SOCIAL DRIVERS OF HEALTH AND LOCAL PUBLIC HEALTH AGENCIES OF NORTH CAROLINA

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ABSTRACT

Laurie L. B. Stradley: Social Drivers of Health and Local Public Health Agencies of North Carolina
(Under the direction of Pam Silberman)

Social determinants of health (SDH) have far reaching impact on population health outcomes. SDH include income, education, transportation, housing, racism and other social factors. Research shows that they account for between 28 and 50% of health outcomes. North Carolina's local public health agencies are tasked with improving the public health through three core functions: assessment, policy development and assurance. In order to determine the major health concerns of their populations, all counties complete a community health needs assessment (CHNA) and identify local health priorities. At the time of this research, only 17 of 100 counties prioritized a SDH.

The purpose of this dissertation was three-fold: identify facilitators of and barriers to prioritizing and engaging in work to improve SDH by local public health agencies; identify common characteristics, circumstances, policies and practices associated with local public health agencies that are prioritizing and engaging in work to improve SDH; and a practical guide to improving prioritizing and engaging in SDH for local public health agencies.

An electronic survey was sent to all NC local health directors. Response rate was 68%. From those respondents, four counties were identified for closer examination. Across the four counties, 15 key informants were interviewed.

Survey results indicated interest in SDH work by local health agencies. Local health directors rated the role of public health highest for education, environment, social connectivity and racism. The lowest rated sectors were income, housing and transportation. The primary concern around implementation was access to resources. There was no single "type" of North Carolina public health agency more or less likely to prioritize SDH. No matter the economic status or population density, different communities are identifying with the roles local public health agencies can or should be playing in SDH.

Interview results further illuminated opportunities and barriers to work in SDH. While access to resources remained a central theme, most informants referenced community connectivity and engagement as a major support for SDH work. Informants were committed to the work, but recognized that formal processes, funding and structure would improve their ability to have an impact.

This dissertation is dedicated to the many people who helped me accomplish this work. First, to my husband, who supported me and carried more than his fair share over the past three years. I love you. To my daughter, Millie, who pushed me to get this finished. To my son, Sammy, who has only ever known me as a student. To my Mother-in-Law, Susan, who showed me what perseverance really looks like. To my Father-in-Law, Les, who bragged about me like one of his own. To countless phenomenal friends who have watched babies, vacuumed rugs, edited papers, and delivered meals. And especially to my Mom, Pat, and my Dad, Dan, who have believed in me and encouraged me to work hard and be the change I want to see in the world. I would not be here today without your love, guidance, and support.

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It is with gratitude and respect that I thank public health leaders and front-line workers across North Carolina, for sharing their knowledge, wisdom, hopes and dreams for public health in our great state. I would also like to acknowledge leaders from sectors including education, housing, transportation, early care & education, and non-profits who shared their perspectives openly and brilliantly. Finally, I would like to acknowledge the support and encouragement I received from my committee in completing this work. Thank you for sharing your insight and experience with patience and kindness.

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LIST OF ABBREVIATIONS

ANOVA	One-Way Analysis of Variance
APHA	American Public Health Association
ASTHO	Association of State and Territorial Health Officials
CDC	Centers for Disease Control and Prevention
CHNA	Community Health Needs Assessment
CHIP	Community Health Improvement Plans
NACCHO	National Association of County & City Health Officials
NCALHD	North Carolina Association of Local Health Directors
NC DHHS	North Carolina Department of Health and Human Services
NCPHH	North Carolina Department of Public Health
NCGA	North Carolina General Assembly
NCLHDAB	North Carolina Local Health Department Accreditation Board
OECD	Organization for Economic Cooperation and Development
SDH	Social Determinants of Health

CHAPTER 1: INTRODUCTION

Background

In 2013, the Institute of Medicine put a spotlight on what is sometimes called the "American Paradox." The United States spends more on medical care and has poorer health outcomes than any other developed nation in the world. The United States lags behind in a variety of health outcomes, including birth outcomes, injuries and homicides, adolescent pregnancy and sexually transmitted infections, HIV and AIDS, drug-related mortality, obesity, diabetes, heart disease, chronic lung disease, and disability. These outcomes combine to provide Americans with shorter lifespans than their peers in other developed nations and are also so persistent that they appear for all ages (through 75 years), across diseases, races, behavioral risk factors, and more (Woolf & Aron, 2013). While some call this a paradox, others see a clear reason. While the United States outspends every other developed nation in health care expenses, they lag far behind in investments in social and environmental factors. According to Bradley and Taylor (2013), "Inadequate attention to and investment in services that address the broader determinants of health is the unnamed culprit behind why the United States spends so much on health care but continues to lag behind in health outcomes" (p. 2).

The United States is spending less than other nations if social spending, such as housing, food access, and pensions, is included in the overall costs associated with health outcomes. The Organization for Economic Cooperation and Development (OECD) defines social spending as the transfer of cash or provision of goods and services that provide support for the general welfare of individuals and families ("An Interpretative Guide to the OECD Social Expenditure

Database (SOCX)," 2001). The United States may simply be spending more money in a less effective manner, as the bulk of U.S. health spending is on medical costs. Other nations spend the bulk of their dollars in social areas. In fact, the United States nearly doubles the next highest medical spender, Netherlands, yet ranks only 37th out of 119 World Health Organization member nations in terms of health system performance (Murray & Frenk, 2000). As shown in Figure 1, the United States falls into the middle of member nations of the OECD in terms of overall spending and to the bottom of the pack in terms of spending on social welfare factors affecting health outcomes (Bradley & Taylor, 2013).

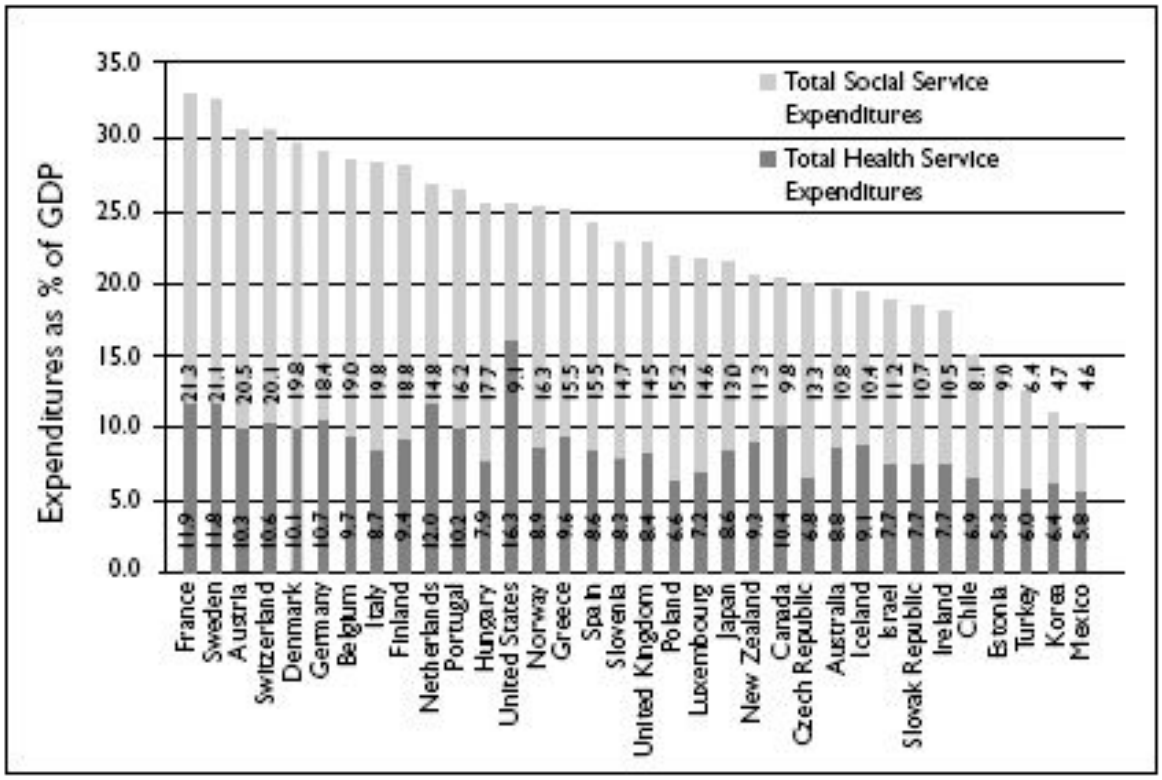

Figure 1. Aggregate health and social spending in 2007 among OECD member nations (Bradley & Taylor, 2013).

In addition to spending less on social areas, Woolf and Aron (2013) noted that American health care spending is cost-ineffective and often involves an inappropriate use of medical care.

For example, overutilization or unnecessary tests and treatments may account for nearly 20% of U.S. medical care spending. However, a panel from the Institute of Medicine did not find ineffective medical spending to be a root cause of the American health paradox. Instead, they noted that issues of access to public health services and medical care, along with non-medical determinants, were more strongly associated with disparate health outcomes (Woolf & Aron, 2013).

What Impacts Health?

Over the past century, our understanding of and focus on issues impacting health have changed, moving from an emphasis on sanitation, to medical care, and then health behaviors (Booske, Athens, Kindig, Park, & Remington, 2010). During the early 1900s, much of the U.S. efforts to improve health involved better sewage management, access to clean water, and garbage removal (Greenberg, 2012). The development and use of vaccines from the mid-1800s onward also became a critical part of limiting infectious disease. In the later 20th and early 21st centuries, public health increasingly focused on chronic disease prevention, ushering in another shift in public health work.

In the era following World War II, western countries began to establish medical care options for low wealth citizens, hoping to improve the poor mortality rates associated with a lower income status. The National Health Service, providing health care for all United Kingdom citizens, was established in 1948. The Canadian system of universal health insurance was established in 1957, and Medicare and Medicaid in the United States began in 1965. These systems aimed to eliminate health gaps by improving access to medical care (Frank & Mustard, 1994). In the following decades, it became apparent to U.S. policy makers that access to quality medical care was not the primary driver of health. A report from the Department of Health and

Human Services in 1981 showed major advances in access to care but conceded that the "attending conditions of poverty," including poor housing, access to good nutrition, and unsafe neighborhoods might make it "impossible" to close health disparities between high and low income populations (Davis, Gold, & Makuc, 1981). The understanding that socioeconomic factors contribute to health outcomes was acknowledged, but there was little effort by public health leaders to introduce policy, programs, and practices to improve health by impacting SDH.

What are the Social Drivers and Determinants of Health?

Social and environmental factors affecting health are commonly known as the social determinants of health (SDH). These factors typically include issues such as education, income, access to safe and affordable housing, access to healthy food and safe places to play, and an environment with clean air and water. The World Health Organization defines the SDH as:

> …the conditions in which people are born, grow, work, live, and age, and the wider set of forces and systems shaping the conditions of daily life. These forces and systems include economic policies and systems, development agendas, social norms, social policies and political systems. ("Social Determinants of Health," 2016)

The Commission on Social Determinants of the World Health Organization developed a conceptual framework to determine how several factors overlap and interact to drive health outcomes (Figure 2). The contributors of health identified in this framework are broader than the typically defined determinants of health. For example, race and ethnicity are identified as factors of social position and are also tied to socioeconomic and political contexts and to factors directly related to the health care system. Each of these factors interact within the system and the individual to contribute to health outcomes. Racism, poverty, lack of education, broken social

cohesion—all factor into unhealthy outcomes and all serve as points for intervention. This framework leads to the three guiding principles of the Commission's aim to improve health outcomes: (1) improve the conditions of daily life; (2) tackle the inequitable distribution of wealth, power and resources; and (3) measure, evaluate, learn, and ensure a global health workforce that understands and educates the public about the impact of social drivers of health (World Health Organization Commission on Social Determinants of Health, 2008). These principles are provided to help public health practitioners and policy makers identify points for intervention and change.

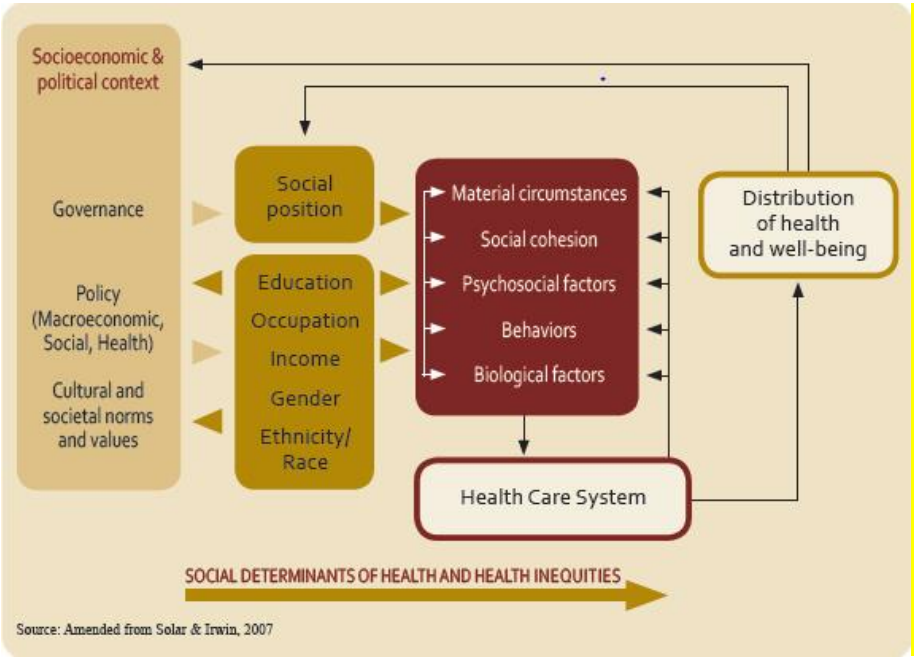

Figure 2. Factors driving health outcomes created by the Commission on Social Determinants of Health of the World Health Organization (World Health Organization Commission on Social Determinants of Health, 2008).

There are many variations of the definition of SDH, however, most speak to similar categories. Those categories typically include income and wealth, education, housing, the built or

human-made environment, and the social and community context (Bambra et al., 2009; Booske et al., 2010; USDHHS, 2014). For the purpose of this project, social drivers of health will include the typical definitions and be expanded to include racism.

Income, wealth, and economic stability are directly associated with lifetime health quality and lifespan (N. E. Adler & Ostrove, 1999; Lantz et al., 1998). These three factors are distinct, but connected constructs that impact the resources an individual can access and will be explored further in the literature review. Those with greater economic stability have greater access to health care, safer housing, healthy food, and other resources that promote health and protect against illness and injury. Conversely, low income, low wealth, and economic instability are directly associated with poorer lifetime health and reduced life expectancy. Research initially focused on poverty status, showing a direct relationship between poverty and health, rather than the spectrum of income and associated health outcomes. With further study, it has become clearer that incrementally higher income is associated with incrementally better health. This is known as the "social gradient." In other words, better income is associated with having better health, without needing extreme poverty or extreme wealth to see the impact (Adler et al., 1994).

Researchers have also found that the type and amount of education received impacts long-term health. Those with more years of education generally have better health status than those with fewer years of schooling (Catherine E. Ross & Wu, 1995). Education affects other factors that impact health, which means that education can have an indirect effect on health outcomes. Individuals with strong educations may have access to higher paying jobs. Greater education is also associated with greater wealth, access to health care, knowledge of self-care, and social and psychological support systems. In addition, direct links between the level of education and health outcomes exist, absent of intermediaries (C. E. W. Ross, Chia-ling, 1995).

This means that when all of these intermediary factors of better jobs, etc. are accounted for, the linkage between total education and health remains.

The environments in which we live also impact long term health (N. E. Adler & Ostrove, 1999; Wright & Kloos, 2007). Access to healthy food, housing quality, safe neighborhoods, and environmental conditions are all separately tied to positive health outcomes. Crime and violence in an individual's neighborhood may reduce the likelihood that individuals are physically active (Molnar, Gortmaker, Bull, & Buka, 2004). Individuals living in food deserts with reduced access to healthy foods are more likely to suffer from diseases of poor nutrition (Walker, Keane, & Burke, 2010). Quality of housing is associated with rates of infectious disease, chronic disease, injury, nutrition, and mental health (Krieger & Higgins, 2002). For example, poor quality housing with mold and insects is linked to higher incidence of chronic asthma in children and adults. In addition to the quality of housing is the location of that housing in relation to environmental risks. Poor air quality, poor drinking water, proximity to landfills, proximity to highways, and other environmental factors are associated with higher risk of chronic disease and mental health concerns (Lee, 2002).

In addition, social connectivity has been associated with better mental health outcomes, but its association with physical health is not as well understood (Seeman, 1996). Social connectivity generally describes the number and quality of relationships in and around an individual. The absence of social connectedness is associated with negative health outcomes more strongly than the presence of social connectedness is associated with positive health outcomes (Seeman, 1996). Furthermore, other studies indicate that strong social connectedness can serve as a buffer for low wealth and other social determinants, but is not strong enough to remove their impact on health (Cattell, 2001).

Racism is defined by those working actively to end it as prejudice plus power (Jones, Jones, Perry, Barclay, & Jones, 2009). Racism exists on several levels, including personal, institutional, and systemic. One potential driver of continued racism in this country is unconscious or implicit bias. Unconscious bias is defined as a predisposition or prejudice about a person, idea, or thing that is unknown or unrecognized by the individual, as opposed to a conscious or explicit bias, which a person can identify and control. Bias has been introduced into American culture, causing unintentional differential and typically negative impacts on individuals and communities of color. This unconscious bias affects everything from hiring practices (Bertrand & Mullainathan, 2004), to medical decision making (Green et al., 2007), and the criminal justice system (Rachlinski, Johnson, Wistrich, & Guthrie, 2009). People of color are less likely to receive an interview call back, more likely to receive below standard medical care, and more likely to be incarcerated than white Americans. Institutional and systemic racism can also be found throughout American history. For example, historically black neighborhoods are often the site of waste management, landfills, and other environmental hazards that are not placed in white neighborhoods (Bullard, 2000). While not currently identified as a SDH, or included in weighting of drivers of health outcomes, this analysis will include racism as an under-recognized determinant of health.

How are the social determinants and drivers of health weighted against other determinants of health? Researchers typically describe up to five components that collectively determine health outcomes: (1) clinical care; (2) social and economic factors; (3) environmental exposures; (4) health behaviors; and (5) genetics (McGinnis, Williams-Russo, & Knickman, 2002). However, there is no consensus regarding the relative importance of these categories. It is also quite possible that other categories will be identified in coming years. How important is one

determinant versus the other? With limited resources, should we focus on one more than another? While research has shown greater impact of social and environmental factors on health outcomes, effective access to and quality of medical care continues to dominate discussions around determinants of health and garner the majority of resources.

There have been many attempts to find the keystone determinant, which could fix most of our health problems. For example, researchers examined whether or not the difference between health outcomes for low and high wealth individuals could be explained by riskier health behaviors, such as tobacco use and poor nutrition, in low wealth communities. This would mean that poverty is not the issue, rather healthy behaviors are. However, differences in behavioral risk factors could not fully account for the differences between low and high wealth individuals, pointing toward additional, deeper factors in determining health outcomes (Lantz et al., 1998).

The County Health Rankings Project, housed at the University of Wisconsin – Madison, collects data on health determinants and outcomes and uses this data to rank counties within each state across the country. For example, North Carolina has 100 counties and each receives a ranking of 1–100. The County Health Rankings faculty aggregate data on birth outcomes, disease incidence and prevalence, education, housing, etc. This data is weighted and compared across counties within each state and are used to rank the counties on a scale of most to least healthy. In order to facilitate the process, faculty leading the County Health Rankings project created a working paper analyzing the different methods used to weight determinants of health (Booske et al., 2010). First, they divided the determinants into four categories: (1) social and economic factors; (2) health behaviors; (3) clinical care; and (4) environmental factors. For the purposes of the County Health Rankings, the fifth category, genetics and biology, were not included in the analysis. Social and economic factors (including education and income), and

environmental factors (such as air pollution and exposures to other toxins) encompass those issues referred to previously as SDH. Health behaviors include such issues as tobacco use, nutrition, and physical activity. Clinical care refers to treatment by a clinician in a medical setting. The authors included the built environment, such as mold in a housing development or public transportation, in environmental factors.

After dividing the four categories, the authors assessed different methods for weighting them (Figure 3).

Summary of Different Perspectives on Assigning Weights to Determinants of Health

	Historical Perspective	Literature Review	Other Rankings*			Analytic Approach	Pragmatic Approach	*County Health Rankings*
			AHR	WI, KS, TN	NM			
Social and economic factors	Increasing importance ↑	21% (up to 8x clinical care)	27%	40%	40%	55%	25%	**40%**
Health behaviors		57%	37%	40%	40%	37%	25%	**30%**
Clinical care		14% (up to 50%)	27%	10%	15%	21%	25%	**20%**
Environmental factors		7%	9%	10%	5%	-3%	25%	**10%**

*AHR = America's Health Rankings; the four other rankings were done within the states of Wisconsin, Kansas, Tennessee, and New Mexico

Figure 3. Multiple perspectives on the weight of factors affecting health outcomes (Booske et al., 2010).

The "historical perspective" method assumes that as public health engaged in and improved upon each factor over time, the improved factor became a greater contributor. Specifically, early public health efforts focused on environmental factors like clean drinking water and sewage removal as it was causing the greatest damage in health outcomes to the greatest number of people. Upon making great strides there, clinical care became the primary focus. Policy efforts were undertaken to expand and improve clinical care across developed nations. As more and more people gained access to clinical care, health behaviors became more important. With the focus on health behaviors came an understanding that not all people have

equal ability to change health behaviors for the better. For example, an individual who knows they should eat more fresh fruits and lean meats may not have a grocery store close enough to access these foods. A child who wants to be more active may not live in a neighborhood that supports them. Thus, the primary driver of health is now in the realm of social and economics.

The second method examined by the researchers was based on a review of the literature. Again, as no consensus about the weight of different determinants exists, the writers attempted to incorporate multiple published proposals. Some articles were very specific in associating percentages with determinants (McGinnis et al., 2002), while others within the literature review, even including the same lead article, were more broad in their findings, possibly due to the early timing of their work (McGinnis & Foege, 1993). Booske et al. (2010) in the literature review column used McGinnis (2002)after adjusting for genetic factors.

The third method for assigning weight to determinants presented in Figure 3 was gathered by examining other ranking models, including America's Health Rankings, those used by Wisconsin, Kansas, Tennessee, and New Mexico. Booske et al. (2010) were not able to directly compare County Health Rankings to other ranking models due to differences in what was contained within a category as well as how the measures of determinants were defined. In order to compare, Booske et al. reorganized measures and created estimated comparisons, as shown in Figure 3.

The fourth method for determining the weight of determinants was based on an unpublished Master's thesis described by Booske et. al. (2010), which used regression factor analysis of 400 U.S. counties to determine the weights of three factors (income, education and access to care), but did not include environmental factors. A second regression study that did include the environment based on the 2010 County Health Rankings data set showed an increase

in the impact of social factors and a decrease in the impact of health behaviors. A recognized limitation of regression analysis used in this case was that the timing of measuring the determinants and the outcomes may not have allowed time for the impact of the determinant on the health outcome. In other words, the outcomes measured may not truly reflect the impact of the determinant.

The fifth and final method of evaluating the weight of determinants of health is labeled the "pragmatic approach." This approach is not reliant on data or other research findings. Rather, it is intended to speak directly to public policy decision making and cross-sector engagement. Each factor may have some level of influence on another, and therefore cannot be completely separated in its impacts. In this way, Booske et al. (2010) suggested that a pragmatic approach would weigh each factor equally.

Finally, the County Health Rankings weighting is shown in the ninth column of Figure 3. Because there is, to date, no perfect method of weighing determinants, the County Health Rankings have settled on a combination of the other five methods shared in the above paragraphs. According to this document, the most conservative impact of SDH (as defined above to include environmental factors) would be 28% based on the literature review, while all other methods reviewed settle in around 50%. Regardless of the weighting system used, it is clear that a focus on SDH has great potential for improving population health.

What is the role of public health in influencing social determinants and drivers of health? The National Public Health Performance Standards at the Centers for Disease Control and Prevention (CDC) define the public health system as "all public, private, and voluntary entities that contribute to the delivery of essential public health services within a jurisdiction."("The Public Health Systems and the 10 Essential Public Health Services," 2017)

Within the public health system, local public health agencies are generally tasked with promoting and protecting the health of the public they serve. The CDC identifies "10 Essential Public Health Services," which were developed by the Core Public Health Functions Steering Committee in 1994 (CDC, 2010). These essential services were created to elaborate upon the three core services of public health described in the 1988 Institute of Medicine report: assessment, assurance, and policy development (Institute of Medicine Committee for the Study of the Future of Public Health, 1988). Assessment is necessary to understand the drivers of health and the impact of chosen interventions. Thus, the authors of the report recommended that each public health agency regularly and systematically collect, analyze, and share the information necessary to make decisions about how to improve the health of the public. With the information gathered through regular and careful assessment, the authors recommended that public health workers develop policy agendas rooted in science that promote the health of the public. Finally, the authors of the IOM report recommended that public health agencies assure the public that the resources necessary to create health will be available through collaboration, regulation, or direct service provision. Within these three categories, the ten essential services are described (Institute of Medicine Committee for the Study of the Future of Public Health, 1988):

Assessment:

1. Monitor health status to identify and solve community health problems;
2. Diagnose and investigate health problems and health hazards in the community.

Policy Development:

3. Inform, educate, and empower people about health issues;
4. Mobilize community partnerships and action to identify and solve health problems;

5. Develop policies and plans that support individual and community health efforts.

Assurance:

6. Enforce laws and regulations that protect health and ensure safety;
7. Link people to needed personal health services and assure the provision of health care when otherwise unavailable;
8. Assure a competent public and personal health care workforce;
9. Evaluate effectiveness, accessibility, and quality of personal and population-based health services;
10. Research for new insights and innovative solutions to health problems.

It is through this framework that local public health agencies should be prioritizing and engaging in efforts to shift social determinants and drivers of health for their populations. If anywhere from 28–50% of a population's health is determined by social, economic, and environmental factors, it follows that local public health agencies should work to improve the SDH of their populations. Beginning with assessment, public health agencies can track the status of SDHs as a part of the core function of assessment, as well as any ongoing interventions designed to impact those factors. Many of the measures of social determinants are outlined by Healthy People 2020(USDHHS, 2014). Healthy People 2020 provides evidence-based national objectives for health outcomes in the United States. Healthy People 2020 includes the following topics under the heading of SDH: economic stability, education, health literacy and access to care, neighborhood and built environment, and social and community context. Examples of SDH measures in Healthy People 2020 include access to quality early education, third grade reading levels and high school graduation rates for educational achievement, as well as income and

wealth for economic stability and access to neighborhood alliances and mentoring programs for social connectivity.

With respect to policy development, the second grouping of the ten essential services, public health agencies should be "informing, educating and empowering" and "mobilizing community partnerships."(Institute of Medicine Committee for the Study of the Future of Public Health, 1988) Much of public discourse focuses on individual behaviors and decisions. Public health agencies have an obligation to educate the public about all the different drivers of health, as well as to empower individuals to become involved in the changes that would lead to better health. Public health is rooted in research and development of evidence-based practice. Public health agencies can educate and engage partners in the identification, implementation, and evaluation of evidence-based practices associated with improving or mitigating the adverse consequences of some of the SDH. One compendium of evidence-based practices is *The Community Guide to Preventive Services* (Fielding et al., 2015), which was created by the Community Preventive Services Task Force in order to review and identify programs and policies that can help improve public health. With these resources, public health agencies can then serve as facilitators or conveners around a variety of health related issues (Alexander et al., 2003; Plough & Olafson, 1994).

The third and final core function of assurance explicitly recommends that public health agencies encourage and collaborate with other organizations who have the resources to improve the health of the public. In addition, it requires public health agencies to assure a well-equipped workforce that can innovate and create new and better initiatives to improve the health of their public. With regards to social determinants, public health workers have ties across sectors, from education to housing to transportation, which could lead to broad conversations about

opportunities for change. They can bring knowledge about how various sectors impact health and have the opportunity to have positive impacts. They can work together to innovate efficient and impactful collaborations. In addition, assurance demands a highly trained public health workforce, which means that education around structural and personally mediated racism should be included in standard workforce training. These essential services provide specific entry points for public health workers into the arena of SDH, though they may be outside traditional definitions of health.

Social Determinants of Health and Health Equity

An additional need for focus on SDH lies in health equity. In North Carolina, people of color have measurably worse health outcomes than white, non-Hispanic people. According to the report "North Carolina Resident Population Health Data by Race and Ethnicity" prepared by the North Carolina Department of Health and Human Services, State Center for Health Statistics in 2017, white and black citizens have exactly the same incidence of total cancer, yet black citizens are 20% more likely to die from this illness (North Carolina Department of Health and Human Services State Center for Health Statistics, 2017). In fact, black men are 2.5-times more likely to die from prostate cancer than white men. The infant mortality rate for Native American children is nearly twice as high as for white children. The same measure for black children is 2.5-times as high as for white children. The adult HIV infection rate is nine-times higher for African American North Carolinians than for white North Carolinians. In general, sexually transmitted infection rates are anywhere from six- to thirteen-times higher for African Americans than for white North Carolinians. At the same time, African Americans in North Carolina are less likely to graduate from high school, twice as likely to be unemployed, and twice as likely to live in poverty. The median household income for a white family in North Carolina is $51,707, while

the median household income for an African American family in North Carolina is $33,022. For a Native American family it is $33,094, and for a Hispanic/Latino family, $32,463. If SDH account for a significant amount of individual health outcomes, then it may follow that gaps in social determinants account for some portion of gaps in health outcomes. Engaging in efforts to improve SDH with racial inequities in mind could also lead to improvements in health equity.

Purpose

Given the importance of social determinants on health outcomes and health equity, and the role of public health in addressing social determinants, it may be necessary to better understand how and why local public health agencies in North Carolina are engaging in work to impact SDH, as well as to better understand those that have chosen not to engage in this area. Thus, the purpose of this dissertation is to:

- Identify facilitators of and barriers to prioritizing and engaging in work to improve social determinants and social drivers of health by local public health agencies (external to the local health agency);
- Identify common characteristics, circumstances, policies, and practices associated with local public health agencies that are prioritizing and engaging in work to improve social determinants and social drivers of health (internal to the local health agency);
- Develop a practical guide for local public health agencies to improve prioritizing and engaging social determinants and social drivers of health.

CHAPTER 2: LITERATURE REVIEW

Introduction

Over the past several decades, researchers have identified a strong link between social, economic, and environmental factors with health outcomes (Davis et al., 1981; J. Lynch, Kaplan, Cohen, Tuomilehto, & Salonen, 1996). Researchers have found that income, education, housing, food security, and other social and economic factors influence health. Still, it has been challenging to disentangle the unique and interactive effects of various social determinants (Winkleby, Jatulis, Frank, & Fortmann, 1992). For example, people with lower incomes are more likely to live in poor and unsafe neighborhoods and have less access to fresh fruits and vegetables. Is the increased likelihood of negative health outcomes related to the level of income itself, or the combination of effects that having a low income can create that negatively affect health outcomes? Over time, researchers have developed evidence that most SDH have both direct and indirect impacts on lifetime health. For example, highly educated individuals also tend to have jobs with a greater income, consume healthier diets, and live in high quality housing. These indirect effects of an education impact health. However, it appears that level of education alone, independent of whether or not a person uses that education to get a good job, buy a nice house, and eat healthy foods, will also impact lifetime health. Thus, education impacts health both directly and indirectly.

Not only have researchers developed an understanding of the impact of these different factors as independent drivers of health, but research has also shown that some of these effects can be bi-directional (e.g., poverty can influence health, and health can influence poverty).

Additionally, gradients of socioeconomic status may have incremental levels of impact on health outcomes (N. E. Adler & Ostrove, 1999). This literature review explores the impact of income, education, environment, social connectedness and racism on health outcomes.

Methodology

In order to identify appropriate research studies, multiple search phrases were employed by the principal investigator within the Google Scholars search engine. Search terms included: "social determinants of health," "education and health," "socioeconomic status and health," "environment and health," "social context and health," "public health as community convener," and "racism and health." For each search phrase, the abstracts of the top 25 results were assessed, and if appropriate, identified for full review. The search strategy resulted in a total of 175 article abstracts that were then screened using the following eligibility criteria:

- Primary interest of the research was to examine linkages between health status and identified determinant of health;
- Article was written in the English language;
- Not an opinion or editorial publication.

Of those 175 abstracts, 26 met all study inclusion criteria and were included in this review. In addition to this formal search, 55 articles were identified through examination of citations, or "snowballing" and recommendations from professional colleagues. Each of these 55 articles received full review and 46 were included in this literature survey. Finally, a Google alerts system was set up in October, 2015 and closed in January 2016 with the phrase "social determinants of health." This alert system generated an additional five articles for full review and all of those articles were included. These results are outlined in Table A1 (Appendix A) in combination with other documents used throughout this project.

Income, Wealth, and Economic Hardship

Financial status has many components. Income, wealth, and economic hardship are independent factors that are often tied together in the research of economics and health. Income is defined by Merriam Webster as money received in exchange for work or investment. Wealth more broadly encompasses income, assets, and other areas of financial resources. Economic hardship typically refers to point in time financial difficulty, for example, the loss of a job and associated income or the acquisition of debt following a serious medical problem. Additionally, income or wealth can be tied to education and job status in order to define socioeconomic status, which appears regularly in the literature, but does not allow for distinct examination of finances versus education.

Researchers have identified poverty as a driver of poor health outcomes with studies focused on comparing those living in poverty with people who have high wealth. Additional research has shown that each step up the income ladder comes with improved health outcomes. A study of social service employees in the United Kingdom identified specific gradations, known as the social gradient, in health outcomes by income level. Individuals working in social service institutions, from well-paid directors to low paid clerical staff, were assessed for cardiovascular health. A direct association between income level and health became apparent. With each increase in income, a parallel increase in health outcomes was seen. This was the first time a graded effect was identified, rather than a simpler understanding that poverty was the only level of income that could impact health outcomes (Marmot et al., 1991).

Other research has shown that the gradient may be getting stronger with new generations. In a 1993 study comparing the impact of income on mortality rate between 1960 and 1986, researchers showed that the gradient was becoming sharper the more recently a population

was born. (Pappas, Queen, Hadden, & Fisher, 1993). Regardless of the familial grouping portrayed in Figure 4, the lowest income individuals fared the worst with regard to mortality rates. The broken line shows mortality ratio for individuals in 1960 while the solid line shows the mortality ratio for individuals in 1986. A mortality ratio of 1.0 indicates expected mortality rate for age, gender, and race. Less than 1.0 indicates lower than expected mortality rate and greater than 1.0 indicates higher than expected. The first point plotted on each of the graphs is for the lowest income level (less than $2,000 in 1960 and less than $11,000 in 1986 for white males living with family members) and the final plot point is for the highest income level (greater than $11,000 in 1960 and greater than $25,000 in 1986). For the most part, as you move from left to right, mortality goes down as income goes up. For white men from families with incomes under $10,999, the mortality ratio was over four times higher than the ratio for white men from families with incomes of more than $25,000. These graphs also suggest trends that the mortality gaps between the lowest and highest wealth individuals has increased with time, seen through the steeper gradients in 1986 relative to 1960. The results of this study indicated a gradient relationship between the incidence of disease and income, with those at subsequently higher income levels having better health outcomes.

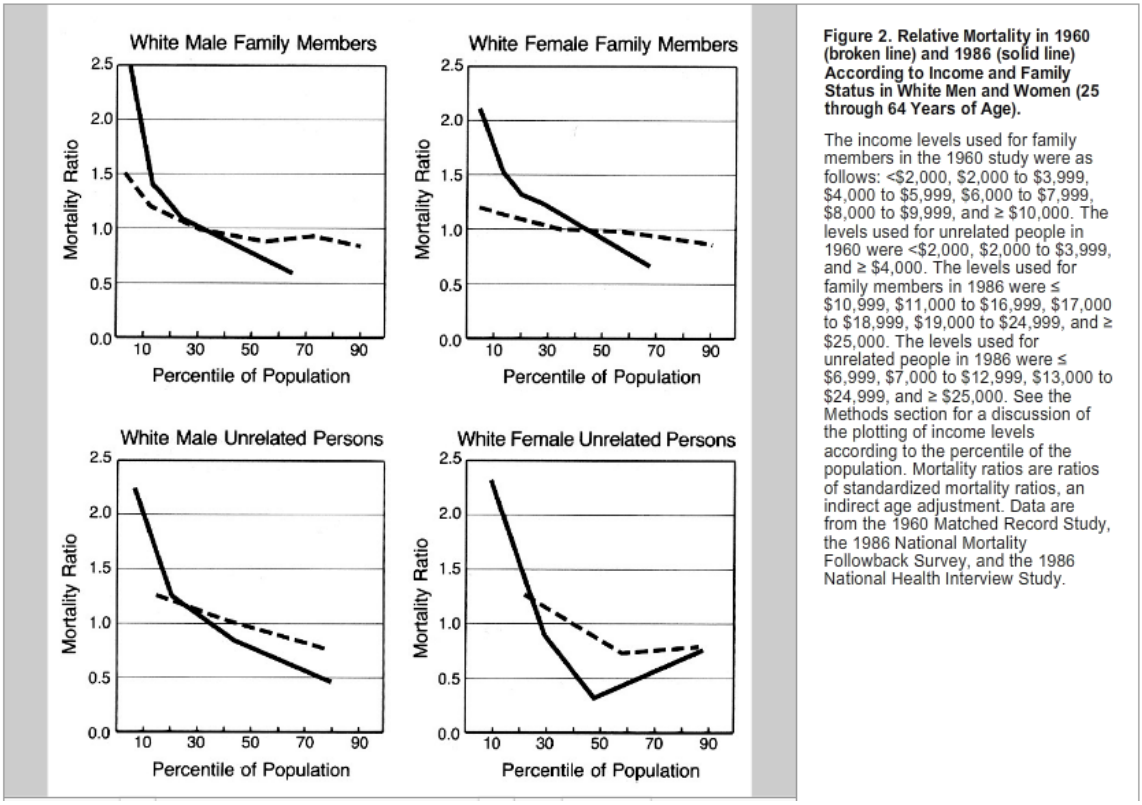

Figure 2. Relative Mortality in 1960 (broken line) and 1986 (solid line) According to Income and Family Status in White Men and Women (25 through 64 Years of Age).

The income levels used for family members in the 1960 study were as follows: <$2,000, $2,000 to $3,999, $4,000 to $5,999, $6,000 to $7,999, $8,000 to $9,999, and ≥ $10,000. The levels used for unrelated people in 1960 were <$2,000, $2,000 to $3,999, and ≥ $4,000. The levels used for family members in 1986 were ≤ $10,999, $11,000 to $16,999, $17,000 to $18,999, $19,000 to $24,999, and ≥ $25,000. The levels used for unrelated people in 1986 were ≤ $6,999, $7,000 to $12,999, $13,000 to $24,999, and ≥ $25,000. See the Methods section for a discussion of the plotting of income levels according to the percentile of the population. Mortality ratios are ratios of standardized mortality ratios, an indirect age adjustment. Data are from the 1960 Matched Record Study, the 1986 National Mortality Followback Survey, and the 1986 National Health Interview Study.

Figure 4. Comparison of mortality by income(Pappas et al., 1993).

This research defining gradation has helped inform additional studies into potential causal associations between wealth, income, and health outcomes. For example, one research team hypothesized that differences in health outcomes by income could be fully explained by the different health behaviors practiced between high and low income groups (Lynch, Kaplan, & Salonen, 1997) The research began with the hypothesis that higher rates of smoking, obesity, alcohol, and drug-use are seen in low-income communities and can account for the fact that low-income individuals have worse health outcomes than high-income individuals who may have better health behaviors. However, there is still a gap in health outcomes, even after accounting for differences in health behaviors. While the mechanism remains undefined, this suggests that there is something specific about income as an independent variable that impacts health outcomes. Other studies have demonstrated an association between economic distress and

increased risk of myocardial infarction, contributing to higher morbidity and mortality rates (J. Lynch et al., 1996). Still more correlate physical and mental wellbeing with personal wealth (Anastasiadis, 2010; Shea, Miles, & Hayward, 1996). One reason it may be important to separate out wealth from income is that the racial disparities in wealth are potentially far greater than in income and may contribute more to racial health disparities (Shea et al., 1996).

Finally, the demands of life associated with graded levels of economic status are inversely tied to the resources available to deal with those demands. In other words, those with the lowest wealth and income have the highest needs because they live with lower quality housing, in potentially unsafe neighborhoods, with reduced access to food and transportation, and they have the fewest resources to manage those demands. An example of an individual with higher demands and lower resources would be a migrant field worker who has high physical demands, high exposure to environmental toxins, and likely little or no resources for medical care. An individual working at a desk for a salary with benefits would have fewer physical demands on his body and more financial and social resources to manage his personal health (Kaplan, Haan, Syme, Minkler, & Winkleby, 1987).

As noted earlier, there is also a body of literature that examines the directionality of the impact between income and health. There is some evidence from the field of economics regarding whether low income causes poor health ("social causation") or if the relationship flows in the other direction, with poor health reducing the ability to complete quality education, acquire stable work, and develop a steady income ("social drift"). One line of thinking is that earlier in life, living in poverty and lacking income security drives health outcomes. As a person ages, however, poor health may increasingly contribute to lost wages, lost savings, and lost economic stability (Smith, 1999). The impact of income during pregnancy and early childhood likely has

lifelong effects because of the vast amounts of physical, mental, and social development taking place at this point in life (Catalano, 1991). Some argue that social drift impacts the full lifespan only when a difficult health status erupts early in life. For example, onset of schizophrenia in the late teens and early twenties is associated with social drift because it can prevent an individual from completing school, establishing a stable career, and developing wealth (Adler et al., 1994).

The impact of acute or chronic low-income status on health is another area of interest. Much of the analysis of income has focused on snapshots in time, comparing point in time health and point in time income. This has allowed for a stronger understanding of the acute impact of income on health outcomes. For example, job loss and acute economic stress is associated with poor mental health diagnoses and associated nonspecific physiological illnesses (Catalano, 1991). In addition, chronic economic hardship is also strongly associated with lifetime health outcomes. In a closed cohort study following the same individuals for 29 years, individuals below 200% of the poverty level had mortality rates that were nearly twice as high as those who did not face economic hardship (Lynch, Kaplan, & Shema, 1997). Chronic low-income status impacted nearly every functional capacity assessed during the study, leading the research team to conclude that income status has a consistent, chronic, and graded effect on psychological, physical, and cognitive function.

In conclusion, the mechanisms behind the relationship between income, wealth, and health outcomes are not perfectly understood. However, the body of research clearly describes a direct, graded relationship that shows impact in instances of acute economic distress as well as over a lifetime of low income, low wealth, and economic distress. Improving income and wealth status can improve lifetime health outcomes, including chronic diseases, mental health, injury, illness, and mortality rates.

Education

The connection between educational attainment and health outcomes is well established (Cutler & Lleras-Muney, 2006; Goesling, 2007). As level of education increases, so too does the likelihood of positive health outcomes. It is a critical area of interest, as it appears that the impact of education on health is increasing with each birth cohort(S. Lynch, 2003). Figure 5 shows the effect of education by age based on a linear regression model. The Y access is the amount of education and the x access is the age. The intercept is the effect of education on health by age. The intercept isn't good health or bad health, it's the amount of effect education has on health by age.

This means that with each passing year of birth, the amount of education an individual achieves will have a greater and greater effect on his or her lifetime health. Figure 5 shows this effect for cohort birth years of 1873, 1918, and 1963. The youngest (1963) cohort saw the greatest impact of education on self-reported health. This may be due to the fact that level of education has had an increasing effect on the ability to acquire a stable income, good housing, and other intertwined factors that lead to improved health outcomes.

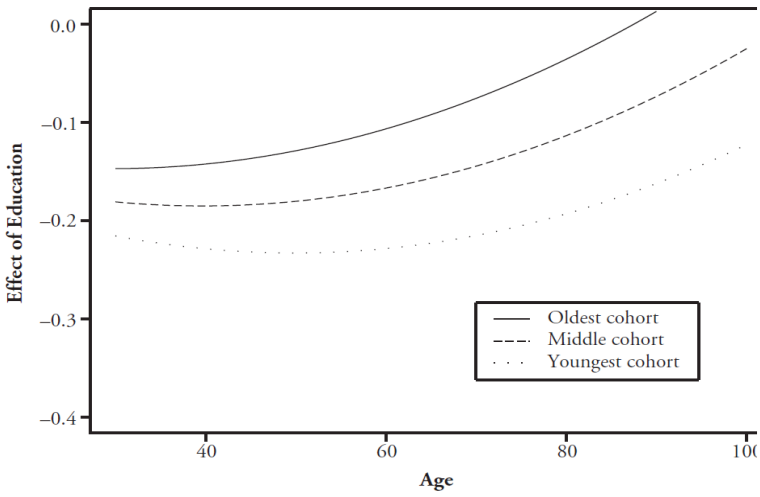

Figure 5. The effect of education across age by cohort (S. Lynch, 2003).

An education gradient, much like an income gradient, also appears in the research. As the amount of education increases from some high school education through a four year degree or more, a reduction in incidence of disease and an improvement in mortality rate can be found (Adler et al., 1994). In Figure 6, average education by country compared to life expectancy shows a positive relationship (Cutler & Lleras-Muney, 2006).

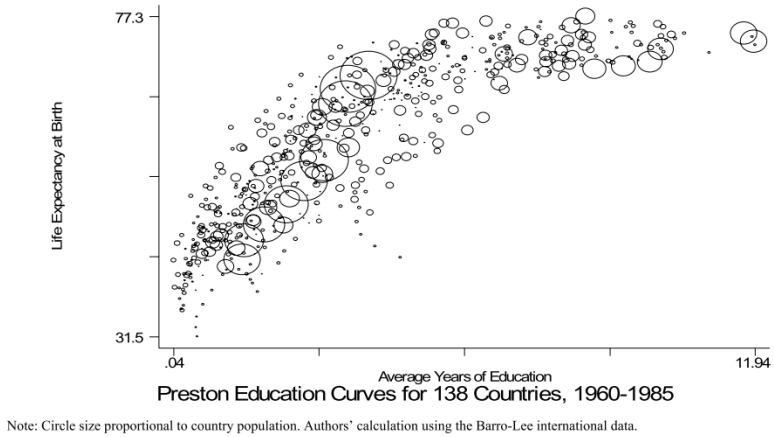

Figure 6. Life expectancy per average years of education for 138 countries (Cutler & Lleras-Muney, 2006).

Research has identified at least two health outcomes impacted by educational attainment. Firstly, the greater the amount of education acquired, the more likely an individual is to experience reduced incidence of disease and improved mortality rates post-diagnosis. Secondly, the greater level of education achieved, the lower the incidence of chronic disease (Castro, 2012). In contrast, the lower the education level, the greater the mortality rate will be if a chronic disease is diagnosed (Christenson & Johnson, 1995). In other words, lower education rates not only mean a greater chance of acquiring a chronic disease, but also a greater chance of dying prematurely because of that disease.

There are several explanations that attempt to describe the factors underlying the association between education and health, which can be sorted into three major ideas that help explain the indirect or intermediate impact on health, including: (1) relationship between education and income; (2) relationship between education and knowledge of self-care; and (3) relationship between education and social and psychological resources (J Paul Leigh, 1983; Masters, Hummer, & Powers, 2012). The first explanation is that increasing educational attainment means greater income and financial stability. The US Bureau of Labor Statistics posts the average income of individuals by educational attainment. Figure 7 is taken from the Current Population Survey at the U.S. Bureau of Labor Statistics, indicating the average weekly income and unemployment rates of individuals by educational attainment. The left side of the graph shows that unemployment rates decrease with increased educational achievement, which impacts income. The right side shows that the average weekly pay for an individual generally increases with increasing education. The average person with less than a high school diploma makes half the income of the average person with a college degree and only one third the income of a person with a terminal degree.

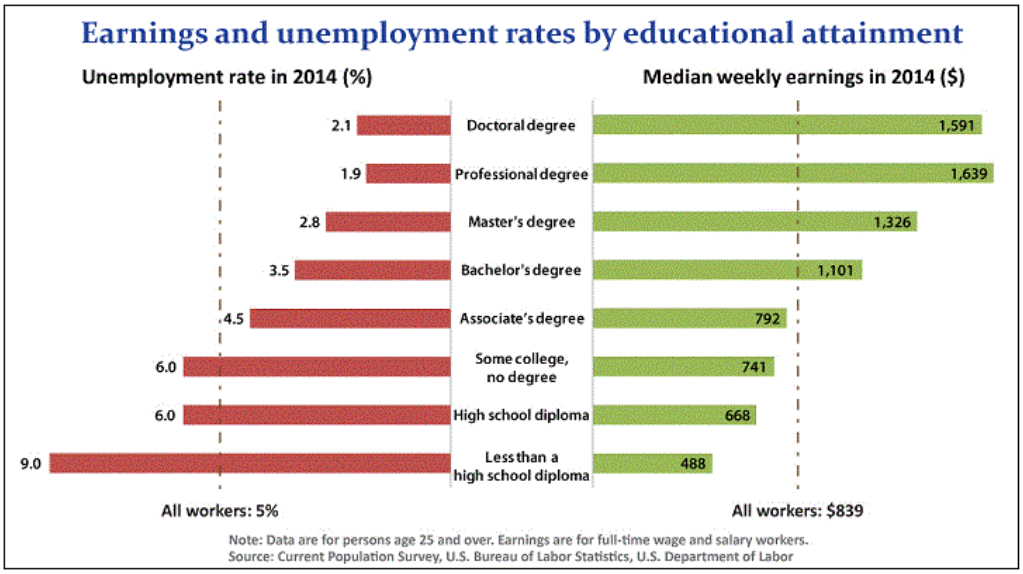

Figure 7. Earnings and unemployment rates by educational attainment.

Follow-up research has shown that the total number of years of education, rather than the type of degree or college selectivity, accounts for most of the differences in life expectancy (Catherine E Ross & Mirowsky, 1999). This means that a person with two community college associate degrees may see the same health impact as an individual with a bachelor's degree. Differences in income, wealth, and other associated constructs are discussed earlier in this review.

The second explanation, focusing on education and knowledge of self-care, shows that increasing educational attainment improves knowledge of self-care and healthy behaviors (J. P. Leigh & Fries, 1994). Those with lower amounts of education have higher rates of smoking, for example, and tobacco-use is associated with increased rates of chronic obstructive pulmonary disease, heart disease, and lung cancer (Montez & Zajacova, 2013).

The third explanation for the difference in life expectancy by educational attainment is that increased educational attainment is associated with improved social and psychological resources (Catherine E. Ross & Wu, 1995). Social and psychological resources are defined in

two ways. The first centers around self-efficacy for healthy living. In other words, those with higher educational attainment improved their belief that they can affect their health, which was in turn associated with improved health behaviors. The second way social resources are defined is in terms of having a social network of support, which is also associated with improved health outcomes. Social support includes having a trusted adult who could help navigate decisions and personal directions. The impact of social support on health is discussed later in this review. Those who went farther in their education had a correlated increase in social support, which was in turn tied to better lifetime health outcomes (Catherine E. Ross & Wu, 1995).

None of the aforementioned explanations can alone account for the impact of educational achievement on disease incidence and overall mortality. After accounting for income, healthy behaviors, and improved psychological attainment, differences in health outcomes by educational levels persist. It appears that, as with other health determinants, there is some additional direct impact of educational attainment on health outcomes. The act of acquiring higher levels of education directly impacts long term health and its influence has been shown to be independent of income and occupation (Winkleby et al., 1992).

The Built Environment

The physical space in which individuals live, work, and play can impact health outcomes of chronic disease, acute illness, and mental health (Diez Roux, 2001; Wright & Kloos, 2007). The quality of an individual's home and housing, as well as existence of environmental supports like sidewalks and bike lanes where people work and spend leisure time, has a real and lasting impact on health.

The effects of environmental factors on health are complex and far-reaching, impacting both short and long-term health outcomes. First, environmental factors can have an acute impact

on health because of their effect on health behaviors. For example, high walkability of neighborhoods is associated with increased physical activity and decreased body mass index, regardless of socioeconomic status of the neighborhood (Sallis et al., 2009). If there is no safe place to walk, few will choose walking or biking to run errands or get to work, and even fewer will participate in leisure walking. In addition, overcrowding or unsanitary conditions in the home and neighborhood can increase acute illness through exposure to infectious disease (Krieger & Higgins, 2002). The second impact, known as "weathering," includes the effect of chronic stress, detrimental environmental exposure, and long-term reduced access to resources (Ellen, Mijanovich, & Dillman, 2001). This can happen as a result of housing proximity to garbage and toxic waste dumps, low water-quality, and poor air-quality. Social factors such as crime and violence also contribute to weathering. Additionally, people who live in low-income communities may lack access to high-quality food, as these neighborhoods may not have stores that sell nutritious food (i.e., food deserts), while also having a wide variety of unhealthy food and drink choices (i.e., food swamps). This can also contribute to chronic health conditions.

Neighborhoods with low socioeconomic status are associated with poor health behaviors. For example, higher rates of smoking, lower rates of physical activity, and poor nutrition are more prevalent in low income neighborhoods than in high wealth neighborhoods (Huie, 2001). However, even after researchers control for these individual health behaviors, the difference in health outcomes between neighborhoods persists (Leventhal & Brooks-Gunn, 2000).

In addition to specific built environment factors associated with low-wealth neighborhoods, including lack of safe walkways and healthy food sources, there are some unexplained negative health outcomes associated with living in a predominantly low-income neighborhood. For example, an older adult of moderate income living in a low-wealth

neighborhood may have health status on par with his or her low-wealth neighbors. Even with the protective qualities of income, poor health outcomes persist in this example, leading to the possibility that location of a person's home in a certain neighborhood independently impacts health outcomes (Diez Roux, 2001). The built environment is likely the key to this issue, not simply health behaviors or the quality of the housing itself. One explanation may be that poor air quality is also associated with increased risk of asthma and other respiratory problems. The family may have enough income to access nutritious food, and a clean and safe home environment, but is still exposed to lower quality air, limited safe space to be physically active, and other community-level factors.

Social Connectedness

The social context of a person's life includes the safety of the neighborhoods in which they live, their personal and social associations, and the belief that a person can rely on and work with their neighbors to effect change (Yen & Syme, 1999). Evidence shows that while the physical space in which a person lives can impact their lives, social context may be important as well (Roberts, 1997).

In addition to the physical properties of housing and neighborhoods, other factors that surround housing can impact health outcomes. Research focused on the "neighborhood effect" examines the relationship between health outcomes and neighborhood-level measures, such as economic hardship, housing costs, social connectivity, and neighborhood socioeconomic status. For example, a negative association between neighborhood-level economic hardship and low birth weight has been shown to exist (Roberts, 1997). One hypothesis examined by the researchers questioned whether mothers in an economically distressed neighborhood may have fewer resources and access to healthy food and other prenatal staples, leading to low birth weight

outcomes. However, the research team drew the conclusion that the lower birth rates may also be indicative of lower social connectivity and social safety nets. For example, these women have fewer friends and family members able to support and guide them toward good prenatal practices. These problems persist throughout the life span, with older adults showing significantly worse health in lower wealth communities, independent of individual socioeconomic status, indicating a need for intervention not just in youth and those of childbearing age, but to be inclusive through end of life (Menec, Shooshtari, Nowicki, & Fournier, 2010).

A subset of the "neighborhood effect" research includes improved understanding of collective efficacy. Collective efficacy is defined as "an emphasis on shared beliefs in a neighborhood's conjoint capability for action to achieve an intended effect, and hence an active sense of engagement on the part of residents" (Sampson, 2003). In other words, neighbors believe in each other's collective interest and ability to make positive change in the neighborhood. This includes such variables as mutual trust among neighbors, shared expectations of relationships, and participation in voluntary community organizations. The results of the author's analysis show that collective efficacy is an additional factor in determining health as a result of neighborhood membership, as communities with higher "collective efficacy" also had lower rates of violent crime and resulting associated injury, illness, and death.

The community, neighborhood, and housing in which individuals live has both direct and indirect impact on short- and long-term health outcomes (Ellen et al., 2001). These outcomes persist even when socioeconomic status, health behaviors, and environmental exposures are taken into account and is therefore an independent determinant of health (Robert, 1999).

Racism

Like other social drivers of health, racism has both direct and indirect impacts on the health of individuals. Racism occurs on multiple levels: personally mediated, internalized, and structural or institutional racism (Jones et al., 2009). This literature review will focus on personally mediated and structural racism and their impacts on health of individuals experiencing racism in daily life. Structural racism is the interaction of policies, practices, and norms that create systems and institutions that provide advantages to some, typically white, people while disadvantaging others, typically minority groups (Lawrence, 2004). Personally mediated racism can be implicit or explicit and is experienced through personal interactions (Lawrence, 2004). An example of personally mediated racism would be the store clerk that closely trails people of color shopping in the store but does not closely track white shoppers, making the person of color feel singled out as a potential criminal. These levels of racism interact and overlap, causing direct and indirect impact on health outcomes.

Indirect impacts of racism appear as an exacerbation of other determinants of health. Structural and personally mediated racism, or the differential treatment of certain racial demographics, increases the risk that an individual will live in poverty, in a less than ideal physical environment, without strong social supports, and with less success in education. As a result, simply having a different skin color means that a person is already at higher risk for the negative health outcomes associated with these social drivers and determinants of health.

According to one meta-analysis, the strongest evidence for the direct impact of racism on health lies in the areas of mental health and personal health behaviors (Paradies, 2006). After accounting for income, education, and geographic location, subjects assessed by the meta-analysis still had poorer mental health outcomes and were more likely to engage in risky health

behavior. Another area of health directly impacted is birth outcomes. African American infants experience disproportionate rates of premature birth and low birth rates (Thornton et al., 2016). One research study identified five contributors to these outcomes: ethnic differences in socioeconomic status and health behaviors; higher levels of stress in African American women; greater susceptibility to stress in African Americans; the impact of racism; and ethnic differences in physiological systems (Giscombé & Lobel, 2005). Two of these pathways, racism and stress, contribute directly to negative birth outcomes. Another study explored more perceived-racism-related stress during pregnancy and confirmed the predictive value of perceived racism with negative birth outcomes(Dominguez, Dunkel-Schetter, Glynn, Hobel, & Sandman, 2008).

The systems and behaviors that result in the differential treatment of segments of the American population are leading to negative health outcomes in those same segments. Racism is a predictor of poor health outcomes. An investment in changing those systems and behaviors is as valid an investment as other identified SDH.

Conclusions

The literature base surrounding SDH is extensive, supporting income and wealth, education, social and environmental factors, and racism as separate and distinct drivers and determinants of health. However, gaps in the research remain around the mechanisms of these determinants on health outcomes. For example, indirect and direct impacts of education level on health outcome can be identified, yet the mechanism of the direct cause of acquired education on health outcomes remains unclear. Given the understanding that social drivers and determinants of health have significant direct and indirect impacts on health, regardless of the mechanism, it becomes important to understand if local health agencies are using this research, and if so, how they use it to impact population health outcomes.

Limitations

This literature review had some limitations worth noting. For example, due to the broad scope of the SDH subject matter, the literature review for each specific SDH was limited to the first 25 articles returned in the search. Over the past several decades, research into SDH has grown exponentially, limiting the ability of this researcher to review all relevant publications. Research over the last 15 years has focused on how—rather than if—social determinants impact health. Thus, this search process identified no articles that contradicted or questioned the general understanding that there are clear relationships between identified SDH and health outcomes.

CHAPTER 3: METHODOLOGY

Study Overview

The purpose of this study was to better understand whether and how some local public health agencies in North Carolina are prioritizing and engaging in efforts to improve SDH as well as the motivating factors behind this work. In order to gain an in-depth understanding, a mixed methods approach was employed. The first phase of the study included a survey targeting all local North Carolina health directors or their proxies. The purpose of this survey was to identify knowledge and attitudes around SDH and their impact on community health, as well as to gain an understanding of public health's efforts to engage cross-sector partners in their work. The survey also assessed local health directors' perception of whether and how they are prioritizing SDH and who they perceive to be their partners outside of public health. For example, while a social determinant may not be listed as a "priority," perhaps developing a partnership with the local education agency is a strategy to overcome another identified priority (e.g., reducing childhood obesity). Lastly, the survey helped to identify appropriate agencies to be recruited into the next phase of data collection.

The second phase used information gathered from the survey and local community health needs assessments (CHNAs) to identify key informant interviewees in multiple locations in the state to better understand the role public health agencies can play in prioritizing and working in SDH, as well as the barriers and facilitators to engaging in such work. Key informants included public health professionals and partners in the community, such as stakeholders from education, economic development, community development, and housing.

Background

Every four years, North Carolina local public health agencies are required to complete and submit a CHNA to the North Carolina Department of Health and Human Services (NC DHHS) as a part of the agency accreditation process, which includes a community health action plan as the final step of the CHNA. The purpose of the CHNA is to engage stakeholders in identifying the key issues impacting the health of the community, to share that information with the community, and then to use that information to make a collective plan for improving the community's health. According to the NC DHHS, CHNA is a "systematic collection, assembly, analysis, and dissemination of information about the health of the community." More recently, public health agencies have had the option of moving to a three-year cycle in order to partner with hospitals that are required to complete a CHNA as a part of the Affordable Care Act. Each CHNA must follow guidelines laid out by NC DHHS. This includes an eight-phase process:

- Phase 1: Establish a community health assessment team. The local health agency identifies local stakeholders, professionals, and community leaders who will drive the community health assessment process.
- Phase 2: Collect primary data. This phase requires the collection of local, county-level health data. This may include surveys, interviews, listening sessions, and focus groups in order to learn about the health concerns facing the community. This goes beyond objective health data and includes the subjective perceptions of community members about which health concerns worry them the most.
- Phase 3: Collect secondary data. During this phase, the CHNA team compares county-level data to regional, state, and national data, as well as to historical local data.

- Phase 4: Analyze and interpret county data. This phase requires the CHNA team to examine the data collected in phases 2 and 3 in order to better understand the factors driving health outcomes in the community.
- Phase 5: Determine health priorities. After the data is assessed, compiled, and analyzed, the CHNA team must present findings to the community for feedback. The CHNA team and community participants must then set priorities for working to improve the health of the community, based on the data from phases 2 and 3. These priorities are set for either three or four years, depending on the life cycle of the CHNA (four years for public health agency accreditation, three years if partnering with a health care organization with the purpose of accreditation and meeting Affordable Care Act requirements).
- Phase 6: Create the community health assessment document. The CHNA team must compile all of the data and processes used to collect it, along with the new priorities and share a detailed description of methods for how the CHNA team came to those priorities.
- Phase 7: Disseminate the community health assessment document. Upon completion of creating the CHNA document, it must be shared widely in the community. This can include press releases, community meetings and other methods.
- Phase 8: Develop community health action plans. The CHNA team must then use the data, community feedback, and resources around evidence-based practice for change in order to set goals, strategies and actions to achieve the priorities outlined in the CHNA. (*Community Health Assessment Guide Book,* 2014)

Each North Carolina county goes through a local version of this process, identifying a range of priority areas. Some public health agencies, known as district health departments, represent more than one county. Though multiple counties may be served by a single public health agency, each county must conduct a community health assessment, create priorities for each of their counties and lay out an action plan for moving forward. Thus, each county has its own health priorities and plans for improvement.

The state public health department requires each county to select at least two of the forty objectives identified by Healthy NC 2020 as priorities for their counties. I reviewed of each county's publicly available community health assessment revealed a range of priorities, which fell into a handful of themes. These assessments were published between 2010 and 2015. Most counties identified three to five priorities, though one county identified 24 separate priorities. For the purposes of this project, the review was limited to the top five priorities of any county. Counties were considered to be prioritizing SDH if one or more social determinants were listed as a top five priority area or concern.

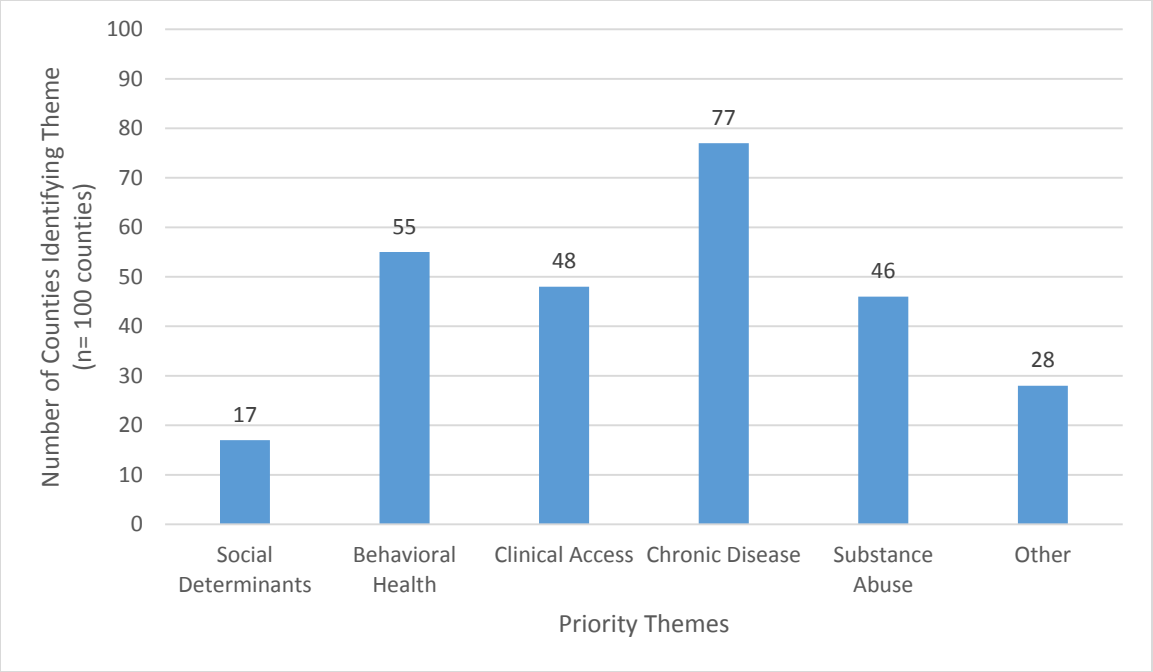

Figure 8. Priority themes across North Carolina community health assessments.

Seventy-seven of 100 counties identified chronic disease as one of its top health priorities. While there was consistency across counties in identifying chronic illness as one of their priority areas, there was some variation in the type of chronic illness (e.g., diabetes, heart disease, cancer). In addition, 55 of 100 counties chose behavioral or mental health, 48 of 100 chose access to clinical care, and 46 of 100 chose substance abuse as one of their top priorities. Another 28 of 100 identified other priority areas, including healthy families, personal responsibility, sexually transmitted diseases, and child and maternal health. Seventeen of 100 counties identified one or more SDH as one of their top five priorities, including:

- Alamance: education, economic factors
- Cabarrus: un/underemployment, education
- Carteret: economic development
- Cleveland: social determinants of health

- Durham: poverty, education
- Granville: success in schools
- Haywood: social determinants of health
- Hertford: social determinants of health
- Mitchell: access/support for low income households (lacking every day needs)
- Orange: built environment
- Polk: economy and health
- Rockingham: social determinants with an emphasis on education
- Vance: success in schools
- Wake: poverty and unemployment
- Wayne: social indicators (poverty, access to health care, crime, education)
- Wilkes: economy/poverty
- Wilson: poverty/low income

A complete list of priorities by county can be found in Appendix B.

Data Collection

Data collection was divided into two phases. In Phase I, a survey was distributed to all local health directors (Appendix C) and administered electronically. Upon completion of analysis of data generated by Phase I, four counties were identified for in-depth analysis in Phase II of the study. Inclusion criteria for those counties identified were developed upon the completion of the surveys, in connection with data published through CHNA reports. The primary inclusion factor

for the selection of the four counties was that the local health director had participated in the survey. Next, the county needed to have identified a SDH within its most recent CHNA. Finally, geographic spread and economic tier status were included to ensure a variety of each (East, West, Central, and tier 1, 2, 3).

Within the four counties, stakeholder leaders from sectors associated with SDH (e.g., education, economic development, housing, public safety, and public health) were recruited as key informants for interviews. Key informants must have had a decision-making role within their agency, and that agency must have been commonly acknowledged as a leading organization within a sector impacting a specific SDH (e.g., superintendent of schools, director of housing, faith leaders, etc.) Separate interview processes and guides were developed for public health key informants versus other sectors (Appendices D and E). For non-public health sector key informants, qualitative data was collected around the mission, vision, and values of the agency. In addition, informants were asked about their interactions with public health and their understanding of SDH. For public health agency leadership, qualitative data was collected around the vision and values of the agency, and the professional beliefs and values of the organizational leadership about if, how, and why public health agencies should be engaging in multi-sector efforts to impact SDH. These beliefs and values may be a factor in why an agency chooses a level of engagement in SDH. Additionally, the interviews attempted to collect information describing beliefs of both public health agencies and external partners on the role of public health in social determinants (i.e., activities not traditionally identified as "health").

Next, the interviews attempted to collect data about the organization and leadership's understanding or beliefs regarding the impact of social determinants on health outcomes. Specific to the public health agency, data was collected to determine beliefs about the agency's

role in affecting change in SDH. The interviews were also used to collect information about facilitators and barriers for local public health agencies in prioritizing SDH. Specific to partner agencies outside of the local public health agency, interviews were used to collect information about the stakeholder organization and leaders' perception of the role of public health in the work of improving SDH, the interest of non-public health sectors in collaborating with the public health agency, and understanding of the capacity of the local health agency to engage in SDH work.

Delimitations

The major delimitation of this study was the decision to focus exclusively on agencies of North Carolina. SDH work faces public health agencies across the nation. As the principal investigator, I work and practice in North Carolina, and I plan to use this research to create a plan for change to implement here. Including other states in the research may have resulted in a more generalizable product, however, as a North Carolina practitioner, that level of generalizability is not necessary.

A secondary delimitation of this study was the limited number of communities that could be included in Phase II of the research due to the capacity necessary to collect in depth detail about each. This design enabled collection of in-depth organizational details for the development and implementation of a focused plan for change rather than a broad and theoretical plan.

Data Management and Analysis

Data management. The statewide survey was completed using Qualtrics. The survey was used to collect information about the respondent's location, including name, organization, organizational reach, and community demographics. Survey data was also used to confirm or update community health priorities as identified by the most recent community health

assessment. This survey was used to collect information from the local health agency director (or designee) regarding beliefs about whether or not the agency should be engaging in work to impact SDH. This data will help to understand which SDH, if any, the local health agency leadership believes they have a role to play. The survey sought to collect data that could help researchers understand the barriers and facilitators to public health engagement in community work to address SDH. The survey asked respondents to share whether or not participants or organizations involved in the CHNA pressed for inclusion of SDH, and if so, who those participants/agencies were. In addition, the survey asked the respondent to identify whether or not the agency has regular partners in other sectors. Finally, the respondent was asked to share whether or not there have been attempts to engage partners from different sectors and whether or not there have been responses to those requests.

Data collected was held confidentially behind password protected encryption and then downloaded and stored in password protected excel files on a secure laptop. While no identifying or attributable data will be shared, results from the interviews were used to identify participants for the second phase of the study. Survey participants were notified that they may be contacted following the submission of the survey. Interviews were audio-recorded and electronically stored in a secure university owned, password-protected cloud service, known as OneDrive. Interviewees were only identified by participant number on the recording. These recordings were submitted to the online service Transcribeme.com for transcription.

Data analysis. Surveys included both quantitative and qualitative questions. From the information collected, a basic overview of responding agencies was completed. This included percent of agencies that identified a social determinant as having a role in public health. In addition, percentages of agencies attempting to partner with different sectors are also presented.

Results from the survey were then analyzed in order to build a profile of characteristics, circumstances, policies, and practices common among public health agencies engaged in work to improve SDH.

Based on the information procured through the survey, including current priorities, cross-sector partnering efforts, belief in public health role in social determinants, and interest in working on social determinants, four communities were selected for more in-depth data collection. These four communities were intended to be representative of the different communities found within North Carolina, and allowed for an in-depth, multi-sector analysis. Within each community, the public health agency and representatives from each sector identified in the survey were contacted for a key informant interview. Of 31 individuals who were contacted, 15 participants from four counties consented to the interview process.

Following the interview and verbatim transcription, the content of the interview was coded using NVivo software. I used both the deductive coding approach, based in themes identified through the initial survey, as well as a grounded theory approach to coding, which allowed for the development of codes inductively. A "constant comparison" method was used to continuously compare newly coded language to previously coded language (Glaser & Strauss, 1967). When matches appeared, new language was coded with existing codes and when it did not, new codes were added. These codes were used to develop themes around the barriers and facilitators for public health agencies to engage in affecting SDH. Barbour (2001) pointed out that the degree of agreement between two coders is less important than the discussions that follow about the disagreement. This allowed me and additional coders (fellow University of North Carolina, School of Public health DrPH candidates) to expand perceptions and possibilities for the data, allowing for more comprehensive and less biased interpretation. I coded

all interviews initially. Two volunteer DrPH students coded a subset of the interviews. We compared and discussed processes. No significant differences appeared. The coding allowed for the exploration of patterns and themes in the content. From those patterns and themes, further analysis allowed the development of information regarding the agencies that were involved in affecting SDH. Finally, the analyzed data was used to develop a framework, leading to a plan for change that will support North Carolina's local public health agencies in expanding efforts to impact SDH.

CHAPTER 4: QUANTITATIVE RESULTS

Fifty-seven of North Carolina's 84 local health directors (68%) responded to the survey. Of those 57, one began the survey but only completed the first question and was therefore removed from the data set. Eleven of the 56 completed some portion of the survey, but did not provide all responses or any location data and were therefore excluded from the analysis that required location information. Forty-five respondents completed the entire survey, representing 52 of North Carolina's 100 counties. Five of the respondents represented multiple counties.

Table 1. Type of agency responding to the survey (N = 56).

	Raw count (percent of total)	Location included (percent of category)
County Level Health Agency	43 (77%)	34 (79%)
District Health Agency	5 (9%)	4 (80%)
Consolidated Health and Human Service Agency	7 (12%)	6 (86%)
Other (Public Health Authority)	1 (2%)	1 (100%)

Forty-three of fifty-six (77%) respondents partnered with a local hospital in the CHNA process. Fifty-four of fifty-six (96%) agencies completed their most recent CHNA within the

allotted time frame for non-profit hospital community benefit requirements (within the past three years) and all responded within the allotted time frame for NC Public Health Agency accreditation (within the past four years).

Figures 9–12 use an "N" of 45 or 56, depending on the number of completed responses. Fifty-four of 54 (100%) respondents reported collaborating with at least one other sector (Figure 9) outside of the assessment process. The most popular sectors for collaboration included education (98%) and health care (100%). Over 80% reported partnering with a community organization, like Big Brothers and Big Sisters, or community associations. In addition, 78% reported partnering with a hospital or hospital system specifically for the CHNA process. This indicates that some agencies who do not partner with hospitals during the CHNA process still partner with the health care sector in some format.

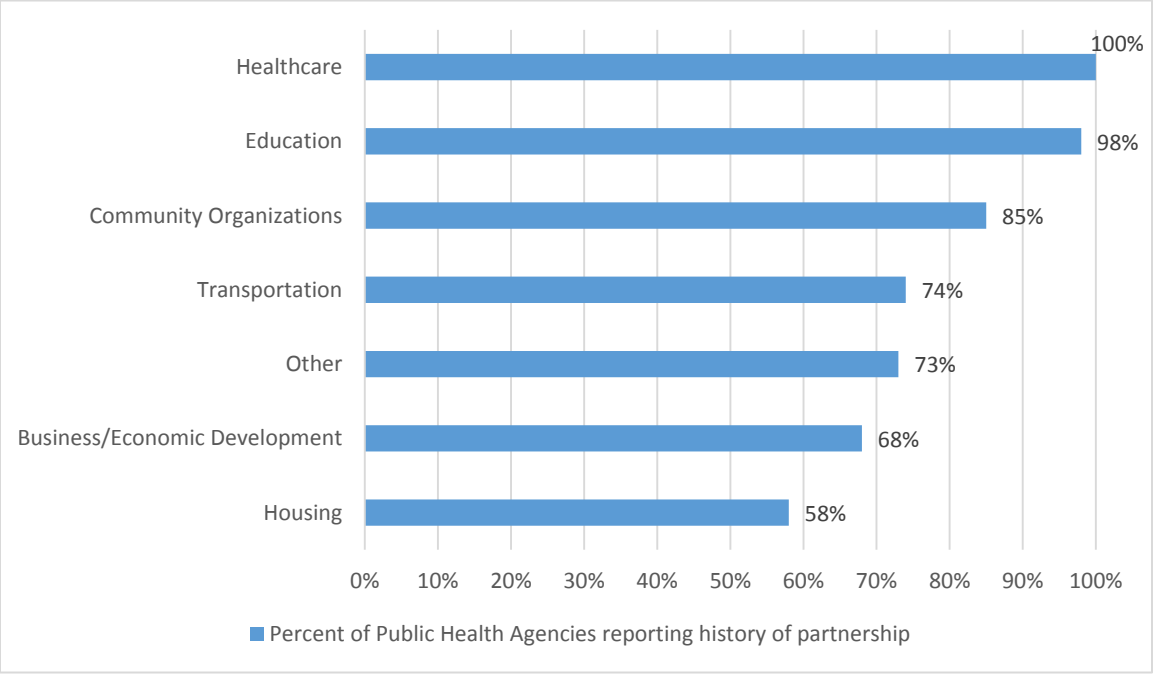

Figure 9. Partnership by sector (N = 56).

Nearly three quarters partnered with transportation, business, and/or economic development sectors. Though housing had the lowest rate of reported partnership, 58% reported

working with the housing sector. Finally, 73% reported partnering with other organizations, including churches, Area Health Education Centers, senior centers, funders, and other similar groups.

Figure 10 shows the results of a question asking respondents' perspective on the role of public health in various sectors. Respondents were asked the following question:
To what extent do you believe public health has a role to play in (on a scale of 1-5, where 1 is not at all and 5 is strong):

1) Affecting educational outcomes in your community?
2) Affecting average income in your community?
3) Shaping the built environment (roads, parks, greenways, etc.) in your community?
4) Affecting the availability of safe, affordable housing in your community?
5) Affecting access to affordable, reliable transportation in your community?
6) Impacting social connectedness, or the quality and quantity of social support systems for individuals in the community (i.e., mentoring programs, community associations, etc.)?
7) Impacting racism or racial bias?

Results were analyzed using a one-way analysis of variance (ANOVA). This test is used to compare mean scores for each response, to see if there is any statistical difference, or variance, between them. For example, the average rating for the role of public health in education was 3.8; the average rating for the role of public health in income was 2.7; and the average rating for the role of public health in the environment was 3.7. The ANOVA can detect whether or not there was a statistical difference between these means. If the p-value of the ANOVA test is greater than 0.05, no statistically relevant relationship exists between the various means. If the p-value is

less than 0.05, this indicates that a statistical difference does exist between at least two means. However, the direction and relationship of the statistical difference is not ascertained by the ANOVA test alone. It cannot say that a given role of public health is statistically higher than the role of public health in income. The Tukey post hoc test is applied to the results of the ANOVA to identify the location of the statistically significant relationships.

The results of the one-way ANOVA showed statistically significant difference between means ($F(6,364) = 6.549$, $p = .000$). The Tukey post hoc test showed that respondents were statistically significantly more likely to report a stronger role for public health in addressing education than income or housing. They were also statistically more likely to report a stronger role for public health in the environment versus housing or transportation. Respondents were also significantly more likely to see a role for public health in addressing social connectivity and racism versus average income.

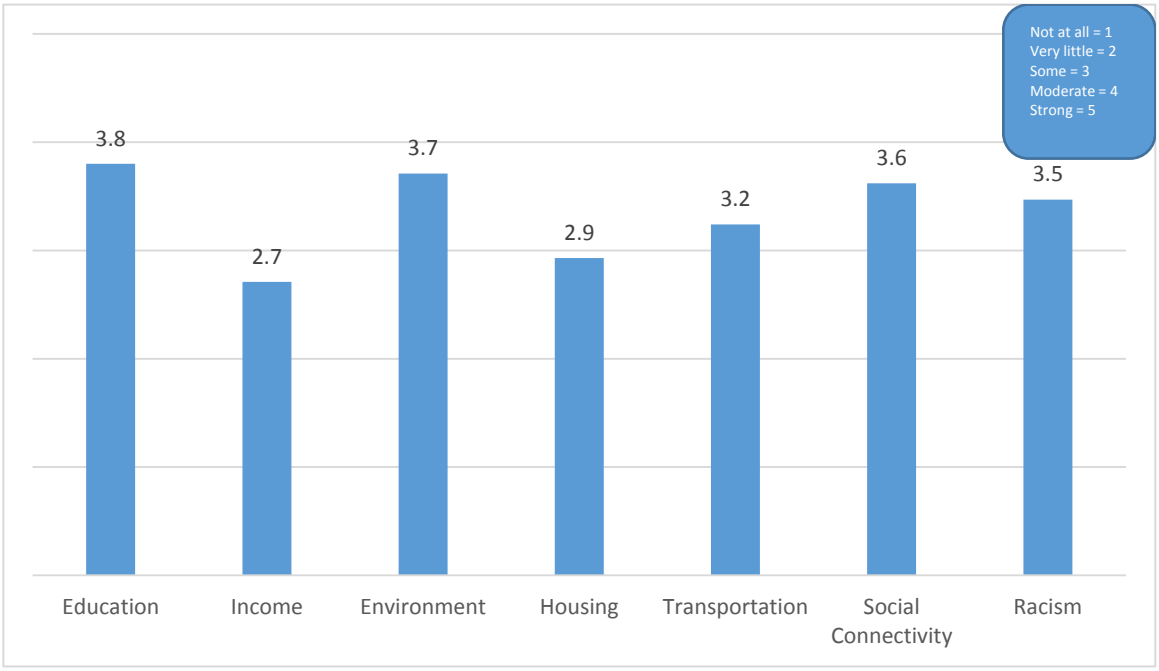

Figure 10. Average rating of the role of public health in addressing specific SDH (N = 56).

Seven separate themes appeared for the role of public health in the community in response to open ended questions. The two most frequently identified were participation on committees and coalitions (21 mentions) and facilitation of committees and coalitions (13). Additional themes included advocacy, community education, data sharing, clinical and programmatic implementation, and grant support.

Respondents were asked to reflect on whether certain potential barriers made it more difficult for public health agencies to work on SDH (Figure 11). Specifically, they were asked to rate, on a scale of 1-5, whether certain factors were barriers to their engagement on SDH issues (with 5 being the most challenging):

1) SDH not identified during the community health needs assessment;
2) SDH not prioritized during the community health needs assessment;
3) SDH not identified as a public health issue;
4) Resistance from administrative leaders;
5) Resistance from elected leaders;
6) Lack of resources; turf wars between sectors;
7) Lack of awareness of evidence-based practice (EBP); and
8) Lack of technical expertise within the public health agency

The results of the one-way ANOVA showed statistically significant difference between means ($F(8,422) = 8.695$, $p = .000$). Based on the Tukey post hoc test, respondents were significantly more likely to indicate that lack of resources was a stronger barrier to work in SDH than any other identified barrier. No other significant differences were identified.

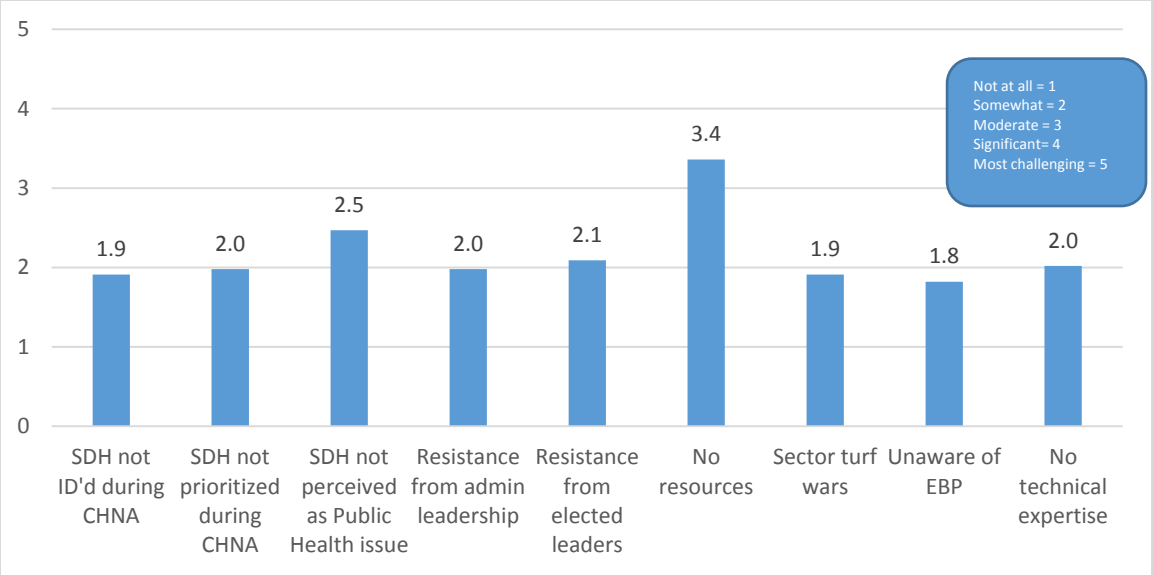

Figure 11. Perceived strength of barriers to work in SDH (N = 45).

Respondents were also asked to rate, on a scale of 1-5, the helpfulness of potential facilitators to working in SDH. These potential facilitators included:

1) SDH prioritized by the community;

2) SDH perceived to be a public health issue;

3) Support from public health administrative leaders;

4) Support from elected officials;

5) Resources allocated to the work;

6) Interest in collaboration by non-public health sectors;

7) Recognized availability of EBP;

8) Availability of technical assistance.

The results are presented in Figure 12. The one-way ANOVA test showed statistically significant difference between the means ($F(7,358) = 2.465$, $p = .018$). The Tukey post hoc analysis showed that the only statistically significant difference occurred between resources allocated and support from public health administrators. Essentially, health directors thought that having allocated

resources was more important than support from public health administrators, but it was not statistically more or less important than any other potential facilitator.

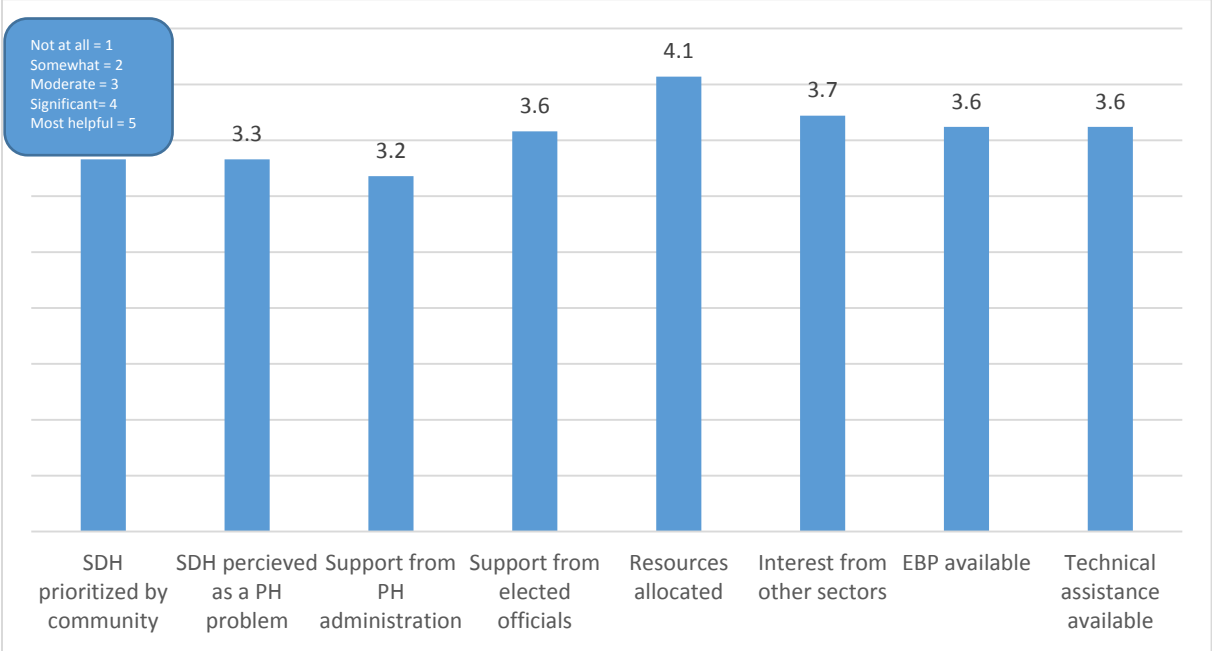

Figure 12. Perceived strength of facilitators for working in SDH (N = 56).

Respondents were also questioned about whether or not specific support systems and activities would increase the likelihood that they would engage in the work of SDH. As shown in Table 2, in all listed cases, the majority of respondents agreed that the stated support would increase the likely participation of their agency's work in SDH. Frequencies were compared to one another using 2 x 2 tables to ascertain Chi Square statistics. Dedicated resources were statistically more frequently identified than clear evidence of the role of public health in SDH and request for partnership by other sectors. No other potential supports were statistically more or less frequently identified by respondents.

Table 2. Potential supports that would encourage participation in work of SDH (% stating that the identified support would increase likelihood of engagement, N = 56).

Facilitator/Support	% of respondents indicating that the support would encourage participation in SDH work
Clear evidence of role of public health in SDH	71%
Availability of EBP or interventions	82%
Dedicated resources	91%
Technical assistance and training	84%
Request for partnership by other sectors	71%

Responses by Urban/Rural and Economic Tiers

Health Resources and Service Administration defines a metropolitan county as having an urban hub of 50,000 or more inhabitants; a micropolitan county has an urban hub of 10,000 to 49,999 inhabitants; and any county not meeting these two definitions is considered neither. For

the purpose of this analysis, counties identified as metropolitan are considered urban and all others are considered rural. By this definition, 22 urban located agencies and 23 rural located agencies completed the survey with enough detail to be categorized. Eight of the 23 locations included in the rural county category were technically "neither." As a sensitivity analysis, statistics were run both with the urban/rural definition and with the HRSA defined groups of metropolitan, micropolitan, and neither. When split into three groups, no meaningful differences were identified for any of the questions. As described earlier in this chapter, additional responses were collected, but those respondents did not answer location questions, which did not allow for categorization as metropolitan, micropolitan, or neither. These responses were excluded from this portion of the analysis leaving an N of 45.

As a point of reference, the median population of a North Carolina county is 55,422. Twenty-seven of the respondents came from counties above the median and 18 respondents came from counties below the median.

Urban/Rural Analysis

With regard to the rating of the role of public health, the results of the one-way ANOVA test showed statistically significant difference between means ($F(13,301) = 4.207$ $p = .000$). While the results of the ANOVA showed that statistically significant differences existed between some means, the Tukey post hoc analysis showed no meaningful differences for the purpose of this comparison (e.g., no difference between rural respondents ranking the role of public health in education and urban respondents ranking the role of public health in income). No statistically significant differences were found in the likelihood of urban or rural respondents reporting a role for public health in any of the SDH areas, including housing, income, education, environment, transportation, social connectivity and racism (Figure 13).

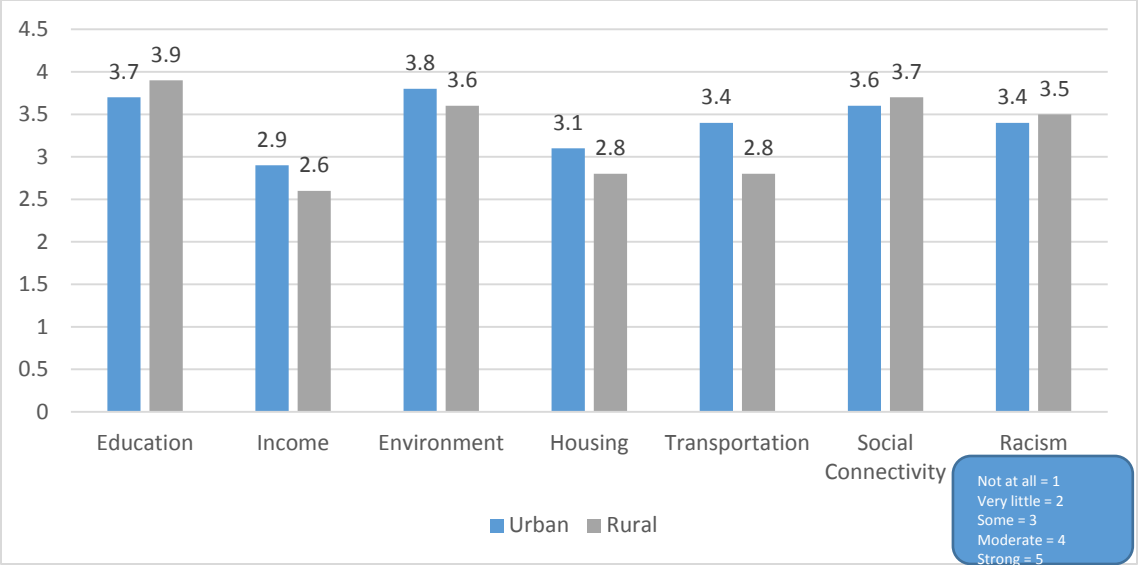

Figure 13. Average rating of the role of public health in addressing specific SDH by county population density (n_{urban} = 23, n_{rural} = 22).

As shown in Table 3, there were no statistical differences (tested by Chi Square comparison of frequencies, $p < 0.05$) between rural and urban respondents in multi-sector partners. All respondents in both rural and urban communities indicated partnerships with education and health care. Urban respondents were slightly more likely to partner with the housing sector, transportation, and community organizations, while rural respondents were slightly more likely to partner with the business sector. These findings are consistent with responses to the perceived role of public health in various sectors relating to SDH.

Table 3. Percent of respondents who have partnered by sector (n_{urban}= 23 , n_{rural}= 22).

Sector	Urban (n = 23)	Rural (n = 22)
Education	100%	100%
Housing	68%	59%
Transportation	82%	77%
Health care	100%	100%
Community Organizing	86%	82%
Business/Economic Development	68%	73%

On the question of rating perceived barriers to working in SDH (Figure 14), the results of the one-way ANOVA test showed statistically significant difference between the means ($F(17,387) = 4.911$ $p = .000$). However, the Tukey post hoc analysis showed that there were no differences between urban and rural respondents in terms of the barriers. While there were no statistically significant differences between rural and urban respondents for any of the barriers listed, there was a statistically significant difference in how rural respondents rated lack of resources, which they rated statistically higher than all other barriers in rural communities.

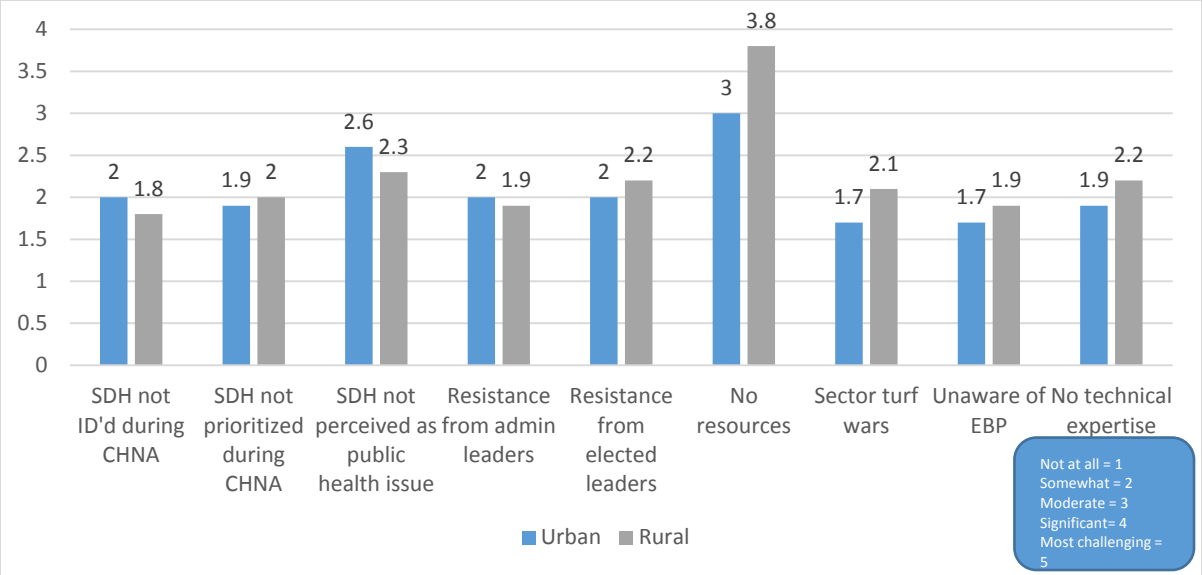

Figure 14. Perceived strength of barriers to work in SDH by population density (n_{urban} = 23, n_{rural} = 22).

In Figure 15, ratings of facilitators by urban and rural respondents are displayed. The results of the one-way ANOVA test showed statistically significant difference between means ($F(15, 342) = 2.701$ $p = .001$). The Tukey post hoc analysis identified several statistical differences, though none were identified within facilitators between rural and urban respondents. Rural respondents identified resources allocated as a higher rated facilitator than administrative support. There were no statistical differences between facilitators for urban respondents. Rural and urban respondents did not have a statistical difference in their rating of allocated resources as a perceived facilitator.

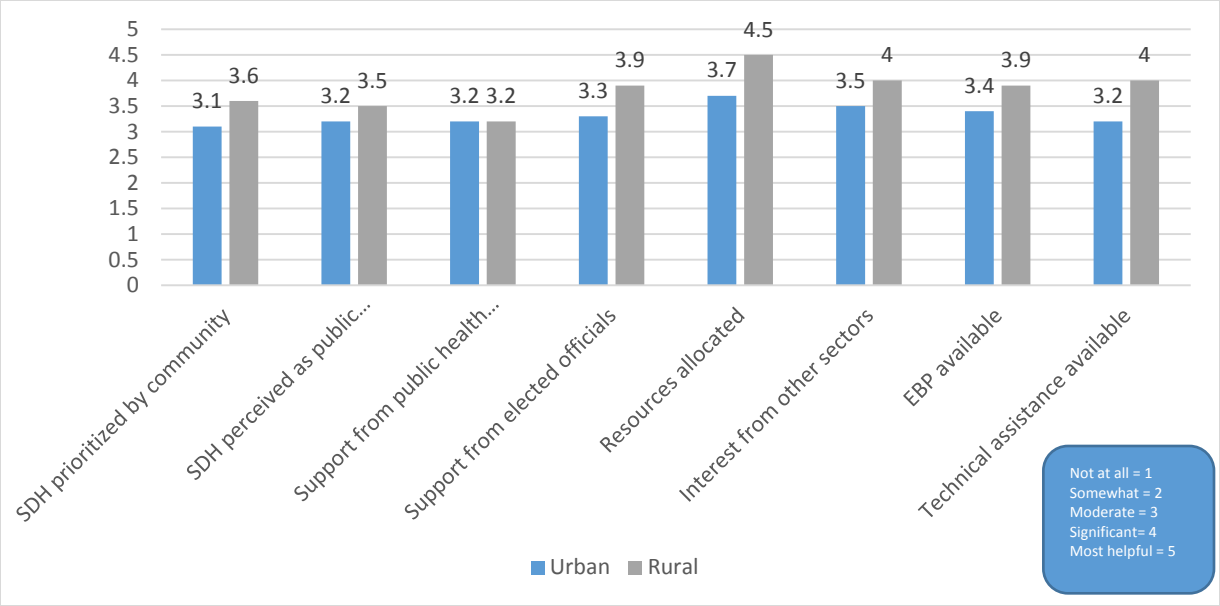

Figure 15. Perceived strength of facilitators for work in SDH by population density (n_{urban} = 23, n_{rural} = 22).

Economic Tier Analysis

The respondents were also split according to the NC Department of Commerce Economic Tiers. Tiers are defined by average unemployment rate, median household income, percentage growth in population, and adjusted property tax base per capita. Tier 1 counties are the 40 most economically distressed counties. Counties are also automatically Tier 1 if they have fewer than 12,000 people, regardless of economic distress measures. Tier 2 counties are the next 40 most distressed counties. Counties are automatically Tier 2 if they have a population between 12,000 and 50,000. Finally, Tier 3 counties are the 20 least distressed counties in the state. Of the 45 respondents that could be identified, 16 were Tier 1, 21 were Tier 2, and 8 were Tier 3. Regional health departments were categorized by the tier most represented in their region. For example, one regional health department from the responses included five Tier 1 counties and two Tier 2 counties, and was thus included in the Tier 1 responses.

The results of the one-way ANOVA test for perceived role of public health by tier showed statistically significant difference between means ($F(6,364) = 6.549$, $p = .000$). The Tukey post hoc analysis showed no difference between tiers for a given role (i.e., no difference between tier 1, tier 2, or tier 3 in education rating). Other statistical differences were not meaningful (e.g., comparison between tier 1 education and tier 2 income). These results are represented in Figure 16.

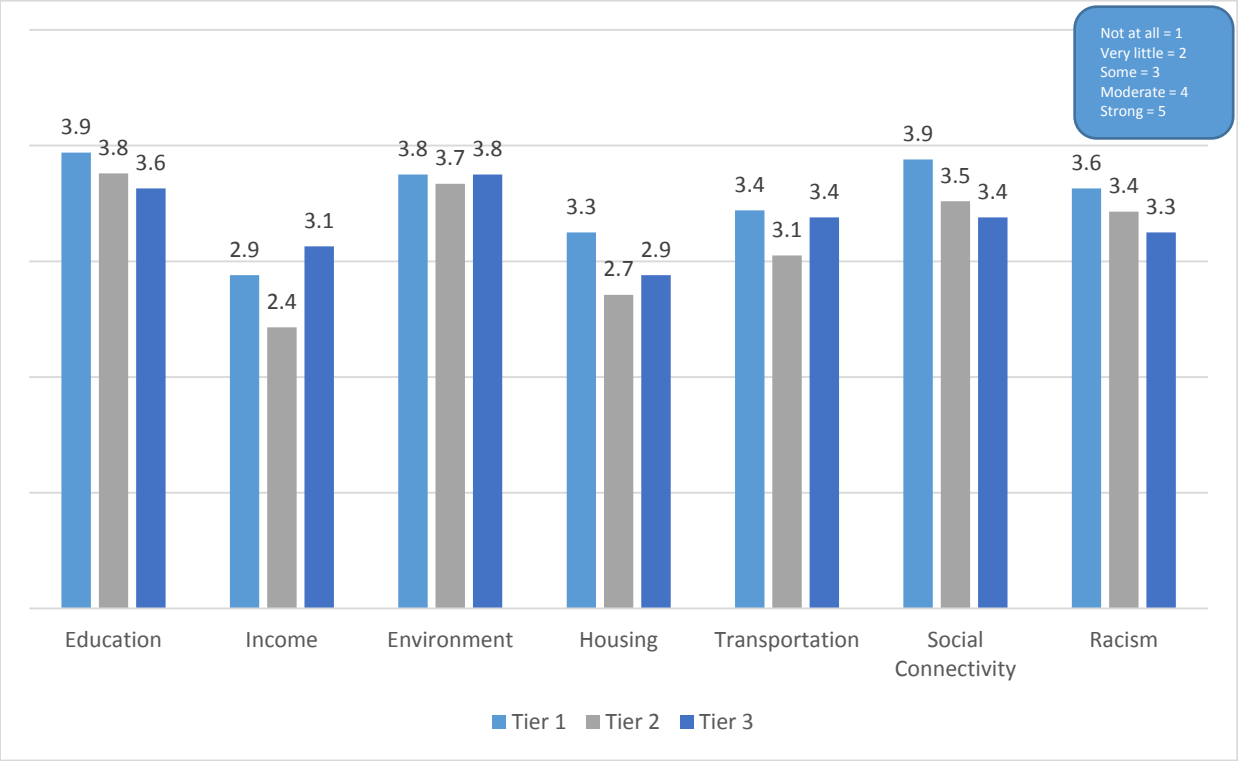

Figure 16. Perceived role of public health by economic tier ($n_{tier1} = 16$, $n_{tier2} = 21$, $n_{tier3} = 8$).

With regard to partnerships, there were no statistical differences between tiers by category of partner (Table 4). Tier 3 respondents were more likely to partner with housing, transportation, and community organizations. Tier 1 respondents were more likely to partner with the business sector. All respondents reported partnering with education and healthcare.

Table 4. Percent of respondents who have partnered by economic tier (n_{tier1} = 16, n_{tier2} = 21, n_{tier3} = 8).

Partner by Sector	Tier 1 (n = 16)	Tier 2 (n = 21)	Tier 3 (n = 8)
Education	100%	100%	100%
Housing	69%	52%	75%
Transportation	75%	76%	100%
Health care	100%	100%	100%
Community Organizing	81%	81%	100%
Business/Economic Development	88%*	62%	63%

*indicates statistical difference via Chi Square comparison of frequencies from other tiers in the same category

The results of the one-way ANOVA by tier showed no statistically significant difference between means of barriers ($F(26, 378) = 3.136$, $p = 0.100$). There was a trend ($p = 0.10$) indicating that all tiers perceived lack of resources to be a similarly critical barrier to working in SDH. The means are displayed in Figure 17.

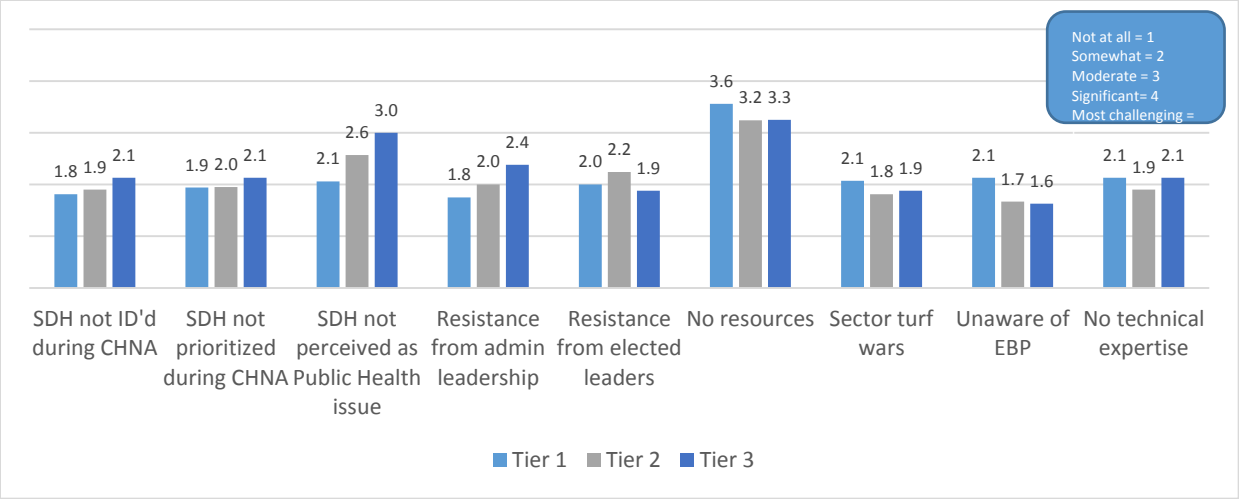

Figure 17. Perceived strength of barriers to work in SDH by economic tier (n_{tier1} = 16, n_{tier2} = 21, n_{tier3} = 8).

With regard to facilitators, the results of the one-way ANOVA by tier showed no statistically significant difference between means (F(23, 336) =1.415, p = .100). The means are displayed in Figure 18.

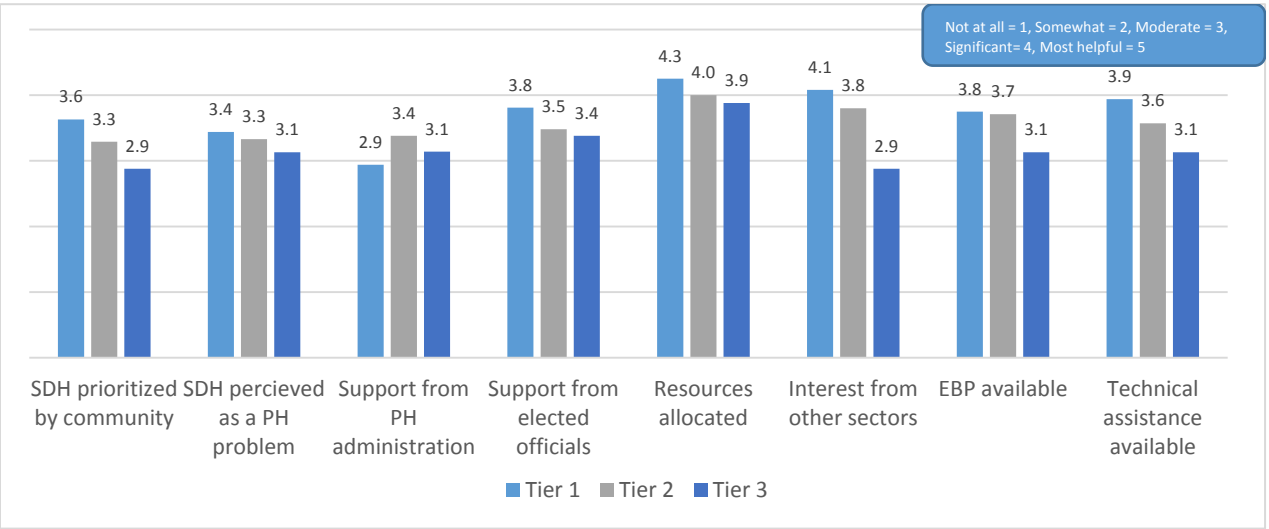

Figure 18. Perceived strength of facilitators to work in SDH by economic tier (n_{tier1} = 16, n_{tier2} = 21, n_{tier3} = 8).

Counties Prioritizing SDH vs. Counties Not Prioritizing SDH

Of the 56 respondents completing the majority of the survey, seven reported a SDH as a priority for their county. The social determinants identified by these respondents included general SDH, economic development, poverty, education, and racial disparities. Of these seven, four respondents were based in rural counties while three were based in urban counties. Three of the seven respondents were based in Tier 1 counties, three were Tier 2 counties, and one was in a Tier 3 county. Additionally, two of the respondents were located in the western third of the state, three in the center third, and two in the eastern third of the state. There were not enough respondents who identified SDH to make appropriate comparisons to those counties who did not prioritize SDH.

Limitations

A primary limitation of these results and the analysis is the small sample size. In addition, these questions are interrelated, so it is likely that the order of questions has some influence on responses. Finally, limiting outreach to North Carolina public health agencies means that the findings may not be generalizable outside of the state.

Conclusions

Overall, public health leaders responding to this survey rated the likelihood of engagement in education, the environment, and social connectivity relatively high, while addressing average income and housing fell to the lowest ratings. Addressing transportation and racism fell between in the middle of the rankings.

The availability of resources was the most highly rated facilitator and barrier. Reinforcing this line is the fact that 91% of respondents agreed that dedicated resources would increase the likelihood that their organization would engage in the work of SDH. According to one

respondent, “Anyone in public health who says 'this isn't about money or funding' is way out of touch with reality.”

At the same time, many respondents were optimistic about the potential non-cash resources that could improve opportunities for engagement in work to improve SDH. Respondents identified opportunities to break down silos, educate across sectors about the impact of their sectors on health outcomes, and bring more people together around this issue. While not statistically significant, the average rating for the facilitator “interest from other sectors” was rated second only to access to resources. Seventy-one percent of respondents stated that requests for partnership from other sectors would increase the likelihood that the respondent would engage in the work of SDH. This may indicate a belief that collaboration and impact can persist, even in the face of low resources. This aligns well with response rates of existing partnerships. All agencies reported some level of partnership with multiple sectors, but opportunity for expansion in this area exists. This opportunity is particularly pronounced for economic development and housing, where less than 70% of respondents were already engaged in partnerships.

No meaningful differences were found between the rural and urban groups of respondents in terms of how they rated the role of public health, facilitators, and barriers. While there were no meaningful differences between rural and urban respondents, there was some statistical difference within rural respondents. For instance, a lack of resources was rated statistically higher than any other barrier to implementation of work in SDH.

This trend continued with comparisons between Tier 1, 2, and 3 counties. No meaningful differences existed between tiered respondents in the role of public health, facilitators, or barriers. However, one notable difference was that 88% of Tier 1 respondents reported working

with economic development partners while only 62% of Tier 2 and 63% of Tier 3 respondents reported doing the same.

There was no single "type" of North Carolina public health agency more or less likely to prioritize SDH. No matter the economic status or population density, different communities are identifying with the roles that the public health agency can or should be playing in social determinants.

For these reasons, an in-depth assessment of four counties who identified social determinants is the focus of Phase II of this research. These four counties include representation from western, central, and eastern North Carolina, all three economic tiers, rural and urban distinction, and a variety of SDH as priorities.

CHAPTER 5: QUALITATIVE RESULTS

Based on the results of the quantitative analysis, I selected four counties for the case study. In each county, I attempted to interview leaders from public health, education, economic development, community organizations, and housing. I successfully recruited and interviewed four public health leaders, four economic development leaders, four community organization leaders, two education leaders, and one housing leader across four communities. I used two separate interview guides: public health leader and non-public health leader (Appendices D and E). I completed all interviews over the phone, received verbal informed consent from participants, and recorded the interviews using an iPhone app called TapeACall. The interviews were transcribed, using a transcription service called Transcribeme.com. During the interview recording, I identified participants using a separate number so that individuals were not identified to the transcription service. I developed a codebook based on analysis of the survey data, which included some codes that were identified in the literature and quantitative survey, and then was augmented based on other themes that emerged in the interviews (Appendix F). A sample of three of the fifteen interviews (one public health, two non-public health) were shared with secondary coders. Their analyses were compared with my initial coding and were found to be highly consistent. Some minor differences were discussed and easily resolved.

Four Counties

Each of the four North Carolina counties included in this analysis identified one or more SDH as a community health priority. They were selected to include geographic, economic status, and population density variation in the study. One county was from the western third of the state,

two counties from the central third of the state, and one county from the eastern third of the state. One was an economic Tier 1, two were Tier 2, and one was Tier 3. Finally, two counties were rural, and two were urban. All four counties completed the prescribed CHNA within the last three years. Through that process, each community worked with dozens of partners across multiple sectors to analyze data, compare perspectives, and define three or more community health priorities for the next three to four years. Even the smallest community involved listed more than 10 partners representing multiple sectors in the process. All four of these communities engaged one or more health care systems in the process. Each community developed community health improvement plans (CHIPs), which include strategies and tactics to address the priorities identified during the community needs assessment. The counties are in various stages of implementation of their CHIPs. More demographic details about each county will not be shared, as it may render the key informants too easily identified. Because the quantitative portion of this research identified no significant differences based on county demographics, those factors will not be discussed as a major influence in this portion of the study.

County A. The four key informants from County A included leaders from public health, economic development, housing, education, and a community organization. Community A followed the identification of an SDH during the CHNA process with a strategic planning effort to develop their CHIP. During the strategic planning process, public health leaders also connected with the local board of health to ensure alignment with the board's strategies. Alignment of the CHIP with the local board of health priorities was identified as critical by the public health informant. The public health informant did not go into detail about how and why the two processes differed, only that alignment was necessary for progress. After completing the CHNA and CHIP, County A began to focus their implementation strategies on the identified

SDH. In addition to community-based initiatives, the County A public health agency focused on policies and practices within their own agency to address this social determinant. For example, internal human resources policies that deal with hiring may have some impact on identified social determinants. At the time of the interview, the community had implemented at least two community-based interventions in coordination with a local health system, social services, education, and community non-profits. The metrics put in place to measure the impact of the interventions showed promising results. This led the public health key informant to believe that the community would continue to prioritize social determinants and make these investments in the future.

When discussing the role for public health, all informants identified more traditional roles for their agencies, including providing access to clinical care, data aggregation and distribution, and health education. Informants shared examples of school vaccinations, data sharing for grant applications, and tobacco policy education. At the same time, all but the education informant noted that the public health agency also played a role of convener and organizer around social determinants, with comments such as:

"But the main thing, I think, would be just facilitating communication and work between the agencies, the housing authorities, and the local health agencies."

Within this community, possibly because the informants strongly identified with the more traditional role of public health, informants shared few examples of how public health played a key role in successful interventions in SDH. In this vein, examples of facilitators and barriers were often softened with language like "I think" or "maybe."

Across the county, eight themes relating to barriers and ten themes relating to facilitators were identified. The most often identified barrier was lack of access to funding within the

community. This was primarily mentioned in the context of competition for the same, limited funding. For example, one informant stated:

> *"But I still think it's going to be hard. We lack funding […] so it's really hard. All our nonprofits are after the same dollar so it's really hard."*

With regard to facilitators, some informants spoke to a theme of an engaged and informed community. All but the economic development respondent referenced this in their interviews. Those that referenced an engaged community generally spoke about community members' involvement in community issues, understanding of social determinants as a health issue, and that multiple sectors, including public health, are interconnected.

> *"We've got [people] that are heavily involved in providing health and then other the projects [like transportation]…So we try to connect the network all of the different moving parts and pieces together. We've done a great job with that."*

Another theme related to facilitators was that of interagency or multi-sector cooperation as a driver of change. Multiple informants referenced the benefit of strong collaboration and coordination as a means of stretching funding.

> *"Because in our community, resources are scarce, and we know we can only spend a dollar once. We can only use individuals in certain ways, so we try to work with one another to meet needs-- to put in programs and plans that meet the needs of multiple organizations so that there's a greater benefit across the county."*

Across all conversations, a broad theme of interconnectedness was clear. All respondents made some reference to mutual reliance and a shared vision for a healthy, sustainable community.

County B. The three key informants from County B included public health, economic development, and community organization leaders. County B completed their CHNA fairly recently and were in the strategic planning CHIP process during the time of the interview. The public health informant saw this window as another opportunity to fully engage other sectors in

an understanding of the impact of social determinants, the role of public health in affecting them, and the role of community members in championing the work.

> *"I keep telling them, [the priorities are] not just [for the] health department. The public health system is the whole county is what I try to teach them."*

This community had strong agreement on the past, present, and future role of public health in the community. All informants clearly identified the traditional role of public health in clinical services, data aggregation and/or health education. In addition, all responses indicated a role for public health as a convener and organizer around a common vision for a better community through changes in SDH. The public health informant recognized that their role was not necessarily to provide services or programming that directly impacted SDH, rather that they may serve in the background to organize and support others providing direct service.

> *"So that [public health's] role is more of a-- more of a facilitator, and [public health is] working through this with them, but then [public health] will advocate for and be their supporters. Because [public health] may not do some things directly."*

Furthermore, some identified public health as a critical partner in the work, not just as an organizer. Public health agencies have unique skill sets and resources that can be applied to multisector work.

> *"But I think, definitely, [public health should be] a participant in [the work of social determinants] because their world is so different than perhaps other entities that approach this— [they] can approach this from a more of a business and strategic approach identifying strengths, weaknesses, and all those types of things."*

County B had both traditional and nontraditional views of the role of public health. This includes the traditional role that public health plays in clinical care and infectious disease, as well as the role they could play as an organizer around SDH.

With regard to facilitators and barriers to engagement in SDH, County B interviews

included four themes around barriers and three themes around facilitators. Both interagency cooperation and community engagement were identified by all respondents.

> *"At this point in time, you have a lot of partners at the table who understand that this is an issue and, at least for the time being, are focused on trying to address the bottom line."*

The only identified barrier mentioned by more than one informant was lack of resources. One informant mentioned the lack of resources as a difficulty, but something that can and should be overcome for the good of the community.

> *"Working with social determinants in health, we deal with them every day with the clients that we serve, but having to take it to the next level at the policy level at a higher level than what we normally do, that's been a challenge, especially when we don't have money to do it. You just have to make the commitment to do it, because things aren't going to change in your society, unless you dig down to what's the root cause."*

County B was early in this process and the informants had somewhat less detail to share than informants from other communities. At the same time, each informant had strong words about the need for resources and the commitment of the community to work toward change.

County C. Four key informants from County C represented public health, economic development, education, and a community organization. After completing the CHNA, County C developed a CHIP, which identified specific roles for public health in affecting the prioritized social determinant, but was also focused on what other sectors can and should be contributing. County C was a little farther along than County B, but not as far along as County A. The public health informant shared the public health agency's efforts to coordinate and facilitate this work. In addition, the community recognized how public health's clinical services contributed to improved SDH. For example, when an individual has good access to clinical care provided by public health nurses, they may have better income, housing, or education outcomes.

There was a divide between the economic development and public health informants and

the other respondents. The economic development and public health informants focused on the convener/organizer role of public health in affecting social determinants, like education and income.

> *"[O]ur public health director could [call] up the right people to be a part of that discussion. And so I think one of the neat things about our community I think is that we're close and collaborative and want to do the right thing. So we were gathered together pretty quickly."*

The other informants spoke to public health's work in clinical care, data aggregation, and health education and not in roles that tie to impacting SDH.

> *"We have also been looking at the data related to children who are overweight. The obesity data is something we have been studying. And our health department has a doctor who has been leading the way in trying to get additional data on our children so that we can maybe put strategies in place to affect this problem."*

In terms of facilitators and barriers, there was still less agreement. Between the four informants, seven barriers were identified, but only lack of access to resources was addressed by at least three of them.

> *"In small communities, it's a little more difficult because the funding is not there at the state and the local level."*

In addition, one informant identified a problem about the public health bureaucracy that hampers public health's involvement in community-wide efforts to address social determinants.

> *"I think for public health it's like working with a hospital. It's the overwhelming structure that you have to go through to move any action. There are so many layers. So […] when you have to go through so many governmental approvals or actions to get a project moving or even to take some baby steps, it's the structure that prevents you from moving quickly. And that's frustrating to the entities that are engaged that can move a little quicker. Much like a hospital, it's just a hierarchy takes a while to get through."*

Identified facilitators were equally as diverse, with the only agreement focused on successful interagency/multisector cooperation. One key informant shared an experience in dealing with

social determinants in a focused intervention that required true multisector community collaboration.

> *"We had an initiative [in our region] dealing with [rural health]… that [involved issues] such as public health, education, and employment. And I wasn't on the committee but I was privy to [the process] as they went through each one of those different topics, and we were encouraged to share that with our community, I was pretty actively involved in that. Collaboration [was] why we were successful."*

The responses provided by leaders in County C are reflective of the idea that small communities have long worked together for the betterment of the community, without necessarily needing or using the language of "social determinants of health" to make an impact.

County D. Three key informants from County D included leaders in public health, economic development, and a community organization. County D was the most advanced of the four counties included in this case study in terms of engaging in work affecting SDH. County D leadership has been successful in acquiring direct funding from federal and local governmental agencies, as well as local non-profits and foundations. The public health agency facilitated both the CHNA and CHIP process. The identification of social determinants led to the development of a community-based council, which is facilitated by the public health agency. In addition, the public health agency was able to hire local staff focused exclusively on this work and move to tactical implementation. The agency was in the early stages of collecting data, though clear metrics were identified when the CHIP was written. While results are promising, the public health informant expressed concerns about the sustainability of the effort because the implementation of authentic, evidence-based programs requires ongoing staffing and other resources.

> *"[To] do this kind of work in a really authentic way, it's very resource-intensive. So we have hired from the community, by [the] beginning [of the] next fiscal year if they can approve our budget, we'll have seven community members that we've hired that are doing*

this work and that are not just working with families but are coming to the advisory council meetings and partner meetings and have input on what we're doing. Without that kind of real connection to the community we would just be professionals perpetuating the current system, you know?"

All County D informants referenced the more traditional role of public health, including the provision of data collection, analysis and sharing, clinical access for vulnerable populations, and health education. Informants also made the connection between the more traditional roles and the ways in which public health can impact social determinants. For example, data aggregation and distribution is a traditional role for public health, but aggregation and distribution of information relating to poverty and education is also critical to the work of social determinants.

"There have been occasions that [public health has] shared with me information on our counties of poverty demographics for other things that I do, and the health department […] has been very responsive to give me information that reflects [economic development's] role particularly in the poverty side of our county."

In addition, both public health and economic development informants spoke to public health as a convener and organizer in the effort to impact social determinants across the community.

"[Public health is] playing the role of conveners in a community-wide initiative that is focusing on two zones where families are more likely to be struggling to make ends meet within our community[...] [Public Health's] main role is as a convener, but we also have resources coming from the county and are [facilitating the] coordination of services and helping to mobilize resources for other organizations to do the work that needs to be done in these zones."

With greater experience in this area, the informants spoke to four themes of barriers and six themes of facilitators. The County D public health informant identified the availability of resources allocated by the county, as well as private foundations, as a critical facilitator to impacting SDH.

> *"So we had two staff people within the counties that are funded to work on this initiative. Plus, we get some intense support from our health informatics team, our communications team. The county commissioners are putting money towards this. So they put [money] last year towards it and they'll do [more] this coming year, plus additional Medicaid funded resources that the health department has at its disposal."*

All informants spoke to the positive impact of community collaboration as a facilitator for impacting SDH.

> *"When we talk about coordinated community responses…having connections with community partners is really important so that we can reach different constituencies and magnify the amount [of support] that we can provide and support that we can provide in our community."*

While all key informants referenced community collaboration as critical to their success as a whole, conversation about community collaboration also appeared around barriers. For County D, only one barrier stands out. Mentioned in some form by all, one informant mentioned and then revisited concerns about potential for interagency turf wars and superficial cooperation.

> *"I believe there's no shortage of ideas or individuals with ideas or non-profits with goals that need fundraising to do in our community but I think they're all competing, at least the non-profits are competing for the funding and the fundraising […] And so that just creates a lot more competition on what you can do, how fast you can do things, and so forth."*

Overall, County D had the most indications of progress toward affecting their prioritized SDH. This may be tied to their strong economic position. The recognition of the role of public health, both traditional and more expansive, in affecting SDH combined with few references to barriers and a wide variety of facilitators shows the possibility of positive impact on SDH.

General Findings and Common Themes

Some themes were near universal, regardless of the profession or location of the informant. Some thoughts were unique to public health and others were scattered among various

informants. A few intriguing issues were referenced by only one or two informants and are still valuable to the discussion.

Public health agencies as conveners or organizers. Recognition of the public health agency as a convener with the ability to bring together many interests was one of the most commonly discussed themes across sectors. This conversation cut two ways. Public health has the ability to bring together multiple sectors and then facilitate the work. Public health agencies were recognized by most informants as the type of group that has connections throughout the community, no matter the issue. For example, while not directly impacting education outcomes, public health leaders are connected to public education. They are a respected and trusted partner, and so are sometimes able to bring education leaders to the table while other interested leaders may not have that same level of influence.

Informants both within and outside of public health recognized that public health agencies have the skills and expertise to guide strategic analysis of data for the creation of a vision and plan. However, public health may also be a convener who then needs to step back and let others take the reins. While expert in bringing people together, some key informants cautioned that public health should not try to be all things to all people. While they may be excellent at calling together the key community leaders, others may have less bureaucracy between them and implementation. One informant suggested that public health is just spread too thin to lead this type of work.

> *"I think much more difficult for leadership in public health to [lead the effort] because in a county, their staffing is short, they're on the day-to-day—they're on the day-to-day treadmill and I think participating, of course, is essential because they have the data, they have the knowledge. But actually, facilitating it, I don't think so."*

Available resources. All public health key informants and nearly all non-public health key informants identified the availability and allocation of resources as a key facilitator or barrier to affecting SDH. Most informants referenced availability of collective resources of the community as well as specific public health funding. For example, informants spoke about how general funding is limited and competition within the community for the same dollars is present. Public health also faces agency specific funding limitations. For public health informants, the discussion typically focused on the lack of resources within public health, to implement efforts to affect SDH. "Resources" were generally a reference to available funding, but also came up in access to personnel. In most cases, access to resources was described as a strong facilitator to public health agencies engaging in social determinants. Where resources were available to be dedicated to the work, more optimism about the ability of the public health agency to influence a given social determinant existed. This positive influence of access to resources is exemplified in the following quotation.

> *"[Our public health agency] couldn't have done this without the resources provided. So we had two staff people within the counties that are funded to work on this initiative. Plus, we get some intense support from our health informatics team, our communications team. The county commissioners are putting money towards this [work], too."*

On the other hand, the lack of resources was commonly discussed as a major barrier to public health agencies affecting change in the SDH. Public health and non-public health informants alike identified limited scope of public health funding; that there is both not enough funding and that the funding is restricted to other critical areas. Public health informants aired frustrations with being expected to do more with less. One public health informant put it this way:

> *"Oh, funding, funding, funding, and funding. There's no funding the new public health 3.0 well. We value it, we talk about it, we understand it, we know it needs to be done, but*

nobody costs out what we need to be able to do that well. And they just assume that since we have social workers and nurses in the health department and since we connect the community well and resource as well, we can just take care of that but it costs a lot of money to deal with social determinants well. And we have not figured out a funding mechanism or reimbursement mechanism whether it's Medicaid, Medicare, grants, state money, you name it, we don't have it to do this work. I think it's a barrier."

Several non-public health informants referenced concern about public health agencies spreading themselves too thin without enough funding and staffing to go around. Traditional public health responsibilities, like clinical care for vulnerable populations, were identified as priorities. Some respondents worried that if public health agencies expanded their scope without additional funding, that core public health functions will suffer or were already suffering.

Community engagement in and understanding of SDH. All but two informants indicated that community understanding of social determinants as well as engagement in the work were critical facilitators to affecting SDH. For one county, the identification of a SDH during the CHNA process was almost a given, according to one key informant:

"That whole group did [pushed for its inclusion.] The VR people, because they're from vocational rehab. You had the college. We had the chamber. We had the hospital. We had the practices. I mean there wasn't anybody in there that didn't say, "Oh, you can't leave this out." It kept coming to the top, when we went through the exercise and the map process to identify what's the priorities. It kept bubbling up to the top, and they all agreed on it. They were like, "This is what's causing these other problems.'"

At the same time, the reverse was referenced as a barrier. Not all sectors of the community understood the impact of social determinants on community health. One key informant identified the issue but did not have a recommended solution, as the informant believes public health has long struggled to communicate with the community at large.

"I think the biggest barrier that they have always faced, and will continue to face, is the ability to communicate [the impact of social determinants] to the public. Not just the

public in need, but to the public that is capable of providing some relief and some help. I think communication is still a problem they're going to continue to face."

Interagency and multisector collaboration. The final nearly universal theme was collaboration as a facilitator to change. Again, all but two key informants identified this facilitator both as existing in their community and critical to the work.

"I think one of the things about us is that we're a pretty close community, that a lot of people know each other. So it's pretty easy to gather a group on a quicker notice. If for example if today you said there's some opportunities to [get] some resources and we're going to get a group to come and talk."

The same topic, a lack of interagency and multisector collaboration, was also a common theme as a barrier to impacting social determinants on the community level. At least one key informant from each community made reference to turf wars or superficial collaboration as a hindrance to lasting change.

"*A lot of times they're still not that interagency-- How to describe it? It's kind of like brothers and sisters that meet at Christmas time only, you know. Sometimes they get together to do something, but as far as continuously doing something. it's a little bit harder to do that."*

The common thread through these themes centered on pulling together resources, coordination, and vision to achieve a greater impact for the community.

Unique commentary.A few items were not mentioned more than once or twice but may represent unique insights into the work of SDH. For example, public health as an advocate for the community was mentioned by one public health leader and one economic development leader. Both spoke to the past role of public health as an advocate for community as a whole and the individuals who live there. The economic development informant indicated an interest for expansion of this role. It was not, however, in the area of advocating for SDH specifically, rather that public health agencies may have a role to play in advocating for health generally.

"I generally believe that the society should be more supportive of people's health, and that, a bit like cigarettes, a lot of things that are advertised and what have you that aren't good for you maybe should be looked at again. Maybe not mandated, but certainly there should be pressure brought to bear, by public health, to create maybe healthier diets and activities for the population."

One public health informant noted that it is not the total amount of funding that is a barrier, but the focused nature of the funding. Funding allocated to local health agencies is typically specific and cannot be redirected based on local preference. The informant noted that public health agencies are already reallocating resources to social determinants work when possible, but that almost all funding coming in to the agency through state and national sources is allocated in such a way that it cannot be redirected to those efforts, no matter how much support is available from the community.

"I think it's not just the lack of funding in general, but the way in which we are funded too - our system has been funded in parts and pieces for so many years - parts and pieces that are not flexible and that require much accountability and audits. We have so many audits. If accountability to funding sources is so critical, yet flexibility is needed to address social determinants well, our system is not supportive of what it takes to actually purchase nontraditional items. For example, a $150 air conditioning unit for a child's room to help with asthma attacks rather than paying much more than that for an ER visit. We would love to be more creative and attack issues that are more relevant to social determinants but the system doesn't allow for that kind of creativity and flexibility yet."

Finally, one respondent formally noted the importance of having a public health staff filled with passion for the work, but others hinted at this across sectors. Compassion and empathy for fellow community members may be a critical component in the capacity for communities to engage in such a tremendous endeavor. Passionate leaders are also a critical component, based on the overall content and time reserved for the development of authentic collaboration.

"I think the only think I'd leave you with is just the final accolades and acknowledgments to the public health workforce. I'm just astounded every week and grateful every week that

I work with the kind of people I work with who definitely have the greater good in mind and who are extremely community-focused, and quality-focused, and dedicated to the max, and go above and beyond the call of duty, and certainly go above and beyond their pay grade. To get things accomplished that help people become healthier [...] This work cannot be accomplished by any one entity alone. It has to be a collective effort, and it has to be driven by people who give a damn. And all of the people working in public health every day across rural and urban areas really do give a damn about people and their health and their community. And that's a beautiful place to work."

Limitations

The primary limitation of the qualitative component of the research was low participation. The initial goal was to recruit five informants from four counties for a total of 20 key informants. Thirty individuals were contacted and only fifteen participated. While multiple sectors for each community participated, the results would have been richer with greater participation from housing and education sectors in particular, but other contributors would also have increased the depth of the discussion.

In addition, while race and racism as factors impacting health outcomes were of interest to me, I failed to ask key informants explicitly about the role of public health in impacting race and racism within their county. Without this direct and explicit question, the topic was not discussed organically. Because race and racism are not typically identified as SDH, it was highly unlikely that participants would have discussed this issue without direct prompting, and this played out in the process.

Conclusions

Lack of resources was the most frequently and colorfully discussed barrier, no matter which sector informant was commenting. This is of interest because each of the communities included in this portion of the research have already prioritized one or more SDH. Participants discussed many other barriers along with ways that their community was overcoming them.

However, financial and human resources may be the most difficult barrier to overcome with regard to implementing strategies affecting community health priorities.

While access to resources was a critical facilitator, as a whole, the key informants were equally focused on engaging the community in SDH, as well as strong interagency and multi-sector collaboration. During some conversations, it almost seemed like a forgone conclusion that resources were pivotal. References were often peppered with language like "of course" or "clearly" when talking about lack of or available funding. Frustration was clear in most of the conversations, because it seems so obvious to the people doing the work that resources should be available now. Those same informants recognized that this was not the case, but clearly as their communities have prioritized social determinants, they have still decided to do the work. One informant's advice to others doing the work was not to focus so much on barriers like funding, because there were so many other facilitators, particularly partner organizations, available to get started.

> *"Just jump in and give it a try, and make the progress that you feel like you can make with the capacity you feel like you have. You don't have to build Rome in a day and fix the whole education, housing, and transportation system by tomorrow. But we have to start in on those kinds of determinants and work with partners to kind of move the ball forward as much as we can with the resources we have right now."*

Finally, the recognition of a role for public health in bringing these strengths and opportunities together to affect change in areas such as poverty, education, transportation, and housing was broadly present in these interviews. The themes and commentary identified in this analysis will be further discussed in Chapter 6.

CHAPTER 6: DISCUSSION

The purpose of this research was three-fold:

- Identify facilitators of and barriers to prioritizing and engaging in work to improve SDH by local public health agencies (external to the agency);
- Identify common characteristics, circumstances, policies and practices associated with local public health agencies that are prioritizing and engaging in work to improve SDH (internal to the agency);
- Develop a practical guide for local public health agencies to prioritize and engage in SDH.

The mixed measures approach of this research has allowed some insight into the first two aims of this work, in order to develop the third. However, the direction of the research blurred the lines between internal and external factors, and their meaning for how and why public health agencies together with their communities prioritize and engage in work to affect SDH. In order to discuss the results and how they may impact future public health practice, I will use the Public Health 3.0 framework to guide the proposed plan for change.

Public Health 3.0

In 2016, The U.S. Department of Health and Human Services Office of the Assistant Secretary for Health launched Public Health 3.0. This initiative was intended to advance the work of public health to "emphasize cross-sectoral environmental, policy and systems-level actions that directly affect the social determinants of health and advance health equity." After

hosting listening sessions across the United States, the Office of the Assistant Secretary for Health issued a white paper, "Public Health 3.0: A Call to Action to Create a 21st Century Public Health Infrastructure." The following recommendations were defined within the report:

1) Public health leaders should embrace the role of Chief Health Strategist for their communities – working with all relevant partners so that they can drive initiatives including those that explicitly address "upstream" social determinants of health. Specialized Public Health 3.0 training should be available for those preparing to enter or already within the public health workforce.
2) Public health departments should engage with community stakeholders—from both the public and private sectors—to form vibrant, structured, cross-sector partnerships designed to develop and guide Public Health 3.0-style initiatives and to foster shared funding, services, governance, and collective action.
3) Public Health Accreditation Board criteria and processes for department accreditation should be enhanced and supported so as to better foster Public Health 3.0 principles as we strive to ensure that every person in the United States is served by nationally accredited health departments.
4) Timely, reliable, granular-level (i.e., sub-county), and actionable data should be made accessible to communities throughout the country, and clear metrics to document successes in public health practice should be developed in order to guide, focus, and assess the impact of prevention initiatives, including those targeting the social determinants of health and enhancing equity.
5) Funding for public health should be enhanced and substantially modified, and innovated funding models should be explored so as to expand financial support for Public Health

3.0-style leadership and prevention initiatives. Blending and braiding of funds from multiple sources should be encouraged and allowed, including recapturing and reinvesting of generated revenue. Funding should be identified to support core infrastructure as well as community-level work to address the SDH.

This framework identifies a path forward for public health leaders across the United States. By discussing the results of this research through the lens of the Public Health 3.0 framework, it may be possible to identify the strengths and weaknesses of North Carolina's public health agencies, so that a path forward may be plotted.

Role of Public Health in its Community

The role of public health was a critical discussion point in both the qualitative and quantitative data. Public health leaders across North Carolina agree that some level of public health involvement is appropriate in the work of SDH. From their perspective, there are social determinants that are already more clearly aligned with public health. For example, when asked to rate the level the role public health should play in various sectors of SDH, survey respondents rated education, environment, and social connectivity higher than other options. Income was rated the lowest. During key informant interviews, similar views were shared by sectors outside of public health. The "lowest hanging fruit" for engagement in SDH likely exists where public health is already engaged. Public health is a trusted partner in education because North Carolina's school nurses are typically employees of the local public health agency. This long-standing relationship may make it easier for public health leaders to engage with education leaders in improving outcomes like school readiness, achievement gaps, and graduation rates. Similarly, public health agencies are already involved in environmental issues like safe drinking and recreational water, and the built environment, which might help explain why the public

health community saw a role for their agencies to work in the environment. The research gave no clear indication about why social connectedness rated so high with respondents. Perhaps it is related to the notion that respondents see themselves generally as connectors and facilitators, so that may also be a role that influences social connectedness within their communities.

Throughout the key informant interviews, the role for public health in SDH was a key area of discussion. Many informants identified the critical role that public health plays in areas of clinical access for vulnerable populations, the aggregation and dissemination of local data, the prevention and investigation of infectious disease, and the implementation of health education. At the same time, many also recognized that because public health is already tied to so many sectors of the community, they have a broad network of trusted allies. Public health leaders are able to call on these allies to come together around a shared vision for a healthier community. In addition, many key informants saw direct ties between traditional public health activities and how those activities could be leveraged in new ways. For example, public health is trusted to aggregate, analyze, and disseminate data concerning the health of the public. This typically includes data around poverty rates, graduation rates, housing access, and other details relevant to SDH. Some informants saw an opportunity for public health to do more using this data to help educate the community about how SDH directly and indirectly affect the health of the community.

Public health is currently walking a tightrope. These local agencies are tasked with everyday needs of the community—from vaccines to the investigation of an outbreak of infectious disease. At the same time, decades of research show that investments in education, housing, transportation, poverty, and other social determinants will have a deeper and wider impact on health than education about proper nutrition. Key informants from the community

voiced concern with public health being spread too thin, while also recognizing a need for public health to do more in social determinants. Public health agencies must find ways to continue to provide the vital services needed within their communities, while also expanding into the role of Chief Health Strategist. This role has been implemented to varying degrees by the four agencies who were included in the qualitative portion of the research. For example, one public health key informant detailed the ways in which their team is coaching the community toward a greater understanding of SDH and how the community can come together to affect change. Another recognized the need for funding to support the broader community's work around social determinants. That public health agency took the lead in obtaining funding to support the broader community effort. The third and fourth public health agencies included in Phase II have focused on painting the picture of how SDH are currently affecting health outcomes, and how work to change social determinants will directly affect health outcomes in their communities. They are building support across sectors for engaging in this work.

One public health strength that was identified within the data may help other communities move toward impacting SDH. Public health agencies are experts in health education. These same skills—focused on educating the public about healthy lifestyles and other factors that impact on health—can be used to educate the public about SDH. Public health can educate partners, institutions, and the general public on both the impact of SDH on health outcomes as well as the potential policy solutions that could be implemented to affect them. Partners who already understand these issues and opportunities should be enlisted as advocates for this work and for public health's role in this work. When public health agencies were able to firmly establish the connection between SDH and health outcomes in their community, they were better able to galvanize other community agencies and funders to advance the work of SDH.

This is also an area of opportunity for public health to educate stakeholders and partners on the impact of racial bias and institutional and systemic racism. Leveraging the evidence base of the impact of racism on health outcomes, public health can engage the community in pragmatic conversations about the need to dismantle racism.

Engagement of Public Health across Sectors

A multi-sector community engaged in health was one of the most common themes across both the qualitative and quantitative data. Public health leaders across the state recognized that this work cannot be done in silos. When multi-sector partners are engaged in health issues, the opportunity to engage the full community in SDH should be easier than in communities where public health operates on its own. Key informants identified that broad and trusting partnerships are needed to successfully engage in SDH work. When leaders in business and education understand how the health of the community impacts their sectors, expanding partnerships to impact social determinants may be more easily achieved. Within the communities who have made the most progress toward identifying, prioritizing, and acting to impact SDH, mutual respect from leaders between sectors came across in the interviews. They were able to speak about each other's work and the strengths and weaknesses of the community. While public health may facilitate the work, other sectors are equal partners at the table. In the communities that had identified social determinants, but had not yet begun to work on them, there was still some uneasiness among partners. Public health leaders were not quite sure of their partners' commitment or understanding, and indicated a need to be more directive and bring the other sectors along. In these communities, leaders from other sectors were not quite sure of public health's role in affecting their sectors, including education and housing.

Public health staff should be seeking out training in leadership and community engagement. The core training for public health staff—epidemiology, environmental health, biostatistics, health behavior—does not always include training in facilitation and collaboration. While some public health leaders naturally develop this skill, it is also a skill that can be learned. The public health work force will also need training in anti-racism work in order to effectively support change in this specific determinant. Organizations like Care Share Health Alliance and the Institute for Dismantling Racism offer training and technical assistance in creating authentic stakeholder engagement. Public health agencies need to prioritize this type of skill development in undergraduate and graduate degree programs, as well as professional development and continuing education.

Beyond the skills and technical assistance necessary to form authentic relationships, public health leaders need to take the next step into formalized partnerships. Collective impact is an evidence-based process for moving an entire community toward a shared goal. Kania and Kramer published the collective impact framework, which has successfully supported communities in achieving shared outcomes. This framework includes five components: (1) developing a common agenda; (2) developing shared measures; (3) mutually reinforcing activities; (4) continuous communication; and (5) the establishment of a backbone organization to hold it all together (Kania, 2011). In some communities, public health may be that backbone organization. In other communities, public health may be a facilitator while an external organization serves as the backbone. Because public health agencies facilitate the CHNA process, they have the opportunity to take the first step in developing a common agenda. Using established processes, like CHNA and CHIP, public health groups can bring many resources to initiate a collective impact effort for improved community health through SDH change. It is then

up to the unique resources of the community to determine the best backbone organization to keep this process moving forward.

Public Health Accreditation and Public Health 3.0

North Carolina has a rigorous public health agency accreditation process. All North Carolina public health agencies are accredited on a four-year cycle. The accreditation process includes an agency self-assessment of 147 activities and 41 benchmarks. This is followed by a peer lead site visit, including leaders from the public health administration, nursing, and boards of health. Finally, each agency undergoes adjudication by the North Carolina Local Health Department Accreditation Board. The activities included in the self-assessment are focused on agency core functions and essential services, facilities, administrative services, and governance.

The self-assessment document includes many areas where emphasis on SDH could be included, but is not explicitly described. For example, assessment of "Essential Service 4" states that agencies should "mobilize community partnerships to identify and solve health problems." Public health agencies could leverage this area to increase focus on multi-sector partnerships affecting SDH. However, public health agencies can meet this requirement without addressing SDH. Public health agencies that focus on traditional disease prevention and leverage community partnerships receive credit in the accreditation application. For example, public health agencies working with schools to ensure the highest possible vaccination rates could meet this essential service area. The 149-page self-assessment is replete with examples of opportunities to fulfill traditional public health activities that could be expanded to encourage or mandate engagement in SDH. At present, there are no explicit demands for engagement in SDH. In fact, the phrase "social determinant" does not appear in the assessment document even once.

A voluntary national accreditation program is also available to public health agencies across the nation. This national accreditation program's goal is to "improve and protect the health of the public by advancing the quality and performance of Tribal, state, local and territorial public health departments." While the national standards retain a heavy focus on the traditional practice of public health, SDH also figure prominently. Applicants are expected to include the impact of SDH in the CHNA.

> "Standard 5.2: Conduct a comprehensive planning process resulting in a Tribal/state/community health improvement plan
>
> Guidance 1a: The desired measurable outcomes or indicators of the health improvement effort and the priorities for action, from the perspective of the population of the state. The plan must include statewide health priorities, measurable objectives, improvement strategies, and activities with time-framed targets that were determined in the planning process. In establishing priorities, the plan must include consideration of addressing social determinants of health, causes of higher health risks and poorer health outcomes of specific populations, and health inequities."

In order to accelerate movement toward Public Health 3.0 in North Carolina, the accreditation process needs to be explicit about the need to engage in SDH. The North Carolina Commission for Public Health is the public health rulemaking body for the state. Its members are appointed by the Governor or by the North Carolina Medical Society. State statute directs the Commission for Public Health to adopt rules establishing accreditation standards for local public health agencies. From there, the North Carolina Local Health Department Accreditation Board (NCLHDAB) is directed by the Commission for Public health to propose rules for the accreditation of North Carolina public health agencies. The policy governing this process is

called “Review and Revision of Standards, Benchmarks and Activities.” The NCLHDAB is charged with both creating the rules and then implementing the accreditation process after they are approved by the Commission. There are many stakeholders involved in taking recommendations through the board, including a Department of Public Health liaison, public health attorneys from the University of North Carolina School of Government, and an Accreditations Standards workgroup. The workgroup is made up of individuals appointed by the NCLHDAB, and includes a member of the NCLHDAB, two agency accreditation coordinators, two Department of Public Health nurse consultants, one local health director, one Board of Health member, and two site visit team members. Existing standards are reviewed annually or as legislation changes. Changes can come in the form of new or revised benchmarks, and they can be brought to the workgroup from a variety of stakeholders, including members of the community. After updated standards are accepted by the board, a minimum of three months must pass before the new standards take effect.

Local public health leaders interested in pressing this work forward could volunteer to participate on a revisions workgroup. They could also participate in the commentary process. There are clear opportunities to affect this process and institutionalize the focus on SDH for North Carolina's public health agencies. The simplest ask may be for alignment with national accreditation standards.

Availability of Timely, Reliable, Granular-level, Actionable Data

Throughout the survey and interview processes, the role of public health in aggregating and disseminating data about health indicators and social determinants was repeatedly discussed. Data collection, analysis, and disbursement is a time consuming and expensive process for public health agencies. This is another area where public health cannot do the work alone. Non-public

health informants discussed the critical role of public health in providing the data needed to make sound decisions. However, they also indicated lack of access to the level of detail they would like to have.

While most key informants discussed the need for accurate, local, and actionable data, most were still looking to public health for the data necessary to tell their community's story. The best solution may be tied back to public health's role as data aggregator and community facilitator. All of the agencies in the community have some type of data. These non-public health agencies have data about their services, their customers or patients, and their impact on the community. For example, a food pantry may have details about where their customers are located and what other issues they are facing. They can help round out the full picture of the population health story. Improving overall data sharing between and among stakeholders will be critical to impacting SDH.

Funding for Community Efforts to Impact Social Determinants of Health

By far, the most highlighted and often mentioned issue in this project was funding. When local agencies achieved success in affecting social determinants, informants believed it was made possible with the significant influx of funding they received. The problem was discussed from two directions. The pie is both too small and already divided up. Generally, there is not enough funding available to public health to accomplish even its core functions, let alone to expand public heath efforts beyond. Even when communities identify SDH as priorities for the community, public health leaders are not typically able to redirect funding from areas that are not prioritized.

Public health has many potential roles to play in acquiring funding for communities across North Carolina. Being good stewards of the funds allocated by governmental resources is

critical in the current political climate. Government spending in all areas, but particularly in health and health care, is under scrutiny. In the past several North Carolina budget cycles, NC DHHS has faced significant budget cuts. Public health agencies must spend funds without waste and with evidence of impact to mitigate future cuts. If and when public health leaders are able to acquire or redirect funding towards SDH, it will be necessary to have strong metrics in place to show the value or return on investment.

Identifying possible use of current funding in existing sources could help in the work of SDH. For example, CHNA and CHIP are funded through state dollars. These are opportunities for public health to establish strong relationships with community leaders while also forwarding the cause of SDH. CHNAs typically collect data around the demographics of the community. This includes poverty rates, employment rates, graduation rates, housing, and other details associated with SDH. When sharing and presenting this data, public health agencies have an opportunity to educate and engage community leaders on the connection of SDH with health outcomes.

While North Carolina's politicians are not currently supportive of increased governmental funding, there are still opportunities to advocate for better resourcing of public health agencies. Medicaid costs continue to grow in North Carolina. In fiscal year 2017, North Carolina Medicaid spending was $12.4 billion (http://files.kff.org/attachment/fact-sheet-medicaid-state-NC). Local public health agencies need to be advocates for funding shifts that could improve health and lower Medicaid spending. Efforts to reduce child poverty, increase high school graduation rates, and improve access to transportation will all impact Medicaid spending in coming years. Dr. Mandy Cohen, North Carolina Secretary of Health and Human Services, has made clear that the current administration understands the need for investment in

SDH as a method of improving health and quality of life outcomes while also reducing the financial burden on the state and its taxpayers (Cohen, 2017). In her op-ed, she stated that her role is to "insure our public dollars are used to buy health – not just health care – and invest more strategically in health." The op-ed is a public statement that reflects the Cooper Administration's intent to shift the focus from health care to health outcomes in public policy. However, without legislative support in the form of budget allocations, this vision will be difficult to achieve.

Local public health agencies can and have advocated for changes to how local public health agencies are funded, as well as the total amount of funding provided to public health. Unfortunately, this has not always resulted in improvements. A coordinated approach during which community leaders speak with local representatives must continue, even in the face of few impacts. The North Carolina Secretary of Health and Human Services cannot do the work alone. Changes to funding strategies is a long-term goal and will take the leadership of agencies like the North Carolina Association of Local Health Directors (NCALHD) as well as grassroots engagement from cross-sector partners throughout North Carolina.

In addition to existing funding, public health agencies often have skills and resources to acquire additional resources for the community. Innovative interventions are often attractive to local, state, and national funding sources. Public health agencies have the data often required for a strong grant application. The public health key informants interviewed for this project also discussed their staff's training in strategic planning and outcome measurements that help create a successful application. In addition, grant makers are demanding more and better collaboration. Place-based funding is popular with grant-makers in North Carolina and nationally. Examples of this type of funding includes The California Endowment's Building Healthier Communities (http://www.calendow.org/building-healthy-communities/), the Kresge Foundation's Place Based

Initiatives (https://kresge.org/programs/arts-culture/place-based-initiatives-0), and Kate B. Reynolds Charitable Trust's Healthy Places NC (). This style of funding encourages community collaboration across sectors to create collective impact. Grant-makers see themselves as investors and want to see measurable impact for their funding. Public health staff members have the skills for impactful implementation and program evaluation as well. This does not mean that public health agencies need to lead the grant-seeking process or even that they need to be the recipient of the grant. Any or all of these skills can be used to support another agency seeking funding. Public health can and should make grant opportunities known to the community, in order to increase the size of the pie and the ability of the community to determine how that slice is applied. The opportunities should be aligned with the community's priorities and the effort should be collaborative. As some key informants indicated, competition for the same dollars is happening in these communities. Public health cannot be picking sides or providing resources for one agency over another. The effort to bring additional funding to the work should be a collective effort toward a collective outcome.

Racism, Race, and Public Health

Earlier in this process, I posed racism as a SDH. Due to researcher oversight, the only time participants were asked directly about the role of public health in impacting racism was during the survey. The average rating given was 3.5 out of 5.0. There was no significant difference between this rating and the other highest rated roles. It was, however, significantly higher than the perceived role for public health in impacting income.

With the recognition that North Carolina's public health leaders are willing to play a role in impacting SDH, it will be necessary for leaders from professional organizations to expand partnerships with groups and individuals already doing the work to dismantle racism. Race and

racism are complicated and difficult topics. Leaders in this area identify breaking down systemic and institutional racism work as a potential role for public health in dismantling racism (Jones et al., 2009). For instance, while interpersonal racism remains a concern, it is the systems and institutions that perpetuate the impact of racism on health and health outcomes, which could be changed through public health leadership.

Public health leaders can and should be working on social determinants. Simultaneously, they should be examining the structures that cause disparities in those determinants and opportunities to exert influence for change. Educational achievement is directly related to health outcomes. As a population, children of color are not achieving the same levels of educational success as white children in this country. Public health has a role to play in analyzing data and systematically approaching this disparity, because of its direct impact on health and health equity.

In order to engage in anti-racism work, the public health workforce will need training and technical assistance. Promising anti-racism work that includes public health leadership is already taking place in areas like Boston and San Francisco ("Bay Area Regional Health Inequities Initiative," 2017; HealthEquityGuide.org, 2015). The Boston Public Health Commission has launched an internal Anti-Racism Advisory Committee and requires its entire staff to complete racial justice and health equity training. The agency is also working to ensure that its staff is representative of the community it serves. In addition, it has instituted accountability measures with respect to its anti-racism and health equity work. San Francisco's eleven public health agencies have come together to launch the Bay Area Regional Health Inequities Initiative. Its mission is to "transform public health practice for the purpose of eliminating health equities using a broad spectrum of approaches that create healthy communities." Together, the members

of this coalition have developed a policy platform for local agencies interested in the work of health equity, rooted in the core functions and essential services. While urban work is not always transferrable to non-urban settings, it is a starting point that can be leveraged by communities in other states and regions. Examples of public health agencies successfully impacting racial justice and health equity should improve the ability of other public health agencies to enter the work, regardless of size.

CHAPTER 7: PLAN FOR CHANGE

The third and final purpose of this research project was to develop a practical guide for local public health agencies to improve, prioritize, and engage in social determinants and social drivers of health. In addition to creating a guide for local public health leaders, this plan for change will include recommendations for stakeholders to increase the likelihood that local public health agencies can make an impact on health outcomes y working with partners on SDH. The stakeholders included in the first portion of this plan for change are: the North Carolina General Assembly (NCGA), North Carolina Department of Health and Human Services, North Carolina Division of Public Health, the NCLHDAB, philanthropic organizations, several community organizations, and myself. I will continue to work with public health professionals, including leaders at the North Carolina Public Health Institute and the NCALHD, to improve the formatting and usefulness of the following guide.

Broad based Recommendations for Stakeholders

Recommendation #1: Increase knowledge about the needs and skills of the public health workforce. This research project is just one component of the information gathering and analysis that should take place to support local public health agencies in SDH work. National organizations like the Association of State and Territorial Health Officials (ASTHO) and the National Association of County & City Health Officials (NACCHO) should use their networks and expertise to collect further information and provide additional guidance about what is needed to support the public health workforce in impacting SDH. In 2015, ASTHO published findings from the Public Health Workforce Interests and Needs Survey, a project also known as Public

Health WINS (Katie Sellers & Kiran Bharthapudi, 2015; "Public Health WINS Infographic," 2015). The initial survey included limited questions about SDH. The authors indicated that training related to the SDH was one of the top three identified workforce development needs. The next logical step would be to include questions that identify whether or not respondents are currently working in public health; what areas of social determinants are affected by that work; and what resources do respondents believe they need to start or improve the work. The following steps should take place:

1) ASTHO should include additional questions in the upcoming Public Health WINS survey. I am currently in discussion with individuals responsible for the second iteration of Public Health WINS, and they are committed to including at least one question based on the survey tool used for this dissertation.
2) The North Carolina Division of Public Health (NCDPH) should include questions about knowledge, skills, and activities related to SDH, including racial bias and systemic racism, in future workforce surveys associated with the Division's accreditation process (Jones-Vessey, Chowdhury, & Duval, 2017).
3) The NCDPH should include similar questions in the local health department staffing and services survey, which takes place biennially. This information could be captured in the Public Health Services portion of the survey and reporting.

Recommendation #2: Improve skills set of the public health workforce. Key informants across sectors acknowledged that skills like authentic relationship development and expanded data collection techniques are a part of engaging in SDH. Whether those skills increased the likelihood of engagement, or just made it easier to proceed is not clear. However, it does seem reasonable to expect public health leaders to have a basic social determinants skillset

in order to be successful in SDH work.

National and state leaders in public health should use new workforce information to create professional development opportunities. Agencies like the American Public Health Association (APHA), NACCHO, and ASTHO have a strong history in workforce development and are also well known for their support of public health engagement of SDH. They will need to continue and expand the conversation and the resources available to do so with their constituencies. The NCDPH provides training and technical assistance to local public health agencies. The 2017 training opportunities offered by NCDPH did not include SDH, community engagement, collective impact, or other similar topics (http://publichealth.nc.gov/lhd/docs/AC-TrainingTopics-Dec2017.pdf). In order to accomplish this level of workforce development, the following steps should be taken:

1) The NCDPH should increase its own workforce capacity to lead change in SDH work;
2) The North Carolina Division of Public Health should begin offering local public health agencies training and technical assistance in the skills and knowledge necessary to work in SDH;
3) National public health professional agencies should offer financially accessible professional development focused on SDH, anti-racism, collective impact, collective measures, and authentic community engagement, as well as other needs identified through workforce development research; and
4) Public health agencies successfully engaging in social determinants work should present their local successes and barriers to peers in different locations through presentations at similar conferences and meetings.

Recommendation #3: Increase funding for local public health agencies specifically to

engage in work around SDH. Funding was identified as both the most significant barrier preventing local agencies from doing the work and the strongest facilitator for those finding success. Other identified barriers to engagement have their roots in a lack of funding. For example, creating authentic relationships necessary for working in social determinants is resource intensive. It requires skilled staff, dedicated staff time, meeting space and materials, and often a food budget. The following actions should be taken to accomplish this recommendation:

1) The NCGA should identify and allocate funding for local public health agencies, specifically to facilitate activities that will impact SDH. The primary cost of this work is personnel and the allocation should cover employee or employees dedicated to the work of SDH. The NCGA should determine a ratio that increases the staffing with increased jurisdiction size of the public health agency.
2) Philanthropic funders, like the Kate B. Reynolds Charitable Trust and the Blue Cross and Blue Shield of North Carolina Foundation, should continue and expand funding in place-based initiatives that pull multiple-sectors together. They also have an opportunity to be leaders within the funding community and should be encouraging other funders to be investing in multi-sector initiatives that can improve SDH and health outcomes. Implementation funding should be directed at communities who already have the capacity to do the work, while training and capacity building should be funded in those communities who do not yet have the capacity to implement.
3) The Secretary of Health and Human Services should include detailed funding recommendations for the Governor's budget that reflect the statements Secretary Cohen has made through popular media and across state government. While the final budget is

always a compromise with the two houses of the state legislature, inclusion in the Governor's budget priorities indicates support from the Governor's office for this work.

Governor Roy Cooper, at the behest of Secretary Cohen, has already included a goal of creating pilot programs focused around impacting SDH in the 1115 waiver. As a part of Medicaid reform, the Secretary has asked for federal support for the following:

> Addressing the unmet social needs that impact the health and healthcare costs of North Carolinians through public-private pilots to identify, test, strengthen, and sustain evidence-based interventions that can measurably improve health and reduce costs. (NC Department of Health and Human Services, 2017)

These pilots should be expanded if proven successful.

Recommendation #4: Codify requirements for local public health agencies to engage in SDH. This recommendation should be carefully considered to avoid an unfunded mandate if possible. While funding is critically important to expanding public health work in social determinants, 17 counties have already shown that it can begin to happen, absent additional funding. While there was widespread concern among respondents that local public health agencies are already spread too thin, the need to address social determinants of health to create positive health outcomes is part of the public health's assurance, assessment, and policy development role. Further, there is a growing national recognition that public health plays a crucial role, along with other community partners, in addressing SDH. Thus, there should be requirements for local public health agencies to engage, at some level, in SDH work. The Division of Public Health within the North Carolina Department of Health and Human Services creates the standards and processes for the CHNA. At the time of this publication, the North Carolina Division of Public Health requires local public health agencies to select at least two

priorities from the Healthy People 2020 goals in the development of CHNA priorities. This may or may not include a SDH. There are two areas prime for revision resulting in new requirements for local public health agencies:

1) The North Carolina Division of Public Health should revise standards to require that each CHNA priority list include at least one SDH; and
2) The NC Local Health Department Accreditation Board should revise existing accreditation requirements to include specifically SDH. Recommendations can come from staff or board members.

The National Public Health Accreditation can be used as a model for inclusion of SDH in the accreditation guidelines:

> Standard 5.2: Conduct a comprehensive planning process resulting in a Tribal/state/community health improvement plan.
>
> Guidance 1a: The desired measurable outcomes or indicators of the health improvement effort and the priorities for action, from the perspective of the population of the state. The plan must include statewide health priorities, measurable objectives, improvement strategies, and activities with time-framed targets that were determined in the planning process. In establishing priorities, the plan must include consideration of addressing social determinants of health, causes of higher health risks and poorer health outcomes of specific populations, and health inequities.

I can facilitate this effort by meeting with leaders, including Lynnette Tolson as staff Director of NCALDH, elected leadership (President, Past President, etc.) of the NCALDH, and Amy Bellflower Thomas as staff to the NCLHDAB to share these findings and recommendations.

Recommendation #5: Educate and engage stakeholders in understanding and

valuing SDH while listening and learning from other sectors for synergistic opportunities.

A highly engaged community plays a critical role in the success of communities interested in impacting SDH. Public health informants specifically pointed out their work to educate the community in how their sectors directly and indirectly affect community health outcomes. Recommended steps include the following:

1) Public health agencies successfully engaging in SDH work should seek media coverage to share their stories in their home communities and beyond;
2) Public health leaders should leverage the work of the community health needs assessment to invite other sectors into the conversation. Leaders from other sectors should be engaged in the process as early as possible so that they can buy into the process and influence the outcomes.
3) Public health leaders should develop authentic relationships with leaders across sectors, agencies and organizations by learning about their specific goals, requirements and strategic directions. This will allow public health leaders to more fully understand, and more easily identify, opportunities for collaboration that could be considered a "win-win." For example, quality, affordable housing is a critical SDH. Federal regulations required that all federal housing units become tobacco free. Individuals caught smoking or using tobacco in their residence risk losing their housing. With an authentic partnership in place, public health resources can be engaged to reduce tobacco use and support community members in retaining their quality, affordable housing, thus meeting the needs of the housing authority, the public health agency and the community member.
4) Public health leaders should engage local decision makers in discussion and planning for public health's role in SDH. This should include municipal and county elected officials,

city and county managers, boards of health and boards of health and human services. As public health becomes more integrated into local government and local budgets, alignment with those agencies is increasingly important.

5) Public health agencies should ensure true community representation in all boards, committees and public process. Better diversity of race/ethnicity, socioeconomic status and other factors will help create a stronger, more authentic, more sustainable community impact. It is also critical that this diversity is created at the earliest possible stage, to avoid "tokenism," or inclusion for the sake of looking good, rather than truly impacting the process.
6) I will present these findings to the following groups:
    - Leadership of NC DHHS
    - Leadership of NC DPH
    - North Carolina Institute of Medicine Taskforce on Social Determinants of Health
    - North Carolina Association of Local Health Directors (NCALHD)
    - North Carolina State Health Directors Conference
    - Chronic Disease and Injury Prevention Branch of the North Carolina Division of Public Health: Health Equity Community of Practice
    - North Carolina Annual Public Health Association Conference
7) I will share the following practical guide with local public health agencies through the North Carolina Association of Local Health Directors or via direct email messaging.

Practical Guide for Local Public Health Agencies

The format of this guide includes pieces taken from example processes, roadmaps, and guidelines produced for local public health leaders by the CDC, state agencies, and other

researchers (Alzheimer's Association and Centers for Disease Control and Prevention, 2013; Kania, 2011; Minnesota Department of Public Health, 2016; National Association of County and City Health Officials, 2012). The plan for change is also based on the findings of the literature review and the information acquired through the data collection and analysis process.

The Alzheimer's Association, together with the CDC, developed a road map for public health known as the Healthy Brain Initiative, to improve outcomes associated with healthy aging, dementia, and Alzheimer's disease. This roadmap identifies four critical areas for public health leaders to work through, in order to drive positive health outcomes in their communities. The activities are founded in core functions of public health, including applied research and translation, assessment, assurance, and policy development (Figure 19). The following plan for change will take components this model to help guide local public health agencies interested in engaging in work to affect SDH.

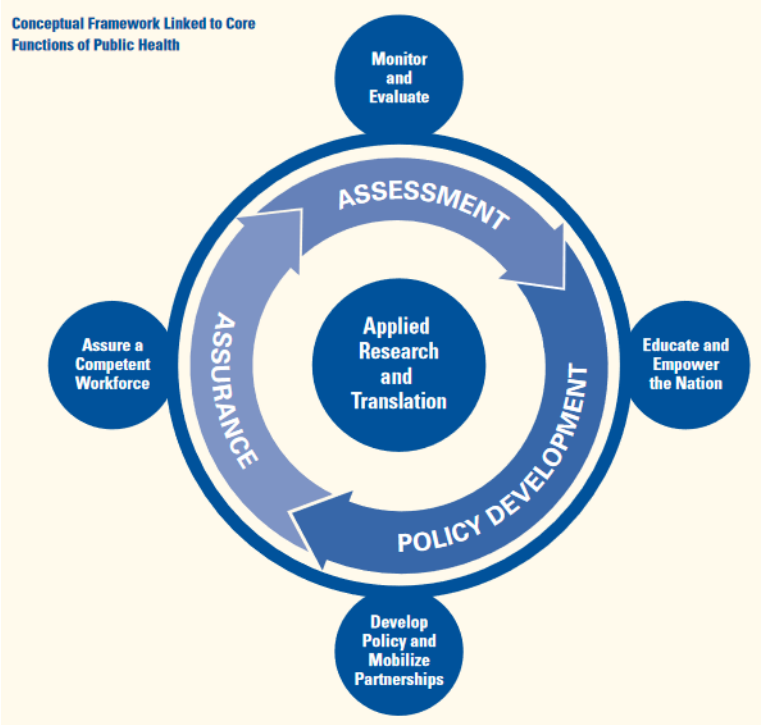

Figure 19. Conceptual framework of the Healthy Brain Initiative.

Assure a Competent Workforce

The public health workforce typically has training necessary to perform core functions of traditional public health. However, training in community engagement, collective impact, collective measures, and SDH has not always been included in public health training, especially in leadership and management public health programs.

Step 1. Leverage local professional development budgets to provide key agency staff with training in SDH, anti-racism, collective impact, authentic community engagement and cross-sector collaboration. Local health directors can contact professional groups for training support. Many organizations have experience in providing training and technical assistance as well as free information and resources to consider when establishing the partnerships necessary to affect SDH. Specific examples are included in Table 5.

Step 2. Create opportunities for local staff to connect with state and national professional development opportunities. Understanding that funding for travel and conferences is limited, individuals should be identified to attend and bring opportunities back to the local agency.

Monitor and Evaluate

Local public health agencies are already recognized as trusted sources for community-level data. Such agencies are typically already collecting and reporting on county-level demographics, social, and economic data as a part of the CHNA. During the data collection process, public health agencies should reach out to sector leaders to determine what additional information those leaders may have to share to expand the picture of the impact of additional health issues in the community. For example, CHNA typically report on homelessness and employment rates. However, taking this data further creates the opportunity to explore the broader impact of social determinants. Non-profit organizations like domestic violence shelters collect information about the communities they serve. Combining the broad demographic data with the details available to the organizations who work with specific populations can create opportunities for collaboration and intervention. To continue this example, domestic violence survivors may be more prone to job loss and homelessness. Partnerships could be developed between public health, housing, economic development, and domestic violence agencies to identify need, and if necessary, increase access to housing and job training for victims of domestic violence.

Step 1. Engage multi-sector leaders in data collection, analysis, and reporting of housing, education, income/employment, transportation, racial and other health disparities and social support information.

Step 2. Host data gap analysis meetings including metrics/data specialists from the following sectors: education, housing, transportation, economic development, social connectivity (i.e., Big Brothers & Big Sisters, neighborhood organizations, etc.) and any other locally identified partners. Use a framework like Results Based Accountability to guide data availability and gap analysis (Friedman, 2009). Results Based Accountability is a program evaluation framework developed by Mark Friedman to streamline program planning, implementation, and evaluation. It has a heavy focus on collecting the "right" information in order to achieve a clearly defined outcome. Identify existing data, plan for data sharing, and any new data collection needs.

Step 3. Facilitate implementation of data plan as a whole community. Expand reporting on these areas to include specific segments of the community served by community organizations. Ensure engagement of informal leaders as well as formal leaders, so that diverse community demographics (i.e. all racial, ethnic, socioeconomic groups) are engaged.

Educate and Empower

Counties who have successfully engaged in SDH work have non-public leaders who understand the impact of social and economic factors on health outcomes. These leaders are active in the work to impact social determinants and they understand the role they have to affect change. In the communities not already having conversations about SDH, public health leaders can create opportunities to explain the connection and how the work of these other organizations directly impacts health outcomes for the community. Public health leaders need to listen to leaders from other sectors about what is necessary to move the needle in those specific sectors. Public health leaders should continue to engage multi-sector leaders in the CHNA and CHIP processes and empower them to take action toward common goals identified through the community health improvement plan.

Step 1. In order to increase public interest in SDH work, including race and racism, write op-eds in local print media. The content should describe the impact of SDH on community health outcomes, similar to the op-ed published by Secretary Mandy Cohen (Cohen, 2017). The op-eds should tie local data to this national conversation. They should also include a call to action, such as asking readers to encourage policy and decision makers to invest in SDH.

Step 2. Prior to launching CHNA, meet with leaders from a variety of sectors to better learn about their goals, priorities and needs. Work to identify common ground that can be used to collaborate on priority setting and implementation.

Step 3. When launching the CHNA, explicitly describe the need to include SDH in the data collection, analysis, and priority-setting process. Ensure that SDH are discussed during the prioritization process.

Develop Policy and Mobilize Partnerships

Public health has long worked through policy change to impact health outcomes. The most frequently identified barrier to implementing work around SDH was lack of funding. While public health leaders want to do more, they need funding and the creative space that comes with strong budgets to move ahead. Because public health funding is allocated at the national, state, county, and municipal levels, local public health leaders should advocate for increased funding from local policy makers.

Step 1. Expand relationships with state and federal legislative leaders who represent the local community. Learn about the issues and concerns that are facing them, and ask about what they're hearing from the rest of their constituency. Educate them about the impact of SDH, as well as the needs of the community. Help them make connections between SDH and the critical policy issues they are facing. Invite them to visit programs and gain a personal understanding of

the impact of SDH on the people they represent. Keep them updated throughout the CHNA process or share existing findings and progress through the CHIP. Request their support in funding allocations specifically for work affecting SDH.

Step 2. Local health agencies are an integral part of the local government. Stakeholders including county managers, county budget officers, and county commissioners should be educated and included in discussions surrounding SDH and their impact on community health outcomes. County and municipal budgets are already dealing with multi-sector community concerns and should be educated about the financial needs of public health efforts to impact SDH. With highly restricted state and national funds, local health agencies may need to reprioritize local requests to elevate the focus on SDH. In addition, local health agency leaders should be prepared to request increased funding for efforts specific to SDH from local policy makers.

Table 5. Recommended actions to be taken by local public health leaders.

	Recommended action	Resources
Monitor and Evaluate	Step 1: Engage multi-sector leaders in data collection, analysis, and reporting for housing, education, income/employment, transportation, and social support.	• Results Based Accountability Framework: www.clearimpact.com
	Step 2: Host data gap analysis meeting.	• Whole Measures Model: http://wholecommunities.org/practice/whole-measures/ • Collective Impact Shared Measures: http://www.collaborationforimpact.com/collective-impact/shared-measurement/
	Step 3: Facilitate implementation of data plan as a whole community	• Results Based Accountability Framework: www.clearimpact.com

Educate and Empower	Step 1: Write op-eds in local print media, sharing the impact of SDH on community health outcomes, similar to the op-ed published by Secretary Mandy Cohen. Engage county government leaders and local elected officials to co-author.	• Example op-ed by Dr. Mandy Cohen: http://www.newsobserver.com/opinion/op-ed/article162767098.html • New York Times: Tips for writing an effective op-ed: https://www.nytimes.com/2017/08/25/opinion/tips-for-aspiring-op-ed-writers.html
	Step 2. Prior to launching CHNA, meet with leaders from a variety of sectors to better learn about their goals, priorities and needs.	• Seek professional development in authentic community engagement, where all participants have valuable contributions to make. • Community-based Participatory Research Program, National Institute on Minority Health and Health Disparities: https://www.nimhd.nih.gov/programs/extramural/community-based-participatory.html
	Step 2: Ensure that social determinants hold a prominent position throughout the CHNA, including the priority-setting process.	• Public Health 3.0 White Paper: https://www.healthypeople.gov/sites/default/files/Public-Health-3.0-White-Paper.pdf
Develop Policy and Mobilize Partnerships	Step 1: Expand relationships with state and federal legislative leaders who represent the local community.	• Legislative representative lookup tool: https://www.ncnonprofits.org/voice/find-elected-officials
	Step 2: Request reprioritized and increased funding for efforts specific to SDH from local policy makers.	

Ensure a Competent Workforce	Step 1: Leverage local professional development budgets to provide key agency staff with training in SDH, anti-racism, collective impact and cross sector collaboration.	• NC Care Share Alliance: https://www.caresharehealth.org/ • Youth Empowered Solutions: www.youthempoweredsolutions.org • WNC Health Network (RBA training specifically): www.wnchn.org • Institute for Dismantling Racism: https://www.idrusnow.org/ • Crossroads Anti-Racism Organizing & Training: http://crossroadsantiracism.org/
	Step 2: Create opportunities for local staff to connect with state and national professional development opportunities.	• NC Public Health Institute: http://sph.unc.edu/nciph/nciph-catalog/ • APHA National Meeting: https://www.apha.org/annualmeeting • ASTHO professional development events: http://www.astho.org/events.aspx • NACCHO Annual Meeting: http://www.nacchoannual.org/

Conclusion

The findings of this project are not surprising and they are useful. This research shows that the role for public health in improving health outcomes by impacting SDH is present in communities across North Carolina. There is proof that the work can be initiated. Now is the time to take action, to accelerate this progress. The impact of SDH can take generations to materialize. Community-level changes that improve SDH will also take time to become apparent in the population, so the time to act is now.

APPENDIX A: LITERATURE REVIEW & RESEARCH PROCESS

Table A1. Summary of search terms and number of articles reviewed for the literature survey.

Search Phrase	Number of documents receiving review of abstract	Number of documents receiving full review	Documents included in project
"Social Determinants of Health"	25	12	1
"Education and Health"	25	10	5
"Socioeconomic Status and Health"	25	12	8
"Environment and Health"	25	8	2
"Social Context and Health"	25	6	3
"Public Health as Community Convener"	25	2	2
"Racism and health"	25	5	5
Google Alerts "Social Determinants of Health"	15	5	5
Selected articles via recommendation or reference list review	92	92	60
Total	282	251	86

APPENDIX B: PRIORITIES BY COUNTY

County	Priority 1	Priority 2	Priority 32	Priority 4	Priority 5
Alamance County	Access to Care	Education	Economic Factors		
Alexander County	Healthy Families	Mental Health & Substance	Access to Health Care		
Alleghany County	Substance Use & Abuse	Physical Activity &	Chronic Disease		
Anson County	Obesity	Diabetes			
Ashe County	Substance Use & Abuse	Physical Activity &	Chronic Disease		
Avery County	Substance Abuse & Prevention & Increasing	Access to Primary Healthcare Services	Access to Dental Care Services		
Beaufort County	Cancer	Chronic Disease	Access to Care	Weight Management,	
Bertie County	Improving Physical	Improving Healthy Eating	Smoking Cessation		
Bladen County	Chronic Disease (heart disease, diabetes,	Community (substance abuse and unintentional			
Brunswick County	Diabetes Education &	Colorectal Cancer	Hypertension	Childhood Obesity	Smoking during
Buncombe County	Safe, stable and nurturing relationships & environments to ensure that all children reach their full potential. (Reduce preventable	All have the opportunity to eat healthy, be active and better manage disease (Increase food security & safe places to be active and			
Burke County	Diabetes				
Cabarrus County	Access to Medical Care	Access to Mental Health	Un- and underemploy	Education	Wellness & Obesity
Caldwell County	Chronic Disease	Teen Health	Mental Health & Substance		
Camden County	Obesity	Chronic Disease	Personal Accountability	Education about	Program Funding
Carteret County	Chronic Disease	Substance Abuse/Mental	Economic Development		
Caswell County (2011)	Overweight/Obesity	Hypertension	Mental Health	Hire Community	
Catawba County	Obesity	Access to Care	Cancer	Substance	
Chatham County	Obesity	Access to Mental Health	Access to Health Care		
Cherokee County	Chronic	Tobacco Use	Physical		
Chowan County	Improving Physical	Improving Healthy Eating	Smoking Cessation		
Clay County	Access to Care	Chronic Disease	Reduce all forms of		
Cleveland County	Substance Abuse	STD/Unintended Pregnancy	Physical Activity and	Chronic Disease	Social Determinants
Columbus County	Chronic	Drugs/Alcohol	Obesity	Lack of	
Craven County	Substance	Obesity	Behavioral/Me		

Cumberland County	Reduce the Burden of	Lack of Physical	Reduce Sexually	Teen Pregnancy	
Currituck County	Obesity	Chronic Disease	Personal Accountability	Education about	Program Funding
Dare County	Obesity	Access to	Flu &	Youth Risk	
Davidson County	Obesity	Access to Health Care	Tobacco	Mental Health	Heart Disease
Davie County	Cancer	Heart Disease	Physical		
Duplin County	Obesity	Chronic	Women's and	Access to Care	
Durham County	Obesity & Chronic Illness	Poverty	Education	Access to Medical &	Mental Health & Substance
Edgecombe County	Chronic Disease Prevention &	Access to care	Obesity & Weight Management	HIV/AIDS, STD and Teen Pregnancy	
Forsyth County	Chronic Diseases	Maternal & Infant Health	Mental Health		
Franklin County	Access to Care	Physical activity and nutrition (inlcuding			
Gaston County	Reducing Obesity and increasing physical	Reducing tobacco use and substance abuse	Reducing Teen Pregnancy		
Gates County	Cancer	Obesity	Diabetes	Mental	Heart Disease
Graham County	Obesity	Access to Health Care	Tobacco free parks &	diabetes	Mental Health & Substance
Granville County	Chronic Disease &	Reproductive Health &	Success in Schools		
Greene County	How can we address obesity related chronic diseases?	How can Greene County create a healthy environment that draws	How can we raise awareness among Greene County residents of		
Guilford County	Poor Birth Outcomes	Chronic Disease Prevention &	Sexually Transmited Infections		
Halifax County	Chronic Disease	Cross-Cutting (Obesity)	Physical Activity and		
Harnett County	Overweight/Obesity	Use of illegal drugs/substan			
Haywood County	substance abuse	physical activity &	chronic disease	social determinants	mental health
Henderson County	obesity	substance abuse/prescription drug	access to mental health care		
Hertford County	access to care	adolescent	chronic	social	
Hoke County	Adolescent Pregnancy and STD Prevention	Chronic Disease with emphasis on Diabetes, Heart Disease,			
Hyde County	Physical Activity/Nutrition (Chronic Disease	Access to Primary Care	Substance Abuse		
Iredell County	Heart Disease	Cancer	Diabetes	Nutrition	Physical
Jackson County	Healthier Food Options in the Community	Physical Activity in Adults (with sub focus on	Substance Abuse in Adolescents		

Johnston County	access to health care -- physical and	obesity and overweight	nutrition and physical activity		
Jones County	Substance Abuse	Weight Management/ Exercise/Nutrit	Behavioral/Mental Health		
Lee County	Obesity	Teen	Mental		
Lenoir County	Prescription Abuse/Drug & Substance	Parenting -- Responsible and Healthy	Obesity		
Lincoln County	Chronic	Access to	Healthy		
Macon County	Reduce the incidence of preventable chronic diseases related to obesity,	Promote recruitment and retention of additional primary care physicians and dental	Reduce the incidence and mortality rates of breast, colon, and lung cancer through		
Madison County	Chronic Disease	Child Health	Mental Health/Substa	(keeping in mind how	
Martin County	Chronic Diseases (including	STDs	Substance Abuse (tobacco,		
McDowell County	Teen Pregnancy	Tobacco Use	Healthy Eating & Active Living	Substance Abuse &	Access to Care
Mecklenburg County	Chronic Disease and	Mental Health	Access to Care	Violence	Substance Abuse
Mitchell County	Healthy Living Behaviors and Lifestyles	Substance Abuse Prevention and Increasing Availability/Ac	Access and Assistance for Low-Income Households (Lack Everyday		
Pitt County	Communicable Disease Control to include sexually transmitted	Infant Mortality and Unintended Pregnancies	Risk Factor Reduction to include tobacco use, physical activity and	Chronic Disease to include cardiovascular disease and diabetes	
Polk County	Reduce Chronic	Healthy Eating and Active	Substance Abuse	Economy and Health	
Randolph County	Physical	Nutrition	Tobacco Use	Access to Care	
Richmond County	Prescription	Wellness			
Robeson County	Obesity	Substance Misuse/Abuse			
Rockingham County	Social Determinants with and	Access to Health Care	Physical activity and nutrition		
Rowan County	Dental Care	Medical Care	Chronic	Teen	Physical
Rutherford County	Substance Abuse	Chronic Disease	Healthy Eating & Active Living	Behavioral Health &	Teen Pregnancy
Sampson County	Chronic				
Scotland County	Hypertension	Diabetes	Heart Disease		
Stanly County	Obesity/Overw	Cancer			
Stokes County	Access to Care	Dental Care			
Surry County	Obesity	Substance	Access to		
Swain County	Tobacco Use	Obesity			
Transylvania County	Nutrition and Physical	Substance Abuse	Dental Health		
Tyrrell County	Physical Activity/Nutrition/Healthy Weight	Chronic Diseases (including heart disease,	Substance Abuse Prevention		

Union County	Twenty four priorities, broken out in groups of 3	None of the 24 were social determinants of health			
Vance County	Chronic Disease &	Reproductive Health &	Success in Schools		
Wake County	Poverty and Unemploymen	Health Care Access and	Mental Health & Substance		
Warren County	Physical Activity (chronic	Substance Abuse (drug, alcohol)	STD/Unintend ed Pregnancy		
Washington County	Chronic Diseases (including	STDs	Substance Abuse (tobacco,		
Watauga County	Obesity Prevention (nutrition and	Access/Afforda bility of Healthcare	Substance Abuse Prevention		
Wayne County	Social Indicators (poverty, access to	Health Indicators (Health literacy,			
Wilkes County	Mental Health / Substance Abuse	Affordable Health Care / Indigent Care	Economy / Poverty	Cardiovascular Disease (Heart &	Cancer
Wilson County	Gang Activity	Alcohol Drug Abuse	Job Availability	Poverty/Low Income	Healthcare Availability/Aff
Yadkin County	Access to Health	Access to Dental Care	Smoke-free Environments	Cancer (prevention /	Teen Issues (self-esteem,
Yancey County	Tobacco, Physical	Access to Mental Health	Access to Health		

APPENDIX C: SURVEY TO LOCAL HEALTH DIRECTORS

This survey is a part of a dissertation project for a doctorate of public health candidate. The focus of the research project is to understand the role that public health agencies currently play in affecting social determinants of health, as well as interest in becoming engaged or in remaining apart from engaging in social determinants of health. Social determinants include income, wealth, education, environment, housing, transportation and the social and community context in which we live. Data collection will take place in two stages. The first is a survey, which will be used to connect with local public health directors across the state. This survey should take approximately 15 minutes to complete. The second stage will include key informant interviews in four counties.

Responses to this survey will be kept confidential but will not be anonymously collected. No identifiable information collected through this survey will be shared or published. Information from this survey will be used to identify counties that would be ideal for the second stage of the research project. After the survey, some but not all county level leaders will be contacted and again asked for participation in key informant interviews. Those interviews, expected to last approximately 45 minutes, would take place via telephone at a time convenient to the participant. Participants can opt out of the study at any time. As a thank you for participation, those who complete the survey and share contact information will be entered into a drawing for one of two $100 Visa gift cards. Chances of winning depend on the number of participants.

Target Audience: Local Health Agency Directors or designee

Type of Agency Responding (please choose one):

1. County Level Health Agency

2. District Health Agency
3. Consolidated Health and Human Service Agency
4. Other (please describe)

Year of most recently completed Community Health Assessment (drop down of 2011 through 2016):

Do you currently partner with a hospital or hospital system in administering the Community Health Assessment? (Multiple choice, yes/no)

Current Priorities (up to top five) as identified through most recent Community Health Assessment: (text box of priorities one through five)

(Grid Multiple Choice):

To what extent do you believe your local public health agency has a role to play in: (Likert Scale, 1=not at all, 2=very little, 3=some, 4=moderate, 5=strong)

8) Affecting educational outcomes in your community?
9) Affecting average income in your community?
10) Shaping the built environment (roads, parks, greenways, etc.) in your community?
11) Affecting the availability of safe, affordable housing in your community?
12) Affecting access to affordable, reliable transportation in your community?
13) Impacting social connectedness, or the quality and quantity of social support systems for individuals in the community (i.e. mentoring programs, community associations, etc.)?
14) Impacting racism or racial bias?

Follow up: Please explain why you think your agency does or does not have a role to play in affecting above listed social determinants.

Aside from the community health assessment process, do you regularly partner with entities working in the following sectors?

1. Education (yes, attempted without success, no)
2. Housing (yes, attempted without success, no)
3. Transportation (yes, attempted without success, no)
4. Healthcare (yes, attempted without success, no)
5. Community Organizing, i.e. community associations, Girls & Boys clubs, and community advocacy groups, anti-racism or racial healing organizations (yes, attempted without success, no)
6. Business/Economic Development (yes, attempted without success, no)
7. Other (please list sector, as well as whether or not you are engaged with them)

Follow up: In what capacity do you work with those groups you have identified as regular partners?

What do you consider to be the primary local barriers to engaging in work to impact social determinants of health? Please rank each on a scale of 1-5 (1=not at all, 2=somewhat, 3=moderately, 4=significant, 5=most challenging)

1. Social determinants of health issues are not identified as a problem by the community during the data collection phase (phase 2) or the interpretation of the data (phase 4) of the community health needs assessment

2. Social determinants of health are not prioritized by the community during the selection of priorities (phase 5) in the community health needs assessment process
3. Social determinants of health may be a local problem, but it is not perceived as a public health problem
4. The local health agency experiences resistance from administrative leadership (i.e. board of health, county manager) against engaging in work related to social determinants of health
5. The local health agency experiences resistance from elected officials against engaging work related to in social determinants of health (i.e. county commissioners, local legislators)
6. There are no resources available for this work
7. Other sectors engage in turf wars over social determinants of health issues or are not willing to partner
8. I am or my team is unaware of evidence based policy and/or intervention proven to impact SDH
9. I have or my team has no technical expertise in how to address these problems

Are there other barriers that make it difficult for your organization to engage in work of social determinants of health? (open ended)

During the community health needs assessment, did any organization or participant press for the inclusion of social determinants of health as a top priority for your county? If so, which organizations or participants?

What factors would make it easier for you to engage locally in work to impact social determinants of health (SDH) (ie, facilitators)? Please rank each on a scale from 1-5 (1=not at all, 2=somewhat, 3=moderately, 4= significant, 5=most helpful)

1. SDH perceived as a problem in the community and/or rose up as a priority in community health assessment
2. SDH perceived as a public health problem
3. Support from public health administration for engaging in SDH
4. Support from elected officials for engaging in SDH
5. Resources allocated for this work
6. Commitment from diverse sectors to work together on SDH
7. Identification of evidence based policy and/or intervention proven to impact SDH
8. No technical expertise in how to address these problems
9. Other (please describe)

Are there other factors that would make it easier for you to engage locally in work to impact social determinants of health? (open ended)

Would you be interested in engaging in work around SDH if:

1. You were provided with strong evidence about the role of public health in affecting social determinants of health (Y/N/Maybe)
2. You were provided with good data about evidence-based models that could address the problem in your community (Y/N/Maybe)
3. Your agency was provided with new financial resources to address this problem (Y/N/Maybe)

4. Your agency was provided with technical assistance or support to help implement evidence-based strategies (Y/N/Maybe)
5. You were asked for your help from other community partners to engage in this work (Y/N/Maybe)

Is there any other information you would like to share about why you are, or are not, engaged in work to address SDH, and/or the type of support you would want to further your work in this area: (open ended)

Name of individual completing the survey:

Name of agency:

Phone number:

Email address:

Would your agency be willing to participate more fully as one of the four counties in the next stage?

Please contact the principal investigator with any questions or comments relating to this survey or project:

Laurie Stradley

Doctoral Candidate at Gillings School of Global Public Health

lbronson@live.unc.edu

APPENDIX D: PUBLIC HEALTH KEY INFORMANT INTERVIEW GUIDE

Thank you for taking the time to speak with me today. As a reminder, this interview is a part of a dissertation project for my doctorate of public health. The focus of this project is to understand the role that public health agencies currently play in affecting social determinants of health. Social determinants include income, wealth, education, environment, housing and the social and community context in which we live.

This is the second stage of data collection. The first was a survey of local public health directors across North Carolina to better understand the role of health departments in addressing social determinants, as well as the perceived barriers or facilitators for that work. This second stage will include key informant interviews in four counties across multiple sectors within each county. The information gathered in this two-step process will be used to develop a guide to accelerate the prioritization of social determinants of health in local public health agencies for those communities that wish to do so.

Participation in this interview is completely voluntary. You may end this interview at any time without penalty. The interview will be recorded and transcribed for analysis. Your comments will be kept confidential and will not be individually tied to you or your county in any publications. However, your county will be described demographically and it may be possible for individuals to guess the county and leaders included.

Do you have any questions before we begin?

Do you consent to participating in this recorded interview?

I will begin the recording at this time and will ask you to restate your consent on the recording.

It is (time) on (date). This interview is participant (number).

Participation in this interview is completely voluntary. You may end this interview at any time without penalty. The interview will be recorded and transcribed for analysis. Your comments will be kept confidential and will not be individually tied to you or your county in any publications. However, your county will be described demographically and it may be possible for individuals to guess the county and leaders included.

Do you consent to participating in this recorded interview?

Do you have any questions before we begin?

1. Please state your current position.

2. Your community identified XXX as public health priorities. I would like you to walk me through the priority setting process in your community.

    a. Who was involved in the process? Key partners?

    b. What were the steps that were used in the process?

    c. Do you have specific staff who have the skills and expertise to manage this process? If so, what skills and expertise were critical to this process?

    d. Were there specific data that supported these priorities over other top public health issues?

    e. Who were the key advocates that were pushing its inclusion as a priority? (Probe: Were county administrators or elected officials involved? If so, how?

f. Was your local health care system involved in setting priorities? If so, how?

g. Did any particular groups press for the inclusion or exclusion of any particular priorities? If so, which groups for which priorities?

h. What process was used to select the final priorities as they appear in your community health needs assessment?

3. Now that you've included XXX as a top public health priority, what are you planning to do to address this problem?

    a. What role will public health play (e.g., convener, facilitator of local efforts, major player in addressing the issue?

    b. Are there other community agencies you are partnering with in this effort? If so, who?

    c. Have you identified evidence-based practices you engage or will engage in to affect change?

    d. What resources will be deployed?

    e. How will you measure process and outcomes?

4. What are the barriers to your agency's work in this area?

    a. Are there any turf issues with other agencies?

    b. Do you have support from your county administrators, board of health or elected officials?

    c. Do you lack resources and/or staff to address this issue?

d. Are you aware of evidence based practices that can be used to affect change? If so, what?

e. What training and technical skills do you believe are critical to addressing these priorities? Does your staff have the appropriate training and technical skills to address this priority?

5. How did you/will you overcome these barriers?
6. Aside from those you already described in your priority setting process, have there been any facilitators that made it easier for you to work in this area? For example, did you have:
    a. Sister agencies or community partners asking for your help?
    b. Key leadership from within your agency or your elected officials?
    c. Resources to address this issue?
    d. Expertise within your staff
    e. Community champions?
    f. Interest from other sectors in working with you?
    g. Access to technical assistance?
7. If you were to give advice to another local health agency interested in engaging in work to improve social determinants of health, what would your advice be?
8. Is there anything else you'd like to share with me about this topic?

Thank you for your time. If you have any questions, please contact me at laurie.stradley@unc.edu or 919-260-8521.

APPENDIX E: NON-PUBLIC HEALTH KEY INFORMANT INTERVIEW GUIDE

Thank you for taking the time to speak with me today. As a reminder, this interview is a part of a dissertation project for my doctorate of public health. The focus of this project is to understand the role that public health agencies currently play in affecting social determinants of health. The purpose of this interview is to understand the perceptions of other sectors, including education, housing and others, of the role of public health in social determinants of health. Social determinants include income, wealth, education, environment, housing and the social and community context in which we live.

This is the second stage of data collection. The first was a survey of local public health directors across North Carolina to better understand the role of health departments in addressing social determinants, as well as the perceived barriers or facilitators for that work. This second stage will include key informant interviews in four counties across multiple sectors within each county. The information gathered in this two-step process will be used to develop a guide to accelerate the prioritization of social determinants of health in local public health agencies for those communities that wish to do so.

Participation in this interview is completely voluntary. You may end this interview at any time without penalty. The interview will be recorded and transcribed for analysis. Your comments will be kept confidential and will not be individually tied to you or your county in any publications. However, your county will be described demographically and it may be possible for individuals to guess the county and leaders included.

Do you have any questions before we begin?

Do you consent to participating in this recorded interview?

I will begin the recording at this time and will ask you to restate your consent on the recording

It is (time) on (date). This interview is participant (number).

Participation in this interview is completely voluntary. You may end this interview at any time without penalty. The interview will be recorded and transcribed for analysis. Your comments will be kept confidential and will not be individually tied to you or your county in any publications. However, your county will be described demographically and it may be possible for individuals to guess the county and leaders included.

Do you consent to participating in this recorded interview?

Do you have any questions before we begin?

1. Please start by describing your current role in the community, professionally or personally.

2. Do you regularly interact with your local public health agency? If so, can you share examples of when and how you interact with your local public health agency?

    a. Have you had problems in the past partnering with public health? If so, please describe the barriers you have encountered in working with public health.
    b. Have you had successes in the past partnership with public health? If so, what factors have led to that success?

3. What is your understanding of "social determinants of health"?
    a. Is your organization currently working on addressing social determinants of health? If so, which ones, and what type of work are you doing?

4. Are you aware that your local health department has identified XXX (a social determinant of health) as a priority through the Community Health Needs Assessment?
    a. What does that mean for your organization or work?
    b. What barriers to you believe the public health agency will face in this work?

c. What facilitators are available in your community that may make it easier for your local public health agency to engage in this work?

5. In your opinion, what, if any role do you believe public health should play in sectors and organizations related to housing, education, etc.? For example, should your local health department:
    a. Help convene community partners and facilitate the work around XX issues.
    b. Take a leadership role in addressing XX. (If so, please describe).
    c. Other?

6. What do you think is the role that public health should play in addressing other social determinants of health?

7. Why do you feel this way?

8. Are you aware of best practice or evidence-based interventions that indicate a need for partnership between your work/agency and public health? If so, what are they?

9. What is your role in working with the public health agency on addressing XXXX?
    a. Do you believe you will increase or decrease your interaction with public health in the future? Why do you feel this way?

10. Is there anything else you would like to share with me regarding public health, social determinants of health, or anything else we've covered today?

Thank you for your time. If you have any questions, please contact me at

laurie.stradley@unc.edu or 919-260-8521.

APPENDIX F: CODEBOOK

Barriers

Name	Description
competing interests	Public health has other priorities, not enough time or resources for SDH
EBP is not applicable to local effort	
Inflexibility of public health agency	Public health is not able to be flexible or nimble; red tape; complicated system
lack of evidence-based practice	Not aware of or does not have access to appropriate EBP to affect change in social determinants
lack of local data	Unclear or absent data about local population
lack of resources	Not enough resources (funding, staffing, tools, etc.) to do existing work, expand work
lack of support for administrators	County and public administrators do not support public health engagement in social determinants
lack of support from	Elected officials do not support public health

Name	Description
elected officials	engagement in social determinants
lack of understanding of social determinants	Community members, leaders, decision makers do not understand the impact of education, income, housing, etc. on health outcomes
no perceived role for public health agency	belief that public health does not have a role to play in sectors like education, housing, etc.
PH bureaucracy difficult to navigate	
SDH problems are too big	
Silos	No connectivity between sectors, organizations, agencies. Silo effect.
superficial interagency cooperation	
Target population difficult to access	
Territory issues or turf wars	Active competition/tension between sectors, organizations, agencies
too many new EBPs	New EBPs coming out regularly, difficult to

Name	Description
	stay on top of new options.

Understanding of social determinants

Name	Description
Personal responsibility	personal choices (i.e. incorrect definition of SDH)
Social Factors	housing, education, income, transportation, environment

Facilitators

Name	Description
allocated resources	Resources from state, local, federal or foundations are available for SDH work
community engagement	
Community understanding of SDH	
evidence based practice	
interagency cooperation	Existing committee or other connectivity

Name	Description
	between organizations affecting SDH
multi sector support for the role of public health	Other sectors look to public health for leadership; agree on the importance of public health engagement in SDH
Passion for the work	
recognition of impact of social determinants of health	Community understands the impact of social determinants on health outcomes
support from administrative officials	Local administrators support public health work in social determinants
support from elected officials	Officials understand and support public health work in social determinants
technical skills	Public health staff has skills or access to training to work in SDH

Public Health Roles

Name	Description
advocate	Shares evidence, data, best practice with policy and decisionmakers to improve the health of

Name	Description
	the community
clinical access provider	Provides clinical care (i.e. vaccines, prenatal care, STI testing, school nurses) to the community
Community Educator	Shares health information with community members
Convener	
Evaluator or Data Provider	Collects, analyses and shares health related data for the community
Facilitator	Agency/staff calls meetings, pulls various organizations, leaders, agencies together for identified purpose
Health program implementer	Implements preventive health programs (i.e. diabetes education program)
Partner	

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