

Cross-Sector Collaborations in Public Health for Promoting Physical Activity, Advancing Health
Equity, and Reducing the Prevalence of Chronic Disease in the U.S.

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A dissertation
submitted in the partial fulfillment of the
requirements for the degree of

Doctor of Philosophy

University of Washington

2025

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School of Nursing

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Abstract

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Rates of chronic diseases such as obesity and diabetes are on the rise in the U.S. disproportionately impacting the Hispanic population. At the local level, public health services research has been focused on the impact of local health department (LHD) performance on improving population health outcomes. State health departments (SHDs) also engage in promoting health equity and reducing chronic disease disparities through cross-sector collaborations, but gaps in the literature exist regarding factors that promote the effectiveness and sustainability of such efforts. Yet, health department engagement could affect performance in and the sustainability of cross-sectoral public health initiatives. This dissertation aimed to explore how the current public health infrastructure within the U.S. can support the engagement and sustainability of cross-sectoral collaborations for promoting physical activity, advancing health equity, and reducing the prevalence of chronic disease.

To add to the existing literature, we utilized the Cross-Sector Alignment Theory of Change and the Chronic Disease Prevention/Healthy Living Promotion (CDP/HLP) Framework to design a multi-method research study for examining cross-sectoral collaborations. We examined formal, written strategies (FWS) in association with LHD engagement in cross-sectoral collaborations for obesity prevention. We conducted a quantitative analysis to determine relationships between a FWS for obesity prevention and the level of LHD engagement in cross-sector collaborations targeting health promotion. Then, LHDs identified as either highly or moderately engaged in obesity prevention efforts were purposively sampled for a qualitative analysis to identify factors within LHDs that assist in maintaining engaged and sustainable cross-sector collaborations that promote PA, particularly for the Hispanic community. Finally, an additional qualitative analysis aimed to (1) explore specific characteristics of existing collaborations between SHD and external organizations that promote the engagement and sustainability of health equity initiatives and (2) identify organizational strategies that SHD staff and partners perceive to be successful in addressing chronic disease disparities through cross-sectoral collaborations.

The studies described here utilized frameworks to evaluate the impact of health department engagement on outcomes and organizational strategies to support the engagement and sustainability of cross-sectoral partnerships. In each study, findings support the need for resource and capacity building, particularly in smaller health departments that serve rural areas. For LHDs prioritizing marginalized populations, there is a need to integrate the social determinants of health (SDOH) into culturally appropriate interventions through partnerships with community-based organizations. When examining state-level organizational strategies for ensuring engagement and the sustainability of cross-sectoral collaborations, public-private partnerships (PPPs) were key to increasing organizational capacity to develop and maintain health equity initiatives that strive to reduce chronic disease disparities

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CHAPTER 1: Introduction

This dissertation examines the need for collaborations between public health and other sectors, including public, private, and non-profit entities, to promote physical activity, reduce the burden of chronic disease, and address health disparities in the U.S. Rates of chronic diseases such as obesity, diabetes, cancer, and heart disease are rising in the U.S.¹, disproportionately impacting marginalized communities. In particular, the Hispanic population has a higher prevalence of obesity and diabetes compared with non-Hispanic whites², and cancer is the leading cause of death in this population.³ A common modifiable risk factor contributing to these chronic diseases is physical inactivity.^{1,4,5}

The COVID-19 pandemic revealed the significance of chronic conditions as precursors to poor health outcomes, with some of the most prevalent underlying conditions among COVID-19 patients including diabetes, hypertension, and cardiovascular disease.⁶ Both local health departments (LHDs) and state health departments (SHDs) have critical roles to play in promoting health equity and reducing chronic disease disparities among their constituents.^{7,8} Social determinants of health (SDOH), or the social, economic, and built environments in which people live, learn, work, and play, are an important basis for consideration in terms of having an impact on these disparities.⁷

When considering SDOH in community-based obesity prevention efforts, it is important to consider structural determinants⁹ that lead to population health disparities and inequities. Health disparities are typically defined as health outcomes that occur in a greater or lesser extent between populations, while health inequities refer to differences in health outcomes related to social advantages or disadvantages.¹⁰ Structural inequities denote how systems of society (i.e., finance, housing, transportation, education, and access to health care) benefit one population over another.¹⁰ In theory, these structural inequities lead to health inequities, which result in health disparities for obesity and other chronic illnesses. Hence, interventions promoting obesity

prevention should focus on structural and health inequities to address the root causes of chronic disease.

To adequately address the SDOH that contribute to health disparities, sustainable collaborations between public health agencies and other institutions are necessary to improve physical activity¹¹ and reduce the burden of chronic diseases. Yet, many funding programs specific to local and state public health agencies have limited self-sustainability,^{12,13} highlighting the need to share resources across sectors such as departments of housing, transportation, and healthcare.⁷ While LHDs and SHDs have historically participated in health promotion activities, little is known regarding the impact of cross-sector collaborations in reducing physical inactivity¹⁴ and chronic diseases.

The built environment (BE) is one area public health departments should consider when striving to address the root causes of chronic disease.¹⁵ The BE is considered the whole of places designed by humans with key attributes that include land use, population density, and location relative to community destinations.¹⁶ BE characteristics associated with physical activity in adults include neighborhood walkability, grid-like street connectivity, mixed-land use, active transport, safety, and the social environment.^{17,18} Evidence from the literature suggests that the physical environment, such as parks and streets in urban settings, is a potential factor predictive of physical inactivity among the Hispanic community.¹⁹ Poor quality of the environment and inequalities in access to recreational facilities may also impact physical inactivity, particularly for marginalized groups.¹⁸ Another contributor to physical inactivity includes outdoor safety concerns.²⁰ Health departments can play a role in population-specific interventions that address and prevent health disparities through cross-sector collaborations with other departments working to improve the built environment.²¹

Research into cross-sectoral collaborations will be essential in guiding public health activities for addressing the SDOH that contribute to chronic disease disparities in the U.S. Almost

half of LHDs surveyed in 2016 reported having no obesity prevention activities within their communities²² and were classified by researchers at the University of Colorado Anschutz Medical Campus as low cross-sector collaborators in obesity prevention efforts.²³ Additionally, SHDs have been shown to primarily collaborate with organizations in the healthcare sector, despite evidence demonstrating that multisectoral collaborations are essential to improving community health²⁴ and reducing disparities.⁷

The purpose of this study was to determine how LHDs and SHDs can effectively engage in sustainable collaborations to promote policies that encourage physical activity, particularly for marginalized populations. LHDs have historically served as important health strategists engaging in cross-sector collaborations that further system-level changes²⁵; yet, critical guidelines specific to LHD roles and engagement in developing built environment policies and programs for obesity prevention are lacking.²⁶

The context that LHDs and SHDs operate within often vary.²⁷ High-level organizational factors that could influence engagement in cross-sector collaborations include per capita spending, number of full-time equivalents (FTEs), population size served (i.e., rural vs. urban), and governance classification (e.g., centralized vs. decentralized). From there, specific LHD and SHD attributes, such as having a workforce dedicated to and/or a formal, written strategy for obesity and chronic disease prevention could impact cross-sector collaborations. Other attributes, such as whether or not a health department participates in conducting epidemiology and surveillance of chronic diseases, Community Health Assessments (CHAs), or Community Health Improvement Planning (CHIP) could also affect an organization's ability to increase the level of engagement in cross-sector collaborations.

Because health department context matters, research into mechanisms that facilitate the implementation of interventions within a particular organization is needed. One theory, called the Cross-Sector Alignment Theory of Change²⁸, can be used to identify enabling mechanisms, like

level of engagement in cross-sectoral collaborations. Furthermore, when assessing effectiveness, implementation science is an approach that offers formative evaluations to reveal the success of interventions through the use of determination frameworks.^{29,30} Specific mechanisms can be assessed for impact on obesity prevention efforts using frameworks like the Chronic Disease Prevention and Healthy Living Promotion (CDP/HLP) Framework to examine how organizational and system-level mechanisms impact progress in achieving proposed outcomes.

Due to varying contexts surrounding cross-sectoral collaborations, evaluating such mechanisms has been difficult. One study found that common concerns related to the sustainability of health equity initiatives include conflicting organizational priorities and limited political or community support for the work.³¹ Yet, little evidence is available on how these cross-sector collaborations function, making it difficult to learn from successes and failures.¹³ Structure, or formalization, within collaborations³² can be a mechanism affecting organizational capacity outcomes, and some researchers have noted that a strategic plan offers a roadmap for action in obesity prevention.³³

Chapters 2, 3, and 4 of this dissertation offer further insight into how LHDs and SHDs engage with other sectors in targeting the built environment for enhancing health equity. Specifically, Chapter 2 examined the relationship between whether a LHD utilized a formal, written obesity prevention strategy and its level of engagement in cross-sector collaborations. Chapter 3 focused specifically on LHD factors that enhanced cross-sector collaborations supporting physical activity promotion for the Hispanic community. Finally, Chapter 4 outlined organizational strategies that SHDs can utilize for supporting cross-sector collaborations that positively impact health equity initiatives. These chapters are intended to provide guidance that both LHDs and SHDs can use for building and maintaining engagement in cross-sector collaborations while taking context into account for improved sustainability of such initiatives.

Chapter 2: Formal, Written Obesity Prevention Strategies and Level of Local Health Department Engagement in Cross-sector Collaborations

Aim: Determine whether a formal, written strategy for obesity prevention activities is associated with the level of LHD engagement in cross-sector collaborations. *H1: LHD with formal, written strategies will demonstrate higher levels of engagement in collaborations than those without formal strategies.*

Chapter 2 examined secondary data from the following merged sources: (1) The 2013 National Study of Local Public Health Activities to Prevent Obesity (Saint Louis University), hereafter referred to as the Obesity Prevention Study, and (2) The 2013 National Association of County and City Health Officials (NACCHO) Profile of Local Health Departments Study. The NACCHO Profile survey is a data source with information about LHD governance, activities, and services.³⁴ For the 2013 Profile, 2,532 LHD were included in the study population. While NACCHO Profile survey data are typically collected every three years, 2013 data were used since these data were collected in the same year as the Obesity Prevention Study data.

The Obesity Prevention Study data are from a uniquely detailed cross-sectional survey, conducted only once (2013). A national sample of 387 LHDs was obtained for the Obesity Prevention Study survey to assess infrastructure and collaboration roles. LHDs were categorized as minimally or moderately/highly engaged in obesity-prevention activities. LHD engagement was characterized by active involvement and participation in cross-sector obesity prevention activities and level of LHD engagement was quantified through a composite score derived from metrics associated with policies supporting improvements in the built environment.

Chapter 3: Local Health Department Factors that Support Sustainable Cross-sector Collaborations in Promoting Physical Activity for the Hispanic Community in the U.S.

Aim: Identify factors within LHD that assist in maintaining highly engaged and sustainable collaborations in promoting physical activity. *Exploratory aim: To explore facilitators and barriers to maintaining effective collaborations for promoting physical activity, particularly for marginalized populations with a higher prevalence of physical inactivity.*

Chapter 3 utilized a purposive sample from the moderately/highly engaged group identified in Chapter 2. We focused on LHDs drawn from this 2013 sample because we aimed to identify factors that assist in maintaining engagement in cross-sector collaborations. Therefore, this sample was useful in terms of asking questions about prior and current organizational capacity to sustain these cross-sector collaborations. LHD representatives from the moderately/highly engaged group were identified for this qualitative analysis either (1) via LHD chronic disease websites or (2) by Health and Human Services region public health agency contacts of the research team.

A total of 28 LHDs from 16 states within the U.S. were contacted, representing each of the ten Health and Human Services regions. Semi-structured interviews were conducted with these representatives to identify facilitators and barriers to maintaining obesity prevention collaborations with other sectors. They were asked about the nature of these collaborations in the last decade and the degree to which they have been sustained. Additionally, because the current prevalence of physical inactivity among adults in the U.S. is highest in the Hispanic population,³⁵ questions surrounding particular programs that potentially impact the SDOH in Hispanic communities were explored.

Chapter 4: State Health Department Organizational Strategies for Cross-sector Collaborations that Address Chronic Disease Disparities

Aim: Identify organizational strategies of cross-sector collaboration engagement that SHD staff perceive to be successful in addressing chronic disease disparities. *Exploratory Aim: To explore*

specific characteristics of existing collaborations between SHDs and organizations from outside of the public health sector that promote health equity initiatives.

Chapter 4 examined the nature of existing relationships between SHDs and other sectors. We conducted semi-structured interviews with SHD staff as part of a larger study between the University of Washington, the Association of State and Territorial Health Officials (ASTHO), and the Centers for Disease Control and Prevention (CDC) to present these cases to SHD leaders with practice-related recommendations. Case study SHDs were identified for the existence of apparent, innovative cross-sector collaborations related to SDOH. Interview questions included those that asked SHD staff about roles, funding, sustainability, and the advancement of health equity initiatives in these cross-sectoral collaborations. These case study data were analyzed to specifically identify characteristics of existing collaborations that appear to make these SHDs successful in promoting health equity initiatives that address chronic disease disparities.

CHAPTER 2: Formal, Written Obesity Prevention Strategies and Level of Local Health Department Engagement in Cross-sector Collaborations

INTRODUCTION

Health promotion initiatives to improve population health often entail a Health in All Policies (HiAP) approach,³⁶ which includes a core element of developing and sustaining cross-sector collaborations.³² There is limited evidence, however, of how collaboration processes impact population-level health equity initiatives. At the local level, public health services research is focused on the impact of local health department (LHD) performance on improving population health outcomes.^{37–39} Yet, few studies have defined LHD engagement,⁴⁰ which could affect performance, in cross-sectoral public health initiatives.

In terms of obesity prevention initiatives, two primary approaches have been used to develop interventions: (1) those targeting decision-making of individual health behaviors and (2) those utilizing socioecological models to target a range of health determinants.⁴¹ From a population perspective, the latter will likely have more impact on communities as a whole.⁴² In fact, the National Academies of Sciences, Engineering, and Medicine has developed a roadmap for using systems science for obesity prevention.³³ One of the guiding principles from this roadmap is to enhance cross-sector collaboration and engagement.³³

Historically, public and private organizations have been formally collaborating to encourage healthy food consumption and promote physical activity.⁴³ For example, the Robert Wood Johnson Foundation (RWJF) has been instrumental in the development of the Active Living Research program⁴⁴ and has pushed for approaches that promote healthy foods/beverages and physical activity in communities. While researchers have studied the relationship between a formalized strategy and performance, there are limitations in variable measurements and causal mechanisms.⁴⁵ Determining how engaged organizations are in these cross-sector collaborations is crucial for measuring performance.

One aspect of LHD engagement is commitment, and studies have found that shared documentation improves a sense of commitment among partners.⁴⁶ Structural contributors, such as organizational capacity and community assessment activities, significantly impact LHD engagement⁴⁷ and are useful in examining the mechanism of how the implementation of a formal, written strategy might impact LHD engagement in obesity prevention activities. Formalization within these collaborations can affect organizational capacity outcomes,³² and some researchers have noted that a formal strategic plan offers a roadmap for collaborative action in obesity prevention.³³

The process of developing a formal strategy for cross-sector collaboration involves use of structured tools and written articulation of plans.⁴⁵ Formal, written strategies for LHDs participating in obesity prevention programs can take on many different forms, including memorandums of understanding and strategic plans, that are used to communicate with numerous entities for clarity and accountability.⁴⁵ Local health departments (LHDs) and state health departments (SHDs) have an important role to play in developing these cross-sectoral collaborations.

LHDs and SHDs typically promote interventions through collaborations with relevant sectors including agriculture, transportation, and parks/recreation. Other entities, such as faith-based organizations, community-based organizations, school systems, etc., have been crucial partners as well. Funding for these collaborations have typically been provided by stakeholders promoting obesity prevention like the National Institutes of Health, Centers for Disease Control and Prevention, American Legacy Foundation, American Medical Association, American Cancer Society, and RWJF.⁴⁴

The RWJF Active Living Research program was initiated in the early 2000s when urban planners found that the built environment and community design had an impact on healthy eating and physical activity.⁴⁴ Its literature database has been created to share findings from research exploring relationships between physical activity and the built environment.⁴⁸ Yet, according to

Sallis et. al. (2014), it has been difficult to demonstrate that the first phases of this research have led to policy changes.⁴⁸ Thus, the third phase of the Active Living Research program, implemented in the early 2010s, was to translate research into policy and practice.⁴⁸ The objective of this study is to assess whether LHDs with formal, written strategies for obesity prevention activities demonstrate higher levels of engagement in cross-sector collaborations related to built environment policies.

Cross-Sector Alignment Theory

LHDs have served in important health strategy roles, engaging in cross-sector collaborations that further system-level changes.²⁵ Yet, guidelines specific to LHD roles and engagement in developing built environment policies and programs for obesity prevention are lacking, potentially hampering their efforts.²⁶ One scoping review found less than 20 publications citing full LHD engagement in obesity prevention activities despite evidence that LHD involvement in comprehensive community interventions are significantly associated with lower obesity prevalence.⁸ LHDs that are highly engaged in these cross-sectoral collaborations could potentially lead to community-level improvements in population health equity. The Cross-Sector Alignment Theory of Change,²⁸ can be useful in assessing LHD level of engagement by outlining factors that enable such engagement in cross-sectoral collaborations.

METHODS

For this study, LHD engagement was considered involvement and participation in cross-sectoral obesity prevention activities that are used to describe LHD engagement in promoting relevant policies. The level of engagement was quantified through composite scores derived from items associated with healthy eating and physical activity. The dependent variable (highly engaged, moderately engaged, or minimally engaged) and independent variable were assessed using the 2013 National Study of Local Public Health Activities to Prevent Obesity⁴⁹ (hereafter referred to as the Obesity Prevention Study). Covariates were derived from both the Obesity

Prevention Study and the 2013 National Association of County and City Health Officials (NACCHO) Profile of Local Health Departments. Although the Obesity Prevention Study data were from 2013, it is a uniquely detailed data set that includes information about LHDs and built environment policies related to obesity prevention efforts that can inform local-level cross-sector collaboration and obesity prevention efforts in the future. Both datasets included county-level Federal Information Processing Standards (FIPS) codes to link them.

Independent variable

Formal, written strategies included the use of concrete mutual agreements or contracts. This study's main independent variable—formal, written strategy—was obtained from the Obesity Prevention Study. In 2013, LHD representatives were asked whether their LHD had a formal, written strategy for obesity prevention or a specific obesity prevention program. Responses included (1) Yes, (2) No, or (3) Don't know.

Dependent variable

LHD level of engagement in policy related to the built environment was measured using 21 items from the Obesity Prevention Study, describing LHD activities to promote healthy eating and physical activity. A summary index was created using these 21 items (nine related to healthy eating and twelve related to physical activity). Appendix 1 provides a full description of the obesity prevention activities that addressed policy and the built environment in neighborhoods and communities. For each of these 21 items, a score was delineated based on the response given by LHD respondents, identifying their agency as having one of the following roles in each activity:

- (1) Either a leader OR leader + collaborator (score=2)
- (2) Collaborator (score=1)
- (3) None or Don't know (score=0)

A 'leader' here was defined as an LHD initiating and/or leading an effort, and a 'collaborator' was defined as an LHD supporting other community partners in an effort. Leader and collaborator delineations originated from the Obesity Prevention Study. A composite score was calculated for all 21 responses combined per LHD. Those with a score of 33-42 were considered highly engaged, 15-32 moderately engaged, or 0-14 minimally engaged. Sensitivity analyses were conducted to assess various cutpoints, based on inputs included in each model. Scores were also calculated for the sets of healthy eating and physical activity items individually.

The index developed represents cross-sector collaboration, given the need for public health alliances with other sectors to achieve obesity prevention objectives. Variables from the healthy eating and physical activity sections of the survey inquired about promoting policies and changes to the built environment. In the Obesity Prevention Study, policy was defined as formal laws, rules, and regulations as well as organizational guidelines. The built environment was considered inclusive of human-made settings (i.e. green space, parks, neighborhoods, buildings) and laws regarding zoning for those areas.

When describing ordinances and incentives, the Obesity Prevention Study specified that these items referred to taxes, land use, and zoning regulations. As an example, one of the items listed asked about public safety efforts (e.g., improving transit and ensuring adequate lighting in parking lots) to enhance accessibility to grocery stores. This would require an LHD to work with other agencies, such as transportation departments, to achieve mutual goals. As Rube et. al. (2014) notes, "LHDs, as health-focused organizations, cannot directly affect the built environment on their own."²⁶

Covariates

While the Cross-Sector Alignment Theory of Change model²⁸ posits that collaborations between healthcare, public health, and social services are necessary to develop enduring and sustainable health initiatives that promote health equity, we argue that sectors outside of public

health, like the transportation sector, should also be included to improve the built environment and enhance opportunities for improving obesity prevention efforts. Additionally, community assessment activities and organizational capacity variables could be incorporated into the original model through a formal, written strategy. Across sectors in the Cross-Sector Alignment Theory of Change model, the four core areas of shared purpose, governance, financing, and data provide a framework for enabling sustainable collaborations that can promote health equity.²⁸

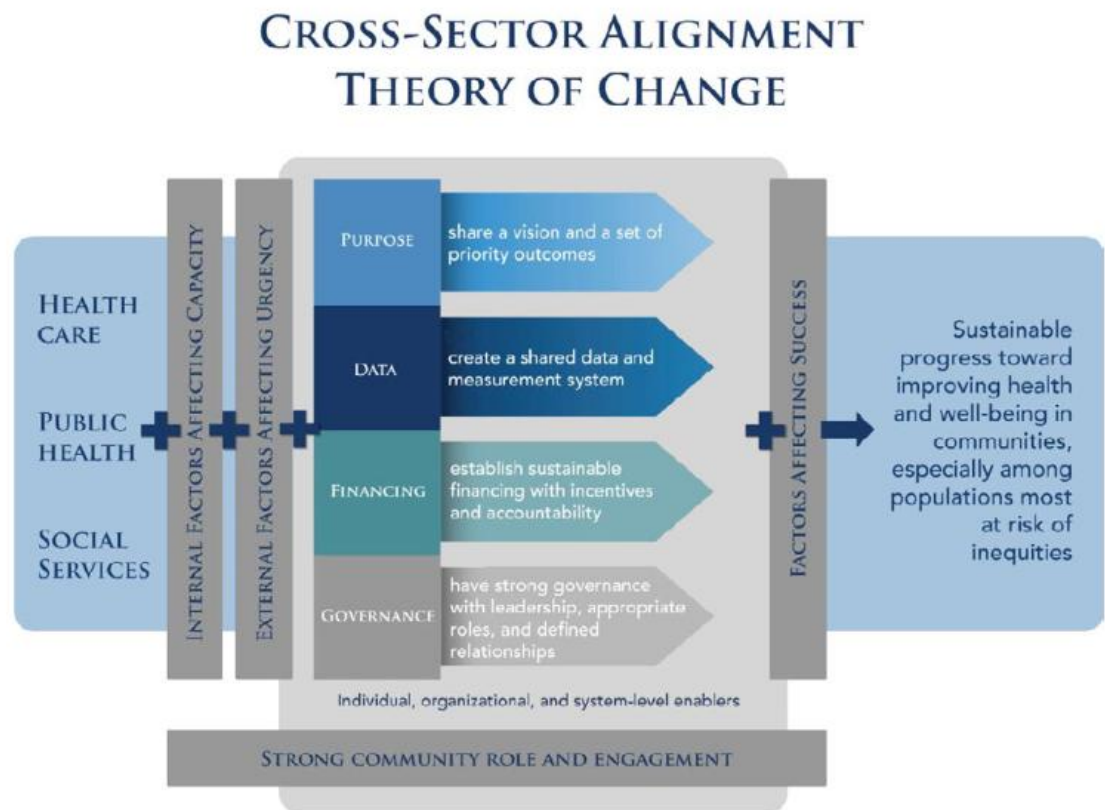


Figure 1. Cross-Sector Alignment Theory of Change, Reprinted with Permissions²⁸

Several influential factors have historically been associated with higher LHD performance, including higher per capita health expenditures, higher number of full-time equivalent (FTE) staff, completion of a community health assessment (CHA) or community health improvement plan (CHIP),⁵⁰ population size, and policy-making authority.⁵¹ Although specific to performance outcomes (and not level of LHD engagement), these factors could undoubtedly impact community

assessment activities and organizational capacity that influences the level of LHD engagement and were, thus, included in our model.

Community Assessment Activities

LHDs are expected to conduct assessment activities such as CHAs and CHIPs, providing communities with information to set public health priorities and goals.⁵² Completing a CHIP within the past five years has been significantly associated with “involvement in policy/advocacy activities in urban design/land use, active transportation, and access to recreational facilities.”⁵³ CHAs or CHIPs could impact the development of a formal, written strategy for obesity prevention. Hence, these variables were included as covariates.

LHDs also often lead or participate in conducting (1) population-based primary prevention^{54,55} and (2) chronic disease epidemiology surveillance activities.⁵⁶ Theoretically, these activities could increase the likelihood of participating in obesity prevention initiatives. LHD participation in population-based primary prevention and chronic disease epidemiology and surveillance were considered covariates since they may be associated with community-wide health improvement planning.

Organizational Capacity Characteristics

In the Obesity Prevention Study, LHDs were asked about the workforce dedicated to activities on obesity prevention, healthy eating, and/or physical activity/active living. They responded whether their LHD had FTEs dedicated to these activities, were sharing FTEs with other agencies/organizations, or were utilizing LHD staff for these activities across program areas as an indicator of organizational capabilities. These variables were included as covariates because the current literature suggests that workforce characteristics may provide key structure for obesity prevention policy involvement.²² Governance classification (i.e., whether or not an LHD

is a unit of state government, local government, or both) was also included as a covariate, as this can affect an organization's ability to authorize policy change.²²

In terms of population size, over half of the LHDs in the U.S. serve a population of $\leq 50,000$, and about 5% serve a population of more than 500,000.²⁷ Large population size has been associated with LHDs with greater engagement in land use and transportation activities.⁵⁷ The population size covariate was utilized as a proxy for urban/rural classification and was categorized as $\leq 50,000$, 50,001-500,000, and $>500,000$ in our analysis.

Finally, per capita spending, or total LHD expenditures divided by the population size,⁵⁸ was calculated using data in the 2013 NACCHO Profile. While we do not know the proportion of funds used towards obesity prevention and health disparities, available data were included because per capita spending is often an indicator of an individual LHD's finances.

Analysis

We conducted chi-squared tests to examine the dependence of pairs of categorical explanatory variables. This was done to address potential multicollinearity, and the results indicated a high correlation between the two variables related to conducting population-based chronic disease primary prevention activities and chronic disease epidemiology surveillance. Because most obesity prevention programs are likely initiated following demonstrated need from surveillance data, the variable "chronic disease epidemiology and surveillance" was selected for modeling.

We combined the moderately and highly engaged groups due to the small sample size in each category. Because the dependent variable consisted of two levels, we fit a logistic regression model after multiple imputation for missing values. We conducted a sensitivity analysis to explore how set cutpoints impacted the results, which were visualized by plotting 95% confidence intervals for each independent variable at each cutpoint.

RESULTS

A total of 136/387 (35.1%) LHDs reported having a formal, written strategy for obesity prevention activities while 239/387 (61.8%) reported having none. In terms of governance, over half of the LHDs, or 218/387 (56.3%), were a unit of local government. Sixty-six (17.1%) reported being a unit of state government and 66/387 (17.1%) reported being governed by both state and local authorities, with 37/387 (9.6%) responding “don’t know” or not responding to this question.

Relevant obesity prevention workforce categories included having FTEs dedicated to obesity prevention (99/387=25.6%), sharing FTEs with another agency or organization (27/387=7%), and having LHD staff scattered across program areas/unable to estimate FTE (231/387=59.7%). Thirty (7.8%) responded “don’t know” or did not respond to this question. Almost half of LHDs (185/387=47.8%) reported serving a population of $\leq 50,000$, 36.7% (142/387) reported serving populations of 50,001-500,000, and 15.3% (59/387) reported serving populations $> 500,000$.

Sixty-eight percent (264/387) of LHDs had available data to calculate per capita spending. For the highly/moderately engaged LHDs, the median per capita spending value was \$48.9 with the 25th percentile at \$31.1 and the 75th percentile at \$74.1. The minimally engaged LHD median was \$41.3 with the 25th percentile at \$26.2 and the 75th percentile at \$79.1.

A total of 259/387 (67.0%) LHDs reported completing a recent CHA/CHIP while 97/387 (25.1%) reported not completing one, with 31/387 (8.0%) responding “don’t know” or not responding to this question. In terms of conducting chronic disease epidemiology and surveillance activities, over one-quarter of the LHDs, or 102/387 (26.4%), reported either performing these activities directly or contracting out the work. Additionally, 124/387 (32.0%) reported these activities were provided by others in the community independent of LHD funding and 76/387 (19.6%) reported that both the LHD and others in the community performed these activities

independent of LHD funding. The remainder of respondents (85/387=22.0%) answered “don’t know,” or did not respond to the question. Engagement composite scores ranged from 0-38 with a median of 8 and IQR of 4-15 (Figure 2).

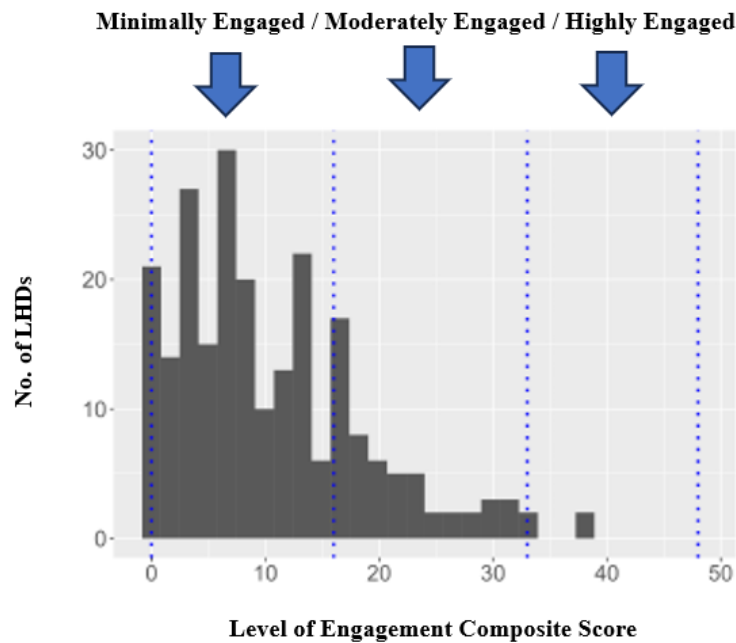


Figure 2. Distribution of Built Environment Engagement Composite Scores

About half (172/387=44.4%) of LHDs were minimally engaged while 63/387 (16.3%) were moderately or highly engaged. Of those with a formal, written strategy, 68/136 (50%) were minimally engaged and 37/136 (27.2%) were moderately or highly engaged. The remaining percent of those with a written strategy were 31/136 (22.8%). Of LHDs without a formal, written strategy, 101/239 (42.3%) were minimally engaged and 24/239 (10%) were moderately or highly engaged. The remaining percent of those without a written strategy were 114/239 (47.7%).

Table 1. Summary of LHD Characteristics by Independent Variable (N=387)

	Highly Engaged + Moderately Engaged (composite score= 15-42)	Minimally Engaged (composite score= 0-14)	Don't Know / NA	
Parameters	N (%)	N (%)	N (%)	Total N (%)
Formal, Written Strategy				
Yes	37 (58.7)	68 (39.5)	31 (20.4)	136 (35.1)
No	24 (38.1)	101 (58.7)	114 (75.0)	239 (61.8)
DK	2 (3.2)	3 (1.7)	7 (4.6)	12 (3.1)
Total	63 (100)	172 (100)	152 (100)	387 (100)
Governance				
Unit of local government	38 (60.3)	98 (57.0)	82 (53.9)	218 (56.3)
Unit of state government	11 (17.5)	27 (15.7)	28 (18.4)	66 (17.1)
Governed by both	9 (14.3)	32 (18.6)	25 (16.4)	66 (17.1)
NA	5 (7.9)	15 (8.7)	17 (11.2)	37 (9.6)
Total	63 (100)	172 (100)	152 (100)	387 (100)
Workforce				
FTEs dedicated to obesity prevention	29 (46.0)	49 (28.5)	21 (13.8)	99 (25.6)
FTEs shared with another agency/organization	5 (7.9)	9 (5.2)	13 (8.5)	27 (7.0)
Staff across program areas/unable to estimate	28 (44.4)	114 (66.3)	89 (58.6)	231 (59.7)
NA	1 (1.6)	0 (0.0)	29 (19.1)	30 (7.8)
Total	63 (100)	172 (100)	152 (100)	387 (100)

	Highly Engaged + Moderately Engaged (composite score= 15-42)	Minimally Engaged (composite score= 0-14)	Don't Know / NA	
Parameters	N (%)	N (%)	N (%)	Total N (%)
Population Size				
≤ 50,000	21 (33.3)	80 (46.5)	84 (55.3)	185 (47.8)
50,001-500,000	24 (38.1)	71 (41.3)	47 (30.9)	142 (36.7)
>500,000	18 (28.6)	21 (12.2)	20 (13.2)	59 (15.3)
NA	0 (0.0)	0 (0.0)	1 (0.6)	1 (0.3)
Total	63 (100)	172 (100)	152 (100)	387 (100)
Per Capita Spending				
Available	74.7/48.9	62.8/41.3	52.7/38.4	264 (68.2)
NA	-	-		123 (31.8)
Total	-	-		387 (100)
Recent Completion of CHA or CHIP				
Yes	45 (71.4)	127 (73.8)	87 (57.2)	259 (67.0)
No	16 (25.4)	39 (22.7)	42 (27.6)	97 (25.1)
Don't Know	2 (3.2)	6 (3.5)	23 (15.1)	31 (8.0)
Total	63 (100)	172 (100)	152 (100)	387 (100)
Conducting Chronic Disease Epidemiology Surveillance Activities				
Performed by LHD directly or contracted out	21 (33.3)	43 (25.0)	38 (25.0)	102 (26.4)
Provided by others independent of LHD	16 (25.4)	58 (33.7)	50 (32.9)	124 (32.0)
Both LHD and others independent of LHD	19 (32.0)	34 (19.8)	23 (15.1)	76 (19.6)
Unavailable/Don't Know	0 (0.0)	11 (6.4)	11 (7.2)	22 (5.7)
NA	7 (11.1)	26 (15.1)	30 (19.7)	63 (16.3)
Total	63 (100)	172 (100)	152 (100)	387 (100)

Built Environment Engagement Composite Scores

At a significance level of 0.05, there were no significant associations between formal, written strategy and the level of LHD engagement in cross-sector collaborations. For LHDs serving a population size > 500,000, the composite score increased 1.15 times compared to if the LHD served a population size of $\leq 50,000$. For LHDs with staff scattered/unable to estimate the number of FTEs, the composite score decreased 0.92 times compared to if LHDs had dedicated FTEs for obesity prevention. However, after combining the moderately/highly engaged groups and completing a sensitivity analysis, logistic regression showed that only LHDs serving populations larger than 500,000 tended to exhibit a statistically significant higher level of engagement in cross-sector collaborations compared to LHDs serving smaller populations of at most 50,000. LHDs with obesity prevention staff scattered or unable to estimate FTE was no longer significant.

We also introduced a composite score measuring engagement level as the dependent variable, but it is possible that LHDs only prioritized one of the following: (1) the promotion of physical activities or (2) the encouragement of healthy eating. Therefore, we conducted an analysis for two outcomes: a physical activity (PA) practice index with composite scores based on questions related just to physical activities (Table 2) and a healthy eating (HE) practice index with composite scores based on questions related just to healthy eating (Table 3).

Table 2. Logistic Regression, Physical Activity Practice Index

Variable	β	p-value
Formal, Written Strategy		
Yes	Ref	
No	-0.8147	0.1917
Workforce		
FTEs dedicated to obesity prevention	Ref	
FTEs shared with another agency/organization	-0.2049	0.7066
Staff across program areas/unable to estimate	-0.7976	0.0150
Population Size		
$\leq 50,000$	Ref	
50,001-500,000	0.4604	0.1340
>500,000	1.1178	0.0082
Conducting Chronic Disease Epidemiology Surveillance Activities		
Performed by LHD directly or contracted out	Ref	
Provided by others independent of LHD	-0.2884	0.3903
Both LHD and others independent of LHD	0.0797	0.8291
Not available	-0.0482	0.9281
Recent Completion of CHA or CHIP		
Yes	Ref	
No	0.2687	0.4185
Formal Strategy: Government Category		
Yes: Local	-0.3261	0.5204
No: Local	0.7572	0.1129
Yes: Both	-0.3681	0.5939
No: Both	0.5619	0.3286
Formal Strategy: Per Capita Spending		
Yes	0.0048	0.1387
No	0.0018	0.6551

Our study did not detect a significant association between written strategy and level of LHD engagement in cross-sector collaborations associated with PA. However, for a LHD that has staff scattered across program areas and unable to estimate the number of FTEs, the odds of having high engagement in PA were on average about 0.45 times lower compared to if the LHD had dedicated FTE for obesity prevention. For a LHD serving a population of size greater than 500,000, the odds of having high engagement in PA were on average about 3.06 times higher compared to if the LHD was serving a population of size at most 50,000.

To classify LHDs into high/low engaged groups, we set cut points based on the percentiles of the PA index scores. The positive relationship between population size (i.e., serving a population of size greater than 500,000) and the engagement level in PA was statistically significant, at the significance level of 0.05, when the cut points were between the 35th and 75th percentile. The negative association between workforce (i.e., having staff scattered and unable to estimate FTEs) and the engagement level in PA was statistically significant, at the significance level of 0.05, when the cut points were at the 35th, 40th percentiles or above the 50th percentile. In terms of the HE index, logistic regression showed no significant associations between written strategy and level of LHD engagement in cross-sector collaborations (Table 3).

Table 3. Logistic Regression, Healthy Eating Practice Index

Variable	β	p-value
Formal, Written Strategy		
Yes	Ref	
No	-0.8153	0.1503
Workforce		
FTEs dedicated to obesity prevention	Ref	
FTEs shared with another agency/organization	0.2086	0.7038
Staff across program areas/unable to estimate	0.0090	0.9767
Population Size		
$\leq 50,000$	Ref	
50,001-500,000	-0.0282	0.9193
>500,000	0.7533	0.0645
Conducting Chronic Disease Epidemiology Surveillance Activities		
Performed by LHD directly or contracted out	Ref	
Provided by others independent of LHD	-0.2695	0.3818
Both LHD and others independent of LHD	-0.1722	0.6208
Not available	-0.9441	0.1463
Recent Completion of CHA or CHIP		
Yes	Ref	
No	-0.4888	0.1105
Formal Strategy: Government Category		
Yes: Local	0.2139	0.6577
No: Local	0.1044	0.8032
Yes: Both	-0.8403	0.2089
No: Both	-0.4308	0.4084
Formal Strategy: Per Capita Spending		
Yes	0.0004	0.8831
No	0.0057	0.1663

DISCUSSION

We hypothesized that LHDs with formal, written strategies would demonstrate higher levels of engagement in cross-sector obesity prevention-related collaborations than those without formal strategies. By using the 2013 Obesity Prevention Study data we were able to conduct a descriptive review to identify what has historically existed at LHDs regarding engagement in obesity prevention activities. Based on the overall composite scores, there appears to be more engagement among LHDs with a written strategy when compared with those that do not.

For comparison to our research, a study by Sreedhara and colleagues used a negative binomial regression to analyze data collected from a survey of LHD respondents and explore LHD characteristics in engagement. The researchers asked which best matched the department's current engagement in land use and transportation policy activities: major responsibility, secondary responsibility, and not major/secondary responsibility.⁵⁷ The responsibility categories similarly correspond with those of engagement in our analysis: highly engaged, moderately engaged, and minimally engaged. However, the term responsibility was not defined and may not have been conceptualized in the same manner as we conceptualized engagement.

Sreedhara and colleagues found that agencies (1) serving larger populations, (2) dedicating staff to working on active transportation issues, and (3) contracting with an individual or organization on active transportation were significantly associated with greater engagement in activities related to land use and transportation. The findings regarding population size and workforce are consistent with those in our study. Of note, NACCHO has identified land use planning as a service that is more likely to be provided in urban jurisdictions when compared with rural ones.⁵⁹ While we did not find a significant association with a written strategy, it is important to note that many LHDs without a written strategy (n=114) were missing data needed to calculate engagement scores, and the trends we found, while not significant, were in line with Sreedhara's findings regarding transportation.

Only 63 LHDs in our sample, both with and without formal, written strategies for obesity prevention efforts, were categorized as moderately or highly engaged around the activities we examined. It was, therefore, difficult to detect associations related to these moderately/highly engaged LHDs. Yet, the trends in our findings were consistently supportive of our hypothesis regarding written strategies and dedicated staff, and trends regarding these approaches and moderate and high engagement around obesity prevention activities, suggesting practices for LHDs in effectively engaging in obesity prevention activities in their communities. Our descriptive data also suggest that further research is warranted after collecting a more complete and current Obesity Prevention Study data set. Additionally, the literature surrounding development of policies and built environment programs in LHDs demonstrates that further research is needed to understand more about LHD engagement in these activities.^{26,53,57}

Although a recent scoping review attempted to synthesize organizational capacity assessments for public health organizations,⁶⁰ those authors found little consistency in measures and domains most commonly used to investigate applicability in different contexts. Our study provided an opportunity to create an index of built environment policies related to healthy eating and physical activity requiring cross-sector collaboration. While this addresses a research gap and advances the development of such measures, organizational factors are an important consideration for future study.

Due to the distinction between organizational capacity characteristics and community assessment activities, specific mechanisms should be assessed for their impact on obesity prevention efforts. This study offers an opportunity to acknowledge the difference between organizational capacity characteristics and community assessment activities, which individually can enrich knowledge surrounding specific contexts that impact LHD levels of engagement in cross-sector initiatives. As Sreedhara et. al. (2022) note, the 2019 NACCHO Profile report indicates that just over half of LHDs included data in their community health assessments related

to built environment factors that impact health.⁵⁷ LHDs could use novel resources, such as the National Physical Activity Plan,⁶¹ to implement strategies for better collection of this crucial data.

The majority of LHDs in our sample were locally governed or had some local governing authority. Despite the unique, detailed information included in the Obesity Prevention Study, our study highlights the lack of information about formal, written strategies for obesity prevention efforts and the potential for such written strategies to be beneficial. This area requires further study in addition to an exploration into different types of formal, written strategies. Further review of the strategies that are common among moderately and highly engaged LHDs is also warranted.

Similar research is particularly vital at this moment given the COVID-19 pandemic. A recent NACCHO Profile Report indicated that over half of LHDs share resources, including funding and staff, with other LHDs, regardless of population size served.⁵⁹ Not only has the LHD workforce been scattered across programs and activities during non-emergencies,⁵⁹ emergency preparedness and response events, such as the COVID-19 pandemic, can compound this issue. Additionally, there has been an overall decline in the LHD workforce nationally between 2013 (FTEs=139,000) and 2019 (FTEs=136,000).⁶² These factors impact LHD engagement in cross-sector collaborations, thus making it imperative to rebuild the obesity prevention infrastructure. It has become clear that chronic disease prevention should not be separate from infectious disease efforts given the impact COVID-19 had on populations suffering from comorbidities.

Per capita spending results in our study were skewed towards lower expenditure amounts. However, this finding is difficult to interpret as NACCHO reports there is “great diversity in funding levels among LHDs serving jurisdictions of similar sizes.”⁵⁹ (p. 56) It is, however, important to note that over time, mean LHD per capita spending has declined nationally from 2013 (\$62) to 2019 (\$56). This could likely be further undermining obesity prevention efforts.

The results of the composite score and physical activity indices suggest that population size is an important consideration. Population size >500,000, which can be considered a proxy for urban settings, was associated with LHD engagement. This is consistent with similar findings from prior studies that found the size of populations $\geq 500,000$ were more engaged in built environment policy work than smaller departments.^{53,57} LHDs that serve larger populations may have more incentives and resources to collaborate with other sectors in obesity prevention efforts. In fact, NACCHO reports that LHDs serving larger population sizes are more likely to offer physical activity and nutrition programs, complete a CHA or CHIP, and conduct chronic disease epidemiology and surveillance than those serving smaller sizes.⁵⁹ More research is necessary to determine whether there may even be a widening gap between the activities we examined, among small and large LHDs. The built environment in rural areas also needs assessment to justify the need for future obesity prevention efforts in rural parts of the country where obesity prevalence is higher.⁶³

In addition, LHDs that were unable to estimate FTEs or had staff scattered across program areas had lower engagement scores. Workforce was found to be significant in the physical activity index, but not the healthy eating index. This could be attributed to the influence that programs like the Special Supplement Nutrition Program for Women, Infants, and Children (WIC) play in healthy eating policies that are separate from obesity prevention efforts. This is supported by the fact that NACCHO reports one of the most common population-based programs/services provided across LHDs includes population-based nutrition services such as WIC.⁵⁹ Additional data regarding roles of LHD staff within particular programs would be useful to study, particularly as NACCHO has noted obesity prevention is a shrinking service provided by LHDs.⁵⁹

As the charge for the third phase of the Active Living Research program is focused on changes in policy and practice, local and state health department representatives need to understand how cross-sectoral collaborations have the potential to reduce health disparities. The

role of formal, written strategies in these efforts will be essential to capture because outlined procedures and expectations in written form can offer clarity on resources and capacity.⁶⁴ Information regarding how these cross-sector collaborations support health outcome goals for marginalized populations is essential in understanding future needs and enhancing program sustainability.

CONCLUSION

Effective obesity prevention activities are complex and require cross-sector partnerships. Our study suggests that there are reasons to believe that LHDs and the communities they serve benefit from formal commitments and dedicated staff devoted to these physical activity and healthy eating initiatives. Our findings also suggest that large, urban LHDs are more likely to have these in place and that rural areas may need additional resources to carry out such cross-sector approaches.

Furthermore, due to varying contexts surrounding cross-sectoral collaborations, assessing factors essential in sustaining health equity initiatives has been difficult. One study found that common concerns related to sustainability include conflicting organizational priorities and limited political or community support for the work.³¹ Little evidence is available on how these cross-sector collaborations function, making it difficult to learn from successes and failures.¹³

Standardization of the term LHD engagement and the development of consistent measures for built environment obesity prevention activities are warranted for future studies. These improvements would permit LHDs to collect the new data necessary for guiding the rebuilding of our weakened public health infrastructure into sustainable programs supporting obesity and chronic disease prevention efforts.

Challenges associated with missing data make it difficult to conclude that there is no association between formal, written strategy and level of LHD engagement in cross-sector

collaborations. One limitation of our study is that reducing the sample size to all LHDs with complete information limits the generalizability of findings. Enhanced and updated data collection would allow for the comparison of data between smaller and larger health departments to support health equity initiatives in regions of the country where obesity prevalence is highest.

CHAPTER 3: Local health department factors that support sustainable cross-sector collaborations in promoting physical activity for the Hispanic community in the U.S.

INTRODUCTION

When considering social determinants of health (SDOH) in community-based obesity prevention efforts, it is important to consider structural determinants that lead to population health inequities and disparities.⁹ Health disparities are typically defined as health outcomes that occur in a greater or lesser extent between populations, while health inequities refer to differences in health outcomes related to social advantages or disadvantages.¹⁰ Structural inequities denote how systems of society (e.g., finance, housing, education) benefit one population over another.¹⁰ In theory, structural inequities lead to health inequities, eventually resulting in health disparities. Hence, interventions promoting the prevention of obesity and chronic illnesses for marginalized populations should focus on structural inequities to address the root causes of chronic disease.

The built environment is considered the whole of places designed by humans with key attributes including land use, population density, and location relative to community destinations.¹⁶ A recent systematic review highlighted the importance of green spaces, especially within one's neighborhood, as these areas are associated with increased physical activity.⁶⁵ Proximity to recreational environments has also been correlated with increased physical activity among adults.¹⁶ Additionally, other built environment characteristics associated with physical activity in adults include neighborhood walkability, mixed-land use, grid-like street connectivity, safety, active transport, pedestrian-supportive infrastructure, and the social environment.^{17,18}

Historically, interventions typically target healthy eating and physical activity initiatives through collaborations with relevant sectors. Both public and private organizations have been working to promote healthy food consumption and promote physical activity.⁴³ Organizations participating in these collaborations have been crucial and include, but are not limited to the

Robert Wood Johnson Foundation (RWJF), National Institutes of Health, Centers for Disease Control and Prevention, American Legacy Foundation, American Medical Association, and American Cancer Society.⁴⁴ Research efforts supported by the RWJF have focused on street-scale built environment enhancements for safety and physical activity for low-income racial and ethnic populations that have been marginalized.⁴⁸ Adult populations that identify as Hispanic could benefit from such interventions, as the prevalence of physical inactivity is highest in this group at 32% when compared with those who identify as non-Hispanic Black (30%), non-Hispanic white (23%) and non-Hispanic Asian (20%) in the U.S.³⁵ Factors specific to the Hispanic population, such as undocumented status, could impact perceptions of safety that reduce the likelihood of participating in physical activity outdoors.

SDOH have been found to affect exposure to conditions influencing physical inactivity.⁶⁶ In local communities, governmental local health departments (LHDs) have a role to play in population-specific interventions that address and prevent health disparities.⁶⁷ LHDs, thus, can participate in upstream activities that target the built environment for marginalized populations. Due to varying contexts surrounding cross-sectoral collaborations, however, assessing factors essential to sustaining such health equity initiatives has been difficult. For example, common concerns related to sustainability include factors such as conflicting organizational priorities and limited political or community support for this work.³¹

One current gap in the literature is understanding the way LHDs engage in obesity prevention efforts.⁸ A recent study by Dankwa et. al (unpublished), noted that LHDs without established plans and processes specific to community health needs show reduced prioritization and performance in population health activities. Implementation science is an approach that offers formative evaluations to assess the effectiveness of interventions based on context, through the use of determinants frameworks.⁶⁸

One such framework, called the Chronic Disease Prevention/Healthy Lifestyle Promotion (CDP/HLP) Framework⁶⁹ was developed specifically for public health within the context of organizational capacity determinants for building and maintaining partnerships (Figure 3). In general, this framework indicates structural determinants (i.e., characteristics of an organization), and organizational determinants (i.e., supports for developing organizational capacity and partnerships) that impact resources and the ability to implement chronic disease prevention and healthy lifestyle activities.⁶⁹ Organizational capacity then influences facilitators, or internal and external factors that mediate the relationship between capacity and outcomes.⁶⁹ These outcomes include aspects such as the extent of chronic disease prevention and healthy lifestyle activity that is being implemented, including the organization's level of engagement.

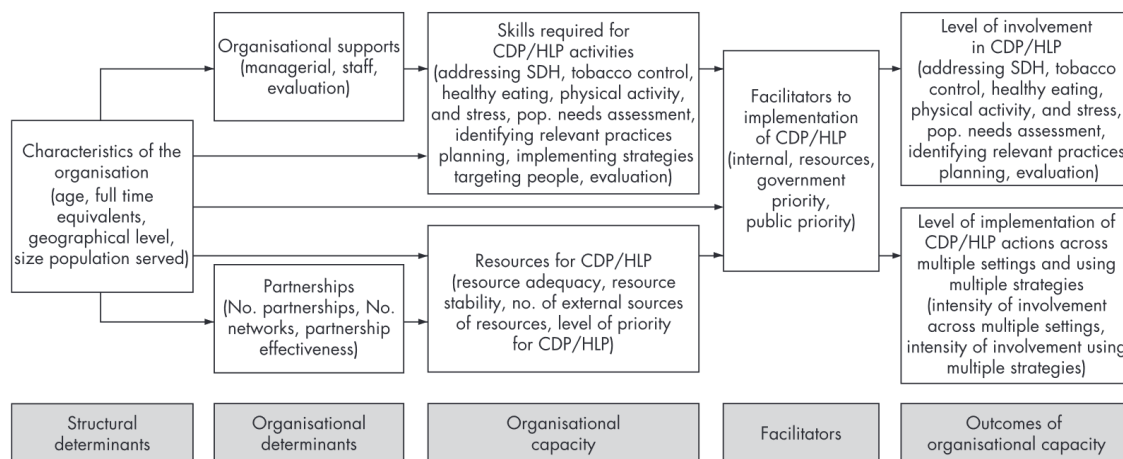


Figure 3. Chronic Disease Prevention/Healthy Lifestyle Promotion (CDP/HLP) Framework, Reprinted with Permissions.⁶⁹

This study aimed to use the CDP/HLP Framework to identify factors within LHDs that assist in maintaining engaged and sustainable cross-sector collaborations that promote physical activity (PA) in the Hispanic community.

METHODS

We obtained approval for Institutional Review Board exemption status by the University of Washington (STUDY00020168). We used data from a prior quantitative study (Brinker,

unpublished) in which data collected from LHDs for the 2013 National Study of Local Public Health Activities to Prevent Obesity⁴⁹ were analyzed. We focused on LHDs drawn from this 2013 sample because we aimed to identify factors that assist LHDs in maintaining engagement in cross-sector collaborations. Therefore, this sample from 2013 was useful in terms of asking questions about prior and current organizational capacity to sustain these cross-sectoral collaborations.

The 2013 survey questions for LHD staff pertained to obesity prevention activities and LHDs were selected through stratification by population size served, followed by random sampling.⁴⁹ In the previously mentioned quantitative analysis regarding LHD engagement in cross-sector collaborations, the LHDs from the 2013 sample were categorized as minimally or moderately/highly engaged in cross-sector obesity prevention activities specific to supporting built environment policies.

For this qualitative study, we sampled LHDs from the list of LHDs identified as moderately/highly engaged. LHD engagement was characterized by active involvement and participation in cross-sector obesity prevention activities and level of LHD engagement was quantified through a composite score derived from metrics associated with both healthy eating (HE) and PA policies supporting improvements of the built environment as described in Appendix 1. LHD level of engagement in policy related to the built environment was measured using 21 items (nine related to HE and twelve related to PA) from the Obesity Prevention Study, describing LHD activities to promote HE and PA.

Examples of the HE policies include zoning regulations to enable healthy food providers to position themselves in underserved neighborhoods and public safety efforts to enhance accessibility of grocery stores. PA policies included items such as building well-connected networks of streets, sidewalks, and crossings that improve the safety of the walking/cycling environment and increasing the availability of open, green spaces. A summary index was created from the survey data, using these 21 items. For each of these 21 items, a score was delineated

based on the answers given by LHD respondents, identifying their agency as having one of the following roles in each activity: (1) Either a leader OR leader + collaborator, (2) Collaborator only, or (3) None or Don't know. A composite score was calculated for all 21 responses combined per LHD. Those with a score of 33-42 were considered highly engaged, 15-32 moderately engaged, or 0-14 minimally engaged (Brinker, unpublished).

From the purposive sample identified for this quantitative analysis, LHD representatives from moderately/highly engaged agencies were either identified for the qualitative analysis (1) via LHD chronic disease prevention websites or (2) by Health and Human Services (HHS) region public health agency contacts of a member of the research team, utilizing a snowball sampling strategy. An introductory e-mail was sent to identified representatives, and if no response was received, a telephone call was made. A total of 28 LHDs from 16 states within the U.S. were contacted, representing each of the ten HHS regions and drawn from our sample of LHDs that had been identified as moderately/highly engaged in cross-sector obesity prevention activities as per the 2013 data we examined.

From June through November 2024, we conducted semi-structured interviews with 12 representatives from 11 LHDs leading chronic disease programs or health equity initiatives from the LHDs in our sample. Interview questions addressed LHD staff roles, funding, sustainability, and the advancement of health equity initiatives for the Hispanic-identifying population in cross-sector collaborations promoting PA (Appendix 2). We focused on PA because in the prior quantitative analysis, we found that for a LHD that had staff scattered across program areas and could not, therefore, estimate the number of full-time equivalents (FTEs) dedicated to obesity prevention, the odds of having high engagement in PA were lower compared to if the LHD had dedicated FTE for obesity prevention. Additionally, for a LHD serving a population of size greater than 500,000, the odds of having high engagement in PA were higher compared to if the LHD was serving a population of size at most 50,000. These differences were not observed in the HE

index. We used Atlas.ti v23 software to complete a thematic analysis of the qualitative data. Both the lead author and another researcher coded transcripts separately.

We utilized the Consolidated Criteria for Reporting Qualitative Research (COREQ) checklist⁷⁰ for planning these semi-structured interviews and as a means to ensure transparency and reproducibility. A codebook was developed for deductive thematic analysis, based on the CDP/HLP Framework (Table 4). However, additional codes were added for inductive thematic analysis, based on interviewee responses. This method has been validated and documented in prior research.¹⁵

A total of 12 interviews were completed, and at least one interview was conducted with an LHD representative located in each HHS region. In one case, two interviews were conducted for one LHD but with representatives from two different roles — both were Division Administrators but one oversaw Child and Family Health while the other was responsible for Health Outreach, Partnership and Equity. Additionally, two LHDs were located within one state that included one small LHD and the one mid-sized LHD included in the sample. In total, four small LHDs (defined as serving a population $\leq 50,000$), one mid-sized LHD (serving between 50,001-500,000), and six large LHDs (serving $>500,000$) were included, categorizing population size similarly to prior studies.^{34,49}

Table 4. CDP/HLP Framework and Associated Interview Questions

CDP/HLP determinants and outcomes of organizational capacity	Cross-Sectoral Physical Activity Promotion Questions
Structural determinants	Are staff or FTEs dedicated to promoting physical activity specifically in your LHD? If so, how many, and what are their roles?
Organizational determinants	As far as you know, do you have some form of a formal, written strategy in your local health department for addressing physical inactivity? If so, what type of strategy is in place? (e.g., contract, memorandum of understanding, etc.)
Organizational capacity	What capacity does your LHD have to influence policy change efforts that address physical inactivity inequities under the umbrella of other agencies such as housing, transportation, etc.?
Facilitators	How does your LHD collect or use data to support community collaborations and engagement related to physical activity? Regarding physical activity promotion, how does your LHD allocate resources to support the meaningful participation of community partners, that are themselves experiencing health inequities, in decision-making and prioritization that affects the community?
Outcomes of organizational capacity	Describe how engaged your LHD is in promoting physical activity. How does your LHD engage communities experiencing health inequities to inform assessments of the policy environment related to physical activity? Regarding physical activity promotion, how does your LHD evaluate its community engagement efforts, to ensure continuous learning and impact of partnering with communities? Is there anything else you'd like to add that is relevant to how your agency serves the Hispanic population surrounding physical activity in particular?

RESULTS

Regarding the Hispanic community, most LHD staff acknowledged that having diverse, bilingual staff, interpreters, and Spanish-translated materials were core components of an effective implementation strategy. Themes specific to serving the Hispanic population among the mid-sized and large-sized LHDs, but not the small-sized LHDs, included the need for (1) prioritizing various subgroups within the Hispanic community, (2) taking a more cultural approach, and (3) partnering with Hispanic businesses, community-based organizations (CBOs), and faith-based organizations to integrate SDOH into PA promotion. Exemplar quotes can be found in Table 5. Specific to the CDP/HLP Framework, interview participants from the small LHDs and the one mid-sized LHD described many common themes that were distinct from those that served large populations. Thus, subsequent results were stratified accordingly.

Small and Mid-Size LHDs

Commonalities included reporting of particularly low (“minimal to medium”) current organizational capacity for PA programs. Some LHDs had Healthy Eating and Active Living programs⁷¹ included in their state-level health initiatives, but these activities were dispersed among various chronic disease activities, including tobacco cessation and injury prevention. A couple of LHDs reported participating in making improvements to the built environment for safety.

Specific to populations identifying as Hispanic, the small LHDs noted having bilingual staff, interpreters, and translated materials available. Collaborations with external entities, however, were rarely mentioned. One small LHD noted they partner with a local medically-focused CBO that serves the Hispanic community. The mid-sized LHD mentioned collaborating with local grocery stores and churches that serve the Hispanic community, as well as engaging with radio stations broadcasting in Spanish for media campaigns related to PA. However, specifics surrounding any collaboratives, such as initiatives or projects formed through partnerships, remained unclear.

- **Structural and Organizational Determinants**

Most of these small and mid-sized LHDs were unable to estimate the number of FTEs they had dedicated to PA. This was in part due to the dispersion of their funding and staff among various chronic disease programs, but also because HE and PA funding was often grouped together for obesity prevention in their agencies. One small LHD estimated that there was one FTE dedicated to nutrition and PA for an entire region in the state that included several counties. Staff contributing to PA activities were described as dietitians, nutritionists, and health or diabetes educators who had some PA responsibilities. PA education was described as included with other education for topics such as smoking cessation and reproductive health. One small LHD was unsure about whether or not they had a formal, written strategy for PA and the others stated they did not. Some noted that PA promotion was included in other strategies prioritized in their Community Health Assessments (CHA) or Community Health Improvement Plans (CHIP). One small LHD noted that PA had not been prioritized in their most recently completed CHIP.

- **Organizational Capacity**

The mid-sized LHD reported serving on coalitions where their own feedback was offered to external leaders for consideration when making recommendations relevant to PA activities. Collaborations were developed with healthcare organizations, recreational facilities, schools, and childcare facilities for PA promotion. Some small LHDs noted reduced PA funding in recent years following the COVID pandemic and others noted limited discretion and authority in how such funds were spent, affecting their ability to maintain some of their PA activities.

- **Facilitators**

The small LHD reported a funded public health services collaborative that reached several small towns which allowed a “shared services agent” to help educate and connect lower-income individuals and the elderly with social and health services, specifically focused on improving health and safety surrounding local public housing. Another small LHD felt community health workers (CHW) were an essential component to the overall implementation strategy, and these

CHW were considered diverse extensions of the public health staff within their departments. Another facilitator that several LHDs noted is the importance of sharing survey and focus group data from needs assessments with the community for feedback, and one LHD noted that pre and post-assessments assist in evaluation of their PA-related activities.

- **Outcomes of Organizational Capacity**

Two small LHDs from different states noted their states' Healthy Eating and Active Living programs, but one mentioned this program had "dissipated years ago." PA programs developed in collaboration with other entities included a PA program targeted to seniors for preventing falls that was reported by the mid-sized LHD and by one small LHD. Other programs offered physical education to children in schools (noted by one small LHD), and a program to build HE and PA into child care facilities (mentioned by the mid-sized LHD). Smaller programs were described as an employee wellness program and a substance abuse program that included some component of promoting PA. One small LHD developed a bike-to-school initiative because rurality made walking difficult, and the same LHD was able to partner with other agencies on planning a walking trail and sponsoring a walking challenge.

Large LHDs

Similar to the small LHDs, the larger departments also had PA promotion dispersed among various chronic disease programs. However, the large LHDs reported a higher capacity to support SDOH work as defined by Health in All Policies (HiAP), a strategy for improving population health and supporting health equity through coordination of policy sectors.⁷² For example, large LHDs reported the recent creation of positions that included a HiAP approach coordinator and a public health liaison specifically dedicated to forming partnerships. Some LHDs had entire health equity teams, and one reported a position for a quality improvement specialist dedicated to reviewing data for making strategic improvements in health equity related to PA and other health promotion efforts. A couple of LHDs noted collaborations with associations that either allowed their leaders to work through legislative processes or their divisions to participate in

innovative projects for improvements to the built environment in particular neighborhoods. On a larger scale, one LHD reported that a policy office was formed around 2013 to look at the intersection of policy and public health and continues to do so, including for PA-related initiatives.

Specific to Hispanic-identifying adults, large LHDs reported having bilingual staff, interpreters, and translated materials just as the small LHDs did. One large LHD also noted obtaining ipads that offered translation services without the need for a human interpreter and felt this service worked well. One LHD partnered with organizations that had bilingual staff trained in community engagement principles so the community could choose the direction of the work. For PA promotion activities, two large LHDs noted collaborations with organizations specifically serving the Hispanic community, including those offering social and faith-based services. However, one LHD noted that in order to sponsor workshops with CBOs, supplementary funding was needed.

One LHD also felt additional funding would be useful in taking a more cultural approach to population health improvement. The LHD representative felt that health equity work was mostly determined by geographical areas targeted because of health disparities, and while this included the Hispanic community, there was no particular PA initiative specifically taking a cultural approach. Another LHD noted that the Hispanic community was often interested in more proximal wins, such as immediate programmatic activities that can be linked to improvements in chronic disease outcomes, in addition to the long-term equity goals pertaining to SDOH. As such, this was an important consideration for their PA initiatives. This same respondent also noted their LHD has had discussions surrounding the ability to compensate individuals to gain representation from various underrepresented subgroups within the Hispanic community for time spent participating in activities such as focus groups.

- **Structural and Organizational Determinants**

Like the small and mid-sized LHDs, most large LHDs had difficulty estimating the number of FTEs dedicated to PA because of the combined nutrition and PA funding for obesity prevention

as well as funding sources from various chronic disease programs. The large LHDs reported anywhere between zero to one FTE for PA. FTEs performing PA work ranged from health educators to chronic disease directors. Two large LHDs noted having a formal, written strategy for PA either within their county's or city's health initiative. Two large LHDs noted PA is indirectly addressed in formal, written strategies for developing and improving the built environment through collaborations with Environmental Health and Transportation Departments. One LHD reported having no formal, written strategy except within smaller projects, master plans, and grant documentation but did note collaboration with the National Parks Service. Like the small LHD group, one large LHD specifically indicated that PA was not a priority in their recent CHIP.

- **Organizational Capacity**

Additional partnerships that were included in PA-related efforts included regional councils, healthcare practices, as well as CBOs and faith-based organizations. One large LHD had resources dedicated to leadership training and capacity building for community representative participation. One large LHD mentioned a challenge regarding minimal funding for this work and that "enforcement" to ensure goals were met was often lacking. However, this LHD representative noted the ability of the LHD's leadership to advocate for these activities and utilize advocacy partners for achieving progress. Two large LHD interview participants felt their LHDs' main role was to educate partners about public health needs.

- **Facilitators**

Two LHDs noted having a champion/advocate within jurisdictional leadership positions is useful. For example, one LHD noted a prior mayor had been an enthusiastic bike coalition proponent and that the SHD staff were passionate about promoting PA. Another LHD noted it is important to build advocates within various departments external to the LHD but that with workforce changes, relying on champions is not a sustainable, long-term solution. This same LHD noted the benefit of also having community navigators as an advisory panel to public health. Similar to the small LHDs, a large LHD described one program that promoted the use of CHW

and noted that utilizing data components for evaluation justified “scaling up.” One LHD felt that being mindful of cultural beliefs was most important and also noted written reports are public record which are beneficial for use in evaluation.

One LHD, which stated PA was considered a priority within its most recent CHIP, noted the recent development and incorporation of metrics to evaluate partnerships with a customer relationship management system as well as a data ambassador program that helped communicate a shared language among partners. This same LHD reported the existence of a repository of health data included in a Health Atlas available to the community, which has been useful in calculating social vulnerability index scores, a quantitative single measure of social vulnerability,⁷³ and building health equity into greenspaces. One LHD noted CHA data available within a data dashboard had allowed them to weave SDOH into all public health work and another noted “data walks” have allowed them to solicit feedback to ensure what is being captured resonates with the community. Two large LHDs mentioned the importance of considering compensation for time when conducting focus groups or data gathering.

- **Outcomes of Organizational Capacity**

Collaborations impacted SDOH and built environment work. One LHD noted the development of a coalition of multiple government agencies, CBOs, and others contributing to their CHIP where built environment aspects impacting PA were considered a priority. Two LHDs mentioned work in assessing park access, how equipment was being used, and any inequities (e.g., for people with disabilities). One hosted a Walkability Action Institute where seven LHDs in nearby counties participated in a walking/biking tour and in updating trails. One LHD collaborated with an association because of their innovative method for funding active transportation that included using public health data and calculating a social vulnerability index score. Another LHD noted a transportation project that worked on getting a circulator bus route to a particular area that was having “problems with transportation” and adding additional stops for light rail and buses.

We also identified congruent themes among both the small/mid-sized LHDs and the large LHDs, but noted two themes specific only to the large LHDs (Table 6). The large LHDs discussed the importance of building and maintaining long-term relationships with community partners and mentioned that, while champions with a passion for PA work were important drivers, gains were often short-lived due to workforce changes. Themes consistent among the small/mid-sized LHDs and the large LHDs included the value of CHW, community navigators, and community-based participatory research (CBPR); sharing resources among agencies to integrate SDOH into planning PA initiatives; and planning for future and back-up funding mechanisms, given recent budget cuts related to PA programs. The small/mid-sized LHDs and the large LHDs also both noted that a barrier to PA promotion is that PA is sometimes not included as a priority within a community's CHA or CHIP.

Table 5. Themes Related to Hispanic Population: Mid and Large-Sized LHDs

Topic	Quote
Prioritizing various subgroups within the Hispanic community	“There's some community members that participate on a regular basis. But I will say those that participate [in the] Latino community are usually middle-aged women with children. So we talk about our focus groups are kind of trying to make sure that we're getting a representative sample of the various perspectives. We have to have more targeted efforts to bring in males, younger populations, older populations...One of the things that has been debated when we talk about engagement strategies is providing monetary incentives and paying people for their involvement because some of these activities, you know, people are devoting a substantial amount of time. Yes, they have a vested interest, but it's also they're providing a certain level of expertise that that we don't have.”
	“So recognizing if we're looking at inequities to access in a specific space, how do we make sure those communities that are feeling the inequities are the ones who are responding and participating in focus groups?”
Taking a more cultural approach	“Our focus is often around geographic areas with the highest health disparities, access disparities...Those are where there's lots of different types of projects happening and are also very high in Hispanic population. The focus of most of our work is often more around the multitude of health inequities, than specific population focus...And then the other part is, if there was more funding, it would be really great to be able to provide more work within a specific cultural group to be able to really have a resonate there...But we're looking a little bit broader, because we don't have that opportunity of excess [resources]...You have to take into effect the cultural layers at play and in designing work.”
	“It's a collaboration of all that's being taught to healthcare practitioners and also to be culturally sensitive...It's not just the Latinos, and even amongst Latinos, you're talking about [the] culture of Puerto Rico and the [Dominican Republic]... So it's being culturally sensitive and making them understand the physical activity point of view...So you have to be respectful and mindful in educating in that aspect, and also [of] their cultural beliefs.”
Partnering with Hispanic businesses, community-based organizations, and faith-based organizations to integrate SDOH	“We have several grocery stores in our county that primarily serve Hispanic families. And making sure we're doing some engagement there...We do a lot of work sometimes with our churches that serve Hispanic families...and then, when we do media campaigns, we have a neighboring county...that's where the Spanish language radio station is... so we've done media campaigns for that population and try to make sure we're targeting that as well.”
	“I think it's really important to work with CBOs and faith-based organizations of [the Hispanic population]. Because it's a trust level. There's an understanding. There might be cultural understanding as well [as] things that I may not understand or hit the mark, because I'm not born in that or grew up in that. So it's really important to have organizations that are faith-based CBOs that are in the community to support and hold these workshops and programs and really be part of that integration. I think that's just really important to do. And that means you need funding and support for that.”
	“We had a social determinant of health accelerator plan that focuses on specific pockets...Also, just down the street from us, is Center Hispano, which is an organization that focuses specifically on serving those within the Latino/Hispanic community, providing them with social services. So, depending on the need, we will partner a lot of times with them.”

Table 6. Themes Related to Organizational Capacity and Exemplar Quotes by LHD Size

	Small and Mid-Size LHDs from HHS Regions 1, 4, 6, & 7	Large Size LHDs from HHS Regions 2, 3, 5, 8, 9 & 10
Theme 1: Building and maintaining long-term relationships with community partners is essential	No mention of this theme.	“We have what we call a public health liaison in each region [of the state], and that person is very involved in their specific community and reaches out to city partners, community partners, local government officials...and makes sure they're aware of our presence.” “Staff are specifically tasked with building and maintaining relationships with various community-based organizations throughout the county...And I would say those relationships are bidirectional. And you know, if we think about sustainability. It's not just about us reaching out to those organizations when we're trying to promote a specific initiative. It's a continual kind of back and forth.”
Theme 2: There is value in community health workers/ navigators and community-based participatory research	“And so [community health workers] for us are very much so the ears on the ground, as well as our extension of health educators. They're not some government official coming in saying, this is what you should do. These are your trusted neighbors, your church people, your friend, that are saying, Hey...let's go walking...If an area in the community expresses a need and that gets to the community health worker, [the] community health worker communicates with us. Then our job is to see what we can do to bring those partnerships together...to make an impact.” “Our shared services manager...They do a lot with new arrivals. They provide services, information for services that are available to them...And we just, you know, now that we have our collaborative, we're a part of those conversations.”	“The community navigators was this group that in COVID...could both be an advisory panel in a way to public health in developing information and projects, and then also a group that would be able to kind of help share information and hear back from the communities about things. And so this group of navigators, they're kind of people who are trusted community members within a whole bunch of different community groups.” “We employ bilingual staff, so making sure that is one of our priorities. And then I think our teams are also really trained in community engagement, and so they feel very connected to the partner organizations that they're working with. They are using community engagement principles where they might provide some [technical assistance], but they're allowing the community to choose the direction of their programs to help shape things as they move through the process. A very participatory research, I think, sort of vibe versus top down.”
Theme 3: Sharing resources among agencies to integrate SDOH into planning physical activity initiatives is critical	“We do...physical activity education or reproductive health education. But then we've all sort of taken four steps back and said, what's the broader context around social determinants of health that are really impacting our community? So we do a lot of connecting people to services. So maybe you're here for our Matter of Balance class, or you're here for Eat Smart, Move More class. But then we're always gonna take some kind of component of addressing social determinants of health.”	“One area that we're really focused on, too, is fostering a stronger relationship with our sister agencies, specifically the Department of Transportation and Highway...I participate in the steering committee to support the implementation of the bike plan, and that includes an expansion of bike share options in suburban [areas]... Another one that we will be participating in is the Safety Action Plan...to reduce traffic-related fatalities in suburban [areas], especially among populations at higher risk...It's about a safer environment so that more people can be active in their communities.”

	Small and Mid-Size LHDs from HHS Regions 1, 4, 6, & 7	Large Size LHDs from HHS Regions 2, 3, 5, 8, 9 & 10
Theme 4: Champions with a passion for physical activity work as a driver, but gains are often short-lived due to workforce changes	No mention of this theme.	“So a lot of it is about trying to build advocates, make friends, build networks... Downside with champions is, as soon as they retire, leave, change jobs, you lose them...” “It was a huge effort of the previous mayor. He was a biker, and so the bike coalition was massive when he was mayor, and he really built it up. And so a lot of the bike lanes that got put in place was because it was something that he was passionate about...So I mean, it just depends on who your champion and your leaders are.”
Theme 5: One barrier is that physical activity is sometimes not considered a priority within the Community Health Assessment or Community Health Improvement Plan	“We do strategic planning every 3 years at our department and we also do our community health assessment every 3 years for the State [Health] Department. It was 2 iterations ago that we did have some stuff along community wellness and physical activity. But we haven't, I would say, since probably 2018...We used to have a really strong diabetes prevention course, and there was a lot of stuff around physical activity in that...But since the pandemic, obviously, when the Health Department's capacity kind of had to change for a little bit in our roles, we kind of evolved after that. If we don't prioritize it, no one else is either.”	“We just did our CHIP, and access to food made the final cut for priorities, but physical activity did not.” “I feel like physical activity is kind of promoted through other mechanisms. For example, we have a gardening program, which promotes both healthy eating and physical activity.”
Theme 6: Funding and budget cuts related to physical activity programs are common so planning for future and back-up mechanisms is crucial	“The funding also drives our direction. And, you know there used to be a lot of funding around physical activity, built environments, trails, parks, school-based programs, and stuff that allowed us to do that work...those grants just don't really exist anymore...” “Since COVID, they lost funding. But they had a very strong coalition...they would bring in the different resources if a school needed some kind of resource for physical activity, or nutrition, too...all different partners in the community. And they had that for probably 10 years before they lost it...I think the core group would still get together and address issues if they came up. It's just not monthly like it was.”	“There's very little funding that's given towards public health, especially health promotion. And it is because it's more long-term...And when you have elected officials that are in for 2 to 4 years, chronic disease across our state doesn't really heavily get funded...CDC cut budgets this last year for their physical activity and nutrition, which meant that it trickled down to the local level...So that's why we will partner with the city [on] their active transportation plan. We provide the technical assistance and support to have it be one of those that is a priority...” “They were subsequent grants...It was different grant periods. They didn't overlap...We maintained the relationships with our key partners to find a way of continuing to advance this work...Different funding streams came down. And they we were able to build. And again, physical activity was a component of these grants.”

DISCUSSION

Our study examined LHDs that had been identified as having a documented history of being moderately/highly engaged in cross-sector obesity prevention activities from the 2013 data we examined. Many of these agencies appeared to still be engaged in obesity prevention activities related to PA. Themes pertaining to engagement in cross-sector collaborations included building/maintaining long-term relationships with community partners, the value of CHW, community navigators, and CBPR, and the importance of sharing resources among agencies to integrate SDOH into planning PA initiatives. To better serve their Hispanic populations, in particular, there appeared to be more need for prioritization of this community, culturally-specific approaches (e.g., use of a cultural adaptation framework and incorporation of cultural values)⁷⁴, and partnerships with Hispanic businesses, CBOs, and faith-based organizations.

With regard to PA promotion activities, LHDs varied in their continued engagement in and sustainability of such activities since 2013, and our findings suggest that larger LHDs have more capacity when compared with smaller health departments to have broad impacts on policy decisions surrounding the built environment for PA promotion and for incorporating SDOH to enhance health equity initiatives. Similarly, several recent studies found that LHDs were more apt to describe engagement in urban design, land use, active transportation, and access to recreational facilities if the population they served was $\geq 500,000$.^{53,57} Identified themes also suggest differences among small and large LHDs in how they address disparities affecting Hispanic communities. Small LHDs described only offering bilingual staff, interpreters, and translated materials as interventions for the Hispanic population. While these are useful in offering services, additional integration of SDOH and health equity interventions are necessary to make a significant impact in culturally-appropriate care and ultimately improving the health of the broader community.

Representatives from these smaller LHDs, however, did not perceive that they have the funding and capacity necessary to build and maintain collaborations that would make them able to develop this infrastructure. Most of these smaller LHDs are rural in nature with populations, therefore, which will often have higher prevalences of obesity⁷⁵ as well as a recent increase in the Hispanic-identifying workforce within rural areas.⁷⁶ Of note community-wide interventions for built environment aspects that have been implemented by LHDs have been found to be associated with a lower obesity prevalence.⁷⁷ Thus, smaller LHDs would appear to need additional resources to accomplish health equity goals targeting chronic disease prevention, particularly in rural areas.

Most of the large LHDs did not describe a paucity of funding but often mentioned the need for more funding to accomplish additional work. These large agencies also discussed recent budget cuts which appear to have taken a toll on their particular LHDs' capacity to incorporate cultural interventions into PA initiatives. While there was no mention of potential cost savings by applying such strategies, there has been some evidence that the implementation of effective measures represents an opportunity to reduce US healthcare expenditures.⁷⁸

One of the ways to address this issue and improve PA promotion in marginalized communities is through the development of public-private partnerships (PPP). A recent systematic review of PPPs in promoting PA described the ability of these entities to finance initiatives, implement various resources, and offer solutions that improve communities.¹⁴ The COVID-19 pandemic has highlighted the value of partnerships between the public and private sectors as necessary to address public health needs,⁷⁹ and PPPs can be a mechanism for accomplishing, and possibly sustaining, public health programs.

For example, PPPs could provide additional capacity for incorporating three capabilities found to enhance organizational engagement in the built environment including transportation and land use policies through: (1) project development and design review, (2) planning and policy development, and (3) reviewing and commenting on plans, policies, and projects.²⁵ While the

larger LHDs described activities surrounding each of these capabilities, only one smaller LHD and the mid-sized LHD described participating in the third capability, which often takes place in later stages of implementation.²⁵ PPPs could strive towards developing formal, written strategies for developing PA initiatives to ensure public health expertise is included in early stages of design, especially for marginalized communities.

For both small and large LHDs, PA promotion was noted in all interviews to be “sprinkled in” with other activities like nutrition, mental health, substance abuse, tobacco cessation, arthritis, and diabetes. Therefore, LHDs had difficulty estimating the number of FTEs allocated to PA. Similarly, a formal, written strategy for obesity prevention may be found within different chronic disease grants or contracts, for example, but as suggested in the literature, planning is often not specific to the process and impact monitoring for PA promotion.⁸⁰ Separating PA program and indicator specifics into a work plan would be beneficial for measuring progress in PA promotion, especially in rural areas where obesity prevalence is highest.^{75,77,80} Currently, some LHDs have strategic plans and CHIPs, but other chronic disease outcomes are often those described, and PA is rarely prioritized. Instead, just as PA promotion is “sprinkled in” with other chronic disease prevention activities, many strategic plans briefly mention PA without prioritizing data collection specific to PA for evaluation purposes, possibly hindering sustainability.

Sustainability, as measured by intervention characteristics and organizational factors,⁸¹ is essential in making progress towards health equity goals. Through implementation science frameworks similar to the CDP/HLP, LHDs can utilize and test implementation strategies that build capacity to develop program elements with adequate intensity and sustainability for achieving desirable PA promotion goals.¹¹ When developing formal, written strategies for new initiatives, it is essential that a measurement and evaluation plan is included to determine the impact of activities. Some of the small LHDs noted that grants supporting physical activity, the built environment, and other related programs no longer exist and that while prior CHIP included

community wellness and physical activity, the COVID pandemic shifted priorities due to limited health department capacity.

The themes that arose for large LHDs that were missing for the small and mid-sized LHDs included the importance of building and maintaining long-term relationships with community partners and the discussion surrounding the influence of champions. Given the higher capacity of large LHDs and the sizes of the populations they serve, it stands to reason that building advocacy and collaboratives could be a more seamless process when compared with small or mid-sized LHDs. As such, most of the large LHDs from our 2013 sample provided qualitative evidence of engagement from the broader context of integrating SDOH into sustainable PA promotion activities, while some of the small LHDs described smaller initiatives with components of PA promotion, some of which no longer exist. Similarly, one study utilizing implementation science to examine healthy eating and active living changes in a rural community noted a need for improved organizational communication and information access, new funding streams and strategies, and enhanced capacity building and support.⁸²

This study had limitations. A small number of eligible LHDs were interviewed as some that were contacted did not respond or declined an interview, and these sites may have been different from those that responded. Additionally, although each HHS region is represented, only one mid-sized LHD responded to requests for interviews despite several outreach attempts to others. Additionally, other LHD staff members within the same LHD may have been aware of additional PA promotion activities that the person interviewed was unaware of. Therefore, not all information surrounding PA promotion may have been recognized.

CONCLUSION

While many of the LHDs, identified based on their engagement in obesity prevention in 2013, had ongoing PA initiatives, there appear to be factors that facilitate and that hinder their efforts. Identified themes were congruent with those found in similar studies, such as the need for

relationship building, partnership development, and alignment of resources among collaborators.^{83,84} Including the expertise of representatives from the community and CBOs also appeared to be essential to PA activity sustainability, and resource prioritization appeared necessary for maintaining relationships with partners, which could be supported by PPPs. Based on themes identified in this study, organizational strategies for building cross-sector collaborations to develop and maintain health equity initiatives addressing PA in the Hispanic community are needed, particularly for small LHDs.

At the local level, public health services research is focused on the impact of LHD performance on improving population health outcomes. However, few studies have explained what contributes to LHD engagement and sustainability in collaborations, which could affect performance in cross-sectoral public health initiatives (Brinker, unpublished). The CDP/HLP Framework is helpful for incorporating implementation science in the development of organizational strategies for building cross-sector collaborations to build and maintain health equity initiatives addressing PA in the community, particularly for marginalized populations.

CHAPTER 4: State Health Department Organizational Strategies for Cross-sector Collaborations that Address Chronic Disease Disparities

INTRODUCTION

The Institute of Medicine's 1988 Future of Public Health Report outlined challenges, including inadequate and unstable funding, lack of investment in public health research, and insufficient collaboration among relevant sectors, that persist today.⁸⁵ Cross-sectoral collaborations between public health and other sectors can help promote upstream solutions to address social needs that impact health and improve health equity.⁸⁶ Recent U.S. public health initiatives, such as the Public Health 3.0 framework⁸⁷, have called for collaborative approaches to address the underlying social determinants of health (SDOH) that affect the nation.

Over half of the U.S. adult population currently lives with at least one chronic condition, and 35% of those with chronic conditions live in rural areas.⁸⁸ Health disparities have been found between rural and urban areas with higher obesity prevalences noted in rural areas.⁷⁵ State health departments (SHD), along with other sectors, such as transportation, can play a role in promoting health equity and reducing chronic disease disparities through the built environment⁸⁹ and improving mobility.¹² Enhanced infrastructure pertaining to the built environment, including sidewalks, bike trails, and public transit, can make physical activity easier and more accessible.⁸⁹ Transportation leverages SDOH through numerous beneficial pathways including increased physical activity, social connectivity, and access to care.⁹⁰

While there is currently a paucity of evidence about how to best address unmet social needs in medical care,⁹¹ some data suggest an equitable transportation infrastructure is associated with positive health behaviors and can address barriers to accessing healthcare.⁹² For example, a strong collaboration between public health and other local government agencies can implement public health initiatives and services related to neighborhood design⁹³ for improving

secondary prevention, thus promoting early detection and prevention of advanced disease progression. Transportation-related services such as non-emergency medical transportation (NEMT), have been shown to increase use of outpatient healthcare and decrease use of expensive care,⁸⁹ particularly for rural areas.

Yet, SHD in the U.S. must have stable investments to build and maintain the organizational capacity for these cross-sectoral collaborations with transportation.⁸⁵ Capacity building has been described as “activities that build durable resources and enable the recipient community to continue the delivery of an evidence-based intervention”⁸¹ and can be enhanced through the engagement of SHD with other sectors in cross-sectoral partnerships. Prior research has included case studies as an effective approach used to examine the sustainability of programs^{81,94} by reviewing what is currently in place and exploring lessons learned. Examining existing cross-sectoral partnerships could, thus, fill gaps in the literature surrounding the sustainability of interventions specific to populations living with chronic disease⁸¹ and the organizational capacity of health departments to engage in cross-sector collaborations related to outcomes.^{12,31}

The Cross-sector Alignment Theory of Change,²⁸ has been proposed as a model for measuring the engagement and sustainability of cross-sectoral initiatives.¹¹ The four core areas of shared purpose, governance, financing, and data provide a mechanism for supporting cross-sector collaborations that promote health equity.²⁸ While this model includes sectors such as health care, public health, and social services, other sectors such as transportation, could enhance opportunities for addressing chronic disease (Brinker, unpublished). Furthermore, implementation science frameworks, such as the Chronic Disease Prevention/Healthy Lifestyle Promotion (CDP/HLP) Framework,⁶⁹ could also be useful in measuring indicators specific to organizational strategies supporting the four core areas for building and maintaining cross-sector collaborations.

The following case studies describe cross-sectoral collaborations between SHD and other sectors addressing SDOH to reduce complications related to chronic disease through enhanced access to care and transportation. Our case study analysis aimed to (1) explore specific characteristics of existing collaborations between SHD and organizations external to the traditional public health sector that promote engagement and sustainability of health equity initiatives and (2) identify organizational strategies that SHD staff and partners perceive to be successful in cross-sector engagement and program sustainability for addressing chronic disease disparities.

METHODS

We obtained approval for Institutional Review Board exemption status by the University of Washington (STUDY00017894). In partnership with the Centers for Disease Control (CDC) and the Association of State and Territorial Health Officials (ASTHO), innovative, cross-sector collaborations involving SHD prioritizing SDOH were identified nationwide via their networks and an environmental scan. The online environmental scan included a search of the word “transportation” within state/territorial health agency strategic plans and state health improvement plans. Eight cases were identified through this process.

The scope was further refined to include cases where the central goal of the program or partnership related to transportation, demonstrating some sort of public health investment (i.e., contributing funding, in-kind staff support, or data). Six of the initial eight case studies identified through the online search met this new inclusion criteria. Finally, four cases that included braiding and/or layering of funds towards transportation and access to health care were selected as they could theoretically address SDOH. Braiding, or lacing funds from several sources, while allowing for the maintenance of individual award requirements, supports common goal initiatives.⁹⁵ Layering of funds involves merging funds, where the awards lose their original identities.⁹⁵ Braiding and/or layering of funds are recognized strategies to expand and increase the

effectiveness of money spent⁹⁵ by allowing contributions from several organizations, thus diversifying sources of funds.

Case documentation, both publicly available and provided by SHD program leadership, included 11 source documents, including proposals, reports, a service definition/fee schedule document, and website links (Table 7). Sources were reviewed in Spring 2023 to gain an understanding of the programs, and the research team developed case summaries to prepare for each interview. State-level team leads for the six cases were contacted for follow-up, and two were non-responsive; thus a total of four cases were included in this study, one case each from Arizona, Oregon, North Carolina, and Vermont.

Research staff members conducted semi-structured interviews with SHD and partnering agency representatives from these programs. Questions focused on staff roles, funding, how collaborations advanced health equity initiatives, collaboration successes, and partnership challenges (Appendix 3). Using a holistic, single-unit of analysis with multiple-case design⁹⁶ we conducted an exploratory, thematic analysis. We utilized Atlas.ti v23 software to inductively code and analyze the qualitative interview data related to the case studies. Five interviews, sometimes with two to three staff members in the same meeting, were completed during June and July of 2023. One case involved two separate interviews with representatives from different agencies working on the same project.

Table 7. Case Study Documentation

Case Study	Type of Documents	Documents Summary
1: Arizona	• Program Overview One-pager • Powerpoint Presentation for Health Systems • Program Website with links to ○ Reporting Hub for Operations Summary ○ Frequently Asked Questions ○ Patient Transfer Request Questions	Explain reasons for program initiation, the program purpose and description, services provided (and those excluded), program logistics, how health systems can participate, benefits of participation for health systems, and quarterly operations reports
2: Oregon	• Memorandum of Understanding • Health and Transportation Report • Partnership Website with links to ○ State Health Improvement Plan ○ Statewide Transportation Plan ○ Program Overview Video	Describe partnership background and purpose, the agencies involved, agencies' roles/responsibilities, mission and values guiding the work, partnership goals and objectives, system metrics, partnership outputs such as specific programs and guidance, and how state legislature funds have benefited partnership
3: North Carolina	• Service Definition/Fee Schedule • Pilot Website with links to ○ Investment Maps Showcasing Public and Private Funds ○ Interactive State Map Displaying SDOH Indicators ○ SDOH Screening Questions	Provide an overview of the pilot's context and history, funding, areas of the state served, services offered and fees charged per service, member eligibility criteria, partner role descriptions, additional resources (e.g., model contracts for use between partners), and the pilot evaluation purpose
4: Vermont	• Braided Funding Model Proposal • Braided Funding Model Report • Program Website with links to ○ Decision-Making Roadmaps On Available Routes Intended for Transportation Staff Use ○ Program Overview Powerpoint Presentation ○ Survey Intended for Users to Collect Data Regarding Trips	Describe program background, numerous funding sources, funding model evaluators' qualifications and experience, list of service providers, current program conditions and system metrics, program risks/benefits, assessment of findings including benefits/challenges of funding model, and recommendations

RESULTS

What follows are the findings from our analysis of the four case studies. They are organized according to the Cross-Sector Alignment Theory of Change core areas of shared purpose, governance, data, and financing as a means to assess cross-sectoral initiatives relating to transportation and access to care. The findings include information collected during the semi-structured interviews and through the document review process relative to factors affecting collaborative engagement and the sustainability of these cross-sectoral partnerships.

Case Findings

- **Case Study 1 – Arizona**

Background: The first case study was a state-wide program that offered 24/7 service to coordinate medical transfers across state hospitals in Arizona.⁸⁴ It operated through the state's Department of Health Services (DHS), a university in the state, and a private organization that offered consulting services to health care systems for improved efficiency and streamlining of processes.⁸⁴ DHS provided support for the program to ensure necessary health-related policy changes were implemented and adequate staffing was in place. The interview for this case included three program representatives. Interviewees included the chief medical officer at the state public health agency, a chief executive officer of the partnering private healthcare consulting company, and a chief nurse for the same company.

Purpose: The interviewees described how, during the COVID pandemic, their organizations partnered together to ensure access to care for patients needing transfer to hospitals. As the COVID pandemic eased, coordination was still sought by healthcare organizations, particularly in rural areas. A coordination hub was formalized as an equity-enhancing initiative through grant funding to continue this hospital transfer work for rural persons.

In terms of documentation, the Program Overview One-pager expanded on the importance of the program in the event of future emergencies. Specifically, this document highlights the potential for program use during a mass casualty event, natural disaster, or another pandemic. In the event the system does not receive renewed funding, some activities could continue with existing resources. Due to the existing program infrastructure, it was suggested that these activities could set the stage for rapid scale-up in an emergency, and a funding proposal could be quickly developed with identified collaborators on board to support disaster-specific needs.

Another document, the PowerPoint Presentation for Health Systems, described what was inside and outside of the program scope. This document noted that if additional services not currently provided were later identified, there was potential for discussion to expand the program. Examples of such services, such as post-acute patient transfers, were described as something that could also be considered for scale-up consideration if there was sufficient need. Sustainability was also sought through program representatives building trust and relationships with healthcare partners. Interviewees felt that meeting directly with partners within their health organizations to gain feedback on processes and adapt some elements helped with program adoption.

Governance: Interviewees felt that passionate champions helped build partnerships and advocate for resources and that the program benefits were vast. They described improved efficiency for providers because instead of hospital staff making numerous calls to multiple systems to find a specialist with an available bed, there was only one call made to the coordination team. In addition to hospital systems, the program communicated with transportation companies to identify service opportunities for promoting mobility. The interviewees felt this could lead to discussions with municipalities in the future, and thus, further expand the partnership.

Data: Useful data, including area social vulnerability index scores—a quantitative measure of social vulnerability,⁷³ were used to identify hospital systems that might be

overwhelmed and to facilitate timely access to care for marginalized patients. As a result of the program, needs that had previously been unmet across rural areas of the state, such as adequate specific provider specialties, were identified. Additionally, the system enabled quick scale-up through formal activation by DHS, as needed, in the event of another emergency.

The Program Website included a noteworthy data reporting hub with a quarterly operations summary. This report offered program operation indicators, such as the number of health systems participating and transfer outcome metrics, among others. Additionally, patient demographics, including race and ethnicity, were reported which could be used to assess health equity. Finally, trends over time and by region presented insight into the program's usefulness for identifying needs and its overall impact.

Hospital staff informed the interviewees that clinical needs data were valuable to them in identifying those that were unavailable within their own clinical sites. Additional services, such as behavioral health-related transport that could not be addressed via telehealth services, were requested, but more resources were required to expand. Interviewees mentioned that the ideal scenario would be to offer more services and scale up to more of a regional, multi-state hub in the U.S., particularly for rural areas.⁸⁴ A real-time dashboard that would allow visibility of the specialty beds available and surrounding their state would also be valuable, especially because patients often cross state lines.

Financing: A potential growth in scope was perceived as a means for opening the door to new funding opportunities offered by additional partners. Yet, a challenge was also described in terms of how to braid funds. The administrative aspects of braiding were considered difficult⁸⁴ because of different requirements, such as conflicting start and end dates of separate funding sources. An alternative suggested included a subscription model for the larger healthcare systems within the state to help with partly funding an FTE.

- **Case Study 2 – Oregon**

Background: The second case study included separate interviews with program representatives of two state-level departments: a Public Health Division and a Department of Transportation in Oregon. These departments developed a Memorandum of Understanding (MOU) between their agencies to integrate their state health and transportation improvement plans. One meeting with the Public Health Division included three interviewees: a strategic initiatives coordinator, a strategist on social influences of health, and the deputy public health director managing the policy and partnerships team.

The other meeting was held with representatives from the Department of Transportation and included two interviewees: a manager for the statewide transportation planning group as well as a principal planner. Their main roles included the development of the statewide transportation policy plans and running a funding program called the Transportation and Growth Management Plan that offers funds, grants, and services to local jurisdictions that are trying to integrate transportation and land use planning with other topics, including public health. They also interpret and implement legislation for new initiatives and programs as well as coordinate work involving interagency partnerships.

Purpose: Interviewees described staying well-connected with coordinated care organizations, hospitals, and local health authorities. Agency relationships were described as strong and an executive sponsor and staff that were committed to the day-to-day maintenance in both agencies for strategic partnerships was helpful for sustainability. These positions were not necessarily outlined in the MOU, but interviewees described it as a practice the agencies had held themselves accountable for. The benefit of these partnerships was that the public health agency's community engagement team was able to share funding opportunities, specifically from the Department of Transportation, with community-based organizations to address needs. By June

2024, interviewees described the public health agency as having assisted 300 community-based organizations gain funds with help from this team.

A state health department interviewee noted that for some initiatives led by other sectors, the public health agency may not necessarily be seen as a required partner even though there may be implications for health. An example given included projects related to land conservation and development. The state public health agency may not have been invited to participate in planning because there was no expectation of their responsibility to be involved in the work. Additionally, staff changes across the state public health and transportation agencies changed who was key within relationships.

Governance: The interviewees noted that their former governor and former county commissioner served as champions, partnering to bring health and transportation together. They had been the ones to initiate the MOU and develop partnership goals. The interviewees noted that initially, their former governor issued an executive branch-wide directive to develop this collaboration and requested that all state agencies develop a strategic plan. However, with a change in leadership, there was no current directive to mandate the work at the time of our case study interview. Though political support for it existed, no dedicated funding or staffing for the work was allocated, and one challenge noted was that different legislative committees review budgets,⁸⁴ so there was limited alignment of priorities from higher levels. One solution offered by the interviewees was to continuously revisit the MOU with new directors and leaders within the agency who have the authority to discuss with legislative bodies. The agencies were, thus, working on completing a matrix of key priorities⁸⁴ to share with leadership, and coordination meetings were being held quarterly. Consistent briefings on the work could highlight the work being done, why it's important, and the resources needed.

Representatives from both agencies serve on one another's boards, committees, and planning bodies to align partnership work in pursuit of the state's Community Health Improvement

Plan (CHIP), which is focused heavily on SDOH and equity. The steering committee often works together on data, guidance, and policy work to reduce duplication of work by sharing information and resources. Both the state public health and transportation agencies were exploring how to potentially leverage the existing infrastructure to include multiple outcomes and maximize efficiency.

The Health and Transportation Report showcased how MOU requirements were met. For example, details regarding a recent workshop held with governing bodies to discuss opportunities for the partnership were included. This document was also linked to a statewide online database that holds strategic planning documents, legislative funding projects, and planning guidance relevant to this work. Notably, the report also highlighted how the partnership was contributing to the state's health assessment and health improvement plan. The Partnership Website included a short video about why both agencies needed to partner in planning for transportation and public health.

The MOU document highlighted governance roles for the two agencies and how the parties agreed to collaborate on activities, specifying mutual representation on advisory bodies and committees as well as coordination of policy proposal development and implementation. Other assigned tasks in the MOU included connecting and enhancing relationships among partners, identifying and leveraging resources to support the work, focusing on diversity, equity, and inclusion practices, and collecting and sharing data on health outcomes.

Data: Much of their work, in connection with their MOU and planning, focused on data systems and sharing, particularly as it related to their Emergency Medical Services (EMS) and trauma systems.⁸⁴ They were able to review neighborhood- and census tract-level data regarding bike/pedestrian injuries and crashes.⁸⁴ A Transportation and Growth Management-funded workshop included county public health groups, county transportation groups, and city transport groups to make community-wide changes. They then began focusing on climate change and

incorporating transportation, health, and housing. Interviewees noted it had been useful to gain feedback from various partners in other sectors, such as those working on housing, on these projects.

Another important aspect of the Health and Transportation report was the mention of process measures developed to assess local public health authority participation related to active transportation, parks and recreation, and land use. An annual survey collected information about staff roles and barriers to engagement among other topic areas. Finally, an essential component of this report detailed efforts regarding data integration between the Department of Transportation and EMS, which was accessible by the Public Health Division, to track pedestrian and cyclist crashes, injuries, and fatalities for future planning and quality improvement purposes.

Financing: One of the Department of Transportation interviewees felt that a challenge was that their department was seen as having more funds than others, leading to partners wondering why more could not be done. However, their funds were often not discretionary, so there was little flexibility in how the money could be spent.⁸⁴ A state health department interviewee noted it had been difficult to determine the staff necessary to support their efforts. One solution the interviewees suggested was to strategically “call out” the types of relationship-building and the staffing they considered necessary for the work, specifically for health equity, to justify the dedication of resources. They suggested that it would be most valuable to have staff covering each SDOH sector. Another solution offered by the interviewees was to continuously revisit the MOU with new directors and leaders within the agency for consistent planning purposes.

- **Case Study 3 – North Carolina**

Background: The third case study highlighted North Carolina’s Department of Health and Human Services collaboration with the state’s Medicaid office to develop a community referral network that connected residents with resources that addressed nonmedical social needs, such

as access to healthy food, adequate transportation, and safe housing. One meeting with two interviewees included the Associate Director for Innovation at the state Department of Health and Human Services (DHHS) and the DHHS program manager for the program pilot highlighted here. The interviewees' job duties included working with network leads that supported community-based organizations and health service organizations addressing social drivers impacting clinical health care.

Purpose: A digital platform for provider use was created through a public-private partnership (PPP) with a non-profit organization, and a new tool was developed to create a statewide closed-loop referral system. The tool was both a statewide resource directory and a means for making and invoicing referrals. Additionally, a shared language document was created to define services and provide a fee schedule for reimbursement.

A benefit of this work was described as having included a newly recognized collaboration between health plans and community-based organizations. These entities developed a shared language that allowed them to approach health care in innovative ways to incorporate both SDOH and clinical care. Additionally, working with community-based organizations (CBOs) that had been doing this work for some time with limited resources allowed for the sharing of knowledge about what additional resources would be helpful.

Governance: The idea for the program was instigated by a champion, former secretary of DHHS, who partnered with the Division of Public Health and Medicaid. To promote health equity, the pilot also included access to transportation for services needed.⁸⁴ One consideration for health services organizations' participation in the pilot was that health plans must authorize the services. When developing contracts, including language for enforcing representativeness of the population covered was key, particularly for the evaluation piece. Additionally, making sure partners were representative of the region they work in, particularly within the board of directors for network leads, was important. Developing model contracts with roles, responsibilities, and a

mechanism for enforcement between different partnering entities was also described as important, especially when there was a high number of partners.⁸⁴ Interviews suggested that documentation should include a mutual language for partners surrounding SDOH and clinical care and should emphasize how working together impacts all parties involved.

Data: The data included within the platform were also a rich resource of information for all partners. A formalized, robust evaluation that includes a randomization methodology had been essential in negotiating the Medicaid waiver,⁸⁴ and the interviewees felt this was needed for program sustainability. The focus had also been on building the partnerships, relationships, and infrastructure to allow this work to continue. Part of the evaluation process included meeting with partners to receive continuous feedback.

The major challenges described were technological in nature. For example, the platform was designed to create invoices rather than claims, specifically for the CBOs, because they did not have claim processing software. However, in making the platform create invoices, the intent was to make it a simple “point and click” system, so all of the transactions were automatically completed on the back end. As a result, there were system glitches due to the different technology systems transferring information. This was difficult to navigate and caused some delayed payments for smaller health service organizations that needed reimbursement relatively quickly. The network leads were vital in communicating the problems so they could be resolved.⁸⁴ Program awareness was also a challenge but there was work being done to improve member and provider awareness. Training for care managers helped clarify questions about service delivery.

One document was shared regarding this particular case study. A service definition/fee schedule for this pilot illuminated the various SDOH addressed by the pilot. Referrals for services related to transportation, housing, and food and nutrition services were a few examples of the SDOH targeted to improve health. The document outlined the service name (e.g. “Reimbursement for health-related public transportation”) and the unit rate or cap (e.g., “Up to \$102 per month”).

The Pilot Website offered many links to resources for those interested in participating or replicating this work. The main page offers a link to a webinar describing responsibilities for health service organizations and care manager training for sites enrolled in the pilot. It included a map of regions and associated counties that are eligible for participation and the eligibility criteria. The website also included role descriptions for administrators, care managers, and network leads. Resources included example or model contracts that could be utilized between pilot partners (e.g., between a network lead and a health service organization). Notably, there was a section justifying the need for a rigorous program evaluation, including strengthening partnerships for a sustainable program.

The pilot evaluation utilized a Sequential Multiple Assignment Randomized Trial (SMART) design, which helped examine multiple interventions and outcomes at once.⁹⁷ A link on the website's main page offered a summary and report of the interim pilot evaluation results. Initial findings included that services were being rendered effectively and were associated with improvements in social needs. Additionally, enrollment in the pilot was associated with reduced emergency room utilization, inpatient hospitalizations for non-pregnant adults, and lower healthcare expenditures. A recommendation to expand services to additional regions within the state was emphasized.

Financing: Funding, primarily through the Medicaid 1115 waiver, was used for capacity building with network leads and other organizations. The tool was partly supported by an administrative match through the state's legislature. Initially, the pilot was supported through state and local philanthropic funding as investments from the public were not sought until some preliminary data were available to show the program's potential value. Other proposed funding structures, including a technology fund, were thought to have strict reporting requirements that would add an extra administrative burden on staff. For platform use to make referrals, both Medicaid and larger state healthcare systems contributed to licensing costs.⁸⁴ For others

interested in developing similar projects, interviewees recommended starting small with the development of tools or products that may not require many resources upfront, particularly in terms of funding.⁸⁴

- **Case Study 4 – Vermont**

Background: The fourth case study was a collaboration between a state's Agency of Transportation and Agency of Health Services. These agencies had several ongoing pilots together, engaging numerous sectors and branches of government that worked towards addressing SDOH. One meeting with the only interviewee for this case study was held with a public transit program manager with the Agency of Transportation.

Purpose

One pilot, which included an MOU between both agencies, offered transportation to those suffering from substance use disorder for job interviews, training, and commuting that lasted several weeks per participant.⁸⁴ Another pilot prioritized people who were unable to access routine or preventive medical care. It included an On Demand Response Service for residents, including older adults and persons with disabilities where providers in the state contract for NEMT service. The goal of these pilots was to expand services and scale-up to reach those populations with a need who were not served by existing programs. The legislature has charged the agencies with conducting an assessment of their braided services.⁸⁴

Governance: The Agency of Transportation interviewee sat on a state council for Opioid Use Recovery and another council for Healthy Aging which helped in obtaining letters of support for these programs.⁸⁴ Representatives from the Agency of Health Services served on the state's Public Transit Advisory Council. The Program Website described how this work was initiated, identifying the governor's inclusion of the Agency of Transportation in the Opioid Coordination

Council. The governor and administration were supportive of the work and their expectation was that these agencies coordinate with one another.

The interviewee felt that early and frequent communication with partners was needed for sustainability.⁸⁴ The state used an equity framework that was heavily embedded in transportation planning, particularly for areas impacted by persistent poverty. Challenges described by the interviewees suggested the potential for conflicting priorities among partners for a particular program. As an example, NEMT may be trying to contain costs but DOT may be focused on expanding trips.⁸⁴ Additionally, MOUs take a couple of months to vet and do require administrative efforts to maintain.⁸⁴ However, the interviewee felt the investment appeared to be worthwhile as neighborhood improvements could lead to downstream effects for other SDOH including mixed-use housing, for example. The interviewee felt a shared vision and goal was necessary to build these relationships and policy development takes time.

Data: Two document reviews were provided, one of which was a Braided Funding Model Proposal for evaluating the braided service model and the other was the Braided Funding Model Report intended for presentation to the state legislature. The proposal and report were written by contractors hired by the Agency of Transportation and offered evaluation by three employees, describing their commitment and prior experience with similar work. The final report addressed the braided service model for NEMT and other demand response programs, including the one offering transportation to those recovering from substance use disorders. The Program website offered details surrounding new services that were historically not covered by other programs, guidance documents or “roadmaps” to aid transportation staff in decision-making regarding services, and a survey for trip data collection.

Financing: The Program Website offered partnership and finance specifics, noting funding through Medicaid, a federal grant, and a state match (evenly split between both agencies through the MOU). The Braided Funding Model Report’s main finding was that the state’s

transportation program was in alignment with national best practices and the braided model was highly effective, specifically in quality of service and participant satisfaction. However, concerns surrounding the sustainability of the model were identified, including financial constraints with Medicaid transportation and the ability to attract and retain volunteer drivers, with one challenge being the distance to locations in rural areas. The recommendation was to maintain the current braided model, but suggestions included (1) adding other agencies to the Public Transit Advisory Council for potential improvement in capacity and (2) establishing a forum to coordinate with Health and Human Services providers on transportation resources and challenges to raise awareness of needs and priorities.

Synthesis

The most common collaboration facilitators to engagement and sustainability of cross-sectoral partnerships that were described among these cases are listed in Table 8. Three of the four case studies had common themes surrounding the importance of (1) relationship building and persistence, (2) having a champion and leader to advocate for these initiatives, (3) managing up to leadership for improved visibility and dedication of resources, (4) data systems and sharing to improve efficiency and focus on disparities, and (5) feedback, process improvement, and adaptability to allow for future expansion of programs. Two of the four case studies also included themes highlighting the necessity to (1) streamline processes for aligning goals, priorities, and strategic plans, (2) document dedicated staffing, roles, and resources needed for initiatives, and (3) perform continual funding assessments to ensure flexibility and feasibility.

Table 8. Collaboration Facilitators to Engagement and Sustainability

Case Studies	Theme	Exemplar Quotes
1, 2, 3	Relationship building and persistence	"We recently went out on a roadshow where we went out and visited all of these hospitals...Meeting with them was quite an undertaking, but it was very beneficial. People were very thankful that we had come out to see them...building the partnerships." "I think it's the relationships between the agencies that has worked really well. I mean, I bet you, if you went back before the partnership started, we would have struggled to find the right people to go to...and either to work together on different policies or development of programs, or, you know, to find out what they're doing. Now, we've got those relationships built." "So we're also just really focusing on trying to build the partnerships and relationships and infrastructure to allow all of these organizations to keep doing the work afterwards. Even regardless of the evaluation results. So we're seeing both of those pieces as key to sustainability."
1, 2, 3	Champion and leader to advocate for initiatives	"It's not that you need to take up your entire...health department to do this. You just need a champion to...be invested...that one person who is passionate about it, who really understands it, who can speak to it, who can lobby for it." "I know a little bit of history where one of our transportation commissioners had a public health background...and was really interested in what the State Transportation Agency was doing to promote public health connections and so that got momentum going for this partnership." "So the idea for us to focus on non-medical drivers of health was originally really instigated by our former Secretary of the...[state's] Department of Health and Human Services...so she had kind of a group in the Secretary's office that included our Chief Medical Officer of the department, and she was also, the leader, one of the leaders within our Division of Public Health. So it was kind of a joint effort between the Secretary's office, our Division of Public Health, and Medicaid."
2, 3, 4	Managing up to leadership for improved visibility and dedication of resources	"I do think that the thing that I would do differently when I compare this partnership to other agency partnerships is to engage more systematically at the highest levels of our organization...I think one of the things that we need to be better at across our agencies is actually continuing to bring [the MOU] forward to every new director...So inching forward but trying to always keep it top of mind for agency leadership." "We get an administrative match on the portion that we fund so our state portion has to go through the legislature...there was a lot of work, at least up front, in selling the concept to our legislature so that we could get the funding for it." "And that's the other thing, this legislature. I'm in front of the Senate and the House 10 times in four months...these folks would like to see more, different, and better. And so when we talk about, you know, what can we do to help more people? Coordination and leveraging other federal funds or other state agencies always bubbles to the top."

Case Studies	Theme	Exemplar Quotes
2, 4	Streamline processes for aligning goals, priorities, and strategic plans	"I think one facilitator we have is that our governor has requested that all state agencies have a strategic plan. So this is an opportunity for kind of ground up to be able to share where we have alignment and [where] we need to rely on each other." "It has to start with a shared vision and goal...What's important to me may not be as important or the same priority as other[s]...MOUs take two months to go through the system...It shouldn't have to take two or three years to get to a plan...but to get to that level of comfort, and that MOU in place, and all those financial pieces the legislature needs to know, it's a little bit slow..."
2, 3	Document dedicated staffing, roles, and resources needed for initiatives	"I would love for our...partners to strategically call out these types of relationships and the necessary staffing needed to do this work...we need to actually have dedicated people to do this work...And it really would be helpful if there was more of an emphasis on this type of cross-sector and social determinants of health approach. It would be great if we had staff that could be covering each of our kind of key social determinants of health sectors...you know, housing, transportation, education, and employment." "The department did a lot of work up front to assist in the development or really to develop model contracts between different partnering entities. I think that was a really important thing for us to have done because there are so many partners that participate in this program...It established...here's the exact model of how each entity should be operating together and their roles and responsibilities...Here's the mechanism through which that will be enforced."
3, 4	Perform continual funding assessments to ensure flexibility and feasibility	"We thought about getting a 90/10 match, but the cost structure didn't really allow it...we ultimately decided that it was a little bit too much of an administrative burden for our staff at that point, all of the like reporting requirements." "This upcoming study on the value or the assessment of the braided service will quantify the value of us working together...and if that was to bifurcate, what would that mean in the transit service? Would we lose 9 million out of that 15 million dollars? What would that do to our overall services?"
1, 2, 3	Data systems and sharing to improve efficiency and focus on disparities	"We dove into the data...and realized that there's really a strong subset of hospitals that used us a lot...those hospitals that are out in rural parts...they just don't have a lot of resources around them." "We have a lot of work that has been ongoing for a while by way of investment in data systems and data sharing, particularly as it relates to our EMS and trauma systems. So being able to look at you know, neighborhood and census track level of where we have bike/pedestrian injuries and crashes [and] where we have EMS services. There's actually maps on where we have equity concerns and considerations, so that we can...support neighborhood level policy and program changes." "The license then grants you a user access to either send or receive referrals on behalf of individuals for needs that they have. So a healthcare provider could make an electronic referral to a food pantry if one of their patients has a food need, and then they'll be able to see online. The food pantry accepts the referral and delivers that food to the member, so that they can track to make sure that their patient actually received that food...We're then able to view our members, medical and non-medical encounters, all within our same analytics platform and database."

Case Studies	Theme	Exemplar Quotes
1, 3, 4	Feedback, process improvement, and adaptability to allow for future expansion of programs	“We went and talked with the leadership team, received feedback, talked about opportunities for expansion if they needed us to do something else. What are the biggest challenges?...Those kinds of things, really just being moldable as a program...” “We try to constantly seek feedback throughout the entire process all the way from kind of idea conception to now we're currently meeting with all these organizations regularly to consistently get feedback...I tend to see it as a success of the program that we are starting to see some of what we had hoped to see over the course of the program which is starting to have a lot more collaboration between health plans and community-based organizations and working to try to develop some shared language between those entities...we have been able to bring people to the table to talk through...How do we think about care management as something that is done by a team of individuals and that incorporates both clinical and SDOH needs? It's a design.” “As we build these services, it's easier to show the benefits therein which makes it easier to develop more service...We're kind of taking a scalpel and trying to figure out where, you know, peeling off other needs to ensure that we're becoming more meaningful to more folks. So what are those gaps? How do we fill those?”

Organizational strategies to support the engagement and sustainability of cross-sectoral partnerships based on themes identified in this study are listed in Table 9. The eight themes we described above can be categorized by the four core areas of the Cross-sector Alignment Theory of data, purpose, governance, and finance. The case studies' organizational strategies included (1) performing quality improvement and evaluation for scalability, (2) continuing/maintaining some activities when the program is not formalized for potential full reactivation when necessary, (3) serving on cross-sectoral councils and working with the legislature to gain assistance with "enforcement," and (4) naming resource requirements including formalized collaborations and staffing levels.

Table 9. Organizational Strategies to Support Engagement and Sustainability

Cross-Sector Alignment Theory Enablers	Themes	Organizational Strategy
Purpose	- Relationship building and persistence - Document dedicated staffing, roles, and resources needed for initiatives	Continue/maintain some activities when program is not formalized for potential full reactivation when necessary
Governance	- Streamline processes for aligning goals, priorities, and strategic plans - Champion and leader to advocate for initiatives	Serve on cross-sectoral councils and work with legislature to gain assistance with "enforcement"
Data	- Data systems and sharing to improve efficiency and focus on disparities - Feedback, process improvement, and adaptability to allow for future expansion of programs	Perform quality improvement and evaluation for scalability
Finance	- Perform continual funding assessments to ensure flexibility and feasibility - Managing up to leadership for improved visibility and dedication of resources	Name resource requirements including formalized collaborations and staffing levels.

DISCUSSION

As of January 2025, there are new threats to the existing public health infrastructure as evidenced by the recent withdrawal of the U.S. from the World Health Organization (WHO)⁹⁸ and an order for the Centers for Disease Control and Prevention (CDC) to discontinue collaborating with WHO.⁹⁹ Yet, the WHO is a crucial partner in combating obesity and chronic disease, and the organization has highlighted the need for various sectors to collaborate in addressing SDOH to reduce health disparities related to chronic disease.¹⁰⁰ This study advances the literature regarding ways SHD can engage in cross-sectoral partnerships with transportation by highlighting the specific organizational strategies that can sustain programs. These organizational strategies and themes were categorized utilizing the Cross-Sector Alignment Theory of Change enablers. Previous literature has identified similar themes surrounding facilitators to engagement and sustainability as described below.

Purpose

Several studies have demonstrated that relationship building^{101–103} and written agreements¹⁰⁴ enhance engagement. The existence and wide dissemination of formal contracts with clearly written roles and responsibilities that encompass accountability have been found to strengthen partnerships.¹⁰⁵ Additionally, regular, consistent, and ongoing communication between partners is a facilitator^{93,105} and might be the only mechanism employed when attempting to maintain some activities when a program is not formalized but there is a need for potential full reactivation, such as during a disaster. This is important because an established infrastructure has been noted to support the scaling up of interventions during a public health emergency.¹⁰⁶

Governance

The literature has also noted that champions are integral to obtaining necessary resources¹⁰³ and aligning program goals with those of partner councils is essential.⁹³ In a study

contrasting sustainable and non-sustainable public health programs, the former were more likely to report interaction with partnering councils, alignment between organizational capacity and program elements, and planning for sustainability.¹⁰⁷ The cases examined here underscore the value of these collaborations and the findings also coincide with the literature in terms of organizational strategies supporting partner engagement in cross-sector activities. Interviewees suspected “enforcement” of activity performance could be achieved if strengthened with legislative support, which has been documented in other studies.^{108,109}

Data

Research studies highlight the need to provide evidence-based data for process improvement to address issues of mutual concern among partners.^{93,105} Additionally, resource and data sharing among partners has been found to allow for increased engagement in cross-sectoral activities.¹¹⁰ These factors are crucial as the literature calls for multilevel indicators of program sustainability, including organizational characteristics and intervention-related factors.⁸¹ Future research, utilizing implementation science methods, could provide data for continuous quality improvement and program evaluation and allow for increased visibility on program outcomes, potentially improving chances of sustainability and scalability.

Financing

A bottom-up approach for coordination across sectors^{111,112} and flexibility in funding¹¹³ have also been deemed important in cross-sector engagement. Generally, braiding of funds have posed challenges for prior partnerships¹³ because they require significant time and energy dedicated to administrative endeavors in developing systems for using the funds.¹¹⁴ Our study findings indicate interviewees faced similar challenges. Yet, dedicated funding for these programs has been found to lead to improved outcomes,¹¹⁵ so an alternative to the braiding of funds is needed and a comparison of financial sustainability models is warranted.¹³ SHD will need to find

a way to enhance cross-sector collaborations under current constraints to public health funding and other resources including its workforce.¹¹⁶ Assessment of funding models could allow for naming resource requirements including formalized collaborations and necessary staffing levels.

Future Collaborations

Public-private partnerships (PPPs) are one proposed mechanism for potentially enhancing the resilience of organizations participating in these cross-sectoral collaborations. PPPs were initially pushed through legislation by states in the U.S. following the 2007 Great Recession.¹¹⁷ PPPs allow the public sector (government and other governmental entities) and the private sector (companies, philanthropies, and nongovernmental organizations) to merge knowledge, experience, and finances to achieve more with fewer resources.^{118,119} They have been found effective in targeting multiple sectors¹⁴ and fostering cross-sector collaborations. Following the COVID-19 pandemic, PPPs were essential in vaccine promotion¹²⁰ and testing strategies to speed up bureaucratic processes and address the undermining of governmental public health efforts by political powers.¹²¹

The cases examined in this study included two cases in which PPPs were key to increasing an organization's capacity to engage and sustain cross-sectoral partnerships enhancing health equity initiatives in their states. Building on collaborations such as these is important in developing networks as well as initiating and scaling public health initiatives. PPPs provide an opportunity to develop sustainable programs through the maintenance of partnerships with public and private entities offering different means of contributions. In these cases, the private sector brought the advantage of healthcare coordination expertise and flexible financing. For example, the North Carolina PPP was initially funded through philanthropic funds without restrictions or reporting requirements for how the money was spent. The Arizona PPP allowed a separate entity, a healthcare consulting company, to offer its proficiency in clinical planning skills that the public health agency did not have the resources to provide. The private sector, thus,

complemented the public health services coordination and ability of the government agencies involved to manage funding.

For those living with chronic disease, PPPs addressing transportation and the built environment could be useful in targeting efforts centered on leveraging SDOH that impact health promotion and access to care. Yet, a recent systematic review highlighted some of the challenges found in PPPs for health promotion including the diverse interests, needs, and goals of public and private partners; a lack of understanding in how each work; the investment of time and human resources necessary; and reduced project consistency when staff turnover.¹⁴ Public and private partners may not want to be viewed as aligned with one another for ideological or political reasons.¹⁴ Additionally, each may have different expectations of accountability if outcomes are not achieved.¹⁴ Topics including but not limited to data ownership¹²² and regulatory barriers to data sharing¹⁰⁵ can pose conflicts among partners. Values and structural alignment would need to be assured and could be outlined in formal, written agreements.

While public sector braiding of funds was considered difficult by case study interviewees, even funding offered by private, large corporations can be considered complex.¹²³ If one sector is providing the majority of funding, there can be an imbalance of power in the relationship between public and private sectors in decision-making processes.^{13,123} However, non-governmental organizations could serve as independent monitors,¹²⁴ and a PPP office may help ensure policy institutionalization and management of projects.¹²⁵

While challenges exist, his systematic review also highlighted the benefits of organizations participating in PPPs for health promotion including the opportunity to collaborate with diverse decision-makers; the organization's involvement in environmental, social, and cultural objectives; the sharing of in-kind resources; and addressing complex problems by increasing awareness within the community.¹⁴ For adequate engagement and sustainability of PPPs, capacity building is necessary¹¹⁷ and can be accomplished through the inclusion of additional sectors into

interagency collaborations.¹²⁶ Sustainability of these programs is important as a lack thereof can lead to frustration among partners and an erosion of trust.¹²⁷ The simple existence of a collaboration has been shown to have no effect on engagement, but when agencies successfully share personnel, resources, and information, there can be a significant impact on participation in activities.¹¹⁰ There is a need for more applicable information on effective intervention processes and decision-making procedures.⁹³

One limitation to this study is that a small number of interviews were conducted encompassing four case studies within the U.S. This limits the generalizability of our findings, and additional research is needed to examine similar case studies across the country. To test the organizational strategies identified in this study, implementation science frameworks, such as the CDP/HLP, can support systematic measurement of moderators of success that support the four core areas of the Cross-Sector Alignment Theory for building and maintaining cross-sector collaborations. This work occurred at one time point and does not reflect the dynamic nature of state systems and their multitude of actors and priorities.

CONCLUSION

Given the current instability of public health infrastructure in the U.S.,¹²⁸ there is a need to streamline organizational strategies for ensuring engagement and sustainable cross-sectoral collaborations that enhance health equity initiatives and reduce chronic disease disparities. The Cross-sector Alignment Theory offers concrete guidance for developing these initiatives. Furthermore, implementation science frameworks can be used in future research studies to measure the success of these collaborations for continued refinements, particularly for future PPPs.

CHAPTER 5: Conclusion

This dissertation offered an opportunity to delineate which mechanisms may impact local health department (LHD) and state health department (SHD) engagement in cross-sector collaborations, depending on the context of these health departments with different characteristics. The Cross-sector Alignment Theory of Change was used to help define a health department's cross-sectoral collaboration capacity for promoting health equity and reducing chronic disease disparities in the U.S. Enablers of this theory, including shared purpose, governance, financing, and data, were examined to inform local LHD and SHD engagement in and the sustainability of these collaborations. Additionally, the Chronic Disease Prevention/Healthy Living Promotion (CDP/HLP) Framework was proposed as an implementation science framework for assessing the engagement and sustainability of cross-sector collaborations in future research. This dissertation added to the current literature by outlining an opportunity to determine how cross-sector collaborations can be effectively implemented to enhance population health outcomes, including health promotion activities related to obesity prevention and the reduction of chronic diseases in the U.S.

In Chapter 2 of this dissertation, we found that there appeared to be more engagement in activities supporting the built environment for obesity prevention among LHDs with a formal, written strategy than those that did not. LHDs that were unable to estimate full-time equivalents (FTEs) or had obesity prevention staff scattered across program areas showed lower engagement scores. Additionally, serving a larger population size (>500,000) was significantly associated with engagement in supporting the built environment for physical activity promotion. Findings suggested that larger LHDs, which can be a proxy for urban settings, may have more resources than smaller LHDs serving rural areas to build capacity for cross-sector collaborations.

Similarly, other analyses^{57,53,59} have noted that agencies serving larger population sizes and dedicating FTEs to active transport are associated with higher LHD engagement,⁵⁷ and land use planning is more common in urban jurisdictions when compared with rural ones.⁵⁹ LHDs serving larger population sizes are more likely to participate in a Community Health Assessment (CHA) or Community Health Improvement Plan (CHIP) as well as physical activity and nutrition programs.⁵⁹ To better support organizational capacity for this work in rural areas, consistent measures for obesity-related activities including the built environment that are geared towards physical activity are needed,⁸⁰ especially considering that obesity prevalence is higher in rural communities.^{63,75}

The role of formal, written strategies in these efforts will be essential to capture in future research because outlined expectations in written form can enhance engagement¹⁰⁴ and strengthen partnerships.¹⁰⁵ Unfortunately, data on obesity prevention activities and collaborations were unavailable after 2013, so our analysis did not allow for a comparison of measures across time. These data must be consistently captured to show the impact of LHD and SHD engagement on cross-sector collaborations and adaptation of strategies when warranted.

Chapter 2 also illuminated that what officially constitutes a formal, written strategy may vary. For example, some LHDs mentioned that a CHA or CHIP could be considered a formal, written strategy. Formats such as Memorandums of Understanding (MOU) and contracts with other organizations were also deemed formal, written strategies. Additional research could examine these formats to determine whether or not there are differences in effectiveness with the type of strategy used.

Chapter 3 of this dissertation highlighted the need for similar information regarding how these cross-sector collaborations support health outcome goals for marginalized populations, specifically the Hispanic community in rural areas. As noted in Chapter 2, findings in Chapter 3 indicated that larger LHDs were found to have more capacity for broader policy impacts around

physical activity promotion compared with smaller LHDs, indicating that rural areas may need support in implementing organizational strategies for building additional capacity. Cross-sector collaborations were considered strong when capacity allowed for building and maintaining long-term relationships with community partners, utilizing community health workers (CHW) and community navigators, conducting community-based participatory research (CBPR), and sharing resources among agencies to integrate social determinants of health (SDOH) into health promotion initiatives.

Chapter 3 also identified a need to plan for future and back-up funding mechanisms, similar to other studies.^{13,129} Interestingly, larger LHDs were thought to have more capacity for incorporating SDOH to enhance health equity initiatives and making policy decisions surrounding the built environment for health promotion. Public-private partnerships (PPPs) were suggested as one way smaller LHDs could enhance their capacity to foster organizational engagement in cross-sector collaborations for promoting physical activity. A recent systematic review of PPPs intended to encourage physical activity promotion described their ability to finance initiatives, implement diverse resources, and offer solutions to make improvements in communities.¹⁴ Because a barrier to physical activity promotion is that it is sometimes not prioritized within a community's CHA or CHIP, PPPs could also be utilized as a form of funding these initiatives since reporting requirements for funding allocations through a PPP may be less dependent on a CHA or CHIP.

The value of such partnerships between the public and private sectors in addressing public health needs has been documented in the literature.^{79,119} Simply because a CHA or CHIP does not include priorities like physical activity promotion, does not preclude the need for work in such areas. Questions such as "Would an MOU with varying private and public partners enable data collection for needs specific to the built environment and physical activity improve the health of the wider community?" could be asked to address complex needs not identified in a CHA or CHIP. Just over half of all LHDs have reported including data in their CHAs related to the built

environment and health,⁶² and because some LHDs do not have the resources to complete a CHA or CHIP, a PPP could offer resources that are otherwise unavailable to prioritize this work.

Yet, this dissertation noted a difference between community assessment activities and organizational strategies. In addition to community assessment activities, organizational strategies will be essential in understanding future needs for enhancing capacity to maintain program engagement and sustainability, particularly for smaller health departments serving rural areas where obesity prevalence is often high. Rural areas also have had a recent increase in a workforce identifying as Hispanic,⁷⁶ which highlights the importance of findings from Chapter 3 identifying a need to (1) prioritize subgroups within marginalized populations (i.e., Hispanic-identifying individuals from different countries from diverse parts of the world), (2) add culturally specific approaches for promoting physical activity, and (3) partner with organizations serving those populations.

Hispanic-identifying individuals should be incorporated into the public health workforce as CHWs and navigators. These roles could be utilized to work with businesses, community-based organizations, and faith-based organizations that serve the Hispanic community to build trust and partnerships. Such an infrastructure could encourage this marginalized population to participate in CBPR⁸³ which might (1) inform public health departments about how to better serve the community and (2) allow the organizations to share resources for integrating SDOH into planning initiatives. For example, studies have shown that CBPR utilizing CHWs is effective in promoting physical activity for Hispanic-identifying individuals.^{129,130}

Future research is needed into types of cultural approaches that could be used for this population by utilizing focus groups with various subsets of the population to identify successful approaches for promoting physical activity. Studies could also focus on factors such as how immigration policy affects physical activity for marginalized populations, particularly because these issues may exacerbate obesity prevalence. For example, some Hispanic-identifying

individuals who are not in the country legally or who are considered temporary residents could avoid participating in physical activity outdoors due to fears of exposure to immigration enforcement officials and deportation.

To include public health expertise in designing interventions for marginalized populations, formal, written strategies for cross-sector collaborations should define the shared purpose, governance, data, and financing of cross-sector collaborations, thus ensuring clarity. Chapter 4 utilized SHD case study information to develop organizational strategies that fit into the Cross-sector Alignment Theory of Change and can be tested using an implementation science framework for enhancing engagement and sustainability of health equity initiatives. Sustainability challenges for health equity initiatives include a lack of support from external community and political powers as well as conflicts with other organizational priorities.³¹ One of the most persistent challenges in studying sustainability has been the range of settings and sectors across health outcomes,⁸¹ highlighting the importance of implementation science for this work¹²⁷ so that context can be taken into account.

This dissertation adds to the literature by incorporating organizational strategies that can be guided by implementation science frameworks for testing the sustainability of health equity initiatives. Organizational strategies identified in Chapter 4 were categorized by enablers in the Cross-Sector Alignment Theory of Change: shared purpose, governance, data, and financing. The purpose of organizing the information in this manner was to guide future data collection for implementation science studies that might utilize the CDP/HLP Framework. Organizational strategies included naming program needs, quality improvement/evaluation for scalability based on evidence-based data sharing, maintenance of some activities while a program is dormant for potential reactivation in an emergency, and working with the state legislature for resources and enforcement of proposed activities.

Similar themes were found within Chapters 3 and 4 including the importance of relationship building across sectors as well as the need for program initiative champions to “manage up” for necessary resources. These findings also relate to Chapter 2, where results from the case studies in Chapter 4 included (1) the importance of written agreements in aligning goals among separate councils working on a particular initiative and (2) written proposals outlining the staff and resources needed to complete the intended work. While these written plans, and others including measurement and evaluation work plans, could assist in engagement and sustainability efforts, standardization of the term “LHD engagement” and the development of consistent measures for obesity prevention activities surrounding the built environment are needed for comparison of findings in different contexts.⁸¹

Utilizing an implementation science framework, like the CDP/HLP Framework, could assist in developing metrics and measuring organizational factors that affect LHD engagement and the sustainability of these cross-sector collaborations. Experts have called for multilevel indicators of program sustainability for both organizational characteristics and intervention-related factors.⁸¹ In terms of intervention-related factors, separating physical activity promotion and disease indicator specifics from other chronic disease programs could help in naming the FTEs necessary to dedicate to such activities. Such precision is lost when activities are grouped into larger categories that include several disease-specific prevention programs—for example, one LHD representative stated the chronic disease prevention program specific to nutrition and physical activity included obesity, diabetes, heart disease, asthma, and arthritis. Evaluation metrics are specific to the diseases rather than the prevalence and performance of initiatives related to physical activity. Funding needs for physical activity promotion activities may also be more informed with specific information about the number of FTEs necessary for this work.

Difficulty in the braiding of funds to support the collaborative engagement and sustainability of these cross-sectoral partnerships was a finding in Chapter 4, and this limitation has also been noted as a barrier to program sustainability in the public health literature.^{13,113} PPPs

were again suggested in Chapter 4 as a possible alternative mechanism for allocating resources towards these cross-sector collaborations. Two of the case studies utilized PPPs as a way of addressing the challenges of funding inflexibility and administrative logistics of braiding federal, state, and local funds. Finally, taking additional steps toward using implementation science for evaluating PPPs could offer the evidence-based data needed to support or refute the notion that PPPs can successfully support a LHD or SHD in enabling shared purpose, governance, financing, and data in these cross-sectoral collaborations for promoting health equity and reducing chronic disease disparities in the U.S.

As a whole this dissertation has extended the existing research regarding cross-sector collaborations in public health for promoting physical activity, advancing health equity, and reducing the prevalence of chronic disease in the U.S. These findings support the need for outlining a health department's shared purpose, governance, financing, and data with other sectors. Additionally, strengthening efforts regarding use of implementation science for measuring engagement and enhancing the sustainability of cross-sector collaborations is warranted. Expanded efforts to address funding and organizational capacity, particularly among rural communities and their LHDs, would help address SDOH and could function to reduce persistent chronic disease disparities among marginalized populations.

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APPENDICES

APPENDIX 1: Promoting Policies and/or Changes to the Built Environment

Healthy Eating	Physical Activity
Fiscal policies and/or local ordinances that discourage the consumption of unhealthy foods and beverages	Implementing Complete Streets or similar programs
Incentives for local farms to distribute locally	Improving access to bicycles, helmets, and related equipment
Ensuring laws and regulations allow breastfeeding in public places	Traffic enforcement programs to improve safety for pedestrians and bicyclists
Zoning regulations to enable healthy food providers to locate in underserved neighborhoods	Improving transit services and access
Public safety efforts to enhance accessibility to grocery stores	Encouraging recreational centers to be located within walking and cyclings distance
Establishing healthy mobile markets	Encouraging public-private partnerships with local gyms/recreational facilities to offer reduced-cost fees for low income residents
Land use policies/zoning regulations for community gardens and farmers markets	Land use policies that support mixed zone development
Creating private areas that support breastfeeding in public places	Building and/or maintaining a network of streets, sidewalks, and crossings that improves the walking and cycling environment
Land use and zoning policies that restrict fast food establishments near school grounds, public playgrounds and residential communities	Planning, building, and maintaining a well-connected network of off-street trails and paths for pedestrians and bicyclists
	Increasing destinations within walking and bicycling distance
	Increasing the availability of open spaces, including parks and community gardens
	Adopting policies that improve safety and security of streets, especially in higher crime neighborhoods

APPENDIX 2: Aim Two Interview Questions

Introductions: Please introduce yourself and describe your role at your agency.

Please answer the following questions about promotion of physical activity (1) overall and (2) particular to the Hispanic population.

1. As far as you know, do you have some form of a formal, written strategy in your local health department for addressing physical inactivity?
 - a. If so, what type of strategy is in place? (e.g., contract, memorandum of understanding, etc.)
2. Are staff or FTEs dedicated to promoting physical activity specifically in your LHD?
 - a. If so, how many, and what are their roles?
3. Describe how engaged your LHD is in promoting physical activity.
4. What capacity does your LHD have to influence policy change efforts that address physical inactivity inequities under the umbrella of other agencies such as housing, transportation, etc.?
5. How does your LHD engage communities experiencing health inequities to inform assessments of the policy environment related to physical activity?
6. Regarding physical activity promotion, how does your LHD evaluate its community engagement efforts, to ensure continuous learning and impact of partnering with communities?
7. How does your LHD collect or use data to support community collaborations and engagement related to physical activity?
8. Regarding physical activity promotion, how does your LHD allocate resources to support the meaningful participation of community partners, that are themselves experiencing health inequities, in decision-making and prioritization that affects the community?
9. Is there anything else you'd like to add that is relevant to how your agency serves the Hispanic population surrounding physical activity in particular?

APPENDIX 3: Aim Three Interview Questions

Introductions: Please introduce yourself and describe your role at your agency.

1. How have you worked with (or are working with) the (other agencies?) transportation sector on project(s) in the past (or currently)?
 - a. What did your SHD contribute and what did the transportation sector (or organization) contribute?
 - i. Funding: please specify grants and how much was invested. What made it easy or difficult to leverage these resources?
 - ii. In-kind staff support: what is the estimated FTE contribution and how was the position funded?
 - b. What would you describe as the nature of your relationship?
 - i. Would you consider the SHD to be a leader, collaborator, or both on the project(s)?
2. Can you describe how the project (or any work produced through this partnership) came about and how it was funded?
 - a. What performance measures or reporting processes were implemented to track outcomes or ensure project/partnership effort sustainability?
 - b. What are some efforts to ensure project/partnership effort sustainability?
3. Describe any direct or indirect efforts to address health inequities through the partnership/project.
4. What worked well with regard to this relationship/project?
5. What was a challenge in relation to the relationship/project?
 - a. Is there anything you would have changed or done differently and why?
6. Is there anything else you'd like to add or insights about this project/partnership that we have not discussed?

7. What advice or recommendations would you have for another agency implementing similar project(s)/building similar relationships?
8. Are you aware of additional/future funding opportunities for your SHD to collaborate with transportation agenc(ies)?
9. Do you have any supplemental materials (e.g., data or reports) to share with us?