspectives on each Local Public Health Governance Model

Table 4.3: Strengths, Challenges and Competing Perspectives on each Local Public Health Configuration			
Form of Restructuring	Identified Strengths	Identified Challenges	Competing Perspectives
Jurisdictional (i.e., DHDs)	- Pooling of resources contributes to economic efficiencies. - Restructuring between counties of different sizes can be used to "prop up" the resources of smaller, less resourced counties and therefore improve health equity. - DHD directors appreciate the additional autonomy ("pseudo-independence") from county governance, especially regarding the access of additional funding streams.	- DHD members noted the complexity of working to coordinate with multiple sets of government agency partners. - The cost of initially forming a DHD was seen as prohibitive to some. - Fairly balancing needs/resources and communications across multiple counties, especially multiple BOCCs, can be difficult.	- Those outside DHD generally believe DHDs get overall more funding from BOCCs; those in DHDs emphasize the limited funding they receive from their BOCCs. - Those outside DHDs believe managing across multiple counties is overwhelming; those in DHDs recognize this challenge, but think it is doable and worthwhile (the current DHDs have been in existence for several years, which may explain their comfortability with this management). - Many Directors believe more small counties should be in DHDs than current exist; for small counties that are not in DHDs, most think neighboring counties are too different from them or their BOCCs do not wish to give up local control (feelings of local autonomy noted as especially strong in small, rural counties); BOCCs from small counties that could form DHDs generally think their regional work (without becoming a district) is sufficient.
Organizational (i.e., CHSAs)	- From citizen/consumer perspective, having a "one-stop-shop" is easier to navigate.	- CHSAs do not automatically lead to integrated services; strong leadership must be involved to	- Some believe CHSAs force integration between DSS and LHDs where it may otherwise not exist; others believe that integration can occur if the two

	- Integration between social services and PH considered an ideal configuration to address social determinants of health. - Appointed CHS boards have a more diverse range of professional perspectives (compared to a BOH), which can facilitate more holistic or comprehensive programming/policies. - BOCCs believe CHSAs can save county managers time, as they now just have a CHSA director to interface with, not both DSS director *and* LHD Director.	effectively integrate staff and, more importantly, processes (e.g., shared screening tools, warm referrals). - Health and public health-related concerns often don't get the same level of attention in CHS board meetings; conversations can be crowded out by DSS-related concerns. - Possibility for confusion over responsibilities between DSS and PH work - The CHSA director position demands knowledge of all the rules and programs associated with each agency, which can be hard to find (especially in smaller counties). - CHSAs create additional layers of governance above Director, making them further removed from county government.	agencies are merely collocated. - CHSAs remove LHDs from being under the SHRA (as a default). Removal from the SHRA provides more flexibility in changing job descriptions/salaries, but employees no longer have the same state-level appeal protections if they are fired. - BOCCs consistently believe that CHSAs save money, primarily through merging personnel. No Director within a CHSA model agrees, suggesting it is more expensive due to the increased cost of a CHSA director. - Some believe in strong overlap between DSS and LHD culture and programming, emphasizing they are both human services and serve, at times, a very similar population. Others emphasize that DSS is more focused on low-income persons and LHD is more focused on the general population, or that both are highly regulated by state funding/mandates which prevents deep integration.
Governance (i.e., Commissioner BOH)	- Many processes can happen more efficiently (i.e., don't have to get approval of BOH *and* BOCC).	- County commissioners may overly focus on funding constraints when considering new	- Whereas most Directors believed that Commissioner BOH allow for BOCCs to make PH decisions for political reasons (appointed BOH is

	- If BOCC is "pro-public health," may provide more opportunity for funding. - Simpler and more "holistic" governance with one BOCC overseeing everything, PH included, in the county. - BOCC gets information from LHD more directly (does not have to pass through BOH), leading to opportunities for better relationship between LHD and BOCC and for BOCC to become more educated on PH programming. - Forces BOCC to become more accountable for LHD performance.	PH programs/policies. - BOCCs can experience high turnover, which demands a significant amount of time spent educating new county commissioners on PH. - BOCCs don't have the necessary medical/health background to make PH-related decisions for the LHD. - Harder to gain consensus on BOCC, given that they don't all come from health backgrounds. - Often the advisory committee (AC) is responsible for most of the former BOH responsibilities, with commissioners rarely attending AC meetings. - Few ideas leave the AC and make it to the BOCC. - Most ACs experience weaker member attendance and participation compared to prior BOH, given limited power influence over the LHD and BOCC. - A BOCC does not have the time	buffered more from politics), Directors within Commissioner BOH expressed this is not often the case until something explicitly political occurs. - Some BOCCs conceptualized it as a model for them become more responsive to constituent needs regarding health, given that people look to them as publicly responsible for the LHD; other BOCCs considered their oversight of an appointed BOH to be a sufficient level of accountability. - Most commissioners believed they don't have the capacity to attend to LHD with all their other board responsibilities and that very little time is given to LHD priorities during BOCC meetings; a handful of commissioners from smaller counties imagined serving as the BOH to be more manageable.

		capacity to effectively govern the LHD.	

Table 4.4: Conditions of Effective Implementation across Three Models of Restructuring

Table 4.4: Conditions of Effective Implementation across Three models of Consolidation

Table 4.4: Conditions of Effective Implementation across Three Models of Restructuring		
Form of Restructuring	Critical Conditions of Effective Implementation	Motivating Quote
Jurisdictional restructuring (District health departments)	1. Open, constant communication between the LHD and each of the commissioner representatives from each county. 2. Sense of shared responsibility (even if not perfectly shared financial contribution) among participating counties. 3. Respect for semi-independence of the DHD while maintaining a strong connection between DHD and county government among each of the participating counties. 4. Capacity and willingness for DHD to secure funding outside local appropriations, given limited county funding.	"And so as long as you can be open, you can have that open communication, establish those ground rules, then it really is a great opportunity. It's a great way to stretch that dollar and really use those resources wisely." (Director, DHD)
Governance restructuring (Commissioner BOH)	1. Attention and respect given to the advisory committee, including consistent attendance from a county commissioner at advisory committee meetings. 2. Ensuring that results of advisory committee discussions reach BOCC meetings. 3. Ensuring clearly dedicated and sufficient time given to addressing BOH-related issues, whether during BOCC meetings or in separate BOH-specific sessions.	"I would say that having the elected board of commissioners be the governing body though is challenging because you don't have their ear as much as you would for an advisory board. They're much more challenging to get connected to. They have a lot of things happening. They're trying to manage the entire organization and from their lens, the entire county essentially." (Director, CHD, Elected Board)
Organizational restructuring (CHSAs)	1. Ensure CHSA director has a background in PH, a willingness to learn about PH programs/policies, or appropriate deference to Director on public health issues.	"That's been the biggest struggle with the health and human service agencies across the state, is just figuring out where that line draws. Traditionally the public health

	2. If removed from SHRA, thoroughly explain to CHSA staff how the change to county personnel policies will impact their employment. 3. Ensure enough space is provided for PH agenda topics during CHSA board meetings.	director has certain authorities that I think are important for the public health director to have. In some communities it depends on the skillset of the consolidated human service agency director. For example, our consolidated Human Service agency director will not say [they're] a public health expert. When it comes to issues of public health, [they] defer to me and don't try to be the public health director. Some communities that's not always the case." (Director, CHSA, Elected Board)
	4.	
All forms of restructuring	1. Constant, comprehensive education of BOCC members on the mission and scope of Public Health. 2. Constant, comprehensive education of BOH members on their roles and responsibilities. 3. Maintaining good relationships with county manager across all configurations (even if LHD Directors do not directly report to them), as the county manager likely has the attention of the BOCC more than BOH members or LHD leadership.	"It actually comes a lot from the county manager first. He does a lot of work around communication with our board and making sure that they're knowledgeable about everything that's happening across the organization. I know if I get in front of him and I'm able to present kind of what it is that they need to know that's going to get to them, and then inadvertently I get that support back from them." (Director, CHD, Elected Board) "We need more engagement with county commissioners to understand local public health and their role in supporting it." (Director, DHD)

CHAPTER 5: DISCUSSION AND CONCLUSION

Summary of Research Findings

Using a mix of datasets and methods, this study sought to interrogate the ways in which LHDs across the country, and especially those in North Carolina, are advancing the goals of Public Health 3.0. Additional attention was given to the ways in which local governance structure and activity influences the ability of LHDs to advance the goals of Public Health 3.0, especially with respect to addressing social determinants of health and policy development. When considering results across each of the three Aims included in this study, several overarching conclusions emerge within three overarching areas: (1) The role and importance of local boards of health; (2) work addressing social determinants of health; and (3) the policy development activity of local public health.

Role and Importance of Local Boards of Health

Recent scholarship within the public health systems and services literature has consistently noted the BOH to be an undervalued and understudied institution in local public health.[34] Notably, research on BOH increased dramatically following the release of the nationally representative Local Board of Health Survey conducted by the NACCHO in 2015.[lvi] This survey was the first attempt in recent history to comprehensively assess the composition and activity of BOH across the country, including their activity across the six core functions of governance as outlined by the NALBOH.

The work conducted in this dissertation contributes to the modern scholarship on BOH in several ways. Firstly, the research conducted in Aim 3 is the first attempt to study the ways in which BOH governance structure and activity is involved with the specific behavior of policy development among

[lvi] https://www.naccho.org/resources/lhd-research/national-profile-of-local-boards-of-health

LHDs. Given that BOH often has regulatory oversight over the adoption of local public health rules, prior work examining the role of LHDs in policy development without considering the potential influence of the BOH is necessarily limited. While the BOH is not the only institution responsible for local public health policymaking, interviews with BOH members and LHD directors across North Carolina revealed several obstacles that stand in the way of the BOH become more active in policymaking (e.g., limited knowledge of LHD operations and state policies regarding public health, a lack of comfortability in adopting local public health rules without the majority consent of the BOCC). Moreover, results from Aim 1 demonstrate the overwhelming impact that BOH can have in the policymaking activity of LHDs. Among the many organizational characteristics included in our model—e.g., workforce capacity, state-local governance arrangements, population size—the activity of the BOH across a handful of governance functions was consistently estimated as influential (even more so than the level of legal authority given to the BOH). The role of the BOH with partnership engagement was estimated to be especially important for LHDs that wished to expand their policymaking activity into areas commonly associated with the social determinants of health.

The nature of the data analyzed in Aim 1 made it challenging to speculate about the mechanisms by which BOH activity could contribute to the policymaking behavior of LHDs. However, results from the interviews conducted in Aim 3 fill in this gap. Based on the interviews with LHD Directors and BOH members from around the state of North Carolina, we identified three core identities that strong BOH can fulfill on behalf of the LHD: advocate, advisor, and bridge. Among these three identities, those of "advocate" and "bridge" were especially important for the ability of LHDs to adopt public health rules in their jurisdiction. When serving as an advocate, the BOH could petition the BOCC to consider "blessing" (i.e., allocating funding) the passage of public health rules. When serving as a "bridge", the BOH could help connect the LHD with partners in other sectors that may be involved in creating or implementing policy potentially related to health issues (e.g., SDOH) or more generally raise awareness about how

activity in other sectors may impact the community's health. Informed by the interviews conducted in Aim 3, the association identified in Aim 1 between the BOH's role in partnership engagement and the expanded policymaking activity of LHDs likely manifests in the ability of the BOH to serve as a key bridge between the LHD and other community organizations, including other medical professionals in the community. The relationships formed through this bridge can inform the LHD about activity within policy arenas outside their immediate jurisdiction that are likely to impact the community's health, and therefore demand some involvement on behalf of the LHD.

Local Boards of Health can be an important, strong institution for the mission of local public health. However, often BOH do not fulfill these identities, especially those of advocate and bridge. As assessed by the Aims included in this dissertation, the barriers in the way of BOH becoming a consistently stronger institution can be generally categorized as interpersonal, legal, and structural.

Interpersonally, strong BOH demands personal buy-in from both LHD leadership (often the LHD Director) as well as individual members on the BOH. At minimum, this requires consistent attendance at BOH meetings among BOH members and a willingness to use those meetings for serious dialogue about pressing public health issues. More specifically, productive engagement between the BOH and LHD leadership demands a willingness on behalf of BOH members to share updates on what they have been learning from their own professions and the potential impact of these updates on community health, as well as professionally formed feedback on initiatives that the LHD is currently undertaking or wishes to undertake. On behalf of the LHD Director, strong engagement demands strong onboarding of the BOH members, ongoing support for their work, and the consistent provision of information about LHD programming and opportunities for BOH members to be engaged in LHD activities. Engagement is especially important for new BOH members who may not be as familiar with LHD programming, even if they are experts in addressing health-related issues from their profession.

Legally, BOH can be defined, in part, by the overall scope of legal authority they possess. As documented by the NACCHO profile study, these authorities include powers such as the ability to hire and terminate the LHD director, the ability to adopt local public health rules, and the ability to establish budgets and internal policies for the LHD. In general, a BOH with more legal authority is likely a strong resource for the LHD to carry out its mission. Results from Aim 1 demonstrated that while no individual authority was demonstratively associated with expanded policymaking activity of LHDs, all the BOH authorities assessed in the Profile Study were jointly significant (albeit the absence of policymaking behavior is not *necessarily* indicative of a weakly performing LHD). However, results from Aim 3 suggest that the benefits associated with a legally empowered BOH depend on at least two conditions: that the BOH members holding such powers are (1) well-informed (i.e., educated about public health programming) and (2) well-intentioned (i.e., centrally concerned about improving health in the community). Where these conditions are not met, the benefits associated with these powers (e.g., the ability to adopt strong local public health rules, the ability to finance the LHD) will go unrealized at best. At worst, the mission of the LHD could be compromised, including the adoption of local public health rules that defy the mission of the LHD or the reallocation of the LHD's financial resources towards other agencies of local government.

Structurally, different configurations of the LHD can make the BOH a generally stronger or weaker institution with respect to its ability to govern the LHD and satisfy the three core identities of advocate, bridge, and advisor. By and large, stronger BOH models are those in which more attention is consistently given to public health topics by those with experience in public health or healthcare-related initiatives. Results from Aim 3 suggest that these qualities are most commonly satisfied by a Standalone, Appointed BOH. Where the governance entity over the LHD strays from this structure, special care must be given to ensure that the LHD nevertheless receives enough attention on its operations by those sufficiently informed of its operations. However, alternative configurations can have additional virtues.

As described by interviewees in Aim 3, CHS boards can facilitate a wider range of conversations and activity regarding the provision of human services in the community, and Commissioner BOH can enable the LHD to more efficiently access financial resources. Standalone, Appointed BOH should likewise attempt to replicate the best of these models, even if they are not as structurally oriented to do so.

Naturally, the interpersonal, legal, and structural conditions that enable strong LHD-BOH relationships are interdependent. As demonstrated by Aim 3 interviewee commentary about the engagement of advisory committees within Commissioner BOH models, BOH that are less legally empowered are likely less motivated to serve as a strong institution for the LHD, given that there are fewer resources they can offer the LHD and fewer decisions they can advise them on that do not have to be endorsed by another authority. Structurally, BOH composed of members without public health backgrounds may also be less motivated to advise the LHD, given what can often be a steep learning curve to understand the identity and mission of public health and their responsibility to govern other agencies that may be under their purview. While it is possible for boards to provide strong support and guidance to an LHD when they are not legally empowered (i.e., advisory committees) or structurally focused solely on public health (i.e., CHS boards), especially if the BOH includes members that are exceptionally passionate and knowledgeable about public health, it is not likely that this will consistently be the case.

Local Public Health and Social Determinants of Health

Over the last few decades there has been increasing interest in the ways in which local public health can address upstream, social determinants of health. Each of the three Aims conducted for this dissertation contributes to our growing understanding of the different ways in which public health can be involved in addressing SDOH, the specific SDOH with which they are most often involved, and the barriers and facilitators of this work. The three Aims of this dissertation sought to interrogate, in various

ways, how local health departments across the country were responding to the PH3.0 challenge to lead the charge in addressing the upstream, SDOH. In Aim 1, this study specifically looked at how LHDs were advancing policy associated with SDOH; in Aim 2 this study considered all the strategies by which LHDs had proposed to address SDOH in their Community Health Improvement Plan;, and in Aim 3, this study interrogated how an LHD's configuration influences its ability to address SDOH.

When considering the policymaking activity of LHDs in Aim 1, we identified a group of LHDs that were more likely than not to have been actively involved with policymaking in areas typically associated with SDOH in their recent past. LHDs in this group were generally 3-5 times more likely to advance SDOH-related policy than other LHDs in our sample. However, this group only comprised about a fourth of the total sample. As described earlier, the likelihood that an LHD would occupy this "Expanded Policy Involvement" group was heavily influenced by its local-state governance arrangement and the governance activity of its BOH. In Aim 2, we identified a wide range of strategies by which LHDs and their local partners had proposed to address SDOH in their community. However, some SDOH were much more likely to be addressed than others, especially those more associated with social *goods* (e.g., healthcare, housing, education) than social *processes* (e.g., discrimination, social support), and in particular social goods or processes more directly associated with health and healthcare access (e.g., transportation to medical visits, discrimination association with mental health, employment in healthcare-related fields). In Aim 3, most interviewees expressed their interest in working to address SDOH in some capacity. However, with a few exceptions, LHD Directors and BOH members were more likely to see themselves as convenors of initiatives to address SDOH than being centrally involved in the "production" of SDOH-related goods themselves. Moreover, interviewees consistently acknowledged that consolidated human service agencies may be the optimal governance model through which to address SDOH, given how many SDOH-related areas (e.g., transportation, housing) must be addressed by public health in partnership with other human service agencies, especially local departments of social

services. However, it should also be noted that many of the services offered within other human service agencies (e.g., social services) are primarily provided at the individual level, and therefore may have limited population-level impact.

When considering our SDOH-related results across all three Aims, a few overall conclusions can be made. Firstly, it is rare for an LHD to be totally removed from work addressing SDOH, though it is equally rare for an LHD to see it as their chief priority. In Aim 1, roughly an equal percentage of LHDs were heavily active in SDOH-related policy making as those with limited involvement, and in Aim 2 a roughly equal percentage (20%) of LHDs had proposed to address three of fewer major SDOH domains as those that proposed to address seven or more. The LHD Directors and BOH members I interviewed for Aim 3 further demonstrated this reality, as only a handful of interviewees viewed the direct involvement with SDOH as central to their work, even if many of them saw them to be an important for the LHD in convening partners to address SDOH and to provide them with the best SDOH-related data. Indeed, both the results of Aim 2 and Aim 3 testify to the *multiple strategies* by which LHDs can be involved in addressing SDOH. The results of Aim 2 provide a helpful roadmap of strategies associated with different mechanisms (e.g., environmental changes, policies, programs) by which each of the major SDOH domains can be addressed within a community health context. However, the nature of data collected for Aim 2 makes it impossible to know the precise role that the LHD imagined for itself in the implementation of proposed SDOH-related strategies.

Policymaking

Inspired by approaches such as HiAP, each of the three Aims conducted for this dissertation sought to better understand the role of policymaking within local public health. While Aim 1 addressed this focus most directly, Aim 2 and Aim 3 also considered the role of policymaking as a strategy by which local public health can improve community health outcomes. Across all three Aims, a few tentative

conclusions can be drawn. Firstly, policymaking within local public health is a relatively rare event. Only about a quarter of LHDs we analyzed in Aim 1 were consistently active with policymaking across the board, a relatively limited number of policies were proposed to address SDOH in Aim 2, and the LHD Directors and BOH members we interviewed in Aim 3 consistently described a limited number of public health rules that they had adopted or were seeking to adopt. However, in both Aim 1 and 3 we identified an especially important role for policymaking in the context of environmental health. When considering our 4-class solution for Aim 1, we identified a major distinction among our "Average Policy Involvement" LHDs that were especially active in environmental health-related topics compared to those that were not (**Appendix 2.3**). Likewise, interviewees in Aim 3 consistently emphasized their frustration with environmental health regulations at the state level. Indeed, results across my Aims suggest that an LHD's involvement with policymaking varies widely based on the topic area. In Aim 1, we identified that LHDs are much more likely to be involved with policymaking associated with "traditional" public health areas (e.g., maternal and child health, communicable disease prevention) than more expanded social determinants of health (e.g., climate change, land use planning, housing). These findings were further confirmed in Aim 3, in which interviewees discussed how SDOH-areas often involved a greater range of partners, and that the LHD is often not the lead entity. The BOCC members we interviewed were especially insistent that the LHD would be less likely to lead initiatives in sectors such as transportation and housing, given that there are separate departments of local government uniquely dedicated to these activities. Finally, we learned that policymaking is heavily influenced by both the local and state governance model in which the LHD operates. In Aim 1, the BOH governance activity and the local-state arrangement were two of the most influential variables associated with which policymaking group the LHD would most likely be assigned to. Likewise, interviewees in Aim 3 consistently remarked on what little capacity they had to make local policies given the number of regulations already established at the state level as well as the relatively limited experience BOH members had with policy development.

Future Research Directions

The research conducted for this dissertation focused on the activity of LHD to advance PH3.0 (especially work addressing SDOH and policy development) and the local governance arrangements through which that activity is conducted. As described in Chapter 1, the research conducted in this dissertation sits at the intersection of several broad topic areas: (1) public health, (2) governmental health departments, (3) policy development, (4) governance, and (5) local public management. Changing one or more of these topic areas opens future areas of inquiry that can build off the research conducted in this dissertation.

Direction #1: Broadening the Geographic Scope

While the first and second aim of this proposed research takes advantage of nationally representative data, the third aim is limited to activities within North Carolina. The focus of the proposed research concerned the governance configurations and activity of *local* health departments, limited to those within North Carolina. However, a similar set of questions could be asked about the activity, especially policy development behavior, of state health departments across the country. As described in Chapter 1, substantial variation in state-local arrangements exist across the country. While studies have documented the operational outcomes across all such arrangements,[21] there has been minimal research on how these arrangements impact specific behavior of the health department as well as population level outcomes. However, the relative merits of a decentralized or centralized public health system are a much-discussed field of research within international health, especially among low- and middle-income countries.[116] Based on the results of Aim 3, we know that public health policies established at the state level have an overwhelming influence on local health department decision-making (regarding policymaking and other activities). Future research should be conducted on how different public health

governance arrangements at the state level (e.g., mixed, centralized, decentralized, and shared) impact the policy development activity of state health departments.

Direction #2: Examining the Governance Arrangements of voluntary, multi-sector coalitions in Local Public Health

The focus of the research contained in this dissertation is on the *legally mandated* and *governmental* governance arrangements impacting the behavior of governmental local public health. However, variations in local public health governance exist beyond those which are provided by law. For instance, while LHDs in North Carolina *must* opt for one of the major LHD configurations established by the General Statutes, they can *voluntarily participate* in additional community coalitions which may also inform their decision-making, so long as they still deliver the essential public health goods and services identified by the General Statutes. As such, one could shift the scope of this analysis by exploring the structure and impact of these coalitions as they operate within other centers of authority within local public health. For instance, many LHDs enter formal partnerships with coalitions of other organizations in the community to deliver public health services. Regardless of their intended purpose, the governance design of these coalitions addresses the multiple ways in which power is delegated and shared within local public health systems. Particular attention may be given to coalitions that center the role of the LHD, as in such arrangements the LHD is simultaneously under the governance of their local and state governing entity as well as the governing entity of the coalition. For instance, the Chatham County Public Health department (a CHD with an Appointed BOH in North Carolina) entered into a coalition with the local hospital, community-based organizations (e.g., the YMCA, Salvation Army), and school system to form a non-profit entity (the "Chatham Health Alliance") tasked with carrying out the plans and strategies to address the health priorities identified in their Community Health Assessment.[lvii] Other,

[lvii] https://www.chathamhealthalliancenc.org/

similar examples include the Partnership for Healthy Durham,[lviii] Healthy Alamance,[lix] LiveWell Catawba,[lx] and likely many others around the state.

Similarly, one may investigate the governance arrangements of regional coalitions among LHDs. While these arrangements do not meet the formal criteria of a DHD, they may be able to deliver a similar or even better set of outcomes than the legal structure of a DHD. In North Carolina, for instance, the Northeastern North Carolina Partnership for Public Health is a coalition of nine health departments and 18 counties in Northeastern North Carolina tasked with assessing community health needs and health issues, addressing those needs and issues by developing policies and programs, and assuring availability and accessibility of health services to the entire population.[lxi] Their governing board consists of members of LHDs from each of the included counties as well as representatives from the North Carolina Division of Public Health, the North Carolina Institute for Public Health at the University of North Carolina, and the Department of Public Health at East Carolina University.

Direction #3: Quantitative Analyses of Changes in North Carolina Public Health Governance

To assess the potential impact that variations in local public health configurations have on LHD decision-making and performance, we limited our data to interviews with LHD Directors and their BOH members in North Carolina. However, to expand this analysis one should employ additional, quantitative methods to estimate the impact that *changes* in governance arrangements have had on LHD operations and, ultimately, on local public health outcomes over the past 10 years in North Carolina. For instance, one could conduct a difference-in-difference analysis using data on a range of local public health

[lviii] https://healthydurham.org

[lix] https://healthyalamance.org/

[lx] http://www.livewellcatawba.org/

[lxi] https://nencpph.net/about

population indicators (e.g., infant mortality), performance measures (e.g., the number of WIC appointments), or operational indicators (e.g., staff turnover rates) immediately before and after a governance change. Given the consistent belief among BOCCs that organizational restructuring (i.e., formation of CHSAs) may lead to cost savings, special attention should be given to the financial outcomes of these changes. While conducting such an analysis, one would naturally need to determine how long after the change in configuration an impact could be reasonably detected and how to control for other characteristics of the LHD that may influence primary outcomes of interest. Nevertheless, such an analysis would provide an even more comprehensive understanding of how evolutions in LHD configurations lead to changes in the behavior of the LHD. Assessing the impact of LHD configurations on community health outcomes is especially important, given that the ultimate goal of all LHD operations is to improve community health. To do so, additional considerations would need to be given to the possible mechanisms through which variations in configuration structure led to community health changes.

Direction #4: Advancing Research on the Tools of Public Health Governance

Through the three Aims conducted for this dissertation (especially Aim 2) we sought to begin investigating the assembly of strategies by which LHDs are currently involved with policy development across a range of policy arenas, as well as the impact that governance arrangement has on those strategies. Informed by recent scholarship on the "tools of governance" within public administration, one could build upon this research by developing a theoretical framework through which public health practitioners can conceptualize the different tools available to address the wide range of health issues in their communities. Building from the results of the analyses presented in this proposal, several future research topics are available. Many of these topics directly parallel literature on the tools of governance as it has been studied in other disciplines. These include the following:

1. The evolution of LHD strategies for policy development over time, including how different mixes of strategies have evolved in response to changing healthcare policy, demographic shifts, and governance arrangement.
2. The robust measurement of LHD strategies to work on policy development, including measures of their density (the number of strategies per jurisdiction), intensity (their degree of invasiveness in the community), and longevity (how long they are in use in the community).
3. The specific "policy mixes" of LHD strategies to work on policy development, including the "interactive effects" (supplementary, complementary, counterproductive) between different strategies.

Conclusion

Across all three Aims of this dissertation, we found that policymaking is a largely underutilized tool among LHDs, whether to address SDOH-related issues or more traditional public health policy areas. The BOH is a core institution to enable the LHD to improve and expand its policymaking behavior, whether through directly proposing and adopting local public health rules or through partnership engagement with other local community organizations. Variations in local governance models substantially impact this ability, however, with appointed BOH who are comfortable exercising oversight and authority being the most likely to aid the LHD in addressing SDOH in the community, whether through policymaking or other strategies. To advance community health and eliminate health disparities, local public health departments must address the SDOH. This research may support LHDs to become better decision-makers with the strategies they already wield and to advocate for administrative structures that enable them to create and implement even better strategies.

APPENDIX 1.1: CLARIFYING POLICY-RELATED TERMINOLOGY

As outlined within the 10 essential services and discussed elsewhere, it is clear that the phrase "policy development" has not meant to be limited to laws passed by elected officials. There is much ambiguity about what is meant by the word "policy" in public health and how this term is distinct from related terms such as laws, rules, ordinances, regulations, programs, strategies, and plans. **Table 1** demonstrates the multiple usages of the word "policy" within major public health frameworks. Most of these resources as well as published scholarship on public health policy development passively allow for this ambiguity. For instance, the CDC's Office of the Associate Director for Policy and Strategy defines "policy" quite broadly as "any law, regulation, procedure, administrative action, incentive, or voluntary practice of governments and other institutions."[lxii] While the motivations for the CDC's implicit ambiguity is unclear, others explicitly encourage a broad definition of what should be considered "policy." When reflecting on the importance of developing workforce capacities for policy development, Brian Castrucci (current president of the de Beaumont Foundation) emphasized that "Policy is not just legislatively enacted through a political process. Rather, it encompasses the use of a wide range of tools and levers available to the public health workforce and should be considered a core component at multiple levels."[18] The specific "tools and levers" he has in mind are unfortunately not identified. Others put special emphasis on the origin of policy as a basis for its definition. For instance, some distinguish between "Big P" and "little P" policy engagement, in which "Big P" refers to major bills created or enacted by legislative bodies and "little P" refers to smaller practices and protocols within local organizations.[lxiii]

[lxii] https://www.cdc.gov/policy/analysis/process/definition.html#:~:text=Within%20the%20context%20of%20public,to%20promote%20improvements%20in%20health

[lxiii] https://amchp.org/big-p-little-p-a-guide-to-policy-engagement-at-all-levels/

It may be that advocates of "policy development" wish for public health to advance what they consider "policy" from many different perspectives, ranging from small community-based programs to federal law. However much this may be the goal, this ambiguity creates confusion. When developing workforce tools to advance policy engagement, leadership from the Nebraska Health Policy Academy have noted that public health practitioners sometime confuse the use of the phrase "policies" and "programs."[117] This ambiguity also makes it challenging to provided tailored recommendations to improve policy development within public health, let alone study the various strategies by which LHDs may address SDOH in their communities. For example, when looking at two of the 10 essential services of public health, there is a substantial difference between the time and energy needed to communicate to the public about health factors (ES #3) and the implementation of laws that impact health (ES #5), though both practices are included under the broad domain of "policy development." As such, while it may be the case that public health practitioners *should* work across all levels (including non-governmental policy and activities like health education), it is important to carefully define one's terms when greater precision is warranted. This ambiguity around the notion of "policy" has led to calls for future research to investigate how public health professional conceptualize the work of policy development.[18]

In part as a response to that call, we outline below a working definition of several otherwise ambiguous policy-related terms as they will be used throughout my proposal. My primary goal is to clarify the ways in which we will use terms in this proposal. We neither wish to establish the official version of these terms nor correct how these terms have been used in other literature. As a point of departure, we refer to Merriam-Webster's dictionary definition of "policy" as "a *definite course* or method of action selected from among alternatives and in light of given conditions to *guide and*

determine present and future decisions."[lxiv] (my emphasis added) Based on this definition, the essential features of a "policy" are that it directs behavior and is enacted ("selected") by an authority to enforce that direction. In keeping with Castrucci's observation and the list included in the CDC's definition, this definition of "policy" is not limited to policies established by political bodies. Most organizations, whether they be small churches, large non-profits, or multinational corporations, must establish written policies (e.g., charters, standard operating protocols, bylaws, etc.) to direct the behavior of their members. However, Merriam-Webster's definition challenges the "voluntary practice" component of the CDC's definition. While policies may be voluntarily adopted (e.g., by voluntary vote of an organization's members), they must, in some cases, be enforceable against those who do not wish to comply voluntarily. To the contrary, the development of a service or program in which participants voluntarily participate is conceptually distinct and arguably should *not* be considered a policy in its own right. While there may be specific policies connected to a program that participants must adhere to, the program itself is not a "policy." This contrast is even clearer when considering how LHDs communicate health information to the general public, which is often unidirectional and completely independent of any active participation of the community.

A narrower definition of policy is consistent with the literature on "Policy, Systems, and Environmental" (PSE) change. Advocacy based in this literature often distinguishes between "PSE change" (associated with organizations and long-term behavior) and "event or program change" (associated with individuals and short-term behavior).[lxv] As an example, developing marketing materials

[lxiv] https://www.merriam-webster.com/dictionary/policy

[lxv] Event/program changes are characterized as one-time, additive (results in only short-term behavior change), individual level, not part of an ongoing plan, short-term, and non-sustaining; PSE changes are ongoing, foundational (produce behavior change over time), community/population level, part of an ongoing plan, long-term, and sustainable. See: http://healthtrust.org/wp-content/uploads/2013/11/2012-12-28-Policy_Systems_and_Environmental_Change.pdf

about affordable, nutritious meals is health education (event/program change), the development of a food pantry to provide fresh produce to the community is a program (event/program change), whereas a decision to mandate that fresh produce constitute at least 25% of the food distributed to clients would be a policy (PSE change). As another example, consider the federally funded Supplemental Nutrition Assistance Program (SNAP). SNAP is a *program* in which individuals can voluntarily participate to receive government benefits. The administration of the SNAP program is governed by *policies* (including federal regulations) that dictate, among other things, eligibility for benefits, benefit amounts, and confidentiality requirements. To bolster participation in the program, an LHD may *educate* individuals in the community about its benefits and how to become enrolled. Policies and programs, as well as other strategies such as public education, all work together to advance the goals of any organization, LHDs included. However, when compared to standalone services or educational events that serve individual clients or consumers (program/event changes), changes in *policies* often have a greater capacity to influence the behavior of entire populations (PSE changes). It is for this reason that policymaking has garnered special attention among public health advocates.

Given this distinction, throughout the remainder of my proposal we will clarify when we refer to the *policies* by which LHDs can advance the goals of PH3.0, as opposed to other strategies such as program development, health education, data collection and analysis, partnership building, and so forth (**Table 2**). Policies, as contemplated in this proposal, must be adopted by authoritative bodies (political or not) and be applicable across constituent populations. We therefore avoid the word "policy" as an umbrella term that captures the entire range of activity included within **Table 2**. This distinction is a minor departure from current literature on public health policy development, including the CDC's definition of policy and how policy development is described within the 10 Essential Services. Moreover, there are several policy-related terms associated with distinct *legal* actions that also deserve clarification. This includes (1) "*statutes*" or "*acts*" which are federal laws enacted by Congress or state

laws enacted by a state legislature, (2) "*rules*" or "*regulations*" which refer to administrative laws promulgated by governmental agencies or bodies (at varying levels) that have been granted authority through general statutes (as laws, they have the full force and effect of law, despite not being enacted by a legislative body), and (3) "*ordinances*" which are laws enacted by the local governing body of a municipality or county. Where others may refer to the "policy development"[lxvi] activity of LHDs very broadly, hereafter we restrict that phrase to refer to an LHD's policy-related work across these legal actions or the policy-related work of an individual, non-governmental organization. This distinction is consistent with the aforementioned dictionary definition and common usage of the term "policy." Moreover, several of the resources outlined in **Table 1** also separate the term "policy" from other terms like "program," "project," and "plans," though without articulating how they differ from one another.

While the aforementioned legal terms are often specific to different levels of government, other commonly used terms outlined in **Table 2** more accurately reflect the "operations" of policy or program development and can exist at any level of decision-making. To clarify the of these terms throughout my proposal, we have referenced Oxford University Press's *A Dictionary of Public Health*.[lxvii] Of note, the operational terms included in **Table 2** have been listed in order of specificity, with "services" and "interventions" being the most generic. The remaining three are nested within each other: LHDs can develop generic plans to respond to specific health issues, within which specific strategies can be outlined. Developing a program in response to the health issue is one specific strategy. However, advancing policy at the local, state, or federal level may also be a strategy. As such, the use of the word "strategy" throughout my proposal will refer to both policies *and* any other behavior that LHDs adopt to improve the health of their community. When we refer to the "strategies" by which LHDs address SDOH,

[lxvi] Alternatively "policy engagement" or "policymaking"—see **Table 1**

[lxvii] Porta, M. (2018). *A dictionary of public health*. Oxford University Press.

we have in mind everything from the development of community food pantries for those who are most vulnerable (a program), the development of federal laws that expand the eligibility criteria for SNAP benefits (a policy) and communicating to the public about healthy eating behavior (a form of health education).

While my narrower definition of policy is important and helpful, literature that appeals to the entire spectrum of LHD strategies is not entirely misguided. Whether intentional or not, frameworks such as the 10 Essential Services suggest that the practices by which public health practitioners influence individual and collective behavior span this entire spectrum. In a sense, each of the four services associated with "policy development" from the 10 Essential Services represent a different "intensity" or degree of "invasiveness" into the behavior of individuals in their community.[lxviii] To respond to the challenges of PH3.0, public health must become adept at navigating different strategies to improve health in their community. This adaptability fits within the longstanding public health tradition of emphasizing the different levels at which public health interventions may operate. For instance, the "Health Impact Pyramid" identifies a menu of interventions that vary across their ability to achieve population impact with the individual effort needed for the policy to be impactful.[118] Lastly, given my explicit focus on the *variety* of these strategies and levels by which LHDs conduct their work in Aim 2, we have also advanced a way of categorizing the work of LHDs based on their unique organizational authorities. Following prior scholarship on the organizational authorities and values by which LHDs conduct system strengthening, these authorities may include the following five: moral, economic,

[lxviii] The example of mask-wearing during COVID-19 is instructive in this regard. At the most non-invasive level, LHDs can simply communicate health information to the public, allowing individuals to make their own, well-informed decisions (e.g., flyers on effectiveness of masks). At another level, they can mobilize partners and local organizations to develop an explicit program or plan directed at the health behavior (e.g., working with local CBOs to distribute masks, speak at their board meetings, evaluate organization protocols to encourage the adoption of mask policies therein, etc.). At the most invasive level, LHDs can adopt and enforce a rule that mandates mask wearing, with a range of enforcement mechanisms and fees tied to violations of that behavior.

political, logistical, and scientific. Emphasis on these authorities helps distinguish between strategies that primarily concern policy development as we have now defined it (primarily associated with political authority), compared to other strategies such as program development (primarily associated with logistical authority), funding the work of other organizations or offsetting the cost of services (economic authority), collecting data and communicating health information to the public (scientific authority), or persuading individuals to do what is best for core community values (moral authority).

Table 1: Uses of the word "Policy" in Notable Public Health Frameworks

Resource	*Relevant Section*	*Quotes about Policy*	*Understanding of "Policy"*
Council on Linkages Between Academia and Public Health Practice	Policy Development and Program Planning Skills	2.1. Develops policies, programs, and services 2.2. Implements policies, programs, and services 2.3. Evaluates policies, programs, services, and organizational performance 2.4. Improves policies, programs, services, and organizational performance 2.5. Influences policies, programs, and services external to the organization 2.6. Engages in organizational strategic planning 2.7. Engages in community health improvement planning	Throughout the resource, the phrase "policies, programs, and services" is always used together; no definitions are given to distinguish the three, though "programs and services" are listed separately from "policies."
De Beaumont Foundation and National Consortium for Public Health Workforce Development	Policy engagement	Policy engagement refers to the spectrum of skills needed to address public health concerns and needs of local, state, and federal policymakers and partners. Successful public health agencies raise the visibility of public health issues by making legislative work a top priority and building strong relationships with policy makers and partners before crises emerge. As a result, public health leadership is viewed as an important and highly respected resource for policy makers.	An emphasis is placed on engaging with "policymakers" and "legislative work," suggesting an emphasis on policies passed by an official governing body.
National Public Health Accreditation	Domain 5: Create, champion, and implement policies, plans, and laws that impact health	"Public health policies and laws should reflect current public health knowledge and emerging issues…. The term "laws" as used in The Standards refers to ALL types of statutes, regulations, rules, executive orders, ordinances, case law, and codes that are applicable to the jurisdiction of the health department." "The community, stakeholders, and partners can use a solid community health improvement plan to set priorities, direct the use of resources,	While the term "policy" and "plan" is not defined, the term "law" is explicitly defined as including any "statutes, regulations, rules, executive orders, ordinances, case law, and codes" within the jurisdiction. Elsewhere, CHIPs are encouraged to establish "projects, programs, and policies;" these three terms are not defined but they are always kept separate. The term "public health strategy" is

		and develop and implement projects, programs, and policies." "Public health strategies implemented may address social change, social customs, policy, services, health communications (e.g., a campaign to promote antiracism or LGBTQ acceptance), level of community resilience, or the community environment which impact on health inequities. Implementation of the strategy is required; a plan would not be sufficient for this requirement."	used to include practices addressing "social change, social customs, policy, services, health communications." Plans are described as distinct from strategy implementation.
10 Essential Services of Public Health	Create, champion, and implement policies, plans, and laws that impact health	ES #5: "Developing and championing policies, plans, and laws that guide the practice of public health" …including "Working across partners and with the community to systematically and continuously develop and implement health improvement strategies and plans, and evaluate and improve those plans."	The terms "policies, plans, and laws" are consistently grouped together throughout the resource. No definitions are given to distinguish the three. The phrase "health improvement strategies and plans" is also used, though without defining the difference between a "strategy" and a "plan."
CDC Office of the Associate Director for Policy	Definition of Policy	"A law, regulation, procedure, administrative action, incentive or voluntary practice of governments and other institutions. Policy decisions are frequently reflected in resource allocations."	Policy is defined broadly to include a range of practices: "law, regulation, procedure, administrative action, incentive or voluntary practice of governments and other institutions." Of note, an emphasis is placed on the policies that non-governmental institutions can develop.
PHNCI Foundational Public Health Services	Foundational Capabilities: Policy Development and Support	"Policy Development and Support: Ability to serve as a primary and expert resource for establishing, maintaining, and developing basic public health policy recommendations that are evidence-based, grounded in law, and legally defendable. This ability includes researching, analyzing, costing out, and articulating the impact of such policies and rules where appropriate, as well as the ability to organize support for these policies and rules and place them before an entity with the legal authority to adopt them….Ability to effectively inform and influence polices being considered by other governmental and non-governmental agencies within your jurisdiction that can improve the physical, environmental, social, and economic conditions affecting health but are beyond the immediate scope	The phrase "policies and rules" is used without distinguishing the two, though emphasis is placed on legal authorities who have to adopt them. Additional emphasis is placed on policies formed in non-governmental agencies.

		or authority of the governmental public health department."	

Table 2 – Working Definitions of Policy-Related Terms	
Term	**Working Definition for Proposal**
Overarching Definition of "Policy" (source: https://www.merriam-webster.com/dictionary/policy)	
"A definite course or method of action selected from among alternatives and in light of given conditions to guide and determine present and future decisions."	
Policy-related Terms (source: Porta, M. (2018). A dictionary of public health. Oxford University Press.)	
Public health service	"A vague, general, all-embracing term for all healthcare services collectively."
Public health intervention	"A general term covering any and all actions taken by health professionals aimed at preventing, curing, or relieving a health problem."
Public health planning	"A prominent activity of all health departments is short-term, medium-term, and long-range planning. Important considerations are resource allocation, priority setting, distribution of staff and physical facilities, planning for emergencies, extremes of demand and unforeseen contingencies, and preparation of budgets for future fiscal periods with a feasible time horizon, often 5 years ahead, sometimes as far ahead as 10 or even 15 years, recognizing that it takes this long to develop new systems and train skilled health professionals, so it is desirable to attempt prediction of future needs for specialized professional staff and their resource needs."
Strategy	"A formally planned set of actions to deal with a problem, with the implication that it is a long-range plan rather than a short-term, ad hoc solution. Tactics are the details of a strategic plan."
Program	"A description or plan of action for an event or sequence of actions or events over a short or prolonged period. More formally, an outline of the way a system or service will function, with specifics such as roles and responsibilities, expected expenditures, outcomes, etc. A health program is generally long term and often multifaceted, whereas a health project is a short-term and usually narrowly focused activity."

APPENDIX 1.2: PRESCRIPTIVE STRATEGIES TO ADVANCE POLICY DEVELOPMENT

Example Resource on LHD strategies to advance Policy Development	**Strategic Practices for LHDs to Advance Health Equity**	**Public Health's Unique Role in Addressing Both Social Needs and Social Determinants of Health**	**7 strategies by which LHDs can implement HiAP**	**5 strategies by which Rural Local Health Departments can address SDOH**
Organization	Human Impact Partners[lxix]	National Alliance to impact the Social Determinants of Health (2014)[lxx]	NACCHO (2014) [lxxi]	NACCHO (2019) [lxxii]
Strategies	Build Internal Infrastructure Work Across Government Foster Community Partnerships Champion Transformative Change	Identifying Need Promoting Evidence-Based Policy and Practice Working Cross-Sector to Facilitate Community Efforts to Address Social Needs and SDOH Advocate Policy Change	Develop and Structure Cross-Sector Relationships Incorporate Health into Decision-Making Enhance Workforce Capacity Coordinate Funding and Investments Integrate Research, Evaluation, and Data Systems Synchronize Communications Implement Accountability Systems	Developing partnerships across multiple sectors Leveraging leadership to drive adoption and implementation of SDOH principles into work Engaging with community members who represent the target population to inform and support initiatives Using timely and reliable data to track SDOH measures Engaging in a formal, community-wide strategic planning process to define priorities that address the SDOH

[lxix] https://healthequityguide.org/wp-content/uploads/2017/12/HealthEquityGuide_StrategicPractices_2017.11.pdf

[lxx] https://www.nasdoh.org/wp-content/uploads/2020/09/NASDOH_Public-Health-Social-Need_v4.pdf

[lxxi] https://www.naccho.org/uploads/downloadable-resources/factsheet_climatechangeandHiAP_Final.pdf

[lxxii] https://www.naccho.org/uploads/downloadable-resources/Rural-Health-SDOH-July-2019_FINAL.pdf

APPENDIX 2.1: DETAILED PROCEDURE FOR LATENT CLASS ANALYSIS

To estimate the best model specification, we used maximum likelihood estimation using the expectation-maximization procedure. However, when using this technique, there is a tendency for the likelihood function to converge on a local, instead of a global, solution, and so we used 50 random start values to establish a global maximum and avoid local solutions.

1. For the one-class model, we examined the model BIC, aBIC, and AIC values. Smaller information criteria values are associated with better model fit. Where information criterion continues to decrease for each additional class added (e.g., there is not a global minimum) we will use an elbow plot to inspect for an "elbow" of point of "diminishing returns" in model fit (e.g., small decreases in the IC for each additional latent class). Where test results are in conflict, the BIC will be preferred.
2. For the two class models, we additionally examined the adjusted LMR-LRT p-value, and the BLRT p-value between the 1 and 2 class models. These likelihood-based tests compare the fit between two neighboring class models (e.g., a 2- class versus a 3-class model). A non-significant p-value (aLHD = 0.05) for a k class solution thus lends support for the k - 1 class solution. We will also track the entropy value, which is a standardized index of model-based classification accuracy, with higher values for model entropy indicate a more precise assignment of individuals to latent classes (that is, better separation). Entropy values close to 0.8 will be deemed acceptable support for the model specification. We will also consider the size of the small classes. While there are no official existing guidelines on determining class size, it has been recommended that models should not have class sizes with fewer than 50 cases and classes should not contain less than 5% of the sample.[119,120] Compute the average posterior probabilities (AvePP), in which values > .70 indicate well-separated classes.

3. Repeat step #2 for K>3, while increasing K by 1 at each cycle until I've encountered empirical under-identification (e.g., overparameterization) or convergence issues.
4. From the models identified in steps 1-3, we will select a smaller subset of two to three candidate models based on the absolute and relative fit indices (these will likely be adjacent to one-another).
5. We will ultimately evaluate which model among the subset identified in step 4 has the overall best fit across the range of fit criteria examined, along with support from the various classification diagnostic criteria and theoretical interpretability.

Appendix Table 1: Statistical and Diagnostic Criteria for Latent Class Analysis

Measure	Evaluation	Specific Test
Information Criteria	Smaller information criteria values are associated with better model fit. Where test results are in conflict, the BIC will be preferred.	Akaike information criterion (AIC)
		Bayesian Information Criterion (BIC)
		Adjusted BIC (aBIC)
Likelihood ratio tests	LRTs compare fit between two neighboring class models (e.g., a 2- class versus a 3-class model). A non-significant p-value (aLHD = 0.05) for a k class solution lends support for the k - 1 class solution. Where tests are in conflict, the bLRT will be preferred.	Likelihood ratio test (LRT)
		Vuong-Lo-Mendell-Rubin adjusted LRT (VLMR-LRT)
		Bootstrapped LRT (bLRT)
Entropy	As a standardized index of model-based classification accuracy, higher values for model entropy indicate a more precise assignment of individuals to latent classes (that is, better separation).	Entropy values close to 0.8 will be deemed acceptable support for the model specification
Class Sizes	As you get really small class sizes, the data is becoming over extracted.	Models should not have class sizes with fewer than 30 cases and classes should not contain less than 5% of the sample. However, when model fit is supported by other statistical criterion, small sample sizes will not be overemphasized.
Average posterior probabilities (AvePP)	AvePP provides information about how well a given model classifies individuals into their most likely class.	Individuals' AvePP values are reported for their most likely class assigned, where values > .80 indicate well-separated classes.

APPENDIX 2.2: STATISTICAL CRITERIA ACROSS MODELS OF DIFFERENT CLASS SIZES

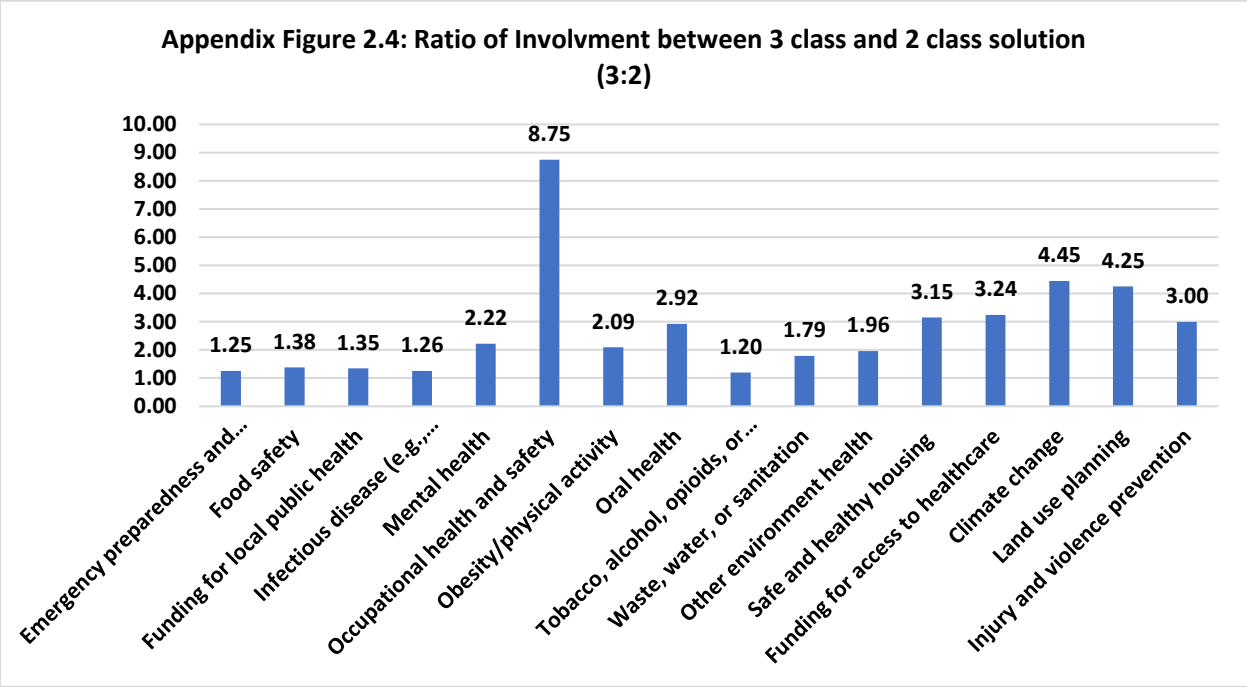
Appendix 2: Statistical Criteria Across Models of Different Class Sizes					
Classes	**2**	**3**	**4**	**5**	**6**
Log likelihood (Ho values)	-8203.892	-7993.605	-7898.475	-7838.95	-7794.797
AIC	16473.784	16087.211	15930.951	15845.9	15791.594
BIC	16635.839	16332.748	16259.971	16258.404	16287.58
aBIC	16531.029	16173.945	16047.175	15991.614	15966.797
Entropy	0.795	0.790	0.737	0.735	0.726
Smallest class size	475	219	208	168	119
Smallest class size % of sample	47%	22%	21%	17%	12%
VLMR-LRT p-value	0.00	0.00	0.15	0.02	0.71
bLRT p-value	0	0	0	0	0
Average Posterior Probabilities (AvePP)					
Class 1	0.925	0.904	0.914	0.919	0.816
Class 2	0.951	0.911	0.853	0.78	0.917
Class 3	N/A	0.889	0.764	0.909	0.786
Class 4	N/A	N/A	0.889	0.781	0.838
Class 5	N/A	N/A	N/A	0.775	0.741
Class 6	N/A	N/A	N/A	N/A	0.756
Overall AvePP	0.94	0.90	0.86	0.83	0.81

APPENDIX 2.3: INTERROGATING THE 4 CLASS SOLUTION

While we ultimately determined that the 3-class solution was the most appropriate across statistical and substantive criteria, the 4-class solution was also strong across several statistical criteria and was therefore deserving of further substantive interrogation. Compared to Figure 1 in the manuscript, the 4-class solution still maintains a "limited policy involvement class" (Class 1, n=222) and an "expanded policy class" (Class 4, n=206), with roughly the same number of assigned LHDs in the 4-Class and 3-Class solution. However, the "average policy involvement" class from the 3-Class solution has been divided into two distinct classes—a larger Class 2 (n=369) and a smaller Class 3 (n=206). When analyzing the predicted probabilities for either of these classes, it's clear that Class 3 is not only generally more involved across the majority of policy areas compared to Class 4, but *especially* more involved in areas related to environmental health and safety (e.g., food safety, waste, water, or other sanitation, climate change, other environmental health) (data not shown).

To investigate the potential cause of this distinction, we considered whether LHDs assigned to Class 3 were more likely to have an Environmental Health (EH) department separate from the LHD. We found that LHDs in Class 3 are over twice (2.5X) as likely to have a separate environmental health department. While we cannot know for sure whether this difference is the cause for greater environmental health-related policy activity among members of Class 3, it may be the case that a separate EH department signals a greater concern for environmental health within the jurisdiction, and that when LHD respondents complete the survey they responded on behalf of both the LHD and the EH's department policymaking activity (especially if the two work strongly together). Further research is needed to clarify and confirm the distinction between these two classes.

APPENDIX 2.4: RATIO OF ESTIMATED INVOLVEMENT – CLASS 3: CLASS 2



APPENDIX 2.5: FULL MULTINOMIAL LOGISTICAL REGRESSION MODEL OUTCOMES

Appendix Table 2.5 – Outcomes of Multinomial Logistic Regression						
	Unadjusted Model		Partially Adjusted Model		Fully Adjusted Model	
	Relative Risk Ratio (SE)	P> |z|	Relative Risk Ratio (SE)	P> |z|	Relative Risk Ratio (SE)	P> |z|
Class 2 – Average Policy Involvement (Baseline: = Class 1, Limited Policy Involvement)						
Governance Functions						
Continuous Improvement	1.036928 (0.1720708)	0.827	1.083661 (0.1888045)	0.645	1.101271 (0.1929736)	0.582
Legal Authority	1.690201 (0.2922504)	0.002	1.496879 (0.286575)	0.035	1.486813 (0.2854541)	0.039
Oversight	1.231851 (0.2458118)	0.296	1.048836 (0.2393562)	0.834	1.048241 (0.2406447)	0.837
Partner Engagement	0.8879915 (0.1367397)	0.44	0.9629245 (0.1597267)	0.82	0.9574622 (0.1577977)	0.792
Policy Development	1.407737 (0.264945)	0.069	1.24223 (0.2299031)	0.241	1.209996 (0.220677)	0.296
Resource Stewardship	0.95384 (0.1612045)	0.78	0.9332116 (0.1790044)	0.719	0.9311314 (0.180002)	0.712
State-Local Governance Arrangement						0
State (baseline)	-					0
Local	-		2.829811 (1.13016)	0.009	2.773156 (1.158959)	0.015
Shared	-		2.360389 (1.013277)	0.045	2.23674 (1.018794)	0.077
LBoH Authority Scale (0-10)	-		0.984108 (0.0321099)	0.623	0.9852858 (0.0332909)	0.661
Population Size (10K)	-		1.002019 (0.0106127)	0.849	1.001933 (0.0106753)	0.856
Total FTE	-		0.9999823 (0.0035857)	0.996	0.9998649 (0.0036025)	0.97
Agency Structure						
Separate Environmental Health Department	-		-		0.7698132 (0.1490587)	0.177
Consolidated with Health and Human Services	-		-		1.032524 (0.1811113)	0.855
Class 3 – Expanded Policy Involvement (Baseline: Class 1)						
Governance Functions						
Continuous Improvement	1.060512 (0.2709959)	0.818	1.10299 (0.2971809)	0.716	1.133347 (0.3031577)	0.64
Legal Authority	1.213354 (0.2567443)	0.361	1.107942 (0.2279937)	0.618	1.110261 (0.2201821)	0.598
Oversight	1.12306 (0.2818862)	0.644	1.050988 (0.2730706)	0.848	1.053204 (0.2736885)	0.842
Partner Engagement	1.836259 (0.3767529)	0.003	1.895568 (0.4013158)	0.003	1.900516 (0.4085585)	0.003
Policy Development	1.051772 (0.2619276)	0.839	0.9690831 (0.2417788)	0.9	0.9462946 (0.2341904)	0.823
Resource Stewardship	1.144566 (0.282049)	0.584	0.9992402 (0.2465725)	0.998	0.9999806 (0.2478645)	1
State-Local Governance Arrangement						
State (baseline)	-					
Local	-		1.693775 (0.7811239)	0.253	1.684108 (0.8339532)	0.293
Shared	-		1.331606 (0.7577421)	0.615	1.334254 (0.8169702)	0.638

LBoH Authority Scale (0-10)	-		1.056177 (0.0462055)	0.212	1.061604 (0.0464974)	0.172
Population Size (10K)	-		1.000526 (0.0029811)	0.86	1.000997 (0.0030389)	0.743
Total FTE	-		1.00445 (0.0014013)	0.001	1.004269 (0.001419)	0.003
Agency Structure						
Separate Environmental Health Department	-		-		0.8252316 (0.1975209)	0.422
Consolidated with Health and Human Services	-		-		1.41982 (0.2907078)	0.087

APPENDIX 2.6: RESULTS WITH BOH AUTHORITY AS 10 BINARY VARIABLES

Appendix Table 6: Multinomial Regression Results with BOH Authority as 10 Binary Variables			
Variable	**Relative Risk Ratio**	**Standard Error**	**P> |z|**
Class 2 – Average Policy Involvement (Baseline: = Class 1, Limited Policy Involvement)			
Governance Functions			
Continuous Improvement	1.077218	0.194503	0.68
Legal Authority	1.501539	0.277981	0.028
Oversight	1.015354	0.241077	0.949
Partner Engagement	0.938658	0.166207	0.721
Policy Development	1.296097	0.260654	0.197
Resource Stewardship	0.92648	0.191047	0.711
State-Local Governance Arrangement			
local	2.916814	0.98036	0.001
shared	2.765526	1.038848	0.007
BOH Authorities			
Advise LHD or elected officials on policies, programs, and budgets	1.106885	0.205893	0.585
Approve the LHD budget	1.109152	0.228776	0.615
Adopt public health regulations	0.906014	0.27323	0.743
Hire or fire agency head	1.142438	0.249319	0.542
Impose or enforce quarantine or isolation orders	1.248637	0.214514	0.196
Impose taxes for public health	0.665796	0.104416	0.009
Request a public health levy	1.10911	0.192159	0.55
Set policies, goals, and priorities that guide the LHD	0.697005	0.196971	0.201
Set and impose fees	0.947746	0.216387	0.814
Population Size (10K)	1.002776	0.010637	1.002776
Total FTE	0.999639	0.003557	0.999639

Separate Environmental Health Department	0.759152	0.162406	0.759152
Consolidated with Health and Human Services	1.089386	0.207643	1.089386
Class 3 – Expanded Policy Involvement (Baseline: Class 2, Average Policy Involvement)			
Variable	**Relative Risk Ratio**	**Standard Error**	**P> |z|**
Governance Functions			
Continuous Improvement	1.165991	0.306562	0.559
Legal Authority	1.10672	0.210777	0.594
Oversight	1.073908	0.300009	0.799
Partner Engagement	1.826669	0.379979	0.004
Policy Development	0.768281	0.181771	0.265
Resource Stewardship	1.042403	0.258737	0.867
State-Local Governance Arrangement			
local	1.859282	0.883566	0.192
shared	1.507388	0.791415	0.434
BOH Authorities			
Advise LHD or elected officials on policies, programs, and budgets	1.5668	0.42841	0.101
Approve the LHD budget	1.167028	0.175427	0.304
Adopt public health regulations	1.244436	0.306209	0.374
Hire or fire agency head	0.545902	0.14783	0.025
Impose or enforce quarantine or isolation orders	0.992471	0.182653	0.967
Impose taxes for public health	0.883198	0.210414	0.602
Request a public health levy	0.992724	0.212117	0.973
Set policies, goals, and priorities that guide the LHD	1.504042	0.550681	0.265
Set and impose fees	1.469429	0.370931	0.127
Population Size (10K)	1.000372	0.003141	0.906
Total FTE	1.004278	0.001427	0.003

Separate Environmental Health Department	0.83651	0.194767	0.443
Consolidated with Health and Human Services	1.360101	0.335756	0.213

APPENDIX 3.1: CHIP CODEBOOK

Appendix Table X: CHIP Codebook Definitions		
Major SDOH Domain	**Minor SDOH Domain**	**Description**
General	SDOH- or equity-focused but unspecified	Any mention of general strategies to address SDOH or health equity, but no SDOH or health equity issue in particular is identified. Should include strategies about Health in All Policies and Health Impact Assessments.
ECONOMIC STABILITY	Tax assistance and accessing tax credits	EITC, tax assistance classes, accessing tax credits
	Financial literacy	Explicit focus on *financial* literacy
	Employment	Accessing employment (full time, part time) or the quality of employment (not including income or employer's wages or vocational training programs)
	Income (wage/salary)	Anything addressing income levels and salary/wage from employers
	Savings	Any mention of *financial* savings
	Other or non-specific economic stability	Any strategy that generically seeks to address economic or financial stability and well-being
EDUCATION ACCESS AND QUALITY	Literacy and language	Anything focused on reading ability, literacy, or language learning
	Early childhood (pre-K) education	Any strategy focused on early childhood learning and education (not including daycare or childcare)
	Vocational training (Trade schools, tech centers)	Any strategy focused on helping individuals access vocation training (not including strategies focused on other forms of higher education--i.e., universities, colleges)
	Higher education (university, college)	Any strategy focused on helping individuals access higher education
	K-12 education (e.g., local public schools)	Any strategy focused on improving access to K-12 education or improving K-12 graduation rates (not including strategies that merely *happen* within K-12 contexts).
	Other or non-specific education access and quality	
HEALTHCARE ACCESS	Health insurance coverage	Any strategy dedicated to expanding insurance coverage or helping individuals to enroll in coverage, including building awareness of health insurance plans (private or public)
	Home visiting	Home visiting programs
	Telemedicine	Any mention of Telehealth within the strategy
	Patient health literacy	Emphasis on health literary of the patient. "Personal health literacy is the degree to which individuals have the ability to find, understand, and use information and services to inform health-related decisions and actions for themselves and others."
	Provider availability -- *Number* of Providers	Whenever the emphasis is on changing the number of providers available in an area or the number of providers licensed in a certain area or certified to provide certain treatments (e.g., buprenorphine

		treatment), including increasing the number of rural providers, developing healthcare workforce pipelines
	Provider availability -- *Schedule* of Providers	Whenever the emphasis is on changing the schedule (i.e., time of day and week) that healthcare facilities/personnel operate (not including generic mention of "timely access" to services)
	Provider availability -- *Location* of Providers	Whenever the emphasis is on changing the *location* of where providers work, including increasing the number of rural providers, mobile medical units, school-based clinics
	Provider *linguistic* competency	Any emphasis on ensuring linguistic competency and flexibility of healthcare settings, including the introduction of translation services
	Provider *cultural* competency	Any emphasis on ensuring cultural competency or cultural humility among healthcare workers (not including peer support services, generic connection to wrap-around services)
	Preventive screening and testing	Any strategy that is uniquely focused on increasing screening or testing for a specific medical condition or collecting data on screening rates (not including generic "prevention programs", warmlines and hotlines)
	Healthcare integration and coordination	Any strategy aimed at increasing healthcare access through the integration of different kinds of healthcare (e.g., mental and physical health) or the integration of healthcare with community/social services, including development of referral systems, patient centered primary homes, improving continuum of care, improving referral systems
	Access through traditional health workers	Any strategy aimed at increasing healthcare access through engagement with traditional health workers (community health workers, doulas, peer support specialists, etc.) (not including programs in which traditional health workers are engaged for other purposes--e.g., health education)
	Other or non-specific healthcare access	Any strategy directed to increasing access to healthcare or preventive care that is NOT one of the above mentioned strategies (e.g., decreasing cost of care, accessing generic healthcare "resources", healthcare resource referral networks, decreasing wait times, access to Naloxone)
SAFE HOUSING	Radon mitigation	Radon mitigation
	Housing heat stress	cooling costs, air conditioning, heat stress
	Lead hazards	Lead hazards, lead exposure, lead paint poisoning, lead inspection
	Housing rehabilitation	Housing rehabilitation, home improvement loans, maintenance repairs, fix/repairs, home, repair programs
	Weatherization	Explicit mention of weatherization

	Other or non-specific safe housing	clean air around housing, housing inspections, smoke-free housing
AFFORDABLE HOUSING	Addressing Adult homelessness	homelessness, encampments, housing stability (not including youth homelessness, permanent supportive housing)
	Housing and land trusts	Housing / land trust, land banking fund , community land trust
	Youth homelessness	Any homeless-related policy uniquely targeted to youth
	Integrating affordable housing and human services	Any strategy that seeks to provide health and human resources to those in affordable housing areas, help those transitioning from the hospital to secure housing, or provide housing to those with mental health or substance abuse difficulties, sober housing, case management at affordable housing sites, permanent supportive housing, housing first
	Low-income housing tax credits	Any strategy focused on utilizing low-income housing tax credits
	Zoning and land use planning	Any strategy focused on explicitly changing zoning codes or other land use policies, including changes to Single Family Home zoning
	Other or non-specific affordable housing	Strategies which emphasis *access* to housing, including those addressing the cost of housing, policies about rent-control, evictions, rental assistance programs, relationships between tenants and landlords, habitat for humanity. (not including permanent supportive housing, low-income housing tax credits)
NIEGHBORHOOD INFASTRUCTURE	Internet Access	Internet or broadband access
	Environmental Quality	Immediate concerns about air, water, and other environmental qualities, as well as any mention of climate change
	Expanded access to transportation for goods and services	Strategies which emphasize providing better transportation such that people can *access* the things they need (goods, healthcare services, etc.). Double code with "non-specific or other healthcare access" when the good in question is healthcare.
	Complete Streets Initiative	Only when the strategy specifically identifies the "complete streets" initiative
	Developing safe routes to school	Any strategy that is explicitly designed to expanding safe, active routes to school. (not including strategies which address safe, active transportation in general or for other purposes).
	Developing recreation areas and active transportation	Anything to do with playing, walkability and biking or developing bike paths, sidewalks, parks, playgrounds, and trails
	Other or non-specific neighborhood infrastructure	Any strategy about the general design of neighborhood buildings, not including housing
SAFETY, CRIME, and VIOLENCE PREVENTION	Criminal Justice Reform	Strategies to reduce DUIs, citizen's review panels, restorative justice programs, Forums for resolving active conflicts, Improving data collection tools, improving relationships between community and law

		enforcement, addressing mental health within criminal justice system
	Crisis Intervention Training	CIT, crisis intervention training
	Safety (non-crime-related)	Any safety issue that is not crime related
	Other or non-specific Safety, Crime, and Violence Prevention	Crime Prevention through Environmental Design strategies (CPTED)
SOCIAL SUPPORT AND COMMUNITY CONTEXT	Civic participation and community engagement	Participation among the community members in public decisions, through formal or informal means (not including strategies that are merely geared to the community or are being implemented "community-wide" -- the emphasis must be on participation and engagement).
	Social integration and social cohesion	Any strategies that seek to increase membership among social associations or the spaces for community to come together, as well as any strategy that generally seeks to address social isolation
	Childcare	Limit this code to explicit mentions of childcare, daycare
	Family Supports	Strategies addressing pro-family policies, such as those specifically addressing children in single-parent households, family work policies, family support services, peer support for parents of young children, support for healthy family relationships, cribs
DISCRIMINATION, PREJUDICE, AND STIGMA	Stigma about mental health and substance abuse	Any strategy aimed to minimize or eliminate bias and stigma around mental illness or seeking mental healthcare (Do not include Mental Health First Aid, unless the explicit intent is to address stigma around mental health or seeking mental healthcare).
	Sexism and LGBTQ+ discrimination	Any strategy addressing sex-based discrimination or discrimination towards those who identify as LGBTQ+
	Racism	Any strategy that explicitly addresses racism, or race equity (do not include generic strategies which seek to improve disparities but not explicitly in anti-racist ways)
	Other or non-specific Discrimination, Prejudice, and Stigma	Anything that just describes discrimination, prejudice, and stigma in the abstract without name specific forms of it; includes unspecified implicit bias training, diversity training, or cultural competency training (limited to general/non-specific public) (NOT including cultural competency for healthcare providers).
FOOD INSECURITY AND ACCESS TO HEALTHY FOOD	Food and nutrition assistance programs	Include the following government programs: SNAP, EBT, WIC, CalFresh, as well as any of publicly funded program designed to increase food and nutrition assistance
	Vegetable and Nutrition Prescription Programs	Veggie / Nutrition Rx programs (do not include generic strategies about increasing healthy eating of vegetables -- "Rx Programs" is a specific kind of program).

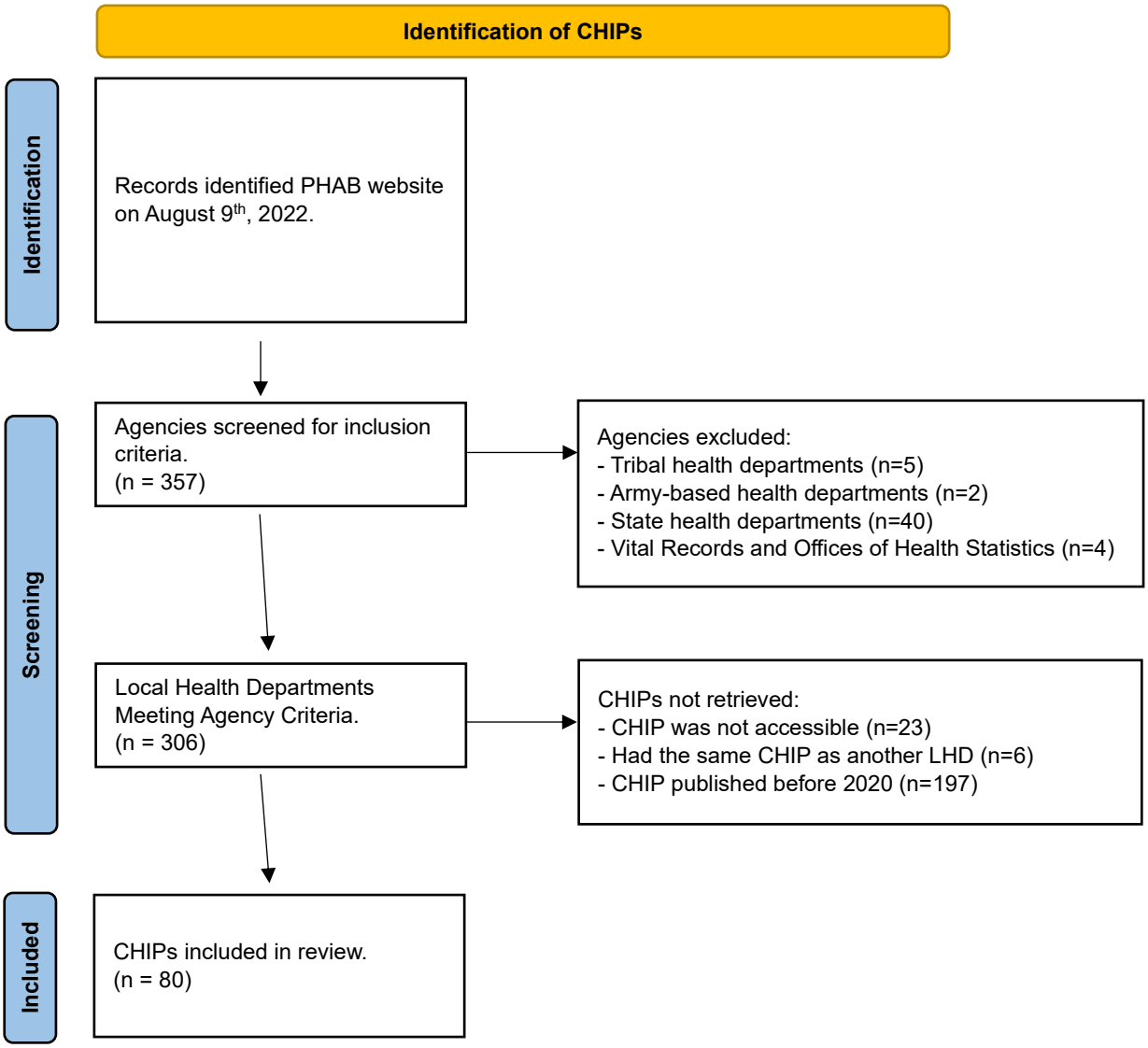
	Food Insecurity Screening	Any strategy concerned with collecting or disseminating data on food insecurity
	Farmers Markets	Any strategy about accessing or improving quality of farmers markets (mobile or otherwise)
	Expanding Healthy Options in Private Food Outlets	Any strategy geared toward increasing the number of health options in private food outlets, including restaurants and vending machines
	Expanding Access to and the amount of Fresh Produce in Food Pantries	Any strategy geared toward increasing the amount of fresh produce in local food pantries or access to food pantries
	Community Gardens	Any strategy to increase or build awareness of community gardens and urban agriculture, CSA (not including school vegetable gardens)
	Youth food insecurity programs	Any strategy to increase access to nutritious foods among youth, especially school-based programs
	Other or non-specific Food insecurity and Access to Healthy Food	Including anything about eating and accessing healthy food, even if not about food insecurity explicitly. This does NOT include education about healthy eating in general

APPENDIX 3.2: DEFINING CHAPTER 3 STRATEGIC MECHANISMS

Table X: Defining Strategic Mechanisms	
Strategic Mechanism*	Definition
Policy Change	Strategies focused on the passage or implementation of policies which are primarily (though not exclusively) legislative, which are most often binding or applied to multiple organizations
Systems Change	Strategies focused on the development of system procedures and protocols primarily *within* one organization (including referral processes between organizations, governance structures).
Environmental Change	Strategies focused on the development of new infrastructure or expansion of current infrastructure (including collocation of buildings/services).
Program/Events	Strategies focused on the direction provision of a good or service through a program or event.
Training and Education	Strategies that are primarily focused the transfer of information/knowledge, including training workforces, educating the public, media campaigns, etc.
Assessments	Strategies focused on the collection, analysis, and dissemination of data.

*Definitions of PSE changes were derived from https://www.douglas.k-state.edu/docs/healthandnutrition/What%20Is%20Policy%20Systems%20and%20Environmental%20Change.pdf and https://www.ruralhealthinfo.org/toolkits/health-promotion/2/strategies/policy-systems-environmental

APPENDIX 3.3: CHIP SEARCH STRATEGY



APPENDIX 3.4: CHIP CHARACTERISTICS

Appendix Table 3.3: Sample Characteristics				
	OUR SAMPLE (n=80)		NACCHO 2019 (n=1,946)	
	Total	Percentage	Total	Percentage
Population Category				
<25,000	0	0%	523	35%
25,000-49,000	12	15%	313	21%
50,000-99,999	16	20%	253	17%
100,000-249,999	26	33%	203	14%
250,000-499,999	13	16%	96	6%
500,000-999,999	9	11%	72	5%
1,000,000+	3	4%	36	2%
Governance Structure				
state	2	3%	315	21%
local	67	85%	1,043	70%
shared	10	12%	138	9%
Region				
New England	4	5%	164	12%
Middle Atlantic	7	9%	124	9%
South	7	9%	443	31%
Midwest	42	53%	459	32%
Southwest	3	4%	78	5%
West	17	21%	157	11%

APPENDIX 3.5: COMPARING CHIPS ACROSS START DATE

Table 1: Percent of CHIPs with at least 1 strategy per major and minor SDOH domain					
Major SDOH Domain	Minor SDOH Domain	Full Sample (n=80)	2021 & 2022 (n=25)	2020 (n=55)	**P Value***
Healthcare Access	**Any Healthcare Access**	**90%**	**88%**	**91%**	**0.6922**
	Healthcare integration and coordination	70%	68%	71%	
	Preventive screening and testing	38%	24%	44%	
	Health insurance coverage	25%	24%	25%	
	Home visiting	20%	20%	20%	
	Telemedicine	25%	40%	18%	
	Patient health literacy	21%	8%	27%	
	Provider availability -- *Number* of Providers	36%	40%	35%	
	Provider availability -- *Schedule* of Providers	6%	4%	7%	
	Provider availability -- *Location* of Providers	30%	24%	33%	
	Provider *linguistic* competency	13%	24%	7%	
	Provider *cultural* competency	25%	32%	22%	
	Access through traditional health workers	25%	24%	25%	
	Other or non-specific healthcare access	64%	56%	67%	
Food Insecurity and Access to Healthy Food	**Any Food Insecurity and Access to Healthy Food**	**65%**	**64%**	**65%**	**0.901**
	Food and nutrition assistance programs	33%	32%	33%	
	Vegetable and Nutrition Prescription Programs	8%	0%	11%	
	Food Insecurity Screening	8%	12%	5%	
	Farmers Markets	23%	20%	24%	
	Expanding Healthy Options in Private Food Outlets	15%	12%	16%	
	Expanding Fresh Produce in Food Pantries	10%	8%	11%	
	Community Gardens	18%	32%	11%	
	Youth food insecurity programs	11%	16%	9%	
	Other or non-specific Food insecurity and Access to Healthy Food	45%	44%	45%	
Neighborhood Infrastructure	**Any Neighborhood Infrastructure**	**61%**	**64%**	**60%**	**0.7375**
	Internet Access	8%	4%	9%	
	Environmental Quality	25%	36%	20%	

	Expanded access to transportation for goods and services	28%	24%	29%	
	Complete Streets	9%	12%	7%	
	Developing safe routes to school	9%	16%	5%	
	Developing recreation areas and active transportation	41%	48%	38%	
	Other or non-specific neighborhood infrastructure	10%	12%	9%	
Affordable Housing	**Any Affordable Housing**	**58%**	**56%**	**58%**	**0.8571**
	Addressing homelessness	23%	24%	22%	
	Housing and land trusts	5%	12%	2%	
	Youth homelessness	5%	4%	5%	
	Integrating affordable housing and human services	25%	16%	29%	
	Low-income housing tax credits	3%	4%	2%	
	Zoning and land use planning	14%	8%	16%	
	Other or non-specific affordable housing	41%	44%	40%	
Social Support and Community Context	**Any Social Support and Community Context**	**43%**	**52%**	**38%**	**0.252**
	Civic participation and community engagement	20%	20%	20%	
	Social integration and social cohesion	13%	12%	13%	
	Childcare	30%	44%	24%	
	Family Supports	11%	8%	13%	
Discrimination, Prejudice, and Stigma	**Any Discrimination**	**31%**	**32%**	**31%**	**0.9235**
	Stigma about mental health and substance abuse	18%	12%	20%	
	Sexism and LGBTQ+ discrimination	8%	8%	7%	
	Racism	13%	16%	11%	
	Other or non-specific Discrimination, Prejudice, and Stigma	14%	16%	13%	
Safe Housing	**Any Safe Housing**	**23%**	**20%**	**24%**	**0.7222**
	Radon mitigation	3%	0%	4%	
	Housing heat stress	3%	4%	2%	
	Lead hazards	5%	4%	5%	
	Housing rehabilitation	6%	4%	7%	
	Weatherization	3%	4%	2%	
	Other or non-specific safe housing	16%	16%	16%	
Education Access and Quality	**Any Education Access and Quality**	**31%**	**24%**	**35%**	**0.3519**
	Literacy and language	5%	8%	4%	

	Early childhood (pre-K) education	24%	24%	24%	
	Vocational training (Trade schools, tech centers)	8%	4%	9%	
	Higher education (university, college)	3%	0%	4%	
	K-12 education (e.g., local public schools)	5%	4%	5%	
	Other or non-specific education access and quality	8%	8%	7%	
Economic Stability	**Any Economic Stability**	**24%**	**28%**	**22%**	**0.5529**
	Tax assistance and accessing tax credits	3%	4%	2%	
	Financial literacy	3%	4%	2%	
	Employment	19%	24%	16%	
	Income (wage/salary)	6%	0%	9%	
	Savings	3%	0%	4%	
	Other or non-specific economic stability	10%	8%	11%	
Safety, Crime, and Violence Prevention	**Any Safety, Crime and Violence Prevention**	**40%**	**52%**	**35%**	**0.1432**
	Criminal Justice Reform	21%	24%	20%	
	Crisis Intervention Training	8%	12%	5%	
	Safety (non crime-related)	10%	16%	7%	
	Other or non-specific Safety, Crime, and Violence Prevention	19%	20%	18%	

*P-values were calculated from a T-Test comparing sample mean values between those CHIPs that began in 2020 (n=55) and those CHIPs that began in 2021 or 2022 (n=25).

APPENDIX 3.6: COMPARING OHIO CHIPS WITH THE REST OF THE SAMPLE

Table 1: Percent of CHIPs with at least 1 strategy per major and minor SDOH domain					
Major SDOH Domain	Minor SDOH Domain	Full Sample (n=80)	Ohio (n=24)	Non-Ohio (n=56)	Percentage change (Non-Ohio Sample --> Ohio)
Healthcare Access	**Any Healthcare Access**	**90%**	**88%**	**91%**	**-4%**
	Healthcare integration and coordination	70%	58%	75%	-29%
	Preventive screening and testing	38%	42%	36%	14%
	Health insurance coverage	25%	25%	25%	0%
	Home visiting	20%	21%	20%	6%
	Telemedicine	25%	25%	25%	0%
	Patient health literacy	21%	29%	18%	39%
	Provider availability -- *Number* of Providers	36%	42%	34%	19%
	Provider availability -- *Schedule* of Providers	6%	4%	7%	-71%
	Provider availability -- *Location* of Providers	30%	25%	32%	-29%
	Provider *linguistic* competency	13%	4%	16%	-286%
	Provider *cultural* competency	25%	17%	29%	-71%
	Access through traditional health workers	25%	29%	23%	20%
	Other or non-specific healthcare access	64%	63%	64%	-3%
Food Insecurity and Access to Healthy Food	**Any Food Insecurity and Access to Healthy Food**	**65%**	**58%**	**68%**	**-16%**
	Food and nutrition assistance programs	33%	38%	30%	19%
	Vegetable and Nutrition Prescription Programs	8%	17%	4%	79%
	Food Insecurity Screening	8%	8%	7%	14%
	Farmers Markets	23%	21%	23%	-11%
	Expanding Healthy Options in Private Food Outlets	15%	17%	14%	14%
	Expanding Fresh Produce in Food Pantries	10%	0%	14%	N/A
	Community Gardens	18%	13%	20%	-57%
	Youth food insecurity programs	11%	0%	16%	N/A
	Other or non-specific Food insecurity and Access to Healthy Food	45%	50%	43%	14%
Neighborhood Infrastructure	**Any Neighborhood Infrastructure**	**61%**	**42%**	**70%**	**-67%**
	Internet Access	8%	4%	9%	-114%
	Environmental Quality	25%	4%	34%	-714%
	Expanded access to transportation for goods and services	28%	38%	23%	38%
	Complete Streets	9%	0%	13%	N/A
	Developing safe routes to school	9%	0%	13%	N/A

	Developing recreation areas and active transportation	41%	21%	50%	-140%
	Other or non-specific neighborhood infrastructure	10%	0%	14%	N/A
Affordable Housing	**Any Affordable Housing**	**58%**	**58%**	**57%**	**2%**
	Addressing homelessness	23%	13%	27%	-114%
	Housing and land trusts	5%	0%	7%	N/A
	Youth homelessness	5%	4%	5%	-29%
	Integrating affordable housing and human services	25%	21%	27%	-29%
	Low-income housing tax credits	3%	0%	4%	N/A
	Zoning and land use planning	14%	4%	18%	-329%
	Other or non-specific affordable housing	41%	38%	43%	-14%
Social Support and Community Context	**Any Social Support and Community Context**	**43%**	**42%**	**43%**	**-3%**
	Civic participation and community engagement	20%	17%	21%	-29%
	Social integration and social cohesion	13%	17%	11%	36%
	Childcare	30%	17%	36%	-114%
	Family Supports	11%	13%	11%	14%
Discrimination, Prejudice, and Stigma	**Any Discrimination**	**31%**	**25%**	**34%**	**-36%**
	Stigma about mental health and substance abuse	18%	13%	20%	-57%
	Sexism and LGBTQ+ discrimination	8%	4%	9%	-114%
	Racism	13%	4%	16%	-286%
	Other or non-specific Discrimination, Prejudice, and Stigma	14%	17%	13%	25%
Safe Housing	**Any Safe Housing**	**23%**	**21%**	**23%**	**-11%**
	Radon mitigation	3%	0%	4%	N/A
	Housing heat stress	3%	0%	4%	N/A
	Lead hazards	5%	4%	5%	-29%
	Housing rehabilitation	6%	8%	5%	36%
	Weatherization	3%	4%	2%	57%
	Other or non-specific safe housing	16%	17%	16%	4%
Education Access and Quality	**Any Education Access and Quality**	**31%**	**25%**	**34%**	**-36%**
	Literacy and language	5%	0%	7%	N/A
	Early childhood (pre-K) education	24%	17%	27%	-61%
	Vocational training (Trade schools, tech centers)	8%	4%	9%	-114%
	Higher education (university, college)	3%	0%	4%	N/A
	K-12 education (e.g., local public schools)	5%	4%	5%	-29%

	Other or non-specific education access and quality	8%	4%	9%	-114%
Economic Stability	**Any Economic Stability**	**24%**	**17%**	**27%**	**-61%**
	Tax assistance and accessing tax credits	3%	0%	4%	N/A
	Financial literacy	3%	0%	4%	N/A
	Employment	19%	13%	21%	-71%
	Income (wage/salary)	6%	4%	7%	-71%
	Savings	3%	4%	2%	57%
	Other or non-specific economic stability	10%	8%	11%	-29%
Safety, Crime, and Violence Prevention	**Any Safety, Crime and Violence Prevention**	**40%**	**50%**	**36%**	**29%**
	Criminal Justice Reform	21%	17%	23%	-39%
	Crisis Intervention Training	8%	17%	4%	79%
	Safety (non crime-related)	10%	8%	11%	-29%
	Other or non-specific Safety, Crime, and Violence Prevention	19%	29%	14%	51%

APPENDIX 4.1: CHAPTER 4 TERMINOLOGY

- Organization structures for LHDs in North Carolina:
    - DHD = Multi-County District Health Department
    - CHD = Single County Health Department
    - CHSA = Consolidated Health and Human Services Agency
    - PHA = Public Health Authority

      LHD configuration: The summary term used for the LHD's unique combination of agency structure (CHD, CHSA, DHD, or PHA) and governance structure (Appointed Standalone BOH, BOCC as Standalone BOH, Appointed CHS Board, BOCC as CHS Board, or District BOH).

- Three major forms of restructuring:
    - *Jurisdictional* restructuring = the formation of DHDs
    - *Organizational* restructuring = the formation of CHSAs
    - *Governance* restructuring = any instance in which the BOCC assumes the duties and responsibilities of the BOH (whether as a Commissioner CHS Board or Commissioner Standalone BOH)
- Key members and boards involved in North Carolina Public Health Governance
    - **Director** = The LHD director, whether in DHD, CHD, CHSA, or PHA
    - **BOCC** = Board of county commissioners
    - **BOH member** = A member of any type of BOH (e.g., CHS board, DHD board, Standalone BOH, etc.)
    - **District BOH** = Appointed District BOH for a DHD
    - **CHS Board** = Governing board of a consolidated human services agency (general)
        - Appointed CHS Board = CHS Board consisting of members appointed by the BOCC.
        - Commissioner CHS Board = BOCC assuming the powers and duties of a CHS Board.
    - **Standalone BOH** = Standalone (i.e., not CHSA) County Board of Health, governing a single county health department.
        - Appointed Standalone BOH = Traditional figuration for a single county health department, consisting of members appointed by the BOCC.
        - Commissioner Standalone BOH = BOCC assuming the powers and responsibilities of an Appointed Standalone BOH
    - **Commissioner BOH** = Any instance in which the BOCC assumes the duties and responsibilities of a BOH (whether a Commissioner CHS Board or Commissioner Standalone BOH).

APPENDIX 4.2: TRENDS IN NORTH CAROLINA PUBLIC HEALTH GOVERNANCE

At the time of the 2013 Report's drafting (during 2012), there were 2 CHSAs, only one of which was governed by a Commissioner CHS Board. Immediately following the change (roughly 1 year later—April 1, 2013), 7 CHD with Appointed BOH had become CHSAs with an Appointed CHS Board. While the number of DHDs has not changed in the last decade (remaining at 6), North Carolina now has CHSAs serving as the LHD for 27 counties (12 of which are governed by a Commissioner CHS Board, 15 of which are governed by an Appointed CHS board), as well as 4 CHDs governed by a Commissioner BOH **(Table A4.2)**.

Table A4.2.1 -- Trends in Public Health Governance Arrangements across North Carolina			
LHD Configuration	July 1, 2012 (while the 2013 Report was conducted)	April 1, 2013 (Immediately after the 2013 Report was conducted)	May 1, 2022 (When this study began)
CHD, Commissioner BOH	0	0	4
CHD, Appointed BOH	75	68	48
CHSA, Commissioner BOH	1	5	12
CHSA, Appointed Board	1	4	15
District Health Department, District BOH	6	6	6
Public Hospital Authority, Public Health Authority Board	1	1	1
Single County Public Health Authority, Single-County Public Health Authority Board	1	1	0
Multi-County Public Health Authority, Multi-County Public Health Authority Board	0	0	0

As presented in **Table A4.2.2**, there were generally two major waves of governance changes in the last decade—the first occurring in the three years immediately following the passage of Session Law 2012-126 (2012-2014), and the second occurring in the three years between 2017-2019. While the potential causes of these two major, distinct waves in beyond the scope of the present study, we recommend additional research into the timeline over which these changes occurred, including the possibility that configuration changes among some LHDs may have precipitated changes in others.

Table A4.2.2-- Dates of Governance Changes, 2012-2019								
Governance Change	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
Commissioner BOH Formation of CHDs						Sampson (Jan 2017) Graham (June 2017)		Pamlico (Jan 2019) Cleveland (Nov 2019)
CHSA and Commissioner BOH formation	Brunswick (Sept 2012) Montgomery (Aug 2012)	Bladen (Nov 2013) Onslow (June 2013) Pender (June 2013) Swain (June 2013) Yadkin (Feb 2013)	Guilford (May 2014) Richmond (Jan 2014)			Clay (Nov 2017)		Alexander (May 2019)
CHSA formation	Buncombe (Sept 2012) Edgecombe (Nov 2012)	Dare (Nov 2013) Rockingham (April 2013) Union (Feb 2013)	Carteret (April 2014) Haywood (Jan 2014)	Nash (Mar 2015)		Stanly (Sep 2017)	Davie (April 2018) Gaston (Feb 2018) Forsyth (June 2018)	New Hanover (Mar 2019) Polk (2019)

Table A4.2.3 – Population Coverage Across Governance Categories		
Governance Category	Population Size*	Percent of total
Across all LHD Configurations		
CHD, Appointed BOH	4,233,056	41%
CHD, Commissioner BOH	178,748	2%
CHSA, Appointed BOH	2,973,019	29%
CHSA, Commissioner BOH	2,231,596	22%
DHD	529,403	5%
Total	10,367,022	100%
Across Governance Structure		
Commissioner BOH	2,410,344	23%
Appointed BOH	7,956,678	77%
Total	10,367,022	100%
Across Organizational Structure		
CHSA	5,204,615	50%
CHD	4,411,804	43%
PHA	221,200	2%
DHD	529,403	5%
Total	10,367,022	100%

*Population sizes for each county were derived from the 2021 American Community Survey: https://www.northcarolina-demographics.com/counties_by_population

APPENDIX 4.3: INTERVIEW GUIDE

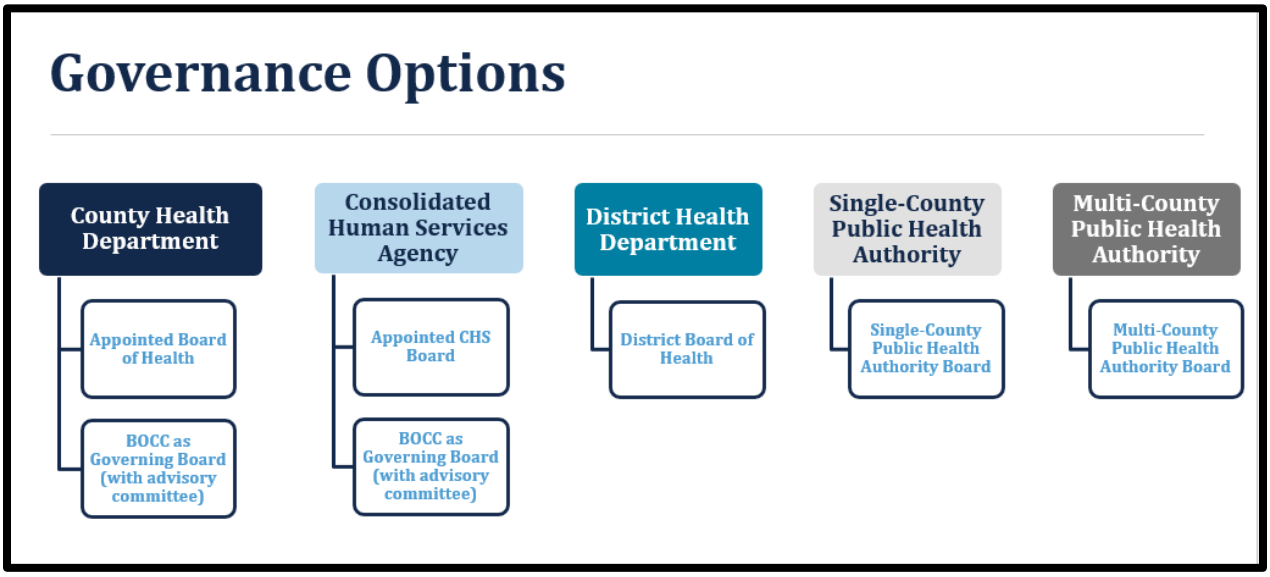
Introduction

There have been many calls for public health to address the social determinants of health—for example, housing, transportation, food insecurity, social integration—especially in partnership with other community organizations. This interest has been embodied in movements such as Public Health 3.0. The local health department (LHD) is often identified to help lead this effort.

Relatedly, there has been calls for public health to be more active in policymaking to advance community health. Policies, here defined, direct behavior and are enacted by an authority to enforce that direction. This includes policies established by political bodies and those developed outside government (e.g., organization charters, organizational policies, bylaws, etc.).

However, local health departments across the country are not equally authorized nor empowered to conduct this work; local and state governance arrangements influence their capacity for policy-development and other strategies to address the social determinants of health. In particular, in some states local boards of health have a particularly strong influence on LHD decision-making. Given their legal and oversight power, most of an LHD's policymaking activity must either be initiated or approved by the BOH. As such, different arrangements for BOH—scope and size, unique authorities, composition, etc.—may in turn influence an LHD's work to advance the goals of Public Health 3.0.

LHDs in NC may assume one of four governance arrangements: a single county health department (CHD), a consolidated health and human services agency (CHSA), a district health department (DHD), or a single or multi-county public health authority (PHA). Among CHDs and CHSAs, boards of county commissioners may assume the powers and responsibilities of the board of health with the addition of a health advisory committee.



In 2012 the North Carolina General Assembly passed a law (S.L. 2012-126) that removed the population threshold for the formation of CHSAs and for allowing complete Board of County Commissioner (BOCC) governance over LHDs. Following this change, dozens of BOCCs have decided to change their community's public health governance arrangement, either by consolidating their social services agency with the health department (and possibly other human services), by assuming direct responsibility for the legal duties of the BOH, and sometimes both. These decisions resulted in the great variety of public health governance arrangements across the state. Twenty-eight counties now have consolidated health and human services agency, and in 16 counties the board of county commissioners now serves as the governing board for public health. The following interview questions seek to study the ways in which public health governance arrangements impact an LHDs policymaking behavior, especially to address SDOH.

Interview Questions

For this interview, where we mention the phrase "board of health," we mean whichever of the following governing entities within North Carolina public health to apply to your jurisdiction: an appointed board of health, an appointed district board of health, an appointed health and human services board, or the elected board of county commissioners if they have assumed all the responsibilities of a board of health or board of health and human services.

Questions Part 1: Understand the relationship between LHD leaders and their BOH members, generally and regarding policy development.

When thinking about the LHD workforce, governing members, and their joint capacity to fulfill the mission of the local public health agency:

1. Where is the most cohesion and support between LHD Directors and BOH members?
    a. What specific needs are satisfied by either entity?
    b. What "role" does either entity play in the relationship?
    c. How would you define a strong relationship between the LHD and the BOH?
2. Where is the most tension between LHD Directors and BOH members?
    a. Are there instances in which your "approaches", "policy desires", or "values" aren't aligned?
    b. What is the biggest source of misunderstanding between the two entities?
3. According to NALBH, boards of health are supposed to serve as a bridge between the LHD and the community. How well do you believe it currently serves that purpose?
    a. How are value misalignments between the board, the LHD, elected officials, and the community handled?
4. Where is there room for improvement?

As outlined by the National Association of Local Boards of Health (NALBH), "policy development" is one of six core governance functions of local boards of health. The function of "policy development" includes the ability to "lead and contribute to the development of policies that protect, promote, and improve public health while ensuring that the [public health agency] and its components remain consistent with the laws and rules (local, state, and federal) to which it is subject." We want to ask a few questions about how your LHD and governing entity work together to pursue policy development-related work.

When thinking about the LHD workforce, governing members, and their joint capacity for public health <u>policy development</u>…

1. Where do you feel there is the greatest strength?
    a. How confident are you in pursuing local policy development?
    b. Where do you feel most comfortable pursuing local policy development?
    c. When pursuing policy development well, what is the unique role of either entity?
2. What are some of the biggest challenges?
    a. Where are you uncomfortable pursing policy development, and why?
3. Where do you feel there is the biggest opportunity for policy development?
    a. What kinds of policies do you wish to pursue in the future?
    b. How can local public health policy development improve?

Question Part 2: Understand the relationship between state and local policy development within North Carolina

Across the United States, policymaking is often a joint process between state and local public health officials. In North Carolina, this includes work between agencies such as the Division of Public Health, the Commission for Public Health, and the North Carolina LHD Accreditation Board at the state level, and local health department workforce, county commissioners, and board of health members at the local level.

For instance, local boards of health cannot pass local public health rules in areas that have already been heavily regulated by the Commission. However, the state may be able to adopt state-wide rules that an individual board of health desires but cannot adopt in their own jurisdiction. On the other hand, rules passed at the local level may inform the development of future rules adopted by the Commission. For instance, the state could be interested in examining the impact of how local rules have been implemented (as a sort of "proving ground") before adopting similar rules at the state level.

Next, we'd like to consider how you've experienced the relationship between state and local public health decision-makers when it comes to policy development in North Carolina.

1. In what ways does public health policymaking at the **local** level most impact policymaking at the **state** level? (Local → state)
    a. What role do you see for local public health advocacy to shape state-level policy making?
    b. How do you think local public health policymaking *should* shape state-level policymaking?
    c. What information or resources do you wish state level policymakers had from local public health officials?
2. In what ways does public health policymaking at the **state** level most impact policymaking at the **local** level? (State → local)
    a. Are there policy areas you believe are under or over-regulated at the state level?
    b. Are there policy areas in which the state provides helpful "coverage"?
    c. How do you think policymaking at the local level is most *constrained* or *harmed* by state-level policymaking?
    d. How do you think policymaking at the local level is most *expanded* or *aided* by state-level policymaking?
    e. Where do you think state policymakers give locals the *greatest discretion* with policymaking?
3. How would you describe the **overall quality of the relationship** between state and local public health policymakers in North Carolina?
    a. At the state level, which agency has the most impact on local policy development?
    b. In what ways do you think local and state policymaking work well together in North Carolina?
    c. Where are sources of disconnect or disagreement between local and state policymaking in North Carolina?

Questions Part 3: Understand the unique role that your health department and governing entity have in making decisions about whether and how to address social issues in the community.

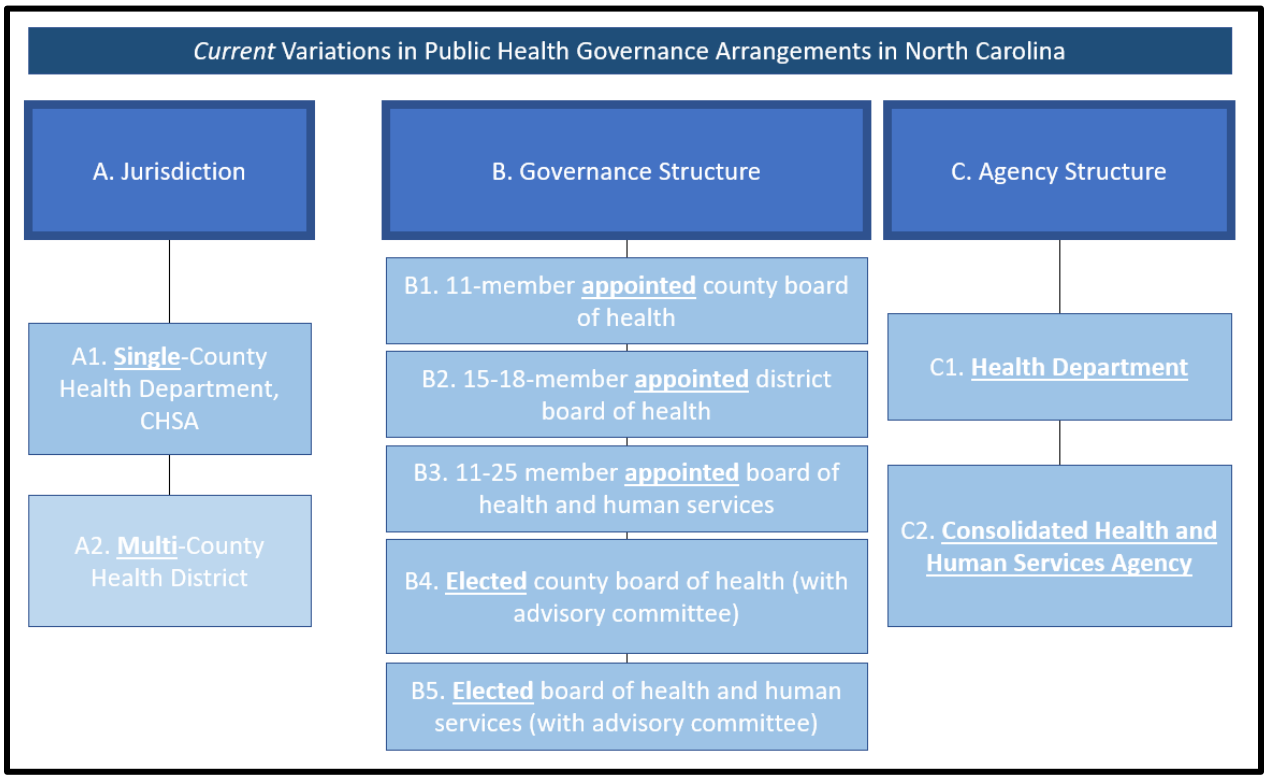
Within the public health 3.0 movement, LHDs are encouraged to work alongside all relevant partners to address social determinants of health such as housing, employment, education, food insecurity, and access to healthcare.

1. Inspired by this depiction, what are the specific role(s) you have already exercised or imagine for your LHD when addressing such social issues with partners in the community?
    a. Some examples: convener, leader, provider of data and evidence, provider of funding.
    b. How does this role vary depending on the social issue you wish to address in the community?

Questions Part 4: Understand how variations in the available local governance arrangements in North Carolina impacts your role in addressing community health, especially the social determinants of health

Within North Carolina, three major dimensions of governance for public health exist: jurisdiction, governance structure, and agency structure:

A. *"Jurisdiction" concerns whether the LHDs covers a single county or multi-county DHD,*
B. *"Governance structure" concerns whether there exists an appointed or elected board of health*
C. *"Agency structure" primarily concerns whether public health is consolidated with social services into a consolidated health and human services agency (CHSA).*



Next, we wish to understand the relationship between public health governance arrangements and your work addressing foundational public health services (i.e., communicable disease control, chronic disease and injury prevention, environmental public health, maternal, child, and family health, and access to and linkage with clinical care).

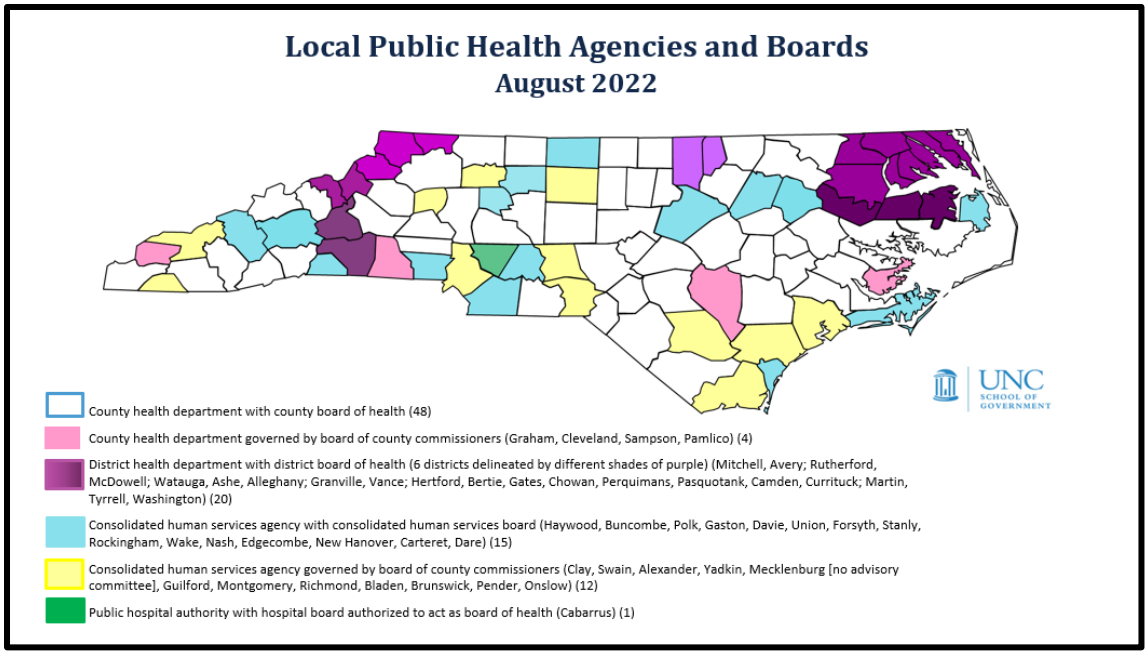
[SELECT THE APPROPRIATE ARRANGEMENT FOR EACH INTERVIEW]

1. **Jurisdiction**: How does your status working in an [A1/A2, as opposed to A2/A1] impact your ability address social issues? Consider the following domains: financing, workforce, service delivery, management and governance
    a. How does it facilitate this work?
    b. How does it challenge this work?
2. **Governance Structure**: How does your status as an [B1-5, as opposed to ~B1-5] impact your ability address social issues? Consider the following domains: financing, workforce, service delivery, management and governance.
    a. How does it facilitate this work?
    b. How does it challenge this work?
3. **Agency Structure**: How does your status as a [C1/C2, as opposed to C2/C1] impact your ability address social issues? Consider the following domains: financing, workforce, service delivery, management and governance
    a. How does it facilitate this work?
    b. How does it challenge this work?
    c. For those in CHSAs:
        i. Pros and cons of State Health Personnel designation
        ii. Pros and cons of CHSA structure (i.e., county manager division from SS and HD leadership, which agencies are included)
4. Across the options outlined in the three governance dimensions we've discussed, which do you think is best suited to address social determinants of health and why?

Questions Part 5: Understand general principles for local public health governance for improving community health

Earlier, we asked you to reflect on three dimensions of local public health governance that are available to LHDs within North Carolina. However, alternatives outlined within the current North Carolina general statutes do not exhaust the range of governance arrangements possible for local public health. In this final section of the interview, we want you to reflect on other possibilities for the governance of local public health, informed by your experience within North Carolina's public health system.

1. Currently, as discussed, NC Law allows for a large variation in governance arrangements for delivering public health goods and services – single-county health departments, multi-county districts, consolidated health and human services agencies, and public health authorities. Based on your experiencing working within NC public health, how much variation in local public health governance is desirable?
    a. What are the advantages of such variation?
    b. What are the challenges of such variation?



2. What changes to local public health governance would you propose in North Carolina and why?
    a. Consider any changes along the three dimensions we've previously discussed (e.g., Jurisdiction, governance structure, agency structure)
    b. Consider various dimensions of the board of health: composition, method of appointment, authorities (policy, imposing fees, budgetary, set salaries, etc.), hiring/firing

APPENDIX 4.4: CHAPTER 4 QUALITATIVE CODEBOOK

Codebook Key:

- BOH = Board of Health AND Board of Health and Human Services
- BOCC = Board of County Commissioners
- CM = County Managers
- LHD = Local Health Department / Local Public Health Agency
- CHSA = Consolidated Human Services Agency
- SDOH = Social Determinants of Health
- NC PH = North Carolina Public Health

Codes:

- Domain #1: Board of Health Dynamics
    - **Role of BOH**: What role the BOH plays *in the life of the LHD*, including roles it currently plays and idealized roles (i.e., how they imagine a board *should* look like), as well as any involvement the BOH has with the community (e.g., in response to them serving as a "bridge" between the LHD and the community). Include current challenges or weaknesses of the board (including points of misalignment/tension between LHD and the BOH), as well as opportunities for the board to overcome those challenges. NOT INCLUDED: the role of the BOH in dealing with BOCCs or CMs (see "inter-government dynamics").
    - **Inter-government dynamics**: Any commentary on the dynamic between the BOH and the BOCC and/or the CM (note: if the interviewee is a BOCC member, only include commentary that explicitly addresses dealings with the BOCC).
- Domain #2: Addressing Social Determinants of Health
    - **LHD addressing SDOH**: Role of the LHD—perceived, actual, or desired—in addressing SDOH in the community, including how that role may differ depending on the SDOH.
    - **Governance Structure and SDOH**: Which governance structure, or dimensions of governance, is best suited for SDOH-related work. (note: if they mention a particular governance structure in this response, also code the governance structure from Domain #4 below)
- Domain #3: Policy Development
    - **BOH Policy Development**: Role of the BOH in working on local public health policy development, including the strengths and weaknesses of this work and policy areas they have or wish to work on.
    - **Local and State Policy Development:** What role, if any, they believe LHDs should have on state policy development, including aspirations for this role and any challenges they may have faced as well as the influence of state administrators and policymakers on local decision-making, including commentary on areas that may be over or under regulated, or areas in which the state gives locals the most discretion. Also include any commentary that is not explicitly about the role that either state or locals have on each other than the context of policy development, but rather the generic relationship they have, including challenges and opportunities for improvement.

- Domain #4: Tradeoffs in Governance Structure
    - **Traditional Model**: Advantages or disadvantages of working in the "traditional" model of public health governance -- code and apply this code whenever they mention the traditional model or implicitly compare themselves with it (even when it overlaps with other governance codes)
    - **District Model**: Advantages or disadvantages of working in the "district" model of public health governance.
    - **Elected Model**: Advantages or disadvantages of working in the "elected" model of public health governance (BOCC oversite of LHD/CHSA), including any commentary about an advisory board/committee.
    - **CHSA Model**: Advantages or disadvantages of working in the "CHSA" model of public health governance, including any commentary about working with DSS.
- Domain #5: Public Health Governance Across North Carolina
    - **Governance Variation across NC:** Advantages and disadvantages from variation in in NC PH governance
    - **Improvements to NC PH Governance**: How interviewees propose changes or improvements to NC PH governance (note: if proposed changes have to do with any of the aforementioned governance structures, code the governance structure as well)

REFERENCES

1. Baker M, Ivory D. Why Public Health Faces a Crisis Across the U.S. *New York Times*. Published online 2021:1-8. https://www.nytimes.com/2021/10/18/us/coronavirus-public-health.html
2. Kuehnert P, Palacio H. Transforming public health in the United States. *Perspect Public Health*. 2014;134(5):251-252. doi:10.1177/1757913914545303
3. DeSalvo KB, Claire Wang Y, Harris A, Auerbach J, Koo D, O'Carroll P. Public health 3.0: A call to action for public health to meet the challenges of the 21st century. *Prev Chronic Dis*. 2017;14(9):1-9. doi:10.5888/pcd14.170017
4. Halverson PK, Mays GP, Hogg R. The organizational landscape of the American public health system. *Contemporary public health: principles, practice, and policy*. Published online 2013:205-225.
5. Sarriot E, Kouletio M. Community health systems as complex adaptive systems: ontology and praxis lessons from an urban health experience with demonstrated sustainability. *Syst Pract Action Res*. 2015;28(3):255-272.
6. Institute of Medicine (U.S.). Committee for the Study of the Future of Public Health. *The Future of Public Health*. National Academy Press; 1988.
7. Grant AK. Patterns of Cross-Sector Collaboration in Local Health Departments: A Cluster Analysis. *Health Promot Pract*. 2022;23(1):128-136. doi:10.1177/1524839920972982
8. Wilson KD, Mohr LB, Beatty KE, Ciecior A. Describing the continuum of collaboration among local health departments with hospitals around the community health assessments. *Journal of Public Health Management and Practice*. 2014;20(6):617-625.
9. Rodriguez HP, Mac McCullough J, Hsuan C. Local health department collaborative capacity to improve population health. *Front Public Health Serv Syst Res*. 2014;3(4):7.
10. Puska P. Health in all policies. *Eur J Public Health*. 2007;17(4):328. doi:10.1093/eurpub/ckm048
11. Kickbusch I, Buckett K. *Implementing Health in All Policies: Adelaide 2010*. Health in All Policies Unit, SA Department of Health Adelaide; 2010.
12. Rudolph L, Caplan J, Ben-Moshe K, Dillon L. Health in all Policies. A Guide for State and Local Governments. Published online 2013:169.
13. Hall RL, Jacobson PD. Examining whether the health-in-all-policies approach promotes health equity. *Health Aff*. 2018;37(3):364-370. doi:10.1377/hlthaff.2017.1292
14. Prevention C for DC and. Essential Public Health Services. National Public Health Performance Standards Program. Published online 10AD.
15. *For the Public's Health: Investing in a Healthier Future*. National Academies Press; 2012. doi:10.17226/13268

16. Frattaroli S, Pollack KM, Young JL, Vernick JS. State health department employees, policy advocacy, and political campaigns: Protections and limits under the law. *The Journal of Law, Medicine & Ethics*. 2015;43(1_suppl):64-68.

17. Frieden TR, Bassett MT, Thorpe LE, Farley TA. Public health in New York City, 2002–2007: confronting epidemics of the modern era. *Int J Epidemiol*. 2008;37(5):966-977.

18. Castrucci BC, Leider JP, Sellers K. Perceptions regarding importance and skill at policy development among public health staff. *Journal of Public Health Management and Practice*. 2015;21:S141-S150. doi:10.1097/PHH.0000000000000324

19. Hearne S, Castrucci BC, Leider JP, Rhoades EK, Russo P, Bass V. The future of urban health: Needs, barriers, opportunities, and policy advancement at large urban health departments. *Journal of Public Health Management and Practice*. 2015;21:S4-S13. doi:10.1097/PHH.0000000000000166

20. Mays GP, Smith SA, Ingram RC, Racster LJ, Lamberth CD, Lovely ES. Public Health Delivery Systems. Evidence, Uncertainty, and Emerging Research Needs. *Am J Prev Med*. 2009;36(3):256-265. doi:10.1016/j.amepre.2008.11.008

21. Meit M, Sellers K, Kronstadt J, et al. Governance typology: A consensus classification of state-local health department relationships. *Journal of Public Health Management and Practice*. 2012;18(6):520-528. doi:10.1097/PHH.0b013e31825ce90b

22. Scutchfield FD. A national research agenda for public health services and systems. *Am J Prev Med*. 2012;42(5 SUPPL. 1):S72-S78. doi:10.1016/j.amepre.2012.01.026

23. Hyde JK, Shortell SM. The structure and organization of local and state public health agencies in the U.S.: A systematic review. *Am J Prev Med*. 2012;42(5 SUPPL. 1). doi:10.1016/j.amepre.2012.01.021

24. Gray BH. Understanding the Organization of Public Health Delivery Systems: An Empirical Typology. *Milbank Q*. 2008;86(4):529-532. doi:10.1111/j.1468-0009.2008.00538.x

25. Richards TB, Rogers JJ, Christenson GM, Miller CA, Taylor MS, Cooper AD. Evaluating local public health performance at a community level on a statewide basis. *Journal of Public Health Management and Practice*. Published online 1995:70-83.

26. Suen J, Christenson GM, Cooper A, Taylor M. *Analysis of the Current Status of Public Health Practice in Local Health Departments Following Assignment of Survey Items, Index Scores Wezr a*. Vol 11.; 1995.

27. Mays GP, Halverson PK, Baker EL, Stevens R, Vann JJ. Availability and perceived effectiveness of public health activities in the nation's most populous communities. *Am J Public Health*. 2004;94(6):1019-1026.

28. Mays GP, McHugh MC, Shim K, et al. Institutional and economic determinants of public health system performance. *Am J Public Health*. 2006;96(3):523-531.

29. McAfee M, Blackwell AG, Bell J. Equity: The soul of collective impact. *Policy Link, Oakland, CA*. Published online 2015.

30. Gonzalez R. The spectrum of community engagement to ownership. *Oakland, CA*. Published online 2019.

31. Hunter DM, Mpofu Z. Leveraging Collective Impact to Address Structural Racism in Buncombe County, North Carolina. *J Public Health Manag Pract*. 2022;28(1):S38-S42. doi:10.1097/PHH.0000000000001434

32. Carlson V, Chilton MJ, Corso LC, Beitsch LM. Defining the functions of public health governance. *Am J Public Health*. 2015;105:S159-S166. doi:10.2105/AJPH.2014.302198

33. Schneider E, Fallon MM, Valasek T. Local board of health authority to address obesity. *Am J Public Health*. 2012;102(SUPPL. 1). doi:10.2105/AJPH.2011.300464

34. Shah GH, Sotnikov S, Leep CJ, Ye J, Van Wave TW. Creating a taxonomy of local boards of health based on local health departments' perspectives. *Am J Public Health*. 2017;107(1):72-80. doi:10.2105/AJPH.2016.303516

35. Allen, Peg; Brownson, Ross C.; Duggan, Kathleen; Stamatakis, Katherine A.; and Erwin PC. Public Health Governance and Population Health Outcomes. *Front Public Health Serv Syst Res*. 2012;1(2):1-6. doi:10.13023/FPHSSR.0101.04

36. Bhandari MW, Scutchfield FD, Charnigo R, Riddell MC, Mays GP. New data, same story? revisiting studies on the relationship of local public health systems characteristics to public health performance. *Journal of Public Health Management and Practice*. 2010;16(2):110-117. doi:10.1097/PHH.0b013e3181c6b525

37. Auerbach J. Social Determinants of Health Can only Be Addressed by a Multisector Spectrum of Activities. *Journal of Public Health Management and Practice*. 2019;25(6):525-528. doi:10.1097/PHH.0000000000001088

38. Abrams EM, Szefler SJ. COVID-19 and the impact of social determinants of health. *Lancet Respir Med*. 2020;8(7):659-661.

39. Sokol R, Moracco B, Nelson S, et al. How local health departments work towards health equity. *Eval Program Plann*. 2017;65:117-123.

40. Shah GH, Sheahan JP. Local health departments' activities to address health disparities and inequities: Are we moving in the right direction? *Int J Environ Res Public Health*. 2015;13(1). doi:10.3390/ijerph13010044

41. Pomeranz JL. The unique authority of state and local health departments to address obesity. *Am J Public Health*. 2011;101(7):1192-1197. doi:10.2105/AJPH.2010.300023

42. Schwarte L, Samuels SE, Boyle M, George C, Flores G, Prentice B. Local public health departments in california: Changing nutrition and physical activity environments for obesity prevention. *Journal of Public Health Management and Practice*. 2010;16(2):e17-e28. doi:10.1097/PHH.0b013e3181af63bb

43. Lemon SC, Goins KV, Sreedhara M, et al. Developing Core Capabilities for Local Health Departments to Engage in Land Use and Transportation Decision Making for Active

Transportation. *Journal of Public Health Management and Practice*. 2019;25(5):464-471. doi:10.1097/PHH.0000000000000948

44. Schaff K, Dorfman L. Local Health Departments Addressing the Social Determinants of Health: A National Survey on the Foreclosure Crisis. *Health Equity*. 2019;3(1):30-35. doi:10.1089/heq.2018.0066

45. Harris JK, Mueller NL. Policy activity and policy adoption in rural, suburban, and urban local health departments. *Journal of Public Health Management and Practice*. 2013;19(2):E1-E8.

46. Meyerson BE, Sayegh MA. State size and government level matter most: a structural equation model of local health department policy behaviors. *Journal of Public Health Management and Practice*. 2016;22(2):157-163.

47. Prevention C for DC and. The core public health functions steering committee, national public health performance standards program. *Retrieved July*. 1994;1:2012.

48. *State Health Department Employees, Policy Advocacy, and Political Campaigns: Protections and Limits Under the Law*.

49. Core Competencies for Public Health Professionals.

50. Building Skills for a More Strategic Public Health Workforce: A Call to Action.

51. Health in All Policies CDC.

52. Health in All Policies. National Association of County and City Health Officials .

53. Beckett AB, Scutchfield FD, Pfeifle W, Hill R, Ingram RC. The forgotten instrument: analysis of the national public health performance standards program governance instrument. *Journal of public health management and practice*. 2008;14(4):E17. doi:10.1097/01.PHH.0000324577.89566.db

54. Lovelace KA, Aronson RE, Rulison KL, Labban JD, Shah GH, Smith M. Laying the groundwork for evidence-based public health: Why some local health departments use more evidence-based decision-making practices than others. *Am J Public Health*. 2015;105:S189-S197. doi:10.2105/AJPH.2014.302306

55. Feng W, Martin EG. Fighting obesity at the local level? An analysis of predictors of local health departments' policy involvement. *Prev Med (Baltim)*. 2020;133. doi:10.1016/j.ypmed.2020.106006

56. Mays GP, McHugh MC, Shim K, et al. Institutional and economic determinants of public health system performance. *Am J Public Health*. 2006;96(3):523-531. doi:10.2105/AJPH.2005.064253

57. McCullough J Mac, Leider JP, Riley WJ. Local Fiscal Allocation for Public Health Departments. *Am J Prev Med*. 2015;49(6):921-929. doi:10.1016/j.amepre.2015.04.021

58. NALBOH'S Six Functions of Public Health Governance.

59. *2015 Local Board of Health National Profile*.; 2016. www.nalboh.org

60. Newell BJ, Shah GH. Impact of Local Boards of Health (LBoH) Governance Functions on Local Health Departments (LHDs) Policy Making or Advocacy Activities. Published online 2017.

61. Shah GH, Sotnikov S, Leep CJ, Ye J, Corso L. Local Boards of Health Characteristics Influencing Support for Health Department Accreditation. *Journal of Public Health Management and Practice*. 2018;24(3):263-270. doi:10.1097/PHH.0000000000000623

62. Shah GH, Corso L, Sotnikov S, Leep CJ. Impact of Local Boards of Health on Local Health Department Accreditation, Community Health Assessment, Community Health Improvement Planning, and Strategic Planning. *Journal of Public Health Management and Practice*. 2019;25(5):423-430. doi:10.1097/PHH.0000000000000847

63. Nguyen TH, Shah GH, Schwartz RD, Jones JA. Factors Associated with Continuous Improvement by Local Boards of Health. *Journal of Public Health Management and Practice*. 2019;25(5):415-422. doi:10.1097/PHH.0000000000001009

64. Shah GH, Leep CJ. Local boards of health as linkages between local health departments and health care and other community organizations. *Journal of Public Health Management and Practice*. 2020;26(5):E17-E23. doi:10.1097/PHH.0000000000000858

65. Feng W, Lischko A, Martin EG, et al. Who Are the Local Policy Innovators? Cluster Analysis of Municipal Tobacco Control Policies in Massachusetts. *Journal of Public Health Management and Practice*. 2023;29(2):151-161. doi:10.1097/PHH.0000000000001649

66. Feng W, Martin EG. Fighting obesity at the local level? An analysis of predictors of local health departments' policy involvement. *Prev Med (Baltim)*. 2020;133. doi:10.1016/j.ypmed.2020.106006

67. Meyerson BE, Sayegh MA. State Size and Government Level Matter Most: A Structural Equation Model of Local Health Department Policy Behaviors. *Journal of Public Health Management and Practice*. 2016;22(2):157-163. doi:10.1097/PHH.0000000000000244

68. Collins L, Lanza S. *Latent Class and Latent Transition Analysis: With Applications in the Social, Behavioral, and Health Sciences*. John Wiley & Sons, Inc. ; 2010.

69. Adams RM, Rivard H, Eisenman DP. Who Participates in Building Disaster Resilient Communities: A Cluster-Analytic Approach. *Journal of Public Health Management and Practice*. 2017;23(1):37-46. doi:10.1097/PHH.0000000000000387

70. Bekemeier B, Pui-Yan Yip M, Flaxman AD, Barrington W. Five community-wide approaches to physical activity promotion: A cluster analysis of these activities in local health jurisdictions in 6 states. *Journal of Public Health Management and Practice*. 2018;24(2):112-120. doi:10.1097/PHH.0000000000000570

71. Bekemeier B, Pantazis A, Dunbar MD, Herting JR. Classifying local health departments on the basis of the constellation of services they provide. *Am J Public Health*. 2014;104(12):e77-e82. doi:10.2105/AJPH.2014.302281

72. PH WINS: 2017 NATIONAL FINDINGS. Public Health Workforce Interests and Needs Survey: 2017 Findings.

73. Weber L, Barry-Jester A. Over Half of States Have Rolled Back Public Health Powers in Pandemic. *Kaiser Health News*. Published online 2021:1-14. https://khn.org/news/article/over-half-of-states-have-rolled-back-public-health-powers-in-pandemic/

74. Shah GH, Leep CJ. Local boards of health as linkages between local health departments and health care and other community organizations. *Journal of Public Health Management and Practice*. 2020;26(5):E17-E23. doi:10.1097/PHH.0000000000000858

75. Little TD. *The Oxford Handbook of Quantitative Methods*. Oxford University Press; 2013.

76. Carroll LD, Wetherill MS, Teasdale TA, Salvatore AL. Community health improvement plans: An analysis of approaches used by local health departments. *Journal of Public Health Management and Practice*. 2021;28(1):291-298. doi:10.1097/PHH.0000000000001279

77. McCullough J Mac, Eisen-Cohen E, Salas SB. Partnership capacity for community health improvement plan implementation: findings from a social network analysis. *BMC Public Health*. 2016;16(1):1-11.

78. Kronstadt J, Chime C, Bhattacharya B, Pettenati N. Accredited Health Department Partnerships to Improve Health: An Analysis of Community Health Assessments and Improvement Plans. *Journal of Public Health Management and Practice*. 2018;24(3):S35-S43. doi:10.1097/PHH.0000000000000735

79. Sreedhara M, Goulding M, Valentine Goins K, Frisard C, Lemon SC. Healthy Eating and Physical Activity Policy, Systems, and Environmental Strategies: A Content Analysis of Community Health Improvement Plans. *Front Public Health*. 2020;8(December):1-11. doi:10.3389/fpubh.2020.580175

80. Laymon B, Shah G, Leep CJ, Elligers JJ, Kumar V. The proof's in the partnerships: Are affordable care act and local health department accreditation practices influencing collaborative partnerships in community health assessment and improvement planning? *Journal of Public Health Management and Practice*. 2015;21(1):12-17. doi:10.1097/PHH.0000000000000087

81. Perrault EK, Inderstrodt-Stephens J, Hintz EA. Tracking Success: Outputs Versus Outcomes—A Comparison of Accredited and Non-Accredited Public Health Agencies' Community Health Improvement Plan objectives. *J Community Health*. 2018;43(3):570-577. doi:10.1007/s10900-017-0454-0

82. THE UNIVERSITY OF OKLAHOMA HEALTH SCIENCES CENTER GRADUATE COLLEGE COMMUNITY HEALTH IMPROVEMENT PLANS AT NATIONAL AND LOCAL LEVELS : AN ANALYSIS OF PLANS AND AN INNOVATIVE APPROACH IN AN URBAN HEALTH DEPARTMENT A DISSERTATION in partial fulfillment of the. Published online 2020.

83. Sreedhara M, Goins KV, Frisard C, Rosal MC, Lemon SC. Stepping up active transportation in community health improvement plans: Findings from a national probability survey of local health departments. *J Phys Act Health*. 2019;16(9):772-779. doi:10.1123/jpah.2018-0623

84. Inderstrodt J, Perrault EK, Hintz EA, Hildenbrand GM. Addressing Health Disparities in America: Analysis of Community Health Improvement Plans. *Nurs Res*. 2019;68(5):405-412. doi:10.1097/NNR.0000000000000364

85. McHugh ML. Interrater reliability: the kappa statistic. *Biochem Med (Zagreb)*. 2012;22(3):276-282.

86. Bunnell R, O'Neil D, Soler R, et al. Fifty communities putting prevention to work: accelerating chronic disease prevention through policy, systems and environmental change. *J Community Health*. 2012;37:1081-1090.

87. Dawes DE. *The Political Determinants of Health*. Johns Hopkins University Press; 2020.

88. Gómez CA, Kleinman D V, Pronk N, et al. Practice full report: addressing health equity and social determinants of health through healthy people 2030. *Journal of Public Health Management and Practice*. 2021;27(6):S249.

89. Franco Vargas MH, Roldán Restrepo D. The instruments of public policy. A transdisciplinary look. *Cuadernos de Administración*. 2019;35(63):101-113. doi:10.25100/cdea.v35i63.6893

90. Howlett M. Policy instruments: definitions and approaches. In: *A Modern Guide to Public Policy*. Edward Elgar Publishing; 2020:165-177.

91. HOOD C. Using Bureaucracy Sparingly. *Public Adm*. 1983;61(2):197-208. doi:10.1111/j.1467-9299.1983.tb00513.x

92. Howlett M. Policy tools and their role in policy formulation: Dealing with procedural and substantive instruments. In: *Handbook of Policy Formulation*. Edward Elgar Publishing; 2017:96-111.

93. Meuleman L. The cultural dimension of metagovernance: Why governance doctrines may fail. *Public Organization Review*. 2010;10(1):49-70. doi:10.1007/s11115-009-0088-5

94. Schneider A, Ingram H. Behavioral Assumptions of Policy Tools Association Stable URL : http://www.jstor.org/stable/2131904 Linked references are available on JSTOR for this article : Behavioral Assumptions of Policy Tools. *J Polit*. 1990;52(2):510-529.

95. Considine M. *Enterprising States: The Public Management of Welfare-to-Work*. Cambridge University Press; 2001.

96. Kooiman J. Societal Governance: Levels, models, and Orders of Social. Published online 2000.

97. Tenbensel T. Multiple modes of governance: Disentangling the alternatives to hierarchies and markets. *Public Management Review*. 2005;7(2):267-288. doi:10.1080/14719030500091566

98. Carmona M. Design governance: theorizing an urban design sub-field. *J Urban Des (Abingdon)*. 2016;21(6):705-730. doi:10.1080/13574809.2016.1234337

99. Wall AN. *Comparing North Carolina's Local Public Health Agencies: The Legal Landscape, the Perspectives, and the Numbers*. School of Government, University of North Carolina; 2013.

100. Hsieh HF, Shannon SE. Three approaches to qualitative content analysis. *Qual Health Res*. 2005;15(9):1277-1288.

101. Erickson A. *Perceptions of Local Board of Health Effectiveness In Georgia*.; 2021. https://digitalcommons.georgiasouthern.edu/etd

102. Dada OO, Bekemeier B, Flaxman A, de Castro AB. Association Between Local Boards of Health Authority Over Budgets and PHAB Accreditation Standard Score. *AJPM Focus*. Published online 2023:100070.

103. PETERS G. The politics of public sector coordination. Published online 2015.

104. Santerre RE. Jurisdiction size and local public health spending. *Health Serv Res*. 2009;44(6):2148-2166.

105. Hoornbeek J, Budnik A, Beechey T, Filla J. Consolidating health departments in Summit County, Ohio: a one year retrospective. *Kent, OH: Kent State University Center for Public Administration and Public Policy*. Published online 2012.

106. Hoornbeek J, Morris M, Libbey P, Pezzino G. Consolidating local health departments in the United States: challenges, evidence, and thoughts for the future. *Public Health Reports*. 2019;134(2):103-108.

107. Bates LJ, Santerre RE. The demand for local public health services: do unified and independent public health departments spend differently? *Med Care*. Published online 2008:590-596.

108. Jones DK, Atkeson P, Goodman A, Houston M. More Public Health Leaders Should Run for Office. *Journal of Public Health Management and Practice*. 2021;27(1):1-3.

109. Regidor E, de la Fuente L, Gutiérrez-Fisac JL, et al. The role of the public health official in communicating public health information. *Am J Public Health*. 2007;97(Supplement_1):S93-S97.

110. Gollust SE, Baum NM, Jacobson PD. Politics and public health ethics in practice: right and left meet right and wrong. *Journal of Public Health Management and Practice*. 2008;14(4):340-347.

111. Hunter EL. Politics and public health—engaging the third rail. *Journal of public health management and practice*. 2016;22(5):436.

112. Galea S, Vaughan RD. Public health, politics, and the creation of meaning: A public health of consequence, July 2019. *Am J Public Health*. 2019;109(7):966-968.

113. Heifetz RA, Heifetz R, Grashow A, Linsky M. *The Practice of Adaptive Leadership: Tools and Tactics for Changing Your Organization and the World*. Harvard business press; 2009.

114. van Dorp EJ, ’t Hart P. Navigating the dichotomy: The top public servant’s craft. *Public Adm*. 2019;97(4):877-891. doi:10.1111/padm.12600

115. Svara JH. The myth of the dichotomy: Complementarity of politics and administration in the past and future of public administration. *Public Adm Rev*. 2001;61(2):176-183. doi:10.1111/0033-3352.00020

116. Abimbola S, Baatiema L, Bigdeli M. The impacts of decentralization on health system equity, efficiency and resilience: a realist synthesis of the evidence. *Health Policy Plan*. 2019;34(8):605-617.

117. Brandert K, McCarthy C, Grimm B, Svoboda C, Palm D, Stimpson JP. Peer Reviewed: A Model for Training Public Health Workers in Health Policy: the Nebraska Health Policy Academy. *Prev Chronic Dis*. 2014;11.

118. Frieden TR. A framework for public health action: the health impact pyramid. *Am J Public Health*. 2010;100(4):590-595.

119. Muthén B, Muthén LK. Integrating person-centered and variable-centered analyses: Growth mixture modeling with latent trajectory classes. *Alcohol Clin Exp Res*. 2000;24(6):882-891.

120. Shanahan L, Copeland WE, Worthman CM, Erkanli A, Angold A, Costello EJ. Sex-differentiated changes in C-reactive protein from ages 9 to 21: the contributions of BMI and physical/sexual maturation. *Psychoneuroendocrinology*. 2013;38(10):2209-2217.