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ASSOCIATION OF HEALTH DEPARTMENTS' COMPLETION OF A COMMUNITY HEALTH ASSESSMENT, COMMUNITY HEALTH IMPROVEMENT PLAN, AND STRATEGIC PLAN WITH BETTER POPULATION HEALTH OUTCOMES

by

KELORA COFER

(Under the Direction of Gulzar Shah)

ABSTRACT

Promoting health and well-being requires a strong public health infrastructure. This study examined the association of engagement of local health departments (LHDs) in accreditation and its pre-requisites with health outcomes in LHD jurisdictions such as the prevalence of premature death and tobacco use in the counties they serve. Two data sets, The 2016 National Profile of Local Health Departments and 2018 Community Health Rankings were linked using deterministic linkage approach, based on county FIPS codes as a unique identifier. Descriptive and multinomial logistic regression analyses were performed using SPSS Version 25. The results showed that having recently completed a community health improvement plan, a strategic plan, PHAB accreditation engagement, governance structure, and jurisdiction size are all significantly associated with high levels of premature death and tobacco use outcomes.

INDEX WORDS: Health outcomes, Community health assessment, Community health improvement plan, Strategic Plan, Health impact, Local health department performance

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DOCTOR OF PUBLIC HEALTH

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TABLE OF CONTENTS

LIST OF TABLES 4
LIST OF FIGURES 5
CHAPTER
1 INTRODUCTION 6
Problem Statement 7
Purpose 8
Research Hypothesis 8
Significance 10
Delimitations 12
Definition of Terms 12
2 LITERATURE REVIEW 15
Introduction 15
Background 16
Importance of LHD Performance 17
Theoretical Framework 19
Origins 20
Goal Setting Theory Principles 21
Community Health Assessment 23
Community Health Improvement Plan 24
Strategic Plan 25
Local Boards of Health 28
LBoH Characteristics 29
PHAB Accreditation 29
3 METHODOLOGY 32
Research Design 32
Data 32
Research Questions 34
Variables 35
Independent Variables 36
Dependent Variables 38
Covariates 39
Statistical Methods 41

4 RESULTS 42
Descriptive Statistics 42
Community Health Assessment 45
Community Health Improvement Plan 49
Strategic Plan 50
Completion of CHA, CHIP, and Strategic Plan 51
PHAB Accreditation 52
Governance 54
Local Board of Health 55
Jurisdiction 55
5 CONCLUSIONS 57
Conclusion 59
Limitations and Recommendations 61
REFERENCES 63

LIST OF TABLES

Table 1: CHR Data Sources Used in this Study 33
Table 2: Independent Variables 37
Table 3: Dependent Variables..... 39
Table 4: Covariates 40
Table 5: Descriptive Statistics for LHD Characteristics, Years of Life Lost, and Tobacco Use.. 44
Table 6: Multinomial Logistic Regression for Years of Potential Life Lost 47
Table 7: Multinomial Logistic Regression for Tobacco Use..... 48

LIST OF FIGURES

Figure 1: Goal Setting Theory 21
Figure 2: Study Logic Model 28

CHAPTER 1

INTRODUCTION

In 2012, a formative assessment of our country's health status noted that the United States had fallen behind many of its peers (Institute of Medicine Committee on Public Health Strategies to Improve Health, 2012). The Committee on Assuring the Health of the Public in the 21st Century notes that promoting health and well-being in the United States will require a strong public health infrastructure. Local health departments are a critical part of that infrastructure, and it is becoming increasingly more important that they strategically identify community health issues and plan and implement long-term interventions. LHDs that do so may be able to better contribute to better health outcomes in their communities. This study aims to examine if there is a positive association between LHDs that complete a community health assessment, community health improvement plan, or strategic plan and their communities' health outcomes.

LHDs must be strategic in their decision-making and in determining how to spend their resources. Strategic planning is a deliberate decision-making process that defines where an organization is going (Public Health Accreditation Board, 2011), how to achieve goal alignment, and obtain effectiveness (Bryson, Crosby, & Bryson, 2009). It may prove to be the key to unlocking insights into performance indicators, improved health outcomes, sustained performance, and a favorable outlook for our nation's health. Given this, it is worthwhile to explore the association between strategic planning in local health departments and health outcomes in the communities they serve. The increase in capacity that can be provided by strategic planning could translate into favorable performance and in turn produce positive health outcomes by employing proper planning to respond to community health problems responsibly (Kemp, 2018).

Problem Statement

Americans are unhealthy and have fallen behind their global counterparts in health outcomes such as life expectancy (Institute of Medicine Committee on Public Health Strategies to Improve Health, 2012). For example, in 2016, the United States spent the most on health care out of all countries tracked by OECD (Organization for Economic Cooperation and Development), yet it ranked 26th out of 35 for life expectancy, with an average life expectancy of 79 years (America's Health Rankings, 2019). Every other OECD country that spent more than 10% GDP on health has higher life expectancy rates than the United States (America's Health Rankings, 2019). Chronic disease incidence in the United States plays a role. According to the Centers for Disease Control and Prevention, in 2012 half of American adults had at least one chronic disease and one in four adults had two or more chronic diseases (Centers for Disease Control and Prevention, 2017) and seventy-five percent of all healthcare spending is spent on chronic diseases (Anusuya Chatterjee, 2014). It is estimated that by 2023 chronic disease incidences will increase by 42 percent, incurring $4.2 trillion in treatment costs and lost economic output (Anusuya Chatterjee, 2014). To remedy this, America should look to energize the public health sector. Governmental public health agencies play a large role in ensuring the delivery of public health services (Hyde & Shortell, 2012), but LHDs play a larger role because they provide most public health services (U.S. Department of Health and Human Services, 2018). It is important to identify LHDs that foster and sustain healthy communities and understand the characteristics associated with them so that we can develop solutions to mitigate our country’s health issues.

Purpose

The purpose of this research is to examine the impact of completing a community health assessment (CHA), community health improvement plan (CHIP), and strategic plan (SP) by local health departments on health outcomes in the communities they serve.

Local health departments must be sure the strategies they choose to employ and investments they make will actually improve population health (Hyde & Shortell, 2012). Strategic planning, community health assessments, and community health improvement planning can aid in the decision-making process; however, limited peer reviewed articles are available on these processes in public health as it pertains to health outcomes. In fact, the number of research publications focused on strategic planning in highly ranked academic journals has decreased since the 1990's (Wolf & Floyd, 2013).

According to Hyde and Shortell, "one of the most notable gaps in the literature is studies that examine the relationship of organizational structure and performance with health status or outcomes". This dissertation is intended to strengthen the public health body of work and make a meaningful contribution to strategic planning and health outcomes literature.

Research Hypothesis

The research questions this dissertation aims to explore are:

Q1: Is the completion of a strategic plan by LHDs in the past five years associated with better health outcomes in premature death and smoking in the LHD's community?

Ho1: Completion of a strategic plan in the last five years is not associated with lower premature death.

Ho2: Completion of a strategic plan in the last five years is not associated with lower tobacco use.

Q2: Is the completion of a community health assessment by LHDs in the last five years associated with better health outcomes in premature death and smoking in the LHD's community?

Ho3: Completion of a community health assessment in the last five years is not associated with lower premature death.

Ho4: Completion of a community health assessment in the last five years is not associated with lower tobacco use.

Q3: Is the completion of a community health improvement plan by LHDs in the last five years associated with better health outcomes in premature death and smoking in the LHD's community?

Ho5: Completion of a community health improvement plan in the last five years is not associated with lower premature death.

Ho6: Completion of a community health improvement plan in the last five years is not associated with lower tobacco use.

Q4: Is the completion of a community health assessment, community health improvement plan, and strategic plan in the last five years associated with better health outcomes in premature death and smoking in the LHD's community?

Ho7: Completion of a community health assessment, community health improvement plan, and strategic plan in the last five years is not associated with lower premature death.

Ho8: Completion of a community health assessment, community health improvement plan, and strategic plan in the last five years is not associated with lower tobacco use.

Because the completion a CHA provides awareness of a community's health gaps and completion of a CHIP and strategic plan indicates an effort to set objectives and allocate resources to achieve identified objectives, it is expected that communities served by LHDs that have completed a community health assessment, community health improvement plan, and strategic plan within the last five years will exhibit lower incidences of premature death and smoking. Additionally, it is expected that other LHD characteristics, such as having a local board of health, jurisdiction population size, PHAB accreditation status, and governance structure, lead to an LHD's increased capacity to implement prevention strategies and are thus associated with lower incidences of premature death and smoking.

Significance

Local health departments are the backbone of the U.S. public health infrastructure and they are tasked with performing the three core functions of public health, which includes assessing the health of the community (Institute of Medicine Committee on Assuring the Health of the Public in the 21st Century, 2003). LHDs are reasonably expected to identify population health issues in their community using tools such as the CHIP, CHA, and SP (G. Shah & Sheahan, 2016) and those who use these tools may be able to better address local health issues

because they have the data to support tailored strategies in their communities (G. Shah & Sheahan, 2016).

This study is significant because there is a need to develop a better understanding of how CHA, CHIP, and SP are utilized to improve population health. In general, the tools have not been subject to widespread assessment through empirical research (Kaissi & Begun, 2008; Lovelace, 2014). Additionally, completion of a community health assessment, community health improvement plan, and strategic plan are critical to receiving PHAB accreditation which, according to Bekemier, is one of the most important initiatives" currently underway to "ensure accountability, consistency, and uniformity" in public health systems to improve the public's health (Riley, Bender, & Lownik, 2012) and it has proven to stimulate quality improvement and performance activities in LHDs as soon as one year after the accreditation decision (Public Health Accreditation Board, 2018a; Siegfried et al., 2018)

Lastly, this study is significant because it explores the association between actual health outcomes and LHD characteristics. According to Bekemier, measurement of the effectiveness of public health organizations and service delivery is now among the research priorities of academic health services researchers, in partnership with public health practitioners (Bekemeier, Zahner, Kulbok, Merrill, & Kub, 2016). In the past decade many LHDs have developed and implemented community health assessments, community health improvement plans, and strategic plans to identify local health issues and set goals; however, there are few empirical reviews of the effects of these tools on LHD performance, especially as it pertains to community health outcomes. Linking data from the National Profile of Local Health Departments (provided by the National Association of County and City Health Officials) and County Health Rankings (provided by the Robert Wood Johnson Foundation and the University of Wisconsin) allows this

study to assess the associations between an LHD's organizational characteristics, such as its size, governance structure, and use of planning tools, and its community's health outcomes. This study will contribute this facet to the current body of literature and offer insight into how organizational tools and characteristics impact health outcomes.

Delimitations

The selected study design is cross-sectional and is based on secondary analysis of the 2016 National Profile of Local Health Departments (Profile) and 2018 County Health Rankings (CHR) data. The Profile dataset was selected because it is the most comprehensive assessment of public health infrastructure available; further, the 2016 dataset was selected because it is the most recent iteration available. The CHR dataset was selected because it provides life expectancy and chronic disease incidence data for all counties in the United States. As most LHD jurisdictions are associated with individual counties, the 2018 CHR dataset included the datapoints of interest that were collected in 2016 and was selected to align with the 2016 Profile dataset and provide a snapshot of the LHDs' organizational statuses and the communities' corresponding health statuses. In this manner, we can attempt to ascertain each LHD's impact on its community's health status.

Definition of Terms

This study utilizes the following terms within the context outlined below.

- Local Health Department
    - "An administrative or service unit of local or state government, concerned with health, and carrying some responsibility for the health of a jurisdiction smaller than the state. (National Association of County and City Health Officials, 2017)
- Strategic Plan

    - A document that results from "a deliberate decision-making process and defines where an organization is going. The plan sets the direction for the organization and, through a common understanding of the mission, vision, goals, and objectives, provides a template for all employees and stakeholders to make decisions that move the organization forward." (Public Health Accreditation Board, 2011)

- Community Health Assessment
    - "A systematic examination of the health status indicators for a given population that is used to identify key problems and assets in a community". (Turnock, 2009)
- Incidence of Premature Death
    - Number of deaths under age 75.
- Incidence of Smoking
    - Percentage of adults that reported smoking.
- Possession of a Local Board of Health
    - A local board of health is the policy-making, rule-making, and adjudicatory body for public health in the county or counties in its jurisdiction. (North Carolina General Assembly, 1983)
- Governance
    - Local Governance: LHDs governed by local authorities.
    - State Governance: LHDs governed by state authorities.
    - Shared Governance: LHDs governed by state and local authorities. (Laymon, Shah, Leep, Elligers, & Kumar, 2015)
- PHAB Accreditation
    - The issuance of recognition of achievement of accreditation within a specified time frame by the Public Health Accreditation Board that ensures measurement and attainment of health department performance against a set of nationally recognized, practice-focused and evidenced-based standards. (Public Health Accreditation Board, 2018c)

- Jurisdiction Size
    - Small LHDs are classified as those that serve populations of fewer than 50,000 people;
    - Medium LHDs serve populations of between 50,000 and 500,000 people;
    - Large LHDs serve populations of 500,000 or more people. (National Association of County and City Health Officials, 2017)

This study assumes that if an LHD identifies as having a strategic plan in the last five years, it has engaged in the process of identifying its goals, surveying its internal and external environments, making decisions, and implementing its decisions. The study also assumes that the development and implementation of the strategic plan occur at the individual health department level. Therefore, the unit of production for this study is the individual local health department.

Additionally, this study assumes that if an LHD has completed a community health assessment in the last five years, it has identified relevant health needs via data collection and analysis with the intent to develop strategies for improvement (Centers for Disease Control and Prevention, 2018). Lastly, premature death is defined as the number of deaths under age 75 and smoking is defined as the percentage of adults that reported smoking.

CHAPTER 2

LITERATURE REVIEW

Introduction

This chapter synthesizes the past and current empirical evidence published on strategic planning, community health assessment, and community health improvement planning in the public health literature. It is organized to present the use of these documents, their frameworks, and applications in both the public and private sectors. Additionally, a review of core tools utilized in the business and healthcare sectors are discussed and the chapter concludes with a discussion of Locke and Latham's Goal Setting Theory.

Identifying relevant publications for this study was achieved by using the structure presented by Kurschner and Gunther (Kürschner & Günther, 2012). The steps are outlined below:

1. In a first step, the existing literature was explored, and essential keywords and search strings were identified.
2. Next, primary studies with key words in the titles and abstracts were searched.
3. Because the identified studies analyze the interaction between more than one design parameter and organizational performance, in a third step, every single interaction was identified and classified within the framework.
4. Finally, using additional key words, and sophisticated literature search for further studies on single design parameters was added by analyzing the reference lists and journals of collected primary studies.

Key terms and phrases used to identify relevant literature include strategy, strategic planning, strategic management, operations management, planning, forecasting, benchmarking, implementation, SWOT analysis, SWOT, goals, goal setting theory, public health department,

public health, hospital, non-profit agency, health department, health, performance and task performance. Boolean logic was employed and many of the searches were performed using the asterisk as a special character to solicit broader results.

Background

The literature reflects a dearth of publications describing strategic planning and its effects on LHD performance. The strategic planning literature strongly agrees that a positive relationship exists between strategic planning and performance (Capon, Farley, & Hulbert, 1994; Phillips, 1996; Dibrell, Craig, & Neubaum, 2013); however, other empirical evidence on the extent and variety of strategic planning in healthcare is highly limited and rarely includes findings that link planning to organizational characteristics (Kaissi & Begun, 2008). Most of the reports are based on case studies or small samples (Dubbs & Mailman, 2001; Lemak & Goodrick, 2003; Sollenberger, 2006; Wells, Lee, McClure, Baronner, & Davis, 2004). Zuckerman (Zuckerman, 2006) reports healthcare strategic planning practices based on a survey of 440 planners, finding widespread support for strategic planning but does not present the associations between planning and hospital characteristics (Kaissi & Begun, 2008). Further, applying strategic planning to healthcare only addresses the treatment of disease, additional research should be applied to addressing the prevention of disease and injury as touted by the Institute of Medicine (IOM) in their formative report *The Future of Public Health* (Institute of Medicine, 1988). In the past two decades there has been increased interest in measuring public health performance. In 2006 Kanarek et al., published a paper that examined LHDs self-reported performance using Turnock's 20 questions. They found that LHD performance affects county health status and that LHD performance was the most consistent predictor of county health status for most of the health outcomes considered (Kanarek, Stanley, & Bialek, 2006).

In 2012 Ingram et al., published a paper on local public health system performance and community health outcomes using data from the Community Health Rankings and the National Public Health Performance Standards (NPHPSP) Local Public Health System Assessment Instrument (LSI). They noted that the NPHPSP LSI instrument and the Essential Public Health Standards (EPS) do, in fact, address key components of health that affect community health (Ingram, Scutchfield, Charnigo, & Riddell, 2012).

Most recently, there is increased activity in studying the associations of CHAs and CHIPs with LHD performance; however, drawing conclusions from the few available studies on strategic planning, CHA, CHIP, and LHD performance can lead to misperceptions regarding the data and the current state of strategic planning and assessment in the health arena. To avoid this, more empirical research is needed.

Importance of LHD Performance

If we are to meet our goals to become healthier, reduce health care spending, reduce the burden of preventable disease, and ensure a strong future national economy we must ensure the strategies our LHDs employ are effective through LHD performance measurement. Identifying effective evidence-based strategies requires more empirical studies to assess and confirm improved and sustained community health outcomes. Little evidence exists to indicate if higher performance is associated with healthier communities (Ingram et al., 2012). Therefore, it is important this study is conducted.

Public health systems exist to protect and promote the health of their communities (Ingram et al., 2012) and LHDs are the backbone of those systems (Institute of Medicine Committee on Assuring the Health of the Public in the 21st Century, 2003; Willard, Shah, Leep, & Ku, 2012). The Institute of Medicine asserts that a strong public health infrastructure is

necessary if health and well-being are to be protected and promoted (Institute of Medicine Committee on Assuring the Health of the Public in the 21st Century, 2003). In March 2018, John Auerbach, CEO of the Trust for America's Health organization, commented that "a healthy United States is a strong United States. Persistent underfunding of the country's public health system has left the nation vulnerable. The country needs a long-term commitment to rebuild the nation's public health capabilities – not just to plug some of the more dangerous gaps but to make sure each community will be prepared, responsive and resilient when the unexpected occurs" (Trust for America's Health, 2018). As LHDs are the primary government agencies responsible for protecting health at the community level (Willard et al., 2012) and are where majority of governmental service-delivery occurs (Ingram et al., 2012), it is critical that LHDs are effective in catalyzing and facilitating health promotion and prevention in the communities they serve.

The Institute of Medicine notes that disease prevention efforts that focus on large populations are more likely to be impactful (Institute of Medicine Committee on Assuring the Health of the Public in the 21st Century, 2003). To protect and promote the health of their communities, LHDs perform a variety of functions and provide an array of services that align with the three core functions of public health: assessment, policy development, and assurance. According to Willard et al., these can include investigating and controlling disease outbreaks and championing policies that reduce the burden of disease. Remington and Booske suggest that sustainable investments are needed to improve health of entire communities. They cite examples of investments such as implementation of health promoting policies, supporting early childhood education, and job training (P. L. Remington & Booske, 2011). In this manner community health can be improved by "assuring conditions" that help people be healthy.

Because LHDs have primary responsibility for protecting the community's health, it is reasonable to expect that their performance correlates with their communities' health statuses (Kanarek et al., 2006). In fact, Ingram notes that higher performing public health systems should produce healthier communities (Ingram et al., 2012). They state that "if the core functions (assessment, policy development, and assurance) are associated with a properly functioning public health system, then variations in performance of the core functions should be associated with variations in community health status." Additionally, the IOM notes that measures of health outcomes can foster greater accountability in government health agencies for health improvement performance and can spur change in improving health conditions (Gold et al., 2011). Thus, measurement of LHD performance becomes paramount and LHDs should be able to accurately assess and provide information to their communities and partners on how their agencies improve the health of the community (Kanarek et al., 2006).

Theoretical Framework

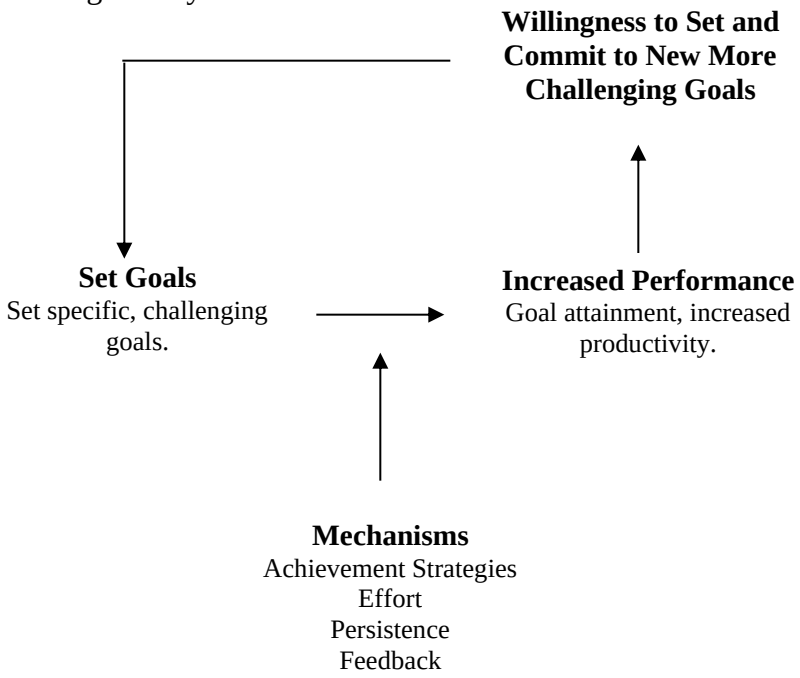
The theoretical framework that establishes this study is Locke and Latham's Goal Setting Theory, which illustrates the relationship between setting specific goals and task performance. The framework links setting specific, measurable, feasible goals to increased task performance and successful implementation. The foundation of the theory lies in the notion that "an individual's conscious intentions regulate his actions" and that hard goals result in a higher level of performance than do easy goals, and specific hard goals result in a higher level of performance than do no goals or a generalized goal of "do your best" (Latham & Yukl, 1975). As Latham and Yukl define a goal "simply as what the individual is consciously trying to do" (Latham & Yukl, 1975), Goal Setting Theory can be applied to any task where individuals have control over their performance (E. A. Locke, 2004).

Organizational behavior scholars have rated Goal Setting Theory as the top-rated theory among 73 management theories (E. Locke & Latham, 2002), and its use in business is nearly universal (Miner, 2003). Goal Setting Theory is often utilized and referenced at the individual level (i.e. setting employee goals and their relationship to performance reviews), but its concepts are also applicable at the organizational level (E. A. Locke, 2004), and thus can be applied to LHD performance. For this study, Goal Setting Theory is used to demonstrate that if a local health department is able to set appropriately challenging goals during the strategic planning process or CHA completion, it will be able to direct its efforts and resources to attain its goals more successfully than a health department that did not set strategic goals or complete a CHA.

Origins

Goal Setting Theory was developed in the 1960s and was introduced by Dr. Edwin Locke in his article "Toward a Theory of Task Motivation and Incentives" (E. Locke & Latham, 2002). It is built upon the precepts of other psychologists such as Ryan, Lewin, and McClelland (E. Locke & Latham, 2002). Its central premise is that setting attainable goals can increase the likelihood that an individual will dedicate effort and persistence to obtain it. The theory consists of many constructs, the most important being goal commitment, persistence, effort, direction, feedback, and improved performance. Figure 1 below summarizes the process outlined by Goal Setting Theory.

Figure 1: Goal Setting Theory



Goal Setting Theory Principles

There are four principles of Goal Setting Theory that lead to increased motivation and performance (1) Goals should be challenging, but attainable, (2) Goals should be specific rather than vague, (3) Employees should be involved in the process of setting their own goals, and (4) Goals should be measurable in terms of being clearly understood by employees (Brudan, 2010).

The first principle notes that set goals must be appropriately challenging so that the individual or organization can rise to the occasion. Locke and Latham found the most difficult goals produced the most effort and performance, whereas lower levels of performance were produced when the capacity to attain goals was reached (E. Locke & Latham, 2002). That is to say, organizational goals must be realistic, difficult yet attainable, and carefully considered by the leaders who select and champion them. Locke and Latham consistently found that specific, difficult goals led to better performance than asking people to "do their best", because in "doing

their best" there is no true standard goal toward which the employees should be working (E. Locke & Latham, 2002). Each employee would independently define the goal and arrive at their perceived acceptable performance independently, producing a wide range of acceptable performance levels (E. Locke & Latham, 2002).

The second principle calls for goals to be specific to reduce any ambiguity about what the employee or organization should attain in a particular period of time. Locke and Latham's research also showed that specificity alone does not ensure higher performance, but it does reduce the variation in performance because it reduces ambiguity about what is to be attained (E. Locke & Latham, 2002).

The third principle states that the affected employees should be involved in the goal-setting process. Brudan notes that "when goals are self-set, people with high self-efficacy set higher goals than do people with lower self-efficacy. They also are more committed to assigned goals, find and use better task strategies to attain the goals, and respond more positively to negative feedback than do people with low self-efficacy. The goal–performance relationship is strongest when people are committed to their goals" (Brudan, 2010; E. Locke & Latham, 1991, 2002).

The fourth principle holds that the goals must be measurable so that employees and organizations must be able to gauge performance and correct for any strategies that are misaligned with goals. The goals must be tracked and measured throughout the time the employee or organization is trying to attain the goal. This allows for necessary feedback that will help the employee or organization adjust the direction of their effort or their strategy for goal attainment. It is more effective to combine goals with feedback than to set goals alone (E. Locke & Latham, 2002).

Community Health Assessment

A community health assessment (CHA) is "a systematic examination of the health status indicators for a given population that is used to identify key problems and assets in a community. The ultimate goal of a CHA is to develop strategies to address the community's health needs and identified issues" (Turnock, 2009). It involves "collecting, analyzing, and using data to educate and mobilize communities, develop priorities, garner resources, and plan actions to improve the public's health (Public Health Accreditation Board, 2018b). Further, "it involves the systematic collection and analysis of data in order to provide the health department and the community it serves with a sound basis for decision-making" (Public Health Accreditation Board, 2018b). The products of a CHA often include a community health profile and other reports that summarize the community's health status and can identify health priorities (Irani, Bohn, Halasan, Landen, & McCusker, 2006). It can ultimately lead to data-driven decision making (Irani et al., 2006) and should inform public health planning and influence public health decisions (Spice & Snyder, 2009).

Although LHDs have been conducting CHAs since the 19th century (Shah, Laymon, Elligers, Leep, & Bhutta, 2013), the IOM formally declared assessment a core public health function in the *Future of Public Health* (Institute of Medicine, 1988). Additionally, the IOM recommends that LHDs "regularly and systematically collect, assemble, analyze, and make available information on the health of the community, including statistics on health status, community health needs, and epidemiologic and other studies of health problems" (Institute of Medicine, 1988). Recently, there has been a renewed interest in CHAs as a result of statutes instituted by the Patient Protection and Affordable Care Act (PPACA) and Public Health Accreditation Board (PHAB). The PPACA includes a requirement for hospitals to conduct a

community health needs assessment (CHNA) and PHAB accreditation requires LHDs to participate in or conduct a CHA (Shah et al., 2013).

Efforts to assess the core functions of LHDs have shown an association between health outcomes and LHD performance (Shah et al., 2013); however, the link between assessment and health outcomes has rarely been evaluated (Spice & Snyder, 2009). Handler et al., addressed the need for studies linking assessment and outcomes as the CHA is an important component (Handler, Grason, Ruderman, Issel, & Turnock, 2002) of improving LHD performance and has been identified as an essential function of public health. In 2004, RAND Health and the New York State Department of Health conducted a literature review and found few evaluations of CHA effectiveness, and of those none were considered systematic or comprehensive (Spice & Snyder, 2009). Rigorous evaluation of CHAs and their effectiveness is still lacking.

Community Health Improvement Plan

The community health assessment is part of a larger community health improvement process which uses data collected during the assessment to inform decisions and priorities concerning the community's health (National Association of County and City Health Officials, 2019). This process is ultimately documented by the community health improvement plan (CHIP). A community health improvement plan is a "long-term systematic effort to address public health problems on the basis of the result of the community health assessment and the community health improvement process" (Centers for Disease Control and Prevention, 2018). Similar to the CHA, it is conducted with community involvement, but its focus is on how a number of community organizations can collaborate to improve health (National Association of County and City Health Officials, 2019). It also differs from the CHA in that it is focused on developing long-term goals to improve the community's health and plans can be in effect for

three to six years before they are updated (Centers for Disease Control and Prevention, 2019). The community health improvement plan is similar to the strategic plan in that it sets and prioritizes goals and develop strategies for action, but it is geared specifically to the community health outcomes, whereas the local health department's strategic plan could include other initiatives such as employee retention, employee engagement, pursuing other funding, etc. Lastly, the community health improvement plan is different from the strategic plan in that it focuses on the community partners that can contribute to systematic health improvement and the strategic plan could only focus internally on what the local health department itself will do to improve health statuses.

Strategic Plan

The IOM's Committee on Assuring the Health of the Public in the 21st Century recommends that public health agencies develop strategies to ensure competency, quality services, and optimal performance (Institute of Medicine Committee on Assuring the Health of the Public in the 21st Century, 2003). Thus, strategic planning can prove to be a valuable management tool for LHDs. Strategic planning can prove to be helpful in this pursuit as it "aimed at producing fundamental decisions", setting appropriate goals, and helps an organization allocate its resources to meet identified goals (National Association of County and City Health Officials, 2018).

The strategic planning process is not the strategic plan. The strategic plan is the document that results from "a deliberate decision-making process and defines where an organization is going. The plan sets the direction for the organization and, through a common understanding of the mission, vision, goals, and objectives, provides a template for all employees and stakeholders to make decisions that move the organization forward" (Public Health

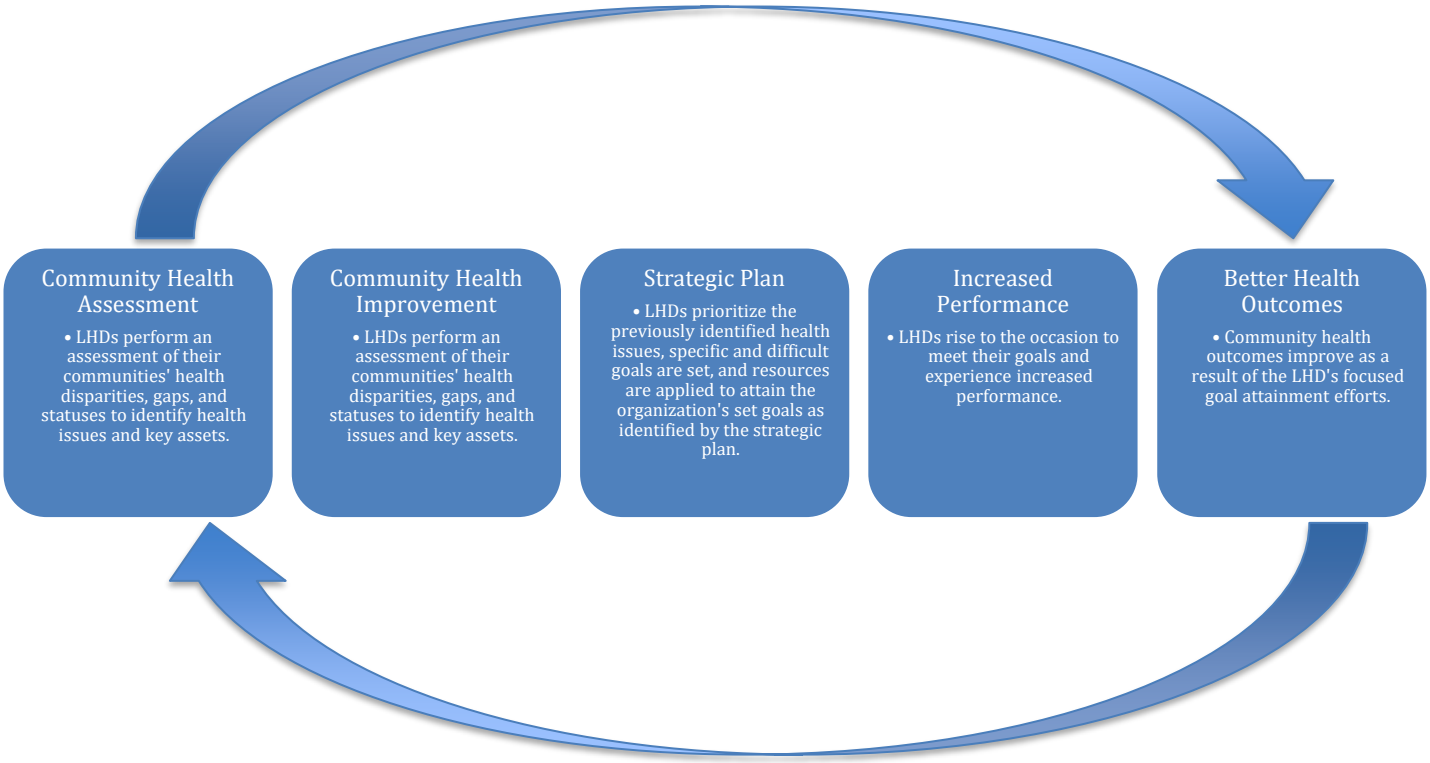
Accreditation Board, 2011). For this study, any LHD that indicates it has completed a strategic plan is assumed to have engaged in and completed the strategic planning process. Much of the literature on public health performance focuses on intervention and its effects on health outcomes, such as the effect of immunization on infectious diseases or the effect of prenatal care on adverse pregnancy outcomes. Fewer studies attempt to address the link between outcomes to public health processes such as assessment and planning (Handler et al., 2002).

Strategic planning has proven useful in a variety of sectors and organizations (Capon, Farley, & Hoenig, 1990), including healthcare organizations (Perera & Peiro, 2012). In general, strategic planning is useful because it establishes a framework by which the organization can function, manage activities, make decisions, and set goals. It can also reveal previously unknown opportunities or threats, misaligned organizational decisions, and unite the entire organization in achieving the planned goals (Perera & Peiro, 2012). Today most LHDs face limited resources and are looking for ways to cut costs. Resource scarcity makes careful planning more important to population health and public health practice (Phelps et al., 2016). Strategic planning highlights resources available for goal attainment, prioritizes competing goals, and aligns the two ensuring greater efficiency. LHDs will benefit from strategic planning because it assists with resource allocation. This is especially pertinent as in 2013, NACCHO reported that 27% of LHDs reported a lower budget in the current fiscal year compared to the prior year and nearly half of all LHDs either reduced or eliminated services in at least one program area (National Association of County and City Health Officials, 2013). In addition, LHDs have lost about 55,000 employees due to layoffs or attrition since 2008 and federal funding for public health has been flat for the last decade, while state public health spending is also decreasing (Trust for America's Health, 2018).

The strategic planning process and the resulting strategic plan are helpful tools used to mobilize an LHD's workforce and focus services and financial resources. The strategic plan serves as a medium to effectively and thoroughly communicate an organization's goals and the means by which those goals will be attained. Barnard Chester writes that "individuals will commit to an organization and work hard to achieve its goals when they perceive that there is a match between the organization's ideology, manifested through mission, vision and leadership practices, and the individual's values. Creating such an alignment occurs by articulating organizational mission" (Chester, 1938). A well-developed strategic plan may help LHDs communicate vision, improve performance, and help focus resources on identified prevention tactics, producing healthier communities.

While strategic planning is applicable to a variety of sectors, strategic planning for public health practice differs from strategic planning for general business development in that "strategic planning for public health begins with an understanding of the needs of a specific population, their disease burdens, and the associated interventions" (Phelps et al., 2016). Thus, the strategic planning process begins with community health assessment and carries through the community health improvement plan. Ideally, the CHA will inform public health planning and public health decisions so programs and policies are tailored to the community's needs and conditions; then the alignment of community partners and LHD resources to address the community's needs in the community health improvement plan and strategic plan will drive improvement in the community's health status (Spice & Snyder, 2009). The logic model shown in Figure 2 below displays the general process by which LHD performance can be influenced by assessment and strategic planning.

Figure 2: Study Logic Model



Local Boards of Health

A local board of health (LBoH) is the policy-making, rule-making, and adjudicatory body for public health in the county or counties in its jurisdiction (North Carolina General Assembly, 1983). LBoHs play an important role in our public health system and are a critical link between LHDs and their communities (Newman & Leep, 2016). They provide oversight and guidance to LHDs (Baker-White, 2011), establish public health priorities, approve budgets, oversee local public health regulations, represent the community's interest in adopting priorities and establishing needed services, and communicate with the community about LHD goals and services available (Newman & Leep, 2016). All LBoHs influence the day-to-day administration of local public health agencies and have expanded powers beyond county and district boards of health (Moore, Berner, & Wall, 2018). They can include, but are not limited to, hiring or firing the local health officer, levying and imposing taxes, approving the LHDs budget, and issuing

licenses (Baker-White, 2011). As LBoHs have considerable power and influence on LHD leadership, resources, and strategies, it is plausible that they are moderators to LHD performance. It is important to understand their role in the public health system (Patton, Moon, & Jones, 2011) and their role in LHD performance and improved health outcomes. It has rarely been evaluated.

LBoH Characteristics

The 2015 Local Board of Health National Profile reports that 77% of LHDs have an LBoH (Newman & Leep, 2016). On average LBoHs have seven members, although this varies greatly from 3 to 30 members throughout the country (Newman & Leep, 2016). Most members are appointed by elected officials, but some are elected into their positions (Newman & Leep, 2016). Nearly 90% LBoHs include health professionals and over 60% have members with public health training.

PHAB Accreditation

PHAB accreditation is defined as "the issuance of recognition of achievement of accreditation within a specified time frame by the Public Health Accreditation Board that ensures measurement and attainment of health department performance against a set of nationally recognized, practice-focused and evidenced-based standards (Public Health Accreditation Board, 2018c). Accreditation is useful in public health as there has been increased demand for LHDs to perform better and produce better health outcomes for the communities they serve (Riley, Parsons, Duffy, Moran, & Henry, 2010). It has also been widely recognized that public health departments need better methods to improve their performance (Riley et al., 2010). Therefore, the accreditation process enacted by the Public Health Accreditation Board (PHAB) serves this

purpose as it "seeks to advance quality and performance within public health departments" (Public Health Accreditation Board, 2018c). PHAB accreditation provides measurement of LHD performance against a set of nationally-recognized standards (Public Health Accreditation Board, 2018c) to ensure that LHDs advance in quality and performance in a unified manner, advance the LHDs' quality improvement and performance initiatives, and lead to increased effectiveness (Siegfried, Heffernan, Kennedy, & Meit, 2018). It has proven to stimulate quality improvement, transparency, and performance activities in LHDs as soon as one year after the accreditation decision (J. Kronstadt et al., 2016; Public Health Accreditation Board, 2018; Siegfried, Heffernan, Kennedy, & Meit, 2018)) and is associated with promotion of high performance, greater public trust, and stronger constituent support (Riley, Bender, & Lownik, 2012).

Since the advent of PHAB accreditation, health departments have increasingly begun completing community health assessments, community health improvement plans, and strategic plans (Beitsch, Kronstadt, Robin, & Leep, 2018; Hill, Wolf, Scallan, Case, & Kellar-Guenther, 2017). This may be the result of PHAB's prerequisite to complete these three documents within the last five years when seeking accreditation (Public Health Accreditation Board, 2015). LHDs seeking accreditation must register in e-PHAB, the accreditation board's electronic information system, and upload a letter of support from the health department director that attests to the completion of the community health assessment, community health improvement plan, and strategic plan within the last five years (Public Health Accreditation Board, 2015). Additionally, the documents must also be uploaded into e-PHAB later in the application process. PHAB's standards require the community health assessment and community health improvement plan to be completed with the input of key community partners, such as hospitals and area health providers (Public Health Accreditation Board, 2015). This increases collaboration and cross-

functional partnerships, which is necessary because mobilizing community partnerships is one of the ten essential functions of public health and building partnerships is shown to promote evidence-based public health (Allen et al., 2018). PHAB also requires documented progress towards strategic plan goals (Public Health Accreditation Board, 2015). This requirement ensures plan implementation and that the community benefits from the planning process.

Enduring the accreditation process can help health departments identify strengths and weaknesses, document capacity to fulfill the core functions and ten Essential Public Health Services, improve competitiveness for funding, and improve management processes (Public Health Accreditation Board, 2015; Russo, 2018). Additionally, it was found that employees of accredited health departments experienced more job satisfaction than those working in non-accredited health departments (Jessica Kronstadt, Bender, & Beitsch, 2018) and that accredited health departments perceived their quality improvement culture had made substantial progress, departmental performance management was improved, and strengths and weaknesses were more easily identified (Beitsch et al., 2018; Kittle & Liss-Levinson, 2018; Jessica Kronstadt et al., 2018).

CHAPTER 3

METHODOLOGY

Research Design

This study used secondary datasets to assess the association between LHD characteristics and community health statuses. The study design is cross-sectional, as it examines data captured at a point in time from LHDs in 2016.

Data

This study used two datasets, linked at health department level, using deterministic linkage approach (Gulzar H Shah, Lertwachara, & Ayanso, 2010). The data used in this study are the 2016 National Profile of Local Health Departments (Profile) dataset collected by the National Association of County and City Health Officials (NACCHO) and the 2018 County Health Rankings (CHR) dataset collected by the University of Wisconsin Population Health Institute and the Robert Wood Johnson Foundation. The two data used in this study did not have a common unique ID for geographic boundaries of the LHS/counties. For deterministic linkage of the Profile Study Data with the outcomes data, we used NACCHO's GIS data because it had both NACCHO ID (the unique ID for LHD jurisdiction available in Profile data) as well as the County FIPS codes (the unique ID for county boundaries).

The Profile dataset was selected because it is the most recent dataset available that describes a local health department's organizational structure, services, and finances. Most importantly it includes data describing the LHD's status as it pertains to a strategic plan completion, community health assessment (CHA) completion, LBoH, jurisdiction size, and governance structure which were all used in this study. It was collected from 2,533 LHDs of approximately 2,800 that meet the Profile definition of an LHD across the United States

(National Association of County and City Health Officials, 2017). Each of the LHDs received the Core Questionnaire and a randomly selected group of LHDs received an additional set of supplemental questions in addition to the Core Questionnaire. This study only focuses on the data collected in the Core Questionnaire. The data were collected from January to April 2016, primarily via online survey (National Association of County and City Health Officials, 2017), and were self-reported by employees of the LHD. The study had a 76% response rate (National Association of County and City Health Officials, 2017).

The CHR dataset was selected because it produces a " 'population health checkup' for the nation's over 3,000 counties" (Patrick L. Remington, Catlin, & Gennuso, 2015) by summarizing overall health outcomes and factors that contribute to health for each county in the United States (P. L. Remington & Booske, 2011). It is derived from various national sources such as the National Center for Health Statistics, Behavioral Risk Factor Surveillance System, and American Community Survey (Patrick L. Remington et al., 2015).

Specifically, the CHR dataset was chosen because it includes data on premature death and adult smoking, which are components of this study. The 2018 dataset was chosen because it includes premature death and adult smoking collected in 2016. This was necessary to align with the 2016 Profile dataset release and provide a snapshot of LHDs' organizational statuses and communities' corresponding health statuses. In this manner, we can attempt to ascertain each LHD's impact on its community's health status. A list of the CHR measures and data sources used in this study are listed in Table 1.

Table 1: CHR Data Sources Used in this Study

Measure	**Data Sources**	**Years of Data**
Premature Death	National Center for Health Statistics	2016
Adult Smoking	Behavioral Risk Factor Surveillance System	2016

Research Questions

- Q1: Is the completion of a strategic plan by LHDs in the past five years associated with better health outcomes in premature death and smoking in the LHD's community?
    - Independent Variable: Completion of a strategic plan in the last five years.
    - Dependent Variables:
        - Years of potential life lost per 100,000
        - Percentage of adults who are current smokers

- Q2: Is the completion of a community health assessment by LHDs in the last five years associated with better health outcomes in premature death and smoking in the LHD's community?
    - Independent Variable: Completion of a community health assessment in the last five years.
    - Dependent Variables:
        - Years of potential life lost per 100,000
        - Percentage of adults who are current smokers

- Q3: Is the completion of a community health improvement plan by LHDs in the last five years associated with better health outcomes in premature death and smoking in the LHD's community?
    - Independent Variable: Completion of a community health improvement plan in the last five years.
    - Dependent Variables:
        - Years of potential life lost per 100,000

        - Percentage of adults who are current smokers

- Q4: Is the completion of a community health assessment, community health improvement plan, and strategic plan in the last five years associated with better health outcomes in premature death and smoking in the LHD's community?

    - Independent Variables: Completion of a community health assessment, community health improvement plan, and strategic plan in the last five years.

    - Dependent Variables:
        - Years of potential life lost per 100,000
        - Percentage of adults who are current smokers

Variables

Variables were selected from two datasets. The independent variables are strategic plan completion, CHA completion, and CHIP completion. They were drawn from the Profile dataset and were selected because they serve as the primary point of comparison for LHD performance. Covariates used in this study were drawn from the Profile dataset. They are jurisdiction population size, governance structure, possession of a local board of health (LBoH), and Public Health Association Board (PHAB) accreditation status. Covariates were selected based on peer-reviewed literature indicates the covariates have relationships with LHD performance. The dependent variables, premature death and adult smoking, were selected from the CHR dataset. They were selected because chronic illness and premature death are preventable, costly, and burdensome for our country (Anusuya Chatterjee, 2014). LHDs were analyzed for their

completion of a strategic plan, CHA, and CHIP in the last five years and the incidence of premature death and percentage of adults who smoke in their corresponding communities.

Independent Variables

Strategic plan completion in the last five years, CHA completion in the last five years, CHIP completion in the last five years, and completion of the CHA, CHIP, and strategic plan in the last five years are the independent variables for this study and were drawn from the Profile dataset. Concerning the independent variables, the questions "Has your LHD developed a comprehensive, agency-wide strategic plan?", "Has a community health assessment been completed for your LHD's jurisdiction?", and "Has your LHD participated in developing a health improvement plan for your community?" were recoded into three categories (1) "Yes, within the last five years", (2) "Yes, more than five years ago", or "No"(3) and "No, but plan to in the next year". The independent variable for Question 4, which assesses if the CHA, CHIP, and strategic plan were all completed within the last five years was coded to (1) None in the last five years, (2) Some in the last five years, and (3) All in the last five years. Detailed description of the independent variables can be found in Table 2 below.

Table 2: Independent Variables

Independent Variables	**Description**	**Original Coding**	**Final Coding**
Strategic Plan Completion	Has your LHD developed a comprehensive, agency-wide strategic plan?	[1] Yes, within the last three years [2] Yes, more than three but less than five years ago [3] Yes, five or more years ago [4] No, but plan to in the next year [5] No	[1] Yes, within the last five years [2] Yes, more than five years ago or No [3] No, but plan to in the next year
Community Health Assessment Completion	Has a community health assessment been completed for your LHD's jurisdiction?	[1] Yes, within the last three years [2] Yes, more than three but less than five years ago [3] Yes, five or more years ago [4] No, but plan to in the next year [5] No	[1] Yes, within the last five years [2] Yes, more than five years ago or No [3] No, but plan to in the next year
Community Health Improvement Plan	Has your LHD participated in developing a health improvement plan for your community?	[1] Yes, within the last three years [2] Yes, more than three but less than five years ago [3] Yes, five or more years ago [4] No, but plan to in the next year [5] No	[1] Yes, within the last five years [2] Yes, more than five years ago or No [3] No, but plan to in the next year
Completion of CHA, CHIP, and strategic plan in the last five years	Recoded responses of the previous three questions to assess if the CHA, CHIP, and strategic plan all had been completed within the last five years.	[1] Yes, within the last three years [2] Yes, more than three but less than five years ago [3] Yes, five or more years ago [4] No, but plan to in the next year [5] No	[1] None, in the last five years [2] Some, in the last five years [3] All, in the last five years
Data Source: 2016 National Profile of Local Health Departments Dataset			

Dependent Variables

Lower incidence of premature death and lower percentage of adults who smoke are the dependent variables for this study and were drawn from the CHR dataset. The premature death data were transformed into tertiles using ordinal variables with Low representing less than or equal to 6,681 years lost, Medium representing greater than 6,681 and less than or equal to 8,611 years lost, and High representing greater than 8,611 years lost. The tobacco use data was transformed into tertiles using ordinal variables with Low representing less than or equal to 15.77 percent of adults smoke, Medium representing greater than 15.77 percent and less than or equal to 19.66 percent of adults smoke, and High representing greater than 19.66 percent of adults smoke. Detailed description of the dependent variables can be found in Table 3 below.

Table 3: Dependent Variables

Dependent Variable	**Description**	**Original Coding**	**Final Coding**
Premature Age Adjusted Mortality	Number of deaths under age 75 per 100,000	Ratio	[1] Low: <=6,681 years lost [2] Medium: >6,681 and <=8,611 years lost [3] High, >8,611 years lost
Adult Smoking	Percentage of adults that reported smoking	Ratio	[1] Low: <=15.77% adults smoke [2] Medium: >15.77% and <=19.66% adults smoke [3] High, >19.66% adults smoke
Data Source: 2018 County Health Rankings Dataset			

Covariates

Covariates used in this study are jurisdiction population size, governance structure, possession of LBoH, and PHAB accreditation status. It is assumed in this study, that LHDs that serve multiple counties provide the same services throughout their jurisdiction; thus, the health assessment of their counties is comparable as it pertains to the covariates listed below. The question concerning PHAB, “Which of the following best describes your LHD’s participation in the Public Health Accreditation Board’s (PHAB’s) national accreditation program for LHDs?” was recoded to three responses (1) “Accredited, submitted application or in e-PHAB”. (2) “Plans to apply”, and (3) “Has decided not to apply”, “Has not decided whether to apply”, or “Does not know”. Jurisdiction Population Size was also recoded into three categories (1) <50,000, (2) 50,000 – 499,999, and (3) >=500,000. Detailed description of the covariates can be found in Table 4 below.

Table 4: Covariates

Covariates	Description	Original Coding	Final Coding
Jurisdiction Population Size	Size of population served (2014 Census estimate)	Ratio	[1] <50,000 [2] 50,000 – 499,999 [3] >=500,000
Governance Structure	2016 LHD governance classification	[1] Unit of state government [2] Unit of local government [3] Unit governed by both state and local authorities	[1] Unit of state government [2] Unit of local government [3] Unit governed by both state and local authorities
Possession of LBoH	Does your LHD have one or more local boards of health?	[0] No [1] Yes	[0] No [1] Yes
PHAB Accreditation Status	Which of the following best describes your LHD's participation in the Public Health Accreditation Board's (PHAB's) national accreditation program for LHDs?	[1] My LHD has been accredited by PHAB [2] My LHD has submitted an application for PHAB accreditation [3] My LHD has registered in e-PHAB in order to pursue accreditation [4] My LHD plans to apply for PHAB accreditation, but has not yet registered in e-PHAB [5] My LHD has not decided whether to apply for PHAB accreditation [6] My LHD has decided NOT to apply for PHAB accreditation [7] My LHD is part of a PHAB-accredited centralized state integrated local public health department system [8] The state health agency has registered in e-PHAB in order to pursue accreditation as an integrated system that includes my LHD [9] The state health agency plans to apply for PHAB accreditation as an integrated system that includes my LHD, but has not yet registered in e-PHAB [10] Do not know	[1] Accredited, submitted application or in e-PHAB [2] Plans to apply [3] Has decided not to apply, has not decided whether to apply, or does not know
Data Source: 2016 National Profile of Local Health Departments Dataset			

Statistical Methods

Analysis of the data was completed using SPSS v25 and the Profile and CHR datasets. Univariate analyses were used to provide descriptive statistics of the LHDs and multinomial logistic regression was used to assess the association between the dependent variables, premature death and tobacco use, as independent functions of completing a community health assessment in the last five years, completing a community health improvement plan in the last five years, and completing a strategic plan in the last five years.

Multinomial logistic regression was used because the dependent variables are ordinal and have more than two levels. This sort of regression assumes that the dependent variables are not related to one another and that the selection of one choice is independent to the selection of another choice. Multinomial logistic regression was also selected because the data was characterized by independence of observations, the dependent variables had mutually exclusive and exhaustive categories, and there is no multicollinearity (e.g. the independent variables are not correlated with each other). In this study, levels for premature death and tobacco use for Question 1, Question 2, and Question 3 were transformed into tertile levels of (1) Low, (2) Medium, and (3) High using the tertile cutoffs mentioned in the previous section. Levels for completion of the community health assessment, community health improvement plan, and strategic plan for Question 4 are (1) Completed all in the last five years, (2) Completed some in the last five years, and (3) Completed none in the last five years.

CHAPTER 4

RESULTS

This section summarizes the results of the analyses to examine the relationships between CHA, CHIP, strategic plans and premature death and tobacco use.

Descriptive Statistics

Of the 1,930 LHDs that completed the survey, 97.5% LHDs responded to the CHA question, 97.4% LHDs responded to the CHIP question, 97.6% LHDs responded to the strategic plan question, 97.8% LHDs responded to the LBoH question, and 93.9% LHDs responded to the PHAB accreditation question. Analysis was performed on the 1,260 LHDs that responded to all of the questions listed above and whose jurisdiction was classified as a single county. This resulted in the analysis being ran on 65.2% of the original sample.

Table 5 shows that community health assessments were completed by 82.1% of LHDs in the past five years, 13.3% of LHDs completed it more than five years ago or not at all, and 4.5% of LHDs answered “No, but plan to in the next year”.

As shown in Table 5, community health improvement plans were completed by 72.4% of LHDs in the past five years, 17.5% of LHDs completed it more than five years ago or not at all, and 10.1% of LHDs answered “No, but plan to in the next year”.

Table 5 shows that strategic plans were completed by 58.7% of LHDs in the past five years, 26.0% of LHDs completed it more than five years ago or not at all, and 15.3% of LHDs answered “No, but plan to in the next year”.

Table 5 also shows all three organizational tools were completed in the last five years by 49.4% of LHDs, 39.3% of LHDs had completed at least one of them in the last five years, and 11.3% of LHDs had not completed any of the three in the last five years.

As listed in Table 5, 22.9% of LHDs were accredited, had submitted the application, or had registered in e-PHAB, 19.6% of LHDs plans to apply for accreditation, and 57.5% of LHDs decided not to apply for accreditation.

The study controlled for three covariates, governance type, population size, and possession of a LBoH. Of the three governance classifications, 70.4% of the LHDs were a unit of a local government, 60.5% of LHDs were identified as having a population size of <50,000, and 70.9% of LHDs possessed a LBoH.

Table 5: Descriptive Statistics for LHD Characteristics, Years of Life Lost, and Tobacco Use

Descriptive Statistics for LHD Characteristics, Years of Life Lost, and Tobacco Use		
Dependent Variables	**n**	**%**
Years of Potential Life Lost		
Low	416	33.0%
Medium	416	33.0%
High	428	34.0%
Tobacco		
Low	416	33.0%
Medium	416	33.0%
High	428	34.0%
Independent Variables	**n**	**%**
CHA Completion		
No or more than 5 yrs ago	168	13.3%
No, but plan to in the next year	57	4.5%
Yes, within last five years	1035	82.1%
CHIP Completion		
No or more than 5 yrs ago	221	17.5%
No, but plan to in the next year	127	10.1%
Yes, within last five years	912	72.4%
SP Completion		
No or more than 5 yrs ago	328	26.0%
No, but plan to in the next year	193	15.3%
Yes, within last five years	739	58.7%
Recent Completion of CHA, CHIP, and SP		
None	143	11.3%
Some	495	39.3%
All	622	49.4%
Covariates	**n**	**%**
PHAB Accreditation		
Decided not to apply, don't know, or undecided	724	57.5%
Plans to apply	247	19.6%
Accredited, has submitted application, or is in e-PHAB	289	22.9%
Governance Type		
Shared	137	10.9%
State	236	18.7%
Local	887	70.4%
Local Board of Health		
No	367	29.1%
Yes	893	70.9%
Jurisdiction Size		
<50,000	762	60.5%
50,000 - 499,999	420	33.3%
>=500,000	78	6.2%

Abbreviations: CHA, Community Health Assessment; CHIP, Community Health Improvement Plan; SP, strategic plan; PHAB, Public Health Accreditation Board; LHD, local health department; n, number of observations; shared governance, LHD governed by both state and local government; small jurisdiction, <50,000; medium jurisdiction, 50,000 - 499,999; large jurisdiction, >=500,000. Years of Potential Life Lost Groups: Low, <=6,681 years lost; Medium, >6,681 and <=8,611 years lost; High, >8,611 years lost. Tobacco Use Groups: Low, <=15.77 percent of adults smoke; Medium, >15.77 and <=19.66 percent of adults smoke; High, >19.66 percent of adults smoke.

Table 6 shows that the odds of being in the low range for years of potential life lost are lower for LHDs that have not completed a CHA within in the last five years as opposed to LHDs that have completed a CHA within the last five years (AOR = .572; CI = .221 –1.480; P = .249). Table 7 shows that odds of being in the low range for tobacco use are lower for LHDs that have not completed a CHA within in the last five years as opposed to LHDs that have completed a CHA within the last five years (AOR = .559; CI = .236 – 1.326; P = .187).

The odds of being in the low range for years of potential life lost are lower for LHDs that have not completed a CHA, but plan to in the next year as opposed to LHDs that have completed a CHA within the last five years (AOR = .807; CI = .254 – 2.561; P = .716). The odds of being in the low range for tobacco use are higher for LHDs have not completed a CHA, but plan to in the next year as opposed to LHDs that have completed a CHA within the last five years (AOR = 1.909; CI = .653 – 5.585; P = .238).

Odds of being in the medium range for years of potential life lost are higher for LHDs that have not completed a CHA within in the last five years as opposed to LHDs that have completed a CHA within the last five years (AOR = 1.485; CI = .682 – 3.233; P = .319). Table 7 shows that odds of being in the medium range for tobacco use are lower for LHDs that have not completed a CHA within in the last five years as opposed to LHDs that have completed a CHA within the last five years (AOR = .705; CI = .329 – 1.509; P = .368).

The odds of being in the medium range for years of potential life lost are higher for LHDs that have not completed a CHA, but plan to in the next year as opposed to LHDs that have completed a CHA within the last five years (AOR = 1.383; CI = .5 – 3.826; P = .532). The odds of being in the medium range for tobacco use are lower for LHDs have not completed a CHA,

but plan to in the next year as opposed to LHDs that have completed a CHA within the last five years (AOR = .783; CI = .277 – 2.215; P = .644).

Table 6: Multinomial Logistic Regression for Years of Potential Life Lost

Multinomial Logistic Regression for Years of Potential Life Lost								
	Low Tertile vs High Tertile				Medium Tertile vs High Tertile			
LHD Characteristics	**P**	**AOR**	**95% Confidence Interval for Exp(B)**		**P**	**AOR**	**95% Confidence Interval for Exp(B)**	
			Lower	**Upper**			**Lower**	**Upper**
Model 1: CHA Completion No or More than 5 yrs ago (vs. Yes, within the Last 5 yrs)	0.249	0.572	0.221	1.480	0.319	1.485	0.682	3.233
Model 2: CHA Completion No, but Plan to in the Next Year (vs. Yes, within the Last 5 yrs)	0.716	0.807	0.254	2.561	0.532	1.383	0.500	3.826
Model 3: CHIP Completion No or More than 5 yrs ago (vs. Yes, within the Last 5 yrs)	0.112	0.572	0.287	1.139	0.319	0.727	0.389	1.360
Model 4: CHIP Completion No, but Plan to in the Next Year (vs. Yes, within the Last 5 yrs)	0.261	0.647	0.303	1.382	0.354	1.385	0.695	2.759
Model 5: SP Completion No or More than 5 yrs ago (vs. Yes, within the Last 5 yrs)	0.765	1.144	0.474	2.757	**0.039**	**2.312**	**1.045**	**5.115**
Model 6: SP Completion No, but Plan to in the Next Year (vs. Yes, within the Last 5 yrs)	0.116	2.095	0.833	5.271	**0.004**	**3.500**	**1.493**	**8.206**
Model 7: CHA, CHIP, and SP Completion Completed None (vs. Completed All within the Last 5 yrs)	0.981	1.025	0.145	7.246	0.148	0.283	0.051	1.564
Model 8: CHA, CHIP, and SP Completion Completed Some (vs. Completed All within the Last 5 yrs)	0.693	0.824	0.316	2.148	0.061	0.427	0.175	1.041
Model 9: PHAB Accreditation Decided Not to Apply, Don't Know, or Undecided (vs.Accredited, Submitted Application, or Registered in e-PHAB)	**0.006**	**0.482**	**0.287**	**0.809**	**0.026**	**0.582**	**0.361**	**0.937**
Model 10: PHAB Accreditation Plans to Apply (vs.Accredited, Submitted Application, or Registered in e-PHAB)	**0.004**	**0.436**	**0.246**	**0.770**	**0.001**	**0.389**	**0.226**	**0.670**
Model 11: Governance Type Shared governance (vs. Local governance)	**0.000**	**0.168**	**0.095**	**0.299**	**0.001**	**0.436**	**0.265**	**0.718**
Model 12: Governance Type State governance (vs. Local governance)	**0.000**	**0.021**	**0.009**	**0.046**	**0.000**	**0.113**	**0.073**	**0.174**
Model 13: LBOH Not having a LBOH (vs. Having a LBOH)	0.322	0.823	0.560	1.210	0.160	0.775	0.543	1.106
Model 14: Jurisdiction Size Small Jurisdiction (vs. Large Jurisdiction)	**0.000**	**0.125**	**0.049**	**0.320**	**0.009**	**0.278**	**0.107**	**0.725**
Model 15: Jurisdiction Size Medium Jurisdiction (vs. Large Jurisdiction)	**0.041**	**0.374**	**0.146**	**0.961**	0.349	0.630	0.240	1.656

Abbreviations: CHA, Community Health Assessment; CHIP, Community Health Improvement Plan; SP, strategic plan; PHAB, Public Health Accreditation Board; LHD, local health department; n, number of observations; shared governance, LHD governed by both state and local government; YPLL, years of potential life lost; small jurisdiction, <50,000; medium jurisdiction, 50,000 - 499,999; large jurisdiction, >=500,000.
Years of Potential Life Lost Groups: Low, <=6,681 years lost; Medium, >6,681 and <=8,611 years lost; High, >8,611 years lost.
Tobacco Use Groups: Low, <=15.77 percent of adults smoke; Medium, >15.77 and <=19.66 percent of adults smoke; High, >19.66 percent of adults smoke.
Confidence Intervals: Represent the range where the true parameter lies. If the range includes 0, the analysis failed to reject the null hypothesis.

Table 7: Multinomial Logistic Regression for Tobacco Use

Multinomial Logistic Regression for Tobacco Use

LHD Characteristics	Low Tertile vs Medium Tertile				Medium Tertile vs High Tertile			
	P	AOR	95% Confidence Interval for Exp(B)		P	AOR	95% Confidence Interval for Exp(B)	
			Lower	Upper			Lower	Upper
CHA Completion No or More than 5 yrs ago (vs. Yes, within the Last 5 yrs)	0.187	0.559	0.236	1.326	0.368	0.705	0.329	1.509
No, but Plan to in the Next Year (vs. Yes, within the Last 5 yrs)	0.238	1.909	0.653	5.585	0.644	0.783	0.277	2.215
CHIP Completion No or More than 5 yrs ago (vs. Yes, within the Last 5 yrs)	**0.013**	**0.440**	**0.230**	**0.840**	0.068	0.562	0.303	1.044
No, but Plan to in the Next Year (vs. Yes, within the Last 5 yrs)	0.215	0.646	0.323	1.290	0.513	0.798	0.406	1.569
SP Completion No or More than 5 yrs ago (vs. Yes, within the Last 5 yrs)	0.083	2.093	0.908	4.827	0.220	1.596	0.756	3.368
No, but Plan to in the Next Year (vs. Yes, within the Last 5 yrs)	**0.010**	**3.187**	**1.319**	**7.699**	**0.042**	**2.299**	**1.030**	**5.132**
CHA, CHIP, and SP Completion Completed None (vs. Completed All within the Last 5 yrs)	0.867	0.857	0.140	5.259	0.914	1.095	0.210	5.708
Completed Some (vs. Completed All within the Last 5 yrs)	0.434	0.693	0.277	1.734	0.260	0.618	0.268	1.428
PHAB Accreditation Decided Not to Apply, Don't Know, or Undecided (vs.Accredited, Submitted Application, or Registered in e-PHAB)	0.209	0.741	0.465	1.182	0.423	0.839	0.547	1.288
Plans to Apply (vs.Accredited, Submitted Application, or Registered in e-PHAB)	0.155	0.677	0.396	1.159	0.803	1.064	0.652	1.738
Governance Type Shared governance (vs. Local governance)	**0.000**	**0.291**	**0.171**	**0.496**	**0.004**	**0.483**	**0.295**	**0.791**
State governance (vs. Local governance)	**0.000**	**0.049**	**0.025**	**0.094**	**0.000**	**0.263**	**0.180**	**0.383**
LBOH Not having a LBOH (vs. Having a LBOH)	0.217	1.260	0.873	1.819	0.925	0.984	0.697	1.389
Jurisdiction Size Small Jurisdiction (vs. Large Jurisdiction)	**0.000**	**0.115**	**0.046**	**0.289**	**0.022**	**0.322**	**0.122**	**0.850**
Medium Jurisdiction (vs. Large Jurisdiction)	**0.000**	**0.185**	**0.074**	**0.463**	0.244	0.561	0.213	1.482

Abbreviations: CHA, Community Health Assessment; CHIP, Community Health Improvement Plan; SP, strategic plan; PHAB, Public Health Accreditation Board; LHD, local health department; n, number of observations; shared governance, LHD governed by both state and local government; small jurisdiction, <50,000; medium jurisdiction, 50,000 - 499,999; large jurisdiction, >=500,000.
Years of Potential Life Lost Groups: Low, <=6,681 years lost; Medium, >6,681 and <=8,611 years lost; High, >8,611 years lost.
Tobacco Use Groups: Low, <=15.77 percent of adults smoke; Medium, >15.77 and <=19.66 percent of adults smoke; High, >19.66 percent of adults smoke.
Confidence Intervals: Represent the range where the true parameter lies. If the range includes 0, the analysis failed to reject the null hypothesis.

Odds of being in the low range for years of potential life lost are lower for LHDs that have not completed a CHIP within in the last five years as opposed to LHDs that have completed a CHIP within the last five years (AOR = .572; CI = .287 –1.139; P = .112). Table 7 shows that the odds of being in the low range for tobacco use are lower for LHDs that have not completed a CHIP within in the last five years as opposed to LHDs that have completed a CHIP within the last five years (AOR = .440; CI = .23 – .84; P = .013). This result was statistically significant.

The odds of being in the low range for years of potential life lost are lower for LHDs that have not completed a CHIP, but plan to in the next year as opposed to LHDs that have completed a CHIP within the last five years (AOR = .647; CI = .303 – 1.382; P = .261). The odds of being in the low range for tobacco use are lower for LHDs have not completed a CHIP, but plan to in the next year as opposed to LHDs that have completed a CHIP within the last five years (AOR = .646; CI = .323 – 1.29; P = .215).

Odds of being in the medium range for years of potential life lost are lower for LHDs that have not completed a CHIP within in the last five years as opposed to LHDs that have completed a CHIP within the last five years (AOR = .727; CI = .389 – 1.360; P = .319). Table 7 shows that odds of being in the medium range for tobacco use are lower for LHDs that have not completed a CHIP within in the last five years as opposed to LHDs that have completed a CHIP within the last five years (AOR = .562; CI = .303 – 1.044; P = .068).

The odds of being in the medium range for years of potential life lost are higher for LHDs that have not completed a CHIP, but plan to in the next year as opposed to LHDs that have completed a CHIP within the last five years (AOR = 1.385; CI = .695 – 2.759; P = .354). The odds of being in the medium range for tobacco use are lower for LHDs have not completed a

CHIP, but plan to in the next year as opposed to LHDs that have completed a CHIP within the last five years (AOR = .798; CI = .406 – 1.569; P = .513).

Strategic Plan

Odds of being in the low range for years of potential life lost are higher for LHDs that have not completed a SP within in the last five years as opposed to LHDs that have completed a SP within the last five years (AOR = 1.144; CI = .474 – 2.757; P = .765). Table 7 shows that odds of being in the low range for tobacco use are higher for LHDs that have not completed a SP within in the last five years as opposed to LHDs that have completed a SP within the last five years (AOR = 2.093; CI = .908 – 4.827; P = .083).

The odds of being in the low range for years of potential life lost are higher for LHDs that have not completed a SP, but plan to in the next year as opposed to LHDs that have completed a SP within the last five years (AOR = 2.095; CI = .833 – 5.271; P = .116). The odds of being in the low range for tobacco use are higher for LHDs have not completed a SP, but plan to in the next year as opposed to LHDs that have completed a SP within the last five years (AOR = 3.187; CI = 1.319 – 7.699; P = .01). This result was statistically significant.

Odds of being in the medium range for years of potential life lost are higher for LHDs that have not completed a SP within in the last five years as opposed to LHDs that have completed a SP within the last five years (AOR = 2.312; CI = 1.045 – 5.115; P = .039). This result was statistically significant. Table 7 shows that odds of being in the medium range for tobacco use are higher for LHDs that have not completed a SP within in the last five years as opposed to LHDs that have completed a SP within the last five years (AOR = 1.596; CI = .756 – 3.368; P = .220).

The odds of being in the medium range for years of potential life lost are higher for LHDs that have not completed a SP, but plan to in the next year as opposed to LHDs that have completed a SP within the last five years (AOR = 3.5; CI = 1.493 – 8.206; P = .004). This result was statistically significant. The odds of being in the medium range for tobacco use are higher for LHDs that have not completed a SP, but plan to in the next year as opposed to LHDs that have completed a SP within the last five years (AOR = 2.299; CI = 1.03 – 5.132; P = .042). This result was statistically significant.

Completion of CHA, CHIP, and Strategic Plan

Odds of being in the low range for years of potential life lost are higher for LHDs that have not recently utilized any of the three organizational tools within in the last five years as opposed to LHDs that have recently utilized all three tools within the last five years (AOR = 1.025; CI = .145 – 7.246; P = .981). Table 7 shows that odds of being in the low range for tobacco use are lower for LHDs that have not recently utilized any of the three organizational tools within the last five years as opposed to LHDs that have recently utilized all three organizational tools within the last five years (AOR = .857; CI = .14 – 5.259; P = .867).

Odds of being in the low range for years of potential life lost are lower for LHDs that have recently utilized at least one of the three organizational tools within in the last five years as opposed to LHDs that have recently utilized all three tools within the last five years (AOR = .824; CI = .316 – 2.148; P = .693). Table 7 shows that odds of being in the low range for tobacco use are lower for LHDs that have recently utilized at least one of the three organizational tools within the last five years as opposed to LHDs that have recently utilized all three tools within the last five years (AOR = .693; CI = .277 – 1.734; P = .434).

Odds of being in the medium range for years of potential life lost are lower for LHDs that have not recently utilized any of the three organizational tools within in the last five years as opposed to LHDs that have recently utilized all three tools within the last five years (AOR = .283; CI = .051 – 1.564; P = .148). Table 7 shows that odds of being in the medium range for tobacco use are higher for LHDs that have not recently utilized any of the three organizational tools within the last five years as opposed to LHDs that have recently utilized all three organizational tools within the last five years (AOR = 1.095; CI = .21 – 5.708; P = .914).

Odds of being in the medium range for years of potential life lost are lower for LHDs that have recently utilized at least one of the three organizational tools within in the last five years as opposed to LHDs that have recently utilized all three tools within the last five years (AOR = .427; CI = .175 – 1.041; P = .061). Table 7 shows that odds of being in the medium range for tobacco use are lower for LHDs that have recently utilized at least one of the three organizational tools within the last five years as opposed to LHDs that have recently utilized all three tools within the last five years (AOR = .618; CI = .268 – 1.428; P = .260).

PHAB Accreditation

Odds of being in the low range for years of potential life lost are lower for LHDs that have decided not to apply, don't know, or are undecided on applying for PHAB accreditation as opposed to LHDs that are accredited, have submitted an application, or are registered in e-PHAB (AOR = .482; CI = .287 – .809; P = .006). This result is statistically significant. Table 7 shows that odds of being in the low range for tobacco use are lower for LHDs that have decided not to apply, don't know, or are undecided on applying for PHAB accreditation as opposed to LHDs that are accredited, have submitted an application, or are registered in e-PHAB (AOR = .741; CI = .465 – 1.182; P = .209).

Odds of being in the low range for years of potential life lost are lower for LHDs that plan to apply for PHAB accreditation as opposed to LHDs that are accredited, have submitted an application, or are registered in e-PHAB (AOR = .436; CI = .246 – .77; P = .004). This result is statistically significant. Table 7 shows that odds of being in the low range for tobacco use are lower for LHDs that plan to apply for PHAB accreditation as opposed to LHDs that are accredited, have submitted an application, or are registered in e-PHAB (AOR = .677; CI = .396 – 1.159; P = .155).

Odds of being in the medium range for years of potential life lost are lower for LHDs that decided not to apply, don't know if they will apply, or are undecided on applying for PHAB accreditation as opposed to LHDs that are accredited, have submitted an application, or are registered in e-PHAB (AOR = .582; CI = .361 – .937; P = .026). This result is statistically significant. Table 7 shows that odds of being in the medium range for tobacco use are lower for LHDs that decided not to apply, don't know if they will apply, or are undecided on applying for PHAB accreditation as opposed to LHDs that are accredited, have submitted an application, or are registered in e-PHAB (AOR = .839; CI = .547 – 1.288; P = .423).

Odds of being in the medium range for years of potential life lost are lower for LHDs that plan to apply for PHAB accreditation as opposed to LHDs that are accredited, have submitted an application, or are registered in e-PHAB (AOR = .389; CI = .226 – .67; P = .001). This result is statistically significant. Table 7 shows that odds of being in the medium range for tobacco use are higher for LHDs that plan to apply for PHAB accreditation as opposed to LHDs that are accredited, have submitted an application, or are registered in e-PHAB (AOR = 1.064; CI = .652 – 1.738; P = .803).

Governance

Odds of being in the low range for years of potential life lost are lower for LHDs that have shared structures between state and local governments as opposed to LHDs that have local governance structures (AOR = .168; CI = .095 – .299; P = .000). This result was statistically significant. Table 7 shows that odds of being in the low range for tobacco use are lower for LHDs that have shared structures between state and local governments as opposed to LHDs that have local governance structures (AOR = .291; CI = .171 – .496; P = .000). This result was statistically significant.

Odds of being in the low range for years of potential life lost are lower for LHDs that have state governance as opposed to LHDs that have local governance structures (AOR = .021; CI = .009 – .046; P = .000). This result was statistically significant. Table 7 shows that odds of being in the low range for tobacco use are lower for LHDs that have state governance as opposed to LHDs that have local governance structures (AOR = .049; CI = .025 – .094; P = .000). This result was statistically significant.

Odds of being in the medium range for years of potential life lost are lower for LHDs that have shared structures between state and local governments as opposed to LHDs that have local governance structures (AOR = .436; CI = .265 – .718; P = .001). This result was statistically significant. Table 7 shows that odds of being in the medium range for tobacco use are lower for LHDs that have shared structures between state and local governments as opposed to LHDs that have local governance structures (AOR = .483; CI = .295 – .791; P = .004). This result was statistically significant.

Odds of being in the medium range for years of potential life lost are lower for LHDs that have state governance as opposed to LHDs that have local governance structures (AOR = .113; CI = .073 – .174; P = .000). This result was statistically significant. Table 7 shows that odds of

being in the medium range for tobacco use are lower for LHDs that have state governance as opposed to LHDs that have local governance structures (AOR = .263; CI = .18 – .383; P = .000). This result was statistically significant.

Local Board of Health

Odds of being in the low range for years of potential life lost are lower for LHDs that do not have a local board of health as opposed to LHDs that have a local board of health (AOR = .823; CI = .56 – 1.21; P = .322). Table 7 shows that odds of being in the low range for tobacco use are higher for LHDs that do not have a local board of health as opposed to LHDs that have a local board of health (AOR = 1.26; CI = .873 – 1.819; P = .217).

Odds of being in the medium range for years of potential life lost are lower for LHDs that do not have a local board of health as opposed to LHDs that have a local board of health (AOR = .775; CI = .543 – 1.106; P = .16). Table 7 shows that odds of being in the medium range for tobacco use are lower for LHDs that do not have a local board of health as opposed to LHDs that have a local board of health (AOR = .984; CI = .697 – 1.389; P = .925).

Jurisdiction

Odds of being in the low range for years of potential life lost are lower for LHDs that have small jurisdictions (0 – 49,999 people served) as opposed to LHDs that have large jurisdictions (500,000+ people served) (AOR = .125; CI = .049 – .32; P = .000). This result is statistically significant. Table 7 shows that odds of being in the low range for tobacco use are lower for LHDs that small jurisdictions (0 – 49,999 people served) as opposed to LHDs that have large jurisdictions (500,000+ people served) (AOR = .115; CI = .046 – .289; P = .000). This result is statistically significant.

Odds of being in the low range for years of potential life lost are lower for LHDs that have medium jurisdictions (50,000 – 499,999 people served) as opposed to LHDs that have large jurisdictions (500,000+ people served) (AOR = .374; CI = .146 – .961; P = .041). This result is statistically significant. Table 7 shows that odds of being in the low range for tobacco use are lower for LHDs that have medium jurisdictions (50,000 – 499,999 people served) as opposed to LHDs that have large jurisdictions (500,000+ people served) (AOR = .185; CI = .074 – .463; P = .000). This result is statistically significant.

Odds of being in the medium range for years of potential life lost are lower for LHDs that have small jurisdictions (0 – 49,999 people served) as opposed to LHDs that have large jurisdictions (500,000+ people served) (AOR = .278; CI = .107 – .725; P = .009). This result is statistically significant. Table 7 shows that odds of being in the medium range for tobacco use are lower for LHDs that have small jurisdictions (0 – 49,999 people served) as opposed to LHDs that have large jurisdictions (500,000+ people served) (AOR = .322; CI = .122 – .85; P = .022). This result is statistically significant.

Odds of being in the medium range for years of potential life lost are lower for LHDs that have medium jurisdictions (50,000 – 499,999 people served) as opposed to LHDs that have large jurisdictions (500,000+ people served) (AOR = .63; CI = .24 – 1.656; P = .349). Table 7 shows that odds of being in the medium range for tobacco use are lower for LHDs that have medium jurisdictions (50,000 – 499,999 people served) as opposed to LHDs that have large jurisdictions (500,000+ people served) (AOR = .561; CI = .213 – 1.482; P = .244).

CHAPTER 5

CONCLUSIONS

This study examined the effects of LHD organizational traits and tools on premature death and tobacco use. The results confirmed that recently completing a community health improvement plan, recently completing a strategic plan, governance structure, PHAB accreditation status, and jurisdiction size all are significantly associated with premature death and tobacco use outcomes. Completing a community health assessment, having a local board of health, and recently completing a CHA, CHIP, and strategic plan within the past five years were not significantly associated with premature death and tobacco use.

The results showed no significant associations between completing a community health assessment and premature death and tobacco use. Perhaps this is because completing the CHA alone doesn't allow for the full impact of evidence collected through CHA to translate into community health plan to officially be adopted through a strategic plan, as reflected in the entire feedback loop shown in the logic model to progress. There may be additional value in carrying the CHA through to the CHIP and strategic planning process. There is little evidence on the effects of community health assessments on health outcomes.

The multinomial logistic regression revealed a significant association between completing a community health improvement plan in the last five years and having fewer adults that use tobacco. There is a dearth of scientific literature on this topic.

The results showed a strong association between planning to complete a strategic plan in the next year and being in the low or medium tertiles for premature death and tobacco use. There is a plethora of literature on the impact of strategic planning on various indicators in the business sector, but there are very few articles available on its impact in LHDs and health outcomes.

There were no significant associations between LHDs that completed a CHA, CHIP, and strategic plan within the last five years and having a community with less premature death and tobacco use.

The results confirmed that being accredited, having submitted an application, or being registered in e-PHAB was significantly associated with having less premature death. This is an area of burgeoning research and recently there have been more articles published on the role of continuous quality improvement in LHDs; however, there aren't many articles that explore their associations to community health outcomes.

This study found that having a local board of health was not significantly associated with premature death or tobacco use. While Hays et al. found that LHDs that were solely ran by empowered local boards of health had poor county health outcomes (Hays et al., 2012), the heterogeneity of local boards of health in their composition, engagement, and authority was not considered in this study. Presence or absence of a local board of health alone is not a good predictor of LHD impact. Variation across LHDs and their local boards of health should be captured and accounted for (Shah et al., 2017).

Having a local governance structure was significantly associated with having less premature death and less tobacco users. Hays et al. also concluded that LHDs with a state governance structure most often achieve the poorest health outcomes (Hays et al., 2012), while Turnock et al. concluded that LHDs with county governance were better able to address the core functions of public health (Handler & Turnock, 1996).

Having a large jurisdiction was significantly associated with having lower premature death and tobacco users. There are several studies that demonstrate larger LHDs are better able

to carry out essential public health activities and often have better community health outcomes than their smaller counterparts (Handler & Turnock, 1996; Mays et al., 2006)

Conclusion

Local health departments have the primary responsibility for the public's health. Because of this, it is imperative that LHDs identify strategies and models that consistently contribute to healthy outcomes that are sustained over long periods of time. The purpose of this study is to investigate if core organizational tools such as a community health assessment, community health improvement plan, and strategic plan are associated with positive health outcomes. It is novel in its objective of looking for associations between the use of organizational tools and positive health outcomes as there is not much published literature on the topic. While it cannot assess causality, this study demonstrates that LHD characteristics and utilizing organizational tools to increase efficiency are associated with positive health outcomes in the LHD's community.

As it pertains to organizational tools, the completion of a community health improvement plan within the last five years was found to be associated with lower tobacco use. This may be true because LHDs that have a developed plan could begin implementing interventions unlike LHDs that don't have a community health improvement plan or have only collected data in a community health assessment. Additionally, intent to complete a strategic plan within the next year is associated with lower premature death and lower tobacco use. This could be because many LHDs don't make strategic planning a priority if their community is not grappling with poor health outcomes. More research is required in this area.

This study found that LHDs that had registered in e-PHAB (PHAB's online application system), had submitted their application, or were accredited were more likely to have less

premature death and tobacco use; however, this study also demonstrated no significant association between positive health outcomes and LHDs that completed a community health assessment, community health improvement plan, and strategic plan in the last five years. There must be other components of the accreditation process that lend to LHD quality improvement. More research should be conducted on this topic.

LHD characteristics such as governance type and jurisdiction size were also significantly associated with positive health outcomes. This may be true for LHDs with larger jurisdictions because they likely have the funding to deploy more programs to promote the health of their communities. LHDs with local governance structure were significantly associated with less premature death and tobacco use in comparison to both state or shared governance structure. This may be because LHDs with a local governance structure are more familiar with their community and its culture because they live there, in addition to locally governed LHDs can make decisions more effectively because they have more autonomy and don't have to partner with people who aren't knowledgeable on their community. This aligns with other published literature that noted state governed LHDs do not perform as well as their counterparts (Handler & Turnock, 1996; Hays et al., 2012).

This study adds to the literature because it is one of very few studies that focuses on the association of LHD characteristics to actual health outcomes in the communities served by the LHDs. It identified associations that can be further explored and expounded upon in future studies. It is also significant because it provides insight using the most recent data available for linkage from NACCHO and the Community Health Rankings. Lastly, this study is significant because it is one of the first to specifically explore the effects of community health assessments, community health improvement plans, strategic plans on health outcomes.

Limitations and Recommendations

Limitations of this study include its cross-sectional design, self-reporting data collection methods, and its use of only county-level LHDs. The study design is cross-sectional and the data only represent a point in time, therefore, causal relationships cannot be ascertained from this study. More research using other study designs is required to observe causal relationships between LHD characteristics and health outcomes. Additionally, this study's cross-sectional design does not allow for observation over time to note if the communities' health outcomes grow progressively better or worse. Recall bias is another limitation of this study as the Profile data used were self-reported by LHD personnel. This creates the potential for introducing errors. Also, the depth of the local board of health variability was not assessed in this study. Local boards of health are not uniform in their composition, influence, or scope, as argued by Shah and colleagues in a series of papers on local board of health governance and levels of engagement in assigned functions (Nguyen, Shah, Schwartz, & Jones, 2019; Gulzar H. Shah, Corso, Sotnikov, & Leep, 2018; Gulzar H Shah & Leep, 2019; Gulzar H Shah, Sotnikov, Leep, Ye, & Corso, 2018; Gulzar H Shah, Sotnikov, Leep, Ye, & Van Wave, 2017). This study only assessed if an LHD had a local board of health, not considering the variability that exists in local boards of health across the nation. This study cannot draw a conclusion on this relationship without assessing variability. Lastly, only single-county LHDs were included in this study's analysis. Single-county LHDs comprised 74% of the original sample of 1,930 that responded, city comprised 14%, city-county comprised 0.2%, multi-city comprised 3%, and multi-county comprised 9%. In general, multi-city and multi-county LHDs had comparable completion percentages for community health assessments, community health improvement plans, or strategic plans within the last five years, but city and city-county LHDs had lower completion

percentages. As the study only assessed associations amongst single-county LHDs, its results are less generalizable and cannot be applied to LHDs that operate with other structures.

Future studies should employ longitudinal designs and observe changes in communities' health status over long periods of time to determine the long-term effects of LHD characteristics on community health status. These studies may find that other LHD characteristics are significant to positively impacting health outcomes and are better predictors of LHD performance.

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