THE AFFORDABLE CARE ACT, PUBLIC HEALTH ACCREDITATION, AND COMMUNITY HEALTH ASSESSMENT IN NORTH CAROLINA: 2011-2017

by

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This study explored the reporting of health equity issues in public health-led community health assessments (CHAs) and the reporting of measurable outcomes in the public health-led community health assessments (CHIPs).

Research design: The study used a cross-sectional descriptive-correlational approach to perform a secondary data analysis of CHA, CHIP, and SOTCH archived documents submitted to the N.C. Division of Public Health from North Carolina local health departments (LHDs).

Sample: The sample included all CHAs (N = 200) from LHDs submitted between 2011 and 2017. The CHAs were used to investigate health equities. In addition to the CHAs, the most recent CHIP submitted by public health departments (N = 100) between the years 2011 and 2015 was selected to identify measurable outcomes. All 100 counties in N.C. are included in the analysis. For each CHIP, the interim SOTCH reports were selected to evaluate the success of the outcomes identified in the CHIPs.

Research questions: The four research questions were: RQ1. What is the prevalence of health equity issues reported in the community health assessment? RQ2. Which characteristics or combination of characteristics are associated with the reporting of health equity issues? RQ3. What are the characteristics (interventions, outputs, and outcomes) of the most recent community

health improvement plans submitted by the 100 counties and what level of progress on the health outcomes have been reported in the county health SOTCH documents? RQ4. Which characteristics or combination of characteristics are associated with successful outcomes?

Findings: The health equity issues reported most frequently included race/ethnicity, gender, education, unemployment, and poverty. Health equity issues reported least often include incarceration, military (active duty, dependents, and veterans), visual, hearing, and mobility impaired, homelessness, and soil quality. Six predictor variables explained 37 percent of the variance in the number of health equities reported in the CHAs. The strongest predictor was using a vendor in the development of a CHA, with a beta value of .429. The analysis of 471 measurable outcomes in the sample showed that 59% were never reported as required by LHD accreditation. The results that were reported found that 24% could not be interpreted as presented in the SOTCH, and 12% were not achieved, 4% were partially achieved, and 2% were achieved.

Practice implications were discussed including support for public health infrastructure, promotion of public-private partnerships, use of population health model with equity lens and disparity focus, and incorporation of results-based accountability for *Healthy People 2030/Healthy NC 2030.*

THE AFFORDABLE CARE ACT, PUBLIC HEALTH ACCREDITATION, AND COMMUNITY HEALTH ASSESSMENT IN NORTH CAROLINA: 2007-2017

A Dissertation

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In Partial Fulfillment of the Requirements for the Degree

Doctor of Philosophy in Nursing

by

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DEDICATION

This work is dedicated to the memory of my parents, to the lives of my children and grandchildren, and to the steadfast love of my husband through these many years.

ACKNOWLEDGEMENTS

I would like to acknowledge the extraordinary contributions of my committee members, Dr. Swanson, Dr. Reis, and Dr. Winterbauer, for their help from inception to publication of this work. Dr. Swanson offered an unfiltered assessment of all the data so that it could be methodologically studied. Dr. Reis brought clarity to the writing process to better understand the literature review, the research design and analysis, and ultimately, the findings. Dr. Winterbauer brought the perspective of an accomplished researcher in public and population health with grounded discussions about the significance of this work.

Appreciation is also extended to Laura Jackson, PhD program associate, who made certain that I was on track to propose, defend, and graduate. To my research assistants, Julie Walker and Emily Wilkins, thank you for your attention to detail that made the secondary analysis of thousands of word documents possible.

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TABLE OF CONTENTS

LIST OF TABLES

LISTS OF FIGURES

CHAPTER 1: INTRODUCTION

Publication of *The Future of Public Health* (Institute of Medicine [IOM], 1988) left an indelible mark on the timeline of public health practice in the United States. Identifying assessment, assurance, and policy development as the three core functions of public health, the report provided a backdrop for the passage of the Patient Protection and Affordable Care Act (ACA) in 2010 and the creation of the Public Health Accreditation Board (PHAB) in 2012.

Responding to the IOM report, the greater public health community anticipated major reform coming for healthcare legislation and convened a steering committee to further explicate the IOM description of population health. Comprised of representatives from the Centers for Disease Control and Prevention (CDC), the Health Resources and Service Administration (HRSA), the Office of Disease Prevention and Health Promotion (ODPHP), and other public health service agencies, the committee outlined the ten essential public health services in their 1994 publication, *Public Health in America* (CDC, 2017; Public Health Functions Project, 1997).

Widespread adoption of both the three core functions and ten essential services followed. In 1995, the American Public Health Association (APHA) adopted the *Public Health Wheel* (see Figure 1). The three core functions (assessment, assurance, and policy development) are shown encircling the wheel of ten essential services. Subsequently, multiple public health organizations collaborated to establish the *National Public Health Performance Standards* (NPHPS) based on the ten essential public health services. (Association of State and Territorial Health Officials [ASTHO], 2018a). The NPHPS provided a framework to

> assess capacity and performance of public health systems and public health governing bodies. This framework can help identify areas for system improvement, strengthen state and local partnerships, and ensure that a strong system is in place for providing the ten essential services" (CDC, 2018b).

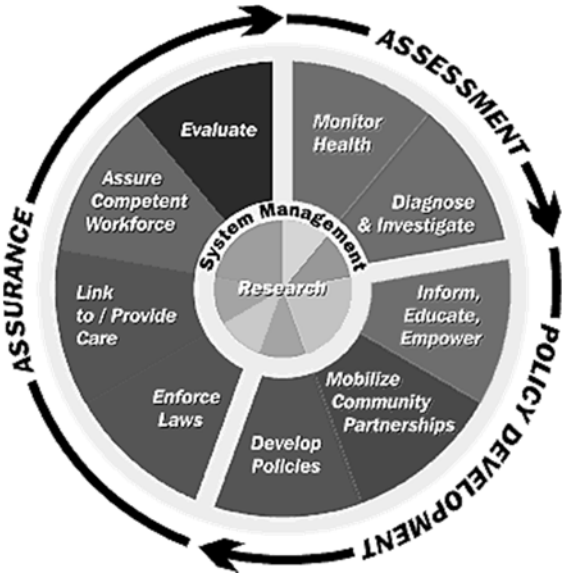

Figure 1. The ten essential pubic health services encircled by the three core functions (CDC, 2017).

Changes to national policy led to changes in practice. Discussions about quality and accountability generated by the NPHPS fueled the creation of public health accreditation at the state and national levels. In 2002, the North Carolina General Assembly (NCGA) created the North Carolina Local Health Department Accreditation Board (NCLHDAB) and in 2005, funded LHD accreditation (North Carolina Local Health Department Accreditation [NCLHDA], 2017). National accreditation, based upon North Carolina's benchmarks, followed in 2012 (PHAB, 2018b). Accreditation seized the opportunity to anchor its defining benchmarks in community health assessment (CHA) and community health improvement planning.

Community Health Assessment

CHAs have evolved over the last two decades. In the United States, policy analysts now recognize the inadequacy of focusing just on at risk-populations (*Healthy People 2000*) and health disparities (*Healthy People 2010, 2020*). Approaching the release of *Healthy People 2030,* state and local public health professionals have been charged to actively look for health

inequities using a population health model (U.S. Department of Health and Human Services, Office of Disease Prevention and Health Promotion [ODPHP], 2018).

By the beginning of the 21st century, CHA and the community health improvement plan (CHIP) had become established practices in local public health agencies in the United States. Today, CHA and CHIP are embedded in state and national public health accreditation, undergraduate and graduate curricula, public health practice, and more recently, in health care policy and legislation. While public health recognizes the responsibility to quantify the social and economic value of CHA and CHIP to the community, the relationship between the time-honored tradition of CHA and health outcomes remains unclear.

Value of CHA-CHIP

It is assumed that individuals and families would be better off as a result of an inherently interdisciplinary, collaborative CHA-CHIP process rooted in service to the community (National Association of County and City Health Officials [NACCHO], 2011). Population indicators would improve incrementally as the community applied multi-level, evidence-based interventions with tenacity until the community eventually turned the curve on the disparity and inequity issues that de-rail the quest for health and well-being.

Given the growing attention to transparency and accountability in both public and private sectors, government led initiatives try to espouse best practice when such evidence exists and identify best available practices when evidence of success has yet to be demonstrated. Community assessments must analyze the needs and resources of the whole community using both an equity lens and a disparity focus. Engaged community members should be at the center of priority setting along with health coalition leaders who are tasked with developing strategic plans by governing boards. Improvement plans then continuously evolve using evidence-based

strategies. The CHIP then tells a story about the results the community wants to see, the data indicators of concern, the partners and programs working to make a difference, and the ways that success is measured (Friedman, 2015).

Simply stated, the goal of the CHA-CHIP process is to improve health outcomes and eliminate health inequities. In North Carolina, local health departments (LHDs) submit an annual State of the County Health (SOTCH) report to the North Carolina Division of Public Health (DPH) in years that a CHA is not submitted. In this report, LHDs are required to report progress on CHIPs. Poorly worded outcomes cannot measure progress (Perrault, Inderstrodt, Stephens, & Hintz, 2017). Moreover, assessments based on data sources that are blind to inequities have done little more than satisfy a check box on public health's accreditation checklist. Similarly, state agency reviews of these documents may have been inadequate, yet understandable, considering the continued decline in funding for public health infrastructure. Population health science needs accountability in practice; leadership is the key to transitioning CHA from a mere tradition to activism (Zuber-Skerritt, 2015).

Funding for CHA-CHIP

Federal and state funds supporting training and technical assistance for CHA-CHIP flourished between 1997 and 2010. From 1997-2002, the North Carolina Community Health Assessment Model began with funding from CDC's Cooperative Agreement to Support State Initiatives. In 2002, Mary Bobbitt-Cooke, former director of the North Carolina Office of Healthy Carolinians and Health Education, persuaded the NCGA to appropriate one million dollars annually to support the public-private partnership initiative known as *Healthy Carolinians.* In just five years, public health leadership had achieved legislative support for both accreditation and community partnerships.

North Carolina received two grants from the CDC to use data for building community capacity, public health program planning, and policy development. Within the DPH, the State Center for Health Statistics (SCHS) and the Office of Healthy Carolinians strengthened CHA activities in LHDs, local Healthy Carolinian partnerships, and other community organizations

After passage of the ACA in 2010, much of the federal funding for CHA disappeared. In 2011, NCGA support for CHA-CHIP also ended leaving the state health agency (DPH) without resources to support state mandated LHD accreditation (see Figure 2). With CHA-CHIP an essential component of accreditation, LHDs were left with an unfunded mandate to conduct CHA with limited state assistance for nearly five years.

At the same time, demand for CHA was being fueled by the ACA and the resulting Internal Revenue Service (IRS) rules regarding tax-exempt or charitable hospitals. According to the IRS, a charitable hospital is subject to the community benefit standard:

> In the context of operating a tax-exempt hospital, it's not enough for a hospital to state that it operates exclusively to promote health. A hospital must also demonstrate that it operates to promote the health of a class of persons that is broad enough to benefit the community. This is known as the community benefit standard (IRS, 2018).

Section 501(r)(3)(A) of the IRS code requires a hospital organization to conduct a community health needs assessment (CHNA) every three years and to adopt an implementation strategy to meet the community health needs identified through the CHNA (IRS, 2014). In five years, 78% of North Carolina LHDs moved from a four-year to a three-year cycle to accommodate the needs of charitable hospitals (Dail, 2018).

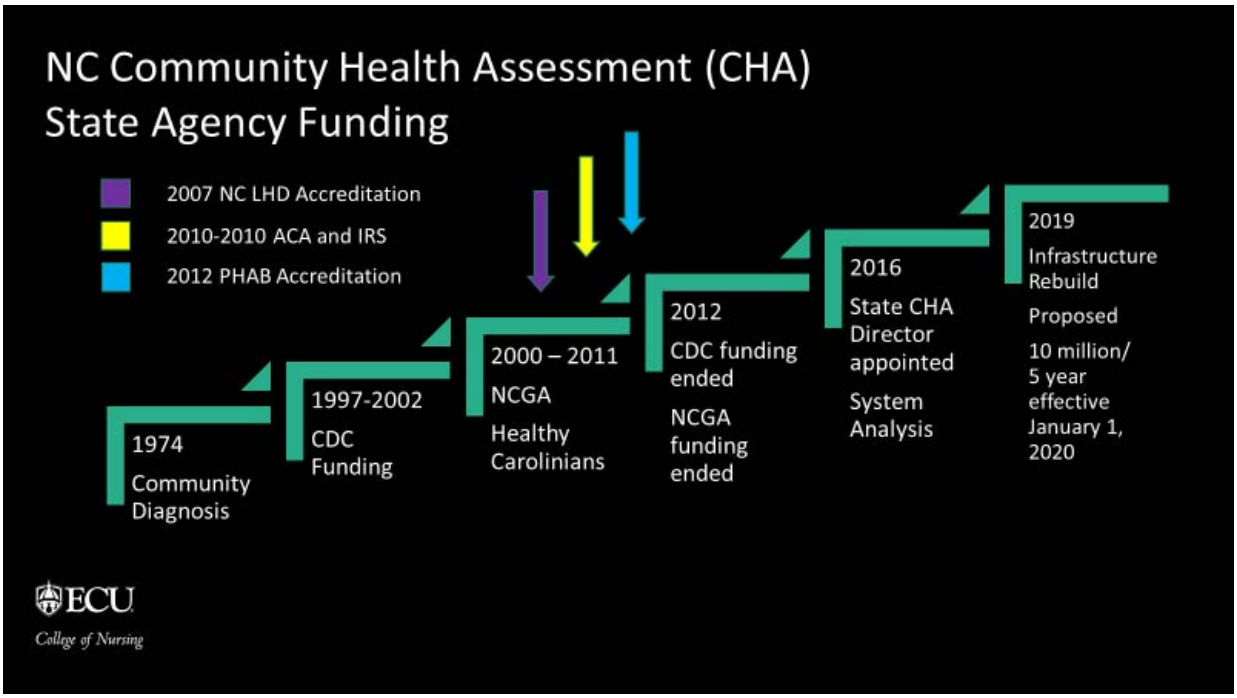

Figure 2. Timeline shows North Carolina pivot points for state agency funding supporting community health assessment 1974 through 2017.

Population Health and the Affordable Care Act

The forward thinking of public health leaders in the 1990s positioned prevention and health promotion at the center of the remedies for spiraling health care costs in the United States. The main purpose of the ACA was twofold: drive down health care costs and provide affordable health insurance for all. Much of the language within the ACA contains references to population health with an acknowledgement that population health is a consequence of many factors. Population health sounds deceptively simple, but in truth, the concept has eluded scholars, epidemiologists, economists, and policy analysts in the United States, Great Britain, and Canada for over a half century (Kindig, 1997; Kindig & Stoddart, 2003).

CDC views population health as

> an interdisciplinary, customizable approach that allows health departments to connect practice to policy for change to happen locally. This approach utilizes non-traditional partnerships among different sectors of the community – public

> health, industry, academia, health care, local government entities, etc. – to achieve positive health outcomes (CDC, 2019).

Population health is impacted collectively by individual health behavior, access to care, and social and environmental determinants of health, with the latter being the most important drivers of health outcomes. This study relied on the population health framework developed by the University of Wisconsin with funding from the Robert Wood Johnson Foundation (RWJF). The framework is best known as the County Health Rankings Model (see Figure 3).

Like most complex phenomena, population health continues to evolve and gain traction as a powerful voice in policy since its inception during post-World War II America. Often the subject of debate between social scientists, the medical community, and public health professionals, the population health framework has established credibility as the underlying approach for public health policy and practice (Knowles, 1977; Laymon et al., 2015). Globally, this has been demonstrated in the Health in All Policies (HiAP) initiative conceived by the World Health Organization (WHO) in the 1980s (WHO, 1986; WHO, 2013). The conceptual language for social determinants of health (SDOH) has been included in strategic plans and reports published by the United States IOM and the U.S. Department of Health and Human Services (U.S. DHHS) for over three decades (IOM, 1988; IOM, 1997; IOM, 2003; IOM, 2011; IOM, 2012; IOM, 2014; IOM, 2015; ODPHP, 2018; OMH, 2008). The *Healthy People* initiatives have responded with decennial goals for the nation to achieve improved population health (ODPHP, 2018). The ACA has propelled the use of population health into the vernacular of health care policy and practice.

Health, Economic, and Education Policies

Positively influencing population health necessitates an in-depth understanding of the inter-relatedness of health, economic, and education policies that have contributed to bias,

structural racism, and oppression of vulnerable populations. All policies matter, but the specific trilogy of health, economic, and education policies underpin not only the health and well-being of individuals, families, and communities, but also protects national security and preserves the environment for future generations.

Economic well-being matters to health. Poverty has been associated with significantly worse health outcomes across all races and ethnicities in all communities across nations (Employment Conditions Knowledge Network [EMCONET], 2007; Knowledge Network on Urban Settings [KNUS], 2008; Metzler, Merrick, Klevens, Ports, & Ford, 2017; Social Exclusion Knowledge Network [SEKN], 2008). Delia and Broughton (2018) proposed that if the health of people depends on the prosperity of the community, then public health must understand how economic development and education act as driving forces of health status. Economic resilience has been achieved through systemic and policy level investments centered on health, schools, and jobs.

Communities that have met the needs of the whole person have produced citizens who are healthy, educated, and prepared to live up to their full potential. When communities have cared for the whole person, their citizens have excelled in school, taken care of their health, succeeded in the workforce, and taken care of their communities in return (Delia & Broughton, 2018).

> Dynamic alliances are paramount to the future of public health. Progress in health outcomes and health equity is impossible without productive partnerships in education and economic development. A healthy community trend can be achieved by utilizing innovative partners to improve access to educational attainment and increasing economic development opportunities for everyone. Our health education and economic development sectors must work together to help our citizens to become healthy and educated and unlock their unlimited potential. Health, education and economic development are linked to each other. If you improve one, you improve all. You neglect one, you neglect all (A. Delia, personal communication, January 13, 2018).

Conceptual Models and Theoretical Frameworks

County Health Rankings Model (CHR)

With funding from the RWJF, researchers at the University of Wisconsin Population Health Institute (UWPHI), conceptualized population health in the CHR model, stressing "the many factors that, if improved, can help make communities healthier places to live, learn, work and play" (UWPHI, 2018). The underlying assumptions expressed by Remington, a senior scientist with UWPHI, presumed that the

- causes of disease and disability are complex and multifactorial;
- percentages applied to the four categories of health factors provide a way to summarize the health outcomes and modifiable factors in every county in the nation, permitting us to rank counties from the healthiest to the least healthy in each state; and
- hundreds of television, radio, and print news stories, along with extensive social media dialog, contributed toward our explicit goal of mobilizing action to improve health by raising awareness among the media and community leaders that many factors contribute to health, and that health differs by place (Remington, 2017, p. 1).

As illustrated in Figure 3, the basic model depicts health outcomes as a function of length of life (mortality) and quality of life (morbidity). The model was constructed inductively from customary data sources for morbidity, mortality, and quality of life, and includes data sources reflecting the social determinants of health. Health outcomes are explained by four categorical factors: clinical care, health behavior, physical environment, and social determinants of health. The four categorical health factors stemming from policies and programs determine health outcomes. The dynamic version of the model illustrated the use of the 2015 CHR sources of national data at the county level (Hood, Gennuso, Swain, & Catlin, 2016, p. 130).

Hood et al. (2016) declared "excellent theoretical support for this CHR model and its weightings" but noted that "no previous peer-reviewed publications have empirically estimated the association between the CHR model's health factors and health outcomes [or] described the

performance of the model's weighting scheme by state" (p. 132). To address this gap, Hood and colleagues studied the model to "empirically estimate the strength of association between these health factors and health outcomes and to describe the performance of the CHR model factor weightings by state" (p. 129). They found "the relative contributions of socioeconomic factors, health behaviors, clinical care, and the physical environment to the health outcomes composite score were 47%, 34%, 16%, and 3%, respectively.

Although the CHR model performed better in some states than others, these results provide broad empirical support for the CHR model and weightings" (p. 129). Similar findings to those of Hood et al. (2016) have been found in peer-reviewed literature (Arndt, Acion, Caspers, & Blood, 2013; Athens, Catlin, Remington, & Gangnon, 2013; Athens, Remington, & Gangnon, 2015; Park, Roubal, Jovaag, Gennuso, & Catlin, 2015).

A frequent criticism of the model is that it is wrong to sum the causes of population health to 100% (Krieger, 2017; Purtle, Peters, Kolker and Roux, 2017). Krieger wrote that the population attributable fraction (PAF) may prove a better model in population health than the rankings, but it is also problematic due to confounding variables – the same issue as assigning percentages in the CHR model (p. 542). The formula used to calculate the PAF in the presence of confounding variables is $PAF = pd\,([RR - 1}/RR$, where pd equals the proportion of cases exposed to the risk factor, and RR equals the adjusted relative risk for exposure to that factor. Because population health science is still an emerging science, all existing models will present challenges and be the subject of debate as the models are used in practice.

Remington (2015) acknowledged that the reliability of the measures used in the CHR varies greatly from county to county, but related efforts to "improve reliability through statistical techniques…and in the survey-based measures…such as the Behavioral Risk Factor Surveillance

System" (p. 1409). Courtemanche, Soneji, and Tchernis (2015) found that in Texas, 86 of 254 counties were excluded from the CHR because the population was less than 10,000. North Carolina has three of 100 counties with 2017 population estimates under 10,000. These are Graham (8,861), Hyde (5,817), and Tyrrell (4,407) (North Carolina Office of State Budget and Management [OSBM], 2018).

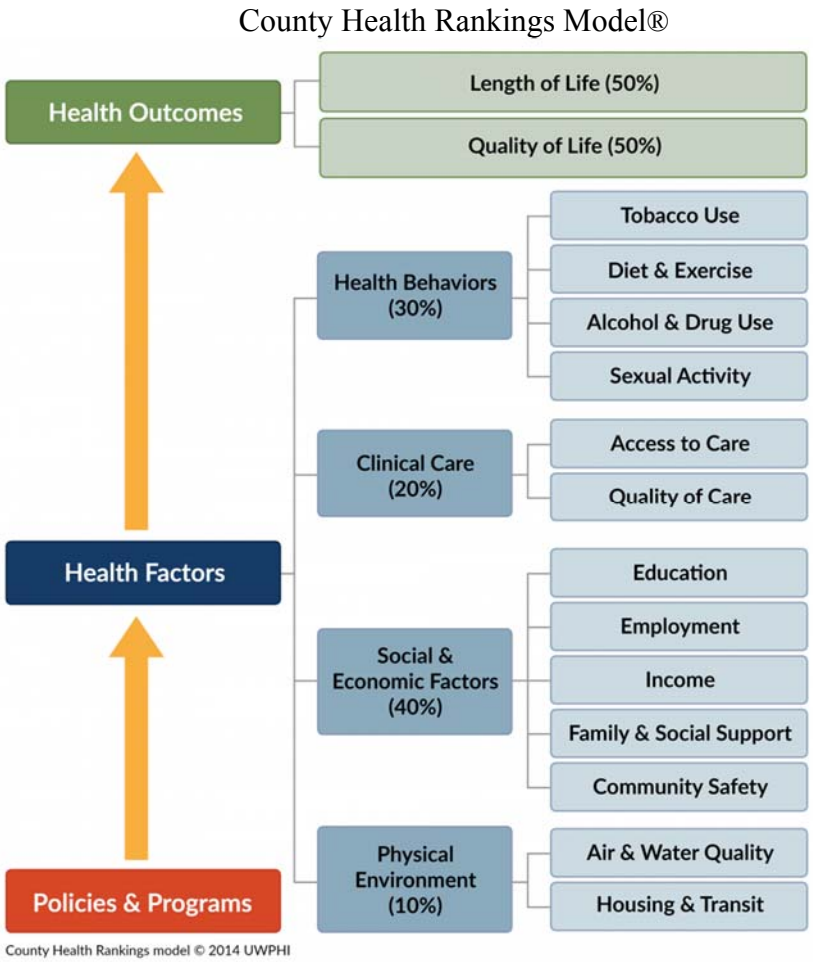

Figure 3. The County Health Rankings Model. Used with permission of the University of Wisconsin Population Health Institute (2018).

The CHR model uses rankings to examine the phenomenon of population health, and in so doing, appeals to the instinct to compete, to be the best, or at least better than those with whom we are frequently compared. Other population health models exist, and all acknowledge

the importance of social determinants of health as a causal factor in morbidity and mortality (MacDonald et al., 2013). Across the United States, LHDs report rankings data as part of the CHA-CHIP process.

Winterbauer, Rafferty, Tucker, Jones, and Tucker-McLaughlin (2016) examined the CHR report to determine LHD use and perceived impact in Florida and North Carolina. They concluded that "tangible benefits to communities from use of the Rankings have yet to be fully realized but are encouraging. More effective media engagement could produce the community awareness necessary to maximize the Rankings' potential to mobilize communities for health improvement" (p. E1).

Purtle et al. (2017) found that "relatively little research has explored how the CH-Rankings are used in real-world settings" (p. 1). The researchers identified three knowledge gaps about usefulness of the model:

- how and why the CH-Rankings are used;
- factors that might influence CH-Ranking utilization; and
- potentially negative impacts of the CH-Rankings.

Findings from their research suggest

> CH-Rankings, and potentially population health rankings more broadly, have positive impacts and the ability to promote evidence informed policy making. However, two potentially negative impacts of the CH-Rankings were identified. First, we found that the CH-Rankings were often used to promote individually focused behavior change interventions in politically conservative counties. While well-intentioned, the preponderance of evidence suggests that the benefits of such interventions are likely to be limited and that policy interventions are needed to produce significant improvements in population health… (p. 14).

The CHR model provides a clear, simple diagram to capture complex relationships. The four general categorical variables that are further divided into multiple sub-categories can be empirically studied. The model and its basis in population health theory provides a framework for nursing to address complex social, political, environmental, and economic factors. As

reported by MacDonald et al. (2012), Lillian Wald, the great founder of public health nursing, challenged nurses to look beyond the immediate environment to the more distal causes of health and illness:

> The call to the nurse is not only for the bedside care of the sick, but to help in seeking out the deep underlying cause of illness and misery, that to the future there may be less sickness to nurse and to care (Wald, 1915, p. 65).

Wald exemplified the practice of population health nursing a century before the ACA by recognizing the role of social and environmental determinants on health and well-being.

Health Disparity to Health Equity Framework

CHA is a natural process – a core function of what people who work in public health know and understand. National policy shapes how public health approaches the community health assessment process. For the last twenty years, public health has approached CHA with a health disparity focus. However, the disparity approach only addresses issues for which there is data that can measure the disparity. If there is no data for the health impact on small sub-populations, then those health needs of vulnerable populations may be overlooked in the CHA-CHIP process. Policy derived from the strategic planning process has provided performance measures focusing on disparity for over two decades.

- In *Healthy People 2000*, it was to reduce health disparities among Americans.
- In *Healthy People 2010*, it was to eliminate, not just reduce, health disparities.
- In *Healthy People 2020*, that goal was expanded even further: to achieve health equity, eliminate disparities, and improve the health of all groups (ODPHP, 2018, Disparities).

Health equity frameworks acknowledge the role of social determinants of health (SDOH) as health equity drivers (Braveman, 2013; Health Equity Institute, n.d.). Davis, Rivera, and Parks (2015) described the SDOH as a combination of structural drivers (the distribution of

power, money, and other resources nationally and globally) and community determinants. Structural drivers shape conditions at the community level where people live, work, learn, play, and age. Typically, these drivers include education, employment, housing, food, transportation, and the environment.

Philosophical Underpinnings

Critical social theory and the theory of communicative action provide a philosophical perspective for interpreting population health and the CHR model. Applied to nursing, critical theory addresses the power imbalances inherent in existing social structures (Walker & Avant, 2011). It is characterized "by an emphasis on language, power relations, and the social processes associated with knowing" (Rodgers, 2005, p. 152). The theory originated in the Frankfurt School as a postmodern tradition with a Marxist orientation with political oppression central to its premise (Corradetti, C., n.d.)

Habermas is credited with giving critical theory its focus on human social interaction on a broad level and with writing about the theory of communicative action. In both critical social theory and communicative action theory, the human element is emphasized in all knowledge. Individuals are emancipated from oppressive ideologies and encouraged to act so that a free and equal exchange of ideas can lead to understanding (Rodgers, 2005).

Critical theory and communicative theory can easily be observed in public health nursing where the community is the client. Research suggests that forming participatory partnerships with the community to address health inequities and disparities may be the only effective means of improving population health in communities of poverty, joblessness, and low levels of education (Omery, Kasper, & Page, 1995). The CHR model suggests that policies and programs make the work of community partnerships and action coalitions more effective and lead to

improved health outcomes. From the perspective of policy changes, critical social theory has been used to address childhood obesity disparities (Schroeder, Kulage, & Lucero, 2015) while Martins and Burbank (2011), embraced critical interactionism to study upstream-downstream approaches to health care reform. Critical interactionism combines symbolic interactionism with critical social theory and moves across systems to inform and reform health care (Martins & Burbank, (2011).

Purpose and Goal

The purpose of this study was two-fold. First, the researcher wanted to know the prevalence of health equity issues reported in the CHA and what characteristics of the CHA were associated with more equity issues described. Secondly, the researcher wanted to identify the prevalence of successful health outcomes in the sampled population and explore characteristics that may be associated with success.

The goal of the research was to answer the questions, "How well do public health led CHAs identify potential equity issues?" and "Are public health CHIPs successful?" Knowing more about past performance could improve performance on CHAs and CHIPs during the next *Healthy People 2030* cycle.

Data was obtained from CHAs, CHIPs, and SOTCH reports. Factors associated with health equity assessment and successful outcomes will underwrite the type of technical assistance and training needs of local communities in future assessment cycles.

The study period also coincided with the initial accreditation of most LHDs in North Carolina. In 2005, Senate Bill 804 created and funded North Carolina LHD accreditation.

> All local health departments shall obtain and maintain accreditation in accordance with this section. The Board shall implement accreditation over a period of eight years, beginning January 1, 2006. The Board shall establish a schedule specifying when each local health department shall apply for initial accreditation and

ensuring that all local health departments have applied for initial accreditation by December 1, 2014 (NCGS § 130A-34.1).

In 2014, NCGS § 130A-34.1 was strengthened adding language requiring that LHDs must be accredited in order to continue to receive state and federal funding (NCGS § 130A-34.4).

Quantifying the social and economic value of CHA and CHIP should begin with an analysis of past performance. North Carolina has a rich data set for studying the specific impact of community health assessment on population health. Community health assessment is rooted in the 1970's activity called community diagnosis but transitioned to the current format between 2002 and 2007. Community health assessment is a key component of public health accreditation benchmarks.

Objectives

Five broad objectives informed the development of specific research questions:

- analyze post-accreditation community health assessments/community health improvement plans in North Carolina, 2011 to 2017;
- identify gaps in the community health assessment process that contribute to unrecognized opportunities to improve health equity;
- characterize community health interventions as outcomes or outputs;
- identify successful community health outcomes; and
- explore associations between new and established regional initiatives, academic partnerships, county socioeconomic (tier) status, hospital/healthcare system partnerships, use of vendors, and subsequent report of health equity issues identified, and health outcomes reported.

Research Questions

The research questions were:

RQ1. What is the prevalence of health equity issues reported in the community health assessment?

RQ2. Which characteristics or combination of characteristics are associated with the reporting of health equity issues?

RQ3. What are the characteristics (interventions, outputs, and outcomes) of the most recent community health improvement plans submitted by the 100 counties and what level of progress on the health outcomes have been reported in the county health SOTCH documents?

RQ4. Which characteristics or combination of characteristics are associated with successful outcomes?

Definition of Terms

Conceptual Definitions

CHA-CHIP-SOTCH Cycle. This study refers specifically to the CHA-CHIP-SOTCH cycle in North Carolina. The basic process of assessment, strategic planning, and monitoring is common to all governmental agencies, but time frames may vary according to purpose. For instance, North Carolina mandates CHA every four years, but PHAB uses a five-year cycle. The ACA/IRS requirement mandates a three-year cycle. The cycle is visualized in Figure 4.

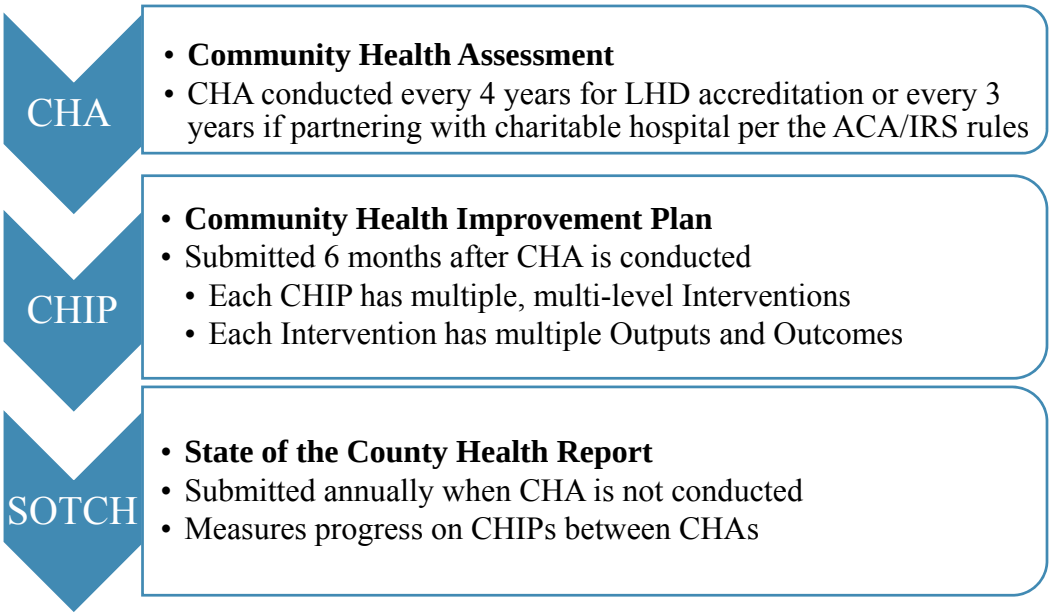

Figure 4. The CHA-CHIP-CYCLE in North Carolina. Prior to ACA, 100% LHDs conducted CHAs every four years. Post ACA, 78% of LHDs were partnering with hospitals on a three-year cycle. If partnering with a hospital, LHDs may use the term CHNA.

Health disparity. A health disparity is a measurable gap in one group's health status in relation to another. *Healthy People 2020* defines health disparity as a particular type of health difference that is closely linked with social, economic, and/or environmental disadvantage. Health disparities adversely affect groups of people who have systematically experienced greater obstacles to health based on their racial or ethnic group; religion; socioeconomic status; gender; age; mental health; cognitive, sensory, or physical disability; sexual orientation or gender identity; geographic location; or other characteristics historically linked to discrimination or exclusion (ODPHP, 2018).

Health equity. Health equity is the opportunity for everyone to have good health. *Healthy People 2020* define health equity as "attainment of the highest level of health for all people. Achieving health equity requires valuing everyone equally with focused and ongoing societal efforts to address avoidable inequalities, historical and contemporary injustices, and the elimination of health and health care disparities" (ODPHP, 2018).

Health inequity. Health inequities are unfair differences preventing everyone from the opportunity to have good health. Population health. Population health is defined as "the health outcomes of a group of individuals, including the distribution of such outcomes within the group" (Kindig and Stoddart, 2003, p. 380).

Public health. Public health is the science of protecting and improving the health of people and their communities. This work is achieved by promoting healthy lifestyles, researching disease and injury prevention, and detecting, preventing and responding to infectious diseases" (CDC Foundation, 2018). In this study, public health refers specifically to governmental (state, local, and tribal) public health unless otherwise stated.

Operational Definitions

Academic partnership with public health. An academic partnership is defined as an agreement or contracted service with a university or college to provide consultation, technical assistance or other deliverables to benefit the CHA-CHIP process. Academic partnership is further described by coding the university that affiliated with the public health entity.

Accreditation. Accreditation refers specifically to North Carolina Local Health Department Accreditation Board (NCLHDAB) requirements unless otherwise stated (NCLHDAB, 2019).

Community engagement. Community engagement refers to the process of working directly with members of the community to help them act to improve their health, the health of their families, and the health of their neighborhoods with the assistance of community coalitions serving the community.

Community health assessment. Community health assessment 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 goal of a community health assessment is to develop strategies to address the community's health needs and identified issues. A variety of tools and processes may be used to conduct a community health assessment; the essential ingredients are community engagement and collaborative participation (PHAB, 2012, p. 8). CHA-CHIP cycles occur every three to five years.

Community health improvement plan. "A community health improvement plan (or CHIP) is a long-term, systematic effort to address public health problems based on the results of community health assessment activities and the community health improvement process. A plan is typically updated every three to five years" (CDC, 2015). North Carolina has also used the

phrase action plan as an alternative term. The community health improvement plan is comprised of multi-year, multi-level interventions.

Community health needs assessment. Community health needs assessment (CHNA) refers to the legal requirement of charitable hospitals to conduct a community assessment in collaboration with community partners and public health every three years. CHNA refers to the product produced to satisfy the IRS requirement and/or accreditation.

County socioeconomic (tier) status. Tier status refers to a specific ranking done annually in North Carolina by the North Carolina Department of Commerce. The department ranks the state's 100 counties based on economic well-being and assigns each a tier designation. The 40 most distressed counties are designated as Tier 1, the next 40 as Tier 2 and the 20 least distressed as Tier 3. Four factors are used to calculate tier status:

- average unemployment rate;
- median household income;
- percentage growth in population; and
- adjusted property tax base per capita (North Carolina Department of Commerce, 2018).

Health equity issue. A health equity issue refers to either a specific subpopulation or a specific type of social or environmental condition that could manifest itself as a health inequity or health disparity within the community. Health equity issues naturally vary according to the community. The health equity issues of concern in this study are race/ethnicity (black, white, native American, Hispanic, non-Hispanic); genderism (birth gender and gender identity); ageism (under 18 and over 65 years of age), the military (active duty, veteran, or dependent); the homeless; the incarcerated; those who are visually, hearing, mobility, developmentally and/or behaviorally impaired; and foreign born (undocumented residents, residents, and immigrants). A health equity issue could also refer to a condition in the community related to the social

determinants of health (education, food, housing, poverty, safety, transportation, and unemployment), or to conditions associated with the environment (air, water, soil). Some of these issues are discussed in terms of the built environment and social determinants of health.

Hospital/healthcare system partnership with public health. A partnership that shares the same vision for community and formalizes the partnership with shared purpose, intent, and resources. Partnerships are further defined as those with origins prior to the Affordable Care Act (ACA), and those that formed after the ACA.

Intervention. A community health intervention is an action taken as part of a strategic plan to improve health outcomes. Interventions can involve individuals, families, social networks, organizations, and public policy.

Measurable outcome. A measurable outcome for a community health intervention is defined as an outcome that is well-worded and supported by baseline data or the ability to establish baseline data so that progress can be measured.

Outcome. "Outcomes are the measurable changes that occur within populations as a result of public health agencies' activities. These outcomes can be changes in people's knowledge, attitudes, behaviors, status, or condition" (Perrault et al., 2017, p. 571). Outcomes are about results, such as increased outdoor activity.

Outcome result. The study quantified an outcome result as achieved, partially achieved, not achieved, unable to determine, and not reported.

Output. Informed by Norman (2007), Perrault et al. (2017) defined outputs as "simple, doable, easily measured indicators of an agency's performance actions" In other words, outputs are related to an organization delivering a product or service—not to an individual or group using the product or service" (p. 571). If increased outdoor activity is the outcome, then the associated

outputs may be installation of bike paths and sidewalks. Outputs are means to achieving outcomes.

Post-ACA. In this study, post-ACA is defined as years 2011-2017.

Regional initiative. A regional initiative is a formal arrangement between two or more LHDs and at least one academic or commercial vendor to strengthen the community health assessment process.

Theoretical framework. A model or framework described by the Centers for Disease Control and Prevention as a recommended approach for CHA and CHIP processes.

State of the County Health report (SOTCH). SOTCH reports specify progress on multi-year interventions throughout the CHA-CHIP cycle. SOTCH reports are submitted to the state agency for each interim year between CHAs.

Vendor. A private sector consultant contracting with the public health entity or a partnering organization to assist with primary and/or secondary data collection/analysis on a fee-for-service basis.

Summary

The introduction included an overview of state, national, and international policies that have aligned over the last thirty years to address concerns about the health of vulnerable populations, including known health disparities and unknown health inequities. In population health, social determinants play the greatest role in creating healthy communities where individuals and families can thrive. These underlying drivers of health and well-being are responsible for both the length of life and the quality of life and were framed in the context of the *County Health Rankings Model* ®.

The ACA and LHD accreditation were given as examples of how legislation leads to policy and practice changes. Funding specific to the CHA-CHIP process in North Carolina was visualized showing an intense development period (1997-2011) followed by a sudden stoppage of state and federal funding at the approximate time that the ACA was enacted.

Attention to the work of Perrault et al. (2017) demonstrated the interest and difficulty of evaluating the effectiveness of outcomes in CHIPs and informed many of the definitions in this study. Critical theory provided a strong philosophical underpinning for the study with its emphasis on how those with power oppress those without power. The parallels to structural racism, ethnicism, genderism, and ableism are addressed in the health equity framework that also guided the research.

The chapter concluded with purpose and goals, objectives, research questions, and definition of terms. The organization of the remaining dissertation is as follows:

Chapter 2: Literature Review

Chapter 3: Methodology

Chapter 4: Results

Chapter 5: Discussion.

CHAPTER 2: LITERATURE REVIEW

The purpose of this study was to examine health equity issues in the CHA and to identify the prevalence of successful health outcomes listed in the CHIPs. Deeply rooted in critical theory, the evolving community health assessment process in the United States has produced multiple models and frameworks to guide the work. This chapter reviews the pertinent literature about national and North Carolina specific policies, programs, and initiatives that have influenced the CHA and CHIP process and summarizes the research for what is known about its impact on population health measures. The chapter concludes by identifying a significant gap in the research that will be the subject of this study.

Population Health

The first tenet of population health demands that quality health care be available and accessible to all people. Incrementally, U.S. health policy has adopted legislation that reduced barriers for many with respect to health care availability and accessibility. Congress adopted the Social Security Amendments of 1965, creating the first U.S. public health insurance plans, Medicare, and Medicaid (Social Security Administration [SSA], 1965). However, it would be 45 years before passage of the Patient Protection and Affordable Care Act (ACA, 2010), providing a path to universal health care in the United States. The ACA specifically called for the aggressive pursuit of population health (Nash, 2015).

With advances in the number of insured Americans, the United States is perceived to have advanced medical care, even though citizens are among the least healthy in developed nations (Evans, Barer, & Marmor, 1994; Fuchs, 1975; Kindig, 1997; Kindig & Stoddart, 2003; Knowles, 1977). For example, the infant mortality rate continues to be one of the best indicators of a nation's health. According to the Centers for Disease Control and Prevention (2017), the

United States has a higher infant mortality rate than any of the other 27 wealthiest countries. A baby born in the United States is nearly three times as likely to die during their first year of life as one born in Finland or Japan (MacDorman, Mathews, Mohangoo, Zeitlin, 2014). United States infant mortality rates vary greatly by race and ethnicity.

Schütte, Acevedo, and Antoine (2018) cautioned that it is important to look at the methodology used in global health rankings to determine healthy nations because of variability between even reputable sources of data analytics. Their study compared the methodologies of three health system rankings: "Health Systems Improving Performance" (WHO); "Mirror, Mirror on the wall: How the Performance of the US Health Care System Compares Internationally" (Commonwealth Fund; and "Most Efficient Health Care" (Bloomberg). Nine reputable ranking were considered, including the County Health Rankings (UWPHI), but six of the nine were eliminated because of the "measurement of population health without any financial component" (p. 10407). The World Health Organization (WHO) rankings were considered the most complete based upon reproducibility and transparency.

The health care system in America has changed, and so has public health. After the industrial revolution in the late 19th century, public health made extraordinary advances in its knowledge about disease, epidemiology and laboratory science, and vaccines and antibiotics led to reduced mortality. This period has become known as Public Health 1.0. (DeSalvo, O'Carroll, Koo, Auerbach, & Monroe, 2016).

Despite these early advances, by 1988, the IOM reported that "this nation has lost sight of its public health goals and has allowed the system of public health activities to fall in disarray" (IOM, 1988, p. 19). AIDS and care of the indigent were the immediate crises, but injuries, teen pregnancy, control of high blood pressure, and smoking and substance abuse were specifically

cited. Toxic substances, Alzheimer's disease, and revitalization of public health capacity were declared "time bombs" (IOM, 1988, p. 29). The IOM report launched the period known as Public Health 2.0 and led to a "clear articulation of the essential services of public health" (DeSalvo et al., 2016, p. 621).

In 2016, the U.S. DHHS launched an initiative to create a new 21st century public health infrastructure to focus on the social determinants of health (DeSalvo, et al., 2016).

> It is time to boldly expand the scope and reach of public health to address all factors that promote health and well-being, including those related to economic development, education, transportation, food, environment, and housing. Despite nearly $3.0 trillion in annual health care spending, the United States ranks 27th in the world in life expectancy, and relatively low in many other measures of health and well-being. Worse yet, for the poor in this country, life expectancy is actually decreasing. Given these trends, and persistent gaps in health status, it's time for a major upgrade to Public Health 3.0 (p. 621).

Public Health 3.0 called for

- Enhanced leadership and workforce - a chief health strategist for communities;
- Structured, cross-sector partnerships – inclusive of business partners and subpopulations at greatest risk of poor health;
- Culture of improvement through nationally accredited health departments;
- Timely, reliable, granular and actionable data at the neighborhood level that replaces outdated, merged across years to improve sample size;
- Clear metrics of what constitutes a healthy, sustainable, thriving community to document success; and
- Funding for public health initiatives aligned with prevention and community-level work (DeSalvo et al., 2016, p. 622).

In summary, interest in the phenomenon of population health in the United States has grown steadily over the last fifty years. From theory to policy to practice, we now can conduct research using population health conceptual frameworks rooted with like theoretical constructs and measures.

Core Functions and Essential Services of Public Health

Public health requires definition to determine its relevance to population health and population health outcomes. *The Future of Public Health* described assessment, assurance, and policy development as the three core functions of public health (IOM, 1988). Anticipating major reform in healthcare legislation, the greater public health community convened a steering committee to further explicate the IOM definition. Comprised of representatives from CDC, the Health Resources and Service Administration (HRSA), ODPHP, and other public health service agencies, the committee outlined the ten essential public health services in their 1994 report *Public Health in America* (CDC, 2017; Public Health Functions Project, 1997).

Widespread adoption of both the three core functions and ten essential services followed. In 1995, APHA adopted the Public Health Wheel to consolidate views about the significant contributions of public health work within society. Subsequently, the NPHPS established its measures based on the ten essential public health services. (ASTHO, 2018).

Global and National Influences

Social Determinants of Health (SDOH)

The link between SDOH and population health has been firmly established (IOM, 1988; IOM, 2003; Wernham & Teutsch, 2015; Wilkinson & Marmot, 2003). The WHO defined the SDOH as "the conditions in which people are born, grow, live, work and age, and the wider set of forces and systems shaping the conditions of daily life" (WHO, 2018, SDOH). WHO has influenced not only national and subnational goals in the United States, but also the global community. One example of how SDOH has shaped global policy is in *Health in All Policies (*HiAP*)*.

HiAP is an approach to population health under the leadership of WHO that was initially conceptualized in the "Declaration of Alma-Ata in 1978, and the Ottawa Charter for health promotion in 1986" (Rudolph, Caplan, Ben-Moshe, & Dillon, 2013, pp. 142-143; WHO, 1986). Final adoption occurred in 2013.

> *Health in All Policies* is an approach to public policies across sectors that systematically takes into account the health implications of decisions, seeks synergies, and avoids harmful health impacts in order to improve population health and health equity. It improves accountability of policymakers for health impacts at all levels of policy-making. It includes an emphasis on the consequences of public policies on health systems, determinants of health and well-being (WHO, 2013, Helsinki Statement).

In the United States, HiAP has been endorsed by both NACHHO and APHA (NACCHO, 2015; APHA, 2018). The five key elements of HiAP are

- Promote health, equity, and sustainability.
- Support inter-sectorial collaboration.
- Benefit multiple partners.
- Engage stakeholders.
- Create structural or process change (Rudolph et al., 2013, p. 5).

Globally, South Australia adopted HiAP broadly, but adoption in the United States has been more incremental with advancement reported in California, Colorado, Florida, Georgia, Hawaii, Illinois, Kansas, Maryland, Massachusetts, Minnesota, Oregon, Pennsylvania, Tennessee, Texas, Vermont, Virginia, Washington, and Washington, D.C. (Gase, Pennotti, & Smith, 2013; Gase et al., 2017; Rudolph et al., 2013; Wernham, & Teutsch, 2015).

Lucyk and McLaren (2017) conducted a scoping review of the literature for SDOH because "during the past 15 years, the SDOH concept has evolved to the point of being a formal component of many undergraduate and graduate training programs in PPH [population and public health] and related fields, and this it is time to take stock of the SDOH literature and

identify its major themes" (p. 2). Initially, 5259 articles were retrieved and ultimately, 108 articles underwent qualitative analysis. They found that health equity was a key theme.

> One theme emerged prominently during our analysis: health equity as an overarching theme and binding concept for the SDOH. We furthermore found that this binding concept of health equity was conceptualized in different ways, which align with more 'upstream' and 'downstream' orientations (p. 13).

Healthy People Initiatives

The Healthy People initiative began in 1979, when Surgeon General Julius Richmond issued *Healthy People: The Surgeon General's Report on Health Promotion and Disease Prevention.* The report included "ambitious, quantifiable objectives to achieve national health promotion and disease prevention goals for the United States within a 10-year period (by 1990)" (ODPHP, 2018, Framework). In subsequent decades, updated, 10-year Healthy People goals and objectives were released (*Healthy People 2000*, *Healthy People 2010*, and *Healthy People 2020*).

The U.S. DHHS partnered with the IOM to provide the national health objectives in the *Healthy People* reports. The mission of *Healthy People 2020 (HP 2020)* is to:

- Identify nationwide health improvement priorities;
- Increase public awareness and understanding of determinants of health, disease, disability, and opportunities for progress;
- Provide measurable objectives and goals applicable at national, state, and local levels;
- Engage multiple sectors to take actions to strengthen policies and improve
- practices that are driven by the best available evidence and knowledge; and
- Identify critical research evaluation and data collection needs (IOM, 2011).

The IOM created its *HP 2020* framework for over 600 objectives based upon a population health framework that was the precursor to the CHR model and included health outcomes (morbidity and mortality), health factors (health behaviors, clinical care, social and economic factors, and physical environment), and programs and policies (IOM, 2011).

The *HP 2020* framework reflected a health disparity approach. Shah and Sheahan (2015) examined health disparity by analyzing data from the NACCHO National Profile of LHD Survey. They studied the performance of LHDs conducting activities to address health disparities over a two-year period. Analyzing three waves of survey data (2003, 2008, and 2013) they found that about 20% of LHDs in 2013 did not perform any activity to address health disparity. The percentage of health departments reporting no activity was greater in 2013 than in 2003 and 2008. Comparing the three waves, Shah and Sheahan concluded that "reduced infrastructural capacity of LHDs has resulted in fewer LHDs addressing health disparities in their jurisdictions" (p.1). The authors reported that this was an unexpected finding, believing that passage of the ACA in 2010, should have stimulated an increase in LHD activities to address health disparities in 2013.

The *Healthy People 2030 (HP 2030)* framework was approved by the Health and Human Services Secretary in June 2018. *HP 2030* iterated the success of the Healthy People initiative citing achievements in "reducing major causes of death such as heart disease and cancer; reducing infant and maternal mortality; reducing risk factors like tobacco smoking, hypertension, and elevated cholesterol; and increasing childhood vaccinations" (ODPHP, 2018, Framework). However, it also recognized that the United States "lags other developed countries…on key measures of health and well-being, including life expectancy, infant mortality, and obesity, despite spending the highest percentage of its gross domestic product on health" (ODPHP, 2018, Framework).

The much-anticipated *HP 2030* uses a healthy equity lens to identify health disparities and uses a population health framework to develop indicators and measures. Hebert-Beirne, Felner, Castaneda, and Cohen (2016) found that the community health assessment can be used to

uncover the roots of community health inequities. The Chicago, Illinois CHA identified six community areas of the 77 communities within Chicago that were identified as having historic and present social and economic needs. This determination used the Economic Hardship Index (EHI) that incorporates six socioeconomic variables: "crowded housing, households living below the federal poverty level, unemployment, high school graduation, the dependency percentage of the population younger than 18 or older than 64 years, and income level" (p. 372). "Thematic analysis of the qualitative data revealed not only discrete and salient community health needs and assets … but also critical insight into how residents perceive the roots of health inequities in their communities" (p. 374).

Public Health Accreditation

National public health department accreditation launched in 2011, after seven years of exploring and planning (PHAB, 2018). PHAB was formed

> as a fledgling organization under the auspices of a board of incorporators made up of the executives of the American Public Health Association, the Association of State and Territorial Health Officials, the National Association of Local Boards of Health, and the National Association of County & City Health Officials, representing the larger practice community. The Robert Wood Johnson Foundation and the Centers for Disease Control and Prevention co-supported PHAB's activities to lead the field-driven development and testing of the many critical elements of a national accreditation program (Beitsch et al., 2014, p. 2).

PHAB offered voluntary national accreditation of state and local public health agencies with three prerequisites for accreditation: health assessments, health improvement plans, and strategic plans (Thielen, Dauer, Burkhardt, Lampe, & VanRaemdonck, 2014).

In 2011, the IOM recommended that states revise their laws to require public health accreditation (IOM, 2011). With PHAB emphasizing the use of evidence-based practice, LHDs became more interested in using CHA to support data-driven CHIPs (Brownson et al., 2014; Conley, Vagi, & Horney, 2014; Fields, Stamatakis, Duggan, & Brownson, 2015; Singh &

Carlton, 2017; Thielen et al., 2014). Evidence-based practice was also associated with CHA and public health accreditation standards (Armstrong et al., 2014; Fields et al., 2015; Lovelace et al., 2015; Sosnowy, Weiss, Maylahn, Pirani, & Katagiri, 2013).

Bender (2017) noted that public health accreditation changed the way that CHAs were conducted. "When public health accreditation first began in 2007, many LHDs had not formalized participatory community health assessments and improvement planning processes" (Bender, 2017, p. S6). For example, Abarca, Grigg, Steele, Osgood, and Keating (2009), did not reference public health accreditation in their assessment of capacity to conduct CHA in the state of Florida. Four years later in the same state, Price, Grigg and Byrne (2013) stressed the importance of PHAB as a reason for strengthening public health performance efforts. Bender (2017) expanded her thoughts on accreditation by writing that

> In the 10 years since PHAB was incorporated, health departments working with their communities to conduct the health assessment and improvement plans have become common. Most health departments now have those documents, and updated reports, on their Web sites. There is a shared commitment by many health departments and their communities to keep getting better and more sophisticated at using timely data to track their progress, in understanding their total community and involving the community in setting goals and making decisions, and in being transparent about all of that work (p. S8).

Impact of the Patient Protection and Affordable Care Act

The ACA required the IRS to assure that charitable hospitals conduct a CHNA every three years to maintain their charitable tax status (IRS, 2014). Failure to comply with the IRS requirements could result in a $50,000 fine, and a possible revocation of the nonprofit hospital's tax-exempt status. In 2006, the Congressional Budget Office estimated the value of federal, state, and local tax exemptions for nonprofit hospitals as $12.6 billion (CBO, 2006). In 2011, the estimate nearly doubled to $24.6 billion (Cramer, Singh, Flaherty & Young, 2017).

Borders (2016) described the three requirements that hospitals must adhere to:

- involve people with special knowledge of or expertise in public health;
- involve persons who represent the broad interests of the community served by the hospital; and
- make the CHNA available to the public, primarily through web posting (p. 500).

Hospitals have reported a need for tools (Schifferdecker et al., 2016) and partners (Wahowiak, 2017) to meet this federal mandate and the result has been favorable for health department and hospital jointly conducted assessments. Nevertheless, a wide variation among hospitals and their ability to conduct CHAs has been reported (Pennel, McLeroy, Burdine, Matarrita-Cascante, & Wang, 2016).

Pennel et al. (2016) found that the IRS requirements had the potential for population health improvement but found that the "first 3-year assessment and planning cycle (2011-2013) suggest this is unlikely" (p. 178). The mixed-methods study by these authors used a population health framework that included interrelated elements:

- a broad definition of health;
- defining the community beyond the hospital or clinic populations;
- population health improvement recognized as a shared responsibility among health care, public health, and community-based organizations;
- broader determinants of health and points of intervention;
- identification of drivers or root causes of health issues;
- implementation of clinical and nonclinical interventions, including health promotion and disease prevention programs and policies; and
- measurement of health outcomes and performance (pp. 178-179).

The study found that of 473 health priorities among the 95 CHNA reports, about half (46.5%) were related to health systems, such as access to care. Health conditions (obesity, diabetes, mental health, substance abuse, cardiovascular disease, asthma, and sexually transmitted diseases) constituted almost 40% of all priorities. Health behaviors (physical activity, nutrition,

and smoking) made up 9%, and community conditions comprised about 5% (air quality, transportation, and environmental infrastructure (p. 180).

Singh and Carlton (2017) conducted a one-year, cross sectional study of LHDs using the 2013 NACCHO National Profile of LHD Survey. The researchers suggested that

> PHAB accreditation prerequisites together with IRS requirements for hospitals foster potential for collaboration around CHAs/CHNAs. Joint completion of CHAs/CHNAs not only allows partners to complete the assessment more efficiently but has also been shown to produce higher-quality assessments, thus building a strong foundation for continued collaboration to improve community health (p. 138).

North Carolina Initiatives

Parallel to the *Healthy People* initiative nationally, North Carolina has produced a set of decennial health objectives every year since 1990, with the goal of making North Carolina a healthier state (HNC 2020; NCDHHS, 2016). Having a North Carolina-specific process for setting objectives that mirrors the national initiative may help to mobilize the state to achieve a common set of health objectives.

Healthy North Carolina

The state public health agency, N.C. DPH, partnered with the North Carolina Institute of Medicine (NCIOM) to develop *Healthy NC 2020* (*HNC 2020*) objectives. The NCIOM convened stakeholders and the public to discuss community concerns and identify the complex issues of concern with the goal of developing workable solutions to improve health, health care access, and quality of health care in North Carolina. *HNC 2020* had 40 objectives within 13 specific focus areas: tobacco use, nutrition and physical activity, sexually transmitted disease and unintended pregnancy, substance abuse, environmental risks, injury and violence, infectious disease and foodborne illness, mental health, social determinants of health, maternal and infant health, oral health, chronic disease, and a cross-cutting focus area (such as increase average life

expectancy) (NCDHHS, 2016; NCIOM, 2011). Since 2010, LHDs "have been required to link their top priorities to the goals and objectives of *HNC 2020*, and they are required to select health improvement strategies that are evidence-based, in order to provide the greatest chance for maximum impact" (Reed and Fleming, 2014, p. 403).

Healthy Carolinians

The *Healthy Carolinian* movement gave structure to the early CHA work in North Carolina. The Office of Healthy Carolinians (OHC) within DPH was funded by CDC and the NCGA. The director of that office "directed the expansion of Healthy Carolinians, a statewide network of public-private partnerships working toward community health improvement through policy changes, community programs, and system changes necessary to realize North Carolina's 2010 objectives" (Bobbitt-Cooke, 2010, p. 327). The program was defunded in 2012; support for CHA transferred from OHC to the DPH Local Technical Assistance and Training Branch without dedicated funding (Nelson, Rocco, & Dail, 2018).

Consolidated Agreement

For more than a decade, state and local public health agencies have entered into negotiated, consolidated agreements annually that specify the high-level requirements for CHAs and CHIPs. Beginning in the late 1990s, the Healthy Carolinian movement had the strongest influence on the CHA process. The OHC published a handbook providing a stepped approach to CHA. Many LHDs and their community partners used the handbook as a formula, rather than a guide, for creating the assessment and improvement plans. (Nelson, et al., 2018).

North Carolina Local Health Department Accreditation

In 2005, before national public health accreditation was available, North Carolina became the first state to mandate LHD accreditation as a condition of public funding (Reed & Fleming,

2014). “The North Carolina Division of Public Health and the North Carolina Association of Local Health Directors undertook an initiative to develop a mandatory, standards-based system for accrediting local public health departments throughout the state” (NCLHDA, 2017). Davis et al. (2011) reviewed data from 48 of 85 North Carolina LHDs that had achieved accreditation status as of July 2009. One area examined spoke to the perceived benefits of being accredited. There results showed improvements in relationships with hospitals and community groups, as well as with county commissioners and boards of health (Davis, et al., 2011).

After 2007, accreditation became the strongest influencer on LHD CHA. Nevertheless, some experienced local health directors have questioned the value of CHA calling it an unfunded mandate of questionable worth except when applying for grants (personal communication of seven anonymous health directors, 2015-2018). Local CHA coordinators, usually employees of the LHD, are the designated leads for the CHA process. A frequently voiced concern of the coordinators is that requirements are constantly changing. During the last decade (2008-2018), the requirements for CHA-CHIP have changed six times (Nelson, et al., 2018)

Cross-Jurisdictional Resource Sharing

Shah, Badana, Robb, and Livingood (2016) discussed the many challenges that LHDs face “amidst fiscal restraints and [the] complex dynamic environment” (p. 110). Examining data from the 2013 NACCHO National Profile of LHD Survey, they found evidence that more than 54% of LHDs shared resources with one or more other LHDs on a continuous basis. Resource sharing (funding, staffing, and equipment) had significant positive influences in both programmatic areas of the LHD and in organizational functions. The weighted percentage of resource sharing indicated high level of sharing in the emergency preparedness program (34.8%) compared to 16.2% in the community health assessment process (p. 114). They concluded that

resource sharing is not a universal norm among resourceful health departments, suggesting that pooling of resources may be a useful strategy for agencies less resourced.

North Carolina has three regional approaches of resource sharing among LHDs and their partners for CHA-CHIP: WNC Healthy Impact, Health ENC, and the Southeastern North Carolina Regional Health Collaborative.

WNC Healthy Impact. Arledge (2018, January) reported on the collective impact of 16 western North Carolina counties that formed a regional partnership known as WNC Healthy Impact in 2008, prior to the ACA. The objectives were

- Enhance partnerships between hospitals and health departments
- Improve efficiency, quality, and standardization of community health assessment data collection and reporting of data and plans
- Encourage strategic investment of community resources to support priority health issues
- Catalyze and coordinate action among existing and new assets and initiatives to address priority health needs
- Monitor results to improve process, quality, and health outcomes
- Promote accountability of hospitals and public health agencies through meeting community health improvement requirements at the state and national level.

The regional partnership, initially funded by WNC Health Network, Inc., has received additional funding from The Duke Endowment to infuse Results-Based Accountability ™ throughout their processes. Most of the counties in the regional initiative are considered small and rural.

Health ENC. Delia and Broughton (2018, January) shared progress toward the full implementation of Health ENC, a collaborative between hospitals and health department in 33 eastern North Carolina counties. The initiative began in 2015 within the Office of Health Access at the Brody School of Medicine at East Carolina University, but also has received support from The Duke Endowment to locate the administrative and operational responsibility to the Foundation for Health Leadership and Innovation. Like WNC Healthy Impact, most of the counties in the regional initiative are considered small and rural.

Southeastern North Carolina Regional Health Collaborative. The University of North Carolina at Wilmington established the Southeastern North Carolina Regional Health Collaborative (SENCRHC) to "improve individual and population/community health in Southeastern North Carolina through regional programs and interventions" (UNCW, 2018, Southeastern). Eight counties health directors served by the collaborative have stated their intent to create a regional health assessment. Seven of the eight counties are considered rural.

Community Health Assessments and Community Health Improvement Plans

Historically, governmental community health assessments have studied morbidity, mortality, and demographic characteristics in hopes of identifying patterns of disease. Risk factor identification added a new dimension in the 1970s and it was common to see the phrase "populations at risk" at risk in CHAs. As social and ecological factors were introduced in the 1980s, health promotion and disease prevention interventions were emphasized. By the mid-1900s, health disparities and social capital were considered; occasionally, health equities were discussed. Throughout three decades of CHA, attention has shifted continually to the CHIPs and to the use of multilevel interventions to address complex community issues (Burdine and Smith, 2017; Schölmerich, & Kawachi, 2016).

Purpose and Structural Components

Pennel, Burdine, Prochaska, and McLeroy (2017b) wrote that the CDC defined the purpose of CHAs and CHIPs as "to examine community health status and health trends; prioritize health issues; and identify, implement, and evaluate intervention strategies, programs, or policies to improve priority health issues" (p. S14). Several CHA and CHIP models have been created specifically for public health agencies. These include

- PATCH – Planned Approach to Community Health,
- APEX-PH - Assessment Protocol for Excellence in Public Health,

- PACE-EH - Protocol for Assessing Community Excellence in Environmental Health,
- MAPP - Mobilizing for Action through Planning and Partnerships,
- Community Health Improvement Process,
- County Health Rankings & Roadmaps to Health Action Cycle, and
- Healthy People 2020 MAP-IT - Mobilize Assess Plan Implement Track (CDC, 2018; Pennel et al., 2017b; US DHHS, 1995; UWPHI, 2018).

In recent years, some models have addressed the specific needs of hospitals and health care systems to fulfill the IRS requirements: The Partnership Approach is one such model. The Catholic Health Association of the United States (2013) has provided guidance to hospitals on how to conduct assessments. More holistic and comprehensive models have been promoted by organizations like WHO's Healthy Cities/Healthy Communities model, and the CDC's CHANGE model (US DHHS CDC, 2010; Pennel et al., 2017b).

Pennel's assessment of all CHA and CHIP models identified common components. These included

> preplanning; partnership development; developing vision and scope; collecting, analyzing, and interpreting data; identifying community assets; identifying priorities; developing and implementing an intervention plan; developing and implementing an evaluation plan; communicating and receiving feedback on the assessment findings and/or the plan; planning for sustainability; and celebrating success (Pennel et al., 2017b, S16).

Bender (2017), writing from the perspective of PHAB, defined the required elements similarly, but stressed that the CHA was developed through a participatory, collaborative process with various sectors of the community. The elements identified were:

- Various sources of data;
- Population demographics;
- Health issues identified;
- Special populations with health issues;
- Contributing causes of health issues;
- Description of assets to address health issues; and
- Documented input from stakeholders (p. S7).

CDC identified eight basic steps in the assessment and planning process that were widely adopted in North Carolina (D. Nelson, 2016, personal communication). The steps were published on the state health agency website and became the table of contents for most community health assessments, often without identifying a conceptual model or framework to support the process (D. Nelson, 2017, personal communication; K. Dail, 2017, observation). The steps of the process were

1. Organize and plan;
2. Engage the community;
3. Develop a goal or vision;
4. Conduct community health assessment(s);
5. Prioritize health issues;
6. Develop community health improvement plan;
7. Implement and monitor community health improvement plan; and
8. Evaluate process and outcomes (NCDHHS, 2014).

Research Findings

The review of the pertinent literature found credible studies in many areas identified by Pennel et al. (2017b) as common components of CHAs and CHIPs. The components are as follows:

Vision and scope. Leaders have responsibility for establishing the vision and scope of the CHA and CHIP. If multisectoral leadership is to be effective, all leaders must agree to a shared vision. Having a clear purpose will hold the stakeholders together (IOM, 2014). The vision and scope of assessment and planning is defined by the leadership and the approach is defined using theories, models and frameworks.

Leadership. Kindig and Isham (2014) proposed that in the community health business model, leadership structure must be designed and implemented. Leadership may come from the healthcare sector, public health, businesses, or community organizations. Servant leadership was

described in 1977 as a leadership style for business (Greenleaf, 1977). Considering the community health business model, Hunter et al. (2012) wrote that a servant leadership model may "improve the ethical culture of modern companies because servant leadership promotes more morality-centered self-reflection by leaders than other leadership styles" such as transformational leadership (p. 2013). This position was supported by Trastek, Hamilton, and Niles (2014).

Hearld, Alexander, and Shi (2015) studied relationships among members of a multisectoral health care alliance during a leadership transition. They found that it was important for the incoming leadership and remaining members of the alliance to maintain a sense of alliance during the transition to avoid unwanted challenges affecting the benefits and costs of being part of an alliance. Kelly, Davies, Greig, and Lee (2016) acknowledged the significant role that the mayor of New York City played over a ten-year period in introducing and facilitating multilevel changes to the environment to impact obesity, particularly in children.

Strong leadership from public health and healthcare systems are essential, but forward progress on population health issues will require a shared vision across multiple sectors, including the business community, government executives, and engaged community advocates.

Use of theories, models and frameworks. The socioecological model has been used as the basis for several CHA and CHIP models. Multilevel interventions were an integral part of the model, directed at individuals, groups, communities, organizations, and policies. Paskett et al. (2016) found that multilevel interventions to address health disparities may improve population health. "Multilevel interventions are those that affect at least two levels of interventions" (Paskett et al., 2016, p. 1429).

Scholmerich & Kawaachi (2016) also found that multilevel interventions were inspired by the socioecological model. "Despite becoming a buzzword in public health, multilevel interventions remain scarce… several studies indicate that public health interventions mostly have single-level targets (i.e., objectives) and are predominantly focused on achieving intrapersonal change" (p. 17).

Lewis, Fitzgerald, Zulkiewicz, Peinado, and Williams (2017) interviewed alliance representatives at five grantee sites across the United States to explore the synergies in multilevel interventions around diabetes self-management. Three themes emerged supporting the synergistic effect: "(1) enhancing engagement between patient and provider and access to quality care; (2) supporting communication, information sharing, and coordination among providers, community stakeholders, and systems; and (3) building relationships and fostering alignment among providers, community stakeholders, and systems" (p. 236).

Joly et al. (2007) used a logic model to link accreditation and public health outcomes. They proposed a framework to show that "public health does result in health status improvement, and that accreditation will both demonstrate and enhance this research." (p. 355). Gutilla, Hewitt, and Cooper (2017) used the Washington State Logic Model for the CHA in Northern Larimer County, Colorado. They found that the logic model "allowed them to broaden their thinking" and "brought to the forefront our intended outcomes, impacts, and modifying factors, and provided a framework from which to develop evaluation questions" (pp. S36-37).

The CHR model developed by the UWPHI with support from the RWJF has been extensively reviewed (Hood, Gennuso, Swain, & Catlin, 2016; Kreiger, 2017; Remington, 2015; Remington, 2017; Remington, Catlin, & Gennuso, 2015). Remington (2017) defended the CHR model stating that although imperfect, it is "useful to motivating communities to work together

toward the goal of long and healthy lives for all" (p. e28). The model applied percentages to the four categories of health factors and summarizes the health outcomes and modifiable risk factors in every county in the nation. Kreiger (2017) strongly criticized models like the CHR stating that "public health claims to scientific rigor are compromised by inaccurate assumptions and methods. The focus should shift to valid and transparent methods to quantify the toll of health inequities and progress toward their eradication" (p. 548). Remington (2015) admitted that the reliability of the measures used in the CHR "varies greatly from county to county" (p. 1409) and discussed efforts to improve the reliability of the survey-based measures within the CHR model. Courtemanche et al. (2015) recommended that CHR incorporate error estimates for the rankings. In the analysis of 2015 CHR data, Hood et al. (2016) recognized that the CHR model performed better in some states than in others. In North Carolina, socioeconomic factors and health behaviors were significant predictors of health outcomes, with socioeconomic factors being the strongest (Hood et al., 2016). Harris, Scutchfield, Heise, and Ingram (2014) also found that socioeconomic factors had the strongest link to health status in Kentucky.

Partnership development. Sibbald, Kothari, and Rudman (2012) conducted a qualitative study to "better understand how partnerships are initiated, maintained, and sustained in public health practice" and reported that "most partnerships are formed on an ad hoc basis" (Sibbald, et al., 2012, p. 95). Perry and Stephenson (2013) discussed the process used in Trenton, New Jersey, to produce a unified CHA and CHIP among its hospitals, the one federally qualified health care center, the health department, and more than 40 community organizations. Having a single plan that met requirements for all participating entities led to the identification and adoption of a web-based tool to publicly report data to the community at the zip code level.

The IRS requirements provided the framework for the unified process; the authors did not report on how this framework may or may not have impacted public health accreditation requirements.

Partnerships with universities. Academic partnerships between public health CHA initiatives and universities have flourished for decades (Chudgar et al., 2014; Hebert-Beirne, Felner, Castañeda, & Cohen, 2016; Lovelace et al., 2015; Neri, Ballman, Lu, Greenlund, Grunbaum, 2014; Wetta, Dong, LaClair, Pezzino, & Orr; 2015). The literature suggested that academic partnerships provide training and technical assistance to governmental CHA teams and support primary and secondary data collection and analysis. In recent years, universities have assisted with spatial mapping and visual displays of determinants of health. In the past, federal funding supported CHA Research Centers at universities throughout the United States; these universities built capacity and interest to work with communities on health improvement plans. Universities were especially well-equipped to conduct evaluation studies of CHA (Neri et al., 2014).

Spoth and Greenburg (2011) identified a knowledge gap regarding the sustainability of community-university academic partnerships using the PROSPER model (Promoting School-community-university Partnerships to Enhance Resilience). The study looked at 28 school districts from two states (Pennsylvania and Iowa) over a six-year period. The multilevel intervention project reported that "several relationships attained statistical significance at particular points in time, [though] none were stable across cohorts" (p. 1).

Krumwiede, Van Gelderen, and Krumwiede (2014) used the Community-Based Collaborative Action Research (CBCAR) framework to assess effectiveness of an academic-hospital partnership. The findings suggested a benefit to the nursing students who conducted the

CHNA. The CHNA met all the requirements mandated by IRS but the evaluation did not consider health outcomes of the community served by the hospital.

Partnerships with hospitals. Governmental public health agencies have always solicited involvement of community hospitals when conducting CHAs, however engagement has historically been weak. The Patient Protection and Affordable Care Act (ACA, 2010) opened dialogues between health departments and hospitals by mandating that charitable hospitals complete community health needs assessments every three years and engage in community improvement activities. A proliferation of activity surrounded this new legislation resulting in many successful partnerships (Alfano-Sobsey, Ledford, Decosimo, & Horney, 2014; Beatty, Wilson, Ciecior, & Stringer, 2015; D'Amore & Bretherton, 2014; Laymon, Shah, Leep, Elligers, & Kumar, 2015; Pennel et al., 2015; Schifferdecker, 2016). One of the most important initiatives to help hospitals embrace CHA was the Centers for Disease Control and Prevention 6/18 Initiative (CDC, 2016). This initiative targeted six high burden, high cost conditions and pairs them with 18 evidence-based interventions.

Partnerships with employers. Engagement with the business community is an absolute necessity in the community health business (CHBM) model (Kindig & Isham, 2014). The model proposed by Kindig and Isham is multisectoral – meaning "medical organizations, government, schools, businesses, and community organizations. All must make substantial changes in how they approach health and allocate resources" (p.3). Businesses must recognize that population health has value to the organization and see population health initiatives as consistent with the mission and capabilities of the organization (IOM, 2014; IOM, 2015). Smith and Burdine (2017) identified engagement with the business community as a need among current public health professionals in practice and academia. The public health workforce has now been challenged to

create high achieving governmental health departments led by the community chief health strategist (DeSalvo et al., 2016; Nash, 2015).

Community engagement and communicating findings. Bender stressed community engagement as a fundamental element of CHA. Parker, Margolis, Eng, and Henriquez-Roidan (2003) recognized the importance of assessing the capacity of health departments to engage in community-based participatory public health. The researchers created indicators of LHD capacity and distributed a 27-item survey to 429 employees in four LHDs. Response rate was about 66 %. Using factor analysis, they identified four factors of community-based participatory practice that could be used to measure capacity. The factors were (1) the agency's and (2) the individual employee's skills in working with community groups and minority populations, (3) the extent and frequency of agency networking, and (4) community participation in health department planning.

Pennel, McLeroy, Burdine, Matarrita-Cascante, and Wang (2017a) looked at community participation in nonprofit Texas hospitals CHNAs between December 1, 2013, and January 5, 2014. They found that

- Overall, most hospitals engaged a wide range of community stakeholders;
- Findings echo previously expressed concerns that some groups are being left out of the assessment and planning process
- While engaging representatives for medically underserved, low-income, and minority populations is important, hospitals should also make meaningful efforts to engage members of these populations.
- Most, although not all, hospitals met the minimum community engagement requirements set forth by the IRS. However, this is a missed opportunity to engage a wide variety of community stakeholders and community members in *meaningful* collaboration *throughout* the assessment and planning process.

Kirk, Johnson-Hakim, Anglin, and Connelly (2017) applied the eight principles of community-based participatory research to CHNA using the classic work of Israel, Schulz, Parker, and Becker (1998). Winterbauer, Bekemeier, VanRaemdonck, and Hoover (2016) also

applied Israel and colleagues' nine CBPR principles to public health-practice based research networks (PH-PBRNs). These networks "partner academic researchers and public health practitioners to answer questions relevant to practice in the nascent field of public health services and systems research" (Winterbauer, Bekemeier et al., 2016, p. 2).

Writing in the *Journal of Community Health Nursing*, Running, Martin, and Tolle (2007) spoke to the value of participatory community health assessment.

> Speaking to members of the community not only builds trust and improves relationships between the people of the community and health care providers, but it also improves the health care providers' understanding of and respect for the lives and unique culture of the members of the community. This improved relationship has been found to encourage better attendance at health care visits, as well as improve patient education through exposure to medical services and community (p. 201).

Data synthesis, priority setting, and intervention planning. Erwin et al. (2013) studied data synthesis in Northern Kentucky Health Department, East Central Health District Health Department of Nebraska, and the Knox County Health Department in Tennessee. The three agencies were experienced users of the MAPP model to conduct CHA. They reported that

> while most models provide clear guidance for many of the steps involved in conducting CHAs, particularly for the actual qualitative and quantitative data collection processes and for prioritization, there is relatively little practical guidance for bridging the steps of data collection and prioritization to synthesize the various types of data (p. 468).

In Kentucky, the synthesis of data into strategic issues was a two-step process. First primary and secondary data sets were analyzed and prioritized by each of four workgroups using nominal group technique, modified Hanlon, and simple voting. Once each group had determined priorities, 78 participants reviewed the summaries from the four assessment workgroups, drew conclusions, and identified commonalities.

> The synthesis methodology evolved from developing recommendations that stemmed from the question: Which issues suggested by the assessment findings

must be addressed to achieve the MAPP vision: "Thriving people living healthy lifestyles in a vibrant community?" (Erwin et al., 2013, p. 470).

Nebraska conducted a CHNA and CHIP covering four counties with 30 sources of data. Due to the complexity of the CHNA, the district "hired an independent consulting firm to review the data and provide a draft set of community health needs for the district overall and for each individual county (Erwin et al., 2013, p. 471). The public was invited to all CHIP meetings; 70 individuals participated in the day long strategic planning meeting where table teams individually, and then as tables of eight, created a sticky wall of issues. Ten issues emerged that were then rank-order prioritized into the top five final strategic issues.

Knox County Tennessee used a 20-member leadership team with multisectoral representatives to facilitate data synthesis and prioritization. Completion of the four MAPP assessments included "contributions from more than 3000 community members through focus groups, completed surveys, daylong large-group activities, and other mechanisms (Erwin et al., 2013, p. 472). Their process asked the leadership team to review the four assessments plus additional locally collected health inequity data and identify "significant data points were defined as data that were surprising … that indicated a greater problem, …. or that merited a closer look or more context" (p. 472). The leadership team met in a daylong meeting to reduce 17 issues into three categories for planning interventions.

Erwin et al. (2013) found that the three cases share commonalities in

- focusing data synthesis activities through daylong (or more) retreats,
- using multiple planning and quality improvement techniques to synthesize data for identifying strategic issues, and
- using iterative approaches to reduce a large number of potential strategic issues to a manageable set for action planning (p. 473).

Identifying community assets. The term "community assets" originated in the context of community mobilization where it was described as "community assets mapping" (Krieger &

McKnight, 1996; Parks & Straker, 1996, p. 321). It also appeared in the work at the Center for Urban Affairs and Policy Research at Northwestern University, but few studies were found in the health education and public health literature. The three elements of community assets assessment are

- capacity inventory of individuals,
- inventory of local associations, and
- inventory of local institutions (Parks & Straker, 1996, p. 322).

Hebert-Beirne et al. (2018) discussed the increasing importance of "the strategic means of identifying community health needs and assets to improve wellbeing" and wrote about its relevance to "taking action on reducing health disparities" (p. 776). North Carolina LHD accreditation standards merely refer to a requirement in the community health assessment to Benchmark1: Activity 1.1: "identify existing and needed health resources" (NCLHDA, 2018).

The Rand Corporation, under contract with the state of New York, conducted an extensive review of studies and publications assessing factors that characterized CHA processes (Myers and Stoto, 2006). The technical report that followed implied identification of community assets but used the language "inventory resources" taken from the IOM's CHIP model (IOM, 1997).

Platonova, Studnicki, Fisher, & Bridger (2010) reported that "public health officers in North Carolina generally utilize subjective criteria more frequently than objective criteria when deciding upon what the most important health issues are in their communities" (p. 146). The exploratory study looked at eleven evaluation criteria for determining the priority of community health problems, including magnitude of the problem, feasibility of correcting a problem, and cost-effectiveness. Educational background and tenure of the health officer could be contributing factors in the ranking of problems.

Earle-Richardson et al. (2015) compared community view and health department views of priorities in New York. They concluded that "health department priorities were consistent with community views on the leading issue, access to quality health care" (p. 43), however the second leading issue for communities, obesity, was only "partially present among county priorities, even though health indicator data suggest that it is particularly severe problem in the study region" (p. 43). They recognized that there are practical benefits of "having high-quality, systematically collected public opinion data along with health indicator data when doing strategic planning: community views are more accurately represented" (p. 43).

Developing and implementing the evaluation plan. The literature on implementation and evaluation of CHA and CHIP processes revealed four categories of studies:

- studies on opinions/meaningfulness/usefulness of CHA,
- studies utilizing NACCHO survey data,
- studies proposing evaluation models, and
- studies measuring outcomes and outputs.

Studies on usefulness/meaningfulness. Research on CHA have examined a variety of aspects. Several studies examined usefulness (Byrne et al., 2002; Kuehnert, Graber, and Stone, 2014; Stoto, Straus, Bohn, & Irani, 2009; Wetta, Dong, LaClair, Pezzino, & Orr, 2015). Bryne developed the only quality assessment tool and assessed 58 New York State CHAs and described high quality sections. Stoto et al. (2009) introduced a web-based assessment tool to determine usefulness of CHA and found "very few rigorous, systematic evaluations of CHA strengths, weaknesses, and outcomes" (Stoto et al., 2009, p. 11). The study concluded that

> community health assessment reports should state their goals and purpose; include the most important aspects of the community's health; allow comparisons with other communities, other benchmarks, and, over time, present data in meaningful subgroups of population; provide sufficient focus on positive characteristics; and document the process and methods that are used to create the CHA (Stoto et al., 2009, p. 10).

Other researchers (Kuehnert, Graber, and Stone, 2014) modified the tool used by Stoto et al. (2009) and set out to evaluate a collaborative community health needs assessment (CHNA). The web-based survey targeted key leaders in Kane County, Illinois, some of whom had been involved in the CHNA, and others who did not have direct involvement. Wetta, Dong, LaClair, Pezzino, & Orr (2015) measured the opinions and perceptions of the CHA-CHIP inputs, process, outputs, and outcomes, but not the actual outputs and outcomes of the CHA-CHIP. Although recommendations were made regarding clarity of goals and purpose, these studies had low response rates.

Studies utilizing NACCHO survey data. Laymon et al. (2015) used the NACCHO National Profile of LHD Survey to obtain baseline data about collaborations in the CHA and CHIP. They observed the "tendency for LHDs with larger jurisdictional populations to conduct CHAs and to partner with hospitals" and that "LHD-led CHAs were associated with greater numbers of types of partnerships than hospital-led efforts" (pp. 15-16).

Studies proposing evaluation models. Solet et al. (2009) pointed out that CHA was "widely practiced, but its effectiveness has seldom been evaluated" (p. 33). The research team proposed a case study method of evaluating CHA and CHIP. Recognizing both a need for a set of rigorous evaluation methods to document the benefits of a CHA and a consensus definition of what constitutes a successful outcome, they developed a working definition of an effective assessment. "We define effective assessment as that which supports development of data-informed policies, environmental changes, systems changes, or other interventions that promote health and prevent disease" (p. 34). The study provided examples of how to apply this definition using three case examples about asthma hospitalizations, SDOH, and sexual abstinence.

Spice and Snyder (2009) wanted to better understand characteristics of CHA that contribute to the use of CHA findings in public health programs and policy decisions. Partnering between state and local public health agencies they established an on-line system for reporting the impacts of CHA projects. They found that the common characteristics of CHAs with reported impacts were

- a focus on a specific subpopulation or health topic;
- involvement of community and public health agency stakeholders in planning and conducting the CHA;
- use of multiple data collection methods, sources of data, and approaches to dissemination; and
- primary data collection at the local level (p. 18).

Studies measuring outcomes and outputs. Sanson-Fisher, Campbell, Htun, Bailey, & Millar (2008) studied research outputs of public health. Conducting a computer-based literature search, they looked for data-based public health research publications from 1987- 2006. They concluded that the volume of public health research publications was encouraging but concluded that the "preponderance of descriptive work … remained consistent over the past three decades" (pp. 384-385).

Welch et al. (2012) conducted a methodology study of equity assessment in systematic reviews. The data source was all systematic reviews and not CHAs specifically, but the results have implications for this study. They found that

> of the 300 systematic reviews, 224 assessed the effectiveness of interventions on health outcomes. Of these 224 reviews, 29 systematic reviews assessed effects on equity in health status using subgroup analysis or targeted analyses of vulnerable populations. Of these, seven conducted subgroup analyses related to health equity which were reported in insufficient detail to judge their credibility. Of these 29 reviews, 18 described implications for policy and practice based on assessment of effects on health equity (Welch et al., 2012, p. e31360).

A study published in 2017 was believed to be the first study to examine objectives of CHIPs. The research wanted to determine whether accredited public health agencies provided a

greater proportion of outcomes-focused objectives than non-accredited agencies. Perrault et al. (2017) analyzed a large and systematically collected sample of CHIP objectives from 280 PHAB accredited non-accredited agencies. In total 4094 objectives were analyzed to determine if the objective was

- output versus outcome;
- if outcome, then knowledge, attitude, or behavior; and
- if objective was double-barreled (multiple aims) (p. 573).

Perrault et al. (2017) found that "accredited agencies were no more successful than non-accredited agencies at proposing outcomes-focused objectives. Even more troubling in our findings was the fact that nearly 2-out-of-3 objectives, regardless of agency accreditation, were found to be output-focused" (p. 574).

Planning for sustainability. Lovelace et al. (2015) provided perspective to the discussion about evidence-based practice, evaluation, and sustainability. Their research focused on variation in the use of evidence-based decision-making (EBDM) practices across LHDs in the United States using a 2-level multilevel regression model. They found "more workforce predictors than resource predictors. Thus, although resources are related to LHDs' use of EBDM practices, the way resources are used (e.g., the types and qualifications of personnel hired) may be more important" (p. S189). They acknowledged the importance of EBDM practices in public health and its potential to increase return on investment (ROI).

Masters, Anwar, Collins, Cookson, and Capewell, (2017) conducted a systematic review of ROI of public health interventions. They identified 2957 titles resulting in 52 studies; ROI in public health programs was stratified by specialism.

They concluded that

> local public health interventions are cost-saving, and offer substantial returns on investment, nationwide programmes even more so. The cuts to public health budgets therefore represent a false economy. They are likely to generate billions of pounds of additional costs to the health services and wider economy (Masters et al., 2017, p. 5).

Gap in Knowledge

This researcher identified a significant gap in the literature in almost every component of community health assessment. The literature revealed publications that described CHA, CHNA, and CHIP components (Bender, 2017; Pennel et al., 2017) and conceptual models and theoretical frameworks (CDC, 2010; CDC, 2018; Pennel et al., 2017; US DHHS, 1995; UWPHI, 2018), but did not lead to research comparing the impact of varied leadership, varied framework, or varied structure on population health indicators. Only a few studies reported on outcome measures (Sanson-Fisher et al., 2008; Perrault et al., 2017). Solet et al. (2009) and Spice and Snyder (2009) recommended models for identifying effective and successful CHAs and CHIPs. No studies were found on the effects of public health interventions on improving health equity and reducing health disparities (Livesey et al., 2015; Welch et al., 2012). No studies explored the prevalence of successful outcomes and outputs in a large cohort of assessments over a multi-year period.

Perrault et al. (2017) were the first researchers to describe multi-state outcome data from CHIPs. The research focused on the influence of accreditation on the success of writing sound objectives in the improvement plans; the study did not explore the success of the interventions.

This research will be the first published study to report the statewide outcomes of CHIP interventions on key community health indicators for a multi-year period. Historically, program

evaluation has consisted of counts of health priorities listed in CHAs. No studies have collectively examined the process, product, and impact on the community, thus making the social and economic value difficult to assess with no measure for success.

This study obtained baseline data about the reporting of health equity issues in the CHA and explored factors that may be related to the number of health equity issues reported– the health equity index. Health equity index is a proxy for use of a healthy equity lens as recommended in *Healthy People 2030*. The study also explored how LHDs reported the results of measurable outcomes from the CHIPs. In North Carolina, LHDs are required to report of their CHIP in the annual State of the County Health (SOTCH) reports.

Summary

In summary, CHA and CHIP in North Carolina, between 2007 and 2017 have been shaped by the

- *National Public Health Performance Standards;*
- *Healthy People* Initiatives;
- Public health accreditation;
- *Healthy Carolinian* movement; and the
- Patient Protection and Affordable Care Act.

Specific gaps in knowledge about the CHA-CHIP process were identified during the review of literature and will be discussed again in the final chapter. Solet et al. (2009) and Spice and Snyder (2009) recommended models for identifying effective/successful CHAs and CHIPs and Livesey et al. (2015) and Welch et al. (2012) were concerned about the lack of studies on the effects of public health interventions on improving health equity and reducing health disparities. Perrault et al. (2017) examined the quality of wording for outcome measures and noted that in a national sample of CHIPs, two out of three objectives were outputs, not outcomes. His work provided methodological direction to this study by examining the quality of the measures used to

report successful interventions. His work clarified and simplified the terms outputs and outcomes by describing outputs are what you *do* to achieve the *results* (outcomes) that you want for the community.

CHAPTER 3: METHODOLOGY

This chapter describes the research questions, research design, sample, data extraction, and data analysis plan.

Research Questions

The research questions were

RQ1. What is the prevalence of health equity issues reported in the community health assessment?

RQ2. Which characteristics or combination of characteristics are associated with the reporting of health equity issues?

RQ3. What are the characteristics (interventions, outputs, and outcomes) of the most recent community health improvement plans submitted by the 100 counties and what level of progress on the health outcomes have been reported in the county health SOTCH documents?

RQ4. Which characteristics or combination of characteristics are associated with successful outcomes?

Research Design

The study used a cross-sectional descriptive-correlational approach to perform a secondary analysis of CHA, CHIP and SOTCH archived documents submitted to DPH from North Carolina LHDs.

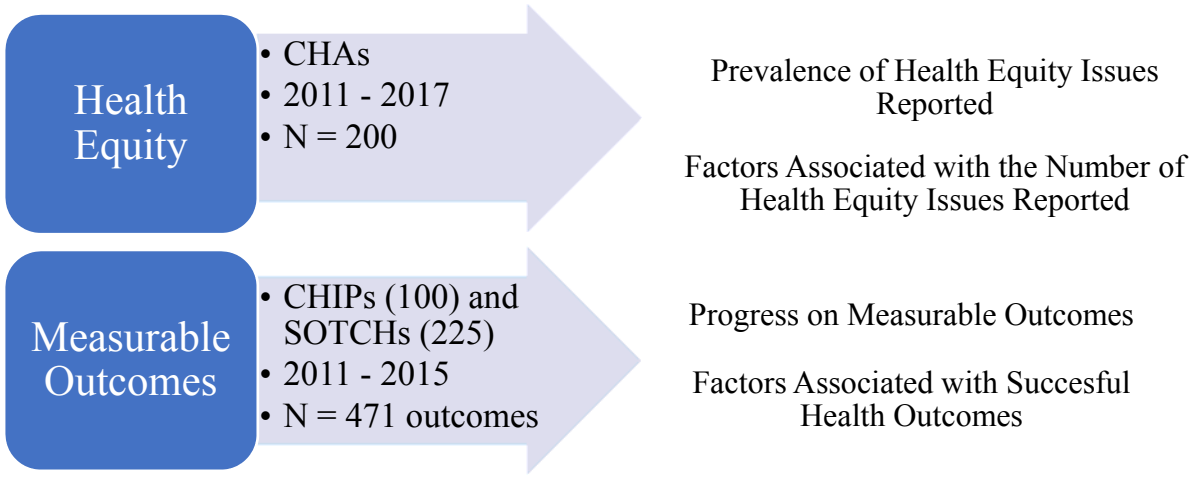

Figure 5. Two samples from the archived database of community health assessments and community health improvement plans were used to describe the identification of health equity issues in the CHA and the measurable outcomes in the CHIPs.

Sample

The study sample consisted of CHA, CHIP, and SOTCH archived documents submitted to the DPH from North Carolina LHDs for years 2011 through 2017. The sample included all CHAs (N = 200) from LHDs submitted between 2011 and 2017. Because CHAs are conducted every 3-4 years, some health department may have submitted two or more CHAs during the seven-year study period. The CHAs were used to investigate health equities.

In addition to the CHAs, the most recent CHIP submitted by public health departments (N = 100) between the years 2011 and 2015 was selected to identify measurable outcomes. All 100 counties in N.C. are included in the analysis. For each CHIP, the interim SOTCH reports were selected to evaluate the success of the outcomes identified in the CHIPs. Since outcomes were tracked for up to three years by the SOTCH reports, the last year for a CHIP document to be selected was 2015. This allowed at least two to three opportunities for reporting progress on CHIP health outcomes in the paired SOTCH reports. The total number of outcomes identified in the 100 CHIPs was 471.

RQ1 and RQ2 included all CHAs from LHDs that submitted assessments between 2011 and 2017 (N=200). Because CHAs are conducted every 3-4 years, each health department may have submitted two or more CHAs during the seven-year study period.

RQ3 and RQ4 sampled CHIPs from LHDs submitting improvement plans between 2011 and 2015 to identify measurable outcomes (N=471). The purposive sample took the most recent CHIP submission for health departments and determined the prevalence of interventions, outputs and outcomes, and the number of measurable outcomes.

- 2015: 39 health departments
- 2014: 28 health departments
- 2013: 22 health departments
- 2012: 10 health departments

- 2011: 1 health department

Progress on the measurable outcomes were tracked for up to three years using the SOTCH reports to determine the success of the LHD and its partners in achieving the outcomes set in the CHIP.

Preliminary Work

This study used findings from two directed research projects that informed the design of the study. The first directed research identified the types of health equity issues reported in North Carolina CHAs, 2007 to 2017. The findings were presented at the National Association of County and City Health Officials (NACCHO) in July 2018. The directed research identified potential health equity variables that comprised the health equity index in this study.

The second directed research project characterized the components of CHAs by exploring CHA structure and leadership in North Carolina CHAs 2007 to 2017. The paper was presented at the American Public Health Association (APHA) national conference in November 2018. This directed research piloted the use of CHA characteristics used in the dissertation.

Qualitative methods were used to develop and pilot tools as preliminary work for this study. Specific techniques included triangulation, member-checking, reflexivity, and continuous meaning-making and progressive focusing.

Variables and Measures

Three sets of variables are used in this study: health equity, CHA characteristics, and CHIP outcomes and outputs. The health equity index is a measure used to explore health equity issues. The variables used to assess for patterns associated with both measures are the structural aspects of CHAs and CHIPs (county tier status, leadership structure, academic partnerships, use of theoretical frameworks and conceptual models, and participation in regional initiatives).

Health equity variables. The 34 health equity variables were

Equity
Disparity
At Risk
Black
White
Native American
Hispanic
Gender
LGBTQ+
Under 18 (Children)
Over 65 (Seniors)
Visually Impaired
Hearing Impaired
Mobility Impaired
Developmentally Impaired
Behavioral Health Impaired
Refugee/Immigrant
Undocumented Residents
Homeless
Incarcerated
Active Duty Military
Veteran Military
Dependent Military
Education
Housing
Poverty
Safety
Transportation
Unemployment
Air Quality
Water Quality
Soil Quality
Built Environment, and
Social Determinants.

CHA characteristic variables. The 18 CHA characteristic variables were

County Code
Year
Leadership structure
Community Engagement
Theoretical Framework
Regional Initiative
Academic Partnership (Primary)
University Affiliation (Primary)
Academic Partnership (Secondary)
University Affiliation (Secondary)
Academic Partnership (Design & Methods)
University Affiliation (Design & Methods)
Vendor (Secondary)
Vendor (Primary)
County Tier Status
Pre-ACA/Post-ACA
Any Vendor, and
Any Academic Partnership.

CHIP outputs and outcome variables. Seven variables were used to explore the progress of LHDs and their partners in achieving success in CHIPs:

Number of CHIPS
Number of Interventions
Number of Outputs
Number of Outcomes
Strength of Outcomes
Number of Measurable Outcomes, and
Measurable Outcome Result.

Data Extraction Plan

The data extraction process varied according to the type of data being extracted. Five data needs were identified: health equity issues, CHA characteristics, CHIP outputs and outcomes, CHIP measurable outcomes, and CHIP outcome results reported in the SOTCH reports.

Extraction of Health Equity Issues

The primary investigatory independently read 200 CHAs and observed for the presence or absence of data about each of 34 health equity issues. A second reviewer, a health information technology specialist, piloted the coding process to check for clarity of instructions before the third reviewer began coding. The third reviewer was a graduate student in public health in her final semester of study. Using structured electronic searching techniques, the primary investigator and third reviewer independently coded observations and entered data into the health equity workbook (See Appendix B and C). Differences were resolved through discussion until consensus was reached. Between December 2018 and February 2019, 6,800 data points were collected and subsequently exported to IBM® SPSS® v.25 for analysis.

Extraction of CHA Characteristics

The author reviewed 200 CHAs using structured electronic searching techniques and coded 18 characteristics according to the pre-determined coding structure. Between January and February 2019, 3,600 data points were recorded in EXCEL workbooks and subsequently exported to SPSS.

Extraction of CHIP Outputs and Outcomes

Data extraction for CHIPs was done by two reviewers between January and March 2019. Extraction involved reading CHIPs submitted by 100 health departments to the state between 2011 and 2017. Reviewers counted the number of interventions in each CHIP and then coded and counted the measures used to support the intervention as either an output or outcome. Data were entered into a Microsoft EXCEL file and then exported to SPSS.

Extraction of CHIP Measurable Outcomes

Each outcome was ranked by the author as to its measurement strength: low, moderate, and high. Moderate and high strength outcomes were designated as measurable outcomes; low strength outcomes were not analyzed. Each measurable outcome was paired with its measured strength and the data entered into a Microsoft EXCEL file and then exported to SPSS.

Extraction of Results for Measurable Outcomes

SOTCH reports were used to look for evidence that the county reported progress on the outcomes as required by accreditation. The author reviewed 225, ten-page SOTCH reports during March 2019 and coded results as achieved, partially achieved, not achieved, unable to interpret, and not reported. Data were entered into a Microsoft EXCEL file and then exported to SPSS.

Data Analysis Plan

All statistical analyses were completed with IBM SPSS, Version 25. Descriptive frequencies and percentages were used to describe the prevalence of health equities, while means and standard deviations were used to describe quantitative variables. Multiple linear regression was used to explain the variability in the number of reported health equities (health equity index) from factors related to the development of the CHAs and the tier status of the county producing the CHA. Statistical significance was evaluated at a p-value of .05 or less.

Limitations

The health equity variables that comprised the health equity index were derived from a review of the literature, the experience of the researcher, and a prior directed research project of

North Carolina CHAs. Only secondary data sources (like U.S. Census data, CHR data) were considered in the CHA and not primary data (data collected locally through surveys, listening sessions, and focus groups). Results from a purposive sample of CHAs from one state may differ significantly from results in other states and may not reflect all governmental public health in the United States. The North Carolina study did not contain any tribal CHAs nor did it address issues of rural and urban communities.

Characteristics of the CHA were limited to those that could be discerned from the document and did not capture the experience or educational preparation of the CHA coordinators with the local community. The study did not examine confounding factors like report templates that may skew the health equity index.

Reporting of outcome results was limited to a review of multiple SOTCH reports up to three years after the intervention was initiated and did not capture the reason for the result. "Whether an intervention works depends not only on the program itself but also on community contextual factors that are often not reported" (Lifsey et al., 2015, p. 135S).

The forms used to develop the CHIP and SOTCH report may impact the results of outcomes being reported. Three changes in forms occurred over the course of six years (2011-2017), but the study did not explore the impact on reporting. Variations in forms between states is likely.

Ethical Considerations

The researcher is sensitive to how the results are presented, making sure that in the discussion, context is considered. For example, health equity is a relatively new focus compared to the health disparity focus in most CHAs in the last decade. The findings must not be used to

judge past peformance, but rather to clarify future training needs and the state's role in developing *Healthy People 2030* objectives.

Summary

This study was a secondary data analysis of archived documents available at the DPH. Three types of documents – CHA, CHIP, and SOTCH – were selected and selected data elements were abstracted from the documents and then entered into SPSS. The statistical analyses focused on determining the prevalence of health equities in the CHAs and identifying factors that could explain the variability in the number of health equities reported in the CHAs. In addition, the study examined the health outcomes in the CHIP documents and the progress in achieving those outcomes as described in the SOTCH documents.

CHAPTER 4: RESULTS

This chapter contains descriptions of the sample and the results of statistical analyses for each of the four research questions in this study. The study involved a secondary data analysis of publicly available documents submitted by LHD to the state public health agency during the years 2011 to 2017.

Sample Description

Three sets of documents were used in this study: North Carolina CHAs between 2011 and 2017, North Carolina CHIPs between 2011 and 2015, and North Carolina SOTCH reports between 2012 and 2017.

The study sample consisted of data abstracted from required documents submitted by LHDs representing 100 counties in North Carolina during the years 2011 to 2017. All CHAs (N = 200) submitted during 2011-2017 provided the data used to compute the prevalence of health equity issues identified as the public health focus of the different LHDs and to investigate associations of CHA characteristics on the number of health equity issues reported by the LHDs. The most recent CHIPs (N = 100) and the multiple SOTCH reports (N=225) associated with each CHIP submitted by LHDs for 100 counties provided the data on the outputs and outcomes and progress on achieving the outcomes. The total number of measurable outcomes abstracted from the 100 CHIPs was 471.

Research Question One

What is the prevalence of health equity issues reported in the community health assessment? Table 1 presents a ranked frequency of health equity issues reported in the 200 CHAs. The issues reported most frequently included race/ethnicity (white, black, and Hispanic),

gender, education, unemployment, and poverty. Health equity issues reported least often include incarceration, military (active duty, dependents, and veterans), visual, hearing, and mobility impaired, homelessness, and soil quality.

Table 1

Ranked Frequency of Health Equity Issues

Health Equity	n	%
White	200	100
Education	194	97
Hispanic	194	97
Unemployment	194	97
Black	194	97
Poverty	190	95
Male Female	182	91
Native American	180	90
Disparity	174	87
Safety	158	79
Transportation	154	77
Air Quality	146	73
Housing	140	70
Water Quality	128	64
Behaviorally Impaired	110	55
Refugee/Immigrant	106	53
Social Determinants	104	52
At Risk	102	51
Built Environment	96	48
Under 18 (Children)	96	48
Equity	68	34
Over 65 (Seniors)	64	32
Developmentally Impaired	64	32
Lesbian, Gay, Bisexual, Transgender, and Queer	46	23
Undocumented	44	22
Veterans	32	16
Visually Impaired	32	16
Homeless	24	12
Soil Quality	12	6
Hearing Impaired	12	6
Mobility Impaired	8	4
Military Dependent.	4	2
Active Duty Military	4	2
Incarcerated	4	2

Crosstab analysis revealed that there was small variability across years 2011 through 2017 for identifying disparity as an issue (range 77.8% to 94.9 %) and a large variability across years in identifying refugee/immigrant as an equity issue (range 18.2% to 76.9%). Large variability was also observed in identification of gender identity issues (LGBTQ) across years with a range of 3.1% to 63.6%.

Research Question Two

Which characteristics or combination of characteristics are associated with the reporting of health equity issues? Table 2 presents the means and standard deviations of the dependent variable, health equity index, and the six CHA characteristic predictor variables. The health equity index is the number of health equity issues reported on the CHAs, and had an average of 17.24 issues, ranging from 7 to 34 issues. The six predictor characteristics are all binary categorical variables, coded as a 1 if the characteristic was present in the CHA and a 0 if absent. Forty percent of the 200 CHAs involved an academic partnership in its development, 34 percent of the CHAs used a vendor to help in its development, 17 percent of the counties were involved in a regional initiative, and 15 percent of the CHAs include a theoretical framework. Since county tier status consisted of three possible categories, two dummy variables were constructed, one comparing tier two status with the lowest tier, and one comparing the highest tier with the lowest tier. In addition, Table 2 presents the correlations of the predictor variables with the dependent variable and the intercorrelations among the predictor variables. The predictor variables with the strongest correlations with health equity index included using a vendor, being part of a regional initiative, and using a theoretical framework in the CHA.

Table 2

Means, Standard Deviations, and Intercorrelations for Health Equity Index and CHA Characteristics Predictor Variables

Variable	M	SD	1	2	3	4	5	6
Health Equity Index	17.24	5.08	.43***	.06	.38***	.34***	-.10	.19**
Predictor variable								
1. Any vendor	0.34	0.47	__	-.30***	.51***	.17*	-.02	-.12
2. Any academic partnership	0.40	0.49		__	-.30***	-.02	.01	.03
3. Regional initiative	0.17	0.37			__	.42***	-.07	-.02
4. Theoretical framework	0.15	0.49				__	-.04	.03
5. Tier 2 status vs. 1	0.41	0.49					__	-.42***
6. Tier 3 status vs. 1	0.20	0.40						__

**p<.05. **p<.01. ***p<.001*

Table 3 presents the results of using the six predictor characteristics to explain the variance in the health equity index. Overall, the six predictor variables explained 37 percent of the variance in the number of health equities reported in the CHAs. Five of the six predictors made a unique and statistically significant contribution to explaining the outcome variable. The strongest predictor was using a vendor in the development of a CHA, with a beta value of .429. The next strongest unique predictors having a high tier status compared to a low tier status and having an academic partnership. The least strong predictors included using a theoretical framework and being part of a regional initiative, the two predictors with the lowest prevalence.

Table 3

Regression Analysis Summary for CHA Characteristic Variables Predicting Health Equity Index

Variable	*B*	*SE B*	β	*t*	*p*
Any Vendor	4.41	.62	.412	6.07	< .001
Any Academic Partnership	2.37	.636	.229	3.73	< .001
Regional Initiative	2.31	1.01	.169	2.29	.023
Theoretical Framework	2.86	.90	.202	3.18	.002
Tier 2 status vs 1	.25	.65	.025	0.39	.696
Tier 3 status vs 1	3.05	.81	.241	3.78	< .001

Note. R^2 *= .37 (N = 200, p <.001).*

Research Question Three

What are the characteristics (interventions, outputs, and outcomes) of the most recent community health improvement plans submitted by the 100 counties and what level of progress on the health outcomes have been reported in the county health SOTCH documents? Table 4 provides a summary of the 100 most recent CHIPs submitted by each North Carolina county. There were 1026 total interventions described in the 100 CHIPs, with a total of 2327 outputs, 766 total outcomes, and a total of 471 measurable outcomes. The ratio of outcomes to outputs is approximately1:3 (33%), and the ratio of measurable outcomes to outputs in approximately 1:5 (20%).

The analysis of 471 measurable outcomes in the sample (see Table 5) showed that 59% were never reported in the SOTCH as required by LHD accreditation. The results that were reported found that 24% could not be interpreted as presented in the SOTCH, and 12 were not achieved, 4% were partially achieved, and 2% were achieved.

Table 4

Descriptive Statistics for Community Health Improvement Plans (N = 100)

Variable	*Min*	*Max*	*Sum*	*M*	*SD*
Interventions	2	68	1026	10.26	7.603
Outputs	2	114	2327	23.27	20.638
Outcomes	0	60	766	7.66	8.651
Measurable Outcomes	0	33	471	4.71	4.953

Note: CHIPs from 100 counties 2011-2015

Table 5

*Descriptive Statistics for Reporting Results of Progress on Measurable Health Outcomes in Community Health Improvement Plans (N=471**)*

Variable	*M*	*SD*	*%**
Not reported	58.99	38.253	59 %
Unable to interpret	23.81	30.376	24 %
Not achieved	11.92	23.108	12 %
Partially achieved	4.32	14.297	4 %
Achieved	2.04	6.246	2 %

*Note: *Rounding resulted in total =101%; **8 counties had no measurable outcomes*

Research Question Four

Which characteristics or combination of characteristics are associated with successful outcomes? Unlike health equity issues in the CHA, no relationship was found between CHA characteristics and successful outcomes in CHIPS. Descriptive statistics revealed that only 2% (less than ten) measurable outcomes achieved success. Success could not be correlated with any CHA characteristics (leadership, academic partnership, regional initiatives, use of vendor,

community engagement, county tier status, and theoretical framework) due to the small number of successes reported.

CHAPTER 5: DISCUSSION

Research should lead to new knowledge and insight about existing problems so that policy, practice and education can be improved. This study contributed to a better understanding of the core public health processes of community health assessment and community health improvement. The findings and their interpretation must not be used to judge past peformance, but rather to clarify the training and technical assistance needs of local public health agencies and their partners and to define the state's role in developing and monitoring *Healthy People/Healthy North Carolina 2030* objectives. The discussion that follows is structured according to this study's research questions and addresses how the study findings are related to the literature. The chapter concludes with implications for practice, future research, and education.

Health Equity Research: Questions One and Two

Prevalence of Health Equity in CHA

Why did health equity issues vary between years? The number of health equity issues identified in a CHA was not shown to be associated with the year that it was submitted. The most likely explanation is that LHDs and their partners tend to produce CHAs based upon the format that they have used for past CHA submissions. Introduction of new data or recognition of a new health equity issue may occur if the new issue has a strong media footprint, or perhaps there is a triggering event in the community, or sometimes because CHA leaders receive program guidance.

What can be inferred about differences between county tier status and the number of health equity issues reported? County tier status varies little between years. In this study

there was no association with tier status two compared to tier status one and the number of health equity issues reported. However, an association was seen between tier status three and tier status one. Perhaps the magnitude of the difference could be attributed to greater resources in tier 3 counties that enabled them to identify more health equity issues.

What contextual understanding should be considered in interpreting low frequency of response for selected health equity issues? Organizational behavior and human psychology could both play a role in ascertaining the cause for low frequency response for selected health issues. Within organizations, particularly bureaucratic organizations, members tend to perform according to the organizational norms of the group. The norm of public health in North Carolina is grounded in state requirements that LHDs follow to avoid corrective action plans.

For this reason, well-intentioned guidelines can restrict the good content. If the guidelines are not continuously updated to reflect current science, the resulting CHAs become stagnant. North Carolina guidelines specified that the CHA process should assess the health needs of special populations but did not specifically suggest a minimum data set. The lack of specificity may have contributed to low counts for incarcerated, military, military dependents, and veterans.

Three other factors may be responsible for low frequency counts of certain health equity issues. These are county demographics (such as a predominantly white population with little racial or ethnic diversity); lack of county-level data (for example, water and soil quality); or concern that the issue is sensitive in nature (as in the case of LGBTQ and undocumented residents).

Although it was not assessed in this study, the educational background and experience of the CHA leadership team may affect health equity identification.

What are the possible explanatory factors for variables associated with predicting a greater number of health equity issues reported in the CHA? The more frequently reported health equity issues tended to have strong, county-level data available (race/ethnicity, age, gender, educational attainment, and poverty level). Use of a vendor was the strongest unique predictor, followed by theoretical framework, county tier status three, regional initiative, and academic partnership.

Only two vendors provided services to counties during the post-CHA period and both had a strong template for displaying data consistently. One vendor was a former researcher at a N.C. university and their template was very similar to that of the university. Nineteen universities provided some degree of assistance for the CHA but not all universities provided a standardized template for the CHA report and common secondary data for health equity issues may have been omitted. The model predicted a higher score if two or more services were provided by the university suggesting that not all university assistance had the same impact on the number of health equity issues reported.

Use of a theoretical framework explained part of the variance in the health equity index score. In one sense, all CHAs were based on a theoretical framework because all used guidance from the state health agency's Community Health Assessment Guidebook. The guidebook was based on the socioecological framework, but counties referred to the process a simply the eight steps.

How do results compare to previous studies? No studies were found on the effects of public health interventions on improving health equity and reducing health disparities (Livesey et al., 2015; Welch et al., 2012). DeSalvo et al. (2016) did lay the foundation for "timely, reliable,

granular and actionable data at the neighborhood level" to replace "outdated, merged data across years" (p. 622). This statement describes much of what is known about health disparities but opens the possibility of using primary data collection within local communities to better understand potential health equity issues. Examples include using data from social service investigations to better understand the issue of elder abuse in people over the age of 65; mapping reports of non-violent crime by census tract to better understand the effect of high school suspension rates; and conducting focus groups at the county jail to better understand the needs of the incarcerated.

What new knowledge was acquired? Health equity has been endorsed by the American Public Health Association (2018), the National Association of County and City Health Officials (2015), County Health Rankings & Roadmaps (2018), and *Healthy People 2030* (ODPHP, 2018). This study provides new knowledge supporting these endorsements by providing health equity prevalence data in a multi-year, statewide sample of CHAs and by identifying a model for explaining increased health equity issues reported (vendor, theoretical framework, tier status 3, regional initiative, and academic partnership).

Measurable Outcomes: Research Questions Three and Four

Comparison of Findings with Related Studies

How do the results of this study compare to findings reported by others? Perrault et al. (2017) wrote from the perspective of communications. They analyzed a large and systematically collected sample of CHIP objectives from accredited and non-accredited agencies using online data sources. In total 4094 objectives were analyzed to determine if the objectives were outcomes versus outputs, and if being accredited made a difference. The research team

found that nearly "two-out-of-three objectives, regardless of agency accreditation, were found to be output focused" (p. 574). Perrault's findings were like the findings in this research study where the ratio of outcomes to outputs in the sample was approximately 1:3, or 33%. However, when the outcomes were screened for strength (i.e., measurable outcomes), the ratio of measurable outcomes to outputs was approximately 1:5, or 20%. All health departments in North Carolina are accredited using similar criteria to that of PHAB.

Solet et al. (2009) recognized that CHA was "widely practiced, but its effectiveness has seldom been evaluated" (p. 33). This study supports the need for evaluation of the CHA-CHIP-SOTCH process with its findings that 59% of the measurable outcomes in CHIPs were never reported in the SOTCH as having been met or not met. In fact, at least in North Carolina, the CHA-CHIP-SOTCH process may be strong theoretically, but in practice, it would appear disjointed. Solet's research team used a qualitative evaluation method (case study) which should be considered in implications for practice in North Carolina.

Spice and Snyder (2009) described a logic model whereby "alignment of public health interventions with local needs should contribute to improvements in community health status over time" (p. 33). They reported that "in practice, the connection between how CHA is conducted and whether it gets used remains largely unknown" (p.33). This study found no relationship between CHA characteristics and the report of successful outcomes consistent with the work of Spice and Snyder.

Explanation of Findings

Previous research reported a need for improved performance and evaluation measures. This study re-affirmed the need to do better when measuring and reporting population and community level outcomes.

CHA-CHIP-SOTCH performance is a shared responsibility of state and LHDs, their partners, and the community they serve. In this study, North Carolina CHAs were frequently the work of a few agencies, while other CHAs had a long-standing history of comprehensive assessment and strategic planning with multiple, diverse organizations. Findings suggested that 39% of the variances in health equity identification could be explained by five CHA characteristics, however no association was found between CHA characteristics and measurable outcomes in the CHIPS. Possibly, resources that support CHAs may not have a carry-over effect that would transfer to support CHIPs.

Oversight of the CHA-CHIP-SOTCH process by the state health department has been inconsistent since loss of funding in 2011. Technical assistance during the post-ACA period was reduced to minimal review by nursing consultants unfamiliar with the program.

New Knowledge

The literature review did not identify any studies that explored the prevalence of successful outcomes and outputs in a large cohort of assessments over a multi-year period. This study definitively described the published results of measurable outcomes for 100 North Carolina counties, post-ACA. Poor performance on reporting results for 471 measurable outcomes (59% not reported) coupled with low percentage of achieved/partially achieved results (6%) is a

powerful finding that can be used to call attention to the problem and leverage support for rebuilding lost infrastructure.

Implications for Practice

Cross Jurisdictional Resource Sharing

Moving from research to practice, this study can lead North Carolina and other public health agencies to cross jurisdictional resource sharing. With a vision of improving the health and wellbeing of every community by supporting local and regional community health assessments and community health improvement planning, the findings provide baseline performance data. Cross jurisdictional resource sharing realigns existing and new resources to align with local priority areas and the *Healthy People 2030/Healthy NC 2030* objectives.

Public-Private Partnerships

It can be said that data drives everything. Leveraging public and private partnerships to increase access to high-quality actionable data for LHDs, hospitals, and their partnering organizations is a priority. Collaboration between public-private partnerships provides a platform for organizations to create useable community health assessments and make data-informed decisions as it relates to enhancing population health.

Population Health Model

A theoretical framework was shown in this study to be associated with better performance on identification of health equity issues. Using the population health model can help local partnerships prioritize short-term and long-term needs to achieve a collective impact on the underlying causes of poor health. Adoption of the population health model locally will mirror the *Healthy People 2030/Healthy NC 2030* framework.

Results-based Accountability

Results-based accountability (RBA) was introduced in the 1990s as a means of using results as a way of assessing the impact of community health improvement plans. RBA is not without risk, but the benefits are clear: communities will be more intentional in how they plan interventions and the public's trust in both public and private human service institutions can be preserved, and in some instances, restored. RBA can diminish the need for "centralized bureaucratic micromanagement and rigid rules" (Schorr, Farrow, Hornbeck, & Watson, 1995, p.6).

Shared Web-based Data Platform

Transparency in community health improvement plans could correct much of what is broken in the current paper-based CHIP written locally and submitted to the state as evidence that a CHIP was completed for accreditation. Many local CHA coordinators in North Carolina have described it as a check-the-box activity. A web-based platform will help communities track outcomes and allow oversight agencies to measure the collective impact on state and national objectives.

Implications for Future Research

Cost-Value Study

The CHA-CHIP-SOTCH process requires resources – human and financial. Unfunded mandates to improve population health can never achieve their potential without backing from government, philanthropy, non-profit organizations, healthcare systems and providers, academia, and the business sector. This study implicates the need for a cost-value study of existing CHA-CHIP processes to establish a baseline and explore how return on investment can be calculated.

Integrative Review

An integrative review examining the capacity of the current public health workforce to practice population health would help public health leaders and institutions of higher learning prepare for the shift in CHAs from a disparity focus and individual responsibility for health to the health equity and social determinant focus espoused in *Healthy People 2030/Healthy NC 2030.*

Intervention Study

If this study leads to changes in practice and policy, it will be important to conduct an intervention study to measure the effect on performance and achievement of health outcomes. North Carolina is specifically looking at the effect of some technology changes and regional initiatives that were outside the sampling window of this study but may impact performance when measured in 2021.

Implications for Education

Community assessment is a core competency for community/public health nursing practice, but nursing is not the most visible discipline in community health assessments. In addition to nurses, health educators, social workers, epidemiologists, dieticians, environmental health specialists, health policy analysts, physicians, communication officers, and health care administrators have also led CHAs in North Carolina. Higher education needs to assure that population health concepts are integrated into curricula at the undergraduate and graduate levels and encourage interprofessional clinical practicums (Evans-Agnew, Reyes, Primomo, Meyer, & Matlock-Hightower, 2017).

Summary

Policy, practice, and education for population health can and should be improved using research. This study examined public documents from local public health agencies and their partners that had not been previously studied for evidence of health equity assessment in CHAs and successful outcomes in CHIPs.

The findings and their interpretation will be used to clarify the training and technical assistance needs of local public health agencies and their partners as *Healthy People/Healthy North Carolina 2030* objectives are finalyzed. Practice implications include cross-jurisdictional resource sharing, public-private partnerships, and expanded use of the population health model, results-based accountability, and shared, web-based data platforms. Future research should explore the cost and value of CHA-CHIP-SOTCH and look at the capacity of the current public health workforce to practice population health. Intervention studies are needed in addition to descriptive studies looking at population health outcomes. Education must do its part to prepare the workforce with basic concepts of population health in undergraduate programs across multiple disciplines, while graduate education must incorporate interprofessional population health practice in clinical practicum experiences.

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APPENDIX A: NOTIFICATION OF UMCIRB APPROVAL

IRB: Study Correspondence Letter

umcirb@ecu.edu

Wed 10/10/2018 09:36 AM

To: Dail, Kathryn Garner <dailka15@students.ecu.edu>;

EAST CAROLINA UNIVERSITY
University & Medical Center Institutional Review Board
4N-64 Brody Medical Sciences Building· Mail Stop 682
600 Moye Boulevard · Greenville, NC 27834
Office **252-744-2914** · Fax **252-744-2284** · www.ecu.edu/ORIC/irb

Not Human Subject Research Certification

From:	Social/Behavioral IRB
To:	Kathryn Dail
CC:	Ann Schreier
Date:	10/10/2018
Re:	UMCIRB 18-000998 Social/Behavioral IRB

On 10/10/18, the IRB Staff reviewed your proposed research and determined that it does not meet the federal definitions of research involving human participants, as applied by East Carolina University.

Therefore, it is with this determination that you may proceed with your research activity and no further action will be required. However, if you should want to modify your research activity, you must submit notification to the IRB before amending or altering this research activity to ensure that the proposed changes do not require additional UMCIRB review.

The UMCIRB appreciates your dedication to the ethical conduct of research. It is your responsibility to ensure that this research is being conducted in accordance with University policies and procedures, the ethical principles set forth in the Belmont Report, and the ethical standards of your profession. If you have questions or require additional information, please feel free to contact the UMCIRB office at 252-744-2914.

IRB00000705 East Carolina U IRB #1 (Biomedical) IORG0000418
IRB00003781 East Carolina U IRB #2 (Behavioral/SS) IORG0000418

APPENDIX B: HEALTH EQUITY CODEBOOK

Suggested Search Terms	Strategy
Equity/Inequity and plurals(Do not count financial equity)	Equit
Disparity/ Disparities	Dispari
at risk population	at risk
Black	Black, African
White	White, Caucasian
Native American	Native American, American Indian, Tribal
Hispanic/Non-Hispanic	Hispanic
Birth Gender	Gender, Male, Female
Gender Identity	LGBTQ, gay, lesbian
Under 18 or children	children
Over 65 senior or elderly	over 65, senior, elderly
Visually impaired	visual, blind
Hearing impaired	hearing, deaf
Mobility impaired	mobility, wheel, accessibl
Developmentally impaired	Developmental
Behavioral health	behavioral, mental
Refugee/ immigrant	Refugee/ immigrant/foreign
Undocumented	undocumented, illegal
Homeless	Homeless
Incarcerated	Incarcerated
Active duty	Active duty
Veteran	Veteran
Dependent military	Dependent military
Education	Education, high school graduation
Housing	Housing
Poverty	Poverty
Safety	Safety, violence, crime
Transportation	Transportation
Unemployment	Unemployment
Air	Air, environment
Water	Water, environment
Soil	Soil, environment
Built environment	Built environment
Social determinant	Social determinant

APPENDIX C: CHA CHARACTERISTIC CODEBOOK

Leadership Structure			
Type of CHA/CHNA	**Description**	**Code**	
CHA - cross sectoral	partner with hospital(s), multiple community agencies, and actively involve the business community in vision/ goal setting?	4	
CHA- multisectoral	partner with one or more hospitals for any aspect of the CHA in addition to the active and ongoing involvement of community agencies?	3	
CHA - traditional	partner with multiple community agencies for all aspects of the CHA	2	
CHA - unilateral	conduct CHA almost exclusively by local health department staff	1	
Unable to determine		0	
Community Engagement	Description		Code
	Reflect engaged community organizers	Yes	1
		No/Unable to determine	0
Theoretical Framework	**Description**	**Code**	
Did the CHA indicate use of theoretical framework/model in design or approach to CHA? If so, which one best describes?	Population Health	7	
	Socioecological	6	
	MAPP	5	

	PATCH (Mobilizing the community)	4	
	CHANGE (compatible with SE)	3	
	PRECEDE/PROCEDE	2	
	Other	1	
	None identified/Unable to determine	0	
Regional Initiative		**Answer**	**Code**
Was the health department participating in a regional initiative during the assessment period? If so, which one?	WNC Healthy Impact	Yes	4
	Health ENC	Yes	3
	Southeastern Regional Collaborative	Yes	2
	Other	Yes	1
	Non regional Initiative	None	0
Academic partnership	**Description**	**Answer**	**Code**
Did the health department engage formally with a 4- year academic institution for…	Primary data	yes	1
		no	0
Vendor for Secondary Data	Secondary data	yes	1
		no	0
	Design and/or Method	Yes	1
		no	0
Vendor for Secondary Data		Answer	Code
Did the health department report use of a	Private sector consultant for secondary data and analysis	Yes	1
		No evidence/report	0
Vendor for Primary Data		Answer	Code
Did the health department use a …		Yes	1
		No evidence/report	0