



**Exploring the Integration of Community Health Workers in a University Health System:
A Qualitative Study**

By

Erin McCarville

B.A. Pomona College, 2003

M.P.H., Johns Hopkins Bloomberg School of Public Health, 2006

DISSERTATION

Submitted in partial fulfillment of the requirements for the degree of Doctor of Public Health in
Leadership in the School of Public Health of the University of Illinois at Chicago

Chicago, Illinois. USA

December 2020

Dissertation Committee:

Preethi Pratap, PhD (Chair)

Molly Martin, MD, MAPP (Department of Pediatrics)

Karen Peters, DrPH (Community Health Sciences)

Eve Pinsker, PhD (Community Health Sciences)

Steve Seweryn, EdD, MPH (Epidemiology and Biostatistics)

Dedication

To my children, Clara, Calvin and August, who never cease to ask, “When are you going to be done with this doctor thing?”

To the rest of my family for supporting me so that “this doctor thing” can happen.

And to community health workers everywhere who inspire me to understand.

Acknowledgements

I gratefully acknowledge that substantial contributions by countless individuals enabled the successful completion of this dissertation product.

First, my dissertation chair Dr. Preethi Pratap served as an endless source of encouragement, support, and practical guidance as I navigated this dissertation process. Her practical approach to “putting one foot in front of the other” ensured that I didn’t stall—even in the face of a pandemic. And her confidence in my abilities buttressed me when I did not have enough of my own to draw upon.

My dissertation committee—including Dr. Steve Seweryn, Dr. Eve Pinsky, Dr. Karen Peters, and Dr. Molly Martin—pushed to ensure that I maintained both methodological rigor and practice relevance. Their wealth of knowledge and experience served as a critical spring feeding my work. Of particular note is the generosity of Dr. Martin in accepting my unsolicited requests for mentorship. This dissertation could not have been completed without her support of my work or her critical practice-based expertise.

Additionally, the UIC CHW Taskforce Leadership Team served as necessary gatekeepers and invaluable advisors in guiding and informing the research process. It is my sincere hope that this research benefits their critical mission.

Those research participants, experts in their experience and generous in their time, were both the reason for and the building blocks of this dissertation. Without their voluntary contribution to this research, nothing would have been possible. And so, this dissertation strives to be worthy of their contributions.

My DrPH cohort played the dual role of mentor and friend. Providing critical emotional support when I needed it most and setting examples in the own lives that I wish to follow. This highlights the important role of “mentor” that so many in my life have generously and selflessly played. My personal and professional mentors (TB, VB, MM, AS, AZ, EE, GD, CC, JP, JW) have challenged me to take risks and to work harder, have questioned the limits that I set upon myself, have provided examples for

which I seek to emulate, and have shared the wisdom that they have collected. Without this mentorship, this dissertation would have never happened.

And last but certainly not least, my family: Jeff, Clara, Calvin, August, Nana, Senor, Megan, Michael, Patrick and the cadre of outlaws and chosen family I have gathered along the way. You provide the love when I need it, the help when I can't ask for it, the confidence when I have none, and the motivation to be a better being. I love you now and always.

Table of Contents

List of Tables.....	vi
List of Figures	vii
Keywords/Abbreviations.....	viii
Summary	ix
Chapter 1: Background and Problem Statement.....	2
Chapter 2: Conceptual and Analytical Framework.....	27
Chapter 3: Study Design, Data, and Methods.....	53
Chapter 4: Results.....	73
Chapter 5: Discussion	128
Cited Literature	154
Bibliography	162
Appendices	163

List of Tables

Table 1	Elements of effective team-based care	28
Table 2	Application of leadership theory to CHW model	33
Table 3	Connection between theory and research questions	45
Table 4	Summary of dissertation research design	57
Table 5	Action research stakeholder group involvement	60
Table 6	Assessing study validity and reliability	70
Table 7	Connection between research questions, manuscripts and key findings	72
M1, Table 1	Subunit Sample Characteristics	83
M1, Table 2	Individual, team, organization, and community-level factors that serve to support CHW integration	92-93
M2, Table 1*	Health system and community-level factors associated with effective CHW integration within clinical care teams	104-105
M2, Table 2	Health system and community-level integration scores	105
M3, Table 1	Elements of a CHW's roles and responsibilities	118
M3, Table 2	Perceptions regarding a CHW's role purpose, value and effectiveness from the perspective of administrators/clinicians and CHWs	120
Table 8	Changes to factors included in the conceptual framework	134-135
Table 9	Factors associated with effective integration of CHWs	137
Table 10	Connection between practitioner recommendations, evidence supporting recommendations, and recommended next steps for the UIC CHW Taskforce	146

*Table numbering in manuscripts is distinct from the rest of the dissertation. M1, Table 1 refers to Manuscript 1, Table 1

List of Figures

Figure 1	Pre-Conceptual model for Integration of CHWs into clinical care teams	26
Figure 2	The Chronic Care Model	39
Figure 3	Healthy Teams Model	39
Figure 4	“The Integration of CHWs into Primary Care Health Systems: The Time for New York is Now!”	40
Figure 5	A CHW “Logic Model” Toward a theory of enhanced performance in low- and middle-income countries	41
Figure 6	Overview of contexts and mechanisms that influence CHWs’ trusting relationships with the community and health sector	42
Figure 7	Conceptual framework visualizing CHW performance as a transactional social process	43
Figure 8	Conceptual framework for integration of CHWs into clinical care teams	46
Figure 9	Study design description	52
Figure 10	Action research model	58
Figure 11	Action research intersection	59
Figure 12	Analysis plan flow chart	69
M2, Fig 1	Health System and Community Integration Scores (% of total) by sub-unit	105
M2, Fig 2	Mapping representation of sub-units along integration spectrums	106
M3, Fig 1	Relative alignment in perceptions of a CHWs role and purpose between groups	120
Figure 13	Code frequencies across sub-units for a prior and emergent codes applied	124
Figure 14	Code map depicting relationships between codes across all sub-units	125
Figure 15	Frequency of codes by sub-unit	126
Figure 16	Modified conceptual framework	137

Keywords/Abbreviations

ACA	Affordable Care Act
ACO	Accountable Care Organization
AHRQ	Agency for Health Research and Quality
CBHW	Community Based Health Worker (<i>sometimes used interchangeably with CHW</i>)
CBO	Community Based Organization
CDC	Center for Disease Control and Prevention
CFIR	Consolidated Framework for Implementation Research
CHW	Community Health Worker
CMMI	Center for Medicare and Medicaid Innovation
DESCARTE	Design of Case Research in Health Care
DrPH	Doctor of Public Health
EMR	Electronic Medical Record
HR	Human Resources
ICER	Institute for Clinical and Economic Review
IOM	Institute of Medicine
PCMH	Patient Centered Medical Home
PCP	Primary Care Provider
SDOH	Social Determinants of Health
SPH	School of Public Health
UI Health	University of Illinois Health and Hospital System
UIC	University of Illinois at Chicago
WHO	World Health Organization

Summary

Community Health Workers (CHWs) offer an evidence-based strategy for addressing social determinants of health (SDOH) within the healthcare sector to improve patient experience, health outcomes, and reduce costs. But in order for CHWs to meet their objectives, they must be effectively integrated into the health system in which they are working. It is therefore imperative that organizations understand the critical factors that are necessary for CHWs to be effectively integrated into clinical care. For this dissertation, a qualitative descriptive multiple embedded case study was completed. The goal of the research was to understand the ways in which CHWs are utilized, perceived, and integrated into a health care system in order to identify those critical factors for effective integration. The case of study was the University of Illinois at Chicago's Hospital and Health Science System (UI Health) which is in the process of establishing a program or infrastructure to support the development and sustainability of a CHW workforce that is integrated with clinical care services across the UIC system. The embedded subunits of analysis were clinical care teams within the UI Health System that are currently using CHWs to assist with the provision of clinical care to patients. The data methods, analysis and findings were informed by check-ins with a key stakeholder group—The UIC CHW Taskforce Leadership Group—through an action research process. Data were collected through document review and semi-structured interviews of multiple members of the clinical care team including administrators, clinicians, and CHWs. Findings suggest that, in addition to commonly recognized elements of effective CHW integration including training, supervision, and the presence of a champion, programs must consider the organizational context in which the program is positioned as well as the ways in which both CHWs and the organization engage with communities served. Additionally, alignment in perceptions regarding a CHW's role and purpose was perceived to be critical for CHW integration. When perceptions regarding CHWs were both positive and aligned, respondents reported higher levels of integration within the healthcare system. Finally, this research brings attention to the need for considering integration in the community as well as the health system. CHWs, and the health systems that employ them, must consider the inherent tradeoffs between the needs of clinical and community-level integration. This research can serve as a roadmap for health systems that seek to integrate CHWs within health care services and can be used to promote best practice in CHW integration.

Chapter 1: Background and Problem Statement

Study Objectives

While, in recent years, the United States has made great advances in the fields of public health and healthcare in preventing disease and improving health outcomes, we continue to fail the most vulnerable. Low-income and minority communities disproportionality struggle with complex health needs. “Novel approaches to address the risks and multiple needs of vulnerable populations is an important public health imperative (Kim et al., 2016, pg e4).” The field of public health has long recognized the importance of social determinants of health (SDOH) in addressing complex health problems. By contrast, historically, the healthcare field has focused primarily on individual health promotion—either through behavior change or healthcare intervention. But this trend is beginning to change. The movement towards Patient Centered Medical Homes (PCMH), reflects a shift in healthcare toward understanding the patient experience. The Affordable Care Act (ACA) has advanced this movement further by creating standards and incentives for preventive care and population health outcomes. With this shift comes a recognition that important social factors such as housing, economics, education, social support, culture, neighborhood, and healthcare access are important drivers of the health of the individual. Healthcare agencies are increasingly assuming responsibility for these broader social factors that influence health.

One strategy that health systems are employing is the implementation of Community Health Worker (CHW) programs in clinical care settings to achieve health reform goals. This chapter will describe the growing body of evidence that demonstrates that CHW interventions are effective in managing complex health conditions and promoting healthy behaviors. Moreover, it will demonstrate that CHW interventions have been shown to be cost effective, particularly in low-income, underserved, and minority communities. Thus, implementation of CHW programs offer opportunities for healthcare agencies to address SDOH—particularly among patients with complex health and social needs. This body of evidence, coupled with the changing healthcare landscape, has contributed to a marked increase in the use of CHWs in the clinical care context as part of clinical care teams. Some in the sector, recognizing this movement, argue that CHWs are an “emerging healthcare workforce” in the US (Rodgers et al., 2018). Allen et al argued that “CHWs are poised to enter the mainstream of healthcare.” But they also note that “without careful and thoughtful consideration, CHWs could get lost in the healthcare system (Allen et al, 2015, pg 1).”

One notable challenge in the implementation of CHW programs in the healthcare sector, is a difference in care philosophy and approach between traditional healthcare roles (e.g. doctor, nurse, or medical assistants) and CHWs. This may be due, at least in part, to the structure of the health systems in which traditional health care providers are trained and employed. CHWs and healthcare providers have different underlying paradigms related to disease prevention and health promotion. While CHWs view their work to be long-term and relationship-driven, traditional healthcare models are more transactional and time-limited. In healthcare, health problems are “solved” with treatment. Whereas, CHWs “understand” health problems within the greater environmental context; and it is the process of understanding the contextual factors associated with a problem that leads to a solution.

Implementation of CHW programs within the healthcare context requires a careful consideration of these differences in order to effectively integrate the two approaches. Moreover, the implementation of CHW programs within healthcare systems can be affected by barriers within the organization or system—such as hiring difficulties, funding or documentation requirements—that set limits on a CHW’s ability to perform their role. Thus, the question of effective integration is paramount. It is imperative that leaders in the healthcare field understand the factors associated with effective integration of CHWs into the clinical care context if CHW program delivery is to be successful.

The question of how to integrate CHWs into the healthcare system mirrors a larger movement to connect the public health and healthcare sectors. In this way, CHWs offer one lens in which to examine the question of how public health and healthcare sectors can be effectively merged in order to address complex health needs of vulnerable populations. Moreover, this study will take a unique systems perspective on the question of integration in order to allow for a broader more nuanced understanding of the problem.

The objectives of this study are as follows:

- (1) To use an action learning framework to explore how CHWs are currently being used in the provision of clinical care within the University of Illinois at Chicago Health and Hospital System.
- (2) To understand perceptions regarding CHWs in the provision of clinical care among different members of the care team—including the extent to which CHWs are meeting objectives.

(3) To explore the ways in which CHWs are currently being integrated into the healthcare system and/or clinical care team as well as the factors (gaps and opportunities) associated with CHW integration.

(4) To use a system's perspective to illuminate ways in which individuals, teams and organizational systems within a health and hospital system may address gaps and leverage opportunities to enhance CHWs integration efforts.

It is anticipated that findings from this research could provide a practical roadmap for healthcare organizations interested in implementation of CHW programs in order to ensure the effective integration of CHWs and robust patient outcomes.

Background and Context

CHW History

Evidence more contemporary CHWs models within the US healthcare system can be traced back to the mid-1960s in which several programs used “neighborhood health aids”, modeled after the “barefoot doctor” programs in rural China, to improve health among underserved populations such as immigrants, farmworkers, the urban poor, and native communities (Witmer et al., 1995). Early programs were typically funded by the federal or local governments and operated by governmental agencies such as public health departments or community health centers (HRSA, 2007).

In the 1990's there was a notable movement toward community-oriented public health policy (HRSA, 2007). Additionally, there was growth in state and federal policies to professionalize and regulate CHWs as part of the health care system (Bovbjerg et al., 2013). For example, in 1999, Texas was the first state in the country to enact legislation to certify CHWs (Nichols, 2005). Over the next decade, other states followed suit. The American Public Health Association formally recognized CHWs as public health professionals in 2001 (APHA, 2001). And in 2010, the U.S. Department of Labor recognized CHWs as a “labor category”, thus capping this transition—moving CHWs from a concept into a recognized member of the public health workforce (BLS, 2020).

At this same time, the public health scientific base began focusing research attention on the use and application of CHWs to improve population health. In the last 10 years, articles about CHWs began appearing more prominently in leading journals, thus increasing professional visibility and public health interest (Martinez et al., 2011; Rosenthal et al., 2010; Singh & Chokshi, 2013). Additionally, issue briefs focused attention to national and state thought leaders on the topic of CHW programs (ASTHO, 2012; Goodwin & Tobler, 2008; NECEPAC, 2013; Sprague, 2012).

But possibly the watershed movement in solidifying the CHW workforce identity was the passage of the Affordable Care Act in 2010. The ACA recognized CHWs as important members of the healthcare team. It also created opportunities to bill for CHWs as part of healthcare interventions to deliver preventive services such as health education, home health, and care management. By describing roles for CHWs within the healthcare context, the ACA created a pathway for the use of CHWs in healthcare (ACA, 2010). Since 2010, there has been an increased movement to define CHW roles and responsibilities. This includes the refinement of CHW definitions, the development of committees to establish CHW roles/responsibilities, and the creation of CHW training and certification programs to standardize the field (London et al., 2016).

The number of CHWs employed within the United States has grown significantly in recent years. According to the Bureau of Labor Statistics, over 56,000 Community Health Workers were employed in the US in 2018—a statistic that has grown every year since its inception in 2010. Notably, the number of CHWs in the US has grown by over 17% in the last 5 years alone (BLS, 2020). But this statistic is likely a significant underestimate given the broad range of professional titles used for a CHW workforce.

Definitions

A number of organizations—including the CDC, the WHO, public health institutes, and CHW alliances—have published differing definitions for the CHW.

The World Health Organization (WHO), for example, offers one definition of CHWs, proposing that “Community health workers should be members of the communities where they work, should be selected by the communities, should be answerable to the communities for their activities, should be supported by the health system but not necessarily a part of its organization, and have shorter training

than professional workers (WHO, 2007).” Thus, this definition focuses on a CHW’s origins and acknowledges the CHW may be placed outside of the health system in which they are working. While this definition illustrates the importance of a CHW’s positioning in the community, it may not fully recognize the growing movement to engage CHWs as part of the healthcare system.

The Health Resource Services Administration (HRSA), states “Community health workers (CHWs) primarily work in underserved communities and are a resource to help advance goals of improved care coordination, health equity, and population health. They assist individuals and communities by working in a broad range of capacities that include care coordination, case management, health coaching, health education, health assessment and screening, resource linking, medication management, remote care, patient follow-up, and social and literacy support (HRSA, 2016). This definition assumes that CHWs work in underserved communities and defines the workforce based on their goals and roles.

The Centers for Disease Control (CDC), defines a CHW as “a frontline public health worker who is a trusted member or has a particularly good understanding of the community served. A CHW serves as a liaison between health and social services and the community to facilitate access to services and to improve the quality and cultural competence of service delivery (CDC, 2016).” While this definition recognizes that a CHW must have “understanding” of the community served, it does not go as far as the WHO in establishing origin from within that community. Moreover, this definition places emphasis on a bridging role between health and social services, thus establishing a CHW’s presence within the health system.

Possibly the most predominate definition within the public health context is one established by the American Public Health Association’s (APHA). According to the APHA, a community health worker (CHW) is defined as “a frontline worker who is a trusted member of and/or has an unusually close understanding of the community served. This trusting relationship enables the worker to serve as a liaison/link/intermediary between health/social services and the community to facilitate access to services and improve the quality and cultural competence of service delivery... A CHW builds individual and community capacity by increasing health knowledge and self-sufficiency through a range of activities such as outreach, community education informal counseling, social support and advocacy (APHA, 2020).” The appeal of this definition is the fact that it builds upon the concept of

understanding a community and establishes the concept of a “trusting relationship.” It also describes both who a CHW is and what s/he does.

The range of CHW definitions illustrate that the CHW workforce is broad and diverse. CHWs serve a number of roles and responsibilities that may differ depending on the community needs and work context. Moreover, CHWs draw on a number of different skills in conducting their work. These skills are sometimes categorized into “hard” and “soft” skills (Bovbjerg, 2013). “Hard” skills are those occupational skills that are necessary to perform typical job tasks—such as health knowledge, understanding of environmental assessments, and knowledge of environmental and social determinants of health. Conversely, “soft” skills are personal attributes that are important to the CHW role. This may include interpersonal and observational skills, the ability to problem solve, and empathy. Some argue that these “soft” skills are more important than health training or expertise. They describe the distinguishing characteristics of CHWs as “natural helpers” within a community (Cherrington et al., 2010; Israel, 1985; Kangovi et al., 2018). A CHW’s actual job responsibilities thus flow from the needs of the individuals and communities served. So, a CHW’s roles and responsibilities may be quite diverse depending on each community context. As a result, the field has struggled to clearly define and standardize the workforce.

Despite this fact, in recent years, many in the field have worked to create more standardization and structure. For example, in 2016 the Community Health Worker Core Consensus Project identified core roles and competencies for CHWs (C3Project, 2019). Roles include: “(1) providing culturally appropriate health education, (2) care coordination, case management and system navigation, (3) providing coaching and social support, (4) advocating for individuals and communities, (5) building individual and community capacity, (6) providing direct service, (7) implementing individual and community assessments, (8) conducting outreach, and (9) participating in evaluation and research (C3Project, 2019).”

These broad definitions reflect the reality that the CHW field is defined more by its close relationship with a specific community than by a clear set of roles and responsibilities. This is driven by a long professional history of relational community-based service delivery. “CHWs typically work as part of a multifaceted intervention; for example, as part of a medical team or alongside other public health or social workers (Bovbjerg, 2013).” They are thus expected to perform successfully in team-based work

environments and, as such, must be able to work with multiple disciplines. They are often described as “connectors” in health service delivery due to their role providing a figurative bridge between the community and other health and social services (Bresciani, 2019).

Training and Certification

In addition to standardizing CHW definitions and responsibilities, there has been a marked increase in efforts to standardize training and certification of the CHW workforce. Over the last decade, a number of states and territories have developed CHW certification programs. As of 2017, 16 states established CHW training/certification programs and/or laws regulating the establishment of CHW certification program requirements. An additional 4 states are in the process of creating an entity for establishing CHW program requirements (ASTHO, 2017). But there is no national standard curriculum for CHW training nor is there a standardized certification of the CHW workforce. Some CHW advocates argue that a standardized curriculum may be detrimental in that standards may not have the flexibility to conform to regional, local, cultural, or community differences (Snyder, 2016).

The CHW workforce, like its roles, are extremely diverse. CHWs often have differing background including personal experiences, health expertise and education or training. Some receive on-the-job training while others may have more advanced professional degrees. Some CHW positions are volunteer or temporary while others are part of a professional career path. Generally, those CHWs working in the healthcare sector have had a greater emphasis placed on degrees, certification and training (Bovbejerg et al., 2013). This aligns with the general emphasis within the healthcare sector on training and education as an important component of the healthcare hierarchy.

While the movement to establish and standardize training and certification for CHWs plays an important part in establishing the identity of the CHW workforce, this technical solution is not necessarily sufficient to ensure the success of CHWs programs in improving population health. In order to achieve this, we must first understand the roles that CHWs perform, the outcomes they achieve, and how they fit into the greater public health and health systems.

CHW Evidence Base

Research into CHW interventions began in earnest in the early 2000’s. Early research found strong evidence for the CHW interventions in improving immunizations and promoting breastfeeding (Lewin

et al., 2005). Later that decade, research showed the potential of CHW programs to manage chronic diseases including childhood asthma, diabetes and hypertension (Brownstein et al., 2007; Norris et al., 2006; Postma et al., 2009; Reinschmidt et al., 2006). In recent years, we have seen growing evidence for the potential of CHWs to deliver effective risk reduction programs including heart disease, obesity, HBP and cholesterol (Baig et al., 2010; Islam et al., 2016; Palmas et al., 2015; Postma et al., 2009; Schroeder et al., 2018; Spencer et al. 2011). CHWs have also been shown to be effective in promoting healthy behaviors such as cancer screening and medication adherence as well as physical activity, nutrition and smoking cessation (CPSTF, 2015; Islam et al., 2016; Kangovi et al., 2018; Kim et al., 2016; Martinez et al., 2011). In a 2013 review, the Institute for Clinical and Economic Review (ICER) evaluated 46 CHW health outcome studies of “good or fair quality” and found positive findings for a range of health conditions and preventive activities (ICER, 2013).

More recently, research has focused on the cost effectiveness of CHW interventions. Notably, CHW interventions have been shown to be cost effective, particularly in low-income, underserved, and minority communities. The Tri-County Rural Health Network program found a 3:1 return-on-investment in using CHWs to provide home and community-based care (NEHI, 2015). Another study focusing on “high-resource-consuming Medicaid members” found reductions in ER visits resulting in \$2 million in cost savings (Johnson & Gunn, 2015). The same ICER review described above also evaluated 14 studies that examined the economic impact of CHW programs. The majority of interventions showed net cost savings (ICER, 2013). More recently, a 2017 review of economic evaluations of international CHW programs noted that all 19 evaluated interventions were “found to be either cost-effective or highly cost-effective (Nkonki, 2017).” Domestically, a recent evaluation of healthcare innovation grant recipients conducted by the Center for Medicare and Medicaid Innovation (CMMI) found that, of all healthcare innovations evaluated, interventions employing CHWs were the only intervention associated with cost savings; these interventions were found to lower costs by \$138 per beneficiary per quarter (CMMI, 2017).

Other studies have found that CHW interventions within the healthcare system can improve the patient care experience as well as direct patients to lower-cost health care options—such as primary care physicians—or reduce unnecessary healthcare utilization (Enard & Ganelin, 2013; Fedder et al., 2003; Kangovi et al., 2014).

This growing body of research demonstrating the potential for CHW interventions to (1) address SDOH, (2) reduce healthcare costs, and (3) improve healthcare delivery have helped to contribute to the increasing popularity of CHW programs in the healthcare sector. But another equally important factor has contributed to CHWs' increasing prominence—the healthcare sector is entering an “era of delivery system” reform. CHWs have grown in prominence as one possible vehicle for this reform.

Era of Delivery System Reform

Over the past two decades, the healthcare sector has undergone significant reform—evolving to place a growing emphasis on the patient experience while also recognizing the importance of SDOH in promoting health, preventing disease and reducing costs. This movement has been driven by a number of factors including rising healthcare costs, shortages in the primary medical care workforce, expanding healthcare coverage, and changing financial incentives for care. But it has also been motivated by a recognition that the healthcare system, as it was designed, is failing patients.

The IOM's landmark 2001 report “Crossing the Quality Chasm” served as a call-to-arms in the effort to address flaws in the US healthcare system (IOM, 2001). This report describes a healthcare system that is “overly devoted to dealing with acute, episodic care needs,” and argues that clinical programs need to establish multidisciplinary infrastructure to provide services to people with chronic conditions. Moreover, it notes that clinical care is overly complex and uncoordinated. It calls for the “sweeping redesign of the entire health system”, and it recommends that the healthcare system focus on the goal of providing “care that is safe, effective, patient-centered, timely, efficient, and equitable.” In order to achieve these goals, the report identified the following “redesign imperatives”:

- “Reengineered care processes
- Effective use of information technologies
- Knowledge and skills management
- Development of effective teams
- Coordination of care across patient-conditions, services, sites of care over time (IOM, 2001)”

Since “Crossing the Quality Chasm” was published, great effort has been put into reforming how healthcare is delivered in the US. Emerging from this reform is the concept of the “quadruple aim”—which establishes three goals of “(1) improving the experience of care, (2) improving the health of populations, (3) reducing per capita costs of health care”, and (4) improving the work life of health

professionals (Berwick et al., 2008; Bisognano & Kenney, 2012; Bodenheimer & Sinsky, 2014). This triple aim is increasingly influencing healthcare policy and structure. With this shift, comes a recognition that important social factors such as housing, economics, education, social support, culture, neighborhood, and healthcare access are important drivers of the health of the individual. Healthcare agencies are increasingly assuming responsibility for these broader social factors that influence health.

One strategy commonly employed in healthcare reform is the movement towards re-designing care delivery models. Traditional models of healthcare typically place the physician at the center of care. These “physician-centered” models, which are designed to optimize physician performance, can often result in higher costs and increased system complexity for the consumer (Dower et al., 2006). Healthcare agencies are beginning to place more emphasis on the needs of patients, rather than the provider, through a range of approaches including Patient Centered Medical Homes (PCMH), interdisciplinary care teams, and task shifting. Many of these components of healthcare reform intersect with efforts to engage CHWs within the healthcare system.

PCMH: The Agency for Healthcare Research and Quality (AHRQ) defines a medical home “not simply as a place, but as a model” of organizing primary care that delivers five core functions: “(1) comprehensive care, (2) patient-centered design, (3) coordinated care, (4) accessible services, and (5) quality and safety (AHRQ, 2018).” Over the past 10 years, PCMH models have grown in prominence and popularity. Today, multiple national accreditation, certification and recognition programs exist to define and reward PCMH models. Arguably a CHW workforce can serve to support many of these PCMH goals.

Interdisciplinary/Multidisciplinary Care Teams: Most PCMH models incorporate integrated or interdisciplinary care teams as one component in their model. The concept of the interdisciplinary care team first gained popularity through the inpatient care of complex diseases—such as cancer and intensive care units—as a way of coordinating care across multiple medical disciplines (Kim et al., 2010; Fennell et al., 2010; Epstein, 2014). But more recently, this approach has been identified as a tool to manage common chronic diseases such as asthma and diabetes. In these latter models, the concept of an interdisciplinary or multidisciplinary care team has been expanded outside the traditional clinical scope of practice into more community-based services including care coordination,

health education, home visitation, and medication management (Wagner, 2000). Sometimes these models are described as “Community Care Teams (CHCS, 2015).” CHWs are commonly used to provide community-based services and education as part of multidisciplinary care team models to improve chronic disease care (Klein & Hostetter, 2015). Evidence also suggests that “well-organized multidisciplinary teams increase patient satisfaction and reduce doctor and staff burnout (Leach et al., 2017).”

Interprofessional Education: One tool that is gaining increasing popularity as a mechanism to promote interdisciplinary work, is interprofessional education. According to the WHO, Interprofessional Education occurs “When students from two or more professions learn about, from and with each other to enable effective collaboration and improve health outcomes” (WHO, 2010). This approach to education is often used to promote the goal of Interprofessional Collaborative Practice, which involves the engagement of multiple disciplines working together to provide patient care (IPEC, 2011). At times, Interprofessional Team Based care is used interchangeably with Interdisciplinary or Multidisciplinary Team Based Care.

Task shifting: One argument for interdisciplinary care teams is the principle of task shifting. This is based on the idea that, in order to improve efficiency and reduce healthcare costs, all practitioners should be performing tasks that they are uniquely qualified/trained for and that cannot be performed by another individual. This is sometimes referred to as practicing at the “top” of one’s license. Conversely, practicing at the “bottom” of one’s license, or performing tasks that can be performed by others with less training, “can be expensive for taxpayers, is draining (or demoralizing) for clinicians, and causes patients to wait longer to get timely and effective care (Lysaught, 2013).” Thus, task shifting—or task sharing—is a process of sharing roles that are sometimes unnecessarily performed by clinicians (such as care coordination, health education, or scheduling) with other members of the care team. CHW models offer an opportunity for all members of a care team to practice at the top of their license by shifting tasks not directly associated with clinical care or treatment to CHW team members. “It is estimated that up to 47% of chronic care and 77% of preventive care could be delegated to other team members, potentially offsetting demand for doctor services while improving access to care (Leach et al., 2017).”

CHWs and Healthcare

There are clear pathways for how CHWs can be employed in all of these facets of healthcare reform. As a result, trends in healthcare reform have led to a growing interest in the potential of the CHW workforce within the healthcare sector. But the movement to reform healthcare was further energized by the passage of the Affordable Care Act (ACA) in 2010. The ACA included a number of incentives for preventive health, population health, and programs that address SDOH. For example, the ACA promoted the use of value-based payments in which providers are incentivized to focus on preventive care by retaining some of the costs savings associated with reduced healthcare utilization. “These innovative payment models create mechanisms to incorporate CHWs within payment structures that can both improve patient outcomes and achieve cost containment goals.” (NEHI, 2015) In addition to creating new payment structures such as value-based payments, the ACA also established “Health Homes” to provide coordinated care to Medicaid beneficiaries with chronic health conditions. This structure requires that healthcare systems take a patient-centered perspective and create opportunities for lay health-workers, such as CHWs, to be involved in team-based care. Martinez et al note that “Both [Affordable Care Organizations (ACOs) and Health Homes] stress the importance of interdisciplinary, interprofessional health care teams, the ideal context for integrating CHWs (2011, pg e1).”

The ACA also established the Center for Medicare and Medicaid Innovation (CMMI) which serves to fund grants for innovative care models in order to reduce healthcare costs. A number of recipients of CMMI’s Health Care Innovation Awards (HCIAs) and State Innovation Model (SIM) grants proposed using CHWs to optimize care and lower costs—data from grantees suggests that CHWs offer a promising model for cost savings (Bir et al., 2018; Moffett et al., 2018).

Leaders in the field are now considering how to advance this progress further. For example, Shortell argues that we must do a better job of integrating health care, public health and community development. We must move from patient-centered care to population-centered care. This can only be done by re-thinking the "place" that healthcare is delivered and the “person” providing care (Shortell et al., 2013) Thus, Shortell is arguing for more models that move clinical care from the clinic into the community. He argues that we should think beyond the physician in the delivery of care—

thus advocating for a CHW care-delivery model (2013)—one that engages CHWs to assist with providing health services to patients where they are.

Notably, a recent assessment of innovative primary care practices engaged in healthcare reform found the following innovation areas improve care: (1) primary care team structures, (2) enhanced role of other care team members in providing care, (3) inclusion of laypeople in care, (4) behavioral health integration, and (5) improved clinic/community connections (Wagner et al., 2017). CHW models intersect with each of these recommendations—offering a potential vehicle to reform care delivery across multiple aims.

Thus, healthcare reforms—including a growing emphasis on SDOH and population health, care model redesign, and cost savings—coupled with a growing body of evidence that CHW models can promote healthy behaviors, improve disease management and reduce costs, has led to the marked increase in CHW programs within the healthcare context. As such, in recent years, CHWs have been described as an “emerging workforce” within the healthcare sector (Rodgers et al., 2018).

An “Emerging Workforce

The fact that the CHW workforce—with its long history of community-based service delivery—is viewed as new or “emerging” by the healthcare sector is indicative of the recent and marked increase in CHW employment within this sector. This trend has been documented in the literature by researchers who describe a recent “shift in CHW employment settings from community-based organizations to hospitals/health systems (Malcarney et al., 2017).” Moreover, “experts have called for a variety of policies to accelerate the adoption and growth of CHW programs in the health care system.” Leading to some experts to predict that CHWs will have growing prominence as a healthcare workforce within the US healthcare system in the future (Kangovi et al., 2015).

It is expected that these trends in healthcare reform are likely to continue and possibly accelerate as an increasing percentage of the healthcare workforce recognizes the need to re-think how clinical care is delivered. In 2000, Gladwell described a tipping point as “a place where the unexpected becomes expected, where radical change is more than a possibility. It is—contrary to all our expectations—a certainty (Gladwell, 2000, pg 13).” We are arguably reaching a tipping point in healthcare reform and

in the use of CHWs (Arnold, 2018). As such, the growing utilization of CHWs as a healthcare workforce is expected to continue.

This trend has potential to improve healthcare service delivery and achieve healthcare's "triple aim." CHWs "can serve as critical connectors between health systems and communities (Johnson & Gunn, 2015)." They facilitate access to high quality healthcare, improve culturally sensitive healthcare delivery, and emphasize preventive and primary care services (Johnson & Gunn, 2015). Moreover, lay health workers, such as CHWs, are often viewed as "bridges" between community and healthcare services. They are "uniquely situated between public health and healthcare and have a particularly important role in representing the communities served (Allen et al., 2015, pg 5)." But the process of bridging two different worlds—with different cultures, priorities and procedures—has the potential to pose challenges for CHWs and for the healthcare context in which they are situated.

Klein et al note, "Many CHWs come from the communities they serve, and often speak the same language—literally or figuratively—as the patients living there. They call upon that shared experience to build relationships with patients, and in turn use their knowledge of patients' neighborhoods and cultures to help providers fine-tune their approaches to the patients they serve. In this way, they differ from social workers, nurse case managers, or others tasked with helping people with complex needs (Klein & Hostetter, 2015)." These fundamental differences in background and approach can pose challenges for the CHW workforce as it transitions from community-based programming into the healthcare sector.

The healthcare sector is increasingly embracing approaches that value speed and efficiency (Martin, 2014). Most healthcare is still provided in fee-for-service environments where care providers are compensated based on the volume of patient encounters. Thus, providers are incentivized to increase the number of patient visits and decrease time per patient encounter. This approach to healthcare delivery was described by one key informant as "transactional" and "time limited (Rush, 2019)." Conversely, CHW care delivery is typically not compensated through a fee-for-service pay structure, although there are some notable exceptions, such as the state of Minnesota which allows for CHW services to be billed via fee-for-services payment mechanisms (mnchwalliance.org). Typically, CHWs prioritize relationships and derive knowledge from a deep understanding of a community as well as the individuals residing in that community. Relational skills such as communication, interpersonal

skills, teaching ability, and care coordination skills are highly valued. As a result, CHW roles tend to be more relationship-based and less transactional (Kangovi et al., 2018).

This poses a fundamental challenge for CHWs who are employed to work in the healthcare sector. Healthcare organizations may lack the infrastructure and culture to accommodate a CHWs different approach to care delivery. Carl Rush, Principal at Community Resources LLC, a CHW consulting firm, notes that CHWs may feel pressure to conform to a healthcare agency's dominant culture. The healthcare sector risks diluting the positive impacts of CHW interventions if CHWs are forced to conform to a more transactional and time limited approach (Rush, 2019).

As the use of CHW interventions within the healthcare sector grows, it is imperative that careful consideration is given to how these two care delivery models can be integrated in order to ensure that CHWs can continue to meet the goals of improved population health through community-informed care delivery.

Integration

As CHW programs have increased in prominence, researchers have begun to explore and describe the implementation of CHW programs in the healthcare context. A growing body of literature suggests that integration within the healthcare system is necessary for CHW program effectiveness (Allen et al., 2015; Collensworth et al., 2014; Kangovi et al., 2015; Findley et al., 2014; Johnson & Gunn, 2015; Martinez et al., 2011; Wennerstrom et al., 2015). A feasibility study conducted by Wennerstrom et al. explored the potential of using CHWs in the primary care setting. They concluded that it was “feasible to integrate behavioral health focused CHWs into primary care settings (Wennerstrom et al., 2015, pg 263).” Collensworth et al described the process of employing CHWs to work in a clinical practice. They conclude that integration of CHWs into a clinical practice improved patient knowledge, engagement and outcomes as well as the ability of PCPs to identify and proactively address patient needs (Collensworth et al., 2014). Of particular value was the potential for task shifting in which CHWs took over responsibility for health education, care coordination, and patient engagement—freeing up more time for clinicians to focus on clinical exams and management of clinical care (Collensworth et al., 2014). Similarly, Kim et al note that “Integration of [Community Based Health Worker (CBHW)] models into the healthcare system appears to be an effective strategy for restructuring primary care delivery, and focuses on accessible, continuous, comprehensive, compassionate and culturally effective

care (Kim et al., 2016, pg e26).” But both authors conclude that more research is needed to fully incorporate CHWs into the healthcare system (Kim et al., 2016; Wennerstrom et al., 2015,). There is no clear definition for integration nor is there guidance for how integration can be achieved. This lack of guidance leaves healthcare organizations without the tools needed to effectively implement CHW programs.

Fundamental in this challenge is the difference in culture and identity between CHWs and clinical care teams. Careful consideration must be given to how CHWs can integrate into the health system while continuing to maintain their unique identity and position within a community (Malcarney et al., 2017). Moreover, CHWs do not typically gain expertise through traditional healthcare training or certification channels—including the common clinical care hierarchy of physician, nurse, and medical assistant (MA). It is therefore difficult for those in the healthcare sector to easily understand what roles or services CHWs can provide. Moreover, in an environment where healthcare quality and patient safety are paramount, healthcare employees may have concerns about whether CHWs have the qualifications to legally provide healthcare services. Malcarney et al highlight this as an important gap in achieving effective integration, concluding that the field needs to identify and build new competencies related to CHW-health system integration (Malcarney et al., 2017).

Many CHW models are based on a community transformation model. The community transformation model—grounded in Paulo Freire’s education approach—is based in an approach to empowerment and social change that is rooted in deep community engagement and trusted relationships (Glass, 2001). Chapman et al note that, as clinical care delivery models look to incorporate CHWs into clinical practice, “an institutional shift and transformation must occur to truly integrate this model of care into clinical settings. This requires a more robust and appropriate workforce development framework that extends beyond traditional workforce planning models in order to acknowledge that the ‘supply’ of CHWs comes out of a transformation model of care; it cannot simply be treated as a new health care job title that can be plugged into traditional medical models of care (Chapman et al., 2017, pg 7).”

While no clear guidance or frameworks for CHW integration exist, we can identify some general themes that are commonly discussed in the literature. A growing number of articles appear to define integration as the use or engagement of CHWs as part of interdisciplinary care teams. In 2015, a CDC review of CHW evidence found that “integration of CHW programs within clinical care teams” is

supported by high-quality evidence and has the potential for a high public impact, concluding that the integration of CHWs within multidisciplinary care teams shows great potential as a public health intervention (CDC, 2015). Thus, this CDC review establishes a definition for CHW integration in which CHWs are employed or engaged as part of interdisciplinary or multidisciplinary care teams. Other researchers have used a similar framing for integration in which CHW implementation involves employing CHWs as part of interdisciplinary care teams.

Additionally, the findings from this early research into implementation of CHW programs within the healthcare system may help to provide an emerging framework for effective integration (Allen et al., 2015; Collensworth et al., 2014; Findley et al., 2014; Kangovi et al., 2015; Johnson & Gunn, 2015; Martinez et al., 2011; Wennerstrom et al., 2015). Kangovi et al note, “CHW programs must address five key barriers in order to succeed in the post-ACA era: insufficient integration with formal health care providers, fragmented and disease specific interventions, lack of clear work protocols, high turnover and variable performance of the workforce, and a history of low-quality evidence... although it’s important for CHWs to maintain their community-based identity, they also need to be able to communicate with clinicians by means of telephone or electronic medical record and collaborate in person through multidisciplinary rounds (Kangovi et al., 2015, pg 2277).” Researchers conclude that best practices for integration of CHWs into the healthcare sector is not clear, but their findings suggest that communication channels and multidisciplinary teamwork is important. In 2014, Findley et al noted that few case studies existed to describe how to integrate CHWs into a clinical care model. They found that effective integration was associated with clear definitions of roles, meticulous recruitment and training, supervision, shared leadership, and documented value for money (Findley et al., 2014). Thus, Findley et al have offered some initial guidance for integration of CHW programs.

Commonly described in the literature is the fact that integration requires significant changes to care team composition, workflow and structure. It requires expanding the idea of medical care beyond traditional models and changing how care teams are structured. Successful implementation of inter-professional teams “involves more than just a reassignment of tasks, but also depends on structuring the environment and workflow in a way that facilitates team-based care (Driessen et al., 2015).” Thus, this research suggests that organizational change is fundamental to effective CHW integration. In 2018, Rodgers took this argument further, noting that the implementation of CHW programs is a

“transformation process” for a clinic or healthcare agency in which the agency must refine their approach and change how healthcare is delivered (Rodgers et al., 2018).

CHW Perceptions, Utilization and Integration

The broad range of CHW definitions, as well as the variability in CHW roles and responsibilities suggests that there is not one consistent way to define a CHW—including their purpose on the team and the ways in which they engage with that team. But without clear consensus regarding a CHW’s role and purpose on a care team, integration of the CHW workforce will remain challenging. It is therefore critically important to explore how CHWs are currently perceived, utilized and integrated within healthcare teams in order to understand CHW integration within the healthcare sector.

The Practice Gap

The discussion around CHW integration highlights a clear practice gap that requires further exploration. In summary, a growing body of literature suggests that CHWs can improve health, particularly among vulnerable populations. Also, due to healthcare reform, the healthcare sector is increasingly looking to CHWs as a promising innovation to address SDOH, contribute to patient-centered care models, and reduce costs. As a result, the number of CHWs employed in the healthcare sector is increasing significantly. While historically CHWs have worked with community-based clinics or health centers, CHWs are increasingly being employed by larger health and hospital systems (Malcarney et al., 2017). Given this shift in employment of CHWs towards larger health systems, it is important to consider how to effectively integrate CHWs into these systems. While research suggests that integration is necessary for effective program delivery, a number of potential barriers exists. Health systems have less experience working with community-based programming and are generally larger and less agile than smaller health centers or clinics. They also have well-established chains of command and protocols to ensure healthcare quality and patient safety. Because CHWs are not a traditional clinical workforce, it is not always clear how CHWs can engage with healthcare providers to improve care. CHWs must also navigate the different work styles and responsibilities in clinical and community settings. Addressing these challenges require more than technical solutions such as increased training or certification. Organizations must make changes to their leadership and culture in order to adjust to new clinical care models that integrate CHWs. More guidance is needed, both for

CHWs and health system employers, to understand how to effectively integrate CHWs into the health systems.

While the literature points to some common strategies for effective integration—including the use of interdisciplinary care teams—it stops short of providing concrete guidance for how to achieve integration. It is clear that more research is needed in order to ensure that CHW programs are able to achieve their desired outcomes of improved high quality culturally competent care and reduced healthcare costs within health and hospital systems.

The Case

Many large metropolitan areas, with a breadth of healthcare institutions and a density of at-risk populations, have engaged in promising experimentation in the use of CHW models within healthcare services. Notably, in the Chicago Metropolitan area, many health and hospital systems including Rush University Medical Center, University of Illinois at Chicago Hospital and Health Sciences System, the University of Chicago Hospital, the Sinai Health System, and Advocate Health Care are all investing in CHW programs. While there is great experimentation and innovation in the field, little coordination exists among these programs—both on an inter and intra-organizational level. As a result, there are limited opportunities to share information or learn best practices.

The University of Illinois at Chicago Hospital and Health Sciences System has recognized how its unique positioning can be used to advance CHW models. As a large institution with broad community and clinical services, UI Health is well positioned to integrate CHW models. Moreover, as a State University, UIC can serve as a thought leader for other institutions to follow. Consequently, UIC is currently working to develop new CHW programming and services to support the development and sustainability of a CHW workforce that is integrated with clinical care services across the health system. This institution, and its existing CHW integration efforts, may offer an interesting opportunity to learn about gaps and opportunities to CHW integration within a large health and hospital system.

UIC's CHW Work

The University of Illinois Hospital and Health Sciences System (UI Health) describes itself as an “Academic Health Enterprise” that “is dedicated to the pursuit of health equity.” Positioned as part of the University of Illinois at Chicago (UIC) system, UI Health “includes a 465-bed tertiary care hospital,

21 outpatient clinics, and 11 federally qualified health center locations.” The UI Health System also includes academic and research activities of seven UIC Health Sciences Colleges including: Applied Health Sciences, Dentistry, Medicine, Nursing, Pharmacy, the School of Public Health, and the College of Social Work. UI Health’s largest footprint is in the Illinois Medical District in the Near Westside Neighborhood of Chicago (uihealth.uic.edu).

A group of doctors, practitioners, and researchers at UIC are in the process of proposing a new UIC CHW program or center to promote CHW models. While this program has not yet been formed, it will be designed to align with UI Health’s priorities of community service and education. Foundational work to establish this program began in 2017 with the creation of a UIC CHW Task Force which regularly meets to assess progress towards its goals. In April of 2018, the Task Force convened a listening session at the UIC School of Public Health to develop ideas for their work, and in Fall of 2019 a Steering Committee was established to build the leadership structure for the Center (UIC CHW Taskforce, 2020).

In addition, in the Summer of 2019, the UIC CHW Task Force conducted a University-wide survey of all programs employing CHWs, or individuals who may be classified as CHWs. The survey was designed to “delineate the vast number of roles and responsibilities of CHWs in the UIC system” in order to determine what is needed to better support the UIC CHW workforce. A report summarizing survey findings was produced in January 2020. In total, the inventory includes data from 47 CHWs and 20 CHW administrators at UIC representing 70 different programs and 182 CHWs. Notably, the survey found that “hiring practices and benefits vary tremendously” across programs. Moreover, CHWs and their administrators described the CHW tasks and roles differently, and training requirements and supervision procedures are not consistent among programs. Only a subset of surveyed programs reported a clinical focus. But this initial survey suggests that programs are employing a broad range of approaches to CHW integration, and that these approaches are not always aligned with evidence-based practice (UIC CHW Taskforce, 2020).

The UIC CHW Taskforce’s work aims to improve University-wide CHW program delivery by serving to: (1) expand CHW services into clinical care, (2) raise awareness regarding the CHW workforce, (3) support CHW program administrators, (4) promote CHW advocacy, and (5) provide training and support for CHWs and CHW supervisors that align with national recommendations. In this way, the

Taskforce aims to “support improved CHW programming, training, professional development and advocacy.”

But while this CHW survey offers a helpful snapshot of current CHW programming at UIC, the picture remains incomplete and many important questions remain. Notably, understanding how organizational and systems level factors influence CHW program implementation is critical. For example, the survey indicated that there is variability in human resource job titles for CHWs. It could be hypothesized that barriers in the HR process may be contributing to this variability. But a deeper exploration of the organizational-level factors is needed. Moreover, because the Taskforce has a specific interest in promoting the use of CHWs in clinical care delivery, questions related to the effective CHW integration within clinical care teams remains paramount. Thus, it is clear that more understanding is needed regarding how and why CHW programs are employing differing models of delivery. A better understanding of the system in which these programs operate is also needed. In this way, the UI Health System and the UIC CHW Taskforce’s work offer a relevant case to explore questions related to the integration of CHWs in the clinical care context.

The CHW field continues to evolve rapidly. During the course of this dissertation, the healthcare and public health fields faced a new profound threat in the COVID-19 pandemic. As a result, CHW models have needed to respond quickly to this changing landscape. A global pandemic, which is disproportionately affecting low income and minority populations, highlights the critical need for better integration of community services and health care. Moreover, a growing demand for contract tracers, with an ability to build relationships and trust, emphasizes the critical role that a community-based health care workforce can play in infectious disease response. Yet, this pandemic also leaves health systems overextended in priorities, limited in resources, and with a heightened focus on disease treatment and management. As a result, efforts to integrate CHW models may be sidelined by the pandemic. Yet, the need for a CHW workforce remains and so too should efforts to integrate this workforce in health services.

Leadership Implications

As a “human resource innovation” within the healthcare sector, CHWs offer great potential to contribute to culturally sensitive care delivery that improves health behaviors, facilitates complex disease management, and reduces healthcare costs. But simply hiring CHWs is not sufficient to ensure

that they achieve these goals. Organizational change is needed in order to fully integrate these individuals into the care team. Without careful and effective integration, CHWs will likely struggle to balance their identities bridging the clinic and the community. They also risk getting “lost” in the complex healthcare system and may remain underutilized as a human resource. Integration is not without its own challenges. It will require change. Many organizations focus efforts on technical solutions—spotlighting primarily on hiring, training or certifying CHWs for work in the healthcare sector. But the field is beginning to recognize that in order for CHWs to be effective, they must be fully integrated into the healthcare sector. They must be engaged as members of interdisciplinary care teams. This requires change not just to the types of employees but also to organizational structure and culture. At its core, this is a problem of organizational change, and as such, remains a leadership challenge.

Many organizations are grappling with these difficult questions. Notably, at UIC, individuals working to develop a coordinated UIC CHW program are seeking to understand the organizational changes needed to enable successful delivery of CHW programs within the UI Health System. Findings from this research will be instrumental in informing future strategy of this group. Thus, this research has direct applications to ongoing work within the UI Health System and has the potential to shape organizational priorities related to CHWs. But this research also has the potential for larger application beyond UIC. Some national organizations are working to drive the conversation around CHW program delivery. Notably, the CHW Core Consensus Project serves to develop national CHW recommendations. The first stage of this work, published in 2016, was focused on recommendations regarding roles, skill and qualities of CHWs (C3Project, 2016). But the next natural extension of this work is on the policies and systems that support effective CHWs. This research has the potential to help inform these national conversations around effective CHW program delivery.

In a clinical context, the physician is at the top of the clinical care hierarchy. Their expertise is derived from education and clinical training. Conversely, a CHW’s expertise derives from his/her knowledge of the full social/ecological model. Thus, this project illustrates a fundamental difference in philosophy between public health and clinical medicine. Moreover, it reflects an attempt on the part of the healthcare field to incorporate a public health perspective in their work. There are significant cultural and structural differences that could serve as barriers to this process. This points to the broader applications of my work. The question of integration of CHWs into clinical care teams has applications

beyond CHW programs—it helps us explore a larger question about how the field of public health can integrate with the healthcare sector in a way that improves health among those with the highest need. Systems thinking offers one lens in which to frame this problem. For example, by expanding the boundaries that we draw around the problem, we may illuminate new critical factors that influence CHW integration. Consequently, this research reflects an attempt to incorporate systems-thinking to improve public health and clinical care. But this problem, with its dynamic network of interacting factors and its changing landscape, can also be categorized as a complex adaptive problem. As such, this problem lends itself to a leadership lens.

Personal Leadership Connection

This research study also aligns with my personal leadership philosophy, leveraging my own strengths as a leader. Through personal reflection in the DrPH program, I have honed my personal leadership vision. I have learned to identify myself as a strategic thinker, a storyteller, a relationship builder, and an agent of change. My research draws on these strengths in the following ways: first, as a relationship builder and a storyteller I believe that I am well suited to a qualitative research design that relies on understanding and summarizing complex lived experiences. Second, my research takes a strengths-based approach that focuses primarily on opportunities within the existing system to build upon existing change-efforts. Finally, as a strategic thinker, I am compelled by an action-research approach that aims to apply learning from the research to inform strategic priorities with the UI Health System. Personally, I have had numerous professional experiences working with CHWs—first, through a community-based NPO in Philadelphia and then supervising CHWs in Ethiopia. This work has helped me develop an appreciation for the potential of CHWs to improve health outcomes. More recently, I enrolled in a year-long design course in which I collaborated with designers, engineers and business students to develop innovative products for CHWs in the OSF healthcare system. This course has helped me identify the opportunities that emerge by thinking differently about an emerging healthcare workforce. But as Project Director at UIC I have also experienced first-hand the challenges inherent in implementing change efforts within a large university health system. I see the potential for this change effort to fail if critical factors are not considered. I therefore feel compelled to draw on my own leadership strengths and professional experience to inform this current effort to integrate CHWs within UI Health. I hope that my unique perspective and experience will contribute meaningfully to this effort.

Problem Statement

Community Health Workers (CHW) are a workforce with a long history of effective public health service delivery—particularly in resource-poor settings. CHWs have been shown to encourage health behaviors, reduce disease risk factors, reduce healthcare costs, and improve health outcomes. In recent years, changes in the healthcare sector—including the Affordable Care Act and the growing popularity of patient-centered care models—have driven an “era of delivery system reform” in which healthcare organizations are developing innovative care delivery models to better address social determinants of health, reduce disparities, and improve health outcomes. As such, healthcare organizations such as UI Health are increasingly looking to CHWs as a “workforce innovation” to address the social determinants associated with chronic disease. But, community-based public health-oriented CHW programs differ from more traditional, hierarchical healthcare models. More research is needed to understand how this emerging CHW healthcare workforce can be leveraged to improve population health within the healthcare sector. Notably, there is variability in the ways in which CHWs are utilized and perceived within the health system. Additionally, recent research indicates that integration of CHWs into the clinical care team is necessary for effective program delivery, but it is unclear what constitutes effective integration of CHWs and what factors support integration. In order to improve CHW program delivery, more information is needed to understand how CHWs are utilized and perceived, factors that support CHW integration, and the ways in which concepts of CHW utilization, perceptions and integration are interrelated. This research aims to employ an organizational and systems-level perspective in order identify those critical factors associated with effective CHW integration in order to leverage this important workforce to improve healthcare’s impact on population health.

Research Questions

Question 1: What is the role of CHWs within healthcare teams at the University of Illinois Hospital and Health Sciences System (UI Health)?

- a) In what ways are CHWs involved in providing care as part of a care team?
- b) In what ways are CHWs involved in providing care in the community? How is this community defined?
- c) In what ways does the organization support the CHW workforce?

Question 2: How do different members of the care team perceive a CHW’s purpose and value on the team?

- a) How is a CHWs purpose and value defined within the team? Has this definition changed over time?
- b) How is a CHW’s contribution measured and evaluated?
- c) To what extent are CHWs able to meet expectations among members of the team?

Question 3: In what ways are CHWs integrated into their work environment? How is this defined?

- a) In what ways are CHWs integrated into the care team?
- b) In what ways are CHWs integrated into the organization and/or health system?
- c) In what ways are CHWs integrated into the communities in which they work?
- d) How is integration defined or conceptualized by different members of the care team?

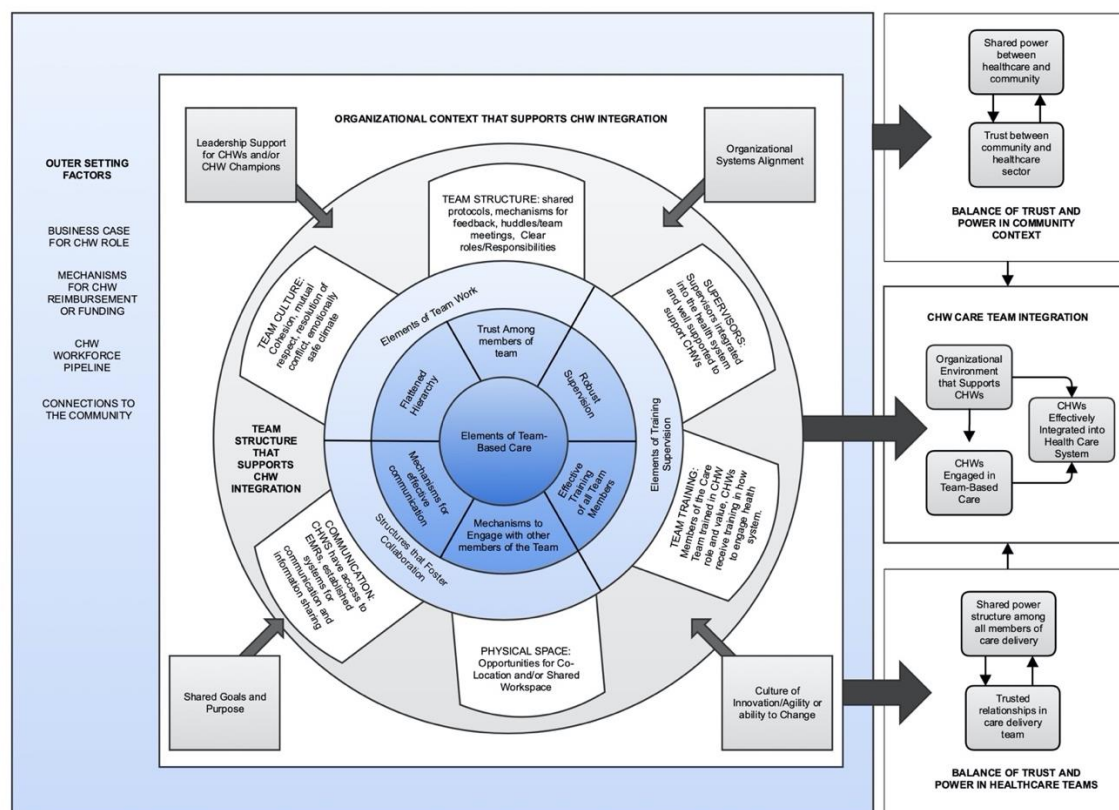
Question 4: What individual, team and organizational-level factors are critical for effective integration of CHWs within the existing system?

- a) What gaps serve to limit CHW integration?
- b) What opportunities help support CHW integration?
- c) What would effective integration of CHWs look like?

Chapter 2: Conceptual and Analytical Framework

In order to further explore the problem statement described in Chapter 1, a review of the literature focused on factors associated with integration, teamwork, and care team composition. This exploration was used to illuminate those factors associated with effective integration of CHWs into clinical care teams. Due to the limited research into CHW integration, other models of integration—both in the healthcare sector as well as other disciplines—were also reviewed and considered (Bodenheimer et al., 2002; Mickan et al., 2005). This literature is summarized in the subsequent chapter. The findings from this literature review were consolidated into a pre-conceptual model for integration of CHWs into clinical care teams (see Figure 1). This model illustrates (1) critical factors that emerged in the systematic literature review, and (2) the relationship among these factors. This model will be used to guide the discussion of the literature review as well as the process of developing the conceptual framework for my research.

Figure 1: Pre-Conceptual model for Integration of CHWs into clinical care teams. Integration involves factors associated with team structures, organizational context, and the outer setting.



To summarize this diagram, the literature suggests that in order to effectively integrate CHWs into the health care system, there must be an organizational environment that supports CHWs and CHWs must be integrated into team-based care (Wagner et al, 2017). Team-based care is defined by the presence of the following characteristics: (1) a flattened hierarchy, (2) trust among team members, (3) robust supervision, (4) effective training of all team members, (5) mechanisms to engage all members of the team, and (6) mechanisms for effective communication (Findley et al., 2014; IPEC, 2011; Mickan & Rodger, 2005; Nancarrow et al., 2013). An organization can support and foster these characteristics through:

1. *Team structure*: Team structures that support collaboration, trust and shared responsibility
2. *Supervision*: Supervisors who are well equipped to work with CHWs and can reward and promote talent
3. *Training*: Effective training for all members of the care team
4. *Physical Space*: Opportunities for co-location and/or shared workspace
5. *Communication*: The presence of mechanisms to share information such as EMRs and other communication mechanisms
6. *Team Culture*: A culture of cohesion, mutual respect, resolution of conflict, and an emotionally safe team environment.

These elements of team-based care are summarized in Table 1.

Furthermore, literature suggests that organizations must have support from leadership and/or CHW champions; a culture of innovation, agility or an ability to change; organizational systems (such as HR and EMR) that facilitate CHW integration, and shared goals and purpose that includes the prioritization of SDOH (Mickan et al., 2005; Rodgers et al., 2018; Wagner et al., 2017). This may be facilitated by an external environment that offers a business case for CHW implementation which in turn contributes to mechanisms for financing of CHW programming (Leach et al., 2017). There must be pipelines for CHW training and hiring and trusting community linkages must also be established (Findley et al., 2014; Rodgers et al., 2018).

These factors contribute to power dynamics present in the system as well as the presence of trust among members of that system. The relationship between power and trust is important both within the care team as well as within the community in which the health system is positioned. The following

sections will explore each component of this model and examine the evidence to support their inclusion in the model.

Table 1: Elements of effective team-based care

Elements of Team based care	Is Supported by...		Results in...
Teamwork	Team Structure	<i>Shared protocols, mechanisms for feedback, huddles/team meetings, clear roles and responsibilities</i>	<ul style="list-style-type: none"> • Flattened Hierarchy • Trust among team members
	Team Culture	<i>Cohesion, mutual respect, resolution of conflict, emotionally safe climate</i>	
Collaboration	Physical Space	<i>Opportunities for co-location and/or shared workspace</i>	<ul style="list-style-type: none"> • Mechanisms to engage with other members of the team. • Mechanisms for effective communication
	Communication	<i>CHWs have access to EMRs, and established systems for communication and information sharing</i>	
Training and Supervision	Team Training	<i>Members of the care team are trained in CHW's role and value. CHWs receive training in how to engage with the health system.</i>	<ul style="list-style-type: none"> • Robust Supervision • Effective training of all team members
	Supervisors	<i>Supervisors integrated into the health system and well positioned to support CHWs</i>	

Team-Based Care

As discussed in Chapter 1, there is a strong and growing body of evidence that the integration of CHWs into team-based care is necessary for CHWs to effectively function within healthcare systems. But less clear are the components of team-based care necessary for integration as well as the factors associated with effective team-based care models for CHWs.

The field of healthcare reform—as well as the growing movement towards team-based approaches within the healthcare sector—offers opportunities to draw on research into teamwork and clinical team-based care from other specialties that may have relevance to a CHW model. As more healthcare organizations look to establish team-based care models, a body of literature has developed examining effective team-based care approaches. These models were examined—without regard to the inclusion of CHWs or lay health workers—in order to draw themes that may be relevant for CHW integration.

Teamwork

Generally, a number of common themes emerged across multiple scholarly articles. Research suggests that teamwork is fostered by a flattened hierarchy as well as a culture of trust among members of the team. This can be facilitated in a number of different ways. First, the development of

specific operating procedures for how members of the care team engage with each other is important. These include shared protocols and team meetings or huddles to coordinate patient care efforts (Allen, 2015; Fiscella et al., 2017b; Leach et al., 2017; HCH Clinicians Network, 1999; Mickan & Rodger, 2005; Nancarrow et al., 2013; Wagner et al., 2017). Also important are elements of team composition that allow for meaningful engagement of all care team members. This includes (1) ensuring the appropriate skill mix of care team members, (2) clearly defining roles and responsibilities, and (3) developing policies and procedures that facilitate engagement of all team members in care delivery (Findley et al., 2014; IPEC, 2011; Mickan & Rodger, 2005; Nancarrow et al., 2013). Thus, the literature suggests that attention must be paid to how teams are structured and operated in order to facilitate teamwork.

Of particular relevance for CHW models is the need for a culture that recognizes the value of disciplines outside of traditional clinical practice (Wagner et al., 2017). Mickan & Rodger note, “teams do not fit neatly into many health care hierarchies, because teams include people of different levels of power and status (Mickan & Rodger, 2005).” Furthermore, they conclude that, in most health care organizations, the medical profession is dominant. One study of health care teams noted that “doctors were typically responsible for most of the decision-making,” often discounting views of other care team members as less important (Hearnshaw et al., 1998). Careful consideration must therefore be given to how teams meaningfully engage all participating team members. Moreover, teams must consider how to address physician-oriented hierarchical structures of decision-making and authority. Some note that, in order to change traditional systems of care delivery, deliberate attention must be paid to developing a team culture and values that supports teamwork. This includes fostering team values such as cohesion, mutual respect, conflict management, and conditions that support an emotionally safe environment (Mickan & Rodger, 2005; Nancarrow et al., 2013; Smith et al., 2015). Central to this theory is the concept of trust. Care teams must establish and foster trust among all members of the team (Fiscella et al., 2017; Leach et al., 2017). Kok et al took this concept further, arguing that in the case of CHWs, the greater health system must trust the expertise and services provided by CHWs in order for them to be effective (Kok et al., 2017a).

Collaboration

Arguably, a fundamental component of facilitating teamwork and team-based care is effective collaboration among team members. This can be fostered through mechanisms and facilities that

foster communication and interaction. Notably, a large body of research supports the argument that effective communication among all members of the care team is necessary for both effective teamwork and integration (Fiscella et al., 2017; Kok et al., 2017a; Leach et al., 2017; Mikan & Rodger, 2000; Mikan & Rodger, 2005; Nancarrow et al., 2013). This is also likely necessary for effective processes as well as a team-oriented culture. In the healthcare environment, one necessary tool for effective communication is the inclusion of all care team members—including CHWs—in electronic medical record (EMR) systems (Allen, 2015). Moreover, for health and hospital systems, it is also important for members of the care team to have access to information sharing through platforms such as local intranet systems and admission and discharge records (Islam et al., 2016).

Also important is a physical space that enables interaction among team members. This may include dedicated meeting space, space for co-working, or shared workspace (Gatchel et al., 2014; Harris et al., 2016; Kuo et al., 2018; Wagner et al., 2017). Of critical importance, is that members of the care team must spend some of their work time in close proximity with other members of that team. Working in separate sites does not allow for care team integration.

Training/Supervision

Finally, research suggests that effective training and supervision is necessary for the integration of CHWs into care teams. Researchers note that it is necessary to ensure that all members of the care delivery team are properly trained in the roles and importance of CHW partners (Allen, 2015; IPEC, 2011; Findley et al., 2014; Fiscella, 2017; Leach et al., 2017; Nancarrow et al., 2013; Palazuelos et al., 2013; Rodgers et al., 2018; Wennerstrom et al., 2015). Notably, physicians in particular, may require training to understand how and why to utilize CHWs in care delivery (HCH Clinicians Network, 1999).

Other researchers note the importance of effective supervision when integrating CHWs into healthcare systems. Supervisors must be properly trained to support CHWs (Wennerstrom et al., 2015). Furthermore, supervisors must be well-equipped, invested in CHW development, and integrated into the health system (Kok et al., 2017a; Palazuelos et al., 2013).

After compiling this body of literature, a picture begins to emerge of an effectively integrated clinical care team which incorporates elements of teamwork, collaboration, and training and supervision. These elements have therefore been incorporated into my pre-conceptual model.

Organizational Context/Inner Setting

While elements of effective team-based care are critical for CHW integration, one must recognize that teams are products of the organizational environment in which they are situated. It is therefore critical to examine the elements of the organizational context which are important for effective CHW integration. Here again, the literature helps point to some key themes.

Shared Goals/Purpose

Literature on care team integration suggests that one important component of effective team integration is a sense of shared goals and purpose (Fiscella et al., 2017; Gatchel et al., 2014; Mickan & Rodger, 2005; Nancarrow et al., 2013). This must be established and perpetuated in a way that unifies individuals across the organization toward a shared vision. This shared vision is necessary for all members of the care team to agree upon an approach to work toward shared goals.

Notably, in the case of CHW integration, literature suggests that the organization must perpetuate the value of population health and behavioral health in its work (Kuo et al., 2018; Rodgers et al., 2018; Smith et al., 2015; Wagner et al., 2017). Health care organizations traditionally prioritize the clinical treatment of disease, thus maintaining an orientation towards treatment rather than prevention. In order for CHWs to be valued and integrated into a clinical system, the greater health care system must recognize the need for preventive services that address SDOH. Without a shared goal of addressing SDOH in a health system, CHWs will struggle to meaningfully contribute to healthcare delivery (Wagner et al., 2017).

Culture of Innovation, Agility, or Ability to Change

Some literature has described the organizational culture needed to integrate new care delivery models in the healthcare sector. Centrally important is the need for an organizational culture that embraces or facilitates organizational change (Smith et al., 2015; Wagner et al., 2017). Traditionally, healthcare organization—particularly large health systems—are conservative and risk adverse (Plske & Kilo, 1999). There is a reluctance to change, and an inclination towards maintaining existing systems or approaches, regardless of their inefficiency (Herzlinger, 2006; Smythe, 2014). But the integration of CHWs requires significant changes to organizational systems and workflows. Consequently, in order for CHW integration to be successful, the organization must have a culture that allows for this change.

Sometimes, this is referred to as a “culture of innovation” in which new or underdeveloped ideas are willingly embraced in an effort to change traditional care delivery models (Thakur et al., 2012). Notably, a recent publication by Rodgers et al incorporates the concept of a “culture of innovation” as an important component of effective CHW integration (Rodgers et al., 2018). Yet others refer to this concept as a willingness to “take risk” (Smith et al., 2015). But willingness to change is only one piece of the puzzle—the organization must also have systems that are amenable or responsive to organizational change. Many healthcare institutions are large, sometimes bureaucratic, organizations that may have complex systems or processes that are slow to change (Segel, 2017).

Organizational Systems

Related to the ability of an organization to change, are the capacity of systems within the organization to change. Particularly within larger institutions, the systems within the institution can play a central role in the ability to influence change. Notable for CHW programs, human resource systems may limit the ability to hire or retain a CHW workforce. Health record systems may restrict the ability for CHWs to engage in patient care. Or financial systems may dictate or limit funding channels for CHW services. Thus, those systems within an organization have the ability to influence whether a clinical care team is able to effectively hire, train, integrate and retain CHWs (Segel, 2017).

Support for CHW Workforce

A final organizational-level element of effective integration is the extent to which an organization supports a CHW workforce. “Support” is a broad term that could refer to a number of elements including individual, financial, and leadership support.

The role of individuals or “Champions” within the organization to support the use of CHWs for provision of health care services is often highlighted in the literature as a critical component (Kuo et al., 2018; Rodgers et al., 2018; Smith et al., 2015). These champions must have sufficient leverage within the organization to advocate for the organizational changes needed to integrate CHWs. Moreover, they must be committed to shared organizational goals and purpose as well as a team-based care approach. Without such a champion to advocate for the CHW role in a clinical environment, it is unlikely that the organization will be able to implement the changes needed to effectively integrate CHWs into care.

Another way an organization may support CHWs and CHW programs is through financial/resource support. This includes the provision of dedicated funds or other organizational resources (such as time or space) to a CHW program. The ability for an organization to provide financial support is closely related to outer setting elements discussed later in this chapter.

One common thread across these organizational elements is the importance of organizational leadership. A number of articles list “leadership” as an important factor in CHW integration (Findley et al., 2014; Fiscella et al., 2017; Gatchel et al, 2014; Mickan & Rodgers, 2005; Nancarrow et al., 2013) but few clearly define what is meant by leadership. Arguably, leadership may be used as a catch-all term to describe organizational-level change. A deeper description of the relevant leadership theory or approach is typically lacking from these articles.

It is here that other leadership frameworks from outside public health and healthcare may have relevance. Possibly one lens to explore this is through the concept of “transformational leadership”. Transformational leadership is defined as working with “teams to identify needed change, creating a vision to guide the change through inspiration, and executing the change in tandem with committed members of a group (Bass, 1994).” Central in transformational leadership is a connection to (1) identity, (2) facilitating greater ownership of work, and (3) facilitating innovation. Thus, this closely maps with the necessary organizational elements defined in the literature review for CHW integration including: a shared goal/purpose, champions, and a culture of innovation (see Table 2).

Table 2: Application of leadership theory to CHW model

Element of Transformational Leadership	Emerging Element from the Literature	Shared components
Connection to identity	Shared goal/purpose	<i>A greater connection to meaning and purpose of work through organizational leadership</i>
Facilitating greater ownership of work	Champions	<i>Empowering others to take ownership of projects/efforts in order to realize change</i>
Allowing individuals to align tasks to enhance performance	Culture of innovation	<i>An approach that embraces innovation by allowing pathways for change and empowering individuals to implement changes in organization.</i>

Outer Setting

Business Case

Just as a consideration of a team’s positioning within an organization is important for effective team-based care, an organization is situated within the context of its local environment—or the outer

setting. Thus, outer setting factors play an important role in the ability for an organization to integrate CHWs into their system. Notably, researchers have observed that the outer setting plays an important role in program effectiveness. Leach et al noted, “with only a few exceptions, the external social and policy context was viewed as a barrier to implementing well-functioning multidisciplinary teams in primary care practices (Leach et al., 2017, pg 7).”

One important element in this context is the potential to secure financial resources to support a CHW workforce. As discussed in Chapter 1, there is great variability in CHW policies and regulations among US states. While some states provide pathways for healthcare reimbursement for CHW care delivery, others do not. Closely tied to this is the question of whether a state’s Medicaid system reimburses for CHW services. Because CHWs primarily serve low income populations, Medicaid reimbursement is critical for financial sustainability (Albritton, 2016). Research suggests that integration of CHWs within the healthcare context is dependent on reliable long-term funding mechanisms or a strong business case for implementation (Johnson & Gunn, 2015; Kuo et al., 2018; Leach et al., 2017; Rodgers et al., 2018). Organizations must establish a business case for how CHW programs will be supported by the organization. Some research indicates that organizations must be able to argue how CHWs provide “value for money” within the healthcare system (Findley et al., 2014). This business case is influenced by the availability of funding mechanisms and policies within the local context. Thus, an organization’s business case for CHW integration is dependent on the outer setting in which the organization is positioned.

CHW Pipeline

Another important component of CHW integration is the ability for healthcare organizations to hire and retain CHWs. It is therefore necessary for the organization to operate in a context where it is possible to hire appropriate CHWs. The ability to hire and retain CHWs could be influenced by a number of factors including: the presence of CHW training or certification programs; partner organizations with existing CHW infrastructure; or an established workforce with the capacity to be trained in CHW service delivery (Findley et al., 2014; Rodgers et al., 2018). Of particular relevance within large health systems is the question of whether the HR system is positioned to effectively hire CHWs. If health systems don’t have appropriate job titles for CHWs, or if hiring requirements (e.g. background checks, drug screening, or citizenship requirements) are too restrictive, it may be difficult to hire CHWs (Martin, 2020).

While an internal capacity to train CHWs is necessary, organizations must also operate in an environment where they have access to a workforce that can serve this role. Some states have dedicated resources to this cause by creating state-wide programs to promote CHW development or utilization. As of 2017, nine states including: Florida, Indiana, Michigan, Minnesota, Mississippi, Nebraska, New York, South Carolina, and Washington have CHW training and certificate programs (ASTHO, 2017). Other states have laws that allow for the creation of state-wide CHW training programs. These programs serve as an important tool to promote professional development of the CHW workforce and ensure that healthcare organizations have access to individuals with the training needed to perform this role.

In other contexts, community-based or for-profit organizations serve the role of developing CHW workforce capacity. The Pathways Community HUB Model, for example, is a nation-wide CHW training and certification program for healthcare organizations. This program seeks to build the CHW workforce capacity for its health system partners (Goldman, 2018). These organizations serve as a critical link in preparing a CHW workforce that can be employed by the healthcare sector. At other times, colleges or universities serve a role in building the CHW workforce. Oregon State University, the University of New Mexico, and Texas A&M University, for example, house national CHW training centers. In Chicago, the Sinai Urban Health Institute assists in training and outsourcing a CHW workforce. The presence of these training centers may influence CHW workforce availability.

Arguably, the existence of programs and policies that promote the professional development of a CHW workforce will affect a healthcare organization's ability to hire and retain CHWs. It therefore serves as an important outer setting factor to be included in the model.

Community Connections

As the name implies, a CHWs role requires connections to and/or knowledge of the communities served by their work. As such, CHWs draw on a network of community resources, referrals, and programming to enhance their ability to address a patient's complex health and social needs. It is not always the case that health and hospital systems have existing connections with community-based programs and service providers. Moreover, it is critical that CHWs have the ability to continue to build and foster community relationships through community-facing work. The organization and its human

resource system may not have the capacity to give CHWs flexibility in hours or work format to allow CHWs engage in this community work (Martin, 2020).

But research suggests that creating and fostering strong connections to individuals and organizations in a target service community is critically important for CHW effectiveness (Kok et al., 2017b; Kuo et al., 2018; Wagner et al., 2017). Moreover, it is essential that trust is established between health care organizations and communities served by CHW programs (Kok et al., 2017b). Research therefore supports the idea that trust is not just about the relationship between a CHW and the community served. The ways in which the greater healthcare system is perceived, and the extent to which trust is established and maintained between the community and the healthcare system, is critically important. Thus, the existence of connections between a healthcare organization and communities served by the CHW program is an important element of effective CHW organizations.

Perceptions about CHWs

Embedded in many of the discussions about effective care team integration is the assumption that all individuals and organizations share the same perceptions about the purpose and value of CHWs. But perceptions about CHWs vary significantly across individuals and organizations (De Jong 2015; Mobula et al., 2015). How an individual or organization perceives CHWs may be influenced by a number of factors including: the prevalent care philosophy or paradigm, the organizational goals, and systems for evaluation and measurement. Perceptions will also, in turn, influence the types of roles and responsibilities that CHWs are tasked to perform. Thus, arguably, perceptions are closely related to the extent to which CHWs are integrated into a health system. Included below are those elements from the literature that may be related to perceptions about CHW job purpose, value, and performance.

Care Philosophy/Paradigm

As discussed in Chapter 1, many health systems are hierarchical, top-down and transactional. This prevalent care philosophy arguably affects how different individuals within the system, such as CHWs, are perceived. For example, in this prevalent system, “hard skills” such technical knowledge and educational credentials are valued over “soft skills” such as communication, adaptability, and empathy (Dolecheck & Griswold, 2019; Murphy, 2020). Thus, CHWs are naturally de-valued in comparison to more credentialed staff.

But this is not necessarily the only care philosophy or paradigm in which health care teams operate. Rifkin et al (1996) offered two different frames for healthcare delivery which include the prevailing top down or a “target oriented” frame as well as a bottom up or “empowerment” frame. The top down or “target-oriented frame has its roots in the biomedical model and Western scientific tradition and is mainly about leveraging CHWs to convince community members to accept medical advice” (Rifkin, 1996). The bottom up or “empowerment frame, influenced by Marxist philosophy and post-war anti-colonial sentiment, is about community members having power over health and resource distribution, rather than being dominated by elite groups, such as doctors” (Rifkin, 1996). Arguably, the empowerment frame, that prioritizes patient perspective, aligns more closely with a CHW model for healthcare delivery, and as such may place more value on a CHW workforce. Thus, the frame or paradigm in which a health system is based influences how a CHW is utilized and perceived.

Clarity of Expectations

A number of articles note that an important component of CHW effectiveness is “clarity of expectations” among members of the care team (Islam et al., 2016; Johnson & Gunn, 2015; Wagner et al., 2017). Clarity of expectations was a term sometimes used broadly to refer either to expected roles, purpose, or performance metrics. Thus, evidence suggests that clear (1) roles and responsibilities, (2) purpose or value of CHWs, and (3) the metrics for evaluating CHW performance may be important for effective integration.

CHW Roles/Responsibilities: Historically CHWs have been employed to serve a range of different tasks including care coordination, education, outreach, and clinical services. A recent literature review published by Hartzler et al found that CHW roles in clinical settings could be categorized into three primary categories: (1) clinical services (e.g. blood pressure screenings), (2) community resource connections, and (3) health education and coaching (Hartzler, 2006). But the IMPaCT model notably adds an additional critical CHW role—creative social support—which is not included in all CHW models (Kangovi et al., 2018). Given the potential for variability among assigned CHW roles, clarity of expectations is a critically important, but sometimes underrecognized, element.

CHW Purpose: Just as CHWs perform multiple roles in healthcare systems, they also can be employed to serve different purposes. Some, for example, view CHWs programs as a tool to address what has

been identified as the “Triple Aim” in healthcare—improved patient experience, health of populations, and reduced cost (Berwick et al., 2008). While others view CHW services through a health equity lens. If the primary purpose of employing CHWs is not explicitly stated, it is possible that different members of the care team will be operating with misaligned perceptions regarding a CHWs purpose on the clinical care team.

Evaluation: Similarly, the metrics used to measure or evaluate CHW performance or effectiveness may vary significantly depending on a CHW’s purpose, the organizational structure, and prevalent evaluation tools. This may include quantitative or qualitative metrics. It also may include metrics related to patient outcomes or improvements to systems or workflows. Central is the need for explicit direction regarding the expectations, roles, and evaluation metrics for a CHW workforce.

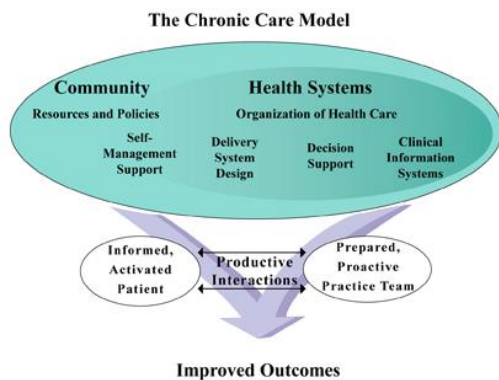
Examining Other Frameworks

In addition to drawing on evidence from the published literature, a review of existing relevant models and frameworks for teamwork, team-based care, or CHW integration was completed, in order to test the validity of my own model. Existing frameworks and models were identified and examined to identify key themes across disciplines, relationships among themes, as well as possible gaps in the current prevalent thinking. This analysis was used to test constructs previously identified in the literature review, identify previously unrecognized constructs of interest, and systematically reflect upon the positioning of my own conceptual model within this theoretical context. Those models that directly influence the development of my conceptual model are described below.

The Chronic Care Model

One important consideration in exploring models for CHW integration, are existing paradigms within the healthcare sector related to disease care or management. One model commonly embraced among the healthcare sector reform advocates is the Chronic Care Model—a model that describes the interrelated systems changes needed to improve patient-centered care delivery (Bodenheimer, 2019). This framework describes the importance of linkages among the community, health system, and patient (see figure 2). Moreover, it introduces the importance of a prepared, proactive practice team in the effective delivery of chronic disease care. Thus, this model reinforces the inclusion of training in my conceptual model. Also, important are the connections among the care team, the health system, and the community, further emphasizing the importance of community connections.

Figure 2: The Chronic Care Model (Bodenheimer, 2002)



Teamwork

In conducting a literature review into teamwork frameworks, one critical paper published by Mickan & Rodger (2005) offers another framework for conceptualizing healthy teams, arguing that four critical components of effective care teams include: team environment, team structure, team processes, and individual contributions (see figure 3). This model illustrates an example of incorporating the concepts of leadership and culture in healthy teams.

Figure 3: Healthy Teams Model (Mickan & Rodger, 2005)

Table VI. Healthy Teams Model.			
Team environment	Team structure	Team processes	Individual contribution
Purpose	<i>[purpose]</i> Goals <i>[leadership]</i>	<i>[goals]</i> Leadership Communication Cohesion	<i>[leadership]</i>
<i>[mutual respect]</i>	<i>[cohesion]</i>	<i>[mutual respect]</i>	Mutual Respect

This teamwork framework help provide additional evidence to support the inclusion of high-level components in my conceptual model including environment, structure, process, and leadership. But also important is the identification of fundamental components of effective teams including alignment around goals, mechanisms for communication, a culture of trust and mutual respect, clear roles and responsibilities, functional meetings, and an appropriate skill mix. Attention has been paid to the inclusion of these relevant components in my model.

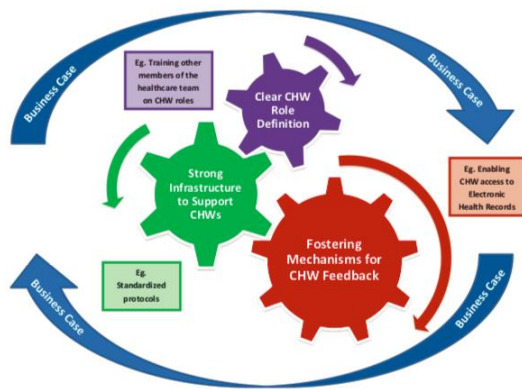
CHW Integration Frameworks

Finally, while the literature into CHW integration is minimal, there are a few frameworks that offer

some guidance in the development of a model. While some of these frameworks derive from practice—in the form of white papers—or from literature on international models of integration, they still offer important relationships that should be considered.

To start, one model of CHW integration, offered by a white paper produced by New York University, considers the question of CHW integration in the healthcare sector (see figure 4) (Islam et al., 2016). This model mirrors other models for clinical care teams that highlight the need for structures that support teamwork, but it also introduces new CHW-specific elements including the need for effective communication, a clear division of roles, as well as a business case for CHW models.

Figure 4: “The Integration of CHWs into Primary Care Health Systems: The Time for New York is Now!” (Islam et al., 2016)



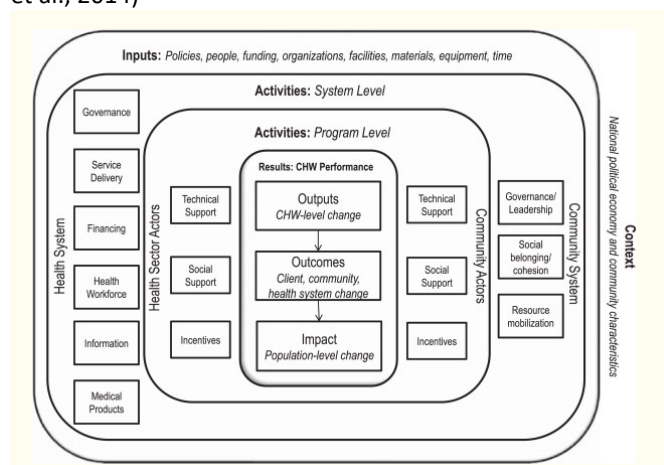
Possibly one of the more well-known models of CHW program delivery was developed by the University of Pennsylvania’s Center for Community Health Workers—the IMPaCT Model (Individualized Management for Patient-Centered Targets) offers a framework for the delivery of CHW programming. While not specifically focused on integration, this model does incorporate important key principles including (1) focusing on “natural helpers”, (2) effective training and supervision, (3) designing programs around patients, not disease, (4) replicating evidence-based models, and finally (5) maintaining a CHW’s important role in the community (chw.upenn.edu). Thus, while this model overlaps with many of the components of my conceptual model, it also emphasizes the delicate balance in integrating CHWs into clinical care. Notably, integration must also allow for the unique identity of CHWs as members of the community. The process of integration must not serve to remove this critical piece of a CHW’s identity.

International Models

The implementation of large-scale CHW programs has a much more robust history in low and middle-income countries when compared to the United States. Many of these international CHW models involve close integration within health or hospital systems. Thus, an exploration of literature related to international CHW programming offers other useful models when considering CHW integration.

For example, a logic model published in 2014 by Naimoli et al (See figure 5) offers a theory of enhanced CHW performance in low- to middle-income countries. This model offers a systems-thinking perspective in expanding upon individual level factors to include programmatic, organizational, community and systems-level factors. These map closely to the factors already identified in my research and thus provide continued support for the emerging constructs in my model.

Figure 5: A CHW “Logic Model” Toward a theory of enhanced performance in low- and middle-income countries (Naimoli et al., 2014)

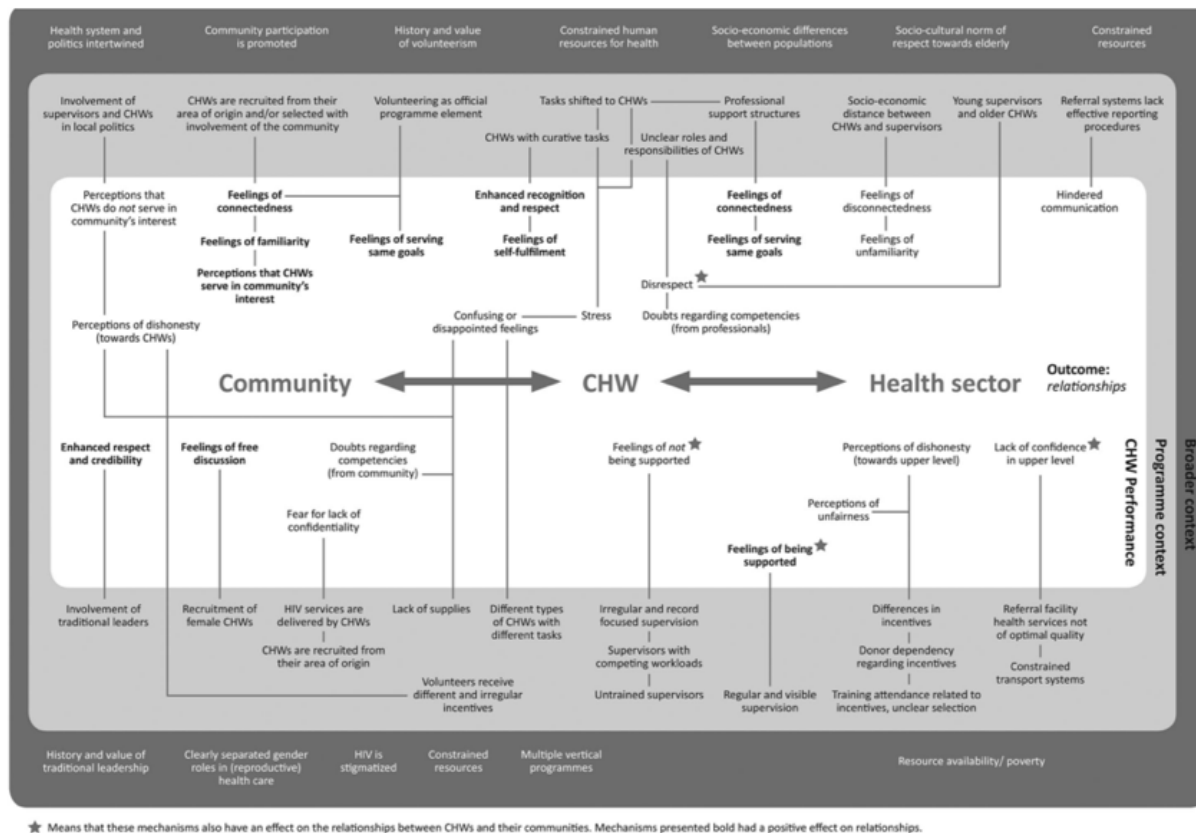


In another article, Kok et al (2017a) examine the integration of CHWs within four African countries. While not all findings are applicable within the US context, some important factors emerge including: (1) A lack of clearly defined roles and responsibilities can lead to stress among CHWs and a lack of respect within the healthcare system, (2) assigning CHWs to work in the communities in which they are familiar is necessary for effective community integration, (3) robust systems of supervision help to ensure that CHWs feel integrated within the greater system, (4) effective communication is important (see figure 6).

The authors frame CHW integration as the establishment of trusted relationships among CHWs, the health system and the community. Thus, the assumption is that integration requires trust. Authors argue, “elements of CHW programme design such as support, accountability and communication

structures can influence relationships. When those structures do not function optimally, CHWs can face significant challenges in building trusting relationships with community members and actors in the health sector, leading to demotivation and tensions as a result of trying to accommodate conflicting interests and expectations.” Thus, this article articulates that integration within the healthcare system is just one important component of a CHWs work. Also important is their integration within the community as well as the establishment of trusting relationships within these systems. This conclusion parallels the one captured in the IMPaCT Model, thus emphasizing its relevance in my conceptual model.

Figure 6: Overview of contexts and mechanisms that influence CHWs’ trusting relationships with the community and health sector (Kok, 2017a)

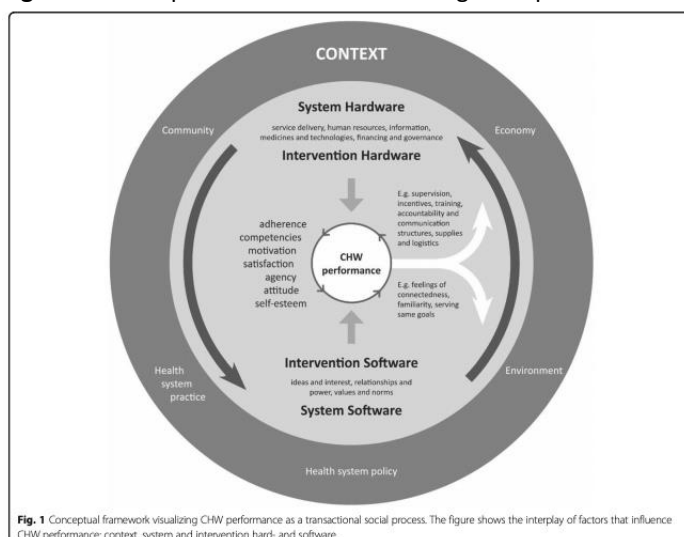


In a 2017 follow-up article, Kok et al offers another framework for enhanced performance of community health workers (see figure 7). In this framework, they argue that it is critical to view the healthcare system as a “complex adaptive system.” It is through this lens that Kok et al describe the factors associated with CHW effectiveness. They group themes into categories which include “hardware,” referring to “supervision systems, training, accountability, communication structures, incentives, supplies, and logistics”; and “software” referring to “ideas, interests, relationships, power, values, and norms of the health system actors.” These factors influence a CHW’s perceptions about

their experience as well as their ability to effectively perform job responsibilities. Authors conclude that the resulting framework shines a spotlight on the need for programs to “pay more attention to ideas, interests, relationships, power, values and norms.” Expanding on earlier work, this framework emphasizes that “Conceptualizing CHW performance as a transactional social process within complex, adaptive health systems has important implications for policy, practice and research. The intermediary position of CHWs between the community and health sector stresses the importance of the (sometimes overlooked) software elements, including trusting relationships between all actors (Kok et al., 2017b).”

This framework speaks to two important concepts that have relevance to my own research. The first is the perspective on the health system as a complex adaptive system (CAS). This CAS framework, originating in complexity theory work integrating insights from biology and computer science, offers a new lens in which to consider the problem of CHW integration and opens new avenues for exploration related to complex adaptive system design principles (Kok et al., 2017b). It builds on the importance of feedback loops—a basic systems thinking concept—in the relationship among hardware and software elements (see Kok et al. diagram below), thus establishing the importance of articulating connections among elements of the model. Second, fundamental in this framework is the question of “power.” This concept of power has been underlying many components of my model including healthcare hierarchies and team culture, but it has not been explicitly stated. Thus, this framework offers a new component that should be added to the model.

Figure 7: Conceptual framework visualizing CHW performance as a transactional social process (Kok et al., 2017b)



The exercise of exploring relevant models and frameworks has offered some critical findings. First, I have concluded my model must consider multiple layers of the healthcare and community systems that influence the effectiveness of a CHW intervention—from the individual to organizational systems landscape.

Second, I concluded that it is important to consider my problem from the perspective of a complex adaptive system. This systems-thinking perspective challenges me to view how factors are interrelated and to consider the important feedback loops—especially among process and culture elements. Notably, feedback loops appear specifically relevant in the relationship between perceptions about CHWs and CHW integration; as well as among the multiple elements of effective team-based care.

Third, while the importance of CHWs’ positioning as trusted members of the community has been a critical component of my model, I did not explicitly consider how the process of integration within the healthcare system could influence the extent to which a CHW is integrated in the community. Many models stress that, while healthcare integration is critical, equally important is the maintenance of a CHW’s unique identity as a trusted member of the community. I have therefore concluded that the question of community integration requires more notable emphasis in the model.

Finally, underlying many of the components of my model are the elements of trust, power, and access. The extent to which these concepts are shared across different components of the system may influence community perceptions about the health system as well as a CHW’s ability to perform their role. I have therefore concluded that these constructs need to be explicitly stated and explored.

In addition, these frameworks also offer additional evidence for the inclusions of the other components of my model previously described in the literature review. They reinforce the importance of including the team-level factors and organizational factors described earlier in this Chapter.

Boundaries

While a review of the literature offers a number of critical interrelated elements that affect my problem of interest, this research will focus on a subsection of these findings. After completion of this review, I theorize that four critical components affect CHW integration: (1) the organizational context,

(2) the team structure, (3) community connectivity, and (4) CHW perceptions. While I recognize that other elements—notably the outer setting factors described above—should be acknowledged and considered, they cannot be reasonably examined through the context of this research study, and therefore remain opportunities for future exploration.

Table 3 below illustrates how the critical elements identified above map to the research questions described in Chapter 1. Each of these elements are included in my conceptual framework below.

Table 3: Connection between theory and research questions

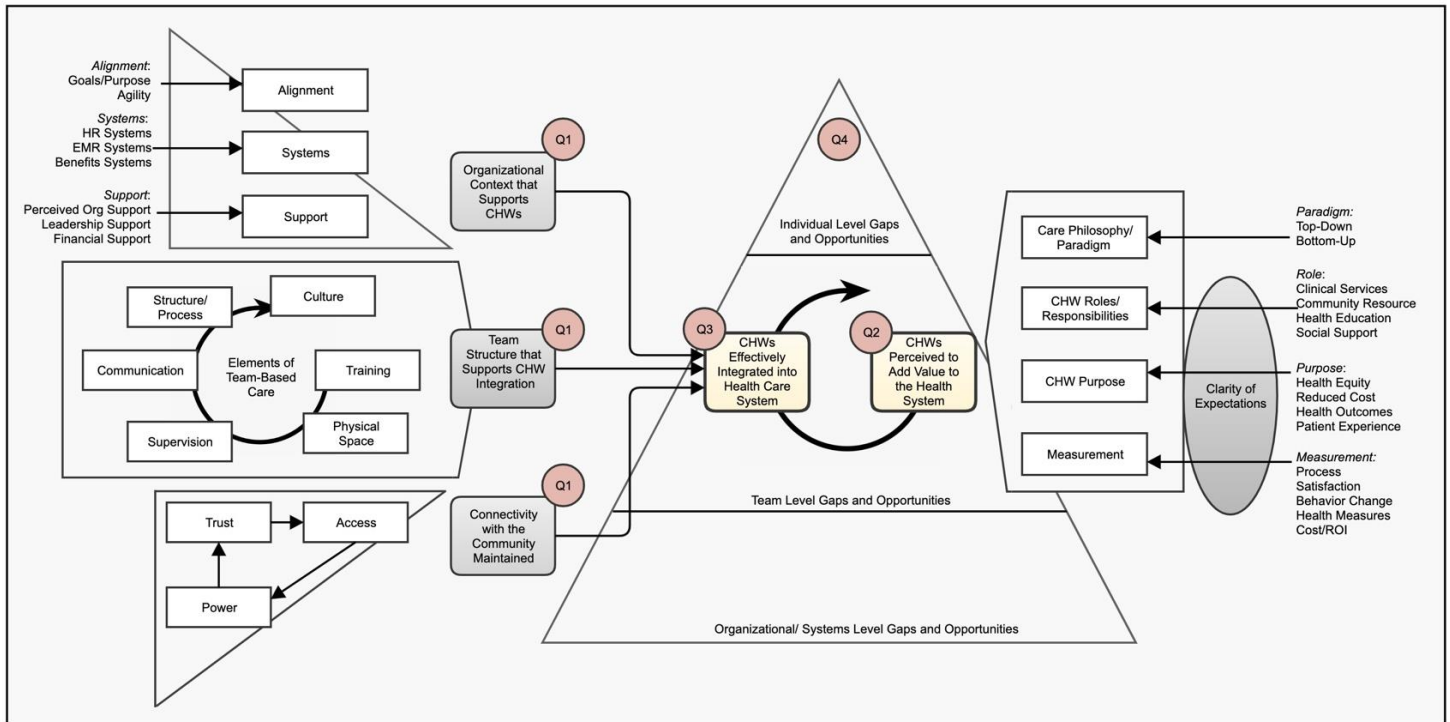
#	Research Question	Theory Derived from Literature Review	Constructs
1	How are CHWs currently being used within health care teams at the University of Illinois Hospital and Health Sciences System (UI Health)?	<i>Three critical components influence how CHWs are used in healthcare settings.</i> <ul style="list-style-type: none"> • <i>Organizational Context</i> • <i>Team Structure</i> • <i>Community Connectivity</i> 	<i>Care Team Structure</i> <i>Community Connection</i> <i>Organizational Context</i>
2	How do different members of the care team perceive a CHW's purpose and value on the team?	<i>Perceptions about CHWs are affected by the prevalent care philosophy as well as clarity of expectations and metrics for evaluation.</i>	<i>Care Philosophy</i> <i>Roles and Responsibilities</i> <i>Purpose</i> <i>Value</i> <i>Measurement</i>
3	In what ways are CHWs integrated into their work environment?	<i>The extent to which integration is present is dependent on the other components of the model including how CHWs are used (Q1) and perceptions of CHWs (Q2).</i>	<i>Integration</i>
4	What individual, team and, organizational level factors are critical for effective integration of CHWs within the existing system?	<i>The components of the model may serve as gaps or opportunities for effective integration. These components can be viewed across multiple layers including individual, team and system. Articulating these gaps/opportunities may lead to key findings for improved integration.</i>	<i>Individual-level Factors</i> <i>Team-level Factors</i> <i>System/Organizational-level Factors</i>

Constructs and sub-constructs related to each of these theories were created and defined in the attached measurement table. These constructs will be used to test my theory and conceptual framework. Chapter 3 describes the methods that will be used to explore these research questions.

Conceptual Framework

Building upon the findings of the literature review, as well as a consideration of relevant frameworks and models, a conceptual framework was developed (Figure 8). This framework illustrates the theorized relationships among critical constructs in my research.

Figure 8: Conceptual Framework for integration of CHWs into clinical care teams. Integration involves (1) an organizational context, (2) team structure, and (3) community connectivity. This influences a feedback loop that exists between effective integration and perceptions about a CHWs value to the system. It is possible to consider opportunities/gaps across multiple layers including the individual, team, and organization.



I theorize that, the extent to which a CHW is integrated into a health system is influenced by (1) the organizational context, (2) team structure, and (3) connectivity with the community. My research will focus on 9 key constructs: care team structure, roles and responsibilities, community connection, organizational context, perceptions, purpose, care philosophy, measurement, and integration. I theorize that a feedback loop exists between CHW integration and perceptions about CHWs. I hypothesize that perceptions are influenced by the prevalent care philosophy, a CHW's roles and responsibilities, the CHW's purpose, and how CHWs programs are measured or evaluated. Thus, my theory of change utilizes a systems-thinking perspective which examines the interrelationships among multiple factors within the system—including individual perceptions as well as organizational, team, and community structures—to understand how these interdependent relationships influence the extent to which a CHW is effectively integrated into the health system. Constructs are defined in more detail below.

To begin, I theorize that the extent to which a CHW is integrated into the health care system is influenced by three critical factors: the care team structure, the organizational context, and connectivity with the community.

Care Team Structure

The clinical care team is defined as a group of individuals who may represent different disciplines or professions (such as physicians, psychiatrists, nurses, CHWs, social workers, etc) who are working together to provide coordinated and/or integrated care and services to an individual patient with the goal of improving health outcomes. Sometimes this term is used interchangeably with other concepts including multidisciplinary care teams or interdisciplinary care teams (Chamberlain-Salaun et al., 2013; Nancarrow et al., 2013,). Based on the literature review described previously in this chapter, I theorize that the following factors are critically important to understand the care team structure: culture, communication, physical space, training, supervision, and structure/process. Consequently, they have been included as clinical care team sub-constructs in the model.

Organizational Context

The organizational context is defined broadly as a description of the systems, processes or environment at UI Health (or a specific department within the UI Health System) that impacts or influences CHWs or CHW programs. In order to unpack the organizational context, the following sub-constructs have therefore been identified: systems, alignment and support. First, organizational systems related to employment, record keeping, or care delivery such as HR systems, electronic record systems, or employee benefits systems are a critical component of the organizational context. These organizational systems may be connected to the ability for the organization to respond quickly or remain agile in a changing environment. Also important is the extent to which an environment is created that enables a specific department, program, or group of individual employees to exist and function. This may include discussions of perceived support from the organization--conceptualized as organizational support, leadership support, or financial support. It may also be influenced by the extent to which CHW programs align with the organization's goals and purpose.

Community Connection

For the purposes of this research, community is defined as a specific group of people or geographic region that has been targeted for CHW services either due to a pressing health need or organizational

priority. In other words, it is the “community” to which the CHW is assigned to serve. Drawing on the IMPaCT Model developed by researchers at University of Pennsylvania, it is assumed that CHWs share some characteristics with the population that they serve (race, disease, language, or geographic residence) (Kangovi et al., 2018). Notably issues of trust, power, and access emerged as important factors related to the community in pre-research interviews conducted for my environmental scan. Thus, they have been included as sub-constructs in the model. In particular, the question of trust functions on multiple levels. Trust between the CHW and the community is important, but so is trust between the community and the organization or system providing care—in this case UIC. Whether or not the community trusts the healthcare system will affect a CHW’s ability to build and maintain connections within the community.

In addition to considering the organizational, team and community context, I theorize that understanding individual perceptions about CHWs are also critically important to understanding the extent to which a CHW is integrated into the health system. Notably, I theorize that a positively or negatively reinforcing feedback loop exists between perceptions about CHWs and the extent to which a CHW is integrated. Below are the relevant constructs for this section of my conceptual model.

Perceptions

Perceptions are defined as the perspectives or thoughts among CHWs, administrators, and other members of the clinical care team about the purpose and value of CHWs. I theorize that these perceptions may differ between individuals and this, in turn, has the potential to influence CHW integration. It is therefore important to understand the perspectives of these individual groups as well as differences among groups. Closely related to perceptions are the concept of value, or how individuals define a CHW’s specific unique skills or qualities. The IMPaCT program at Penn defines CHW’s unique value as (1) they represent the populations that are being served, and (2) that they are “natural helpers.” (Kangovi et al., 2018) But this research will test whether that assumption holds in this new context.

Through my literature review, I have identified the following factors which I hypothesize are related to perceptions about CHWs: care philosophy, roles and responsibilities, purpose, and measurement. They have therefore been included as constructs in my model.

Care Philosophy

Care Philosophy is defined as the philosophical rationale for how members within that health system (including administrators and leadership, CHWs and patients) should view health and healthcare. This care philosophy or “paradigm” influences how CHWs are viewed within the healthcare system. Thus, understanding this underlying philosophy is important for understanding how CHWs are perceived and utilized. Rifkin et al (1996) offered two different frames for healthcare delivery which include top down or a “target oriented” frame and bottom up or an “empowerment” frame. Generally speaking, CHW care delivery is more aligned with a bottom-up care philosophy. These two different framing are therefore included as sub-constructs in the model.

Roles and Responsibilities

The construct “Roles and Responsibilities” is defined as a description of the roles and tasks performed by CHWs as well as the expectations placed on CHWs in their professional capacity. This may include formal job descriptions or informal descriptions of the tasks and/or responsibilities of CHWs. A recent literature review published by Hartzler et al found that CHW roles in clinical settings could be categorized into three primary categories: (1) clinical services, (2) community resource connections, and (3) health education and coaching (Hartzler, 2018). These three categories have therefore been listed as sub-constructs in my model. But the IMPaCT model notably adds an additional critical CHW role—creative social support—which is not always included in all CHW models. (Kangovi et al., 2018) This research will test the relevance of those sub-constructs to define the CHW role.

Purpose

Purpose is defined as the stated or unstated intent for hiring and/or employing a specific group of CHWs. The perceived purpose may be different among different members of the program or clinical care team. Some view CHWs as a strategy to address what has been identified as the “Triple Aim” in healthcare—improved patient experience, health of populations, and reduced cost. (Berwick et al., 2008) While others view CHW services through a health equity lens. These concepts have therefore been included as sub-constructs in my model.

Measurement

The construct “Measurement” is defined as the metrics used to measure or evaluate CHW performance or effectiveness. This may include quantitative or qualitative metrics. It also may include

metrics related to patient outcomes or improvements to systems or workflows. The Institute for Clinical and Economic Review released a guidance paper regarding measurement of CHW outcomes (ICER, 2013). The following categories of measurement were included: process, knowledge/behavior change, satisfaction, health outcomes, or costs (ICER, 2013). Consequently, these categories have been included as sub-constructs in my model.

Ultimately, I am interested in examining how all of these constructs interact to influence the outcome of interest—integration. The concept of integration is consequently a critically important central construct in my research.

Integration

Integration is defined by the Human Factors Engineering discipline as the seamless merging of different disciplines—possibly with different goals, needs and/or cultures--into a cohesive unit that leverages individual strengths to work together and achieve a shared goal (Baiden et al., 2015; Shuffler et al., 2018). Another definition of integration is the process of “bringing together different requisite contributory functional disciplines to work in a continuous collaborative and cohesive manner to achieve a more efficient and informed desired collective objectives (Baiden et al., 2003).” Central principles include working together, a common goal, and systems for shared information. Thus, an exploration of the presence or absence of these principles within CHW models may serve to illuminate factors that support integration within this context.

In healthcare, SAMHSA-HRSA created the CIHS Standard Framework for levels of integrated healthcare. This framework describes the process of integrating healthcare and behavioral health services as a continuum that can be mapped to specific deliverables. The CIHS Model describes the Integration Continuum as one that begins with coordination, progresses to co-location, and culminates in integration (Heath et al., 2013). This offers one perspective on how to measure integration—using a spectrum perspective. The concept of integration as a continuum or spectrum is a sub-construct that will be tested in my model. Closely related to integration is the concept of complementary individuals, programs or services. This refers to the process of enhancing or emphasizing the qualities of another person or thing. According to theory based in practice, the extent to which CHWs and clinical care can serve complementary roles is a critical component of integration. This assumption will be tested as part of this research.

To summarize this research model briefly, I am interested in examining the factors associated with effective integration of CHWs. I theorize that effective integration is related to the organizational, team and community context as well as perceptions about CHWs. I will use a systems-thinking lens to consider how these factors interact—through feedback loops—to affect integration. Each component in this model exists as a construct in the corresponding measurement table (Appendix 1-2). Also mapped onto this diagram are how research questions will be used to evaluate each component of the model. Constructs will be evaluated for gaps and opportunities across multiple levels including the individual, care team, and organization or system.

Conclusion

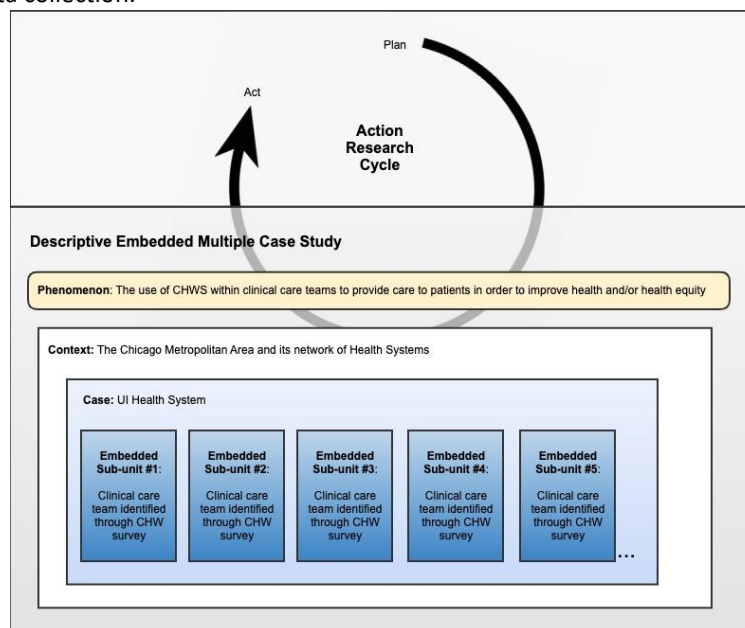
A review of the literature has provided evidence to support the development of my conceptual framework. It illuminates the complexity in my problem, describes the important components that influence the problem, and create directionality to relationships and feedback loops. Moreover, it provides a pathway to explore the question of CHW integration within the healthcare system. This model has been used to develop the methods for this dissertation project described in the subsequent chapter

Chapter 3: Study Design, Data, and Methods

Summary

For this dissertation, a qualitative descriptive multiple embedded case study that was informed by an action research process was completed (see figure 9). The case of study was the University of Illinois at Chicago's Hospital and Health Science System (UI Health) which is in the process of establishing a UIC CHW Center to support the development and sustainability of a CHW workforce that is integrated with clinical care services across the UIC system. The embedded subunits of analysis were care teams within the UI Health System that currently employing CHWs to assist with the provision of care or services to patients. Subunits were identified and recruited using a recently completed survey of UIC CHW programs. The research methods, analysis and findings were informed by check-ins with a key stakeholder group—The UIC CHW Taskforce Leadership Group—through an action research process. Data were collected through document review and semi-structured interviews conducted with multiple members of the team including administrators, clinicians, and CHWs. Data were analyzed using a hybrid coding design and MaxQDA software.

Figure 9: Study design description. Study employed a descriptive embedded multiple case study which was informed by an action research process. Action research was used to inform the study design prior to study implementation (plan), data collection and analysis during the dissertation, as well as recommendations (act) at the completion of data collection.



Study Context

As a preliminary step in conducting my dissertation research, I completed an environmental scan of CHW programs within the Chicago Metropolitan Region. This environmental scan, conducted in the Spring and Summer of 2019, included semi-structured interviews, document reviews, and a literature search coupled with reflection and an iterative study design process. It served as an important tool in developing and refining my research problem, questions, and methods. The findings from this environmental scan are as follows:

1. **Programs are growing:** The number of CHW programs developed and/or implemented by health and hospital systems within the Chicago Metropolitan Area is increasing. Moreover, existing programs are being expanded to serve more people and include more clinical care environments.
2. **Need for more coordination:** While in the past, a coalition existed to coordinate information sharing and collaboration among CHW programs in the region, this coalition is no longer operational. There is no central repository for CHW programs, and few people (if any) have knowledge of the full scope of programs being developed or implemented in the region. This is true on both the inter and intra organizational level among healthcare systems. One exception to this is the UIC CHW Taskforce which is currently working to improve coordination across UIC.
3. **Dynamic environment:** The use of CHWs in clinical care settings is a relatively new strategy to address health equity among many of the health and hospital systems implementing programming. Currently, there is notable experimentation and innovation occurring. It is unclear how much consistency there is among programs and to what extent there is congruence or divergence in strategies among programs.

Many in the field argue that it is imperative within this dynamic, disjointed and growing field that we develop a deeper understanding of those factors that contribute to effective CHW programs. Moreover, this understanding must be inclusive of the complex organizational and systems-level context in which these programs are positioned.

At the same time, researchers and practitioners within the UI Health system have developed a Community Health Worker Taskforce to establish the structure for more coordinated UIC CHW programming across the university. Many of the goals of the taskforce—including improving

coordination of CHW programming, support for new and growing programming, and promotion of evidence-based practice—align closely with the findings from my environmental scan. At this time, the formal structure of this effort has not been established, but taskforce leadership is working to develop the justification and resource support for this initiative.

Rationale

The UI Health System offers a unique context in which to explore CHW integration within a clinical system. It was selected as my case for the following reasons. First, the trends identified in my environmental scan—including CHW growth, disjointed coordination of CHW programs and services, and a dynamic environment in which there is experimentation and innovation—are all present within the UI Health system. Thus, this offers a representative case that mirrors larger trends within the greater Chicago Metropolitan Area and beyond. Second, the current UIC CHW Taskforce offers an existing infrastructure in which data can be collected as well as a change effort in which my research can be positioned. Notably, the recent completion of a University-wide survey offers a first look at the current state of CHW program delivery within this system. It was possible for me to build upon this foundational work for my dissertation research, thus leading to a more robust understanding. Finally, there are still many unanswered questions to explore within this specific context. Because the UIC CHW coordination efforts, and subsequent CHW-related research and coordination, is still in developmental stages, many unanswered questions about the factors associated with effective program delivery remain.

Through the environmental scan, I identified a unique context in which to explore questions related to CHW integration. The establishment of a UIC CHW Taskforce and the ongoing efforts to develop a UIC CHW programming offers an opportunity to build upon existing work to design a research study that will ultimately inform the priorities and structure of a new University-wide initiative. Notably, a deeper understanding of the organizational and systems level factors associated with effective CHW integration will help this Taskforce develop programming that is responsive to its external environment and its stakeholders. The potential for this research to both be informed by and have an impact on an ongoing organizational change effort highlights the critical importance of ensuring that the research be connected to practice. Consequently, I concluded that an Action Research approach was needed. I therefore proposed working closely with the CHW Taskforce Leadership Team as a Stakeholder group to inform research design and findings. This group was engaged using an Action

Research model to solicit feedback at multiple points in the research process. Notably, the action research process creates “a ‘double burden’ of both finding new knowledge and creating positive change”, thus creating a deeper connection between research and practice (Whyte, 1991).

Consequently, I engaged with the UIC CHW Taskforce Leadership team, as an initial step in the Action Research Process, to develop research methodology. During the proposal development phase, I participated in four meetings with Taskforce Leadership to understand the group’s priorities and needs. Additionally, findings from recently completed UIC CHW and CHW Administrator Surveys offered early insights into the dynamics of CHW programming across the UIC system (See Chapter 1). Findings from this survey reinforced the conclusion that a more in-depth understanding of UIC CHW programs—including the ways in which these programs are affected by organizational systems—is needed.

According to Simons et al, “Case study is an in-depth exploration from multiple perspectives of the complexity and uniqueness of a particular project, policy, institution, program or system in a ‘real life’ context.” (Simons, 2009, pg 21) Arguably, my problem lends itself well to this approach. My problem is current, dynamic, and unique. Moreover, contextual factors play a critical role. The UI Health System is a large and complex health system that is positioned within Illinois’ largest public research university. This system has unique features related to communication, data collection, human resources, funding and leadership that intersect with my conceptual model. As described earlier, while evidence-based models for CHW service delivery exist, the organizational and systems-level factors needed for effective program delivery are less well known. It is therefore important to explore these factors in more depth. In this dynamic, growing, and uncoordinated environment, a case study approach offers an opportunity to understand the local landscape—including complex contextual and systems-level factors—while also contributing to a body of knowledge about the factors associated with effective integration. Thus, this descriptive study—in which I am exploring the features, context and processes associated with my problem—is well positioned for a case study design.

Finally, within the UI Health system are multiple CHW programs working in silos. While these programs are situated in the same organizational context, they are approaching the problem of CHW program development and implementation with minimal knowledge about other existing programs and little collaboration or coordination. This dynamic offers a unique opportunity to look at multiple

programs (subunits) within the same context (case) to identify both unique and universal lessons that may contribute to learning across the system. Thus, an embedded case study approach is particularly relevant to my problem of interest and case. The inclusion of multiple CHW programs embedded within the same health system allowed me to explore how different care teams are approaching CHW integration within the same local context. This enabled me to (1) confirm findings (replication), and (2) identify divergent patterns across organizations, thereby reaching more explanatory power and generalizability (Yin, 2003). Moreover, by examining multiple sub-units within a specific case, this research design has the potential to improve validity of findings (Yin, 2003). An embedded case study design was therefore chosen due to the unique, rich, and complex context within this specific case as well as the needs of my Action Research Stakeholder Group.

Interviews are appropriate for gathering rich data about the actual experiences of those within the system as well as the dynamics underlying this system—through an exploration of experiences, perceptions and feelings (Patton, 1990). Interviews therefore offer an important source of data for this study. The purpose of the document review is to provide contextual data on the system and processes associated with integration. This may include training, organizational structure, and project evolution or growth. The use of multiple data sources—interviews and document review—complementarily is intended to improve validity of findings through data triangulation (Yin, 2003).

Research Assumptions

In developing my dissertation research design, I drew on the DESCARTE model for the design of case study research in health care, developed by Carolan et al (Carolan et al., 2016). This model identifies three key stages for the researcher “(1) situating the research and the researcher, (2) determining the components of the case study design, [and] (3) data analysis—adopting the three stances.” For each of these stages, guiding reflective questions can be used to help the researcher be more explicit in describing the underlying assumptions embedded in their work. This reflection exercise is described in more detail in Appendix 3.

Table 4: Summary of Dissertation Research Design/The Research Onion

Research Onion	
Research Component	Dissertation Summary
<i>Philosophy</i>	Pragmatic interpretivist
<i>Approach</i>	Hybrid deductive/inductive
<i>Methodological Choice</i>	Action Research/ Qualitative
<i>Strategy</i>	Case Study
<i>Time Horizon</i>	Cross-sectional
<i>Data</i>	Semi-structured interviews and document review

Generally, as a researcher, I fall within the pragmatic philosophical approach. I believe that there are many ways of interpreting the world and conducting research. Depending on one's viewpoint, a researcher may "see" different things. In recognizing that there are different realities, I must also recognize that there is value in viewing a situation from multiple perspectives or viewpoints. I am therefore open to incorporating both positivist and interpretivist perspectives. But, for the purposes of this study, I am particularly interested in exploring the contextual factors associated with a specific phenomenon. I am thus more closely aligned with an interpretivist paradigm for this research. I have therefore defined myself as a "pragmatic interpretivist" in that, while fundamentally pragmatic, I am positioned closer to the interpretivist end of the spectrum in my approach.

There are arguably traces of both positivism and interpretivism in action research. Action research may draw on positivist research techniques (i.e. quasi-experimental design), but it is generally classified as an interpretivist mode of inquiry due to its conditional nature (Tekin & Kotaman, 2013). This positioning of action research as a pragmatic discipline that is more closely aligned with interpretivism closely aligns with my personal philosophy.

Moreover, there is close alignment between the theoretical underpinnings of action research and my own personal leadership values (see Chapter 1). As noted by Ernest Stringer in *Action Research* (Stringer, 2014), "Action research is a collaborative approach to inquiry or investigation that provides people with the means to take systematic action to resolve specific problems." This specific focus on research as a "collaborative" and "systematic" process in which a group is engaged with an "action-oriented" perspective is particularly notable. I personally define myself as a relationship builder and

strategic thinker who uses a systems perspective to affect change. Thus, the action research approach closely aligns with these personal leadership values.

Action research “works from an assumption that all people affected by or having an effect on an issue should be involved in the process of inquiry (Stringer, 2014).” I believe that researchers, when disengaged from their environment, run the risk of failing to understand or consider critical dynamics that influence the question of interest. It is therefore imperative that researchers, not only seek to understand the local context, but also seek to engage the voices and perspectives of those affected by the research. It is this set of assumptions that drive my research design described below.

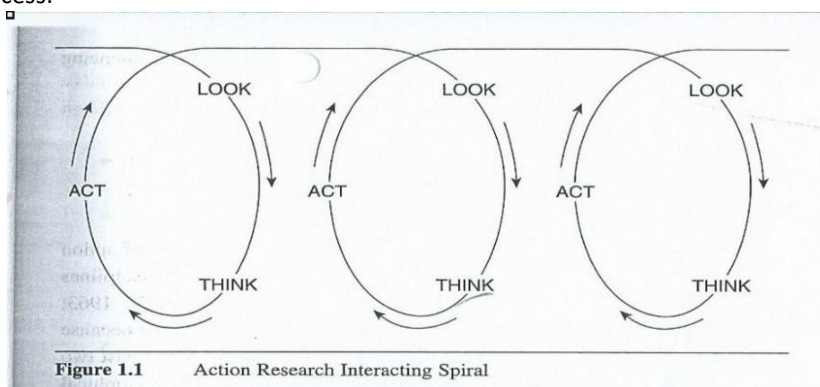
Finally, while this research considers both barriers and facilitators to integration, the research was designed to illuminate and amplify best practice in order to build and support more robust CHW models that are well integrated within the systems in which they are positioned. As such, this research takes an appreciate frame in considering the research questions, thus drawing on appreciative inquiry principles in research design and execution (Hammond, 2013; Preskill & Catsambass, 2006). This focus also aligns with my own personal leadership orientation toward strengths-based approaches.

Data Sources, Collection and Management

Action Research Process

Action research methodology was employed throughout my dissertation to engage stakeholder input. This includes the pre-research (or design) phase, the research phases, and post-research action. The process was modeled after Stringer’s (2014) iterative process of look, think, and act (figure 10).

Figure 10: Action Research model has been derived from Stringer’s iterative cycles of look, think, act. To describe steps in the action research process.



Critically important is that the Stakeholder Group—The CHW Taskforce Leadership Team—was involved in the design phase to inform both the methodology and theory. Additionally, after the dissertation is complete, this Stakeholder Group will collaboratively work to understand findings and develop recommendation with the intention of using these findings to inform new phases of inquiry, thus continuing the action research process.

The Action Research Stakeholder Group was solicited for feedback at three different phases in the research process: (1) the pre-research planning period, (2) the data collection phase, and (3) the data analysis and reflection phase. Moving forward, I will work directly with the stakeholder group in a post-research action phase to determine next steps. Figure 11 illustrates each of these phases, how they align with Stringer’s model, and the intersection with my dissertation research products.

Figure 11: Summarizes how the action research process intersects with my dissertation research including pre-research phases (before dissertation initiation), and post-research phases (after dissertation completion). The yellow triangle in this diagram illustrates the portion of the work that intersects with dissertation research deliverables.

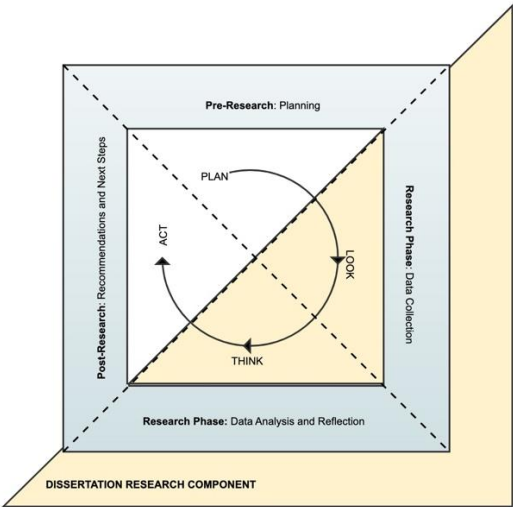


Table 5 below describes how the stakeholder group was used to inform each of these phases. Stakeholders were engaged during data collection to ensure appropriate sub-unit selection, and in the analysis phase to review initial findings (described below).

Table 5: A description of how the Action Research Stakeholder Group engaged in the research process at different stages of the research.

Action Research Stakeholder Group Engagement Strategy		
Research Stage		Role of Stakeholder Group
<i>Pre-Research</i>		Meeting was held with Stakeholder Group to solicit feedback on research design, questions, and instruments. Particular focus was given to refining interview guides.
<i>Research</i>	<i>Data Collection</i>	Stakeholder Group reviewed programs identified through the sampling strategy to ensure that critical programs have not been excluded from analysis.
	<i>Data Analysis</i>	Stakeholder group received final summary of findings (paper drafts) for reaction and feedback.
<i>Post Research</i>		At least one (1) meeting will be held with Stakeholder Group to consider recommendations and appropriate next steps in the transition into the post-research phase.

Data Sources/Recruitment

Data were collected from teams that make up sub-units within the UI Health system. Sub-units met the following eligibility requirements to be included in this study: (1) the sub-unit employed CHW(s) in paid part-time or full-time positions, (2) CHWs worked, at least in part, as part of a team to provide care or services to patients, and (3) the team was operated by the UI Health System. A recruitment goal of 5-7 sub-units were targeted for recruitment.

In order to identify sub-units for recruitment, the recently conducted UIC Survey of CHWs/CHW Administrators was used. To comply with IRB recruitment guidelines, the UC CHW survey was used to identify CHW programs or projects for sub-unit recruitment. Survey results were reviewed to identify a list of CHW programs reported in the survey. No names or individual contact information was collected from the survey. In addition to the survey, I conducted an internet search of CHW programs at UIC to identify additional programs that may meet my eligibility criteria. A list of potential CHW programs for recruitment was created and shared with the Stakeholder Group to ensure that no important programs were inadvertently excluded from the recruitment pool. In total, 11 programs were identified through this process.

After the list of CHW programs was finalized, I identified each program's administrator, director or Principal Investigator (PI) to initial recruitment. An email was sent explaining my research and requesting permission to enroll the program as a research sub-unit. If necessary, a phone call was scheduled with the appropriate administrator to explain the program. An IRB-approved recruitment script was used for email and phone correspondence. Questions were asked of the administrator to

determine eligibility. Administrator approval was obtained in writing (email) prior to initiating participant recruitment. Once administrator permission was obtained, I worked with the administrator to identify individuals representing target categories of CHWs, administrators, and clinicians to contact for recruitment. When preferred by the administrator, the administrator sent an email to participants to inform them of my research prior to participant recruitment initiation.

The goal was to obtain a representative sample of clinical programs employing CHWs across the UI Health System. Consequently, all programs that met the eligibility criteria were recruited to participate. Out of the 11 programs initially identified, 9 were confirmed to be eligible, and 6 (66.7%) agreed to participate. 3 declined due to insufficient time or inactive CHWs. Administrators provided a list of staff to contact for recruitment. A total of 25 staff (CHWs, clinicians and administrators) from the 6 participating sub-units were recruited. 17 (68%) agreed to participate. Out of the 8 individuals that did not participate, 1 declined due to lack of interest, 1 declined due to a lack of time, 3 did not show up for scheduled interviews, and 3 did not respond to contact attempts.

Data Collection

Data were collected from each enrolled sub-unit via document review and semi-structured interviews (see Appendix 4 for interview guides).

Each sub-unit was asked to provide the following documents (if available): (1) publications describing the program or its findings, (2) training documents (such as manuals, agendas, or evaluation instruments) used when training CHWs, (3) reports prepared for funders or outside agencies about the CHW program, (4) protocol or procedure documents describing workflows for the CHW program, (5) job descriptions used when hiring CHWs, or (6) other relevant documents describing or detailing the CHW program itself.

Semi-structured interviews were conducted with individuals representing multiple layers of the clinical care team or sub-unit including (1) clinical care (doctor, nurse, PA) (n=1 per sub-unit), (2) leadership/administration (n=1 per sub-unit), and (3) the CHW (n=1-3 per sub-unit). Not all programs had representation from all target categories. Some respondents reported dual roles (such as administrator and clinician). Respondents were recruited via email using an IRB-approved recruitment script. A copy of the IRB-approved consent document was shared electronically with participants and

verbal consent was obtained and documented prior to the interview (Appendix 6). The interview protocol was revised in response to the COVID-19 pandemic. All interviews were conducted remotely in compliance with IRB requirements. Interviews were conducted via a video-chatting program (Zoom or Webex) or phone and audio recorded.

A semi-structured interview guide was created for interviews to increase reliability and validity. Separate interview guides were used for CHWs and administrators and clinicians. Interview guides drew on narrative interviewing techniques as described by Anderson et al to use storytelling as a tool to understand the lived experiences of those individuals participating (Anderson et al., 2016). The CHW interview guide included questions about the CHW's role; ways they worked with the care team, including communication tools and procedures for workflow; the CHW's perceptions of the organization; the team culture; the ways in which they worked in the community; and challenges and opportunities in their job. Administrators and clinicians were asked how they worked with CHWs including communication tools and procedures for workflow; the CHW's primary roles and purpose; the nature of CHW training and supervision; the team culture; perceptions about CHWs; and challenges and opportunities faced when working with CHWs. Interview guides were pilot tested and shared with the stakeholder group for review prior to starting the study. The guides were designed for an interview of 45-60 minutes in length. Interviews were transcribed verbatim using an automated transcription service (temi.com) and coded using MaxQDA software.

Reflective journaling served as another tool for capturing data. I use a reflective journal to record thoughts, feelings and impressions throughout the research process—from data collection to analysis. This journal served to offer “transparency” in the research process by articulating my assumptions and delineating my point-of-view (Ortlipp, 2008). This method also aligns closely with the DrPH core principle of systematic reflection.

The data instruments were designed to align with the conceptual model and theory of change presented in Chapter 2. A measurement table which maps the alignment among data sources, research questions, and key constructs from the conceptual model has been included in Appendix 1. A second measurement table describes how the constructs were operationalized (Appendix 2).

Data Management

Interviews were recorded and stored in a password protected file on the secure UIC server (UIC Box). Interviews were transcribed using an online transcription service (temi.com). Written transcripts as well as documents obtained through the document review were also stored in UIC Box. In order to maintain confidentiality, interview transcripts were de-identified. A list linking research number, name and contact information of respondents was stored in a separate folder on UIC Box.

Documents collected during the document review phase were tracked in an excel file and saved on UIC Box. Data were extracted from documents using a document review matrix (see Appendix 5).

Analysis Plan

Data were collected and analyzed in the following order. First, documents were obtained and analyzed. Next, semi-structured interviews were completed and analyzed. Then, any documents obtained during or after the interviews were analyzed. Finally, data from multiple sources were triangulated, first by sub-unit and then across sub-units.

This study used coding to group and categorize concepts for analysis. Coding allowed the data to be grouped in order to describe and interpret the text and passages extracted from interviews and documents, and collapse data into conceptual elements that could be understood (White & Marsh, 2006). I applied a hybrid coding scheme that included both deductive and inductive approaches. Data were analyzed first using a deductive approach (Crabtree & Miller, 1999). A priori codes were derived from the literature and mapped to key constructs in the conceptual model described in Chapter 2 in order to ensure that the coding scheme was responsive to both the theoretical model and the purpose of the research (Merriam & Tisdell, 2016). The a priori coding schema for this study applied 21 codes that were linked to the conceptual framework (Appendix 7). Codes were grouped into larger parent code categories including the individual, team, organization and community. Additionally, the cross-layer codes of integration, leadership, facilitators, and barriers were also defined a priori. Codes were used to establish “conceptual congruence” across concepts included in the conceptual framework (Merriam & Tisdell, 2016).

Inductive, emergent coding was then applied to identify relevant codes not included in the original coding schema (Altheide & Schneider, 2013). Inductive codes were identified when a concept, that didn’t fall within with the a priori coding schema, was repeated either within or across data sources.

Memos were written to conceptualize and define emergent codes and explore the ways in which the emergent code connects to the conceptual model. 11 distinct emergent codes were added during the coding phase.

Most codes were applied to larger sections of text, defined as a “unit of meaning.” Commonly, units of meaning were framed on the paragraph-level in order to capture the context in which the concept was situated. For rich text sections covering complex topics, simultaneous coding was utilized, thus applying multiple codes to the same text section. For example, in a coded text section about CHW roles and responsibilities the respondent may have also described how training physicians in a CHW’s role was helpful. Thus, multiple codes would have been applied to this section including facilitators, roles and responsibilities, and training thus establishing co-occurrence among these codes.

Document Review

Documents were summarized using the attached document review matrix (Appendix 5) (Miles & Huberman, 2014). Documents were first summarized for key characteristics including author, document type, date, and audience. Then, for each document type, a separate review matrix was created to guide the application of codes to specific document types (description below). Documents were surveyed for program-specific details, and the presence or absence of specific codes. Next, sections of the text related to constructs were extracted, and document-specific memos were written summarizing and reflecting on key findings or outstanding questions.

(1) Publications describing the program, or its findings offered information related to a program’s structure, as well as metrics used to evaluate CHW programs. Documents were reviewed for text describing the type or role of CHWs (roles and responsibilities), the community or population served (community-level factors), the CHW hiring or training process (HR), the supervision or meeting structure (supervision, communication), predominate funding mechanisms (financial support), or the care philosophy. Documents were also reviewed for data related to integration, or barriers and facilitators of implementation.

(2) Training documents provided information on the training structure and process. Documents were reviewed for the presence/absence of specific training elements (cross disciplinary training, evaluation instruments, or team-based skills). Documents were also reviewed for details related to the training duration and format.

(3) *Reports prepared for funders or outside agencies about the CHW program* offered similar data as collected for publications (see description above).

(4) *Protocol or procedure documents describing workflows* provided data on how the care team worked together or the roles and responsibilities of CHWs. Documents were reviewed for details related to a CHW's roles, the care team composition or structure, process for communication, or the workflow or process of work-sharing.

(5) *Job descriptions used when hiring CHWs* provided data on the process of hiring CHWs, the primary roles of a CHW, and the desired qualifications or experiences of CHWs. Documents were surveyed to determine whether they referenced experience, training requirements, roles, or goals and objectives. Relevant text related to each of these elements were extracted. Documents were also assessed for descriptions of the CHW's salary, job title, and components of the job description including roles and purpose.

Semi-structured Interviews

Semi-structured interview transcripts were uploaded into MaxQDA for analysis. A hybrid coding approach was applied beginning with deductive a priori codes derived from the theoretical model. An a priori codebook defining and operationalizing a priori codes was created and also uploaded into MaxQDA (Appendix 7). After a priori codes were applied, transcripts were reviewed to identify emergent codes, thus employing a grounded or inductive approach to illuminate new or previously unrecognized patterns or trends (Glazer & Strauss, 2010). In this inductive cycle, transcripts were reviewed to identify themes not captured by a priori codes.

A second independent coder reviewed the coding process for a subset of interviews to ensure coding consistency and reliability (Merriam & Tisdell, 2016). The secondary coder was provided the code book and a pre-coded interview for review. This coder provided feedback on the application of the codebook, specifically focusing on areas of disagreement in the application of the coding scheme. As needed, the codebook, including the codes or code definitions were revised to improve clarity. Additional coded interviews were reviewed by the secondary coder until coding agreement was achieved (2 review cycles).

This study applied multiple cycles of coding beginning with an initial descriptive cycle and followed by subsequent inferential cycles (Saldana, 2016). In the first cycle, the a priori coding scheme was

applied to sections of the text to break down interviews into conceptual pieces. A subsequent cycle of coding was used to identify relationships among concepts, thus creating grouping or relational maps. Code frequencies were calculated and mapped to visualize important code patterns. Additionally, data visualization tools were used to look for patterns such as co-occurrence.

Codes with evidence of co-occurrence, based on data visualization tools, were reviewed together to assess relationships or connections, and memos were written to describe relationships among codes. Some co-occurrent codes were determined to be connected because of similarities in concept or overlapping definitions (e.g. purpose and value codes) while others were determined to be connected because of a relationship between two distinct concepts (e.g. communication and trust).

Sub-unit Level Data Triangulation

For each sub-unit, interviews and documents were brought together to identify key sub-unit level themes. Across interviews, codes were reviewed together to identify patterns of convergence or agreement and divergence or disagreement. For example, all text coded for “roles and responsibilities” across data sources within a sub-unit were reviewed together. Within some sub-units, CHWs and administrators described a CHW’s role differently (divergence). When appropriate, tables were created to compare codes within sub-units. For example, tables were created to compare how administrators/HCPs described a CHW’s roles and responsibilities compared to how CHWs described their own roles. In another example, when reviewing text coded for “communication” within a sub-unit, all interview respondents described weekly huddles to be a helpful communication strategy (convergence). Memos about divergence or convergence were written and illustrative quotes were extracted. Sub-unit specific documents were then reviewed to determine whether key document data aligned with interview themes. For example, was there a formal job description and did it align with the administrator’s or CHW’s conceptualization of their roles and responsibilities? Overarching memos were written reflecting on each theme and potential relationships among themes. Finally, a sub-unit report was written summarizing key findings within the sub-unit. This report summarized key sub-unit characteristics (size, service population, history) and organized themes by parent code category (individual, team, organization and community)—providing evidence via examples both from interview and document data sources.

Member checking

Sub-unit reports were shared with participating research subjects via email for feedback. Feedback was provided via a Qualtrics member-checking questionnaire (Appendix 8). This questionnaire asked whether report findings matched the participant's experience, whether the participant wanted to change or add anything to the report, whether anything in the report resonated or was surprising, and whether the participant had additional thoughts they would like to share. In total, 8 respondents (47%) completed the member checking survey. When needed, member-checking feedback was incorporated into sub-unit report to refine findings.

Cross-unit Triangulation

Once member checking was complete for all sub-units, cross-unit triangulation was used to identify overarching themes. I searched for consistent and distinct patterns among the sub-units to further develop my analysis and create a list of themes that emerged across embedded cases (Miles & Huberman, 2014). Data were summarized into themes and relevant explanatory examples were identified as evidence to support themes. Findings from this process was summarized in summary tables and text. This occurred through multiple distinct passes through the data including a data-source-specific analysis, cross sub-unit analysis, and quantitative content analysis.

Data Source-specific Analysis

I first examined the data for patterns across all similar formats (i.e. job descriptions, reports or interviews). I looked for differences or similarities across all sub-units to illuminate patterns or discordant findings. For example, job descriptions across sub-units were compared to determine whether roles and responsibilities were described similarly across sub-units and whether similar job descriptions were used by different sub-units. And reports were reviewed to examine differences in program size or budget. Memos were written identifying findings from this comparison. For interviews, all coded sections for a specific code were reviewed together to identify trends. For example, all text coded for "integration" was reviewed together and memos were written examining how the concept of integration was framed across the case.

Sub-unit Report Analysis

Using case reports prepared and refined above, I compared key findings across sub-units to illuminate common themes across all sub-units and/or critical differences that emerged between sub-units. A table summarizing findings for each sub-unit report was created to look for patterns across sub-units.

When differences emerged, additional review of relevant codes and themes was performed to determine whether there were patterns in the nature of the divergence. For example, some sub-units reported working closely with the communities served and others did not. Sub-units reporting high levels of community work were compared to those reporting low-levels of community work to consider whether different characteristics were associated with these groups.

Content Analysis

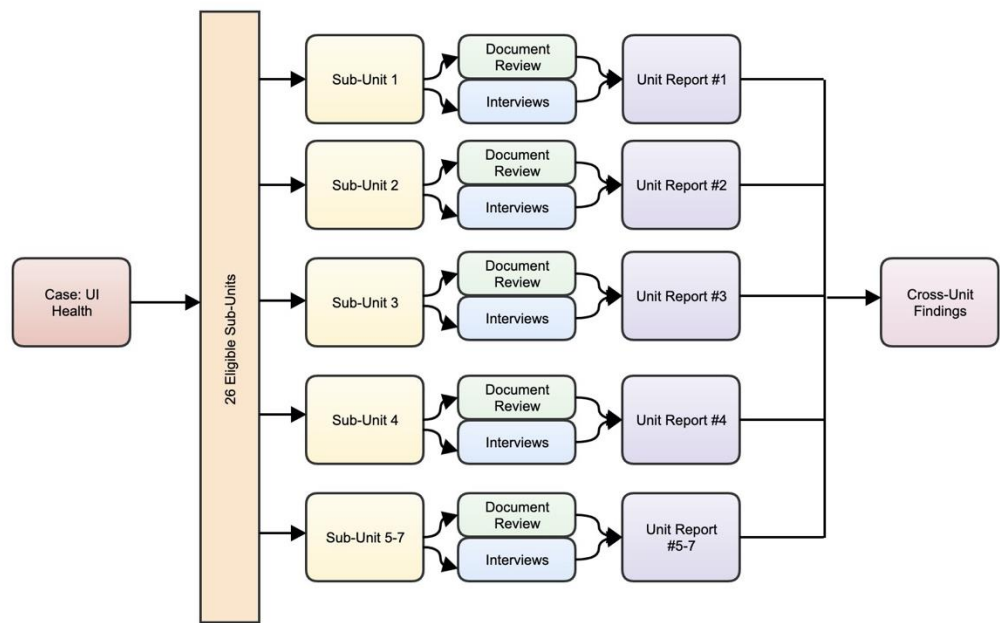
Sub-unit data were then analyzed to conduct a quantitative content analysis using qualitative data (White & Marsh, 2006). A method of quantizing was used to transform qualitative data into a quantitative score that allowed for comparison across sub-units (Sandelowski et al., 2009). The triangulation process described above was used to generate a list of factors that were found to be associated with health system or community integration among sub-units. This list was distilled into 9 clinic-level factors and 7 community-level factors associated with CHW integration. Next, interview and document data from each sub-unit was analyzed to determine the presence or absence of each integration factor within that sub-unit using a 3-point scale (present, partially present, or absent). A factor was categorized as “present” when clear examples of the factor’s presence was provided and confirmed across multiple data sources. A factor was categorized as “partially present” if some data suggested that the factor may be present or it was perceived to be present by some but not all of the respondents. A factor was categorized as “not present” if there was no evidence that the factor was present or if data explicitly indicated that the factor was not present. For example, one clinical-level factor scored was the presence of a flattened hierarchy within the team. If a specific reference was made to a “flattened” hierarchy within the team that was supported by examples across multiple data sources, the sub-unit received a score of “present” for “flattened hierarchy.” If no direct reference was made to flattened hierarchy but an example or text sections from data sources suggested that a flattened hierarchy may be present, a score of “partially present” was recorded. If respondents within a sub-unit described their organization as hierarchical (not flattened) or no descriptions of the sub-unit’s hierarchical structure were included, then the sub-unit received a score of “not present” for that factor. A scoring system was applied with 1 point assigned to present, .5 to partially present and 0 to absent. Sub-units and factor scores were compared using the charting method (Gale et al., 2013). Community and clinical integration scores were then totaled across factors for each sub-unit to generate an integration score. Each sub-unit received a score between 0 and 9 for clinical integration and 0 and 7 for community integration with a higher score associated with more representation across

integration factors in that category. This score was then analyzed and compared to apply a quantitative content analysis to the qualitative data. For example, sub-units were grouped into high, medium and low clinical integration categories (low=0-3, medium=4-6, high=7-9). Groups were compared to identify themes associated with each group. Sub-unit integration scores were graphed to visually depict differences in integration across sub-units. The actual value of the scores do not have meaning as a tool for evaluating individual sub-units. Rather, this scoring system offers a methodology for comparing integration across sub-units.

Bringing it all together

Data were then analyzed and interpreted to answer the research questions included in Chapter 1. Findings were grouped by research questions and reflective memos were used to examine how findings serve to inform research questions. A list of key findings for each research question was created. An appreciative lens was used in presenting key findings in order to present best practice recommendations for CHW integration. Finally, themes and relationships among these themes were mapped to the conceptual framework to identify points of alignment and divergence (see Chapter 5, Table 8). The conceptual model was revised to incorporate these changes (see Chapter 5, Figure 16). After data across sub-units was integrated and key findings summarized in draft paper format, findings were shared with the Stakeholder Group via email to solicit feedback.

Figure 12: This analysis plan flow chart illustrates how data were collected and analyzed. Individual sub-units were identified. For each sub-unit, interviews and a document review were completed. A report was prepared for each sub-unit and shared through a member-checking process. Unit reports were triangulated to generate cross-unit findings.



Validity Considerations

The study was designed to minimize threats to validity and reliability. First, the study was designed to leverage multiple data sources—including semi-structured interviews and a document review. This aligns with Maxwell who notes that the use of multiple data sources helps to ensure the validity of findings (Maxwell, 2013). Moreover, multiple sub-units within the selected case served to further validate findings. Notably, a member-checking process was built into the data analysis phase in order to check the validity of findings.

Second, the purposeful sampling design is structured to identify relevant cases for analysis while also reducing the potential for bias in case selection. Notably, the use of a survey recently completed for all CHW programs helps to minimize the possibility that cases were inadvertently or purposefully excluded.

Next, the creation of clear semi-structured interview guides served to improve consistency in data collection in order to ensure construct validity and reliability. Moreover, a second independent coder was used for a sub-sample of the total interviews in order to ensure consistency and reliability in study coding.

Finally, the reflective journaling process was used to illuminate and check bias that I may introduce into my research through my personal experiences or viewpoint.

Table 6: Assessing study validity and reliability (Yin 2018)

	Strategy Employed
<i>Construct Validity</i>	<ul style="list-style-type: none">• A priori constructs connected to the literature• Check constructs with Stakeholder Group through Action Research process
<i>Internal Validity</i>	<ul style="list-style-type: none">• Multiple data sources (interview and document review)• Triangulation across multiple sub-units
<i>External Validity</i>	<ul style="list-style-type: none">• Case selection criteria
<i>Reliability</i>	<ul style="list-style-type: none">• Explicit methodology• Second coder

But it should be noted that despite these efforts, some potential threats to validity remain.

For example, the small sample size of qualitative research inherently limits generalizability and can threaten validity. While findings may be relevant to the UI Health system, one must be careful when extrapolating these findings to other contexts.

Next, as an employee and student at UIC, I am not an objective observer of the system in which I am studying. I therefore have the potential to introduce bias into my work. Because my dissertation research is not related to my work responsibilities at UIC, I hope the potential for bias is minimized. Additionally, interview guides, the use of a secondary coder, reflecting journaling and a member-checking process are intended to minimize this effect. But I cannot guarantee that it is totally eliminated.

Chapter 4: Results

Commentary on Manuscripts

In total three manuscripts were prepared summarizing findings from this research. Details of each manuscript including the focus and the rational for journal selection are included below. Copies of each manuscript are also included in this chapter. Table 7 maps the connection between each manuscript, the research questions, and the key findings. Manuscripts 1 and 2 will be submitted in fulfillment of the requirements of the dissertation. Proof of submission is included in the appendix (Appendix 9).

Table 7: Connection between research questions, manuscripts and key findings

Research Question	Manuscript	Key Findings
Question 1: What is the role of CHWs within healthcare teams at the University of Illinois Hospital and Health Sciences System (UI Health)?	3	<ul style="list-style-type: none"> • CHW roles and responsibilities are broad and diverse both within and across sub-units • CHW's roles included connector, cultural translator, and educator • There remains a lack of clarity regarding a CHW's roles
Question 2: How do different members of the care team perceive a CHW's purpose and value on the team?	3	<ul style="list-style-type: none"> • Perceptions of CHWs differ both within and across sub-units • A misalignment in perceptions and purpose was observed between CHWs and administrator's/clinicians • Closer alignment around perceptions of a CHW was associated with higher levels of integration
Question 3: In what ways are CHWs integrated into their work environment? How is this defined?	2	<ul style="list-style-type: none"> • The integration of CHWs can be conceptualized along a spectrum • CHWs may have different levels of integration in the clinical and community context • Key factors associated with higher levels of integration in both clinical and community environments were identified
Question 4: What individual, team and organizational-level factors are critical for effective integration of CHWs within the existing system?	1	<ul style="list-style-type: none"> • 14 factors associated with integration of CHWs were identified • These factors can be grouped into individual, team, organizational, and community-level. • Considering the broader organization and community is critical for effective integration

Manuscript 1: *Understanding critical factors associated with integration of community health workers into health and hospital systems*

This manuscript describes the factors that were found to be associated with CHW integration and maps these factors on the individual, team, organization and community levels (research question #4). This research has a specific focus on CHW integration from the perspective of a health system. I have therefore selected the journal *Social Science in Medicine* for this manuscript. The journal publishes “material relevant to any aspect of health from a wide range of social science disciplines, and material relevant to the social sciences from any of the professions concerned with physical and mental health,

health care, clinical practice, and health policy and organization.” Backup journals to be considered include: *Journal of Multidisciplinary Healthcare*, or the *Journal of Primary Care & Community Health*.

Manuscript 2: *Framing the integration of CHWs into healthcare systems along health and community spectrums*

This manuscript summarizes the ways in which CHWs are integrated into the health system (research question #3). A matrix tracking elements of integration present for each sub-unit was created to assess the extent to which each sub-unit was integrated both in the healthcare and community context. Additionally, the concept of integration along a spectrum was introduced and described. This article frames the question of CHW integration within a health promotion and community-oriented lens. The *American Journal of Health Promotion* was therefore selected for submission. This journal was determined to be suitable because of its specific interdisciplinary focus, as well as its orientation toward community health and practice-based research. Backup journals to be considered include: *Health Services Research*, the *Journal of Ambulatory Care Management*, or the *Journal of Community Health*.

Manuscript 3: *Understanding the relationship between care team perceptions about CHWs and CHW integration within a health system*

This manuscript summarizes the roles and responsibilities of CHWs (research question #1), and perceptions of a CHW’s purpose and value among members of the care team (research #2). The connection between perceptions of CHWs and integration is also explored. This research has a specific focus on workforce-related questions related to CHW integration. The journal *Human Resources for Health* was therefore selected due to its cross-disciplinary focus on health workforce issues. The intention is to submit papers in a staggered format with the first two papers being submitted first. The third paper will be submitted at a later date in order to reference previous papers. **It is being included here because of its relevance to the research questions and findings, but it is not one of the two papers that will be submitted in compliance with the dissertation’s two manuscript requirements.**

Manuscript 1 (Formatted for Publication)

Title: Understanding critical factors associated with integration of community health workers into health and hospital systems

Keywords: Community Health Worker, integration, hospital systems, care teams, healthcare, United States

Abstract:

Community health worker (CHW) models have been shown to improve health behaviors and health outcomes and reduce cost, particularly among low-income underserved populations. Consequently, health systems are increasingly employing CHWs to provide health services in clinical environments. A growing body of literature suggests that effective integration of CHWs within the healthcare system is important to achieve the desired outcomes, but the question of how to achieve effective integration is less clear. This study seeks to explore the integration of CHWs within a large state university health system to identify factors critical to the effective integration of CHWs into the clinical care environment. We conducted a qualitative descriptive multiple embedded case study of the University of Illinois at Chicago's Hospital and Health Science System (UI Health). The embedded subunits of analysis were teams within the UI Health System that currently employ CHWs to assist with the provision of clinical care or services to patients. Data were collected via semi-structured interviews and document review. In total, 6 sub-units were enrolled, and 17 interviews were conducted with CHWs (n=9), and administrators or health care providers (n=8). Fourteen factors related to effective CHW integration were identified and organized in four layers represented by the individual, the team, the organization, and the community. Findings suggest that in addition to commonly recognized elements of effective CHW models including training, supervision, and the presence

of a champion, programs must consider the organizational context in which the program is positioned as well as the ways in which both CHWs and the organization engage with communities served. This research can serve as a roadmap for health systems that seek to integrate CHWs within health care services and can be used to promote best practice in CHW integration.

Background:

A community health worker (CHW) is defined as “a frontline worker who is a trusted member of and/or has an unusually close understanding of the community served (APHA, 2009).” A CHW builds individual and community capacity by increasing population “health knowledge and self-sufficiency through a range of activities such as outreach, community education, informal counseling, social support and advocacy (APHA, 2009).”

CHWs are effective in managing complex health conditions and promoting healthy behaviors (Baig et al., 2010; CPSTF, 2015; Islam et al., 2016; Kangovi et al., 2018; Kim et al., 2016; Martinez et al., 2011; Palmas et al., 2015; Postma et al., 2009; Schroeder et al., 2018; Spencer et al., 2011), and CHW models have been shown to be cost effective, particularly in low-income, underserved, and minority communities (AHRQ, 2014; ICER, 2013; Johnson & Gunn, 2015; Nkonki, et al., 2017). Additionally, CHWs may serve as a promising component of healthcare reform, facilitating access to high quality healthcare, improving culturally sensitive healthcare delivery, emphasizing preventive and primary care services, and facilitating task shifting that allows health care providers to perform the most highly skilled work for which they are qualified

(i.e. work at the top of their licenses) (Collensworth et al., 2014; Johnson & Gunn, 2015). As a result, the use of CHW models in the healthcare sector has increased notably over the last 10 years (Arnold et al., 2018; Kangovi et al., 2015; Malcarney et al., 2017; Rodgers et al., 2018).

As CHW programs have increased in prominence, researchers have begun to explore implementation of CHW programs or models in the healthcare context. A growing body of literature suggests that effective CHW integration within the healthcare system is critical (Allen et al., 2015; Collensworth et al., 2014; Findley et al., 2014; Johnson & Gunn, 2015; Kangovi et al., 2015; Martinez et al., 2011; Wennerstrom et al., 2015). Integration, or the process of engaging CHWs as a critical component of care delivery and key member of a healthcare team, has been found to improve patient knowledge, engagement, and outcomes as well as the ability of primary care providers (PCPs) to identify and proactively address patient needs (Collensworth et al., 2014).

However, the question of how to achieve integration is less clear. There is no consistent definition for CHW integration nor is there guidance for how integration can be achieved. This lack of guidance leaves healthcare organizations without the tools needed to effectively integrate CHW models. Early research into CHW integration has focused on individual roles and responsibilities as well as team level factors, but health care teams are often situated within complex health and hospital systems that may also affect CHW integration (Martin et al., 2019; Rodgers et al., 2018). A broader systems-level perspective on CHW integration is therefore needed.

Looking to other disciplines serves to provide some insight into the critical components of integration. Human factors engineering, for example, defines integration as “bringing together different requisite contributory functional disciplines to work in a continuous collaborative and cohesive manner to achieve a more efficient and informed desired collective objectives.”

Central principles include working together, a common goal, and systems for shared information. Additionally, research into international CHW models offers early frameworks for CHW integration within low- or middle-income countries (Kok et al., 2017a; Kok et al., 2017b; Naimoli et al., 2015). An exploration of the presence or absence of these principles within CHW models may serve to illuminate factors that support integration within this context. Building upon existing literature, a conceptual model for CHW integration within the US healthcare sector was created (see appendix).

A qualitative case study allows for a deeper understanding of the complex and interrelated systems level factors that may be associated with CHW integration, and thus offers the potential for unique insights into the field. This research seeks to explore the integration of CHWs within a large state university health system in order to identify critical factors associated with effective integration of CHWs.

Materials and Methods

Study design

This study is an exploratory case study utilizing cross-case comparison among clinical teams as sub-units of analysis, using primarily interviews as a qualitative data source. The case of study is the University of Illinois at Chicago's Hospital and Health Science System (UI Health). The embedded subunits of analysis are teams within the UI Health System that currently employ CHWs to assist with the provision of clinical care or services to patients. UI Health is an academic hospital system based in the near west side of Chicago. Part of the University of Illinois at Chicago (UIC) system, UI Health includes a 465-bed tertiary care hospital, 21 outpatient clinics, and 11 federally qualified health center locations.

During the study design phase, an environmental scanning process (key informant interviews and literature review) was employed to develop a conceptual framework for CHW integration which identified theorized relationships among factors that may be associated with effective integration. This conceptual framework was used to inform study methods.

Sample selection

We employed a three-pronged strategy to identify sub-units for recruitment. First, researchers used a recently completed survey of UIC CHWs and CHW administrators which produced a list of potential CHW programs. An internet search was used to identify additional programs for recruitment not included in the survey. Finally, the generated list of programs was shared with a stakeholder group of UIC CHW experts for review to ensure completeness.

Subunit recruitment targeted program leadership including an administrator, director, or principal investigator with management authority over the sub-unit to determine eligibility and willingness to participate. Once leadership approval was obtained, researchers recruited up to 4 participants per sub-unit representing (1) CHWs (n=1-3), (2) administrators (n=1), and (3) clinicians (n=1) when applicable. Subunit documents associated with CHW programming or services were also collected for review.

Measures and Measurement

A semi-structured interview guide was designed for interviews, which lasted approximately 60 minutes. Interview questions centered on team structure and dynamics: how CHWs work with other members of the team including communication and documentation tools, roles and responsibilities, and supervision and training; how CHWs are perceived by different members of the care team; and how CHWs engage with individuals in the clinical and community context. Respondents were also asked about the perceptions about integration, the extent to which CHWs were integrated within the healthcare team, and perceived barriers and facilitators to integration. A document review matrix was also created to collect document data including program information and structure (number of CHWs, size of caseload, program budget).

Data collection

First, program administrators and/or research participants were invited to share documents including: (1) CHW training documents (manuals, agendas, or evaluation instruments); (2) CHW job descriptions; (3) clinical or CHW protocols; (4) reports prepared for funders or outside

agencies; (5) publications; and (6) other relevant documents describing the CHW program. The researchers also conducted an online search to identify additional documents such as websites, program reports, or publications.

Next, individual one-on-one semi-structured interviews were conducted with 1-4 representatives from each sub-unit over Zoom and audio recorded. When appropriate, the semi-structure interview guide was modified in response to data collected in the document review phase to eliminate redundancy or add clarifying questions. Memos were written at the end of each interview capturing initial researcher thoughts regarding overarching themes or key impressions. All study procedures were approved by the University of Illinois at Chicago Institutional Review Board.

Data Analysis

Data were analyzed by the Principal Investigator (EM) first on the sub-unit level, beginning with document review and followed by interviews. Document data were summarized in Microsoft Excel and document-specific memos were written. Interview recordings were transcribed verbatim, edited to ensure accuracy, and de-identified. Interview data were analyzed using MaxQDA software (version # 2018.2, VERBI Software) and thematic coding. Researchers applied a hybrid coding approach beginning with a priori codes derived from the literature (Miles & Huberman, 2014). In a subsequent pass, emergent codes were also developed utilizing a more inductive, grounded approach to illuminate new or previously unrecognized patterns (Timonen et al., 2018). A subset of interviews was coded separately by an independent coder

and coders met to review and discuss the coding scheme. This cycle was repeated until a minimum of 80% cross-coder agreement was achieved.

Documents and interviews from each subunit were triangulated and subunit-level codes were analyzed across data sources (interviews and documents) to identify points of convergence (agreement) and divergence (disagreement). Memos were written to generate a list of subunit-level themes. This was repeated until thematic saturation was achieved. A subunit report summarizing themes was shared with research participants from the respective subunit for feedback (member checking).

Themes from each sub-unit were then triangulated to identify convergent and divergent patterns across sub-units through the charting method (Gale et al., 2013). Discussions, reflection, and the resulting memos helped identify cross-subunit themes, thus unifying concepts and interrelationships across subunit data.

The extent to which programs reported integration was assessed qualitatively. We reviewed factors identified in the conceptual framework theorized to be associated with effective integration including communication, structure and process, training and supervision, a local champion, and clear roles and responsibilities to assess the extent to which CHWs were integrated into clinical care teams. Sub-units were mapped on an integration spectrum applying a human factors definition of integration—with high levels of clinical integration associated with cohesive co-working among multidisciplinary members of the care team

supported by clear information sharing channels (e.g. meetings and shared work space), systems that support co-working (e.g. clear structures and process), and a common goal (clear roles, training, and leadership support) and low levels of integration was associated with no or infrequent adherence with the critical integration factors described above.

Researchers purposefully applied an appreciative inquiry, or asset-focused lens, when developing findings (Preskill & Catsambas, 2006). Critical comments and findings were still included in the analysis, but themes were framed positively, thus capturing those aspects of each theme which were associated with higher levels of integration.

Results

In total, 11 distinct programs were identified for subunit recruitment, and 9 were confirmed to be eligible. One program was ineligible because the CHWs were employed outside of UIC, and the second was ineligible because the CHWs did not speak English and study procedures were limited to English speakers. Of the 9 eligible programs, 6 (66.7%) agreed to participate, while 3 declined due to insufficient time or unavailable CHWs. There was variability in the size, specialty and location of the 6 enrolled subunits (Table 1).

Between 1-4 interviews were completed for each subunit for a total of 17 interviews (9 male, 8 female interviewees). We completed 9 interviews with CHWs, 3 with administrators, 2 with health care providers/clinicians, and 3 with dual administrator/health care provider roles. Mean interview duration was 46 minutes (range= 23-62 minutes).

We reviewed 34 distinct documents including 4 job descriptions, 13 reports/publications, 4 websites, 12 training documents, and 1 protocol.

Table 1: Subunit Sample Characteristics

Subunit	Size	CHW program focus or specialty	Predominant Location of CHW work	Interviews
1	10+	Pediatrics	Clinic	2 CHW, 1 HCP, 1 Admin/HCP*
2	1-4	Oral health	Community	2 CHWs, 1 Admin
3	5-9	Harm reduction	Community	2 CHWs, 1 Admin
4	1-4	HIV	Community	1 CHW, 1 HCP, 1 Admin
5	5-9	Generalist/primary care	Clinic	2 CHWs, 1 Admin/HCP
6	1-4	Diabetes	Clinic	1 Admin/HCP

*Admin=Someone overseeing the administration of the project including an administrator, coordinator, CEO, director, or PI
HCP=Health care provider or clinician including physician, nurse, nurse practitioner, or physician's assistant

Programs were mapped onto a spectrum for clinical integration represented by high, medium and low-level integration. Two programs reported high levels of integration, two reported moderate levels, and two reported low levels of integration. All sub-units reported some integration factors identified in the conceptual framework, thus suggesting that all sub-units were engaging in efforts to integrate CHWs in clinical care. 14 factors related to CHW integration were identified and organized in 4 layers represented by the individual, the team, the organization and the community. A description of the research findings including themes, critical integration factors, and illustrative quotes supporting findings has been included in table 2.

Individual

Individual factors associated with effective integration included clear roles and responsibilities, an understanding of the CHW's purpose and value, training for all care team members, and a consideration of the background of CHWs when hiring.

Roles and Responsibilities: CHW integration can be supported through clear CHW roles and responsibilities that are understood by all members of the team and aligned with the CHW's skill set. Among sub-units, there was notable diversity in CHW roles and responsibilities.

Respondents across multiple sub-units reported a lack of clarity or understanding regarding a CHWs roles, or how roles were divided among members of a team. One administrator noted, “when you’re trying to plug in community health workers, you'll run into this thing where nobody's quite sure where they're supposed to fit.” CHW respondents also reported challenges when performing roles that did not draw on their skills as a relational workforce. For example, recordkeeping and paperwork were commonly described by both CHWs and administrators as a time consuming and challenging for the CHW workforce. Clear roles that were aligned with a CHW's skill set was associated with higher levels of integration across sub-units.

Purpose and Value: CHW integration can be supported through a clear and shared understanding of the purpose and value of CHWs that is amplified by program or organizational leadership. Closely related to roles and responsibilities is the question of why a CHW is on the team and what value they contribute. We observed variability in the extent to which CHWs were valued as critical members of the team across sub-units. A perception that CHWs were a valuable member of the care team was associated with higher levels of integration. One element of framing a CHW's value are the metrics that are used to evaluate CHW performance. Some CHWs expressed dissatisfaction with evaluation metrics that relied on quantitative counts of activities completed (number of calls, home visits, or notes completed). These metrics were

perceived by CHWs to not adequately capture the nuance of working with patients with complex health and psychosocial needs.

Training: CHW integration can be supported by training or orientations that incorporates the multidisciplinary team and helps healthcare providers learn how to engage with CHWs. All respondents reported training for CHWs which included some level of didactic training on health topics as well as practice-based, observational, or on-the-ground training through shadowing models. A number of programs also incorporated other members of the care team in the training process. For example, one program employed CHWs to conduct a new physician orientation. Another program offered ongoing training for multiple care team members at once to promote co-learning. Involving other members of the care team in trainings about the CHW model was associated with higher levels of integration.

Background and Experience: CHW integration can be supported by employing CHWs with the experience, background, or characteristics to be successful. There was considerable variability in the reported professional and educational experience of the CHWs interviewed. Some sub-units employed an “Indigenous Leader” or “embedded” model in which CHWs were hired due to their shared experience with the patients served (Needle et al., 2005). Other CHWs had professional degrees or an interest in a specific topic or health profession. While there was no consensus on what experience or characteristics were most important, alignment between roles and background emerged as a critical factor. Programs with a larger community presence

were more likely to hire embedded CHWs, and programs with a greater clinical or data collection focus were more likely to hire CHWs with health training or credentialing.

Team

Team level factors associated with effective integration included the team culture, strong communication, and team buy-in.

Culture: CHW integration can be supported by a team culture that is aligned with CHW models via a flattened hierarchy and/or a receptiveness to different health care delivery approaches.

Respondents commonly described the culture of the team as an important factor in integration. A flattened hierarchy, or a structure in which all care team members are considered to have equal value and power, was described by respondents across multiple sub-units to be beneficial when integrating CHWs. Administrators also described the importance of a care team that was receptive to novel health care models as important.

Communication: CHW integration can be supported by employing tools that foster effective communication among team members. Communication was a common theme both as a facilitator to effective integration as well as a challenge or barrier. Generally, there was a positive association between communication and integration. Common communication strategies included meetings, phone calls, email, electronic medical record (EMR) messaging, or shared physical space. Communication tools that were perceived most positively included consistent team meetings and shared physical space. Teams with high levels of communication,

also reported creating opportunities for informal relationship-building and fellowship such as regular lunches or potlucks. Perceptions on other communication tools were mixed. Some CHWs appreciated the ability to call health providers directly, but phone communication was not utilized by all sub-units. Perceptions about EMRs as a communication tool were also inconsistent. Some felt that EMRs were useful for CHWs and other healthcare providers to share health information, while others felt that EMRs were difficult to use or access.

Buy-in: CHW integration can be supported by ensuring buy-in among team members and individuals with decision-making authority. The membership or composition of a care team emerged as an important consideration in effective CHW integration. Multiple respondents described the importance of champions on the care team who valued CHWs. While the champion wasn't always described as a clinician, they did need to have authority within the team to influence change. Additionally, it was important for healthcare providers to have the desire to work with CHWs. To achieve this, one site purposefully recruited and hired healthcare providers who wanted to engage in community-based work.

Organization

Organizational level factors associated with integration included human resource systems, financial support, agility, and care philosophy.

Human Resources: CHW integration can be supported by human resource systems that facilitate employing a less traditional workforce including clear job descriptions and a low barrier hiring

processes. The process of hiring and onboarding CHWs was commonly described by administrators as a barrier to implementing CHW models. Multiple respondents across sub-units reported difficulty in identifying a job title that aligned with the CHW's unique role on the team. Administrators also reported a lengthy hiring process that was not user friendly (i.e. online application was difficult to complete). At least one sub-unit described losing qualified applicants due to hiring delays. Additionally, the university's hiring rules that restricted options for hiring those without educational training, or with prior criminal backgrounds or a history of drug use, was described by administrators as limiting when hiring a CHW workforce. Improved pathways for hiring including clear CHW job titles, a streamlined hiring process for those with low health system literacy, and flexibility to hire employees with less education or criminal backgrounds was perceived across sub-units to be important in supporting CHW integration.

Financial Support: CHW integration can be supported by an organizational commitment to investing in CHWs through financial support, reimbursement models, or fundraising to facilitate sustainability and long-term investment. Most sub-units reported challenges supporting CHWs programs financially. Grant funding was the most commonly reported source of financial support. While some programs utilized National Institutes of Health-funded research grants to support CHW models, others received funding from foundations, or state or federal grants to provide services to underserved populations. A number of grants required a specific disease-focus or deliverables, thus limiting a CHW's scope of work. The challenges sustaining a CHW workforce through grant cycles emerged as a common challenge among administrators across sub-units. Cost savings or return on investment was commonly discussed as a strategy for CHW

sustainability through (1) increasing patient show rates, (2) decreasing provider burn-out, or (3) health insurance shared savings. However, demonstrating cost savings with a CHW model was perceived by administrators as challenging. The question of how best to support a CHW program financially remained a common challenge across sub-units.

Agility: CHW integration can be supported by an organizational ability to change or evolve quickly in response to the need for novel approaches. Respondents described the need for CHW models to evolve and change rapidly due to changes in funding, staff, the population served, or the care delivery structure or process. One administrator noted, “We were constantly having to adjust for changes...either in the population or in the kind of work that we needed to do, or the systems we use to do it.” Respondents also described the need for their organization to pivot or adapt quickly to a changing context. A lack of agility on the organizational level was described by multiple sub-units as a barrier to integration.

Care Philosophy: CHW integration can be supported by an organizational care philosophy that recognizes the importance of social determinants of health (SDOH) and the patient’s lived experience and is articulated and acted upon within the organization via the mission/vision statements, strategy planning, and/or promotional efforts. When CHWs were situated within an organizational context in which there was a clear focus on SDOH and patient experience, CHWs reported positive experiences with integration. Thus, the alignment between the organization’s mission and a CHW model was perceived as important. Some organizations went as far as to

create mission/vision statements that highlighted a focus on community health, social service, and/or patient experience.

Community

Finally, the ability for CHWs to engage meaningfully in community-level work emerged as an important theme. While not necessarily associated with care team integration, CHWs perceived their ability to engage with communities served as a critical element of their job. CHW respondents described challenges balancing the health system orientation necessary for clinical integration while maintaining strong connections with the communities in which they worked. Striking an appropriate balance between clinical and community-facing roles was viewed to be critical when considering CHW integration. Thus, efforts to integrate CHWs within clinical care needed to allow sufficient flexibility for CHWs to maintain a community orientation. Important factors that enhanced a CHW's community orientation included the ability for CHWs to establish trust, systems that enhance healthcare access, and flexibility that allows CHWs to build relationships.

Trust: CHW integration can be enhanced when CHWs are able to build trust both in the community and healthcare context. We noted that the term "trust" was commonly used across respondents and sub-units when describing a CHW's role. A trusting relationship between the CHW and patient was described by all CHWs as important. Critical elements of trust-building included listening, consistency, investing time, and following through on commitments.

Access: CHW integration can be enhanced when there are clear pathways for patients to access care in an environment that is comfortable to them. For some of the sub-units analyzed, the use of CHW's reflected a broader strategy to improve healthcare access. For example, some sub-units located health services in the communities of highest need through community-based clinical services. Others used CHWs to deliver health services within the home, to facilitate remote telehealth visits, or to help patients access and navigate health services within the health system. Regardless of the approach, the importance of helping to improve both health access and experience was described across multiple sub-units as important.

Relationships: CHW integration can be enhanced when the CHW is able to form strong relationships with members of the community, health system partners, and social service providers serving the population. Closely related to trust is the importance of relationship-building in CHW integration. Respondents described the need for CHWs to build and maintain strong relationships within the communities in which they worked. Striking the right balance between community and clinic-based work was a common challenge for CHWs. Some sub-units addressed this challenge by basing clinical services within the community, thus fostering strong community relationships. Others employed CHWs in a clinic but provided them with the flexibility to spend time in the community—working 1-on-1 with patients or other partner agencies. While there was no single gold standard in balancing community and clinic priorities, the importance of allowing for community-facing relationship building was universally viewed to be important.

Table 2: Individual, team, organization, and community-level factors that serve to support CHW integration

	Theme	How theme serves to support CHW integration	Illustrating Quotes
Individual	Roles & Responsibilities	Clear CHW roles and responsibilities that are understood by all members of the team.	<p>(-) "There's always been this weird divide...and when you're trying to plug in community health workers, you'll run into this thing where nobody's quite sure where they're supposed to fit." (Administrator)</p> <p>(-/+) "The biggest issue is that everyone learns how to stay in their own lane." (CHW)</p> <p>(-) There was this lovely resource of community health workers who are so good at interpersonal relationships and knowing their community, being all interpersonal, but a large part of their [job]... was sitting at a computer entering data and they just like, they hated it. (Physician)</p>
	Purpose & Value	A clear shared understanding of the purpose and value of CHWs and why they are included as members of the health care team.	<p>(-) "It was where, you know, 'you're just a community health worker'...because they didn't understand the work that we did and how valuable the work that we do is to the overall care of the patient." (CHW)</p> <p>(+) "I value the most, the honesty when, which they, they can, they can talk to patients and how they can kind of bring me down to the, to the level of where our patients are at." (Administrator)</p>
	Training & Orientation	Training or orientations that incorporates the multidisciplinary team and helps healthcare providers learn how to engage with CHWs	(-) "I think that before I came here and was part of this program, I don't think we're necessarily, as physicians, trained or exposed to [CHWs]. So I think that in the beginning it took some time to understand their role and what they do." (HCP)
	Background	Selecting for CHWs with the experience and background to be successful including a deep understanding of the communities served.	(-/+) "There's some people who are in these roles of community health worker, and it's essentially like an entry job for them on routes to something else," (Administrator)
Team	Culture	A culture that supports the include of CHWs including a structure that is less hierarchical and more accepting of less traditional processes or systems.	<p>(+) "I think that there's... a sense that there's less hierarchy. I think that there's more recognition of everybody's contribution... in the clinics I work with, our staff is diverse in multiple ways. And I think that we connect with our patients in different ways because of that sometimes. And I've realized that that makes our team stronger because we're able to make our own connections." (HCP)</p> <p>(-) "Usually I just, I tried to, you know, stay out of the doctor's way." (CHW)</p>
	Communication	Tools that foster effective communication between CHWs and other members of the team including shared workspace and access to systems for record keeping, scheduling and communication.	<p>(-/+) "One of the biggest things like with most things in life is communication. Making sure there's clear communication." (CHW)</p> <p>(+) "Every Friday we have a case conferencing meeting, which the entire medical team gets together...And they, they look at the missed appointments. They looked at the patients that they haven't seen. They look at the patients that have high viral loads. And those are the patients that we ask the outreach workers to kind of concentrate on; to get a hold of; to bring them to back or just to contact them and make sure that, you know, they're taking their medications or if there are any other barriers." (Administrator)</p>
	Buy-in	Inclusion of the appropriate team membership to ensure success such as champions that support CHW models and individuals with decision-making authority.	(+) "Having a physician who understands the value of community health workers and care coordinators and advocates for that is extremely helpful." (Administrator)
Organization	Human Resources	Human Resource systems that support employing a less traditional workforce including clear job descriptions, streamlined hiring processes, and workplace rules that allow for flexibility.	(-) "It's a little difficult just because of so much red tape and the bureaucracy that exists within the whole with all different levels of hiring." (Administrator)
	Financial Support	Commitment to investing in CHWs through financial support, reimbursement models, or	(-) "It becomes very difficult for anyone to find money because then what they get used to doing is looking at what's the direct return on investment immediately for this work. And, you know... it isn't immediate. A lot of times what we're looking at is creating an arc where

		fundraising support to facilitate sustainability and long-term investment.	these patients will not be as costly on the system as they would have been had they not learned all the skills that they're learning now through their work with community health workers. And so the benefits might be a couple years down the road or even further, which is great, but it's really hard to get anyone to fund." (Administrator)
	Agility	Ability for the organization to change or evolve quickly in response to the need for novel approaches.	(+) "We've got a group of staff that are incredibly adaptable.... I mean, we were constantly having to adjust for changes...either in the population or in the kind of work that we needed to do, or the systems we use to do it." (Administrator)
	Care Philosophy	A care philosophy that recognizes the importance of SDOH and patient experience in healthcare that is both articulated and acted upon within the organization.	(+) "I think also the university and the health system in general is pretty congruent in knowing that there's a service component to medical care. You know, I work in a system that actually means something. It's not just a business." (HCP)
Community	Trust	Community members trust both the CHW and the organization to work in their best interest.	(+/-) "I think getting the word out in the community and getting community trust is a really big challenge, but we don't face that 'cause we've been there for so long. I think for individuals, it takes time. Like when I started, I remember there was a lot of reluctance and kind of like, who is this person? And it took time to get, to get to know people and for them to trust." (HCP) (+/-) "I think there's a lot of mistrust medical mistrust basically. And I think that the nature of a community-based group like this and the outreach workers really contribute to try to alleviate that." (Administrator)
	Access	There are clear pathways for patients to easily access care in an environment that is comfortable to them.	(+) "You meet people where they are. It just can't be a cliché that you throw around. You know, we actually literally did that, met people where they are, where they were physically as, as well as what they were ready to do mentally and emotionally." (CHW)
	Relationships	The CHW is able to form strong relationships with members of the community and other health system and social service providers serving the population.	(+) "I have to, I have to entice them to stay there. That's why I provide them with coffee. I provide them with some sandwiches. I'll try to get them motivated to stay there, you know, cause it's in their best interest. So, I do all these other little things that I don't necessarily put on the chart. So yes, I do spend two hours or three hours with a client or however long it takes with the client because I need to make sure that the client is well taken care of and not just, you know, not just another number." (CHW)

(+) Quote is positively associated with theme, (-) quote is negatively associated with them, (+/-) quote does not have a positive or negative association

Limitations

This study has limitations. As a case study, this research focused specifically on one health and hospital system, and thus generalizability may be limited. Efforts were made to identify a case of study that shares traits with other health and hospital systems to improve generalizability. Additionally, by including only those programs interested in discussing CHW integration, recruitment practices may have selected for those programs with the most robust CHW integration models. But the relatively high response rate among recruited sub-units serves to minimize bias. It is also possible that biases may exist among respondents. Those care teams engaging CHWs in health services may represent those individuals or teams who are more prone to organizational change or non-traditional care models. Or these individuals may be more likely to value a CHW. Consequently, additional barriers may exist for those programs seeking to initiate CHW integration for the first time in a health system unaccustomed to CHW models.

Conclusions

This research identifies 14 individual, team, organizational and community-level factors that were associated with higher levels of CHW integration. These factors can serve as a roadmap for health systems that are seeking to integrate CHWs within health care services.

This research supports existing literature which points to critical individual and team level factors such as champions, communication, training, and clear roles and responsibilities for effective integration of CHW models (Allen et al., 2015; Collensworth et al., 2014;; Findley et al., 2014; Johnson & Gunn, 2015; Kangovi et al., 2015; Martinez et al., 2011; Martin et al., 2019; Wennerstrom et al., 2015). However, it also points to broader factors such as the organizational structure, culture, care paradigms, and community connections that must also be considered. Others in the field have identified critical

systems factors such as “embracing organizational innovation” and “valuing patient’s non-medical needs” (Rogers et al., 2018). Thus, this research builds upon early findings, drawing particular attention to the complex systems-level factors that influence CHW integration. It should be noted that many of these factors require organizational change, and thus, may require long-term time horizons and leadership engagement. Identifying strategies for achieving this systems-level change therefore remains an important question.

The asset-focused framing of this research is not intended to suggest that all factors were observed to be present in the case of study or that all sub-units achieved all factors. Rather, these factors reflect elements of best practice that emerged from the data.

Notable in this research is the variability in both CHW roles and responsibilities and perceptions about a CHW’s purpose and value. This aligns with other research highlighting the inconsistencies in how CHWs are utilized within the health system (Hartzler et al., 2018). While a CHW’s daily responsibilities may be varied, alignment or agreement regarding a CHW’s roles and purpose was associated with improved integration. Consequently, care teams should prioritize establishing agreement regarding a CHW’s role on the team and the value that they add.

One unresolved question in this research is how to ensure long-term financial sustainability of CHW models. Some states allow payer reimbursement for CHW services through a fee-for-service pay structure. Other strategies for achieving financial sustainability include Medicaid waivers, contractual agreements, or a shift to outcome-based care in which systems are paid capitated rates for desired patient outcomes (e.g. ACOs). Illinois does not currently offer a CHW reimbursement model. However, some local changes, including the growth of shared-savings models, a growing body of literature demonstrating CHW cost-savings, and the health system’s shifting focus on SDOH, suggest that new

pathways for sustaining CHW models may be emerging. This remains an area for continued research and advocacy.

Work Cited

[See Work Cited Section]

Manuscript 2 (Formatted for publication)

Title: Framing the integration of community health workers into healthcare systems along health and community spectrums

Abstract:

Purpose: While research calls for improved CHW integration within the health system, there is no clear definition for what CHW integration is nor guidance for how integration can be achieved.

Moreover, CHWs often struggle to integrate into the health care system while maintaining their unique position within the community.

Design: This research aims to understand the critical factors for effective CHW integration both in community and healthcare settings. We conducted a qualitative descriptive multiple embedded case study of programs or teams currently employing CHWs to assist with the provision of clinical care or services to patients at a health and hospital system.

Setting: The setting was the University of Illinois at Chicago's Hospital and Health Science System.

Participants: Data were collected via semi-structured interviews and document review. In total, 6 sub-units were enrolled, and 17 interviews were conducted with CHWs (n=9), and administrators or healthcare professionals (n=8).

Method: Thematic coding was used to identify factors associated with effective CHW integration. Subunits were then scored for the presence/absence of these factors using quantitative content analysis of qualitative data to assess each sub-unit's progress toward integration.

Results: There was variability in the level of integration across sub-units. Factors associated with higher levels of integration were identified.

Conclusion: Findings can be used to help guide health systems seeking to improve CHW integration.

Key words: Community Health Workers, Integration, case study, community, health system

Purpose:

Over the last two decades, health and hospital systems have increasingly assumed a responsibility for re-thinking the ways in which health services are delivered. Spurred by the landmark report, “Crossing the Quality Chasm,” (IOM, 2001) and further amplified by health care reform efforts including the “triple aim” (Berwick et al., 2008), health systems have increasingly engaged in health care reforms through new health service models such as patient-centered medical homes, multidisciplinary care team models, and task shifting. This reform reflects a broader recognition that health systems are not doing enough to address complex social determinants of health (SDOH) particularly among their most vulnerable patients.

Increasingly, health systems are looking to Community Health Worker (CHW) models as a strategy to improve health outcomes, reduce cost and improve patient experience, thus contributing to a shift in CHW employment from community-based programming to health system settings. Recognizing this trend, experts have described CHWs as an “emerging healthcare workforce,” predicting that CHWs will have growing prominence within the US healthcare system in the future (Kangovi et al., 2015; Malcarney et al., 2017; Rodgers et al., 2018).

Research suggests that integration of CHWs within the healthcare system is critical for program effectiveness (Allen et al., 2015; Collensworth et al., 2014; Findley et al., 2014; Kangovi et al., 2015; Johnson & Gunn, 2015; Martinez et al., 2011; Wennerstrom et al., 2015), but there is no clear definition for CHW integration nor is there guidance for how integration can be achieved. Looking to other disciplines provides some insight into the critical components of integration. The field of human factors engineering defines integration as “bringing together different requisite contributory functional disciplines to work in a continuous collaborative and cohesive manner to achieve a more

efficient and informed desired collective objectives.” Central principles include working together, a common goal, and systems for shared information. Additionally, research into international CHW models offers early frameworks for CHW integration within low- or middle-income countries (Kok et al., 2017(a); Kok et al., 2017(b); Naimoli et al., 2016). An exploration of the presence or absence of these principles within CHW models may serve to illuminate factors that support integration within the US healthcare system, particularly large hospital systems. Building upon this existing literature, a conceptual model for CHW integration within the US healthcare sector was created (see appendix).

Notable is the question of how to balance a CHW’s community and clinic-facing priorities when integrating this workforce into a health system. CHWs are valued for their intimate knowledge of the populations and communities served. They are viewed as bridges between community and healthcare services (Allen et al., 2015). But the process of bridging two sectors—with different cultures, priorities and procedures—has the potential to pose challenges for CHWs and for the healthcare context in which they are situated. The question of how to effectively integrate CHWs into the health care system while continuing to maintain their unique identity and position within the community remains unclear (Malcarney et al., 2017).

A qualitative case study allows for a deeper understanding of the complex and interrelated systems level factors that may be associated with CHW integration, and thus offers the potential for unique insights into the field. This research aims to examine teams that currently employ CHWs to understand the critical factors for effective CHW integration. It also aims to understand how the dual priorities of clinical and community-level integration can be achieved, thus serving to support efforts to engage CHWs to improve health service delivery for the most vulnerable.

Design:

This study is an exploratory case study utilizing cross-case comparison among clinical teams as sub-units of analysis, using primarily interviews as a qualitative data source. The case of study is the University of Illinois at Chicago's Hospital and Health Science System (UI Health). The embedded subunits of analysis are teams within the UI Health System that currently employ CHWs to assist with the provision of clinical care or services to patients. UI Health is an academic hospital system based in the near west side of Chicago. Part of the University of Illinois at Chicago (UIC) system, UI Health includes a 465-bed tertiary care hospital, 21 outpatient clinics, and 11 federally qualified health center locations.

During the study design phase, an environmental scanning process (key informant interviews and literature review) was employed to develop a conceptual framework for CHW integration which identified theorized relationships among factors that may be associated with effective integration. This conceptual framework was used to inform study methods.

Participants:

We employed a three-pronged strategy to identify sub-units for recruitment. First, researchers used a recently completed survey of UIC CHWs and CHW administrators which produced a list of potential CHW programs. An internet search was used to identify additional programs for recruitment not included in the survey. Finally, the generated list of programs was shared with a stakeholder group of UIC CHW experts for review to ensure completeness.

Subunit recruitment targeted program leadership including an administrator, director, or principal investigator with management authority over the sub-unit to determine eligibility and willingness to

participate. Once leadership approval was obtained, researchers recruited up to 4 participants per sub-unit representing (1) CHWs (n=1-3), (2) administrators (n=1), and (3) clinicians (n=1) when applicable. Subunit documents associated with CHW programming or services were also collected for review.

Method:

A semi-structured interview guide was designed for interviews lasting approximately 60 minutes. The interview included questions about CHW integration including how CHWs worked with other members of the team, how CHWs worked with patients and the community, how integration was perceived, and what were barriers and facilitators to effective integration. A document review matrix was also created to collect document data including program information and structure (number of CHWs, size of caseload, program budget).

Data collection

First, program administrators and/or research participants were invited to share documents including: (1) CHW training documents (manuals, agendas, or evaluation instruments); (2) CHW job descriptions; (3) clinical or CHW protocols; (4) reports prepared for funders or outside agencies; (5) publications; and (6) other relevant documents describing the CHW program. We also conducted an online search to identify additional documents such as websites, program reports, or publications.

Next, individual one-on-one semi-structured interviews were conducted with 1-4 representatives from each sub-unit over Zoom and audio recorded. When appropriate, the semi-structure interview guide was modified in response to data collected in the document review phase to eliminate redundancy or add clarifying questions. Memos were written at the end of each interview capturing initial researcher

thoughts regarding overarching themes or key impressions. All study procedures were approved by the University of Illinois at Chicago Institutional Review Board.

Data Analysis

Data were analyzed by the Principal Investigator (EM) first on the sub-unit level, beginning with document review and followed by interviews. Document data were summarized in Microsoft Excel and document-specific memos were written. Interview recordings were transcribed verbatim, edited to ensure accuracy, and de-identified. Interview data were analyzed using MaxQDA software (version # 2018.2, VERBI Software) and thematic coding. Researchers applied a hybrid coding approach beginning with a priori codes derived from the literature (Miles & Huberman, 2014). In a subsequent pass, emergent codes were also developed utilizing a more inductive, grounded approach to illuminate new or previously unrecognized patterns (Timonen et al., 2018). A subset of coded interviews was reviewed by an independent coder and coders met to review and discuss the coding scheme. This cycle was repeated until a minimum of 80% cross-coder agreement was achieved.

Documents and interviews from each subunit were triangulated and subunit-level codes were analyzed across data sources (interviews and documents) to identify points of convergence (agreement) and divergence (disagreement). Memos were written to generate a list of subunit-level themes. This was repeated until thematic saturation was achieved. A subunit report summarizing themes was shared with research participants from the respective subunit for feedback (member checking).

Themes from each sub-unit were then triangulated to identify convergent and divergent patterns across sub-units through the charting method (Gale et al., 2013). Discussions, reflection, and the

resulting memos helped identify cross-subunit themes, thus unifying concepts and interrelationships across subunit data.

Quantitizing was used to transform qualitative data into a quantitative score that allowed for comparison across sub-units and ranking of sub-units along clinical and community-level integration spectrums (Sandelowski et al., 2009). A list of 9 clinic-level factors and 7 community-level factors theorized to be associated with CHW integration was created utilizing the thematic coding process described above. Interview and document data from each sub-unit was analyzed to determine the presence or absence of each integration factor using a 3-point scale of present (1 point), partially present (0.5 points), or absent (0 points) (Gale et al., 2013). Community and clinical integration scores were then totaled across factors for each sub-unit to generate an integration score. Each sub-unit received a score between 0 and 9 for clinical integration and 0 and 7 for community integration with a higher score associated with more representation across integration factors in that category. Sub-units were grouped into high, medium and low clinical integration categories (low=0-3, medium=4-6, high=7-9) and compared across levels.

Results

In total, 11 distinct programs were identified for subunit recruitment, and 9 were confirmed to be eligible. Of the 9 eligible programs, 6 (66.7%) agreed to participate. 3 declined due to insufficient time or inactive CHWs. Between 1-4 interviews were completed for each subunit for a total of 17 interviews (9 male, 8 female interviewees). We completed 9 interviews with CHWs, 3 with administrators, 2 with health care providers/clinicians, and 3 with a dual administrator/health care provider role. Mean interview duration was 46 minutes (range= 23-62 minutes).

34 distinct documents were reviewed including 4 job descriptions, 13 reports/publications, 4 websites, 12 training documents, and 1 protocol.

A total of 9 health system factors and 7 community-level factors were identified through data analysis as associated with CHW integration. Each sub-unit was reviewed for the presence/absence of these factors. Table 1 summarizes the distribution of factors across sub-units. The most common health system factors employed across sub-units include: (1) creating mechanisms for CHWs and care team members to communicate, (2) regular team meetings, (3) CHWs working in close proximity with care team members, (4) a local leader or champion that supports CHWs, and (5) training or mentorship for health care providers in working with CHWs. The most common community-level factors employed across sub-units include: (1) employing CHWs with a knowledge of the communities served, (2) employing CHWs to work directly with patients in the community setting, (3) allowing CHWs time to build relationships, and (4) delivering health services in a way that is easily accessible to patients.

This table allows for consideration of integration as a spectrum—with sub-units reporting a high number of factors positioned more highly on the integration spectrum and sub-units with a lower number of factors lower on this spectrum. Notable is the fact that some sub-units reported a higher number of integration factors either in the health system or community-level sector, thus suggesting that sub-units may opt to specialize efforts on integrating within one sector.

Table 1: Health system and community-level factors associated with effective CHW integration within clinical care teams

Subunit #		1	2	3	4	5	6
Health System Factors	Respondents reported working as part of care team	X			X	X	X
	Mechanisms for CHWs and care team members to communicate	X		P	X	X	P
	CHWs participated in regular meetings with care team	X		P	X	X	X
	CHWs had access to EMRs or other medical record systems	X			P	P	P
	CHW working in close proximity to care team members (share physical workspace)	P	P	X	X	X	
	A champion or leader within the team supports CHWs integration	X	P		X	X	P
	A flattened hierarchy enables CHWs to engage in aspects of care				X	P	
	Health care providers received training or mentorship in working with CHWs			X	X	X	P

	Protocols or procedures involve CHWs in health service delivery	X			P	P	
Community Factors	Respondents reported integration with the communities served	P	X	X	X	X	P
	CHWs have shared experiences with patients or intimate knowledge of communities served	P	P	X	X	X	P
	CHWs work with patients where they live in homes or community settings close to patients	P	X	X	P	P	X
	CHWs have time to build relationships/rapport with patients	P	X	P	X	P	X
	CHWs are perceived as trusted members of the community		X	X	X	X	
	Health services are delivered in a way that is easily accessed by patients		P	X	X	X	P
	Strong partnerships with other community organizations are maintained			X	X	X	

X=This factor was confirmed to be present via multiple data points within the sub-unit

P=This factor was described as partially present or only confirmed to be present by one data point within the sub-unit

Blank=This factor was not described in data collected, or this factor was described as specifically not present within the sub-unit

Integration scores were calculated for both health system and community-level integration (Table 2).

Clinical integration scores ranged from 1 to 8 (mean=5.0) on a scale of 0-9. Community-level

integration scores ranged from 2 to 6.5 (mean=4.9) on a scale of 0-7. Scores (as a percent of the total)

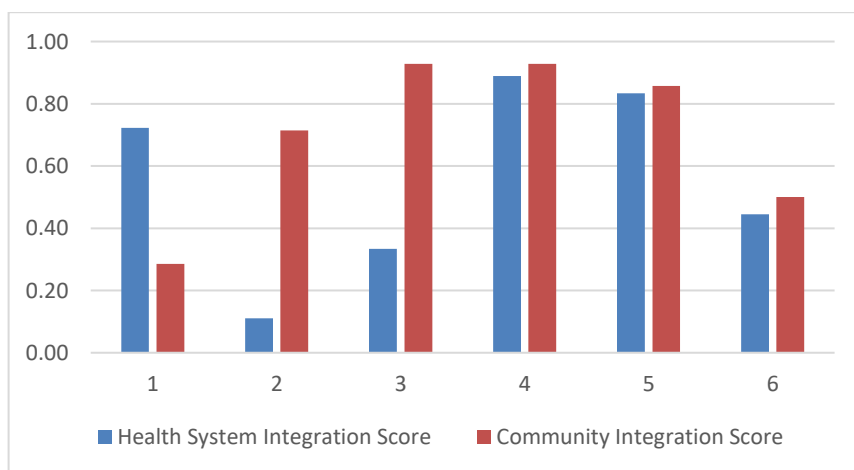
were graphed to compare community and health system integration scores.

Table 2: Health system and Community-level integration scores calculated as a sum of present (1) and partially present (.5) integration factors observed for each sub-unit.

Subunit #	1	2	3	4	5	6
Health System-Level Integration Score	6.5 (0.72) *	1 (0.11)	3 (0.33)	8 (0.89)	7.5 (0.83)	4 (0.44)
Community-Level Integration Score	2 (0.29)	5 (0.71)	6.5 (0.93)	6.5 (0.93)	6 (0.86)	3.5 (0.50)

*health-system score range (0-9) and community-level score range (0-7) followed by percentage of total score in parentheses

Figure 1: Health System and Community Integration Scores (% of total) by sub-unit



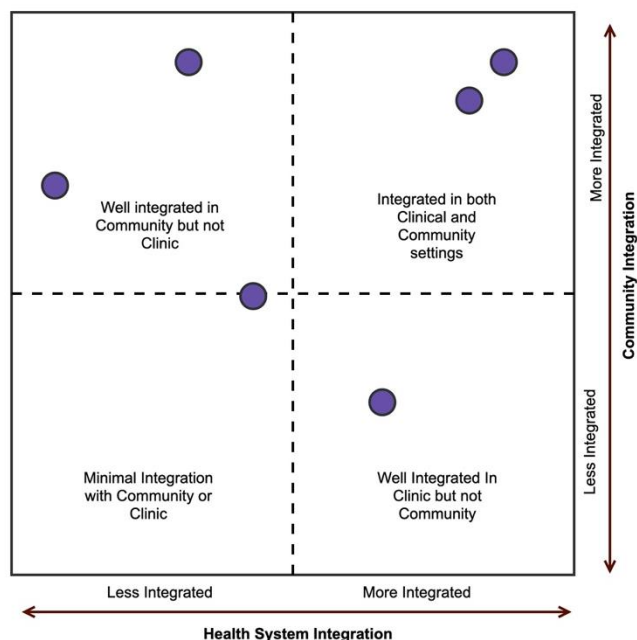
In order to examine the relationship between community and health system factors for integration,

each sub-unit was mapped on a 2x2 table for presence/absence of community and health system

integration factors (Figure 1). The resulting 2x2 table illustrates that some sub-units were more

heavily integrated within the community while others were more heavily integrated within the health system. Two sub-units reported both high levels of community and health system integration.

Figure 2: Mapping representation of sub-units along integration spectrums across health system and community-level factors



Facilitators of Clinical or Health System Integration

Those sub-units that reported high levels of healthcare integration, indicated that CHWs felt like important members of the health care team. One respondent noted, “I really love learning from my coworkers because it’s so team-oriented...we depend on each other so much. And in order for our clients to get all the services that they need, we really, really, truly need to like work together.” Teams with high levels of integration also reported having a flattened team hierarchy where a CHW’s knowledge and contribution was perceived as valuable.

A higher level of clinical integration was associated with strong communication among members of the team. Common ways in which communication was facilitated included regular meetings or huddles and shared co-working space.

Also important for clinical integration was the creation of procedures or protocols that facilitate CHW engagement in care or services to patients. Some sub-units re-designed aspects of patient scheduling, intake, or clinic flow to engage CHWs in the process. One respondent, discussing the challenges of integrating CHWs, noted,

Doctor's offices are set up to sort of process patients in a certain way. They come in, they check in when they're ready, they go to a... patient room they're there long enough for the nurse potentially to come in and do some basic checks, and the doctor to come in and do what they need to do. And then they're out the door and that room gets set up again for the next patient to come in. So, trying to add another person to spend time anywhere in that clinic with a patient is challenging because they don't tend to have extra rooms.

Thus, both systems and physical spaces needed to be re-designed to engage CHWs. But this re-design was also perceived to be a challenge. The presence of a local champion on the team and leadership support for CHW models helped to support these changes.

Finally, care providers reported needing support when learning how to work with CHWs. Sub-units that reported high levels of clinical integration providing trainings or orientations for physicians to support their work with CHWs. Some sub-units also created mechanisms for health care providers to shadow or receive mentorship from other clinicians with experience working with CHWs.

Facilitators of Community Integration

High levels of integration in the community was associated with services that were more accessible to patients. Clinical facilities were more commonly located at community-based locations, and CHWs more commonly met patients in home or community settings. Additionally, CHWs spent time building relationships with both patients and other community members through in-person community-based interaction. One respondent described the importance of accessibility stating, “You meet people where they are, it just can't be a cliché that you throw around. You know, we actually literally did that,

met people where they are, where they were physically, as well as what they were ready to do mentally and emotionally.”

CHWs also described the importance of connecting with patients. This was facilitated by the ability to empathize with the patient’s experience. In stressing the importance of this shared experience, one CHW noted, “We come from the streets, same as people that we serviced. We were there. We've been there. We've done that....and we love what we do because, you know, we give a helping hand to the people in the community because someone in the past gave a helping hand to us.”

Also important were strong trusting relationships that were fostered through long-term relationship building. Sub-units that allowed CHWs to invest in long-term relationship building also reported higher levels of community integration. In describing how they work with patients, one CHW said, “I provide them with coffee. I provide them with some sandwiches. I'll try to get them motivated to stay there, you know, cause it's in their best interest. So, I do all these other little things that I don't necessarily put on the chart. So yes, I do spend two hours or three hours with a client or however long it takes with the client, because I need to make sure that the client is well taken care of and not just, you know, not just another number.”

In this research, the presence or absence of each integration factor was assessed qualitatively through interviews and document review. Attempts were made to confirm findings via triangulation across data sources. But some factors cannot be easily categorized into a dichotomous category. For example, the extent to which the care team structure is hierarchical is not easy to quantify and may be perceived differently within a sub-unit. Consequently, the scoring applied in this research should be viewed as both fluid and interpretable. Moreover, the absence of a factor cannot be assumed to

mean that this factor was not present. It may reflect the fact that this topic wasn't discussed in sub-unit interviews or documents.

This study has limitations. As a case study, this research focused specifically on one health and hospital system, and thus generalizability may be limited. Efforts were made to identify a case of study that shares traits with other health and hospital systems to improve generalizability. Additionally, by including only those programs interested in discussing CHW integration, recruitment practices may have selected for those programs with the most robust CHW integration models. But the relatively high response rate among recruited sub-units serves to minimize bias. It is also possible that biases may exist among respondents. Those care teams engaging CHWs in health services may represent those individuals or teams who are more prone to organizational change or non-traditional care models. Or these individuals may be more likely to value a CHW. Consequently, additional barriers may exist for those programs seeking to initiate CHW integration for the first time in a health system unaccustomed to CHW models. The scoring system utilized in this research should not be viewed as an evaluation of individual programs, rather offers a methodology for comparing integration across sub-units.

Conclusion:

This research highlights those factors that are important for effective integration of CHWs within health systems. Health system level factors identified in this research align with other research that suggests that communication, and champions are important (Rogers et al., 2018). Communication can be fostered through regular meetings, and regular in-person interaction. Also important is a training process that includes all members of the care team, and clear protocols that delineate responsibility. But this research also highlights the critical role that the predominant team culture and

hierarchical structure play in health system integration. Simply providing trainings and creating protocols isn't enough. Teams must consider their hierarchical structure and whether it supports CHW integration.

This research also brings attention to the importance of considering integration in the community as well as the health system. CHWs, and the health systems that employ them, must manage a delicate balance between the needs of clinical and community-level integration. Community integration is fostered through shared experiences, relationship-building, trust, and health services that are accessible to communities served.

Critical for effective community-level integration is the process of re-thinking of where healthcare is delivered--focusing care delivery in formats that are more accessible or comfortable for patients. Conversely, critical for high levels of health system integration is the need to re-design how health services are delivered to enable the engagement of a CHW workforce. Shortell et al. argue that we must do a better job of integrating health care, public health and community development. We must move from patient-centered care to population-centered care. This can only be done by re-thinking the "place" that healthcare is delivered and the "person" providing care (Shortell et al., 2013). Thus, Shortell is arguing for models that move clinical care from the clinic into the community. He argues that we should think beyond the physician in the delivery of care. Integrated CHW models provide an example of how the re-thinking of health care delivery can be achieved.

Such examples of healthcare re-design pose notable leadership challenges in facilitating systems-level change. Emergent in this research was a discussion of the relationship between the hierarchical structure of the care team and CHW integration. There remains a recognition that the current health

care structure—with its emphasis on certifications or educational credentialing—does not enable integration of lay health workers such as CHWs. Yet, changing the predominant culture of a health care team cannot be achieved quickly. More research is needed to understand how this systems level change can be achieved.

It is possible that for some programs, fully integrating within both clinical and community settings is not appropriate or achievable. Some programs may choose to specialize their delivery model in one context. It should therefore be noted that the placement of a CHW program on the integration spectrum does not necessarily serve as a proxy measure of the program's strength or effectiveness.

So What?

What is already known on this topic? Community health worker models based at health and hospital systems offer a promising strategy for improved health service delivery and community health. But the question of how to effectively integrate this workforce into health systems is less clear.

What does this article add? This research suggests that integration should be considered across two spectrums—both the health system and the community. It also identifies critical factors that are associated with high levels of integration at the health system and community-level.

What are the implications for health promotion practice or research? Effective integration of CHWs within health systems is not as simple as just hiring this workforce. Health systems must consider how CHWs are positioned within their organizational system and how to balance the dual goals of health system and community integration.

References

See work cited section

Manuscript 3

** Manuscript 3 will be formatted and submitted after dissertation completion*

Title: Understanding the relationship between care team perceptions about CHWs and CHW integration within a health system

Abstract: Due to the potential of community health workers (CHW) to improve health access and outcomes, particularly among high risk or vulnerable patients, CHWs have grown in prominence within the healthcare sector—leading some to identify CHWs as an “emerging healthcare workforce” within the United States. But the field of CHW research continues to lack clear consensus around CHW roles, purpose and value. This lack of clarity has the potential to affect how CHWs are perceived and utilized within the healthcare sector. This research aims to study health care teams that are currently utilizing CHW models to (1) understand how different members of the care team perceive CHWs’ purpose and value, and (2) consider how perceptions of CHWs are related to CHW integration within health care teams. Researchers conducted a qualitative descriptive multiple embedded case study of the University of Illinois at Chicago’s Hospital and Health Science System (UI Health). The embedded subunits of analysis were teams within UI Health that are currently employing CHWs to assist with the provision of clinical care or services to patients. Data were collected via semi-structured interviews and document review. In total, 6 sub-units were enrolled to participate, and 17 interviews were conducted with CHWs (n=9), administrators or health care providers (n=8). Respondents reported inconsistent perceptions related to CHWs. CHWs roles were not always understood, and the CHW’s purpose and value was perceived differently by different members of the care team. Moreover, evaluation metrics did not always capture CHWs’ value to the health care system. In some cases, care teams were more aligned around a shared understanding of the CHW’s roles and purpose within the care team. Alignment in perceptions regarding a CHW’s role and purpose was perceived to be critical for CHW integration. When perceptions regarding CHWs were both positive and aligned, respondents reported higher levels of integration within the healthcare system. The positive association between aligned perceptions and integration suggests a reinforcing feedback loop between perceptions and integration, thus suggesting that even modest improvements in alignment around perceptions may contribute to substantial improvements in integration over time.

Background:

Community health workers (CHWs) are a workforce that is characterized by its goal of improving the health of individuals and communities through a close trusting relationship with the communities served. While CHWs have a long history of community-based health service delivery, recent trends have contributed to the popularization of CHW models within health and hospital systems (Kangovi et al., 2015; Malcarney et al., 2017). Some in the sector, recognizing this movement, argue that CHWs are an “emerging healthcare workforce” in the US (Rodgers et al., 2018). Allen et al (2015) argued that “CHWs are poised to enter the mainstream of healthcare.” But they also note that “without careful and thoughtful consideration, CHWs could get lost in the healthcare system.” Thus, the question of how to effectively integrate CHWs into a healthcare system is critical.

One notable challenge is the potential for differences in care philosophy and approach between healthcare workers and CHWs (Klein et al., 2015). CHWs and healthcare providers may operate with different underlying paradigms related to disease prevention and health promotion. While CHWs view their work to be long-term and relationship-driven, traditional healthcare models are transactional and time-limited (Martin et al., 2014). In healthcare, health problems are “solved” with treatment. Whereas, CHWs “understand” health problems within the greater environmental context; and it is the process of understanding the contextual factors associated with a problem that leads to health improvement (Kangovi et al., 2018). Thus, inclusion of CHW programs within the healthcare context requires a careful consideration of these differences in order to effectively integrate the two disciplines.

Moreover, CHWs do not typically gain expertise through traditional healthcare training or certification channels. It is therefore difficult for those in the healthcare sector to easily understand what roles or services CHWs can provide (Malcarney et al., 2017).

Contributing to complexity is the fact that the CHW field continues to lack clear consensus regarding CHW roles, purpose and value. CHW roles tend to be broad and varied depending on the needs of the communities served (Cherrington et al., 2010; Israel et al., 1985; Kangovi et al., 2018). While national standards for the CHW workforce have been established (C3Project, 2019), inconsistency in CHW roles remains on the local programmatic level. Additionally, some individuals within the healthcare sector

may not understand the purpose or value of a CHW workforce. Without a clear consensus regarding a CHW's role or purpose, it remains difficult to integrate CHWs into health care teams.

This research therefore strives to study programs that are currently utilizing CHWs in the provision of clinical care to (1) understand how different members of the care team perceive a CHW's purpose and value, and (2) consider the role of CHW perceptions in CHW integration.

Methods:

Study design

This study is an exploratory case study utilizing cross-case comparison among clinical teams as sub-units of analysis, using primarily interviews as a qualitative data source. The case of study is the University of Illinois at Chicago's Hospital and Health Science System (UI Health). The embedded subunits of analysis are teams within the UI Health System that currently employ CHWs to assist with the provision of clinical care or services to patients. UI Health is an academic hospital system based in the near west side of Chicago. Part of the University of Illinois at Chicago (UIC) system, UI Health includes a 465-bed tertiary care hospital, 21 outpatient clinics, and 11 federally qualified health center locations.

During the study design phase, an environmental scanning process (key informant interviews and literature review) was employed to develop a conceptual framework for CHW integration which identified theorized relationships among factors that may be associated with effective integration. This conceptual framework was used to inform study methods.

Sample selection

We employed a three-pronged strategy to identify sub-units for recruitment. First, researchers used a recently completed survey of UIC CHWs and CHW administrators which produced a list of potential CHW programs (UIC CHW Taskforce, 2020). An internet search was used to identify additional programs for recruitment not included in the survey. Finally, the generated list of programs was shared with a stakeholder group of UIC CHW experts for review to ensure completeness.

Subunit recruitment targeted program leadership including an administrator, director, or principal investigator with management authority over the sub-unit to determine eligibility and willingness to

participate. Once leadership approval was obtained, researchers recruited up to 4 participants per sub-unit representing (1) CHWs (n=1-3), (2) administrators (n=1), and (3) clinicians (n=1) when applicable. Subunit documents associated with CHW programming or services were also collected for review.

Measures and Measurement

A semi-structured interview guide was designed for interviews lasting approximately 60 minutes. Interview questions included CHW roles and responsibilities, perceptions related to a CHW's purpose and value, and metrics for evaluating CHW performance. A document review matrix was also created to collect document data including program information and structure (number of CHWs, size of caseload, program budget).

Data collection

First, program administrators and/or research participants were invited to share documents including: (1) CHW training documents (manuals, agendas, or evaluation instruments); (2) CHW job descriptions; (3) clinical or CHW protocols; (4) reports prepared for funders or outside agencies; (5) publications; and (6) other relevant documents describing the CHW program. We also conducted an online search to identify additional documents such as websites, program reports, or publications.

Next, individual one-on-one semi-structured interviews were conducted with 1-4 representatives from each sub-unit over Zoom and audio recorded. When appropriate, the semi-structure interview guide was modified in response to data collected in the document review phase to eliminate redundancy or add clarifying questions. Memos were written at the end of each interview capturing initial researcher thoughts regarding overarching themes or key impressions. All study procedures were approved by the University of Illinois at Chicago Institutional Review Board.

Data Analysis

Data were analyzed by the Principal Investigator (EM) first on the sub-unit level, beginning with document review and followed by interviews. Document data were summarized in Microsoft Excel and document-specific memos were written. Interview recordings were transcribed verbatim, edited to ensure accuracy, and de-identified. Interview data were analyzed using MaxQDA software (version # 2018.2, VERBI Software) and thematic coding. Researchers applied a hybrid coding approach

beginning with a priori codes derived from the literature (Miles & Huberman, 2014). In a subsequent pass, emergent codes were also developed utilizing a more inductive, grounded approach to illuminate new or previously unrecognized patterns (Timonen et al., 2018). A subset of interviews was coded separately by an independent coder and coders met to review and discuss the coding scheme. This cycle was repeated until a minimum of 80% cross-coder agreement was achieved.

Documents and interviews from each subunit were triangulated and subunit-level codes were analyzed across data sources (interviews and documents) to identify points of convergence (agreement) and divergence (disagreement). Memos were written to generate a list of subunit-level themes. This was repeated until thematic saturation was achieved. A subunit report summarizing themes was shared with research participants from the respective subunit for feedback (member checking).

Themes from each sub-unit were then triangulated to identify convergent and divergent patterns across sub-units through the charting method (Gale et al., 2013). Discussions, reflection, and the resulting memos helped identify cross-subunit themes, thus unifying concepts and interrelationships across subunit data.

The extent to which programs reported integration was assessed qualitatively. We reviewed factors identified in the conceptual framework theorized to be associated with effective integration including communication, structure and process, training and supervision, a local champion, and clear roles and responsibilities to assess the extent to which CHWs were integrated into clinical care teams. Sub-units were mapped on an integration spectrum applying a human factors definition of integration—with high levels of clinical integration associated with cohesive co-working among multidisciplinary members of the care team supported by clear information sharing channels (e.g. meetings and shared work space), systems that support co-working (e.g. clear structures and process), and a common goal (clear roles, training, and leadership support) and low levels of integration was associated with no or infrequent adherence with the critical integration factors described above. Quotes illustrating key findings have been included in an appendix.

Results

9 subunits were enrolled in the research study (66% of eligible program). 3 declined due to insufficient time or inactive CHWs. Between 1-4 interviews were completed for each subunit for a total of 17 interviews (9 male, 8 female interviewees). 9 interviews were completed with CHWs, 3 with administrators, 2 with health care providers/clinicians, and 3 with dual administrator/health care provider roles. Mean interview duration was 46 minutes (range= 23-62 minutes). 34 documents were reviewed including 4 job descriptions, 13 reports/publications, 4 websites, 12 training documents, and 1 protocol.

Perceptions

Respondent's perceptions of CHWs were assessed by examining descriptions of a CHW's roles and responsibilities, their purpose and value, as well as metrics used for measuring CHW effectiveness.

Roles and Responsibilities: Respondents were asked to describe a CHW's roles and responsibilities. A critical theme that emerged was the diversity in how CHWs were employed in the provision of services within the health system. This could be observed in the broad range of CHW job titles, service populations, service delivery models, and roles and responsibilities (Table 1). Different formal job titles were used for CHWs both within and across sub-units. Some programs also assigned informal job titles that were distinct from the formal human resource title. None of the respondents reported a formal job title of "Community Health Worker", but many identified informally as such. The CHW's target population was also framed differently across subunits—some CHWs focused on a specific disease, location, or prevention activity. Some CHWs delivered services primarily in the community while others were based in a clinical setting. Roles and responsibilities described by respondents were also broad. Some CHWs assisted patients in accessing clinical services, others supported patient's psycho-social needs, or served as a "cultural translator" between the patient and the health system. Some CHW roles required specific certifications such as HIV testing/counseling. Respondents commonly reported that a CHW's roles were not well understood. Also, respondents described a lack of clarity regarding what CHWs were responsible for and how responsibilities were divided within the team.

Table 1: Elements of a CHW's roles and responsibilities

Category	Descriptions Used by Interview Respondents or Documents
Job Titles	Formal HR job title: Clinical Care Coordinator, Behavioral Health Coordinator, Program Service Aid, Community Affairs Specialist. Informal team-level job title: Community Health Worker, Outreach Worker, or Case Manager.
Target Population	Disease-focus: People with uncontrolled diabetes, people who inject drugs, HIV positive patients Location-based: Inpatient hospital, school-based health center Health promotion or risk reduction-focus: Needle exchange, oral health
Service Delivery Model	Clinical Setting: Doctors office, hospital Community Setting: Home, community-based organizations Engagement model: In person, phone, or telehealth
Roles	Health education, motivational interviewing, care coordination, case management, counseling, or community outreach.
Responsibilities	Promoting access to clinical services: Appointment scheduling, clinical intake, transportation, addressing barriers to care Health service support: Assisting with medication refills, health education Psycho-social needs: Supporting patients in obtaining jobs, housing, or personal identification; social service referrals; health insurance enrollment Direct service: Provision of food, toiletries, or clothing Translation: Language translation, helping providers understand patient experience, helping patients understand instructions from health care providers Research: Research study recruitment, enrollment, data collection Documentation: Data collection or entry for documentation purposes

Purpose/Value: Respondents were asked why CHWs were employed as part of the team (the CHW's purpose) and how the CHW contributed to helping patients or the team (their value). CHWs were perceived to play a critical role as “connectors” by serving as the linkage or middleman between the patient and the health system. Other respondents valued CHWs for their ability to build trusting relationships with patients. Building trust required that CHWs invest time working closely with patients and the communities where they reside. But some discrepancy existed in how a CHW's value was perceived among members of the team. Generally, CHWs framed their value in their ability to reach or impact individual patients, framing their value from the perspective of the patient's lived experience. While administrators and clinicians more regularly perceived a CHWs value in their ability to contribution to health service goals. Thus, a CHW was valued by health providers or administrators for helping patients access care, improving physician efficiency, or reducing healthcare provider burnout. While all interviewed respondents valued CHWs and understood their purpose, respondents indicated that not all care team members shared this understanding (Table 2). A lack of understanding of a CHW's purpose and value was a common challenge described by respondents.

Metrics of Success: Respondents were asked how CHWs were evaluated and how they determined whether CHWs were effective. While some common elements of evaluation emerged, there remained considerable diversity in evaluation metrics both across sub-units and between CHWs and

administrators. CHWs were assessed on activities completed (number of calls or home visits completed), patient engagement (patient no-show rates), or biological metrics (hemoglobin A1C levels). Common evaluation tools included patient health assessments, patient satisfaction surveys, CHW activity reports, health action plans, or treatment plans. Some sub-units also tracked costs associated with CHW services to assess cost effectiveness or return on investment (ROI), others used healthcare utilization metrics (such as hospital readmission rates) to estimate a CHW's impact. But perspectives on health and cost metrics were mixed. While these metrics were perceived to be valuable in sustaining funding and leadership support for CHW models, they were also perceived to be limited in their ability to properly capture a CHW's value. Notable was the perception that it takes a long time for CHWs to change individual health outcomes. Consequently, a CHW's positive impact may be missed by short evaluation periods. Additionally, CHW respondents felt that the full scope of their work was not properly captured by quantitative assessments of activities completed. CHWs described taking hours, weeks, or even months to build trust with patients in order to work toward health improvement goals. Assessments that relied too heavily on numerical counts of CHW activities did not always capture the nuanced work essential for patients with complex health and psychosocial needs.

In addition to these formal metrics, CHWs most commonly assessed their effectiveness based on qualitative experiences with patients. CHWs described visual assessments of patients either via observations in the home or during patient interactions. For example, one CHW observed patients for signs of recent drug use (fresh IDU tracks) while another observed child tooth brushing to determine the regularity of practice. CHWs also received direct feedback from patients via success stories, and they identified this direct feedback as critical in assessing effectiveness.

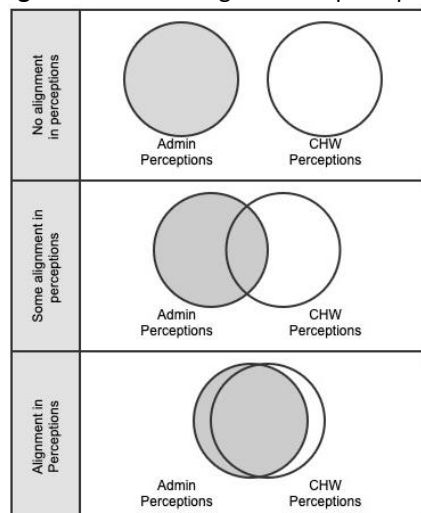
Table 2: Perceptions regarding a CHW’s role purpose, value and effectiveness from the perspective of administrators/clinicians and CHWs.

	Administrators or Clinicians	CHWs
Roles and Responsibilities	<ul style="list-style-type: none"> • Supporting patients in accessing health services • Addressing psycho-social needs • Research study enrollment • Helping providers understand the lived experiences of patients 	<ul style="list-style-type: none"> • Supporting patients in accessing health services • Addressing psycho-social needs • Research Study enrollment • Helping providers understand the lived experiences of patients • Helping patients understand instructions from health care providers • Recordkeeping
Purpose and Value	<ul style="list-style-type: none"> • Building patient capacity to navigate health system* • Improved health outcomes • Facilitating access to care • Improved medication adherence • Reduced physician burnout • Reduced healthcare costs 	<ul style="list-style-type: none"> • Building patient capacity to navigate health system • Improving health outcomes • Building relationships with patients • Helping patients feel valued • Working in the service of others • Making a difference in patient’s lives • Helping patients with complex psycho-social needs
Metrics of success	<ul style="list-style-type: none"> • Patient engagement • Patient experience • Return on Investment • No-show rates • Changes in disease metrics • Changes in health service utilization • Number of calls or visits completed 	<ul style="list-style-type: none"> • Patient engagement • Patient experience • Trusting relationships with patients • Resourcefulness in accessing services • Success stories/direct feedback from patients • Feeling that they helped

*overlap/alignment bolded

Thus, respondents reported inconsistent perceptions related to CHW roles and purpose. CHW roles were not always understood, and the CHW’s purpose and value was sometimes framed differently by different members of the care team. Moreover, evaluation metrics did not always effectively capture a CHW’s impact on the health care system. But in some cases, care teams were more aligned around a shared understanding of the CHW’s role and purpose within the care team (Figure 1)—with some sub-units reporting little alignment and others reporting close alignment in perceptions.

Figure 1: Relative alignment in perceptions of a CHWs role and purpose between groups



Integration

Respondents were also asked how CHWs were integrated into the care team, how team members worked with CHWs, how CHWs and care team members communicated, and to what extent CHWs were integrated into care. Respondents reported a range of models for integration. Some sub-units employed CHWs to work directly with health care providers or care teams—sometimes in the same clinic or facility. While others facilitated integration through regular check-ins such as huddles or meetings. And some sub-units worked minimally with healthcare providers outside of brief phone calls or messages. Generally, a spectrum of integration was observed in which high clinical integration was associated with cohesive co-working among multidisciplinary members of the care team supported by clear information sharing channels (e.g. meetings and shared work space), systems that support co-working (e.g. clear structures and process), and a common goal (clear roles, training, and leadership support) and low levels of integration was associated with low or infrequent adherence with the critical integration factors described above (reference paper #2).

An association was observed between perceptions and integration. Alignment in perceptions regarding a CHW's role and purpose was perceived to be critical for CHW integration. When perceptions about CHWs were both positive and aligned, respondents reported higher levels of integration within the healthcare system. Thus, establishing positive CHW perceptions, via clear roles & responsibilities and purpose & value, supported CHW integration.

Limitations

This study has limitations. As a case study, this research focused specifically on one health and hospital system, and thus generalizability may be limited. Efforts were made to identify a case of study that shares traits with other health and hospital systems to improve generalizability. Additionally, by including only those programs interested in discussing CHW integration, recruitment practices may have selected for those programs with the most robust CHW integration models. But the relatively high response rate among recruited sub-units serves to minimize bias. It is also possible that biases may exist among respondents. Those care teams engaging CHWs in health services may represent those individuals or teams who are more prone to organizational change or non-traditional care models. Or these individuals may be more likely to value a CHW. Consequently, additional barriers may exist for those programs seeking to initiate CHW integration for the first time in a health system unaccustomed to CHW models.

Discussion

This research highlights the importance of understanding how CHWs are perceived by different members of the care team. Programs with higher levels of integration had more alignment across administrators, clinicians and CHWs in their perceptions of a CHW's purpose and value. Thus, clearly defining a CHW's role and purpose is a critical consideration in programs seeking to engage CHWs as part of clinical care teams. But simply writing a clear job description is not sufficient. A CHW's role and purpose must also be articulated to members of the care team, and closely aligned with the metrics that are used to evaluate CHW effectiveness. This is particularly important in ensuring that care team understand that CHWs aren't competing for responsibilities or resources. Alignment is of particular importance because of its ability to unite the team around a shared vision for the CHW model.

This research supports other research which highlights the diversity in CHW roles and responsibilities. Diversity itself may not be a problem. CHW's responsibilities are naturally varied in response to the broad spectrum of needs across different patient populations. But integrating a workforce with a range of responsibilities can be challenging for health systems or care teams unaccustomed to CHW models. Furthermore, standard tools for evaluating health care effectiveness may not capture the impact of CHW models. Findings suggest that health systems need to adapt by identifying strategies to engage this unique workforce and developing new metrics for evaluation.

This research also points to the importance of framing the underlying purpose and value of CHWs. While roles and responsibilities may be varied, consistent messaging regarding a CHW's purpose and value can still be achieved. The extent to which CHWs are valued as a member of the care team was perceived to be a critical component of integration. Of particular importance was the question of how CHWs were evaluated. An overemphasis on short-term quantitative performance metrics may miss the complex and long-term impact of CHW models.

The field of systems thinking is growing in prominence within healthcare and public health sectors, as practitioners seek to understand the complex adaptive context in which they are working (Williams, 2011). While systems thinking itself is a broad transdiscipline marked by differing theoretical approaches, one commonly shared concept is the feedback loop—or the idea that causal pathways are not linear, but loop back on themselves in continuing cycles that result in exacerbating

(reinforcing) or balancing ongoing change, it is considered a reinforcing loop (Meadows, 2009). In feedback loops, effects have the potential to be compounded over time via either virtuous or vicious cycles (Meadows 2009). The positive association between aligned perceptions and integration suggests the presence of a reinforcing feedback loop between perceptions and integration. The presence of a feedback loop has important considerations for CHW integration due to its potential to compound change. It suggests that even modest improvements in alignment around perceptions may contribute to substantial improvements over time.

Thus, this research offers critical priority areas for healthcare leaders as they seek to improve health service delivery, particularly among underserved populations, through CHW models.

References

See Work Cited Section

Notes on Data Visualization Findings

Data visualization tools were used to examine the data and explore potential patterns and relationships. Data on code frequencies was mapped in Excel and relationships between codes were diagrammed visually using MaxQDA tools. While these tools, on their own, did not generate results, this section describes how visualization tools were used to inform and provide evidence for findings described in the manuscripts.

An examination of code frequencies served to identify codes that were recorded frequently in interview transcripts (figure 13). While code frequency cannot serve as a proxy for a code's relevance or importance, it can be used to identify concepts that may deserve additional attention or exploration. For example, higher code frequencies suggest that the topic was discussed more frequently by respondents and may indicate that they should be examined further. Higher code frequencies were observed among the team-level codes of communication, culture, structure and process, training, and supervision as well as the community-level codes of trust, access and relationships. Organizational-level codes with higher frequencies included HR, electronic record systems, financial support, and agility. Finally, the individual-level codes of experience, measurement, roles and responsibilities, and purpose and value were observed in higher frequencies.

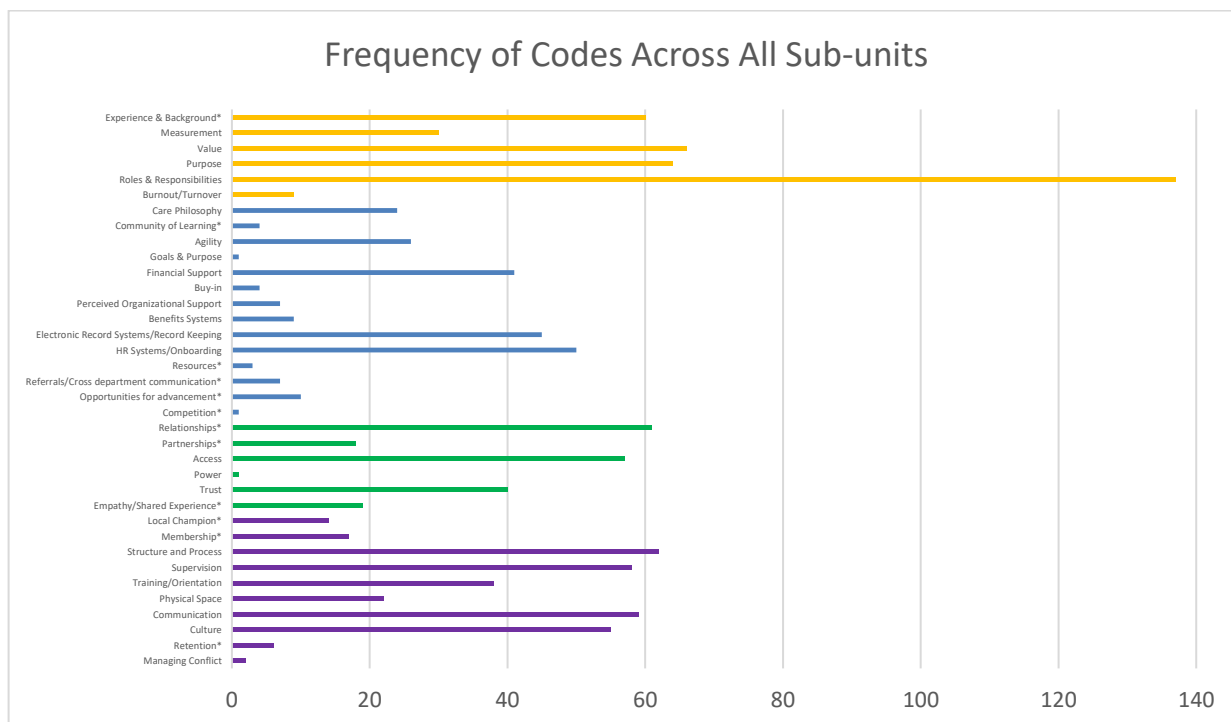


Figure 13: Code frequencies across sub-units for a prior and emergent codes applied

Relationships between codes were also explored through mapping tools to visually examine potential relationships and the strength of relationships among codes (figure 14). For example, these maps highlight close relationships between some codes including purpose and value, and trust and relationships. This these maps support key relationships between factors described in both papers #1 and 3.

These maps also visually illustrate associations between codes and barriers or facilitators of integration. For example, the codes of trust, relationships, roles and responsibilities, communication, purpose and value were closely linked to the code facilitator while financial support, HR systems, and record keeping were more commonly connected to the barrier code. As a result, additional attention was given to these relationships as potential themes.

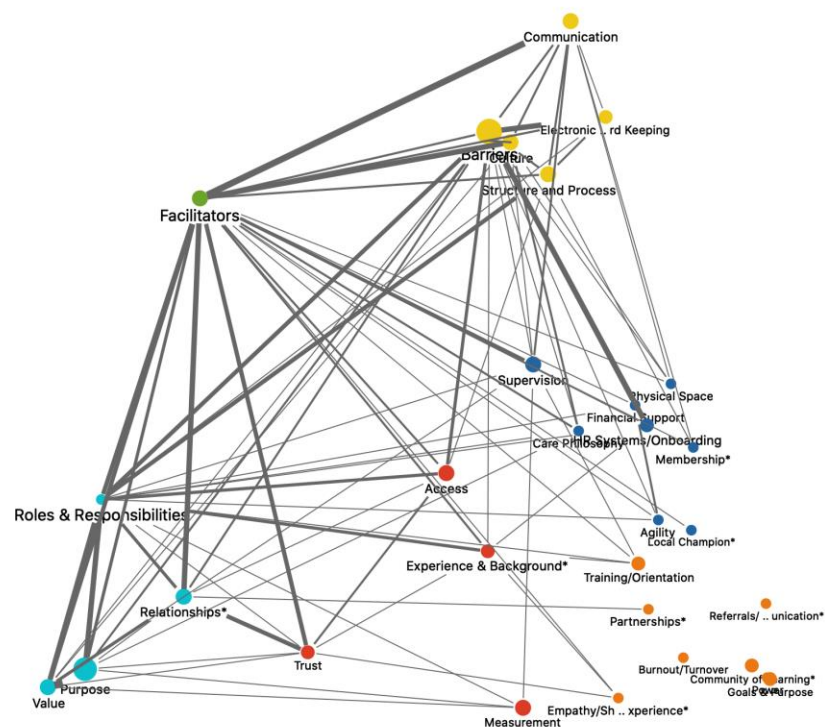


Figure 14: Code map depicting relationships between codes across all sub-units

Code co-occurrence was also explored using the MaxQDA code relationships browser to illuminate those codes most commonly appearing together in the same coded text segment. Higher levels of co-occurrence were observed between the codes of trust and relationships; purpose, value and relationships; and communication and culture.

Also, code frequencies and relationships were also examined by sub-unit to examine between sub-unit differences (figure 15). Notably, some sub-units had higher frequency of organizational or team-level codes while others had higher frequencies with community-level codes. These differences were mapped with other patterns related to community and clinical integration described in manuscript #2.

When these codes and code relationships were examined in more detail through the inclusion of quotes and other visualization tools, additional nuance was observed. For example, some codes, such as purpose and value were commonly discussed concurrently, suggesting overlap between these concepts. Additionally, some elements of these codes were viewed to have a positive association with integration while others had a negative association. Thus, code frequencies served as a starting point in examining more nuanced code relationships in order to build out the themes identified in the manuscripts. Code frequencies and code relationship maps were combined with interview quotes and document findings, served to support the list of themes associated with CHW integration described in paper #1.

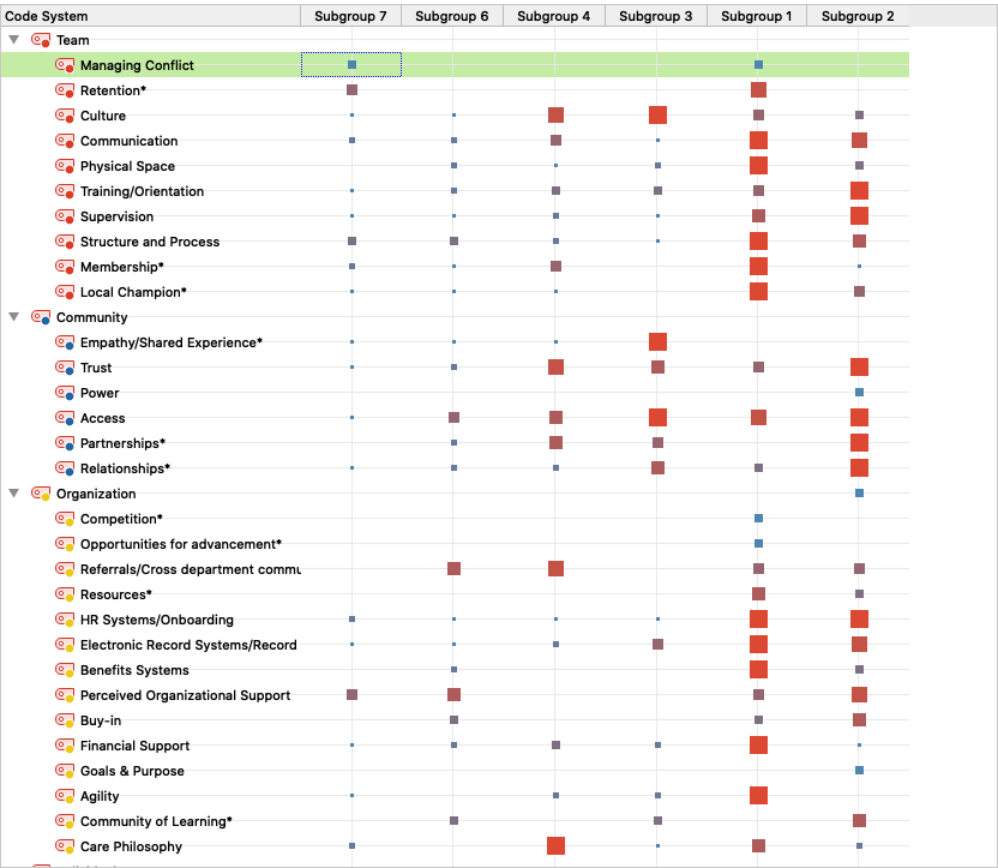


Figure 15: Frequency of codes by sub-unit

Chapter 5: Discussion

This research serves to contribute to the national research and policy conversation around CHWs by (1) contributing to the body of evidence regarding factors associated with CHW integration in clinical practice, (2) offering insight into how the integration of CHWs can be defined and assessed within the clinical and community contexts, and (3) emphasizing the critical relationship between perceptions about CHWs and CHW integration. This research also serves to highlight the critical systems considerations and leadership implications associated with CHW integration. As such, it can be used to guide practitioners in the field.

Factors associated with CHW integration

In identifying 14 factors associated with CHW integration, this research serves to offer practical guidance for practitioners seeking to integrate CHWs into clinical care environments. Factors were grouped into individual, team, organizational and community-level categories. Individual-level factors are those factors that enable a CHW workforce to be positioned for integration. Team-level factors create a team structure that supports CHW integration. Organizational-level factors build an organizational context that enables CHW integration. Finally, community-level factors allow that connectivity with the community is maintained while clinical care integration is pursued.

This research supports existing literature which points to critical individual and team level factors such as champions, communication, training, and clear roles and responsibilities (Allen, 2015; Collensworth et al., 2014; Findley et al., 2014; Johnson & Gunn, 2015; Martinez et al., 2011; Kangovi et al., 2015; Martin et al., 2019; Wennerstrom et al., 2015). However, it also illuminates broader factors such as the organizational structure, culture, care paradigms, and community connections that must also be considered. Others in the field have identified critical organizational factors such as “embracing organizational innovation” and “valuing patient’s non-medical needs” (Rogers et al., 2018). This research highlights and expands upon these findings by drawing particular attention to these broader organizational and systems-level factors.

Among respondents, the term “hierarchy” was commonly used when describing the prevalent culture of the team. A discussion of the team’s hierarchical structure was notably present across multiple

respondents and sub-units. Respondents generally indicated that a more “flattened” hierarchy was important for CHW integration. One respondent noted,

I think that there's... a sense that there's... less hierarchy. I think that there's more recognition of everybody's contribution, that... our staff is diverse in multiple ways. And I think that we connect with our patients in different ways because of that sometimes. And I've realized that that makes our team stronger because we're able to make our own connections, even staff that don't really have a clinical reason to interact with that person all that much, for whatever reason, they like bond with them. And then [the patients] are there all the time. And I think it creates kind of a safe, comfortable place for them. And I think that carries over... kind of the understanding that you know, although I am a physician and I have all this technical training, you know, everybody is contributing their own skills and improvement on the care of the patients.

Thus, this research points to the specific positive association between a team’s culture, its organizational structure, and CHW integration. A team that is less hierarchical was viewed to be more effective at integrating a CHW workforce.

But the reverse was also true. Some respondents described dynamics in which CHWs were not valued or not able to engage with other members of the team. Some CHWs across sub-units described their work with care teams using negative language, such as...

- Usually, I just, I tried to, you know, stay out of the doctor's way.
- I don't think they even know who the fuck I am.
- There's definitely some reluctance to reach out to a doc.

In these contexts, the root cause of this lack of integration was often described as the team’s culture, specifically the team’s hierarchical structure. One respondent noted,

So, there could be some conflict potentially as well, where you know, where it's unclear exactly where the responsibility lies...in healthcare, this happens all the time...with lots of finger pointing and there's a hierarchy and...I hated it. It's awful. But we do try and want to engage people positively and know we're doing it for the patients...‘Rah, sis, boom bah’ kind of thing... and get everyone to think collaboratively and positively towards taking care of patients and... to have good relationships where they feel like we're a team and doing team building things. And no one's, like, finger pointing and saying, you know, I'm too busy, you do this...or this is what you should be doing. I'm going to tell you how to run your life.

This respondent highlights the critical challenge that care teams face in integrating CHWs. It recognizes the important role that a hierarchical structure play in CHW integration. Yet, it also points to the challenges that teams face in changing this structure. Sometimes, team building efforts are not sufficient to change the predominant care philosophy. These factors may require significant organizational change.

Thus, this research builds upon early findings, drawing particular attention to the complex systems-level factors that influence CHW integration. It should be noted that many of these factors require organizational change, and thus, may require long-term time horizons and leadership engagement.

Balancing integration between the community and clinical contexts

A second critical finding of this research is the careful line that CHWs walk in balancing clinical and community orientations. A key challenge faced by CHWs as they integrate into health systems is the question of how to maintain their unique positioning and relationships within the community while also engaging more closely within the clinical care environment.

Some respondents described how an increasing clinical orientation inhibited their community-oriented work. When describing an increasing clinical role, one CHW stated, “So, you weren't able to do [the same community work] anymore because everything had to be documented....and you had to get trainings all of a sudden from people that didn't know shit about what we did, you know? ...Then you learn, and you get rid of some of the ‘streets’ in your head.” For this respondent, the concept of “street” was associated with the ability for the CHW to know the communities that they were working with. The process of becoming more integrated within the health system lead to some level of loss in this community knowledge. Community-level relationship building was perceived to take time, and maintaining relationships required ongoing effort. Another CHW described the challenge of maintaining relationships in the community while also spending more time performing clinical or administrative work noting, “The downside of being away from [community work] is communities change. So, if you’re away a little bit too long, you gotta kind of roll up sleeves and try to lay some groundwork all over again.”

Respondents also reported differences in the roles performed in the clinical and community environments, as well as different skills needed when working in the community compared to the clinic. Clinical work relied on health knowledge, an ability to engage with professional staff, effective record keeping or documentation, and more time in an office setting. At times, the demands of these clinical roles were perceived to be at odds with a CHW’s skill set. One respondent noted,

There was this lovely resource of community health workers who are so good at interpersonal relationships and knowing their community, being all interpersonal, but a large part of their [work] was sitting at a computer entering data and they just like, they hated it. It was like taking a racehorse and tying them up in a barn. So that, was striking... just how much of a mismatch between role and tasks. Several [CHWs] left the program in pretty

short time, because there was like this feeling that, this is not what I signed up to do. I wanted to be talking to the people.

Thus, respondents reported a struggle in managing the demands of these two different orientations.

It could therefore be perceived that there is an inherent trade-off between clinical integration and community-based work. But this research also identifies programs that effectively achieved clinical integration while continuing to maintain a community orientation, thus suggesting that community and healthcare integration are not mutually exclusive. Programs that maintained both community and clinical integration were marked by notable differences in how the program was structured and health services were delivered. An examination of those programs that made progress toward the dual goal of community and clinical level integration has the potential to offer insights into best practice for integration.

In framing CHW integration, this research considers integration as a spectrum with high levels of clinical and community integration associated specific factors that serve to facilitate integration. Clinical-level factors include clear pathways for communication including regular meetings, EMR access, or members working in close proximity with each other. Also included is the presence of a champion or leader that supports the CHW model, and a flattened hierarchy that enables CHWs to engage in care. Finally, training and mentorship for healthcare providers and protocols and procedures that support CHW integration were also included. Together, assessing the presence or absence of these factors within a CHW program can provide some insight into the extent to which CHWs are integrated into clinical care. Thus, the frequency of health system factors listed above may offer a way to conceptualize CHW integration in clinical care along an integration spectrum.

But the concept of integration may also be considered from the perspective of community-level integration. For the purposes of this research, community level integration was assessed by examining the presence or absence of the following factors: a CHW's background that is aligned with community-level work, how CHW and health services were accessed, the ability for CHWs to build relationships, positive perceptions of CHWs within the community, and strong partnerships with other community organizations. Again, the presence or absence of these factors could be used to assess where a specific program falls on a spectrum of community-level integration.

This list of factors may also offer guidance for CHW programs seeking to improve integration across both spectrums. By identifying critical factors, this research offers direction for CHW programs, regardless of their placement on the integration spectrum, by identifying additional steps that can be taking to improve integration—considering the dual goal of health care and community-level integration. Thus, this research may serve to guide CHW program improvement efforts within health systems.

Critical for effective community-level integration is the process of re-thinking where healthcare is delivered--focusing care delivery in formats that are more accessible or comfortable for patients. Conversely, critical for high levels of health system integration is the need to re-design how health services are delivered to enable the engagement of a CHW workforce. Shortell et al argue that we must do a better job of integrating health care, public health and community development. We must move from patient-centered care to population-centered care. This can only be done by re-thinking the "place" that healthcare is delivered and the "person" providing care (Shortell et al., 2013). Thus, Shortell is arguing for models that move clinical care from the clinic into the community. He argues that we should think beyond the physician in the delivery of care. Integrated CHW models provide an example of how the re-thinking of health care delivery can be achieved.

Such examples of healthcare re-design pose notable leadership challenges in facilitating systems-level change. There remains a recognition that the current health care structure—with its emphasis on certifications or educational credentialing—does not always support integration of lay health workers such as CHWs. Moreover, efforts to improve health care access and patient experience, particularly among marginalized populations, remains a challenging goal for many health systems. Finally, as described earlier, changing the predominant culture of a health care team cannot be achieved quickly. More research and documentation practice experience is needed to understand how this systems level change can be achieved.

It is possible that for some programs, fully integrating within both clinical and community settings is not appropriate or achievable. Some programs may choose to specialize their delivery model in one context. It should therefore be noted that the placement of a CHW program on the integration spectrum does not necessarily serve as a proxy measure of the program's strength or effectiveness. For programs choosing to specialize, the inherent tradeoff in this decision should be recognized and

accounted for. For example, programs with high levels of health care integration and low community integration may see improvements in their care delivery model, but not in the quality of community engagement. By being explicit in defining the focus of integration, program can ensure that their approach aligns with their priorities. Those programs seeking to prioritize high levels of health care integration, may also want to prioritize hiring a CHW workforce with greater health system literacy and interest in working in a clinical environment. These programs may also want to focus on the changes needed to integrate CHWs into health care service delivery—such as changes in workflows or EMR systems to allow for CHWs to engage in clinical care. Conversely, programs seeking to specialize in community-level integration may prioritize hiring a workforce with more direct community knowledge while placing less emphasis on written communication skills or computer literacy. They may also focus efforts on ensuring that services are delivered in a manner that is most accessible to or comfortable for patients. Thus, programs can modify their strategy to ensure alignment with goals.

The importance of perceptions of CHWs

A final critical finding of this research is the potential for a reinforcing feedback loop between CHW integration and positive perceptions of CHWs. This research highlights the importance of understanding how CHWs are perceived by different members of the care team. When administrators, clinicians and CHWs are aligned in their perceptions of a CHW's purpose and value, this can serve to support effective integration of CHWs within a care team. Thus, clearly defining a CHW's role and purpose is a critical consideration among programs seeking to engage CHWs as part of clinical care teams. But simply providing a clear job description is not sufficient. A CHW's role and purpose must also be articulated to members of the care team, and closely aligned with the metrics that are used to evaluate CHW effectiveness. Alignment is of particular importance because of its ability to unite the team around a shared vision for the CHW model.

This research supports other research which highlights the diversity and lack of clarity in CHW roles and responsibilities (Jacobs, 2017). At times, respondents struggled to define exactly what a CHW's role was. One respondent stated, "We all do more than what we should do. We do a lot more than what we should be doing." While another described a CHW's role by saying, "They wear a lot of hats." While the actual roles a CHW performed varied across sub-units, one unifying theme was the diversity in a CHW's role. Diversity itself may not be a problem. CHWs' responsibilities are naturally varied in response to the broad spectrum of needs within the health system. But this finding points to the need

for clarity, particularly across multidisciplinary health care teams, regarding how CHWs can be utilized. It is critical for teams to understand a CHW's role. One respondent highlighted this point noting, when "trying to plug [in] community health workers, you'll run into [this] kind of thing where nobody's quite sure where they're supposed to fit." Thus, clarity of roles and responsibilities emerges as a critical factor in effective CHW integration.

This research also points to the importance of framing the underlying purpose and value of CHWs. While roles and responsibilities may be varied, consistent messaging regarding a CHW's purpose and value can still be achieved. The extent to which CHWs are valued as a member of the care team was perceived to be a critical component of integration. When CHWs were not valued, they also did not perceive themselves to be an integrated member of the team. One CHW noted, "It was where, you know, you're *just* a community health worker... you're just... you're just... because they didn't understand the work that we did and how valuable the work that we do is to the overall care of the patient." Thus, there was a sense that understanding a CHW's value was critical for effective integration. Some felt that the team's leadership played an important role in articulating this value. One respondent noted, you "just really [need to] make sure that the leadership... understands the value and the importance of a community worker."

Of particular importance was the question of how CHWs were evaluated. Commonly, CHWs did not feel that evaluation metrics captured the complexity of their work. An overemphasis on short-term quantitative performance metrics may miss the complex and long-term impact of CHW models.

Using a System's Thinking Lens

The field of systems thinking is growing in prominence within healthcare and public health sectors, as practitioners seek to understand the complex adaptive context in which they are working (Williams & Hummelbrunner, 2010). While systems thinking itself is a broad transdiscipline marked by differing theoretical approaches, one commonly shared concept is the feedback loop—or the idea that a change in something can ultimately cause a further change in that same thing. If the further change is in the same direction, it is considered a reinforcing loop (Meadows, 2009). In feedback loops, effects have the potential to be compounded over time via either virtuous or vicious cycles (Meadows, 2009). The positive association between aligned perceptions and integration suggests the presence of a reinforcing feedback loop between perceptions and integration.

The presence of a feedback loop has important considerations for CHW integration due to its potential to compound change. Positive momentum toward improved perceptions may lead to improvements in integration which may in-turn lead to improvements in perceptions. This cycle has the potential to build upon itself over time. Thus, even modest improvements in alignment around perceptions may contribute to substantial improvements over time. This finding may offer opportunities for organizations that do not have the capacity to achieve significant short-term organizational change. Even small-scale modifications, if sustained, have the potential to contribute to more considerable improvements over time.

Thus, in incorporating a systems perspective, this research highlights the critical interrelationship among integration factors—highlighting how understanding the dynamics within the system can lead to a deeper understanding of how improvements can be made.

Modifications to the conceptual model

Research findings were examined to assess the validity of the conceptual framework developed in Chapter 2 (Figure 8). Generally, consistency was observed between relationships theorized in the original conceptual framework and research findings. Notable was the importance of team, the organization, and community level factors in CHW integration. But within these factors, my research suggested that the number of elements of the model should be refined to eliminate those components that are not supported by the research and add emergent themes (Table 8).

Table 8: Changes to factors included in the conceptual framework

	Factors included in Pre-Research Framework	Changes made as a result of research findings	Added or Emergent Factors
Individual	NA	This level was added to the model	Background
Team	Training	Moved to individual level	Buy-in
	Physical Space	Combined with communication	
	Supervision	Combined with training	
	Communication	Included in model	
	Structure/Process	Not included	
	Culture	Included in model	
Organization	Agility	Included in model	Care Philosophy
	Human Resources	Included in model	
	Electronic Medical Record Systems	Not included	
	Benefits Systems	Not included	
	Organizational Support	Not included	
	Leadership Support	Combined with buy-in	
	Financial Support	Included in model	

Community	Trust	Included in model	Relationships
	Access	Included in model	
	Power	No included	
Perceptions	Care Philosophy	Moved to organizational level	Alignment
	Roles and Responsibilities	Moved to individual level	
	Purpose and Value	Moved to individual level	
	Measurement	Included in model	

*Highlighted factors are included in the final conceptual framework

On the organizational level, I originally theorized that alignment in the goals and purpose; agility; HR, EMR and benefits systems; and organizational, leadership, and financial support were all important organizational factors. While evidence supported the inclusion of agility, financial support, and human resources as critical organizational-level factors, there was not enough evidence to support the inclusion of the other components of the model. For example, while EMR systems were discussed by multiple respondents, perspectives on EMRs were mixed—with some viewing them as a positive tool for engaging members of the care team and others viewing them as cumbersome and difficult to use, especially for CHWs. Also, “care philosophy” was included in the original conceptual framework in its relationship to perceptions of CHWs. But this research suggested that care philosophy was closely related to the organization’s goals and purpose and could reasonable be combined with these elements. Moreover, the care philosophy, goals and purpose were all largely driven by the organization’s leadership through formal (e.g. mission and vision statements) and informal messaging. Thus, it connected more closely in the framework as an organizational-level factor.

My original conceptual model theorized that the following team-level factors were associated with integration: training, physical space, supervision, communication, structure/process, and culture. My research suggested that some of these team level factors, including training, may have more closely connected to the individual rather than the team. Also, other factors could be combined. For example, physical space was primarily discussed by respondents as an important tool for communication. Finally, an emergent theme was identified in the data. Notably, ensuring buy-in from team members including champions, leadership support, and clinical support of a CHW model emerged as critical in this research. Thus, “buy-in” was added as a factor in the model. This research supported the inclusion of culture, communication, and buy-in as critical team-level factors.

Next, I assessed alignment between community-level factors proposed in the original conceptual framework and research findings. Both the original elements of trust and access were supported by my research but there was not enough evidence to support the inclusion of power as a factor.

Emergent in the research was the critical association between trust and relationships. Relationships between CHWs and community members (both patients and service providers) was perceived to be important. Relationships was therefore added as an element of the model.

Data analysis suggested that, in addition to organizational, community and team level factors, a fourth level was missing from the conceptual model. Research suggested that another element of effective CHW integration was a workforce that is well positioned for integration. Thus, a consideration of individual-level factors of the CHWs themselves is also important. Critical individual-level factors included a CHW's background and experience, roles and responsibilities, and purpose and value. Training was also identified as an individual-level factor. While roles and responsibilities and purpose and value were included in the original conceptual framework in relation to perceptions about CHWs, they were not considered as an element of integration. The conceptual framework was therefore modified to include individual-level factors as important for integration.

Finally, the original conceptual model suggested that a feedback loop exists between positive perceptions of CHWs and CHW integration. This feedback loop was supported by my research. But this research also suggested that an *alignment* in perceptions of CHWs was also important. Alignment among members of the care team regarding a CHW's role and purpose was associated with more positive perceptions of CHWs. Also important was ensuring that the metrics used to evaluate CHWs aligned with their role and purpose. Thus, alignment was added as a critical component of my model.

The modified and simplified conceptual model (Figure 16) highlights the importance of (1) a CHW workforce that is positioned for integration (2) team structures that support CHW integration, and (3) an organizational context that supports CHW integration. Additionally, it is critical that care teams ensure that (4) connectivity with the community is maintained, and (5) positive perceptions of CHWs are promoted through alignment regarding a CHW's roles, purpose, and evaluation.

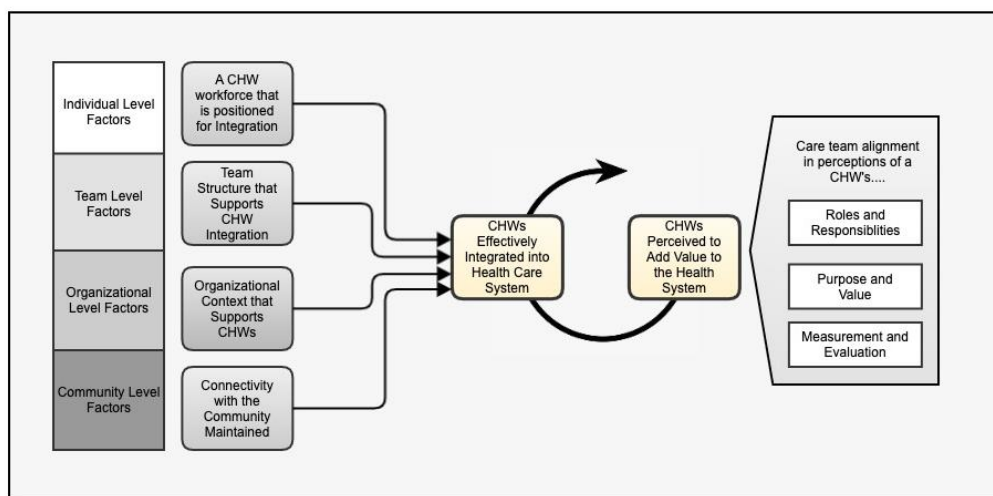


Figure 16: Modified conceptual framework for the integration of CHWs within health care teams

Table 9 provides more detail regarding the factors associated with each component on the left-hand side of the conceptual framework. Notable is the fact that background, buy-in, and relationships were all emergent factors not previously included in the framework. While there is literature to support the inclusion of these factors, they were not explicitly identified as individual factors within my original model. This research has emphasized their importance as individual factors in the modified framework.

Table 9: Individual, team, organizational and community-level factors associated with effective integration of CHWs within health care team.

		Factor	How factor serves to support CHW integration
Individual	A CHW workforce that is positioned for Integration	Roles & Responsibilities	Clear CHW roles and responsibilities that are understood by all members of the team.
		Purpose & Value	A clear shared understanding of the purpose and value of CHWs and why they are included as members of the health care team.
		Training	Training for all members of the team, including healthcare providers in the use and purpose of CHWs.
		Background*	Selecting for CHWs with the experience and background to be successful including a deep understanding of the communities served.
Team	Team structure that supports CHW Integration	Culture	A culture that supports the include of CHWs including a structure that is less hierarchical and more accepting of less traditional processes or systems.
		Communication	Tools that foster effective communication between CHWs and other members of the team including shared workspace and access to systems for record keeping, scheduling and communication.
		Buy-in*	Inclusion of the appropriate team membership to ensure success such as champions that support CHW models and individuals with decision-making authority.
Organization	Organizational context that supports CHW integration	Human Resources	Human Resource systems that support employing a less traditional workforce including clear job descriptions, streamlined hiring processes, and workplace rules that allow for flexibility.
		Financial Support	Commitment to investing in CHWs through financial support, reimbursement models, or fundraising support to facilitate sustainability and long-term investment.
		Agility	Ability for the organization to change or evolve quickly in response to the need for novel approaches.
		Care Philosophy	A care philosophy that recognizes the importance of SDOH and patient experience in healthcare that is both articulated and acted upon within the organization.
Community	Connectivity with the community is maintained	Trust	Community members trust both the CHW and the organization to work in their best interest.
		Access	There are clear pathways for patients to easily access care in an environment that is comfortable to them.
		Relationships*	The CHW is able to form strong relationships with members of the community and other health system and social service providers serving the population.

*emergent factor

A comparison was performed to examine the alignment between this newly refined model and the models and frameworks that were analyzed in Chapter 2. Of particular interest was the UPENN IMPaCT model which has emerged which is growing in prominence as a leading model in US Health Systems. The IMPaCT model articulates “clinical integration” as an element of their model and identifies the following priority areas for integration: patient referrals, data infrastructure, team huddles, and communication via the electronic medical record. Thus, the IMPaCT model’s focus on communication and process aligns with key findings associated with team structures in my research. The IMPaCT model also places emphasis on the importance of hiring a specialized CHW workforce, as well as the utilization of data tools that effectively capture a CHW’s impact. Thus, the IMPaCT model aligns with key findings from this research including the importance of a CHW workforce that is positioned for integration, and re-thinking metrics for success. The IMPaCT model suggests that a patient-centered focus is also important, thus aligning with key findings related to the importance of the team’s culture. But possibility distinct from the IMPaCT model in my research is a broader examination of the organizational level factors that are important for integration including systems, support, agility and care philosophy. These components are not discussed in the IMPaCT framework. Moreover, some of the critical leadership components of my conceptual framework such as leadership buy-in as well as a consideration of care team perceptions are not included in the IMPaCT model. Thus, this research confirms and aligns with this existing model while also building upon the discussions regarding the importance of organizational and leadership factors associated with CHW integration.

Implications for Practice

In reflecting upon the implications of this research on public health practice, the following lessons have emerged:

Looking at CHWs as a workforce in the context of health systems: Commonly CHW research has focused primarily on individual CHW characteristics, or at times, how a CHW fits within the care team. But less common is a consideration a CHW’s fit within the broader health system in which they are positioned. This is particularly important for a CHW workforce which may differ in philosophy and approach from the health system in which they are working. Critical in systems theory is the concept of boundaries. It is important for practitioners to expand the boundaries in which they are looking at a problem in order to ensure that critical interrelated components are not being missed. A systems-level

perspective allows for a consideration of the broader system in which a CHW is integrated and the interrelationships within this system which may serve to enhance CHW integration. Notably, the concept of a feedback loop offers insight into how different elements of the system may interact to affect CHW integration.

Understanding how CHWs are supported by their organizational context in which they are working in order to meet the needs of the community: In considering a systems perspective, two contexts emerged as important for CHW integration—the organizational and community level. This research draws attention to how organizational systems (e.g. HR) and culture (e.g. focus on SDOH) is correlated with CHW integration. But also important is the question of how CHWs maintain a community orientation. Critical is the ability for programs to consider trust, relationships and access when considering CHW’s community-facing work. Thus, this research serves to highlight the need for practitioners to examine how their program is positioned within the organizational culture and systems as well as the community context.

Considering the potential for tradeoffs between clinical and community priorities in CHW integration: This research illustrates the delicate balance that CHWs must consider when engaging in CHW integration. Integration must be framed both from the perspective of the clinical and community context. Clinical integration cannot be achieved at the expense of community level integration. Thus, a careful balance must be achieved in maintaining both clinical and community orientations. The process of integration can be framed along a spectrum, suggesting that organizations can continue to work toward the dual goals of clinical and community integration at the same time.

Engaging policy and leadership to ensure CHW program’s financial sustainability: One unresolved question in this research is how to ensure long-term financial sustainability of CHW models. States have employed different approaches to promoting CHW sustainability including policies, mandates, or reimbursement mechanisms that enable the employment of a CHW workforce. Some states allow for payer reimbursement for CHW services through a fee-for-service pay structure. Others have utilized waivers, contractual agreements, or shared savings models. Illinois does not currently offer a CHW reimbursement mechanism, however local changes, including the growth of ACO or shared-savings models, a growing body of literature demonstrating CHW cost-savings, and the health system’s

shifting focus on SDOH, suggest that new pathways for sustaining CHW models may be emerging. More work is needed to build sustainable financial models for CHW programs.

Redesigning healthcare is critical: Those programs that effectively balanced community and clinical integration achieved this by re-thinking how health services are delivered—including re-thinking the “who” and “where” of healthcare. CHW models offer a different approach in considering “who” delivers health services—shifting orientation away from physicians and nurses to a CHW workforce. Also, some CHW models re-think “where” health services are provided, moving health services out of the hospital and into the community. This change in orientation requires significant changes to the health delivery model. These changes must be supported by the organization.

Leadership buy-in is essential: This research demonstrates that the predominant culture and priorities of the organization can be associated with CHW integration. It is critical for the organizational priorities of a health system to be aligned with the CHW model in order for CHWs to be effectively integrated. Leadership buy-in is therefore critical. But so too is action. Articulating the organization’s values (e.g. mission statements) and taking steps to shape an organization’s culture (e.g. flattened hierarchy, agility) are critical steps that leaders can take to promote integration of CHW models.

This research was specifically conducted with programs that are already implementing CHW models. The focus was therefore on CHW model implementation. Less specific focus was given to program planning and development. But despite this fact, some key lessons can be used to inform the program planning phase. First is the critical step of building leadership buy-in. This should be viewed as a necessary first step when planning a new CHW model. Additionally, thinking about the system from the beginning is critical. Where will the CHW work? How will they engage with other members of the team? How will the care delivery model be modified in order to meaningfully engage this workforce? And how will the CHW balance the different priorities of the community and health system? These questions should be asked before developing a CHW model, not after.

Because this research focused specifically on programs that are already implementing CHW models, it may have missed other critical components of CHW program planning or development. For example, the barriers to building buy-in may not be fully recognized. Or the challenges in changing or modifying

care delivery systems may be understated. It should therefore be noted that additional factors critical for CHW program planning may still be unidentified.

Recommendations for Practitioners

In order to more meaningfully connect this research to practice, research findings and practice implications were reviewed and reflected upon to generate a list of recommendations for practitioners in the field. This list draws upon research findings (the “what”) and conclusions (the “so what”) to consider how this research can be applied to inform practice (the “now what”). These recommendations offer practical evidence-based steps for how health systems, or the care teams embedded within them, can improve CHW integration.

In order to improve CHW integration, the following steps should be taken:

1. **Operationalize a checklist:** This research has generated a list of 14 factors associated with effective integration of CHWs within care teams. Practitioners can operationalize these factors by using them as a checklist which can be employed to regularly assess progress toward integration goals. CHW programs can qualitatively assess progress towards each of the 14 factors. If desired, programs may consider utilizing a scoring system as described in Manuscript 2. Thus, a clinical and community integration score can be calculated and tracked. This process offers a strategy for programs to track and modify integration progress via rapid improvement cycles, thus ensuring accountability and process improvement. But it also helps to illuminate “priority areas” that may need additional attention or support. The checklist serves to identify organizational gaps and focus limited resources on high-priority targets that are supported by research to improve integration goals. The UIC CHW Taskforce could consider developing a tool for programs to easily collect and monitor integration across factors. This tool could be refined and improved over time through a systematic process of improvement via a community of learning or pilot projects, and its use could be promoted via resource sharing or a training center.
2. **Consolidate efforts toward organizational change:** Within this case of study, CHW programs still primarily worked independently with minimal collaboration across programs. The UIC CHW Taskforce is seeking to address this by improving coordination across programs. This research emphasizes the importance of this cross-program collaboration in advancing CHW integration efforts. By highlighting the importance of organizational and systems level factors, this

research demonstrates that the organizational context in which CHW programs are positioned is critically important for integration. Yet, it remains challenging for individual programs to make measurable changes to organizational factors on their own. More cross-program collaboration is needed to prioritize and address organizational-level factors. For example, the need for HR systems that are responsive to the unique challenges of hiring a CHW workforce was a key finding of this research. But individual CHW programs have little leverage to change HR systems within a large health and hospital system. Programs must work collaboratively on efforts to achieve organizational change. Even more difficult is the question of how to change the prevalent care philosophy within the organization. These larger organizational change efforts require coordination across multiple fronts. Thus, this research highlights the important role that the UIC CHW Taskforce, and other similar interdepartmental organizations engaged in cross-organization collaboration, play in facilitating CHW integration. This research therefore suggests that health systems should establish and invest in these interdepartmental coordination efforts—Thus, UIC should consider investing more significantly in the UIC CHW Taskforce’s work.

3. **Approach alignment as a process, not a destination:** A key finding of this research is the importance of alignment across a care team regarding a CHW’s role and purpose. But this research also suggests that alignment and integration may be closely connected via a feedback loop. Thus, the goal of “alignment” isn’t one that is met, rather it is one that is refined. Often programs approach alignment by articulating the organization’s mission and ensuring that this mission aligns with the CHW model. While this step is valuable in a movement toward alignment, it cannot be viewed as a "one and done" effort. Finding alignment reflects an ongoing process across multiple factors including the organization’s mission, the training and orientation process, the organization’s protocols and procedures, and amplifying CHW voices. Each step has the potential to contribute to ongoing improvements in both alignment and integration. Thus, leaders within care teams must be asking what steps can be taken to improve alignment on an ongoing basis. The UIC CHW Taskforce could consider developing a tool for tracking perceptions of CHWs across different members of the team and offer a list of strategies for improving alignment. Or the taskforce could develop training, talent development or mentorship programs that serve to improve this alignment.
4. **Engage in advocacy a critical step:** Some practitioners lose sight of the ways in which the policy and regulatory context influences individual behavior. This research highlights the uphill battle

that health systems face when integrating CHW models due, in part, to the paucity of mechanisms for CHW program financial support. As long as CHW programs are primarily reliant on grant funding to sustain services, the ability for both programs and the CHW workforce to be fully integrated into the organization is limited. Programs and practitioners must work to influence state or federal level policies, mandates, or reimbursement mechanisms that enable the employment of a CHW workforce. Moreover, health system payers—including Medicaid and other health insurers—play a critical role in financial sustainability through waivers, contractual agreements, and shared savings models. It is critical for leaders in the field to advocate for financial models that enable the long-term sustainability of CHW programs and the critical workforce that they employ. This creates an opportunity for the UIC CHW Taskforce to lead policy and advocacy efforts on behalf of the University and its CHW programs.

5. **Re-think metrics for success:** Commonly administrators and CHWs included in this research lamented health outcome metrics. Among CHWs, health data were perceived to be time consuming to collect and it detracted from their ability to meet patient needs. Among administrators, these metrics were viewed to be limited by short time-horizons and difficult to change outcome variables. Among all respondents, evaluation metrics were perceived to be limited in their ability to capture a CHW's value to the health system. Together, this suggests that it is time for CHW programs to consider new tools for evaluating a CHW's contribution. This research offers some insight into opportunities for innovation in evaluation. Qualitative assessments of CHW, provider, and patient experiences can give more nuanced insight. For example, how have provider behaviors changed as a result of CHW integration? Additionally, lengthening the time horizon in which CHWs are evaluated could also serve to capture health improvements that take a longer time to realize. Finally, programs could consider using evaluation metrics for health system efficiency rather than patient outcomes. Anecdotally many health professionals observed that the integration of CHWs into clinical care improved clinical workflow and efficiency by reducing patient no-show rates, freeing up provider time, or by reducing provider burn-out. It's possible that shifting focus on new evaluation metrics could lead to a deeper understanding of the ways in which CHWs contribute to health service delivery goals. Thus, recommendation for new evaluation tools can be developed and promoted by the UIC CHW Taskforce. These tools could be developed and promoted either through a community of learning, resource sharing, or a training center.

6. **Drive Health Care Re-Design:** The efforts to integrate CHWs within the healthcare sector mirror larger efforts to re-think how health services are delivered to patients. This includes new models for care delivery (e.g. multidisciplinary care teams), new ways of providing health services (e.g. home-based services), or new ways that clinicians work with patients (e.g. telehealth or 2-1 care models). CHW models reported higher levels of integration when CHWs were employed in a health care context that was simultaneously engaging in new models for health care delivery. It is therefore critical that CHW models consider health care re-design as valuable strategy for improving the care model. The UIC CHW Taskforce can promote such models through training centers or demonstration projects that test and pilot best-practice for health system re-design in CHW models.

The intent of this research is to inform practice by providing guidance for those teams seeking to integrate CHWs into clinical care. The research study was therefore designed to solicit provider input throughout the process via an action research framework. The action research stakeholder group reviewed the study design, measures, recruitment strategy, and findings to provide input. Additionally, a member checking process was utilized to ensure that practitioners involved in the research were able to review and provide input on findings as they emerged. Thus, this research was designed to ensure relevance to practice. Additionally, findings from this research are designed to provide practical and actionable practice-based guidance for programs working to integrate CHWs into health systems. This research offers critical priority areas for healthcare leaders as they seek to improve health service delivery, particularly among underserved populations, through CHW models.

The next step of this process will be to consider appropriate applications for the translation of this research into practice. This includes the generation of a report summarizing key findings and recommendations for the action research stakeholder group.

Stakeholder Group Report

A report for the action research stakeholder group was developed to summarize key findings regarding the nature of CHW programs at UIC. This includes a description of program characteristics as well as common facilitators and barriers experienced across sub-units. This group is specifically interested in supporting CHW programs or models across the organization, so particular attention was

given to those organizational-level gaps and opportunities that can be mitigated or leveraged (Appendix 10).

Additionally, interview respondents were asked how a central group, such as a CHW center or program, could support their work. Data were compiled and a list of findings were generated to provide evidence that may support next steps in promoting CHW models across the University system. In considering how a CHW Taskforce (or group that supports CHW programs and services) may serve to support existing CHW programs, it is important to consider factors related to program ownership. The Taskforce should serve to support and augment existing programs and services, and not compete with ongoing CHW efforts. Moreover, by centralizing services or resources, the University may limit agility in the face of a changing landscape. Therefore, the Taskforce should thoughtfully consider how it will fit within the current landscape of CHW programs and services across the University system.

Some ways that a CHW taskforce could support ongoing CHW efforts may include:

- *Talent Development:* Helping to build a talent pool of CHWs through mentoring, training, or professional development services for CHWs and CHW supervisors. This serves to support the goal of establishing alignment regarding CHW perceptions and promoting evidence-based best practice for CHW integration as identified in this research.
- *Tool Development:* Helping to create tools that can be used to enhance CHW models by drawing on evidence promoting best practice across the University system. By developing, piloting, and refining these tools, the Taskforce can position itself as a thought leader in improving CHW practice.
- *Community of Learning:* Developing a “Community of Learning” for CHWs and CHW supervisors to share and learn from experiences of other CHW programs. It could create a space for CHWs and administrators to share challenges, successes, and lessons learned. It also could serve as a mechanism to build alignment around CHW perceptions and consolidate efforts toward organizational change. In this environment, tools or new metrics for CHW evaluation could be developed and piloted.
- *Human Resource Support:* Helping to work with the University’s human resource system to develop clearer job titles for a CHW workforce and to help establish a clear pathway for hiring and retaining a CHW workforce. This provides an example of how the Taskforce can

serve to consolidate efforts toward organizational change and engage in advocacy. By unifying CHW programs around the goal of improving CHW hiring processes, the Taskforce can demonstrate their potential to achieve broader organizational change efforts.

- *Resource Sharing:* Helping CHWs support patients by developing or sharing additional services or resources that are available at the University, the City of Chicago, or the larger region. Taskforce can also consider creating and promoting tools that enhance CHW integration, such as a checklist or alignment tracking tool as described above.
- *Training Center:* It could support CHW training efforts by leveraging existing CHWs to “consult” as trainers or mentors for newly established CHW programs. This would serve to improve and standardize the quality of CHW service delivery and align programs around best practice. It also would allow for shadowing which is perceived to be a valuable training mechanism for CHWs.
- *Advocacy:* It could serve to articulate and amplify the argument for CHWs in order to help build leadership or financial support for the model and promote its use. This leverages the finding that advocacy is a critical component of effective CHW integration. Early advocacy efforts should focus on supporting more robust models for financial sustainability of CHW models.
- *Demonstration project:* It could serve to pilot and research CHW models in order to illuminate and promote best practice. Such pilot projects can be used to test tools, demonstrate effective care delivery models, and iterate on practice improvements strategies.

These Taskforce recommendations reflect an effort to operationalize practitioner recommendations and key research findings in order to develop actionable next steps in improving CHW integration across the health system. Table 10 links the recommendations for practitioners with the CHW Taskforce recommendations to illustrate how these recommendations are linked.

Table 10: Connection between practitioner recommendations, evidence supporting recommendations, and recommended next steps for the UIC CHW Taskforce

Practitioner Recommendation		Evidence	Taskforce next steps
1	Operationalize a checklist	<ul style="list-style-type: none"> • Research identified 14 factors associated with effective integration • Research created a scoring process for tracking CHW integration 	Tool Development Training Center Resource Sharing

2	Consolidate efforts toward organizational change	<ul style="list-style-type: none"> • Research highlights the important organizational-level factors associated with CHW Integration • Research identifies HR systems as a major organizational-level barrier for CHW models 	Human Resource Support Community of Learning
3	Approach alignment as a process	<ul style="list-style-type: none"> • Research identifies alignment in perceptions of CHWs' roles and purpose to be critical for effective integration • Research identifies a feedback loop between alignment, perceptions and integration 	Talent Development Training Center Community of Learning Resource Sharing
4	Engage in advocacy as a critical step	<ul style="list-style-type: none"> • Research identifies financial sustainability as a critical gap for CHW models • Research identifies critical organizational and outer setting factors associated with financial sustainability. 	Advocacy
5	Re-think metrics of success	<ul style="list-style-type: none"> • Research identifies current metrics for success of CHW models to be limited 	Tool development Resource Sharing
6	Drive healthcare redesign	<ul style="list-style-type: none"> • Research suggests that integration is associated with the model of care delivery 	Demonstration Projects

Implications for Research

This research contributes to the body of literature related to CHW integration, thus advancing the academic conversation in the field of CHW research. But this research also raises additional questions that can be explored in future studies. For example,

- *CHW Roles and Responsibilities:* Notable in this research is the variability of CHW roles and responsibilities. This aligns with other research highlighting the inconsistencies in how CHWs are utilized within the health system. Systems must consider how to accommodate a CHW workforce that performs a variety of roles. It is therefore critical to develop ways to support and monitor fidelity for this type of variation.
- *Defining Integration:* This research makes a first attempt at defining integration and identifying the framing of integration along a spectrum. But more refinement is needed to hone both the definition and conceptualization of an integration spectrum. Additional research may serve to clarify or enhance those health system and community level factors associated with integration. It is possible that implementation science frameworks may serve to enhance research in the field. Or, a delphi process could be used to validate factors associated with integration proposed in this research. Moreover, research could be used to test tools developed to enhance CHW integration.
- *Changing Organizational Culture:* A common challenge described in this research is the predominant culture and hierarchical structure of health systems which sometimes place an enhanced emphasis on traditional educational and training qualifications, thus de-valuing a CHW workforce. This was perceived as a common barrier to effective CHW integration,

particularly within health systems. But it is less clear how changes to this organizational culture and hierarchical structure can be achieved. Thus, more research is needed to understand the critical factors associated with broad cultural change within a health system.

Methodological considerations

This research is a qualitative study. The findings presented in this research were validated through triangulation across multiple sources (both interview and document data). Evidence was provided via quotes and examples. But the strength of the findings may be limited due to the limited sample size and scope of the research. It is important to note that the framing of CHW integration is a relatively new field that has not yet received considerable research. It would therefore be desirable to conduct additional research to validate these research findings.

Also, in the second manuscript, a scoring rubric was developed to assess integration along a spectrum. Integration factors emerged as important for integration in the qualitative analysis and the presence or absence of each integration factor was assessed qualitatively through interviews and document review. Attempts were made to confirm findings via triangulation across data sources. But some factors cannot be easily categorized into a dichotomous variable. For example, the extent to which the care team structure is hierarchical is not easy to quantify and may be perceived differently within a sub-unit. Consequently, the scoring applied in this research should be viewed as both fluid and interpretable. Moreover, the absence of a factor cannot be assumed to mean that this factor was not present. It may reflect the fact that this topic wasn't discussed in sub-unit interviews or documents. Therefore, while helpful in framing the discussion related to integration, this strategy for conceptualizing integration needs additional refinement. Further validation of factors used to assess integration and methodologies to assess the presence/absence of each factor would be useful. It should be noted that the score itself should not serve as an evaluation of a specific sub-unit—the score is only useful as a tool for comparison across sub-units in that it offers a way to examine the relative integration across sub-units.

Next, the COVID-19 pandemic emerged as a threat after the dissertation proposal was approved but prior to when data collection was initiated. As a result, the study was not designed to examine changes that emerged as a result of the pandemic, yet the impact of the pandemic was present while data was collected. Anecdotally, CHWs expressed concern that the pandemic limited their ability to

work directly with patients and build relationships. Administrators were concerned about the implications of the pandemic on their ability to sustain CHW programs. But this research study did not fully capture those effects. It is unclear to what extent findings may have been distorted by the pandemic landscape.

Finally, it is important to note that this research chose a specific frame for exploring the research questions. By selecting UI Health as a case of study, this research established an organizational-level lens in which it explored CHW integration. This aligns with findings that identified organizational-level factors associated with integration. But by drawing boundaries around the problem on an organizational level, this research may have missed broader outer-setting factors associated with CHW integration. Some of these factors have still be identified—including the critical question of financial sustainability which is closely related to factors beyond the organizational level. But it is also possible that additional critical factors were missed by choosing this specific boundary.

Additionally, I made the methodological choice to focus sub-unit recruitment on existing CHW programs. The focus of the research was on the current context including facilitators and barriers to integration. By choosing this lens, this research's findings are particularly relevant to programs with an ongoing CHW model as they identify factors associated with higher levels of CHW integration. This framing may have missed other programs that may have offered valuable insights into other challenges. Or it may have disproportionately focused on the most successful programs. For example, programs that attempted to develop a CHW model but were unsuccessful may have provided more data related to barriers of program planning and development. Or programs that developed a CHW model but were not able to successfully sustain it may have offered insights into questions of sustainability or organizational change.

Limitations

This research study has limitations. As a case study, this research focused specifically on one health and hospital system, and thus generalizability may be limited. Efforts were made to identify a case of study that shares traits with other health and hospital systems to improve generalizability, but it is possible that findings may not easily translate to other contexts. Additionally, by including only those programs interested in discussing CHW integration, recruitment practices may have selected for those programs with the most robust CHW integration models. But the relatively high response rate among

recruited sub-units serves to minimize this bias. It is also possible that biases may exist among respondents. Those care teams engaging CHWs in health services may represent those individuals or teams who are more prone to organizational change or non-traditional care models. Or these individuals may be more likely to value a CHW. Consequently, additional barriers may exist for those programs seeking to initiate CHW integration for the first time in a health system unaccustomed to CHW models. Finally, this research did not examine the ways that models changed as a result of the COVID-19 pandemic. It is possible that some findings were a direct result of distortions that may have emerged as a result of the pandemic.

Conclusions

As the utilization of a CHW workforce grows in prominence within the health sector, more policy coordination, advocacy and research are needed to shape how this workforce can be effectively integrated into healthcare delivery. Findings from this research offers an initial framework for CHW integration—identifying critical individual, team, and organizational-level factors for effective integration. Also important is the ability for CHWs to balance demands of health care and community level work. This research also highlights the critical role that perceptions of CHWs plays in effective integration. Notable is the importance of taking a systems perspective in examining integration to ensure that critical organizational level factors are also considered. The resulting framework can be used to help guide practitioners in the field and may be used as a starting point for further research into CHW integration.

Institutional Review Board

Research was conducted in two phases. Phase 1 data collection included document review, and Phase 2 included semi-structured interviews and member checking. Phase 1 of the research was reviewed by University of Illinois at Chicago Institutional Review Board (Board #2) and determined not to constitute human subjects research on February 5, 2020 (Protocol # 2020-0132).

This second phase of the research was approved the University of Illinois at Chicago Institutional Review Board (Board #2) on April 4, 2020 (protocol #2020-0326).

Two amendments were submitted for this research as described:

1. Amendment #1: to submit name and confidentiality agreement for transcription service (approved May 19, 2020)
2. Amendment #2: to submit the member checking measures developed after study was initiated (approved July 15, 2020)

Measures including the semi-structured interview guide and member checking questionnaire were reviewed and approved by the IRB. A consent document was used to obtain verbal consent from participants prior to completing one-on-one interviews. IRB approved measures and forms are included in Appendix 4, 6 and 8.

Conflict of Interest Statement

The investigator has no conflicts of interest to report.

Cited Literature

- Agency for Health Research Quality (AHRQ). (2018). Transforming the organization and delivery of primary care. US Department of Health and Human Services, PCMH resource center (PCMH). Retrieved from <https://pcmh.ahrq.gov/>
- Albritton, E. (2016). How states can fund community health workers through Medicaid to improve people's health. Decrease costs and reduce disparities. *Issue Brief*. Washington, DC: Families USA. Retrieved from <https://www.nationalcomplex.care/wp-content/uploads/2017/11/Community-Health-Workers-Brief.pdf>
- Allen, C. G., Escoffery, C., Satsangi, A., & Brownstein, J. N. (2015). Strategies to improve the integration of community health workers into health care teams: "A little fish in a big pond". *Preventing Chronic Disease*, 12, E154.
- Altheide, D., & Schneider, C. (2012). *Qualitative media analysis* (2nd Ed ed.). Thousand Oaks, CA: SAGE Publications, Inc.
- American Public Health Association, (APHA). (2020). Community Health Workers. <https://www.apha.org/apha-communities/member-sections/community-health-workers>.
- Anderson, C., & Kirkpatrick, S. (2016). Narrative interviewing. *International Journal of Clinical Pharmacy*, 38(3), 631-634.
- Arnold, S. (2018, February 6,). Innovation and the search for health care's tipping point. <https://www.ahrq.gov/news/blog/ahrqviews/health-care-tipping-point.html>
- ASTHO. (2020). *Community health workers training/certification standards*. Retrieved from: <https://www.astho.org/Programs/Clinical-to-Community-Connections/Documents/Map-of-State-Approaches-to-CHW-Certification/>
- Baiden, B., Price, A., & Dainty, A. (2003). Looking beyond processes: Human factors in team integration. Paper presented at the 19th ARCOM at Brighton, Brighton, UK.
- Baig, A. A., Wilkes, A. E., Davis, A. M., Peek, M. E., Huang, E. S., Bell, D. S., & Chin, M. H. (2010). The use of quality improvement and health information technology approaches to improve diabetes outcomes in african-american and hispanic patients. *Medical Care Research and Review : MCRR*, 67(5 Suppl), 163S-197S.
- Bass, B. (1994). *Improving organizational effectiveness through transformational leadership*. Thousand Oaks, CA: SAGE Publications, Inc.
- Berwick, D. M., Nolan, T. W., & Whittington, J. (2008). The triple aim: Care, health, and cost. *Health Affairs*, 27(3), 759-769.
- Bir, A., Smith, K., Kahwati, L., Derzon, J., Freeman, N., Emery, K., . . . Liebling, E. (2018). *Health care innovation awards (HCIA) meta-analysis and evaluators collaborative*. RTI International. Retrieved from: <https://downloads.cms.gov/files/cmml/hcia-metaanalysisisthirdannualrpt.pdf>
- Bisognano, M., & Kenney, C. (2012). *Pursuing the triple aim: Seven innovators show the way to better care, better health, and lower costs*. San Francisco: Jossey-Bass Publishers. Retrieved from <http://www.ihl.org:80/resources/Pages/Publications/PursuingtheTripleAimSevenInnovatorsShowtheWay.aspx>
- Bodenheimer, T. (2019). Building powerful primary care teams. *Mayo Clinic Proceedings*, 94(7), 1135-1137.
- Bodenheimer, T., & Sinsky, C. (2014). From triple to quadruple aim: care of the patient requires care of the provider. *Annals of family medicine*, 12(6), 573-576
- Bovbjerg, R., Eyster, L., Ormond, B., Anderson, T., & Richardson, E. (2013). *The evolution, expansion, and effectiveness of community health workers*. (). Washington, DC:
- Bresciani, M. (2019). *Trusted voices: The role of community health workers in health system transformation*. Washington, DC: Community Catalyst. Retrieved from <https://www.communitycatalyst.org/resources/publications/document/Community-Catalyst-CHW-Issue-Brief.pdf?1444843262>

- Brownstein, J. N., Chowdhury, F. M., Norris, S. L., Horsley, T., Jack, L., Zhang, X., & Satterfield, D. (2007). Effectiveness of community health workers in the care of people with hypertension. *American Journal of Preventive Medicine*, 32(5), 435-447.
- Bureau of Labor Statistics (BLS). (2020). Health Educators and Community Health Workers. *Occupational Outlook Handbook*.
- Carolan, C. M., Forbat, L., & Smith, A. (2016). Developing the DESCARTE model: The design of case study research in health care. *Qualitative Health Research*, 26(5), 626-639.
- Center for Health Care Strategies, (CHCS). (2016). *Community care teams: An overview of state approaches*. Retrieved from: <https://www.chcs.org/media/Community-Care-Teams-An-Overview-of-State-Approaches-030316.pdf>
- Centers for Disease Control, (CDC). (2016). Community health worker resources. Retrieved from: <https://www.cdc.gov/publichealthgateway/chw/index.html>
- Chamberlain-Salaun, J., Mills, J., & Usher, K. (2013). Terminology used to describe health care teams: An integrative review of the literature. *Journal of Multidisciplinary Healthcare*, 6, 65-74.
- Chapman, S., Schindel, J., & Miller, J. (2017). *Supporting the integration of community health workers into health care teams in california*. Retrieved from: https://healthforce.ucsf.edu/sites/healthforce.ucsf.edu/files/publication-pdf/Supporting%20the%20Integration%20of%20Community%20Health%20Workers%20into%20Health%20Care%20Teams_2017_06_26.pdf
- Cherrington, A., Ayala, G. X., Elder, J. P., Arredondo, E. M., Fouad, M., & Scarinci, I. (2010). Recognizing the diverse roles of community health workers in the elimination of health disparities: From paid staff to volunteers. *Ethnicity & Disease*, 20(2), 189-194.
- CHW Core Consensus Project (C3 Project). (2018). Retrieved from: <https://www.c3project.org>
- Collinsworth, A. W., Vulimiri, M., Schmidt, K. L., & Snead, C. A. (2013). Effectiveness of a community health worker-led diabetes self-management education program and implications for CHW involvement in care coordination strategies. *The Diabetes Educator*, 39(6), 792-799.
- Collinsworth, A., Vulimiri, M., Snead, C., & Walton, J. (2014). Community health workers in primary care practice: Redesigning health care delivery systems to extend and improve diabetes care in underserved populations. *Health Promotion Practice*, 15(2 Suppl), 51S-61S.
- Community Preventive Services Task Force, (CPSTF). (2015). *Cardiovascular disease: Interventions engaging community health workers*. Retrieved from https://www.thecommunityguide.org/sites/default/files/assets/CVD-Community-Health-Workers_0.pdf
- Crabtree, B. F., & Miller, W. L. (1999). *Doing qualitative research* (2nd ed.). Thousands Oaks, CA: SAGE Publications, Inc.
- De Jong, K. (2015). *Registered nurses' perceptions of community health workers*. Retrieved from https://sophia.stkate.edu/dnp_projects/63
- Dolecheck, J., & Griswold, P. (2019, August 30,). Realize the value of soft skills in healthcare - AAPC Knowledge Center. Retrieved from <https://www.aapc.com/blog/48405-realize-the-value-of-soft-skills-in-healthcare/>
- Dower, C., Knox, M., Lindler, V., & O'Neil, E. (2006). *Advancing community health worker practice utilization*. National Fund for Medical Education. San Francisco, CA.
- Driessen, J., Bellon, J. E., Stevans, J., James, A. E., Minnier, T., Reynolds, B. R., & Zhang, Y. (2015). Innovative approaches to interprofessional care at the university of pittsburgh medical center. *Journal of Interprofessional Care*, 29(5), 520-521.
- Global Forum on Innovation in Health Professional Education; Board on Global Health; Institute of Medicine (IOM). (2013). *Interprofessional Education for Collaboration: Learning How to Improve Health from Interprofessional Models Across the Continuum of Education to Practice: Workshop Summary*. Washington (DC): National Academies Press (US).

- Enard, K. R., & Ganelin, D. M. (2013). Reducing preventable emergency department utilization and costs by using community health workers as patient navigators. *Journal of Healthcare Management / American College of Healthcare Executives*, 58(6), 412-427; discussion 428.
- Epstein, N. E. (2014). Multidisciplinary in-hospital teams improve patient outcomes: A review. *Surgical Neurology International*, 5(Suppl 7), 295.
- Fedder, D. O., Chang, R. J., Curry, S., & Nichols, G. (2003). The effectiveness of a community health worker outreach program on healthcare utilization of west baltimore city medicaid patients with diabetes, with or without hypertension. *Ethnicity & Disease*, 13(1), 22-27.
- Fennell, M. L., Das, I. P., Clauser, S., Petrelli, N., & Salner, A. (2010). The organization of multidisciplinary care teams: Modeling internal and external influences on cancer care quality. *Journal of the National Cancer Institute. Monographs*, 2010(40), 72-80.
- Findley, S., Matos, S., Hicks, A., Chang, J., & Reich, D. (2014). Community health worker integration into the health care team accomplishes the triple aim in a patient-centered medical home: A bronx tale. *The Journal of Ambulatory Care Management*, 37(1), 82-91.
- Firth-Cozens, J. (2001). Multidisciplinary teamwork: The good, bad, and everything in between. *Quality in Health Care: QHC*, 10(2), 65-66.
- Fiscella, K. (2017a). Improving the health of patients and communities: Evolving practice-based research (PBR) and collaborations. *Journal of the American Board of Family Medicine. JABFM*, 30(5), 562-566.
- Fiscella, K., Mauksch, L., Bodenheimer, T., & Salas, E. (2017). Improving care teams' functioning: Recommendations from team science. *Joint Commission Journal on Quality and Patient Safety*, 43(7), 361-368.
- Gale, N. K., Heath, G., Cameron, E., Rashid, S., & Redwood, S. (2013). Using the framework method for the analysis of qualitative data in multi-disciplinary health research. *BMC Medical Research Methodology*, 13, 117.
- Gatchel, R. J., McGeary, D. D., McGeary, C. A., & Lippe, B. (2014). Interdisciplinary chronic pain management: Past, present, and future. *The American Psychologist*, 69(2), 119-130.
- Gladwell, M. (2000). *The tipping point: How little things can make a big difference*. New York, NY: Little Brown.
- Glaser, B. G., & Strauss, A. L. (2010). *The discovery of grounded theory: Strategies for qualitative research*. New Brunswick: Aldine de Gruyter.
- Glass, R. D. (2016). On paulo freire's philosophy of praxis and the foundations of liberation education: *Educational Researcher*, doi:10.3102/0013189X030002015
- Goldman, T. R. (2018). Charting A pathway to better health. *Health Affairs (Project Hope)*, 37(12), 1918-1922.
- Goodwin, K., & Tobler, L. (2008). Community health workers: Expanding the scope of the healthcare delivery system. *National Conference of State Legislatures*,
- Hammond, S.A. (2013). *The Thin Book of Appreciative Inquiry* (3rd ed.). Bend, OR: Thin Book Publishing Co.
- Harris, M. F., Advocat, J., Crabtree, B. F., Levesque, J. F., Miller, W. L., Gunn, J. M., . . . Russell, G. M. (2016). Interprofessional teamwork innovations for primary health care practices and practitioners: Evidence from a comparison of reform in three countries. *Journal of Multidisciplinary Healthcare*, 9, 35-46.
- Hartzler, A. L., Tuzzio, L., Hsu, C., & Wagner, E. H. (2018). Roles and functions of community health workers in primary care. *Annals of Family Medicine*, 16(3), 240-245.
- HCN Clinicians Network. (1999). *Integrated, interdisciplinary models of care*. Healing Hands. Retrieved from https://nhchc.org/wp-content/uploads/2019/08/hh.08_99.pdf
- Health, B., Wise Romero, P., & Reynolds, K. (2013). *A review and proposed standard framework for levels of integrated healthcare*. Washington, DC: SAMHSA-HRSA Center for Integrated Health Solutions.

- Herzlinger, R. E. (2006). Why innovation in health care is so hard. *Harvard Business Review*, Retrieved from <https://hbr.org/2006/05/why-innovation-in-health-care-is-so-hard>
- Institute for Clinical and Economic Review (ICER). (2013). A review of program evolution, evidence on effectiveness and value, and status of workforce development in New England. Retrieved from <https://icer-review.org/wp-content/uploads/2016/01/CHW-Final-Report-07-26-MASTER.pdf>
- Institute of Medicine (IOM). (2001). *Crossing the quality chasm: A new health system for the 21st century*. Washington (DC): National Academies Press (US).
- Interprofessional Education Collaborative Expert Panel, (IPEC). (2011). *Core competencies for interprofessional collaborative practice: Report of an expert panel*. Washington, DC: Interprofessional Education Collaborative.
- Islam, N., Nadkarni, S., Peretz, P., Matiz Luz, A., Hirsch, G., Kane, E., . . . Trinh-Shevrin, C. (2016). *Integration of community health workers into primary care health systems: The time for new york is now!*. New York, NY: NYU-CUNY Prevention Research Center.
- Israel, B. A. (1985). Social networks and social support: Implications for natural helper and community level interventions. *Health Education Quarterly*, 12(1), 65-80.
- Jacobs, F. (2017). Community Health Workers in the Community Health Center Context: Approaches in the Pacific Northwest (Unpublished doctoral dissertation). University of Illinois at Chicago, School of Public Health, Chicago, IL.
- Jewish Healthcare Foundation (JHF). (2015). Community health workers: Getting the job done in healthcare delivery. CHW Issue Brief. *Network for Excellence in Health Innovation*. Retrieved from: https://www.nehi.net/writable/publication_files/file/jhf-nehi_chw_issue_brief_web_ready_.pdf
- Johnson, S. L., & Gunn, V. L. (2015). Community health workers as a component of the health care team. *Pediatric Clinics of North America*, 62(5), 1313-1328.
- Kangovi, S., & Asch, D. (2018). The community health workers boom. *NEJM Catalyst*, Retrieved from <https://catalyst-nejm-org.proxy.cc.uic.edu/community-health-workers-boom/>
- Kangovi, S., Carter, T., Charles, D., Smith, R. A., Glanz, K., Long, J. A., & Grande, D. (2016). Toward A scalable, patient-centered community health worker model: Adapting the IMPaCT intervention for use in the outpatient setting. *Population Health Management*, 19(6), 380-388.
- Kangovi, S., Grande, D., & Trinh-Shevrin, C. (2015). From rhetoric to reality--community health workers in post-reform U.S. health care. *The New England Journal of Medicine*, 372(24), 2277-2279.
- Kangovi, S., Mitra, N., Grande, D., White, M. L., McCollum, S., Sellman, J., . . . Long, J. A. (2014). Patient-centered community health worker intervention to improve posthospital outcomes: A randomized clinical trial. *JAMA Internal Medicine*, 174(4), 535-543.
- Kangovi, S., Mitra, N., Norton, L., Harte, R., Zhao, X., Carter, T., . . . Long, J. A. (2018). Effect of community health worker support on clinical outcomes of low-income patients across primary care facilities: A randomized clinical trial. *JAMA Internal Medicine*, 178(12), 1635-1643.
- Kangovi, S., Mitra, N., Turr, L., Huo, H., Grande, D., & Long, J. A. (2017). A randomized controlled trial of a community health worker intervention in a population of patients with multiple chronic diseases: Study design and protocol. *Contemporary Clinical Trials*, 53, 115-121.
- Kim, K., Choi, J. S., Choi, E., Nieman, C. L., Joo, J. H., Lin, F. R., . . . Han, H. R. (2016). Effects of community-based health worker interventions to improve chronic disease management and care among vulnerable populations: A systematic review. *American Journal of Public Health*, 106(4), e3-e28.
- Kim, M. M., Barnato, A. E., Angus, D. C., Fleisher, L. A., & Kahn, J. M. (2010). The effect of multidisciplinary care teams on intensive care unit mortality. *Archives of Internal Medicine*, 170(4), 369-376.
- Klein, S., & Hostetter, M. (2015). In focus: Integrating community health workers into care teams. *Commonwealth fund*. Retrieved from <https://www.commonwealthfund.org/publications/newsletter-article/2015/dec/focus-integrating-community-health-workers-care-teams>

- Kok, M. C., Broerse, J. E. W., Theobald, S., Ormel, H., Dieleman, M., & Taegtmeier, M. (2017a). Performance of community health workers: Situating their intermediary position within complex adaptive health systems. *Human Resources for Health*, 15(1), 59-z.
- Kok, M. C., Ormel, H., Broerse, J. E. W., Kane, S., Namakhoma, I., Otiso, L., . . . Dieleman, M. (2017b). Optimising the benefits of community health workers' unique position between communities and the health sector: A comparative analysis of factors shaping relationships in four countries. *Global Public Health*, 12(11), 1404-1432.
- Kuo, T., Barragan, N. C., & Readhead, H. (2018). Public health investment in team care: Increasing access to clinical preventive services in los angeles county. *Frontiers in Public Health*, 6, 17.
- Leach, B., Morgan, P., Strand de Oliveira, J., Hull, S., Ostbye, T., & Everett, C. (2017). Primary care multidisciplinary teams in practice: A qualitative study. *BMC Family Practice*, 18(1), 115-6.
- Lewin, S. A., Dick, J., Pond, P., Zwarenstein, M., Aja, G., van Wyk, B., . . . Patrick, M. (2005). Lay health workers in primary and community health care. *The Cochrane Database of Systematic Reviews*. (1), CD004015.
- London, K., Carey, M., & Russell, K. (2016). *Community health worker certification requirements by state*. Connecticut Health Foundation. Retrieved from: <https://www.cthealth.org/wp-content/uploads/2016/02/CHW-Certificaiton-by-State-Final-Final.pdf>
- Lysaught, M. T. (2013). Reverse innovation from the least of our neighbors. *Health Progress (Saint Louis, Mo.)*, 94(1), 44. Retrieved from <https://www.ncbi-nlm-nih-gov.proxy.cc.uic.edu/pubmed/23393729>
- Malcarney, M., Pittman, P., Quigley, L., Horton, K., & Seiler, N. (2017). The changing roles of community health workers. *Health Services Research*, 52(1), 360-382.
- Martin, G. (2014). Healthcare system becoming more transactional and impersonal. *Medical Xpress*. Retrieved from <https://medicalxpress.com/news/2014-02-healthcare-transactional-impersonal.html>
- Martin, M. A., Perry-Bell, K., Minier, M., Glassgow, A. E., & Van Voorhees, B. W. (2019). A real-world community health worker care coordination model for high-risk children. *Health Promotion Practice*, 20(3), 409-418.
- Martin, M. A., (2020). *Practice expert key Informant interview*.
- Martinez, J., Ro, M., Villa, N. W., Powell, W., & Knickman, J. R. (2011). Transforming the delivery of care in the post-health reform era: What role will community health workers play? *American Journal of Public Health*, 101(12), 1.
- Maxwell, J. A. (2013). *Qualitative research design: An interactive approach* (3rd Ed ed.). Thousand Oaks, CA: SAGE Publications, Inc.
- Meadows, D. (2009). *Thinking in systems: A primer*. White River Junction, VT: Chelsea Green Publishing.
- Merriam, S., & Tisdell, E. (2015). *Qualitative research: A guide to design and implementation* (4th Ed ed.). San Francisco, CA: John-Wiley & Sons.
- Mickan, S. M., & Rodger, S. A. (2005). Effective health care teams: A model of six characteristics developed from shared perceptions. *Journal of Interprofessional Care*, 19(4), 358-370.
- Mickan, S., & Rodger, S. (2000). The organisational context for teamwork: Comparing health care and business literature. *Australian Health Review: A Publication of the Australian Hospital Association*, 23(1), 179-192.
- Miles, M., Huberman, A., & Saldana, J. (2014). *Qualitative data analysis* (3rd Edition ed.) SAGE Publications.
- Minnesota Community Health Worker Alliance (MCHWA). (2020). Minnesota community health worker alliance. Retrieved from <https://mnchwalliance.org/>
- Mobula, L. M., Okoye, M. T., Boulware, L. E., Carson, K. A., Marsteller, J. A., & Cooper, L. A. (2015). Cultural competence and perceptions of community health workers' effectiveness for reducing health care disparities. *Journal of Primary Care & Community Health*, 6(1), 10-15.
- Moffett, M. L., Kaufman, A., & Bazemore, A. (2018). Community Health Workers Bring Cost Savings to Patient-Centered Medical Homes. *Journal of community health*, 43(1), 1-3.

- Moloughney, B. W., & Skinner, H. A. (2006). Rethinking schools of public health: A strategic alliance model. *Canadian Journal of Public Health = Revue Canadienne De Sante Publique*, 97(3), 251-254.
- Monat, J. P., & Gannon, T. F. (2015). What is systems thinking? A review of selected literature plus recommendations. *American Journal of Systems Science*, 4(1), 11-26.
- Murphy, H. (2020). The importance of soft skills in the healthcare professions. *Elsevier Education*. Retrieved from <https://evolve.elsevier.com/education/expertise/faculty-development/the-importance-of-soft-skills-in-healthcare-professions/>
- Naimoli, J. F., Frymus, D. E., Wuliji, T., Franco, L. M., & Newsome, M. H. (2014). A community health worker "logic model": Towards a theory of enhanced performance in low- and middle-income countries. *Human Resources for Health*, 12, 56-56.
- Nancarrow, S. A., Booth, A., Ariss, S., Smith, T., Enderby, P., & Roots, A. (2013). Ten principles of good interdisciplinary team work. *Human Resources for Health*, 11, 19-19.
- Needle, R., Burrows, D., Friedman, S., Dorabjee, J., Touzé, G., Badrieva, L., . . . Latkin, C. (2005). Effectiveness of community-based outreach in preventing HIV/AIDS among injecting drug users. *International Journal of Drug Policy*, 16, 45-57.
- Nichols, D. C., Berrios, C., & Samar, H. (2005). Texas' community health workforce: from state health promotion policy to community-level practice. *Preventing chronic disease*, 2 Spec no(Spec No), A13.
- Nkonki, L., Tugendhaft, A., & Hofman, K. (2017). A systematic review of economic evaluations of CHW interventions aimed at improving child health outcomes. *Human Resources for Health*, 15(1), 19-5.
- Norris, S. L., Chowdhury, F. M., Van Le, K., Horsley, T., Brownstein, J. N., Zhang, X., . . . Satterfield, D. W. (2006). Effectiveness of community health workers in the care of persons with diabetes. *Diabetic Medicine: A Journal of the British Diabetic Association*, 23(5), 544-556.
- Ortlipp, M. (2008). Keeping and using reflective journals in the qualitative research process. *The Qualitative Report*, 13(4), 695-705.
- Palazuelos, D., Ellis, K., Im, D. D., Peckarsky, M., Schwarz, D., Farmer, D. B., . . . Mitnick, C. D. (2013). 5-SPICE: The application of an original framework for community health worker program design, quality improvement and research agenda setting. *Global Health Action*, 6, 19658.
- Palmas, W., March, D., Darakjy, S., Findley, S. E., Teresi, J., Carrasquillo, O., & Luchsinger, J. A. (2015). Community health worker interventions to improve glycemic control in people with diabetes: A systematic review and meta-analysis. *Journal of General Internal Medicine*, 30(7), 1004-1012.
- Patton, M. Q. (1990). *Qualitative evaluation and research methods*, (2nd ed ed.). Thousand Oaks, CA: Sage Publications, Inc.
- Patient Protection and Affordable Care Act (ACA) of 2010. (2010) Pub. L. No. 111-148, 124 Stat. 119
- Peters, D. H. (2014). The application of systems thinking in health: Why use systems thinking? *Health Research Policy and Systems*, 12, 51.
- Plsek, P. E., & Kilo, C. M. (1999). From resistance to attraction: A different approach to change. *Physician Executive*, 25(6), 40-2, 44.
- Postma, J., Karr, C., & Kieckhefer, G. (2009a). Community health workers and environmental interventions for children with asthma: A systematic review. *The Journal of Asthma: Official Journal of the Association for the Care of Asthma*, 46(6), 564-576.
- Preskill, H., & Catsambass, T.T., (2006). *Reframing Evaluation Through Appreciative Inquiry*. Thousand Oaks, CA: SAGE Publications, Inc.
- Reinschmidt, K. M., Hunter, J. B., Fernández, M. L., Lacy-Martínez, C. R., Guernsey de Zapien, J., & Meister, J. (2006). Understanding the success of promotoras in increasing chronic diseases screening. *Journal of Health Care for the Poor and Underserved*, 17(2), 256-264.

- Rhoades, L., & Eisenberger, R. (2002). Perceived organizational support: A review of the literature. *The Journal of Applied Psychology, 87*(4), 698-714.
- Rifkin, S. B. (1996). Paradigms lost: Toward a new understanding of community participation in health programmes. *Acta Tropica, 61*(2), 79-92.
- Rogers, E. A., Manser, S. T., Cleary, J., Joseph, A. M., Harwood, E. M., & Call, K. T. (2018). Integrating community health workers into medical homes. *Annals of Family Medicine, 16*(1), 14-20.
- Rosenthal, E. L., Brownstein, J. N., Rush, C. H., Hirsch, G. R., Willaert, A. M., Scott, J. R., . . . Fox, D. J. (2010). Community health workers: Part of the solution. *Health Affairs (Project Hope), 29*(7), 1338-1342.
- Rush, C. (2019). *Key informant interview*.
- Saldana, J. (2015). *The coding manual for qualitative researchers* (3rd Ed ed.). Thousand Oaks, CA: SAGE Publications, Inc.
- Sandelowski, M., Voils, C. I., & Knafl, G. (2009). On quantitizing. *Journal of Mixed Methods Research, 3*(3), 208-222.
- Schroeder, K., McCormick, R., Perez, A., & Lipman, T. H. (2018). The role and impact of community health workers in childhood obesity interventions: A systematic review and meta-analysis. *Obesity Reviews, 19*(10), 1371-1384.
- Segel, K. T. (2017). Bureaucracy is keeping health care from getting better. *Harvard Business Review*, Retrieved from <https://hbr.org/2017/10/bureaucracy-is-keeping-health-care-from-getting-better>
- Shortell, S. M. (2013). Bridging the divide between health and health care. *Jama, 309*(11), 1121-1122.
- Shuffler, M. L., Diazgranados, D., Maynard, M. T., & Salas, E. (2018). Developing, sustaining, and maximizing team effectiveness: An integrative, dynamic perspective of team development interventions. *The Academy of Management Annals, 12*(2), 688-724.
- Simons, H. (2009). *Case study research in practice*. Thousand Oaks, CA: SAGE Publications, Inc.
- Singh, P., & Chokshi, D. A. (2013). Community health workers — A local solution to a global problem. *New England Journal of Medicine, 369*(10), 894-896.
- Smith, C. S., Gerrish, W. G., Nash, M., Fisher, A., Brotman, A., Smith, D., . . . Dreffin, M. (2015). Professional equipoise: Getting beyond dominant discourses in an interprofessional team. *Journal of Interprofessional Care, 29*(6), 603-609.
- Smythe, R. (2014, February 24,). Why changing health care is hard. *Forbes*, Retrieved from <https://www.forbes.com/sites/roysmythe/2014/02/24/why-changing-health-care-is-hard/>
- Snyder, J. (2016). *Community health workers: Roles and opportunities in healthcare delivery system reform*. Washington, DC: Department of Health and Human Services.
- Spencer, M. S., Rosland, A., Kieffer, E. C., Sinco, B. R., Valerio, M., Palmisano, G., . . . Heisler, M. (2011). Effectiveness of a community health worker intervention among african american and latino adults with type 2 diabetes: A randomized controlled trial. *American Journal of Public Health, 101*(12), 2253-2260.
- Sprague, L. (2012). Community health workers: A front line for primary care? *National Health Policy Forum*. Retrieved from https://hsrc.himmelfarb.gwu.edu/sphhs_centers_nhpf/267
- Stringer, E. (2013). *Action research* (4th Ed ed.). Thousands Oaks, CA: SAGE Publications, Inc.
- Thakur, R., Hsu, S. H., & Fontenot, G. (2012). Innovation in healthcare: Issues and future trends. *Journal of Business Research. 65*(4): 562-569.
- Tekin, A.K., Kotaman, H. (2013) The epistemological perspective on action research. *Journal of Educational and Social Research. 3*(1): 81-91.
- Timonen, V., Foley, G., & Conlon, C. (2018). Challenges when using grounded theory: A pragmatic introduction to doing GT research. *International Journal of Qualitative Methods. 6*: 67-80.
- UIC CHW Taskforce. (2020). *An inventory of community health workers at the University of Illinois at Chicago*.

- Umble, K. E., Orton, S., Rosen, B., & Ottoson, J. (2006). Evaluating the impact of the management academy for public health: Developing entrepreneurial managers and organizations. *Journal of Public Health Management and Practice: JPHMP*, 12(5), 436-445.
- US Department of Health and Human Services Health Resources and Services Administration (HRSA). (2007). *Community health worker national workforce study: An annotated bibliography*. Retrieved from <https://bhwh.hrsa.gov/sites/default/files/bhwh/nchwa/projections/communityhealthworkforcebibliography.pdf>
- Wagner, E. H. (2000). The role of patient care teams in chronic disease management. *BMJ (Clinical Research Ed.)*, 320(7234), 569-572.
- Wagner, E. H., Austin, B. T., Davis, C., Hindmarsh, M., Schaefer, J., & Bonomi, A. (2001). Improving chronic illness care: Translating evidence into action. *Health Affairs (Project Hope)*, 20(6), 64-78.
- Wagner, E. H., Flinter, M., Hsu, C., Crompton, D., Austin, B. T., Etz, R., . . . Ladden, M. D. (2017). Effective team-based primary care: Observations from innovative practices. *BMC Family Practice*, 18(1), 13-8.
- Wennerstrom, A., Hargrove, L., Minor, S., Kirkland, A. L., & Shelton, S. R. (2015). Integrating community health workers into primary care to support behavioral health service delivery: A pilot study. *The Journal of Ambulatory Care Management*, 38(3), 263-272.
- Wennerstrom, A., Johnson, L., Gibson, K., Batta, S. E., & Springgate, B. F. (2014). Community health workers leading the charge on workforce development: Lessons from new orleans. *Journal of Community Health*, 39(6), 1140-1149.
- Williams, B., & Hummelbrunner, R. (2010). *Systems Concepts in Action: A practitioner's toolkit*. Stanford, CA: Stanford University Press.
- White, E. E., Downey, J., Sathananthan, V., Kanjee, Z., Kenny, A., Waters, A., . . . Kraemer, J. D. (2018). A community health worker intervention to increase childhood disease treatment coverage in rural liberia: A controlled before-and-after evaluation. *American Journal of Public Health*, 108(9), 1252-1259.
- White, M., & Marsh, E. (2006). Content analysis: A flexible methodology. *Library Trends*, 55(1): 22-55.
- Whyte W. (Ed.). (1991). *Participatory action research* (1991). Newbury Park, CA: SAGE Publications, Inc.
- Witmer, A., Seifer, S. D., Finocchio, L., Leslie, J., & O'Neil, E. H. (1995). Community health workers: Integral members of the health care work force. *American Journal of Public Health*, 85(8 Pt 1), 1055-1058.
- World Health Organization (WHO). (2007). Community health workers: What do we know about them? *Evidence and Information for Policy, Department of Human Resources for Health*, Retrieved from https://www-who-int.proxy.cc.uic.edu/hrh/documents/community_health_workers_brief.pdf
- World Health Organization (WHO). (2010). *Framework for action on interprofessional education and collaborative practice* World Health Organization. Retrieved from http://www.who.int.proxy.cc.uic.edu/hrh/resources/framework_action/en/
- Yin, R. K. (2003). *Case study research: Design and methods*. Thousands Oaks, CA: SAGE Publications, Inc.

Bibliography

- Herman, A. (2011). Community health workers and integrated primary health care teams in the 21st century. *Journal of Ambulatory Care Management*, 34(4), 354-361.
- Iliffe, S. (2008). Myths and realities in multidisciplinary team-working. *London Journal of Primary Care*, 1(2), 100-102.
- Kahssay, H. M., Taylor, M. E., Berman, P. A., & Organization, W. H. (1998). *Community health workers: The way forward*. World Health Organization.
- Kangovi, S., Grande, D., Carter, T., Barg, F. K., Rogers, M., Glanz, K., . . . Long, J. A. (2014). The use of participatory action research to design a patient-centered community health worker care transitions intervention. *Healthcare (Amsterdam, Netherlands)*, 2(2), 136-144.
- Kangovi, S., Long, J. A., & Emanuel, E. (2012). Community health workers combat readmission. *Archives of Internal Medicine*, 172(22), 1756-1757.
- Kangovi, S., Mitra, N., Grande, D., Huo, H., Smith, R. A., & Long, J. A. (2017). Community health worker support for disadvantaged patients with multiple chronic diseases: A randomized clinical trial. *American Journal of Public Health*, 107(10), 1660-1667.
- Kash, B. A., May, M. L., & Tai-Seale, M. (2007). Community health worker training and certification programs in the united states: Findings from a national survey. *Health Policy (Amsterdam, Netherlands)*, 80(1), 32-42.
- Matiz, L. A., Peretz, P. J., Jacotin, P. G., Cruz, C., Ramirez-Diaz, E., & Nieto, A. R. (2014). The impact of integrating community health workers into the patient-centered medical home. *Journal of Primary Care & Community Health*, 5(4), 271-274.
- Morgan, A. U., Grande, D. T., Carter, T., Long, J. A., & Kangovi, S. (2016). Penn center for community health workers: Step-by-step approach to sustain an evidence-based community health worker intervention at an academic medical center. *American Journal of Public Health*, 106(11), 1958-1960.
- Perry, H. B., Zulliger, R., & Rogers, M. M. (2014). Community health workers in low-, middle-, and high-income countries: An overview of their history, recent evolution, and current effectiveness. *Annual Review of Public Health*, 35, 399-421.
- Phalen, J., & Paradis, R. (2015). How community health workers can reinvent health care delivery in the US. *Health Affairs Blog*. Retrieved from <https://www.healthaffairs.org/doi/10.1377/hblog20150116.043851/full/>
- Rowland, P. (2013). Core principles and values of effective team-based health care. *Journal of Interprofessional Care*, 28(1), 79-81.
- Sabo, S., Wennerstrom, A., Phillips, D., Haywood, C., Redondo, F., Bell, M. L., & Ingram, M. (2015). Community health worker professional advocacy: Voices of action from the 2014 national community health worker advocacy survey. *The Journal of Ambulatory Care Management*, 38(3), 225-235.
- Senge, P., Hamilton, H., & Kania, J. (2015). The dawn of system leadership. *Stanford Social Innovation Review*, 13(1), 26-33.
- Whiteman, L. N., Gibbons, M. C., Smith, W. R., & Stewart, R. (2016). Top 10 things you need to know to run community health worker programs: Lessons learned in the field. *Southern Medical Journal*, 109(9), 579-582.

Appendices

- 1 Measurement Table 1: A priori construct definition and conceptualization
- 2 Measurement Table 2: Data collection and analysis plan
- 3 DESCARTE reflection exercise
- 4 Semi-structured interview guides for CHWs, and Clinicians/Administrators (IRB approved)
- 5 Document review matrix (screen shots from excel)
- 6 Consent document (IRB approved)
- 7 Codebook
- 8 Member checking survey (IRB approved)
- 9 Proof of manuscript submission
- 10 Stakeholder report

Appendix 1: Measurement Table 1: Construct Definition and Conceptualization

Measurement Table I				
Research Question 1: How are CHWs currently being used within health care teams at the University of Illinois Hospital and Health Sciences System (UI Health)? Sub-question 1a: In what ways are CHWs involved in providing care as part of a care team? Sub-question 1b: In what ways are CHWs involved in providing care in the community? How is this community defined? Sub-question 1c: In what ways does the organization support the CHW workforce?				
Construct	Definition (citation)	Subconstruct (Keyword/Terms)	Subconstruct Definition (citation)	Measures (see "Measurement Table II" for more detail)
Care Team Structure	<p>Is defined as a group of individuals who may represent different discipline/professions (such as physicians, psychiatrists, nurses, CHWs, social workers, etc) who are working together to provide coordinated and/or integrated care and services to an individual patient with the goal of improving health outcomes.</p> <p>Sometimes also referred to as a multidisciplinary care team or interdisciplinary care team. (Firth-Cozens 2001, Nancarrow 2013, Chamberlain-Salaun 2013)</p> <p>The subconstructs of culture, communication, physical space, training, supervision, and structure/process emerged as important elements of an effective care team in my literature review and are summarized in my conceptual model.</p>	Culture	A description of how members of the care team define or describe their organizational culture. This may involve a description of the presence or absence of a hierarchy, trust, respect, and/or cohesion.	Data regarding the care team structure will be collected from (1) CHW Interviews, (2) Administrator Interviews, and (3) the Document Review Matrix.
		Communication	A description of how members of the care team communicate with each other including the use of technology (such as EMRs) for communication as well as the structure of communication (huddles, meetings, etc).	
		Physical Space	A description of the physical space in which the care team works and how individuals use this physical space to perform job responsibilities.	
		Training	A description of if/how staff are trained regarding CHWs. This includes how CHWs are trained and how others in the care team are trained in working with CHWs. This may also include a discussion regarding the presence or absence of a Community of Learning.	
		Supervision	The process whereby supervision is provided to CHWs. This includes who is their "direct supervisor" in HR terms as well as who gives the CHW tasks for which they are responsible, feedback, coaching or training.	
		Structure and Process	The process whereby a care team works together. This includes policies and procedures, protocols, workflows and record keeping.	
Roles and Responsibilities	<p>A description of the roles performed by CHWs. This may include formal job descriptions or informal descriptions of the tasks and/or responsibilities of CHWs. This can be conceptualized by some as the "contribution" made by CHWs.</p> <p>A recent literature review published by Hartzler et al found that CHW roles in clinical settings could be</p>	Clear definition	The extent to which a CHW's role is clearly defined and articulated. This may include whether or not different members of the care team share a common definition regarding a CHW's role.	Data regarding the roles and responsibilities will be collected from (1) CHW Interviews, (2) Administrator Interviews, and (3) the Document Review Matrix.
		Clinical services	"Examples include assessment of vital signs, lifestyle, health knowledge, psychosocial factors, and care through routine exams aided by remote communication with physicians. These services provide for patient dialog, helping care teams understand patients' health, background, and preferences." (Hartzler 2018)	

	<p>categorized into three primary categories: (1) clinical services, (2) community resource connections, and (3) health education and coaching. (Hartzler 2018)</p> <p>But the IMPaCT model notably adds an additional critical CHW role—creative social support—which is not always included in all CHW models. (Kangovi 2018)</p>	Community resource connections	“Community resource connections link patients with community-based services, such as referrals for transportation or food assistance” (Hartzler 2018)	
		Health Education and Coaching	“Health coaching generally involved motivational interviewing and action planning to help patients achieve health goals. Health education typically targeted specific issues, such as cancer screening or self-management of a chronic illness.” (Hartzler 2018)	
		Social Support	The ability to tailor interventions to patients needs which may have little to do with medical care. This may involve leveraging family, community or grass-roots resources. It also may include the engagement of CHWs with the patient in the process of intervention or service delivery. (Kangovi 2018)	
Community Connection	<p>For the purposes of this research, community is defined as a specific group of people or geographic region that has been targeted for CHW services either due to a pressing health need or organizational priority. It is the “community” to which the CHW is assigned to serve. Drawing on the IMPaCT Model developed by researchers at University of Pennsylvania, it is assumed that CHWs share some characteristics with the population that they serve (race, disease, language, geographic residence). (Kangovi 2018)</p> <p>Notably issues of trust, power, and access emerged as important factors related to the community in interviews conducted for my environmental scan.</p>	Trust	The presence or absence of trust between the community served and others in the system including the hospital system, the healthcare provider, or the CHW themselves.	Data regarding how CHWs engage with the community and subconstructs of trust, access and power will be collected using CHW Interviews.
		Power	The presence or absence of power (or the perception of power) among the community serviced by CHWs. This may be related to healthcare services, CHW services, or other programs or services provided by the health system.	
		Access	The ways in which a CHW accesses the community that it serves. This may include transportation facilitator and barriers. Or it may include structural or systematic factors with accessing or working with the target community.	
Organizational Context	<p>A description of the organizational context or environment at UI Health (or a specific department within the UI Health System) that impacts or influences CHWs or CHW programs.</p> <p>This may involve organizational systems related to employment, record keeping, or care delivery such as HR systems, electronic record systems, or employee benefits systems. These organizational systems may be connected to the ability for the organization to respond quickly or remain agile in a changing environment.</p> <p>Also important is the extent to which an environment is created that enables a specific department, program, or group of individual employees to exist and function. This may include discussions of perceived support from the</p>	Human Resource (HR) Systems	The systems involved in hiring, compensating, promoting and terminating individuals employed by the organization. This may include job titles, salary and/or promotion requirements, employee requirements or other aspects regulated by the HR system.	Data regarding organizational context (UI Health System) will be collected using CHW and Administrator Interviews.
		Electronic Record Systems	The systems involved in recording health information for the purposes of documenting and coordinating disease and treatment information across providers in a health system. This also includes the ability to collect and access data for the purpose of care delivery.	
		Benefits Systems	The systems in place to provide supports and benefits to employees within a system. This may include health, transportation, or education benefits that are offered to employees of the system.	
		Perceived Organizational Support (POS)	The extent to which an employee believes that their organization values their contributions and cares about their well-being. Based on Eisenberger and Rhoades’ organizational support theory, POS is thought to be associated with a positive reciprocity dynamic	

	organization--conceptualized as organizational support, leadership support, or financial support. It may also be influenced by the extent to which CHW programs align with the organization's goals and purpose.		between employees and their workplace—in which employees perform better if they perceive a positive POS. Three common factors contributing to POS include: fairness, supervisor support, and organizational rewards and job condition. POS is closely related to job satisfaction. (Eisenberger 2002)	
		Leadership Support	The extent to which leadership within the organization is viewed to support CHW programs or the use of CHWs in the provision of clinical care. This may include the presence or absence of a “champion” or an individual who is passionate about promoting and advocating for the use of CHWs.	
		Financial Support	A description of the ways in which a CHW or CHW program is supported financially. This may include a description of grants, donations, reimbursements, or other funding mechanisms.	
		Goals/Purpose	A description of the perceived or stated goals of the organization. This may also include consideration regarding the extent to which these goals are shared across individuals within the team or organization and whether the use of CHWs aligns with these goals.	
		Agility	The extent to which agility is present within the organization or team. Agility relates to the ability for an organization to quickly change or respond to its changing environment (Goldman 1995). It's sometimes defined as a combination of (1) nimbleness, (2) flexibility, and (3) speed.	

Measurement Table

Research Question 2: How do different members of the care team perceive a CHW's purpose and value on the team?

Sub-question 2a: How is a CHW's purpose and value defined within the team? Has this definition changed over time?

Sub-question 2b: How is a CHW's contribution measured and evaluated?

Sub-question 2c: To what extent are CHWs able to meet expectations among members of the team?

Construct	Definition (citation)	Subconstruct (Keyword/Terms)	Subconstruct Definition (citation)	Measures (see “Measurement Table II” for more detail)
Care Philosophy	The philosophical rationale for how CHWs and patients should view health and healthcare influences how CHWs are viewed within the healthcare system. Thus, understanding this	Top down	The top down or “Target-oriented frame has its roots in the biomedical model and Western scientific tradition and is mainly about leveraging CHWs to convince community members to accept medical advice.” (Rifkin 1996)	Data regarding care philosophy of care teams will be collected

	<p>underlying philosophy is important for understanding how CHWs are perceived and utilized.</p> <p>Rifkin et al (1996) offered two different frames for healthcare delivery which include top down or a “target oriented” frame and bottom up or an “empowerment” frame.</p>	Bottom up	The bottom up or “empowerment frame, influenced by Marxist philosophy and post-war anti-colonial sentiment, is about community members having power over health and resource distribution, rather than being dominated by elite groups, such as doctors. (Rifkin 1996)	using CHW Interview instrument.
Purpose	<p>The stated purpose for hiring/employing a specific group of CHWs. The purpose may be different among different members of the program or clinical care team.</p> <p>Some view CHWs as a strategy to address what has been identified as the “Triple Aim” in healthcare—improved patient experience, health of populations, and reduced cost. (Berwick, 2008) While others view CHW services through a health equity lens.</p>	Health Equity	Health equity is defined by the WHO as “the absence of avoidable, unfair, or remediable differences among groups of people, whether those groups are defined socially, economically, demographically or geographically or by other means of stratification.” (who.int)	Data regarding the purpose of employing CHWs will be collected using CHW and Administrator Interviews and document review.
		Reduced Cost	Defined by the IHI as “reducing the per capita costs of care for populations” refers to the goal of achieving a measurable decrease in the cost of the provision of health care to target individuals or populations. But reduced costs may also refer to reduced costs for organizations, groups or individuals within the health system (such as a hospital system).	
		Health Outcomes	Defined by the IHI as “improving the health of populations,” health outcomes refer to a measurable reduction in disease morbidity and/or mortality for groups or populations of people.	
		Patient Experience	Defined by the IHI as “improving the individual experience of care” patient experience refers to how patients feel about their health care experience including people, places and processes.	
Value	How individuals define a CHW’s specific unique skills or qualities. The IMPaCT program at Penn defines CHW’s unique value as (1) they represent the populations that are being served, and (2) that they are “natural helpers.” (Kanvovi 2018)	Community Representatives	The extent to which CHWs share similar characteristics—such as race, ethnicity, language, country of origin, income, education and/or community of residence with the populations that they are serving.	Data regarding the Value that CHWs provide will be collected using CHW and Administrator Interviews and document review.
		Natural Helpers	The extent to which CHWs meet the definition of a “natural helper. A natural helper is defined as individual who is “innately empathetic and altruistic.” This may be demonstrated through listening skills, emotional intelligence, or a history of helping and caring for others.	
Perceptions	The perceptions among CHWs and Administrators about the purpose and value of CHWs may differ. It is therefore	CHW Perceptions	A consideration of how CHWs view their own role as part of their healthcare team including their primary purpose(s) and how they contribute to the larger healthcare team.	Data regarding perceptions about CHWs (among

	important to understand the perspectives of these different groups as well as differences within groups.	Administrator Perceptions	A consideration of how administrators view a CHW's roles as part of the healthcare team including the CHW's primary purpose(s) and how they contribute to the larger healthcare team.	different members of the care team) will be collected using CHW and Administrator Interviews.
Measurement	The metrics used to measure or evaluate CHW performance or effectiveness. This may include quantitative or qualitative metrics. It also may include metrics related to patient outcomes or improvements to systems or workflows. The Institute for Clinical and Economic Review (2013) released a guidance paper regarding measurement of CHW outcomes. The following categories of measurement were included: process, knowledge/behavior change, satisfaction, health outcomes, or costs. (ICER 2013)	Process Measures	A consideration of the CHW process. This may include adherence to specific targets (number served, number of visits) or it may include assessments of improvements to processes, workflows or patient access.	Data regarding how CHW performance is measured will be collected using CHW and Administrator Interviews and document review.
		Behavior Change	The extent to which an individual patient changes a behavior that has been linked to improved health outcomes. For example, smoking cessation, change in salt intake, or change in prescription adherence.	
		Satisfaction	A consideration of how satisfied individuals are with CHW services. This may include assessments of patient satisfaction or it may include satisfaction among other care providers due to improvements in work flow or patient care.	
		Health Measures	The use of health metrics that measure an individual patient's health status. This may include measures of disease control (such as CD4 or A1C), health status (blood pressure, cholesterol), or health management (hospitalizations, ER visits)	
		Costs/ROI	The use of metrics to measure the costs associated with healthcare services. This may include an assessment of Return on Investment (ROI) or a consideration of insurance incentive payments.	

Measurement Table				
Research Question 3: In what ways are CHWs integrated into their work environment? Sub-question 3a: In what ways are CHWs integrated into the care team? Sub-question 3b: In what ways are CHWs integrated into the organization and/or health system? Sub-question 3c: In what ways are CHWs integrated into the communities in which they work?				
Construct	Definition	Subconstruct (Keyword/Terms)	Subconstruct Definition	Measures (see "Measurement Table II" for more detail)
Integration	Integration is defined by the Human Factors Engineering discipline as the seamless merging of different disciplines—possibly with different goals, needs and/or cultures—into a	Integration Continuum	The CIHS Model describes the Integration Continuum as one that begins with coordination, progresses to co-location, and culminates in integration. (Heath 2013)	Data regarding the extent to which integration is present

	<p>cohesive unit that leverages individual strengths to work together and achieve a shared goal. (Baiden 2015, Kozlowski 2006, Shuffler 2018)</p> <p>In healthcare, SAMHSA-HRSA created the CIHS Standard Framework for levels of integrated healthcare. This framework describes the process of integrating healthcare and behavioral health services as a continuum that can be mapped to specific deliverables (Heath 2013)</p>	Integration Perspective	Perspective among CHWs and Administrators or other members of the clinical team regarding the extent to which integration is present. This relates closely with the constructs of “care team,” “community,” “organization,” and “support.”	will be collected using CHW and Administrator Interviews and document review.
		Complementary	Complementary refers to enhancing or emphasizing the qualities of another person or thing. According to theory based in practice, the extent to which CHWs and clinical care can serve complementary roles is a critical component of integration.	

Measurement Table

Research Question 4: What individual, team and organizational-level factors are critical for effective integration of CHWs within the existing system?

Sub-question 4a: What gaps serve to limit CHW integration?

Sub-question 4b: What opportunities help support CHW integration?

Sub-question 4c: What would effective integration of CHWs look like?

Construct	Definition	Subconstruct (Keyword/Terms)	Subconstruct Definition	Measures (see “Measurement Table II” for more detail)
Gaps	Those factors that may serve to limit or restrict the ability of a CHW to meet their objectives. This may include a discussion of constructs/subconstructs already discussed, or other gaps not already identified.	Team-level factors	Those barriers associated with a specific care team (see “care team” construct).	Data regarding gaps and opportunities will be collected using CHW and Administrator Interviews. These will be identified and tested through a member checking and action research process.
		System/Organizational-level factors	Those barriers associated with the organization/system (see “organization” construct)	
Opportunities	Those factors that may serve to enhance or support the ability of a CHW to meet their objectives. This may include a discussion of constructs/subconstructs already discussed, or other opportunities not already identified.	Team-level factors	Those opportunities associated with a specific care team (see “care team” construct).	
		System/Organizational-level factors	Those opportunities associated with the organization/system (see “organization” construct)	

Appendix 2: Measurement Table 2: Data Collection and Analysis

Measurement Table II				
Research Question 1: How are CHWs currently being used within health care teams at the University of Illinois Hospital and Health Sciences System (UI Health)?				
Sub-Question 1a: In what ways are CHWs involved in providing care as part of a care team?				
Hypothesis 1.1: The presence or absence of elements of an effective care team will affect the extent to which CHWs are integrated into the team				
Construct	Sub-Construct	Measure	Data Source	Analysis Plan
Care Team Structure	Culture	Data will be collected via the following mechanisms: <ul style="list-style-type: none">Semi-Structured interviews with multiple members of the care teamProgram-level document review	CHW Instrument Q6a Admin Instrument Q5a Org Mission/Vision Docs	CHW and Administrator Survey Instruments will be used to conduct one-on-one in-person interviews. Interviews will be recorded, transcribed, and coded using MAXQDA software. Corresponding questions will be coded in regard to care team structure and roles/responsibilities. The following documents will be targeted for review: <ul style="list-style-type: none">Documents describing the organizations mission/visionDocuments used for communication with CHWsDocuments/manuals used for training purposesDocuments/manuals used for supervision purposesProtocol/Workflow documentsCHW Job Descriptions Documents will be summarized in a document review matrix and coded using MAXQDA. For each sub-unit, document review and interview memos will be integrated to prepare a case report. Case reports will be shared with the relevant program through a member-checking process to validate findings. Findings will then be synthesized across sub-units.
	Communication		CHW Instrument Q6b Admin Instrument Q5b Communication Docs	
	Physical Space		CHW Instrument Q6c Admin Instrument Q5c	
	Training	Between 5-7 CHW programs will be targeted for data collection. 3-5 semi-structured interviews will be completed within each program/sub-unit (1-2 clinicians, 1 supervisor, and 1-3 CHWs) using the appropriate interview instrument.	CHW Instrument Q3 Admin Instrument Q5e Training Docs	
	Supervision		CHW Instrument Q4 Admin Instrument Q2,3,5f Supervision Docs	
	Structure and Process		CHW Instrument Q5,6d Admin Instrument Q4, 5d Protocols, Workflow Docs	
Roles & Responsibilities	Clear definition		CHW Instrument Q1a-e Admin Instrument Q#17-18 CHW Job Descriptions	
	Clinical Services			
	Community Resource Connections			
	Health Education and Coaching			
	Social Support			
Sub-Question 1b: In what ways are CHWs involved in providing in the community?				
Hypothesis 1.2: CHWs must balance their work between the clinic and the community				
Construct	Sub-Construct	Measure	Data Source	Analysis Plan
Community Connection	Trust	Data will be collected via the following mechanisms:	CHW Instrument Q13-17	The CHW Survey Instrument will be used to conduct one-on-one in-person interviews. Interviews will be recorded,
	Power			

	Access	<ul style="list-style-type: none"> Semi-Structured interviews with multiple members of the care team <p>Between 5-7 CHW programs will be targeted for data collection. 3-5 semi-structured interviews will be completed within each program/sub-unit (1-2 clinicians, 1 supervisor, and 1-3 CHWs) using the appropriate interview instrument.</p>		<p>transcribed, and coded using MAXQDA software. Corresponding questions will be coded in regard to community connection sub-constructs.</p> <p>For each sub-unit, a case report will be written and shared with the program through a member-checking process. Findings will be synthesized across sub-units.</p>
--	--------	--	--	--

Sub-Question 1c: In what ways do organizational systems support the CHW workforce?

Hypothesis 1.3: Elements of the organizational context including systems, supports, and alignment are associated with CHW integration.

Construct	Sub-Construct	Measure	Data Source	Analysis Plan
Organizational Context	Human Resource (HR) Systems	Data will be collected via the following mechanisms: <ul style="list-style-type: none"> Semi-Structured interviews with multiple members of the care team 	CHW Instrument Q10,12 Admin Instrument Q9,10	The CHW and Admin Survey Instruments will be used to conduct one-on-one in-person interviews. Interviews will be recorded, transcribed, and coded using MAXQDA software. Corresponding questions will be coded in regard to organizational context subconstructs.
	Electronic Record Systems		CHW Instrument Q11	
	Benefits Systems	Between 5-7 CHW programs will be targeted for data collection. 3-5 semi-structured interviews will be completed within each program/sub-unit (1-2 clinicians, 1 supervisor, and 1-3 CHWs) using the appropriate interview instrument.	Admin Instrument Q14	For each sub-unit, a case report will be written and shared with the program through a member-checking process. Findings will be synthesized across sub-units.
	Perceived Organizational Support		Admin Instrument Q13	
	Leadership Support		Admin Instrument Q15	
	Financial Support		Admin Instrument Q11	
	Goals/Purpose			
	Agility			

Research Question 2: How do different members of the care team perceive a CHW's purpose and value on the team?

Sub-Question 2a: How is a CHW's purpose and value defined within the team? Has this definition changed over time?

Hypothesis 2.1: Clear and aligned awareness of a CHW's purpose and value is necessary for positive perceptions CHWs

Construct	Sub-Construct	Measure	Data Source	Analysis Plan
Care Philosophy	Top Down			

	Bottom up	Data will be collected via the following mechanisms: <ul style="list-style-type: none">• Semi-Structured interviews with multiple members of the care team• Program-level document review	CHW Instrument Q6a, Q13, Q20, Q21	The CHW and Admin Survey Instruments will be used to conduct one-on-one in-person interviews. Interviews will be recorded, transcribed, and coded using MAXQDA software. Corresponding questions will be coded in regard to organizational context subconstructs. For each sub-unit, a case report will be written and shared with the program through a member-checking process. Findings will be synthesized across sub-units.
Purpose	Health Equity	Between 5-7 CHW programs will be targeted for data collection. 3-5 semi-structured interviews will be completed within each program/sub-unit (1-2 clinicians, 1 supervisor, and 1-3 CHWs) using the appropriate interview instrument.	CHW Instrument Q2 Admin Instrument Q16, Q21 Goals/Objectives	CHW and Administrator Survey Instruments will be used to conduct one-on-one in-person interviews. Interviews will be recorded, transcribed, and coded using MAXQDA software. Corresponding questions will be coded in regard to care team structure and roles/responsibilities. The following documents will be targeted for review: <ul style="list-style-type: none">• Documents describing goals/objectives, mission, vision Documents will be summarized in a document review matrix and coded using MAXQDA. For each sub-unit, document review and interview memos will be integrated to prepare a case report. Case reports will be shared with the relevant program through a member-checking process to validate findings. Findings will then be synthesized across sub-units.
	Reduced Cost			
	Health Outcomes			
	Patient Experience			
Value	Community Representatives		CHW Instrument Q18-21 Admin Instrument Q19-20	The CHW and Admin Survey Instruments will be used to conduct one-on-one in-person interviews. Interviews will be recorded, transcribed, and coded using MAXQDA software. Corresponding questions will be coded in regard to organizational context subconstructs. For each sub-unit, a case report will be written and shared with the program through a member-checking process. Findings will be synthesized across sub-units.
	Natural Helpers			
Sub-Question 2b: How is a CHW’s contribution measured and evaluated?				
Hypothesis 2.2: The way(s) in which a CHW/CHW performance is measures is associated with perceptions of CHWs.				
Construct	Sub-Construct	Measure	Data Source	Analysis Plan
Measurement	Process Measures	Data will be collected via the following mechanisms:	CHW Instrument Q22-23 Admin Instrument Q22	CHW and Administrator Survey Instruments will be used to conduct one-on-one in-person interviews. Interviews will be
	Behavior Change			

	Satisfaction	<ul style="list-style-type: none"> Semi-Structured interviews with multiple members of the care team Program-level document review 	Evaluation Reports	<p>recorded, transcribed, and coded using MAXQDA software. Corresponding questions will be coded in regard to care team structure and roles/responsibilities. The following documents will be targeted for review:</p> <ul style="list-style-type: none"> Evaluation Reports <p>Documents will be summarized in a document review matrix and coded using MAXQDA. For each sub-unit, document review and interview memos will be integrated to prepare a case report. Case reports will be shared with the relevant program through a member-checking process to validate findings. Findings will then be synthesized across sub-units.</p>
	Health Measures			
	Costs/ROI	Between 5-7 CHW programs will be targeted for data collection. 3-5 semi-structured interviews will be completed within each program/sub-unit (1-2 clinicians, 1 supervisor, and 1-3 CHWs) using the appropriate interview instrument.		

Sub-Question 2c: To what extent are CHWs able to meet expectations among members of the team?

Hypothesis 2.3: If CHWs are perceived to add value to the health system, they will be more integrated into the care team.

Construct	Sub-Construct	Measure	Data Source	Analysis Plan
Perceptions	CHW Perceptions	<p>Data will be collected via the following mechanisms:</p> <ul style="list-style-type: none"> Semi-Structured interviews with multiple members of the care team <p>Between 5-7 CHW programs will be targeted for data collection. 3-5 semi-structured interviews will be completed within each program/sub-unit (1-2 clinicians, 1 supervisor, and 1-3 CHWs) using the appropriate interview instrument.</p>	CHW Instrument Q7, Q12, Q24-26 Admin Instrument Q6, Q10, Q23	<p>The CHW and Admin Survey Instruments will be used to conduct one-on-one in-person interviews. Interviews will be recorded, transcribed, and coded using MAXQDA software. Corresponding questions will be coded in regard to organizational context subconstructs.</p> <p>For each sub-unit, a case report will be written and shared with the program through a member-checking process. Findings will be synthesized across sub-units.</p>
	Administrator Perceptions			

Research Question 3: In what ways are CHWs integrated into their work environment?

Sub-Question 3a: In what ways are CHWs integrated into the care team

Hypothesis 3.1: The extent to which CHWs are integrated into the care team is dependent on care team subconstructs

Construct	Sub-Construct	Measure	Data Source	Analysis Plan
-----------	---------------	---------	-------------	---------------

Integration	Integration Continuum	Data will be collected via the following mechanisms: <ul style="list-style-type: none">Semi-Structured interviews with multiple members of the care team Between 5-7 CHW programs will be targeted for data collection. 3-5 semi-structured interviews will be completed within each program/sub-unit (1-2 clinicians, 1 supervisor, and 1-3 CHWs) using the appropriate interview instrument.	CHW Instrument Q7, Q12 Admin Instrument Q6, Q10	The CHW and Admin Survey Instruments will be used to conduct one-on-one in-person interviews. Interviews will be recorded, transcribed, and coded using MAXQDA software. Corresponding questions will be coded in regard to organizational context subconstructs. Specific memos will be used to compare levels of integration with care team structure constructs. For each sub-unit, a case report will be written and shared with the program through a member-checking process. Findings will be synthesized across sub-units.
	Integration Perspective			
	Complementary			
See also, “Care Team Structure” Construct and Sub-Construct				
Sub-Question 3b: In what ways are CHWs integrated into organization and/or health system?				
Hypothesis 3.2: The extent to which CHWs are integrated into the organization are dependent on organizational context subconstructs				
Construct	Sub-Construct	Measure	Data Source	Analysis Plan
See “Integration” and “Organizational Context” Construct and Sub-Constructs				The CHW and Admin Survey Instruments will be used to conduct one-on-one in-person interviews. Interviews will be recorded, transcribed, and coded using MAXQDA software. Corresponding questions will be coded in regard to organizational context subconstructs. Specific memos will be used to compare levels of integration with organizational context constructs. For each sub-unit, a case report will be written and shared with the program through a member-checking process. Findings will be synthesized across sub-units.
Sub-Question 3c: In what ways are CHWs integrated into the communities in which they work?				
Hypothesis 3.3: The extent to which CHWs are integrated into the community is dependent on community subconstructs				
Construct	Sub-Construct	Measure	Data Source	Analysis Plan
See “Integration” and “Community” Construct and Sub-Constructs				The CHW and Admin Survey Instruments will be used to conduct one-on-one in-person interviews. Interviews will be recorded, transcribed, and coded using MAXQDA software. Corresponding questions will be coded in

	regard to organizational context subconstructs. Specific memos will be used to compare levels of integration with community constructs. For each sub-unit, a case report will be written and shared with the program through a member-checking process. Findings will be synthesized across sub-units.
--	--

Research Question 4: What individual, organizational and systems-level factors are critical for effective integration of CHWs within the existing system?

Sub-Question 4a: What gaps serve to limit CHW integration?

Hypothesis 4.1: It is possible to identify those factors that limit CHW integration.

Hypothesis #2: It is possible to identify those factors that limit CHW integration.				
Construct	Sub-Construct	Measure	Data Source	Analysis Plan
Gaps	Team-level Factors	CHW and Admin Interview Instrument (see above)	CHW Instrument Q9, Q26-27 Admin Instrument Q24	The CHW and Admin Survey Instruments will be used to conduct one-on-one in-person interviews. Interviews will be recorded, transcribed, and coded using MAXQDA software. Corresponding questions will be coded in regard to organizational context subconstructs. Specific memos will be used to evaluate other constructs for gaps. For each sub-unit, a case report will be written and shared with the program through a member-checking process. Findings will be synthesized across sub-units.
	Organizational-level Factors			
See also, other Constructs and Sub-Constructs in the model				

Sub-Question 4b: What opportunities help support CHW Integration?

Hypothesis 4.2: It is possible to identify those factors that promote CHW integration

Hypothesis 4.2: It is possible to identify those factors that promote CHW integration				
Construct	Sub-Construct	Measure	Data Source	Analysis Plan
Opportunities	Team-Level Factors	CHW and Admin Interview Instrument (see above)	CHW Instrument Q8, Q25, Q28-31 Admin Instrument Q25-28	The CHW and Admin Survey Instruments will be used to conduct one-on-one in-person interviews. Interviews will be recorded, transcribed, and coded using MAXQDA software. Corresponding questions will be coded in regard to organizational context subconstructs. Specific memos will be used to evaluate constructs for opportunities. For each sub-unit, a case report will be written and shared with the program through a member-checking process. Findings will be synthesized across sub-units.
	Organizational-Level Factors			
See also, other Constructs and Sub-Constructs in the model				

Sub-Question 4c: What would effective integration look like?

Hypothesis 3.3: It is possible to use gaps and opportunities to develop recommendations for improved CHW integration.

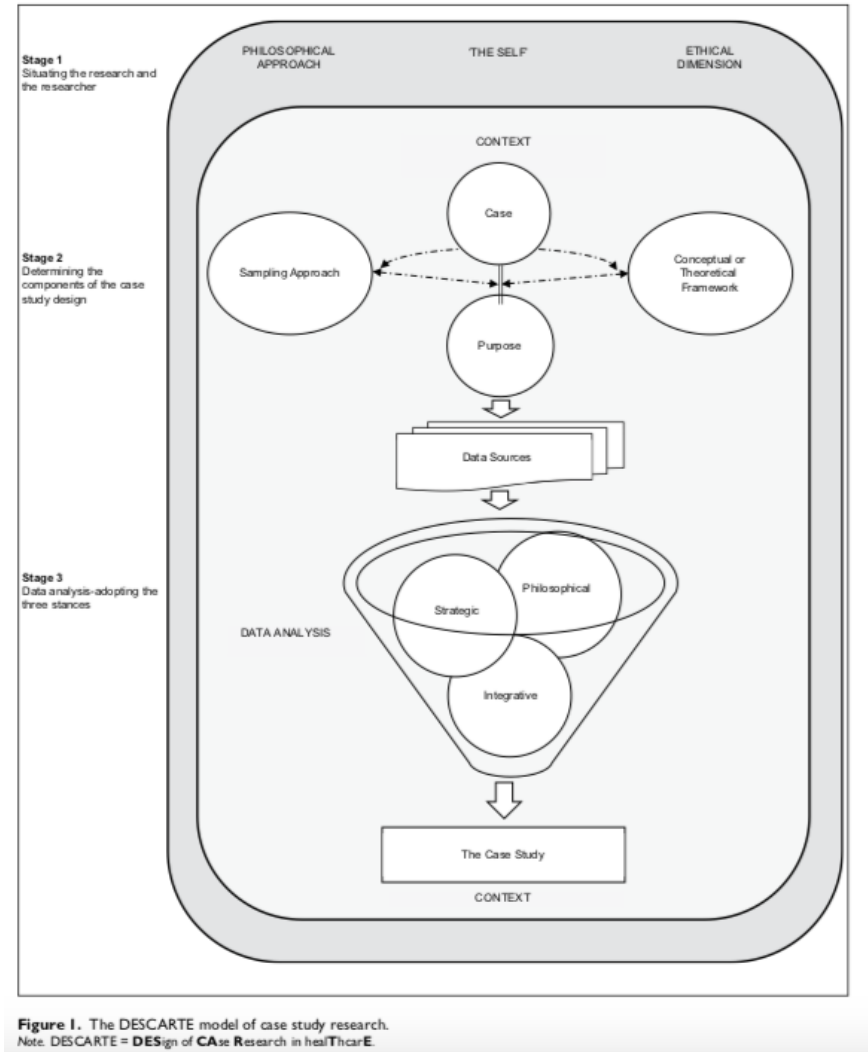
Construct	Sub-Construct	Measure	Data Source	Analysis Plan
-----------	---------------	---------	-------------	---------------

See other Constructs and Sub-Constructs in the model

The CHW and Admin Survey Instruments will be used to conduct one-on-one in-person interviews. Interviews will be recorded, transcribed, and coded using MAXQDA software. Corresponding questions will be coded in regard to organizational context subconstructs. Memos will be used to elaborate upon gaps and opportunities and propose specific recommendations to build upon these findings. For each sub-unit, a case report will be written which includes recommendations and shared with the program through a member-checking process which will serve to receive feedback on specific recommendations. This process will also be performed with the Stakeholder Group. Findings will be synthesized across sub-units to summarize organization-wide recommendations.

Appendix 3: DESCARTE Reflection Exercise

Figure: DESCARTE Model (Carolan, 2016)



Stages of the DESCARTE Model	Guiding Questions for Researchers
Situating the research and the researcher	1. What is my philosophical approach? 2. How do I situate my “self” in this research? 3. What are the ethical dimensions of this research?
Determining the components of the case study design	4. How is the case defined? 5. How is context defined? 6. What is the purpose of the case study? 7. What is the conceptual/theoretical framework for the case study? 8. What is my sampling approach? 9. What is the rationale for my choice of data sources?
Data analysis—Adopting the three stances	10. Is data analysis congruent with the philosophical approach? 11. Is my analysis adopting a case-based or a variable analysis-based approach? 12. How and why is data integrated during data analysis and interpretation?

Note. DESCARTE = **DES**ign of **CA**se **R**esearch in **healTh**car**E**.

Reflective Questions (Carolan 2016)	Personal Responses
What is my philosophical approach?	Generally, I believe that I fall within the pragmatic philosophical approach. I believe that there are many different ways of interpreting the world and conducting research, and that depending on your viewpoint you may “see” different things. In recognizing

	that there are different realities, I must also recognize that there is value in viewing a situation from multiple perspectives or viewpoints. I am therefore open to incorporating both positivist and interpretivist perspectives. But I also recognize that, given the questions I am interested in exploring the contextual factors associated with a phenomenon. This perspective therefore lends itself more closely with an interpretivist paradigm. I have therefore defined myself as a “pragmatic interpretivist” in that, while fundamentally pragmatic, I am positioned closer to the interpretivist end of the spectrum.
<i>How do I situate my “self” in this research?</i>	It is important to consider how I’m positioned as an emic (insider) and etic (outsider) viewpoint. In some ways, I view myself as an outsider. I am not personally involved in the implementation of CHW programming and I do not directly work with any of the cases that I am interested in exploring. But I am also employed by and a student at UIC—one of the potential hospital systems within my research. Moreover, I work within the embedded system in which I am studying. This positioning has potential benefits and drawbacks. As one who works within the embedded system, I am familiar with the contextual factors influencing my system and may be able to understand these factors better. But conversely, I may be introducing my own personal perspectives and values into my research. Moreover, given my positioning within the system, my access to and perspectives on the UI Health system may be influenced by my own personal experiences. I therefore feel that I should do my best to pay attention to these different roles as my “situational self” and take an etic perspective in my research in order to ensure the reliability of my analysis across cases. It also will be valuable to include a reflection process—through reflective memos—about my positioning within the research and if my perspective on my positioning within the research changes during the process. This will also affect how I present my research and whether findings are presented objectively or with my own personal voice embedded within my research. Again, in reflecting upon this question, I am drawn toward a more objective perspective.
<i>How is the case defined?</i>	In my context, my case is the UI Health and Hospital System. My embedded subunit of analysis are clinical care teams within these Health and Hospital Systems that are using CHWs as part of clinical care teams to assist with the provision of clinical care to patients.
<i>How is the context defined?</i>	For my research, my case definition provides a boundary for my context. Because there is currently so much uncoordinated experimentation around the use of CHWs in the healthcare setting, we do not yet have a clear picture of the existing landscape nor do we have a framework for what successful programs exist. Because UI Health contains a large concentration of healthcare teams experimenting with the use of CHWs, this offers an opportunity to understand the diversity of approaches as well as the shared commonalities. While the care teams may be different in their structures and service population, they do operate within the same organizational, political and social context. Moreover, they have the potential to serve similar overlapping populations because their service areas are similar.
<i>What is the purpose of the case study?</i>	The purpose of this case study is to (1) understand what is currently being done to integrate CHWs within healthcare settings within an area of concentrated implementation, and (2) identify lessons learned/best practices to inform other CHW programs.
<i>What is the conceptual/theoretical framework for the case study?</i>	See chapter 2. This conceptual framework has been informed by literature related to team dynamics—particularly clinical care teams—as well as models of CHW integration and care delivery. Moreover, the model is inspired by implementation science frameworks for exploring contextual factors associated with effective implementation.
<i>What is my sampling approach?</i>	I will attempt to sample programs using a recently completed survey of CHW programs within the UI Health System. Programs will be targeted for recruitment if they meet the eligibility requirements outlined below.

	<p>Programs that meet the following criteria will be included: (1) They employ CHWs in a paid capacity, (2) CHWS work, at least in part, as part of a clinical care team, (3) the clinical care team is operated by The UI Health and Hospital System.</p> <p>Within each program, I will sample multiple layers of the clinical care team including (1) clinical care (doctor, nurse, PA), (2) leadership, and (3) the CHW.</p>
<i>What is the rationale for my choice of data sources?</i>	<p>As described above, the UI Health System offers a unique microcosm in which to explore current approaches to the integration of CHWs within clinical care teams. Moreover, this system is in the process of developing or implementing innovative CHW programs that bridge the community and clinical environments. This offers an opportunity to study this unique context in order to understand current approaches and begin to identify the factors associated with effective integration of CHWs into the clinical context.</p>
<i>Is data analysis congruent with the philosophical approach?</i>	<p>I believe so. Because my research is intended to explore an ongoing phenomenon (the implementation of CHW programs), it lends itself well to a case study approach. My case in particular has been selected because it offers an opportunity to explore a number of existing programs within the same context. This design was intentional in order to, hopefully, capture at least some of the existing diversity of approaches. It is also my hope that, by selecting multiple diverse sub-units, my findings will have more generalizability—at minimum to other programs within the city of Chicago and possibly beyond. Moreover, a qualitative study design aligns with my epistemological approach and my identity as a researcher.</p>
<i>Is my analysis adopting a case-based or a variable analysis-based approach?</i>	<p>My research intends to develop rich descriptions of a few examples of a specific phenomenon. Thus, it aligns more closely with a case-based approach. But I may engage in some content analysis as part of my qualitative coding. Thus, some aspects of my data presentation could also draw from variable analysis-based approaches.</p>
<i>How and why is data integrated during data analysis and interpretation?</i>	<p>I will first integrate data for each sub-unit. Using semi-structured interview data and document reviews to develop case-statements for each sub-unit. These case statements will be shared with sub-units through a member-checking exercise to validate findings. I will then integrate sub-units through reflective memos to search for consistent and distinct patterns to further develop my analysis and develop a list of themes that emerge across my embedded case. A stakeholder group will also be engaged through an action research process in order to enhance relevance and responsiveness to an existing change effort.</p>

Appendix 4: Interview Guides

Administrator Interview Guide

Hi! My name is Erin McCarville. I am a student at the UIC School of Public Health. Thank you for taking the time to meet with me. I am interested in speaking with you to learn more about your personal experiences working with Community Health Workers (CHW) within the UI Health System. I hope to use your experiences to better understand the opportunities and challenges for Community Health Workers at UIC. This may help to inform the development of a new UIC center that will serve to support CHWs across the University. I expect this interview to last between 60-90 minutes. I will be using this interview as part of my dissertation for the Doctor of Public Health Leadership program at UIC. I will therefore be recording and transcribing this interview. To start, I wanted to share the results of a publicly available CHW report which was recently completed at UIC. Here is a copy of that report. You're welcome to take a look at this before we start the interview.

Role/Responsibility

1. Can you please describe your current role at UIC?
 - a. What is your official job title? Do you have a different informal title?
 - b. What are your primary roles and responsibilities?
 - c. What department do you work in?
2. Can you please describe the ways in which you work with CHWs?
3. How long have you been working with CHWs?
4. Can you walk me through how CHWs are hired, trained and supervised?
 - a. Who is responsible for hiring them? How does this work? [*Probes: what job codes are used? Who conducts the interviews?*]
 - b. Who trains the CHW? What does training look like?
 - c. How is the CHW supervised? [*Probe: If there are different supervisors, how do they work together?*] Who supervises the CHW managers?
 - d. How are these procedures document (if at all)? [*Probe: are there written protocols?*]

Clinical Care Teams

This section is applicable for clinicians who work in a clinical capacity at UIC.

5. Do CHWs ever work with you in the provision of clinical care as part of a clinical care team? [*if no, skip to question 9*]
6. Can you please describe in what ways in which the CHW works with the clinical care team?
 - a. Can you describe the culture of the clinical care team?
 - b. How does the team communicate with the CHW?
 - c. Do you ever work in a shared or common space with the CHW? If so, can you describe it to me?
 - d. Are there any protocols or workflows that describe how to work with the CHW?
7. How well do you feel CHWs are integrated into (or part of) the care team? [*Probe: In what ways do you support the CHWs in their work? In what ways do they help you?*]

Organization

8. Can you tell me a little bit about what it is like to employ CHWs in the UI Health system?
9. How well do you think CHWs are integrated into the UI Health System? Why?
10. Has the organization needed to change at all in order to work with CHWs? If so how? What was that change process like?
11. In what ways does the organization support a CHW or CHW program?
12. How is your CHW/CHW program supported financially? How do you feel about the current system of financial support? [*potential probe: Is there anything that you would change?*]
13. Are leaders of your department or program involved in supporting CHWs (or the CHW program)? In what ways? How has this contributed to or hindered the CHWs.
14. How do CHWs support (or not support) the goals of your program/department?

Objectives

15. Why are you working with CHWs?

16. What are the primary jobs that the CHW performs?
17. How do you determine which patients a CHW should work with?
18. Do you think the CHW's role is clearly defined and/or understood? Can you explain?
19. What do you value most about CHWs? [*probe: what problems do CHWs help to solve?*]
20. What do you think patients/clients value most about CHWs?
21. What are your goals/objectives for CHWs? When you think of CHWs why are they important to your work?
22. How do you (or your department) evaluate CHWs?
23. From your perspective, are CHWs meeting your goals/objectives?

Gaps/Opportunities

24. Can you please tell me a little bit about some of the biggest challenges or barriers to employing and/or working with CHWs?
 - e. Do you have any challenges working as part of clinical care teams? What are they?
 - f. Do you have any challenges working within the UI Health system? What are they?
25. What do you think is working really when it comes to CHWs?
26. How do you think we could build upon those things that are working well?
27. In what ways do you think your program and CHWs in general could be supported? What do you need?
 - a. *Possible addition:* Here are the results from the survey? How do you feel about these? Do any of them resonate for you? Is there anything missing?
28. If there was a CHW Center at UIC, what would you want it to do?

CHW Interview Guide

Hi! My name is Erin McCarville. I am a student at the UIC School of Public Health. Thank you for taking the time to meet with me. I am interested in speaking with you to learn more about your personal experiences working as a Community Health Worker (CHW) within the UI Health System. I hope to use your experiences to better understand the opportunities and challenges for Community Health Workers at UIC. This may help to inform the development of a new UIC center that will serve to support CHWs across the University. I expect this interview to last between 60-90 minutes. I will be using this interview as part of my dissertation for the Doctor of Public Health Leadership program at UIC. I will therefore be recording and transcribing this interview. To start, I wanted to share the results of a publicly available CHW report which was recently completed at UIC. Here is a copy of that report. You're welcome to take a look at this before we start the interview.

Role/Responsibility

1. Can you please describe your current role at UIC?
 - a. What is your official job title? Do you have a different informal title?
 - b. What are your primary roles and responsibilities? How clear are these responsibilities? Do they ever change?
 - c. How long have you worked in your role?
 - d. What department do you work in?
 - e. Who do you report to? How are you supervised?
2. What do you view your purpose to be in your job?
3. Can you please tell me a little bit about your training?

Clinical Care Teams

4. Do you work with any clinical care providers or a clinical care team? *[if no, skip to question xx]*
5. How are you assigned patients to work with?
6. Can you please describe in what ways you work with clinical providers or a clinical care team? Maybe you can walk me through a typical day?
 - g. How does the team communicate with each other? How do they communicate with you?
 - h. Do you ever work in a shared or common space with the clinical team? If so, can you describe it to me?
 - i. Are there any protocols or workflows that describe how you and the care team works together?
7. How well do you feel you are integrated, engaged or included into (or part of) the care team? *[Probe: In what ways do you support the care team in their work? In what ways do they help you?]*
 - a. Can you describe some of the things that help you work well with the clinical care team?
 - b. Can you describe some things that make it difficult for you to work with the care team?

Organization

8. Do you feel that UIC as an organization values you as an employee? Why/why not?
9. How well do you think you are integrated into the UI Health System?

Community

10. Can you describe to me how you work in a community or neighborhood outside of UIC (if at all)? What do you do?
11. How do you define the community that you work with?
12. How much time would you say that you work in a community setting?
13. How do you feel you are perceived by the community?
14. How do you feel that UIC is viewed by the community?
15. How do you feel about the balance of your time between the community and the clinic? Do you with you spent your time differently?
16. What are some of your primary challenges when working in the community?

Objectives

17. What do you think your patients/clients value most about you?
18. What do you think the people that you work with at UIC value most about you?
19. In what ways do you contribute to the work being done by clinicians at UIC?
20. In what ways do you contribute to the health of the patients/clients that you work with?
21. How do you track whether your patients have made progress? How do you know when they no longer need services?
22. Do you receive feedback on your work? Who gives you this feedback and how is it shared with you? How often?

23. What are your own personal goals in your work?
24. How successful are you in meeting your goals?
25. What do you like most about your job? How much time do you spend doing this part of your job?
26. Is there anything you would change about your job? What is it? Why?

Gaps/Opportunities

27. Can you please tell me a little bit about some of your biggest challenges or barriers?
28. What do you think is working really well in your current job?
29. How do you think we could build upon those things that are working well?
30. In what ways do you think you could be supported better? What do you need?
 - a. *Possible addition:* Here are the results from the survey? How do you feel about these? Do any of them resonate for you? Is there anything missing?
31. If there was a CHW Center at UIC, what would you want it to do?

Appendix 5: Document Review Matrix

See excel file for more detail

Overview Matrix

	A	B	C	D	E	F	G	H	I	J	K	L	
	Review Date	#	Category	Sub-unit Number		Title	Author (if applicable)	Purpose	Date	Audience	Format	Description/Summary	Memo
1													
2													
3													
4													

Job Descriptions Matrix

	A	B
1	CHW Job Descriptions	
2	Document Number:	1
3	Subunit Number:	1
4	Job title	
5	Required educational level	
6	Required years of experience	
7	Salary	
8	Reports to	
9	Previous CHW experience required? (Y/N)	
10	CHW training/certification required? (Y/N)	
11	Clear roles/responsibilities (Y/N)	
12	Describes working with other members of the care team? (Y/N)	
13	Describes goals/objectives? (Y/N)	
14	Describes target population/community? (Y/N)	
15	Desired qualities?	
16	Desired qualifications?	
17	Stated roles/responsibilities? (Y/N)	
18	Roles & Responsibilities/Definition	
19	Roles & Responsibilities/ Health Education	
20	Roles & Responsibilities/ Patient Navigator	
21	Roles & Responsibilities/Clinical Services	
22	Roles & Responsibilities/Community Resources	
23	Roles & Responsibilities/Outreach & Enrollment	
24	Roles & Responsibilities/Social Support	
25	Roles & Responsibilities/Other	
26	Memo	
27	Follow-up questions	

Reports, publications, and website matrix

	A	B
1		
2	Reports and Publications	
3	Document Number:	
4	Subunit Number:	
5	Report Description	
6	Length (# of pages)	
7	Audience	
8	Budget	
9	Age of program	
10	Org chart present (Y/N)	
11	Size of program/# of CHWs	
12	Size of program/# of total staff	
13	Size of program/# served	
14	Size of program/# of clinics or service sites	
15	Caseload	
16	CHW pay rate	
17	Documented successes?	
18	Documented challenges	
19	Description of program (Key terms)	
20	Description of CHWs (Key terms)	
21	Description of community (key terms)	
22	Description of population served (key terms)	
23	CHW Interaction description	
24	CHW Philosophy	
25	Hiring Process	
26	Evaluation	
27	Training Time	
28	Supervision structure	
29	History/evolution	
30	Funding mechanisms	
31	Meetings	
32	Integration	
33	Other Comments	
34	Memo 1	

Training documents matrix

	A	B
1		
2	Training Documents	
3	Document Number:	
4	Subunit Number:	
5	Document Audience	
6	Presence of cross-disciplinary training? Y/N	
7	Key training components (list)	
8	Time/duration of training	
9	Necessary skills described? (Y/N)	
10	Key skills (list)	
11	Test/Evaluation (Y/N)	
12	Evaluation format	
13	Training format? (group, individual)	
14	Reference to team-based skills	
15	Team-based skills	
16	Training approach (lecture, discussion)	
	Memo 1	

Protocol matrix

	A	B
1		
2	Protocols	
3	Document Number:	
4	Subunit Number	
5	Roles clearly established? (Y/N)	
6	Description of CHW roles?	
7	Nature of CHW work?	
8	Individual(s) included in care team	
9	Reference to communication? (Y/N)	
10	Reference to supervision? (Y/N)	
11	Codes:	
12	Power/Decision Making	
13	Power/Opinions	
14	Process/Misc	
15	Process/Protocols	
16	Care Philosophy/Bottom up	
17	Care Philosophy/Top-Down	
18	Care Philosophy/Other	
19	Care Team/Communication/EMRs	
20	Care Team/Communication/Huddles	
21	Care Team/Communication/Meetings	
22	Care Team.Other	
23	Roles and Responsibilities	
24	Memo	
25	Questions	

Appendix 6: IRB approved consent document

University of Illinois at Chicago

Research Information and Consent for Participation in Social, Behavioral, or Educational Research Understanding the Use of Community Health Workers in a University Health System

Principal Investigator/Researcher Name and Title: Erin McCarville, MPH, DrPH Candidate

Faculty Advisor Name and Title: Preethi Pratap, PhD, Research Assistant Professor, UIC

Department and Institution: University of Illinois at Chicago, School of Public Health, Doctor in Public Health Leadership Program

Address and Contact Information: 1603 W. Taylor Street, Chicago IL 60612, 847-767-6724
emccar2@uic.edu

About this research study

You are being asked to participate in a research study. Research studies answer important questions that might help change or improve the way we do things in the future.

Taking part in this study is voluntary

Your participation in this research study is voluntary. You may choose to say “no” to this research or may choose to stop participating in the research at any time. Deciding not to participate, or deciding to stop participating later, will not result in the loss of any services, class standing, and/or professional status to which you are entitled, and will not affect your relationship with the University of Illinois at Chicago (UIC) and/or University of Illinois Hospital and Health Sciences System (UI Health), or any of the agencies or organizations collaborating in this research.

This consent form will give you information about the research study to help you decide whether you want to participate. Please read this form and ask any questions you have before agreeing to be in the study.

You are being asked to participate in this research study because you work as part of a Community Health Worker (CHW) program at UIC. A maximum of 40 subjects will be enrolled in this research study.

Important Information

This information gives you an overview of the research. More information about these topics may be found in the pages that follow.

WHY IS THIS STUDY BEING DONE?	We want to understand how Community Health Workers (CHWs) are currently being used within the UI Health System in order to support this workforce. Three different groups will be recruited to participate: (1) CHWs, (2) clinicians that work with CHWs, and (3) administrators who oversee CHW programs.
WHAT WILL I BE ASKED TO DO DURING THE STUDY?	<p>You will be asked to participate in a one-on-one interview where you will be asked questions about your job at UIC or UI Health. Interview questions will include questions about your professional roles and responsibilities, the presence of collaborative working relationships, your thoughts about challenges and opportunities in your job, and lessons learned that can help improve CHW programs. Your interview will be audio-recorded and transcribed. You may opt not to have your interview recorded if you would like. You may still enroll even if others in your unit decide not to participate or if you are the only one who wants to participate.</p> <p>After interviews are complete, findings will be summarized into a de-identified report and shared with you for feedback. Findings will also be shared with other research participants. A paper or electronic feedback form will ask your impressions of the report including whether or not the report accurately summarizes your thoughts and experiences. This form will also ask if you want to discuss your thoughts more in person. If so, a meeting will be scheduled at your convenience.</p>
HOW MUCH TIME WILL I SPEND ON THE STUDY?	The interview will last between 60-90 minutes. Completion of the feedback survey will take approximately 5-15 minutes. For a total of between 65 and 105 minutes of participation.
ARE THERE ANY BENEFITS TO TAKING PART IN THE STUDY?	Being in this research study may not benefit you directly, but we hope that your participation in the study may benefit other people in the future by helping us learn more about how to better integrate CHWs within clinical care teams. Findings from this research may lead to improved practices within the UIC or UI Health System.
WHAT ARE THE MAIN RISKS OF THE STUDY?	<p>The primary risks presented by this research study are breaches of privacy (others outside of the study may find out you are a subject) and/or confidentiality (others outside of the study may find out what you did, said, or information that was collected about you during the study).</p> <p>You may be uncomfortable with some of the questions you are asked. This research includes some items about your job including</p>

	University systems and leadership. You can skip and/or not respond to any questions that make you uncomfortable.
DO I HAVE OTHER OPTIONS BESIDES TAKING PART IN THE STUDY?	This research study is not designed to provide treatment or therapy, and you have the option to decide not to take part at all or you're your participation at any time without any consequences.
QUESTIONS ABOUT THE STUDY?	<p>For questions, concerns, or complaints about the study, please contact Erin McCarville, MPH at 847-767-6724 or email at emccar2@uic.edu or Preethi Pratap, PhD at 312-413-1739 or email at plakshmi@uic.edu.</p> <p>If you have questions about your rights as a study subject; including questions, concerns, complaints, or if you feel you have not been treated according to the description in this form; or to offer input you may call the UIC Office for the Protection of Research Subjects (OPRS) at 312-996-1711 or 1-866-789-6215 (toll-free) or e-mail OPRS at uicirb@uic.edu.</p>

Please review the rest of this document for details about these topics and additional things you should know before making a decision about whether to participate in this research. Please also feel free to ask the researchers questions at any time.

What about privacy and confidentiality?

Efforts will be made to keep your personal information confidential; however, we cannot guarantee absolute confidentiality. In general, information about you, or provided by you, during the research study, will not be disclosed to others without your written permission. However, laws and state university rules might require us to tell certain people about you. For example, study information which identifies you and the consent form signed by you may be looked at and/or copied for quality assurance and data analysis by:

- Representatives of the university committee and office that reviews and approves research studies, the Institutional Review Board (IRB) and Office for the Protection of Research Subjects.
- Other representatives of the State and University responsible for ethical, regulatory, or financial oversight of research.
- Government Regulatory Agencies, such as the Office for Human Research Protections (OHRP).

A possible risk of the study is that your participation in the study or information about you might become known to individuals outside the study. Your interview transcripts will be de-identified and stored on a password protected computer to prevent access by unauthorized personnel.

Your individual data will be assigned a unique research number at the beginning of the research study. This number will be used to identify you in the interview recordings. Interview transcripts will be stripped of all direct and indirect identifiers after recordings have been transcribed. A file linking research participants names with research numbers will be stored in a separate password protected file and destroyed after data analysis completion.

When the results of the study are published or discussed in conferences, no one will know that you were in the study. During the study, audio recordings will be collected. Your identity will be protected by assigning you a unique research number and not using your name or contact information on the recording. Recordings will be destroyed after data analysis completion.

What are the costs for participating in this research?

There are no costs to you for participating in this research.

Will I be reimbursed for any of my expenses or paid for my participation in this research?

You will not be offered payment for being in this study.

Can I withdraw or be removed from the study?

If you decide to participate, you have the right to withdraw your consent and leave the study at any time without penalty. You only need to contact the PI using the contact information provided in this document.

The researchers and/or funder also have the right to stop your participation in this study without your consent if:

- They believe it is in your best interests;

What if I am a UIC or UI Health employee?

Your participation in this research is in no way a part of your university duties, and your refusal to participate will not in any way affect your employment with the university, or the benefits, privileges, or opportunities associated with your employment at UIC or UI Health. You will not be offered or receive any special consideration if you participate in this research.

Remember:

Your participation in this research is voluntary. Your decision whether or not to participate will not affect your current or future relations with the University. If you decide to participate, you are free to withdraw at any time without affecting that relationship.

Signature of Subject

I have read the above information. I have been given an opportunity to ask questions and my questions have been answered to my satisfaction. I agree to participate in this research. I will be given a copy of this signed and dated form.

The researcher would like to record your interview.

- ☐ I agree to being audio recorded
☐ I decline from being audio recorded

Signature

Date

Printed Name

- ☐ Consent obtained verbally (*only to be used if interview is conducted over phone or video chat*)

Signature of Person Obtaining Consent

Date (must be same as subject's)

Printed Name of Person Obtaining Consent

Appendix 7: Codebook cheat sheet

See excel document for full codebook

Parent Code	Child Code	Definition
Team <i>WHAT are the critical components of teams working with CHWs?</i>	Culture	How do members of the team describe their culture?
	Communication	How do team members communicate? Include the use of technology (EMRs) as well as structures of communication (meetings, huddles, etc).
	Physical Space	Description of the physical space where the team works including if/how it is shared.
	Training/Orientation	How are staff trained? Includes how CHWs are trained as well as how others are trained to work with CHWs.
	Supervision	How are CHWs supervised. May include their “official” supervisor or others who may give feedback, coaching, training, etc.
	Structure and Process	The process whereby a team works together (including policies and procedures, protocols, workflows, and record keeping).
	Membership (emergent)	A consideration of who is and is not included as part of the team. This may include the extent to which partners and or clinical care providers are part of the team. Closely related to questions of integration
	Retention	The ability to maintain CHWs or other staff in positions for a duration that supports program implementation and allows for continuity of care. The lack of retention is sometimes referred to “staff turn-over”. Code for both retention and lack of retention using this codes.
	Local Champion	The presence or absence of an individual who will facilitate the engagement of CHW model
Community <i>WHAT How do CHWs engage with the community they are assigned to serve?</i>	Trust	The presence or absence of trust between the community and others in the system (including CHWs and health system)
	Power	The presence or absence of power between the community and others in the system (including CHWs and health system)
	Access	The ways in which a CHW accesses the community that it serves. This may include transportation, structural or systematic factors with accessing or working with target community
	Partnerships	The presence and strengths of partnerships with organizations in the community to delivery CHW services or engage in clinical care.
	Relationships	The importance of relationship-building in the delivery of CHW services in the community
	Shared Experiences	The sense that CHWs have shared experiences with the populations that they serve. This serves to build empathy and a stronger relationship between the CHW and patients.
Organization <i>WHAT elements of the organizational context influence a CHWs role?</i>	Human Resource Systems	The system involved in hiring, compensating, promoting and terminating individuals employed by the organization (including job titles, salary, and promotion requirements)
	Electronic Record Systems	The system involved in recording health information for the purposes of documenting and coordinating disease treatment information across the system.
	Benefits Systems	The system in place to provide supports and benefits to employees within a system. (ex/health, transportation, education)
	Perceived Organizational Support	The extent to which an employee believes that their organization values their contributions and cares about their well-being.

	Financial Support	The ways in which a CHW model is supported financially.
	Goals/Purpose	The perceived or stated goals of the organization.
	Agility	The extent to which agility is present—(1) nimbleness, (2) flexibility, and (3) speed.
	Care Philosophy	The philosophical rationale for how CHWs and patients should view health and healthcare. May include a discussion of “top down” (hierarchical, physician dominated) frameworks, or “bottom up” (relational or community oriented) frameworks.
	Community of Learning	The extent to which individuals within the organization can learn from each other’s practice and experience
	Referrals	The ability for CHWs or other staff to connect patients to other health and social services either within the community or within other departments/programs at the University.
	Competition	A sense that CHW programs may be competing for resources or recognition.
	Buy-in	The extent to which individuals within the organization support CHW model or the use of CHWs in the provision of clinical care.
Individual (CHW Role) <i><u>HOW a CHWs purpose and value is conceptualized within the team?</u></i>	Roles and Responsibilities	The roles that CHWs are expected to perform. This may include clinical services, community resource connections, health education/coaching, and/or social support. It may also include a discussion of whether or not roles are clearly defined.
	Purpose	The purpose for hiring/employing CHWs including health equity, cost, health outcomes, or patient experience.
	Value	How individuals define a CHW’s specific unique skills or qualities.
	Measurement	How CHWs are evaluated
	Experience & Background	Past experiences or perspectives

Across all layers (Community, Organization, Team and Individual), I will assess for the codes of Integration, Barriers and Facilitators...

Integration <i><u>HOW a CHW is integrated into the clinical care system in which they are working?</u></i>	Integration	Perceptions among CHWs, administrators and clinicians regarding the extent to which integration is present. This is closely related to the other parent codes in the model.
Leadership <i><u>HOW do leadership principles influence the use or delivery of a CHW model?</u></i>	Leadership	A consideration of the importance of leadership a multiple layers of the process including the organization, the care team, or community partnerships.

Facilitators <i><u>WHAT serves to support and/or encourage a CHW model?</u></i>	Facilitators	Perceptions among CHWs, administrators and clinicians regarding what serves as a facilitator to a CHW model
Barriers <i><u>WHAT serves to limit and/or restrict a CHW model?</u></i>	Barriers	Perceptions among CHWs, administrators and clinicians regarding what serves as a barrier to a CHW model.

Appendix 8: Member Checking Questionnaire

Member Checking Form (Qualtrics)

1. Does this report match your experience? Y/N
 - a. If no, can you describe what does not match your experience? (open ended)
2. Do you want to change anything about this report? Y/N
 - a. If yes, can you describe what you would like to change about this report? (open ended)
3. Do you want to add anything to this report? Y/N
 - a. If yes, what would you like to add to this report? (open ended)
4. Is there anything in this report that particularly resonates (or feels true) for you? (Y/N)
 - a. If yes, could you share what resonates for you? (open ended)
5. Is there anything in this report that is surprising to you? (Y/N)
 - a. If yes, what is surprising to you? (open ended)
6. Has reading this report prompted you to have any additional thoughts that you would like to share? Y/N
 - a. Please share your thoughts (open ended)
7. Would you like me to contact you to discuss this report more? Y/N
 - a. If yes, how would you like me to contact you?
8. If there is anything else you would like to share, please feel free to do it here: (open ended)

Appendix 9: Proof of paper submission

Manuscript #1: Social Science in Medicine

Submission Confirmation: Research paper



em.ssm.0.7070c8.f58334e5@editorialmanager.com on
behalf of
Social Science and Medicine <em@editorialmanager.com>



Mon 1/4/2021 3:34 PM
To: McCarville, Erin E

Dear Ms. McCarville,

Your submission entitled "Understanding critical factors associated with integration of community health workers into health and hospital systems" has been received by Social Science & Medicine

You will be able to check on the progress of your paper by logging on to Editorial Managers as an author.

Please go to <https://nam04.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.editorialmanager.com%2Fssm%2F&data=04%7C01%7Cemccar2%40uic.edu%7C6571aeb1e4584fb90ff208d8b0f88640%7Ce202cd477a564baa99e3e3b71a7c77dd%7C0%7C0%7C637453928732747376%7CUnknown%7CTWFpbGZsb3d8eyJWljiMC4wLjAwMDAiLCJQIjoiV2luMzliLCJBTil6Ikl1aWwiLCJXVCi6Mn0%3D%7C1000&data=1S77R0oyQkT1nwAOOyok5tU8y1Qi8JnPOvZCbaeh8PY%3D&reserved=0> and use the 'log in' link at the top of the page.

Your manuscript will be given a reference number once an Editor has been assigned.

Thank you for submitting your work to this journal.

Manuscript #2: American Journal of Health Promotion

Submission Confirmation



Thank you for your submission

Submitted to	American Journal of Health Promotion
Manuscript ID	AJHP-21-0016
Title	Framing the integration of community health workers along health care and community spectrums
Authors	McCarville, Erin Martin, Molly Pratap, Preethi Pinsker, Eve Seweryn, Steven Peters, Karen
Date Submitted	08-Jan-2021

Appendix 10: Report for stakeholders

See next page

An aerial photograph of a city skyline at sunset. The sun is low on the horizon, casting a warm orange glow over the city. Several tall skyscrapers are visible, including a prominent one on the right. The foreground shows a dense urban area with various buildings and a large dome structure. A solid green horizontal bar spans the bottom of the image.

UIC CHW Research Report Findings

NOVEMBER 2020

Report prepared for the UIC CHW Taskforce Leadership team

Authored by: Erin McCarville, DrPH (C), MPH

Executive Summary

Community Health Workers (CHWs) offer an evidence-based strategy for addressing social determinants of health within the healthcare sector to improve patient experience, health outcomes and reduce costs (Martinez et al., 2011; Rosenthal et al., 2010; Singh & Chokshi, 2013). But the implementation or integration of CHW models within health and hospital systems can be challenging (Allen et al., 2015; Rodgers et al., 2018). A qualitative case study was conducted at the University of Illinois at Chicago's Hospital and Health Sciences System (UI Health) in order to understand the ways in which CHWs are utilized, perceived and integrated in this context. This research serves to identify facilitators and barriers faced by programs implementing CHW models and can highlight opportunities to enhance CHW service delivery across the UI Health system. Moreover, it identifies priorities for the UIC CHW Taskforce to consider when promoting CHW models or developing a CHW Center.

Findings

There was notable diversity in the titles, roles, and responsibilities of CHWs as well as the models of service delivery employed across programs studied. Facilitators that were found to support CHW models include (1) effective communication across members of the team, (2) training designed to enhance CHW integration, (3) an organizational culture that supports a CHW model, (4) a care team structure that engages the CHW workforce, and (5) agility or the ability for the team to evolve quickly in response to a changing landscape.

Barriers that were found to impede CHW models include (1) onerous record keeping demands, (2) personnel or workforce challenges, (3) a human resource system that does not support hiring or retention of a CHW workforce, (4) administrative barriers to CHW service delivery, (5) insufficient or unstable funding, (6) a lack of agreement on CHW evaluation metrics, and (7) organizational barriers including a traditional hierarchical structure and/ or a reluctance to change.

Audience

This report was prepared in November 2020 for the UIC CHW Taskforce Leadership Team to be used to inform ongoing efforts to support and build CHW programming and services across the University system and beyond.

In January 2020, the UIC CHW Taskforce conducted a University-wide survey of all programs employing CHWs, or individuals who may be classified as CHWs to “delineate the vast number of roles and responsibilities of CHWs in the UIC system” in order to determine what is needed to better support the UIC CHW workforce (CHW Taskforce, 2020). This report builds upon this survey to further understand existing UIC CHW programs in order to advance the Taskforce’s mission.

“CHWs are poised to enter the mainstream of healthcare... but without careful and thoughtful consideration, CHWs could get lost in the healthcare system.” (Allen et al, 2015)

Recommendations

Respondents offered ideas for how a CHW Taskforce or Center could serve to support CHW models across the University system. Ideas included: developing programs that foster CHW talent development, establishing a community of learning for CHW programs, efforts to streamline the human resource process, resource sharing across programs, the development of a training center for CHWs, advocacy to promote leadership support for CHW models or financial reimbursement that enhances CHW sustainability, or CHW demonstration/pilot projects that study and disseminate best practice.

Findings

CHW Roles and Responsibilities

Respondents were asked to describe a CHW's roles and responsibilities. A critical theme that emerged was the diversity in how CHWs were employed in the provision of services within the health system. This could be observed in the broad range of CHW job titles, service populations, service delivery models, and roles and responsibilities (Table 1).

Table 1: Elements of a CHW's roles and responsibilities

Category	Descriptions Used by Interview Respondents or Documents
Job Titles	Formal HR job title: Clinical Care Coordinator, Behavioral Health Coordinator, Program Service Aid, Community Affairs Specialist. Informal team-level job title: Community Health Worker, Outreach Worker, or Case Manager.
Target Population	Disease-focus: People with uncontrolled diabetes, people who inject drugs, HIV positive patients Location-based: Inpatient hospital, school-based health center Health promotion or risk reduction-focus: Needle exchange, oral health
Service Delivery Model	Clinical Setting: Doctors office, hospital Community Setting: Home, community-based organizations Engagement model: In person, phone, or telehealth
Roles	Health education, motivational interviewing, care coordination, case management, counseling, or community outreach.
Responsibilities	Promoting access to clinical services: Appointment scheduling, clinical intake, transportation, addressing barriers to care Health service support: Assisting with medication refills, health education Psycho-social needs: Supporting patients in obtaining jobs, housing, or personal identification; social service referrals; health insurance enrollment Direct service: Provision of food, toiletries, or clothing Translation: Language translation, helping providers understand patient experience, helping patients understand instructions from health care providers Research: Research study recruitment, enrollment, data collection Documentation: Data collection or entry for documentation purposes

Different formal job titles were used for CHWs both within and across programs. Some programs also assigned informal job titles that were distinct from the formal human resource title. These findings align with CHW Taskforce survey findings. None of the respondents reported a formal job title of "Community Health Worker", but many identified informally as such. The CHW's target population was also framed differently across programs—some CHWs focused on a specific disease, location, or prevention activity. Some CHWs delivered services primarily in the community while others were based in a clinical setting.

Roles and responsibilities described by respondents were also broad. Some CHWs assisted patients in accessing clinical services, others supported patient’s psycho-social needs or served as a “cultural translator” between the patient and the health system. Some CHW roles required specific certifications such as HIV testing/counseling. Respondents commonly reported that a CHW’s roles were not well understood. Also, respondents described a lack of clarity regarding what CHWs were responsible for and how responsibilities were divided within the team.

“It was where, you know, you're JUST a community health worker... you're just... you're just... because they didn't understand the work that we did and how valuable the work that we do is to the overall care of the patient.” (Study Participant)

Perceptions

Respondents reported inconsistent perceptions related to CHWs. CHW roles were not always understood, and the CHW’s purpose and value was sometimes framed differently by different members of the care team. Moreover, evaluation metrics did not always effectively capture a CHW’s impact on the health care system. But in some cases, care teams were more aligned around a shared understanding of the CHW’s role and purpose within the care team—with some programs reporting poor alignment and others reporting close alignment in perceptions. Alignment in perceptions regarding a CHWs role and purpose was found to be associated with improved integration of CHWs in health services.

Facilitators

Respondents were asked to describe what was working well in their program or what helps to support the CHW model. Generally, respondents identified communication, training, organizational support, care team structure, and agility as important facilitators.

Facilitators or success factors described by CHW programs		Opportunities for a CHW center
Communication	CHWs working in close proximity with other members of the team (e.g. shared workspace or co-working)	<i>A center can serve to demonstrate or promote best practice related to communication through training/education programs, piloting CHW models and/or the conduct of research.</i>
	Opportunities for all members of the team (including CHWs) to meet regularly to share information (e.g. huddles)	
	Opportunities for social relationship building (e.g. potlucks and lunches)	
	Electronic systems to help identify resources, share information and coordinate care (e.g. EMRs)	
Training	Training and mentorship programs for CHWs in how to work within health systems	<i>A center can offer training or mentorship programs for CHWs or other care team members in best practice. It can also serve to support a community of learning (COL) to support co-learning and promote best practice.</i>
	Training and mentorship for other care providers in how to work with CHWs	
	On-the-job practice-based training and shadowing to enable ongoing learning	
	A community of peers to share experiences and lessons learned	
Organizational Support	The presence of a champion within the team that supports and values CHWs and has the authority to promote organizational change efforts.	<i>A center can serve to build team and organizational support for CHW models through advocacy work that promotes CHW models and a CHW workforce.</i>
	The presence of representatives within organizational leadership who see the value of CHWs and support a CHW model.	
	Respect for CHW knowledge and experience across members of the team.	
Agility	Adjusting or customizing a CHW's roles and responsibilities to their strengths	<i>A center can serve to support programs in building flexibility by promoting best practice in care delivery and supporting flexible or adaptive programs by creating systems for sharing CHW across programs.</i>
	Agility of the organization or team in order to allow for the ability to learn and evolve	
	The ability for the organization to adjust to changing healthcare delivery structure or healthcare delivery models (e.g. care team structure)	
Team and Care Structure	Flexibility in the care delivery model to allow CHWs to adjust to patient needs	<i>A center can serve to support best practice in care delivery by promoting training and educational efforts, demonstrating best practice through pilot programs, or through the conduct of research into best practice.</i>
	CHWs are provided sufficient time and an environment to build strong trusting relationships with patients	
	A care delivery system that enables easy access to care for patients (e.g. home visits, transportation to appointments, or community-based clinics)	
	Strong partnerships with other healthcare and or social service programs and agencies	

Barriers

Respondents were asked to describe common challenges or barriers encountered when developing or delivering the CHW model. Generally, respondents identified record keeping, personnel or workforce challenges, human resource challenges, and administrative and organizational challenges when describing barriers. They also commonly identified funding and metrics for evaluation or measurement to be barriers.

Barriers or challenges described by CHW programs		Opportunities for a CHW center
Record Keeping	Recordkeeping requirements that contributed to computer-based tasks maybe be perceived as challenging or less desirable to some CHWs	<i>A center can serve to support effective recordkeeping by working with EMR systems to develop modules or components that are appropriate for CHW use.</i>
	Electronic data entry was time consuming and difficult to complete in the field	
Personnel or Workforce	Challenges in organizing large caseloads of patients with complex health and psycho-social needs may be stressful for CHWs	<i>A center can work to proactively identify potential workforce issues and provide additional resources, training or support to CHW programs to address these issues.</i>
	High stress and a high-need patient population may contribute to staff burnout which contributes to high staff turnover	
	CHWs may be asked to frequently make transitions related to program or job changes	
	CHWs may encounter safety issues when working in community settings	
	Navigating multiple work environments can be difficult for CHWs (i.e. parking near UIC is challenging when driving for work)	
	Supervising CHWs with different skills and needs can be challenging for those unfamiliar with the role	
Human Resources and Onboarding	Hiring and onboarding CHWs took a long time	<i>A center could work with the human resource department to address some of the common HR-related challenges. For example, a CHW-specific job description can be created that enables efficient hiring of a CHW workforce. Center could also promote CHW hiring by establishing CHW job training or internship programs.</i>
	The CHW roles requires a unique combination of skills/experience. It can be challenging to recruit and hire the right person for a CHW role	
	Creating pathways for growth/advancement of front-line staff can be difficult	
	Identifying appropriate/approved job descriptions within the University system for hiring or staff promotions may be difficult	
	University-required trainings were long and not always appropriate for CHWs	
	Staff turnover is a challenge due to the long hiring and training process	
Administrative or Organizational	Identifying shared space for CHWs to work with clinical care teams can be limited	<i>A center can serve to identify potential administrative barriers and promote best-practice strategies for overcoming barriers. The center can also promote best practice by sharing case reports highlighting effective CHW models.</i>
	Scheduling appointments with providers in the UIC system was time consuming or difficult	
	Health care providers aren't always trained in how to use CHWs. It takes time/practice/training to learn their role and how to work with them.	
	Integration of CHWs requires organizational change that can sometimes be difficult to achieve, especially in larger more bureaucratic organizations.	
	Traditional health systems that have a hierarchical structure may create challenges for successful integration.	
Funding	Sustaining programs through transitions and/or changes in funding can be difficult. The primary mechanism to support this work is grant funding, and this requires that the program is constantly seeking new grants that may have different expectations or requirements.	<i>A center can serve to support funding transitions by advocating for other CHW funding mechanisms (i.e. fee for service reimbursement or ACO models). The center can also help support programs during funding transitions by facilitating sharing of staff across projects.</i>
	Sustaining staff and infrastructure when grant-funding runs out can be challenging	
Measurement	CHW benefits may take time to realize, and benefits may difficult to measure. Determining the appropriate metric for measuring CHW effectiveness can be difficult.	<i>A center can service to promote best practice for data collection/evaluation. It could also serve as a repository for CHW data to promote research and information sharing.</i>

Recommendations

Positioning

Interview respondents were asked how a central group, such as a CHW Center, could support their program or CHW services across the University. Data were compiled and a list of findings were generated to provide evidence that may support next steps in promoting CHW models across the University system.

In considering how a new CHW Center may serve to support existing CHW programs, it is important to consider factors related to program ownership. A center should serve to support and augment existing programs and services, and not compete with ongoing CHW efforts. Moreover, by centralizing services or resources, the University may limit agility in the face of a changing landscape. Therefore, a CHW Center should thoughtfully consider how it will fit within the current landscape of CHW programs and services across the University system.

“CHWs do so much...We all do more than what we should do. We do a lot more than what we should be doing.” (Study Participant)



Opportunities

Some ways that a CHW Center could support ongoing CHW efforts may include:

- **Talent Development:** Helping to build a talent pool of CHWs through mentoring, internship, training, or professional development services for CHWs and CHW supervisors. This could be contracted to CHW programs as needed or it could serve to establish a talent pool of CHWs that programs can draw from.
- **Community of Learning:** Developing a “Community of Learning” for CHWs and CHW supervisors to share and learn from experiences of other CHW programs. It could create a space for CHWs and administrators to share challenges, successes, and lessons learned. Or it could serve to foster relationship building in order to establish new collaborations or the promotion of best practice.
- **Human Resource Support:** Helping to work with the University’s human resource system to develop clearer job titles for a CHW workforce and to help establish a clear pathway for hiring and retaining a CHW workforce. The Center could also serve to assist programs in the recruiting, hiring or onboarding process.
- **Resource Sharing:** Helping CHWs support patients by sharing additional services or resources that are available at the University, the City of Chicago, or the larger region. This may include materials that can be used by CHWs in health education or coaching, or resources or organizations that CHWs may refer patients to.
- **Training Center:** Supporting CHW training efforts by leveraging experienced staff to “consult” as trainers or mentors for newly established CHW programs. This would serve to improve and standardize the quality of CHW service delivery. It also would allow for shadowing which is perceived to be a valuable training mechanism for CHWs.
- **Advocacy:** It could serve to articulate and amplify the argument for CHWs through advocacy in order to help build leadership or financial support for the model and promote its use.
- **Demonstration projects:** It could serve to pilot and research CHW models in order to illuminate and promote best practice.

References

- Allen, C. G., Escoffery, C., Satsangi, A., & Brownstein, J. N. (2015). Strategies to improve the integration of community health workers into health care teams: "A little fish in a big pond". *Preventing Chronic Disease*, 12, E154.
- Martinez, J., Ro, M., Villa, N. W., Powell, W., & Knickman, J. R. (2011). Transforming the delivery of care in the post health reform era: What role will community health workers play? *American Journal of Public Health*, 101(12), 1.
- Rogers, E. A., Manser, S. T., Cleary, J., Joseph, A. M., Harwood, E. M., & Call, K. T. (2018). Integrating community health workers into medical homes. *Annals of Family Medicine*, 16(1), 14-20.
- Rosenthal, E. L., Brownstein, J. N., Rush, C. H., Hirsch, G. R., Willaert, A. M., Scott, J. R., . . . Fox, D. J. (2010). Community health workers: Part of the solution. *Health Affairs (Project Hope)*, 29(7), 1338-1342.
- Singh, P., & Chokshi, D. A. (2013). Community health workers — A local solution to a global problem. *New England Journal of Medicine*, 369(10), 894-896.
- UIC CHW Taskforce. (2020). *An inventory of community health workers at the University of Illinois at Chicago*.