2020

Utilizing CDC Framework for Program Evaluation to Inform Assessment of an Interprofessional Leadership and Teamwork Curriculum

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UTILIZING CDC FRAMEWORK FOR PROGRAM EVALUATION TO INFORM ASSESSMENT OF AN INTERPROFESSIONAL LEADERSHIP AND TEAMWORK CURRICULUM

CAPSTONE

A Capstone project submitted in partial fulfillment of
the requirements for the degree of Doctor of Public
Health in the College of Public Health
at the University of Kentucky

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Abstract of Capstone

Background
The ability to collaborate effectively and lead a team when the need arises has become an expectation of health professionals. Graduates of health professions programs are expected to possess skillsets that will allow them to both collaborate and lead effectively in addition to their profession-specific knowledge. Leadership Legacy, an interprofessional elective created at the University of Kentucky in 2009, was designed to address this need.

Methods
After nearly ten years of cohorts, an opportunity arose for program evaluation with a reliable method such as the Centers for Disease Control and Prevention Framework for Program Evaluation. The novel use of this six-step, stakeholder-informed framework focused the evaluation on whether the program was achieving stated outcomes with regards to professional identity development and development of leadership skillsets.

Results
Evaluation of Leadership Legacy with the CDC Framework demonstrated that the course was graduating learners with an increased knowledge of their own role and the roles of their interprofessional health teammates and developing leadership skills within feedback agility and conflict resolution. However, a crucial opportunity emerged to better align the stated course competencies, the course activities, and the evaluation instrument.

Conclusions
The CDC Framework for Program Evaluation provided a clear, methodical process for program evaluation that appropriately involved key stakeholders. Although opportunities emerged to improve Leadership Legacy, these opportunities ultimately contribute to the health and survival of the course.

Keywords: program evaluation, CDC Framework, interprofessional education, leadership, health professions education

_Madeline Aulisio, 4/8/20_____
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By

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2020

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TABLE OF CONTENTS

ACKNOWLEDGEMENTS

I dedicate this capstone project to my partner Christopher Miller, who helped make this journey possible with his love, support, and insistence that “it’s supposed to be hard. If it wasn’t hard, everyone would do it. The hard is what makes it great!”

I would also like to express my sincerest gratitude to Dr. Leslie Woltenberg, whose friendship, wise advice, and mentorship have meant so much to me.

This project would also have suffered without the tireless assistance and review of multiple drafts by Dr. Sarah Wackerbarth and Dr. Rick Ingram. The students of the UK College of Public Health are lucky to have the opportunity to work alongside you and learn from you.

I am so grateful to all of you.

Chapter 1: Introduction

The ability to collaborate effectively and lead a team when the need arises has become an expectation of today's health professionals.[1,2] As the healthcare system continues to evolve, employers increasingly seek graduates equipped with skills in effective communication, emotional intelligence, project management, negotiation, and conflict management (among others) in addition to their profession-specific technical knowledge.[3,4]

Despite this emerging expectation, the development of such skills is absent or inconsistent in most health programs curricula, and professionals frequently find themselves thrust into unfamiliar situations with little if any formal training.[5,6] To address this disparity at the University of Kentucky, several students from the university's College of Medicine created Leadership Legacy, an extracurricular program for medical students designed to complement the formal curriculum by enhancing professionalism, creativity, and leadership skills and raising learners' awareness of the importance of leadership and teamwork skills in the clinical realm.[7] Given this program's importance and potential implications, it merited further examination at the level of intensive study appropriate for a capstone project. Guided by a Centers for Disease Control and Prevention (CDC) framework trusted for its reliability and flexibility, this capstone first describes the history and evolution of Leadership Legacy before connecting it to its place within the leadership literature.[8] The remaining chapters of this capstone emphasize a stakeholder-informed evaluation process of the program before reporting findings.

History and Evolution

Leadership Legacy was originally launched in 2009. The creators weighed the merits of several different formats for the program that included a longitudinal course extending over four years, a series of short seminars, and periodic workshops that focused on either theory or practice of developing skills through simulation before selecting a combination of short seminars and workshops. An advisory

committee of physician and non-physician medical educators provided guidance with the development of leadership competencies, learning outcomes (Table 1), and design of a pilot program for the course. The leadership competencies originally included the following: effective communication; problem solving and decision making; innovation, strategy and vision; conflict negotiation and resolution; situational leadership; collaboration, teambuilding, and partnership; project management; time management; financial analysis and planning; change management; coaching, mentoring, and delegation; and feedback agility. Leadership competencies and learning objectives were intentionally kept broad to better accommodate creativity and individualization of the program.[7]

A cohort of 25 learners was randomly selected from the entire class of third-year UK medical students to participate in the program pilot. Eighteen learners opted in to the first iteration of Leadership Legacy which took place over ten months and consisted of a weekend retreat, monthly evening workshops, and a mentoring element (the legacy component). Participants completed the Myers-Briggs Type Indicator Step II assessment prior to the intensive two-day retreat, stimulating discussion of how personality preferences and characteristics can influence leadership and communication.[9] Monthly seminars on a variety of leadership topics followed the initial retreat. Learners worked in pairs, selecting a topic and creating a workshop they delivered to their peers that consisted of didactic teaching, experiential learning activities, and a debriefing discussion. Workshop topics included project development and resource management; financial analysis, planning, and management; effectively creating change; mentoring, teaching, and coaching; interprofessionalism; academic medicine; work/life balance and time management; problem solving and decision making; negotiation and conflict management; research and medicine; community outreach; ethics and integrity; and career choices in medicine.

The pilot concluded with the legacy component of the program which served the dual purposes of allowing Leadership Legacy participants to practice their newly developed skillsets within the context

of a mentoring relationship and give back to the College of Medicine and their fellow medical students. Learners taped simulated interactions depicting positive, negative, and neutral interpersonal encounters they had experienced during their clinical years and demonstrated the importance of the leadership competencies they had been developing in responding to those situations. These videos were then shown to groups of six to eight pre-clinical (second-year) medical students in the college's Introduction to Clinical Medicine course. Small groups were precepted by a Leadership Legacy participant who also utilized discussion questions written for each vignette. This culminating experience afforded Leadership Legacy learners the opportunity to apply their newly developed competencies within the context of a mentoring relationship while also assisting with the preparation of second-year medical students for the types of clinical interactions they were likely to encounter.

Throughout the duration of the course, Leadership Legacy participants completed evaluations intended to both assess the pilot and enable them to reflect on their own development. Evaluation instruments consisted of open-ended questions, Likert-style questions, and the Attitudes Toward Healthcare Teams Scale.[7,10] Thematic analysis of the qualitative comments suggested that participants found the program useful, necessary, and potentially of benefit to their colleagues who had not participated. Participants believed that they were better able to communicate and interact openly and more capable of participating on a team with diverse members, having completed Leadership Legacy. The activities pertaining to self-awareness, teambuilding, and communication were particularly highly rated and described as directly translatable to the wards in which students were gaining clinical experience. The retreat was uniformly rated as the participant's favorite component of the program, given its hands-on nature. Finally, both Leadership Legacy participants and pre-clinical second-year students who participated in the small groups reported that they enjoyed and benefited from the facilitated mentoring sessions.

With the initial success of Leadership Legacy among College of Medicine students, the program was expanded to include students from UK's other health programs (dentistry, health sciences, nursing, pharmacy, and public health) to better reflect the increasingly interprofessional nature of the modern healthcare team.[11] To facilitate this expansion, one of the original creators, Dr. Erika Erlandson, began to collaborate with the UK Center for Interprofessional Health Education, Research, and Practice now called the Center for Interprofessional Health Education (CIHE). CIHE facilitated the formation of a committee composed of representatives from each health college to negotiate curricular changes to the course to promote the participation of an interprofessional cohort of learners. The newly-interprofessional version of the program first occurred in partnership with CIHE in spring 2011.

Notable initial changes to Leadership Legacy included both structural changes and topical changes to more strongly emphasize the importance of interprofessionalism. The participating colleges capped the size of the participant cohort at 24, utilizing a selective application process to ensure that students were committed to the course and capable of participating and that the program contained an approximately equal distribution of professions. The learning outcomes were rewritten to reflect three of the 2011 Core Competencies for Interprofessional Collaborative Practice, guidance written by the Interprofessional Education Collaborative (IPEC), and the duration of the program was reduced from ten months to seven months (Table 1).[12] The retreat was also modified to include a full- day retreat at the start of the program in the fall semester and a half day in the spring semester to conclude it. The monthly workshop format remained the same but was reduced in number to only four workshop presentations by participants to their peers. The "physician-centric" workshop topics such as "Career Choice in Medicine…" were discontinued. New additions to the 2011 iteration of Leadership Legacy included monthly coaching sessions with faculty to understand the components of leadership in an interprofessional health system and an interprofessional community-focused service activity intended to introduce the idea of how a community can directly benefit from interprofessional collaboration. The

legacy component of the program was also modified and was composed of individual presentations by participants on the development of their leadership skills and the future impact they anticipated on their careers. In addition to the Attitudes Toward Healthcare Team Scale, additional Likert-type questions asking about student perceptions of their knowledge of other professions' educational requirements and scopes of practice were also added to the program evaluation instruments.

This version of Leadership Legacy continued until evaluation data from student participants as well as an anticipated update to the guiding IPEC Core Competencies inspired the Leadership Legacy course committee to put the program on hold during the 2013-2014 school year and instead utilize the year to revise the Leadership Legacy curriculum. Those revisions introduced new structural changes and topical additions that further emphasized interprofessionalism. Leadership Legacy was further refined to a single semester to reduce reported scheduling conflicts with participants' required coursework. The retreat became a single, full day activity at the beginning of the program and saw the replacement of the Myers-Briggs with the DISC Personality Assessment.[13] Learners also engaged in the "Demystifying the Myths of My Profession" activity during the retreat, briefly presenting the most common stereotypes and myths associated with their respective fields and then correcting those misunderstandings to provide their peers with more accurate knowledge. Four pre-determined workshops followed the retreat that learners participated in but did not personally deliver to their peers (Table 2). The reduction in number and variety of workshops also necessitated further refinement of the leadership competencies addressed by the course. The second interprofessional iteration of the course retained the interprofessional community service project and culminated in a graduation reception during which interprofessional teams shared their experiences and associated outcomes of their community service projects. The legacy component of the course was transformed into an opportunity for previous participants to assist with the execution of the activities for the next cohort and assist with recruiting via recommendations for future participants.

This iteration of Leadership enjoyed high ratings by student participants and representation by a broad variety of CIHE partner colleges.[14] However, in response to feedback from participants of the 2015-2016 cohort, the course committee advised the addition of a dinner with members of the Kentucky Legislative Research Commission to enable learners to get assistance with their ideas for their Political Advocacy project proposals (Table 2). The learning outcomes were also revised to include guidance from the 2016 update of the 2011 Core Competencies for Interprofessional Collaborative Practice (Table 1).[15] In response to feedback from interprofessional learners that items questioning the stereotype of the physician as the de-facto leader of the interprofessional healthcare team were offensive, a new evaluation tool, the Interprofessional Collaborative Competency Attainment Survey (ICCAS), also served as a needed update to the Attitudes Toward Healthcare Teams Scale (ATHTS) and became part of the program evaluation completed by program participants.[10,16] Continued adjustments to the program in the 2018-2019 academic year included the removal of the community service activity from the program due to confusion about its place in the curriculum and a new simulation activity requiring participants to collaboratively develop a plan for survival after a helicopter crash to replace the Negotiation Skills Simulation. The learning outcomes were again modified to more accurately reflect the new program curriculum (Table 1). Post-workshop assignments were also added to promote more regular reflection about lessons learned by participants. As a result of the ongoing self-assessment, Leadership Legacy continued to be highly rated by participants and the program was carried forward in the most recent iteration for the 2019-2020 academic year.

As evidenced by the history of the course, evaluation has always been a component of Leadership Legacy. However, the course more frequently experienced ongoing informal assessment executed by the course committee than systematic and formal evaluation. Leadership Legacy has undergone sufficient adjustments to warrant a more in-depth examination of whether it achieves its original purpose of developing the leadership and professional skills of its participants. One could argue

that, despite the importance of leadership skill development to future health professionals, such a broad study of the course has not occurred since the 2013-2014 school year. Therefore, an intentional evaluation of Leadership Legacy that extended beyond the logistical adjustments implemented by the course committee each year was timely. In response to this, program evaluation of Leadership Legacy was conducted in fulfillment of the UK Doctor of Public Health (DrPH) degree capstone requirement. The process began with a literature review to first provide context for the evaluation.

Chapter 2: Literature Review

Types of Leadership

One would be hard-pressed to find a profession that does not value the ability to successfully lead a team when the situation calls for it. Although consideration of leadership across professions has largely evolved from individuals being destined for leadership through some combination of birth order and genes (Galton's great man theory) to every person having the potential to lead if properly developed, there is still no agreed-upon set of traits or pattern of behaviors that predicts leadership ability.[17,18] Yet, this has not prevented the development of over two hundred definitions and theories of leadership over the years, attempting to answer the need to identify characteristics and behaviors a leader should have in her arsenal.[19]

Given their number, these definitions and theories of leadership are often categorized along a continuum or dichotomized. One of the most frequently employed categorizing strategies classifies leadership theories as either task-oriented or relationship-oriented. Task-oriented leadership places more emphasis on accomplishing the task at hand than building relationships with team members and tending to the needs of others. Leaders who practice task-oriented leadership tend to define the roles, resources, and processes for the team with less input from team members.[17,20,21] Autocratic leaders may be the most well-known example of the task-oriented leaders, frequently found in situations where there is little margin for error. Although autocratic leadership can promote high levels of productivity, it

can also be met with low motivation and attrition by team members.[22-25] At the opposite end of the task-oriented leadership spectrum, leaders who engage in a laissez-faire leadership may provide opportunities for team members to make most decisions. Laissez-faire leaders tend to engage in few behaviors typically attributed to a leader such as providing feedback. Although this style can inspire the development of informal leadership behaviors among team members who see themselves fulfilling a need on the team, such practices can also have the negative effect of lowering productivity and adding complexity.[25-27] Laissez-faire leadership is considered most effective when a team is already highly experienced and high functioning.

Relationship-oriented leadership is often viewed as the opposite of task-oriented leadership, emphasizing interaction, focusing on relationships, team member wellbeing and motivation, fostering positive relationships, and communication.[23,24] In supportive leadership, a well-known type of relationship-oriented leadership, leaders focus on building relationships with the members of their team and explicitly supporting them in an effort to increase the likelihood that team members will have positive feelings about their team membership and be more satisfied with their work, positively impacting motivation to work towards shared goals.[28] Similarly, collaborative leadership focuses on communication and engagement. When team members with varying levels of responsibility are kept informed and allowed to engage with leadership processes, dialogue is enhanced, rapport is built, and the level of complexity within an organization is reduced. These outcomes can lead to an organization being more nimble and better able to adapt to changing demands.[28] Although the potential benefits gained from having less anxious and more motivated team members are numerous, evidence in the literature also suggests decreased efficiency when groups are led by leaders who primarily employ relationship-oriented styles and behaviors compared to those who are led by primarily task-oriented leaders.[23,24]

Outside of the task-oriented versus relationship-oriented dichotomy, increased attention is being directed towards leadership that is either transactional or transformational in nature. Transactional leadership styles and behaviors focus on the exchanges that occur between leaders and their team members.[17,20,29,30] The nature of the relationship between a leader and the rest of the team can be viewed as the accrual of personal and professional benefits such as fulfillment of self-interest, minimized workplace anxiety, and the ability to visualize and concentrate on clear organizational objectives such as increased quality and production, customer service, and cost reduction in exchange for work that allows the leader and team to accomplish objectives, complete required tasks, avoid unnecessary risks, and improve efficiency.[17,31,32] Although these exchanges may be mutually beneficial for individual team members and the productivity of the team as a whole, critics argue that transactional leadership styles and behaviors can lead to short-term, shallow relationships between team members and between team members and the leader, potentially hindering the development of foundational rapport needed for future work.[33,34]

Conversely, transformational leadership styles emphasize much deeper development of the relationship between leaders and team members. Leaders who engage in transformational leadership inspire confidence and respect from team members, convincing them to put the needs of the group above their own self-interests and transforming team member's current focus from more simple task fulfillment to achievement and self-actualization as described by Maslow's hierarchy of needs.[20,25,35] Transformational leadership is not without its critics who emphasize problems such as a lack of clarity regarding underlying mechanisms of leader influence. However, transformational leadership continues to generate a great deal of attention as an ideal form of leadership.

The plethora of leadership styles, theories, and behaviors have led to the current understanding that no single type is superior to the others, and that a "one size fits all approach" is untenable. Additionally, the nature of many of the leadership types transcends dichotomous categorization. All

have their utility given a particular situation and team dynamic, and effective leaders must be capable of employing a blend of styles, behaviors, and theories in order to promote effective teamwork. In fact, situational leadership theory espouses the (arguably) more realistic concept that leaders with a rational understanding of their situation, regardless of their field, will adopt a blend of behaviors from different styles as the situation calls for it.[17,36]

Leadership in the Health System

Despite this developing understanding across fields that effective leadership requires the ability to command a blend of leadership styles and behaviors, some professionals may struggle to find leadership theories that are appropriately tailored to their field.[37] For example, few if any leadership frameworks, models, or styles were developed specifically with health professionals or future health professionals in mind.[28] Yet, professionals from all health fields have at times been called upon to lead when the situation demanded. Leadership skillsets and training are relevant for all health professionals, especially given the increasingly complex landscape of the United States healthcare system.[38,39]

This increasing complexity is most evident in the recent, renewed emphasis on providing high quality care.[40] The Institute of Medicine (now the National Academy of Medicine) defines high quality care as care that is safe, effective, reliable, patient-centered, efficient, and equitable, as measured by patient outcomes by the National Quality Measures Clearing House.[25,41] The importance of a professional possessing leadership capacity in order to lead a team capable of providing high quality care cannot be overstated. Whatever blend of styles it assumes, effective leadership and its related positive outcomes for a team are associated with the downstream effects of establishing a culture of patient safety, promoting greater expertise and practicing at the height of their training among team members, increased staff stability, reduction of mortality rates, raising patient satisfaction, and reducing adverse events.[25,41,42]

Upon examination of these underlying benefits, one can detect an overarching emphasis on patient safety, as all the aforementioned benefits ultimately impact the safety of the care a patient receives from a health professional.[25] This emphasis stems from the fact that every year, tens of thousands of patients are harmed by adverse events experienced during care.[43] Although controversy exists with regards to the actual numbers, there is widespread agreement that human error during the provision of health services is a significant contributing factor.[44-46] Efforts to combat the rates of patient harm largely recognize that because "to err is human", a more supportive, skill-building culture created and supported by effective leadership and teamwork rather than a punitive one focusing on blame must be constructed system-wide in order to provide safer and higher quality services.[47-49] Such a supportive culture arises when providers are not only clinically knowledgeable but also equipped with emotionally intelligent leadership and teamwork skills.[5,15,43,47] Although a definitive list of required leadership competencies remains elusive, skills such as effective communication, negotiation, conflict and project management, and team building are integral to not only the ability to perform as part of a team but also to be an effective leader when the situation calls for it.[1,7]

Leadership in the Education of Future Health Professionals

These types of skills are important for teamwork and leadership, and many learners profess an interest in them. However, their appearance in the curricula of developing health professionals is inconsistent, and many learners develop these skillsets "accidentally".[1,2,6,50] The situation is further complicated by a lack of consensus on best practices to guide curriculum planning with regards to leadership and teamwork skill development.[50-54] For example, when surveyed, medical students have cited an interest in developing leadership and teamwork-relevant skills pertaining to communication, ethics, conflict resolution, time management, and interprofessional teamwork.[4,6,55] However, the interventions utilized to address this unmet need have had mixed results. For example, a one- week leadership course grounded in business pedagogy offered to first year medical students at the Schulich

School of Medicine and Dentistry in Ontario, Canada was viewed as suboptimal by learners because of its brevity, primarily lecture-based format, and grounding in business pedagogy instead of a more relevant healthcare context.[6] Other institutions such as The Warren Alpert Medical School of Brown University have been piloting multi-year interventions more fully integrated in the larger medical curriculum that promote student engagement with leadership topics such as negotiation, conflict management, and effective communication as early as the preclinical stages of training with more positive results.[2]

The literature in this area predominantly focuses on the development of curricula for medical students, as they are most frequently viewed as the de-facto leader of the health team, despite the changing landscape of the US health system.[4] However, other professions are employing a variety of methods and interventions to develop these skillsets in their learners. A year-long Nurse Leadership Institute was recently implemented at Indiana University to foster empowerment for nurses through the development of teamwork and leadership skillsets with discussion groups and workshops using the Five Leadership Practices of modeling the way, inspiring a shared vision, challenging the process, enabling others to act, and encouraging the heart in conjunction with the Lean In Circle materials developed by Facebook COO Sheryl Sandberg.[56] Nurse learners earlier in their education at the University of Connecticut School of Nursing have participated in "Lunch and Lead" sessions, priming learners with a discussion about leadership followed by participation in two simulations requiring demonstration of newly realized leadership behaviors.[57] Courses, institutes, and retreat- style interventions have also been developed for pharmacy students to familiarize themselves with and practice "core leadership skills", self-awareness, teambuilding, and communication.[58-60] Third-year dental learners at Harvard School of Dental Medicine have engaged in a course titled "Dental Health Care Delivery: Concepts of Oral Health Leadership" comprised of ten modules on topics that fall within either management or leadership categories such as reducing medical errors, communication, business, ethics, team building, and access

to care.[61] Several schools of public health have dedicated efforts to determining which teamwork and leadership competencies must frame a course for learners in public health.[54] Additionally, the CDC has been formally supporting the establishment of public health leadership institutes across the country since the early nineties. These institutes are linked by a network of schools of public health and state public health departments and typically offer longitudinal curricula spanning one or two years. The curricula have the broad goal of enhancing leadership competencies to facilitate improved performance of the essential public health services and therefore the public's health.[62,63]

Despite the varied experiences of students in health professions programs as they encounter interventions intended for the development of leadership and teamwork skillsets, a few commonalities emerge. Most health professions (and their respective specialties) have recognized the need for their graduates to possess capabilities that will enable them to participate on a team effectively and lead if the situation calls for it. Most, if not all, of the accrediting bodies of these professions mandate training for this type of teamwork and inherent possibility of leadership. To address this, institutions are piloting and utilizing a variety of formats: weekly courses, embedded institutes, singular retreats, online modules, and lecture series (among others). Adding to the subjectivity, these formats utilize a variety of theories, frameworks, styles, and ideas about teamwork and leadership, from Sandberg's Lean In Circle to Goleman's Six Styles of Leadership.[56] Discussion also continues with regards to when to introduce and how best to integrate this type of curriculum throughout learners' studies.[64,65]

Barriers to the successful implementation of any of these efforts typically arise within three main areas: lack of space for the content in the pre-existing, broader program curriculum; student disinterest in components of the teamwork and leadership curriculum leading to disengagement; and lack of resources including funding and qualified faculty instructors.[55,66] Additional barriers to the development of leadership and teamwork skills curricula lie in the available data to inform future efforts. At this time, the literature is primarily comprised of descriptions of curriculum development

processes, program pilots, and cross-sectional observational data. Bias may be present in the form of learners with a pre-existing proclivity to seek out opportunities to develop leadership and teamwork skillsets self-selecting for participation in many of these programs. The outcomes measured also primarily consist of student perceptions of skill development or their overall reception of and satisfaction with a particular intervention instead of actual demonstrations of leadership ability. More robust data collection in the form of experimental, longitudinal outcomes research is needed in order to better inform curriculum planners whether activities are truly positively impacting the capabilities of graduates in the desired way.

Chapter 3: Methods of Evaluation

Given the challenges and opportunities associated with the creation of a curriculum intended to enhance learners' leadership and collaborative skillsets and the importance of such efforts for learners, it was appropriate to evaluate Leadership Legacy within the context of this capstone. Evaluating Leadership Legacy was a crucial step not only for the University of Kentucky but also more broadly for the field of leadership development. However, there is no one "right" method of evaluating a program. Like theories of leadership, the models available for conducting program evaluation are similarly numerous.

Programs of all sizes at the federal, state, and local levels frequently employ the Centers for Disease Control and Prevention's Framework for Program Evaluation in Public Health, a reliable and valid method for planning, designing, implementing, and utilizing comprehensive evaluations (Figure 1).[8] This six-step framework prioritizes utility, feasibility, propriety, and accuracy and uses these standards to guide each step of the process: engagement of stakeholders, careful program description, focused evaluation based on feedback from stakeholders, methodical evidence collection, forming sound conclusions, and dissemination of lessons learned. As Leadership Legacy reaches future public health practitioners and other professionals who will impact the public's health, this evaluation of the course

was conducted with the guidance of the CDC's Framework to ensure a systematic process that intentionally and thoughtfully engaged stakeholders. Additionally, SPSS was utilized for quantitative analytics.[67]

Step 1: Engaging Stakeholders

The first step in this evaluation process focused on engaging stakeholders, the people and organizations invested in the program who have an interest in the evaluation[8]. Key stakeholders for this process included two groups: those involved in program operations and those served by the program.[68] Those involved in program operations included the staff of the Center for Interprofessional Health Education and faculty members from the Center's partner health professions programs who served on the Leadership Legacy course committee. These stakeholders not only increased the credibility of the evaluation with their firsthand knowledge and academic expertise but also were in the position to potentially implement any suggestions that arose from the evaluation. Stakeholders served by the program primarily included the students from UK's health colleges who participated in Leadership Legacy and were also positioned to advocate for the program. An email introducing the project and inviting feedback was sent to CIHE staff, members of the Leadership Legacy course committee, and a sample of students from recent Leadership Legacy cohorts who were identified by program faculty as still having an active UK email address.

The selection of stakeholders to provide information for this project satisfied the CDC Framework priorities of utility, feasibility, propriety, and accuracy. The stakeholders most likely to use the results of this evaluation (CIHE staff, Leadership Legacy course committee members, and past participants interested in continuing to engage with the course through the legacy component) were initially engaged via requests for their input (utility). Of note, this evaluation was not requested by the Leadership Legacy course committee or CIHE and was completed in fulfillment of the UK DrPH program capstone requirement. Therefore, stakeholders were informed that requests for their input for this

project would not exceed the 2019-2020 academic year and would be a periodic and modest request on their time (feasibility). However, stakeholders who had in the past and would likely continue to identify both positive and negative aspects of Leadership Legacy were recognized and asked to participate (propriety). Finally, stakeholders were frequently engaged throughout the evaluation in order to accurately depict Leadership Legacy (accuracy).

Step 2: Describing the Program

Stakeholders were first each asked to describe Leadership Legacy to ensure consensus of a description of the program (Table 3). The CDC Framework advises discerning the following components in a logic model to fully describe the program and provide a foundation for the evaluation: 1) a program's inputs/resources necessary for its implementation 2) its activities, the actual interventions the program uses to achieve outcomes 3) the outputs, direct products obtained as a result of program activities 4) outcomes, the short-term, intermediate, long-term, and distal changes, impacts, or results of the program activities and outputs 5) the environmental context including any challenges the program faces.[8] Responses were received from three course committee members, two CIHE staff members, and four previous student participants. An informal analysis for major themes within the responses was conducted to distill them into key points, working forward from the inputs/resources. The key points were sent to stakeholders within a logic model depicting the relationships among the program's components for confirmation of an accurate description of the program. Stakeholders confirmed that the logic model was intelligible and easy to understand (addressing the CDC Framework's priority of utility), contained activities and outcomes within direct control of the program (feasibility), spoke to all aspects of the program (propriety), and was comprehensive (accuracy). Additionally, responding stakeholders concurred that the program evaluation should consider that the program was in the maintenance phase, having existed with minimal adjustments for several years.

Step 3: Focusing the Evaluation Design

With the assistance of the logic model and in recognition of Leadership Legacy being in a maintenance phase, work began to determine the focus for the evaluation. A clear focus for the evaluation was crucial, given the current challenging factors faced by Leadership Legacy (Table 3). Stakeholders agreed that the six seminars currently in place were valuable and that the program contained sufficient inherent flexibility to allow the schedule of the seminars to continue to fluctuate while remaining high quality. For example, in the fall 2019 iteration of Leadership Legacy, the Political Advocacy Legislative Session became the last seminar of the course due to challenges reserving space and time at the Kentucky Capitol Annex in Frankfort. Stakeholders also frequently mentioned content experts from the community, UK faculty, and CIHE staff positively in their responses, emphasizing that they were valuable resources/inputs integral to the program. An evaluation focused on implementation of the program was therefore deemed unnecessary.

Although the stakeholder responses contained frequent mentions of the program producing graduates who had more respectful communication, more humility, a better understanding of their own future roles on a healthcare team as well as those of their colleagues, and enhanced leadership capabilities, questions arose about whether or not the program was actually collecting data to support these beliefs and if there was any way to provide stronger evidence that Leadership Legacy was actually producing those benefits. In response, it was decided that this evaluation would focus on Leadership Legacy's outcomes and effectiveness. Continued stakeholder discussion considered that students and their instructors commonly believed that most learners "already knew how to be respectful and humble in their communication" and that this could be an artifact of the type of student admitted to a health professions program at UK who is also likely to pursue this type of skill development. Therefore, the focus of the evaluation question was further narrowed to pursuit of evidence that Leadership Legacy was actually graduating students who had a better understanding of their own future roles as well as

those of their colleagues in other health professions and whether these students were also graduating from the program with enhanced leadership capabilities.

As with other components of this evaluation, the aforementioned CDC priorities guided the process. For example, utility considerations highlighted the fact that this evaluation of Leadership Legacy would be most useful (for stakeholders and for the purposes of the DrPH capstone) as a means to determine the true effects of the program with the potential to improve it by identifying components that may need adjustment. Feasibility considerations acknowledged that there were enough political and financial resources to sustain Leadership Legacy and potentially implement suggested findings from this evaluation. The focus and design of this evaluation appropriately included examination of the experiences of those affected by the program. Finally, there was an accurate alignment of both the evaluation's focus and design to generate meaningful information.

Step 4: Gathering Credible Evidence

After working with stakeholders to narrow the focus of the evaluation and develop guiding questions, the evaluation proceeded to gathering credible evidence. Per the CDC Framework guidelines, this process incorporated considerations of indicators, sources of evidence and the methods of data collection, the quality and quantity of evidence gathered, and other logistics. Given the amount of data collected from program participants at the beginning and closing of each semester of Leadership Legacy, indicators included learner responses to the course evaluation instruments. Course evaluation instruments addressed student perceptions of knowledge acquisition, effect of the course, and plans to utilize newly acquired skills during future professional practice. Methods of data collection included primary data collection in the form of discussion with stakeholders and secondary data collection from program evaluations completed by Leadership Legacy participants. The quality of the data collected benefited from the fact that the creators of the Leadership Legacy evaluation instruments were teams of faculty and staff with both experience and expertise in measuring learning outcomes. A sufficient

quantity of data was available from years of Leadership Legacy cohorts. Finally, the logistics of data collection protected participant's confidentiality, as the evaluations had been previously de-identified, and information gathered from the evaluations was only shared in aggregate via presentation of this DrPH capstone's findings.

Processes for gathering credible evidence were constructed to meet the CDC priority areas of utility, feasibility, propriety, and accuracy. The evidence collected came directly from stakeholders and previous participants, lending it credibility (utility). The evidence sources of stakeholder discussions and program evaluations were both affordable and readily available, given the timeline of the evaluation (feasibility). Student graduates of Leadership Legacy did not have issues with literacy nor were the evaluation questions significantly different than the types of question the students commonly answered to evaluate their experiences in their other courses (propriety). Finally, questions about personal knowledge acquisition and demonstration of newly acquired skills were concepts that respondents were likely to know and be able to articulate (accuracy).

Chapter 4: Results

Step 5: Justifying Conclusions

After gathering evidence, the fifth step in the CDC Framework mandates that the evaluator not only analyze and interpret the data but also draw conclusions and clarify implications for stakeholders. It is crucial for the evaluator to draw conclusions utilizing stakeholders' values and their concepts of what constitutes programmatic success. This process can be complicated by stakeholders bringing differing values to the evaluation process depending upon their position. However, in the case of Leadership Legacy, stakeholders were almost uniform in their indication that they valued not only the course producing positive change for students but also that change being measurable and thus more robust. Per the CDC Framework, these values aligned with standards for successful program performance being focused not only on the judgements of participants but also on stated program mission and objectives

and performance by similar academic programs. Keeping these values in mind, the focused evaluation questions of whether the program was producing an enhanced understanding of one's own role and of the roles of one's colleagues and whether students were graduating with enhanced leadership capabilities were explored.

Findings for Outcome of Enhanced Understanding of Own Role and Roles of Colleagues

Primary data collection from stakeholders first focused on Leadership Legacy enhancing participants' understanding of their own roles and the roles of their colleagues. Stakeholders identified the following: "there is a better understanding of what the various disciplines do and how they interact with each other in practice"; "the course interventions bring together students from different professions for exploration of…perspectives of professions outside one's own"; "the course creates an understanding of extraprofessional scopes of practice"; "the course enhances understanding of other professions and external views of the student's own profession"; and "the course leaves learners with more knowledge and greater appreciation and understanding for their own profession". The logic model created in collaboration with stakeholders included an output of students gaining a "better understanding of own and others' roles and how they interact with each other in practice settings" to characterize this feedback (Table 3).

These primary data were considered in conjunction with secondary data from evaluations from previous and the current academic year. Evaluations from 2014-2015, 2015-2016, 2016-2017, 2017-2018, 2018-2019, and 2019-2020 were available for analysis. The majority of evaluations from 2011-2012 and 2012-2013 were missing or incomplete. As mentioned previously, Leadership Legacy was not held in 2013-2014 due to more significant programmatic revision. Upon examination of evaluation instruments, measurement of an enhanced understanding of roles was reflected in the items "Please describe the extent of your knowledge about the educational requirements for each of the following professions" and "Please describe the extent of your knowledge about the scope of practice of the

following professions". The "following professions" referred to in each question was a list constructed to reflect the professions who had participated in that year's Leadership Legacy cohort. Students were asked to consider both their own professional role and the roles of their colleagues. Responses for these items on the 2014-2015 and 2015-2016 evaluations were indicated using a Likert scale with "0" indicating nothing at all and "4" indicating the most. For subsequent years, the scale was transformed to 1-5 (transformations also made accordingly in Tables 5 and 6). These two scaled measures were utilized for all academic years for which data was available. Notably, academic years 2012-2013, 2014-2015, and 2015-2016 also included an additional item "this program increased my knowledge of another profession(s)" (Likert scale ranging from "1-Strongly Disagree" to "5- Strongly Agree"). However, the participating health programs have typically described information from students regarding the gains in knowledge of educational requirements and scope of practice of individual professions as more informative.

Academic year 2017-2018 also saw the introduction of the ICCAS, a retrospective post-test with reflective prompts based on "BEFORE participating in the program" and "AFTER…" using a scale of "1-Strongly Disagree" to "7-Strongly Agree". ICCAS includes items such as: "I was able to understand the abilities and contributions of interprofessional team members" (others' roles), "I was able to identify and describe my abilities and contributions to the interprofessional (IP) team" (own role), and "I was able to recognize how others' skills and knowledge complement and overlap with my own" (which may speak to a better understanding of both one's own role and the roles of others).[16] These ICCAS items were carried forward through the 2018-2019 academic year and into the 2019-2020 academic year cohort (Table 7).

Although stakeholders reported that program graduates gain an enhanced understanding of their own and the interprofessional roles of others, analysis of responses to the non-ICCAS and ICCAS items pertaining to professional identity development provided additional context. The non-ICCAS

questions regarding gains in knowledge of educational requirements and scopes of practice asked learners to consider not only the roles of others but also their own role. However, CIHE elected to focus on students' learning about the roles of others and did not thoroughly explore analysis of personal role learning, removing student responses to non-ICCAS items about their own program's educational requirements and scope of practice from data reports provided to all participating colleges. Therefore, although the non-ICCAS items had the potential to measure knowledge gains about one's own role, they were not being utilized in that manner. The ICCAS items concerned with learning about one's own role were not removed.

The non-ICCAS items corresponding to knowledge gains for other roles have had statistically significant positive shifts in mean scores over the course of the program for several of the academic years, indicating some success with regards to knowledge increases for the educational requirements and the scopes of practice for other professions (Tables 5 and 6).[1] The ICCAS items addressing knowledge gains for both one's own role and the roles of others also displayed statistically significant gains (Table 7). The judgements of stakeholders asserted that participants gained a better understanding of both their own roles and the roles of their colleagues; however, the additional stakeholder value of the appearance of robust evidence to support this assertion was less well-established. Notably, although an enhanced understanding of one's own role and the roles of colleagues could be inferred from such course objectives and competencies as "Engage in continuous professional and interprofessional development to enhance team performance and collaboration…" and "Describe the roles and practices of effective teams", an explicit statement of those goals for learners was also absent from the course competencies (Table 1).

Findings for Outcome of Enhanced Leadership Capabilities

When considering Leadership Legacy's ability to graduate participants with enhanced leadership capabilities, many stakeholders included positive change in foundational understanding of leadership or confidence in one's self as a leader as desirable outcomes that complemented the development of "actual" leadership skillsets such as conflict resolution. Stakeholders stated that "improvements in leadership, communication, and collaboration across the health professions are the most evident outcomes. These are not only evident in the school setting but can be seen in the clinical setting as well"; "longer term outcomes may also include creation of leaders within the healthcare system as we advance and further our education"; "outcomes of the program include knowledge of personality/leadership styles and application to the team's work (project)…"; "the program brings self-awareness of leadership style…"; "the program increases understanding of leadership and varying styles and includes an opportunity to show leadership style in a team environment…"; "…the outcomes include participants being more confident in their leadership roles"; "the program activities enhance interprofessional leadership skills of student participants"; and "the overarching product…a group of well-rounded leaders going out into the university and the world prepared to take on leadership roles wherever they choose…". The logic model created to reflect these statements included the outcome of "creation of more confident future leaders" (Table 3).

Secondary data from course evaluations demonstrated the presence of several items that aligned with the development of specific leadership skills motivating others and facilitating consensus. The 2012-2013 evaluation included the items "how effective do you think you are in motivating others toward a common goal?" and "how effective do you think you are in managing group conflict (facilitating consensus)?" using a scale of "0-Not at all" to "4-Very Much". Nine other items spoke to communication and teamwork but did not address participation that exceeded being a team member and progressed to serving as an actual leader with the exception of "I feel uncomfortable taking the lead

in a group" ("1-Strongly Disagree" to "4-Strongly Agree"). The evaluations from 2014-2015 and 2015-2016 included those questions with the addition of "by participating in this program I learned to…" "…apply leadership practices that support collaborative practice and team effectiveness" and "…give timely, sensitive, instructive feedback to others about their performance on the team" ("1-Strongly Disagree to 5- Strongly Agree").

The 2017-2018, 2018-2019, and 2019-2020 evaluations did not include the previously mentioned items but instead utilized ICCAS items pertaining to specific leadership skills providing feedback "I was able to provide constructive feedback to interprofessional (IP) team members" and managing team conflict "I was able to take into account the ideas of interprofessional (IP) team members" and "I was able to address team conflict in a respectful manner" (all inquiring about perceptions both before participating in Leadership Legacy and after and utilizing a scale of "1-Strongly Disagree" to "7-Strongly Agree" and including a "Not Applicable" option).[16] An additional, non-ICCAS item asked participants if "by participating in Leadership Legacy [they] learned to apply leadership practices that support collaborative practice and team effectiveness" (measured on a scale of "1-Not at All" to "5-A Great Deal"). Finally, multiple items again inquired about communication but did so in a manner that reflected on interprofessional communication as a team member but not, specifically, as a leader of that team.

Similar to the findings for the outcome of an enhanced understanding of the roles of others, statistically significant positive shifts have arisen over multiple cohorts for many of these items (Table 7). However, it was difficult to isolate the development of any specific leadership skill with the exception of conflict management and feedback agility from these evaluations. The course evaluations, although they examined many crucial behaviors that an effective team member and leader should possess, largely could not provide robust evidence that the leadership skills students develop during the course were standardized and measured. Additionally, an opportunity for better alignment of the course

competencies and evaluation items presented itself. Leadership skill-relevant competencies such as "negotiation and problem solving"; "giving timely, sensitive, instructive feedback to others about their performance on the team…"; and "applying leadership practices that support collaborative practice and effective teams" appeared in the competencies over the evolution of the course, however, their reinforcement during course activities and measurement on course evaluations has been variable (Table 1).

In completing the fifth step of the evaluation, the CDC Framework priority areas of utility, feasibility, propriety, and accuracy again provided overarching guidance for drawing conclusions. This process included careful consideration of the perspectives (three separate groups of stakeholders comprised of course committee faculty, students, and CIHE staff), procedures (comparison of stakeholder feedback and written course evaluations), and rationale (determination of whether desired outcomes were actually being achieved) used to interpret the findings (utility). The approach to this analysis and the interpretation of results was considered appropriate by both the stakeholders and the DrPH capstone course committee who recognized the (developing) level of expertise of and the (minimal) resources available to the evaluation author (feasibility). The standards and values of those least powerful and those most affected by the program (arguably the student participants) were taken into account in the consideration of their feedback as informative of an opportunity to improve Leadership Legacy (propriety). Finally, the conclusions could be justified to and understood by stakeholders, given that they were informed both by their own words and the course evaluations they either helped create or personally completed (accuracy).

Chapter 5: Discussion

Given the identified opportunity for better alignment of course competencies, development that may result from the activities, the stated gains reported by stakeholders, and the appearance of items measuring these gains on course evaluations, it is vital to note that the findings of this evaluation

do not implicate any failing on the part of Leadership Legacy to benefit participants. On the contrary, examples and reports of gains in knowledge and skill development were too abundant to ignore, even if not explicitly supported by evaluations. For example, one could argue that the Political Advocacy activity addressed leadership competencies pertaining to an understanding of social justice. The key lesson from this evaluation was that the recognition of this need for better alignment provides ample opportunity to strengthen the course and bolster its content by standardizing it and more explicitly incorporating measurement of development into course evaluations.

Chapter 6: Ensuring Use and Sharing Lessons Learned

With this in mind, plans for addressing the final step of the CDC Framework and ensuring the use of evaluation findings and sharing lessons learned proceeded. As previously mentioned, this evaluation was not sanctioned by either the Leadership Legacy course committee or the Center for Interprofessional Health Education but was completed in fulfillment of the DrPH capstone requirement. However, receiving the results of the evaluation was considered potentially beneficial to stakeholders, as students could gain a deeper understanding of and potentially learn additional lessons from a program they completed, and course committee faculty and Center staff could be made aware of actionable items to improve the course. Five elements (recommendations, preparation, feedback, follow-up, and dissemination) suggested by the CDC were used to develop plans for ensuring use of evaluation findings and sharing lessons learned.[8] Notably, the completion of this DrPH capstone project did not align with the Leadership Legacy course committee meeting for planning of the next cohort's experience. Thus, completion of the final step of the CDC Framework was planned to span two phases.

In the first phase, recommendations were developed and tailored to the audience comprised of the stakeholder groups who had originally provided data for this evaluation. Having been engaged throughout the process, many stakeholders were receptive to receiving recommendations drawn from evaluation conclusions. Recommendations pertained directly to identified conclusions and only included

suggestions that were feasible given financial and personnel (number of staff and designation of effort) constraints. These recommendations were compiled into a report to address the need for a dissemination plan appropriate for an academic audience (see Executive Report). To match the needs of the academic audience, the report was organized with sections that provided an overview of the context of the project, its evaluation methods, results, and discussion with recommendations.

Because evidence indicated that learners more consistently graduated Leadership Legacy with an enhanced understanding of the roles of their professional colleagues, these recommendations were intended to better address the measurement of a student's own professional identity development and the development of specific leadership skillsets. They included first revisiting the intent of Leadership Legacy to determine if leadership should remain part of the stated focus. After finalizing the intent of the course, its activities should then be examined to determine what leadership skills could most reliably be expected to emerge from each activity. This review would then inform an update to the course outcomes. Working in conjunction with activity leaders such as the panel of mock legislators in the Political Advocacy activity, the activities themselves should then be updated to more intentionally incorporate and attempt to standardize the appearance of expected specific skills. Pre-work such as an introductory article reading could then be introduced to prime students for the skill(s) they would likely encounter during the activity. The reflection assignments students have been completing following each activity should then be updated to explicitly address leadership skill development. These updates would be better served by modified course evaluations that better address course outcomes and incorporate measures of the emergence of specific leadership skills in developing leaders. The analysis of these course evaluations should also include the items demonstrating knowledge gains within one's own role.

In the second phase of this final step of the evaluation (following defense of the DrPH capstone project), the recommendations and full report will be shown to leadership from CIHE, the convening body of the Leadership Legacy course committee and organizer of any participation in the course on the

part of student alumni. The director of CIHE will then designate time during a future Leadership Legacy planning meeting to discuss the report with the other groups of stakeholders (course committee faculty and student alumni). Discussing the findings as a group will serve as the first step in exploring the potential positive and negative implications of the results and identifying different options for program improvement.[8] During this meeting, Center staff, course committee faculty, and student representatives will also have time allocated to providing feedback about both the report and any options for program improvement that are discussed. Additionally, the meeting will facilitate the creation of plans for follow-up in the form of additional meetings and the potential formation of work groups to help prevent misuse of results and attempt to prevent lessons learned from becoming lost or ignored.[8]

Although an opportunity to better align course outcomes, activity content, and evaluation instruments emerged from this evaluation, the findings must be considered in light of potential biases and limitations. Response bias may have been present within this evaluation in that the stakeholders who provided data may have been different in some way than the "average" stakeholder who did not respond to the request to provide feedback. Social desirability bias and/or the Hawthorne effect may also have been present, as stakeholders may have modified their responses to what they perceived the "right" or more socially desirable response was with the knowledge that their submissions would be read. The evaluation instruments themselves may have been subject to questions about validity and reliability. Although they were constructed by faculty and staff with experience in instructional design and evaluation, necessary validity and reliability testing may not have been conducted on evaluation items that were not adopted from peer-reviewed literature. Notably, the ICCAS is not intended to measure leadership skills and is instead recommended as a measure for capabilities in interprofessional teamwork. Additionally, this evaluation was also potentially limited by missing and incomplete data (the 2011-2012 and 2012-2013 course evaluations) that could have provided additional insight regarding the evaluation of course objectives. However, despite these biases, opportunities have also emerged to

revisit and re-evaluate Leadership Legacy with the CDC Framework to determine if recommendations created by this process have been implemented in a manner that constitutes programmatic success for stakeholders. Future research with the framework may also include evaluation of CIHE's other programs, given its clear and methodical guidance.

As with the completion of the other CDC Framework steps, the standards of utility, feasibility, propriety, and accuracy were prioritized during this stage. The creation of the report clearly described the evaluation, and the report will be disseminated in a manner that encourages follow-through by stakeholders via planning meetings (utility). The format of the report was appropriate given limited resources and the academic audience (feasibility). The evaluation findings contained within the report (including the limitations) will be made accessible not just to stakeholders who participated in the evaluation process but to others affected by it such as the Leadership Legacy course committee members who did not participate (propriety). Finally, the evaluation report impartially reflected evaluation findings (accuracy). It may have been more desirable to determine that Leadership Legacy, a program established in 2009 and held in high regard by many, was accomplishing the outcomes stakeholders hoped it was and measuring those accomplishments in a robust manner. However, it is ultimately more meaningful and vital to the program's survival to ensure that when changes needed to better serve future health professionals and assure that they are better prepared for their future practice are identified, they are addressed.

Appendix

Table 1. Learning Outcomes

AY 2009-2010; 2010-2011	AY 2011- 2012; 2012-2013; 2015-2016; 2016-2017	AY 2017-2018	AY 2018-2019; 2019-2020
❖ Teambuilding and Collaboration: Build positive interactions between third-year students that can be applied to their work on a ward team. ❖ Self-Awareness, Innovation, and Vision: Assess personal values, interests, and strengths/weaknesses to identify valuable skills one can bring to the team. ❖ Negotiation and Problem Solving: Present, discuss, and negotiate a treatment plan for a patient with a complex medical problem to advance understanding of resource management and situational leadership within organized medicine. ❖ Practicum: Apply leadership competencies to advance understanding of project management, conflict management, and people management as one will face it in today's healthcare society. Foster creative and effective collaboration, cooperation, and leadership to promote positive change. ❖ Legacy: Encourage and support team members to maintain their commitment and enthusiasm for enrichment and share these skills and experiences with other health professional students.	❖ Apply leadership practices that support collaborative practice and team effectiveness. ❖ Recognize how one's own uniqueness, including experience level, expertise, culture, power, and hierarchy within the healthcare team, contributes to effective communication, conflict resolution, and positive interprofessional working relationships. ❖ Engage in continuous professional and interprofessional development to enhance team performance.	❖ Build positive interactions and attitudes between health professional students that can be applied to their work on an interprofessional health care team. ❖ Apply leadership practices that support collaborative practice and team effectiveness. ❖ Listen actively and encourage ideas and opinions of other team members. ❖ Respect the unique cultures, values, roles/responsibilities, and expertise of other health professions and the impact these factors can have on health outcomes. ❖ Give timely, sensitive, instructive feedback to others about their performance on the team, responding respectfully as a team member to feedback from others. ❖ Encourage and support team members to maintain their commitment and enthusiasm for enrichment and share these skills and experiences with other health professional students (Legacy).	❖ Recognize and embrace the cultural diversity and individual differences that characterize the health team. ❖ Respect the unique cultures, values, roles/responsibilities, and expertise of other health professions and the impact these factors can have on health outcomes. ❖ Listen actively and encourage ideas and opinions of other team members. ❖ Give timely, sensitive, instructive feedback to others about their performance on the team, responding respectfully as a team member to feedback from others. ❖ Recognize how one's uniqueness contributes to effective communication, conflict resolution, and positive interprofessional working relationships. ❖ Engage in continuous professional and interprofessional development to enhance team performance and collaboration, and share these skills and experiences with other health professional students. ❖ Describe the roles and practices of effective teams. ❖ Apply leadership practices that support collaborative practice and team effectiveness. ❖ Reflect on individual and team performance for individual, as well as team, performance improvement.

Table 2. Workshops Following Initial Retreat Prior to 2018

Workshop	Description
Speed Mentoring	Learners meet with a diverse group of leaders from UK and the surrounding community to discuss their paths to leadership.
Political Advocacy	Participants plan a project addressing a pressing health need. They deliver their proposals to a panel of current and former Kentucky legislators and community leaders during a mock legislative hearing in the state capitol intended to build leadership capabilities within the context of political advocacy.
Negotiation Skills Simulation	Participants take part in a simulation developed by Harvard Law School to enhance negotiation skills and improve understanding of community engagement.
Herd Dynamics for Leaders	Learners engage in equine-guided leadership development at a local horse farm to learn leadership competencies that are translatable to working with others in a variety of contexts.

Fig. 1 Centers for Disease Control and Prevention Framework for Program Evaluation

Previously published by Centers for Disease Control and Prevention. In: A Framework for program evaluation. CDC Program Performance and Evaluation Office. https://www.cdc.gov/eval/framework/index.htm.

Table 3. Conceptual Model of Leadership Legacy

Inputs	Activities	Outputs	Outcomes
❖ Content experts from within the community to lead the seminars. ❖ Faculty liaisons to recruit students, manage absences, serve on course committee, facilitate. ❖ Funding. ❖ Space for activities. ❖ Staffing-administrative support. ❖ Students interested in developing their leadership skills and recruiting future participants. ❖ Time.	❖ Brainstorming about how to develop action plans using leadership skills that will positively impact communities. ❖ Bringing together students from different professions. ❖ DISC Assessment. ❖ The individual seminars themselves. ❖ Team discussions, sharing. ❖ Student written reflections.	❖ Assessments via direct observation. ❖ Awareness of the problems caused by poor communication. ❖ Better understanding of own and others' roles and how they interact with each other in practice settings. ❖ Decreased fear approaching other professionals with concerns. ❖ Relationships among future professionals from different programs. ❖ Student self-discovery and reflection on personality/leadership styles and behaviors/traits such as strengths and challenges in communicating, respectful and inclusive consensus-building.	❖ Creation of more confident future leaders. ❖ Improvements in patient care. ❖ Students better prepared to work in interprofessional teams. ❖ Students communicating with humility and respect. ❖ Students valuing other professionals' input & perspectives.

Environmental Context:
Stage of Development: Program has been occurring for approximately 10 years and could be considered to be in the maintenance phase.

Facilitating Factors:
- ❖ Variety of class formats/venues and hands-on learning experiences outside of the classroom.
- ❖ Transparency of course policies and open dialogue regarding scheduling conflicts in student schedules.

Challenging Factors:
- ❖ Varying levels of student readiness for simulation model and observer feedback and engagement in project work.
- ❖ Fluctuating levels of support and interest from participating programs.
- ❖ Questions of return on investment when reaching only a small cohort.
- ❖ Small Center staff facing potential opportunity costs due to effort needed to run Leadership Legacy.
- ❖ Student recruitment challenges. Adding Leadership Legacy to an already full schedule can be/seem overwhelming.
- ❖ Increasing costs associated with the program: farm rental, gas mileage reimbursement, catered meals, graduation gifts.

Table 4. Interprofessional Cohorts by Year of Participation

Profession	2015	2016	2017	2018	2018-Fall	2019-Fall	Total
Nursing	3	4	3	2	1	2	15
Dentistry	2	1	0	2	2	1	8
Physician Assistant	0	0	2	2	0	0	4
Pharmacy	6	5	4	6	4	6	31
Physical Therapy	5	5	2	5	1	3	21
Medicine	4	3	5	1	0	0	13
Public Health	2	0	2	0	3	3	10
Social Work	0	0	0	1	0	0	1
Communication and Speech Disorders	2	0	2	2	1	0	7
Total	24	18	20	21	12	15	110

Table 5. Results for Knowledge of Other Professions' Educational Requirements

Profession	Edu. Reqs 2015			Edu. Reqs 2016			Edu. Reqs 2017			Edu. Reqs 2018			Edu. Reqs 2018-Fall			Edu. Reqs 2019-Fall		
	Pre	Post	*P*	Pre	Post	*P*	Pre	Post	*P*	Pre	Post	*P*	Pre	Post	*P*	Pre	Post	*P*
Nurse	3.58 (0.77)	4.32 (0.67)	0.001**	3.57 (0.76)	3.93 (0.83)	0.136	3.00 (0.89)	3.81 (0.83)	0.010*	3.35 (0.93)	3.82 (0.88)	0.041*	3.22 (1.09)	3.78 (0.97)	0.051*	3.22 (0.67)	4.22 (0.67)	0.017*
Dentist	3.05 (0.76)	4.20 (0.62)	0.000**	2.88 (0.93)	3.71 (0.85)	0.004**	2.95 (1.03)	3.11 (1.10)	.625	3.12 (1.11)	3.94 (0.83)	0.003**	3.00 (1.23)	4.00 (1.32)	0.017*	2.89 (1.05)	3.78 (0.83)	0.069
Physician Assistant	3.68 (0.72)	3.86 (0.99)	0.329	3.11 (0.90)	3.78 (0.73)	0.004**	2.83 (0.92)	3.83 (0.79)	.005**	3.00 (0.94)	3.82 (0.95)	0.014*	2.70 (1.25)	3.20 (1.48)	0.213*	3.60 (0.97)	3.40 (1.08)	0.555
Pharmacist	3.89 (0.96)	4.56 (0.51)	0.002**	3.15 (0.90)	4.08 (0.76)	0.002**	3.53 (0.99)	3.87 (0.64)	.173	3.29 (0.91)	4.00 (0.88)	0.035*	3.00 (0.89)	4.17 (1.17)	0.013*	3.00 (1.16)	3.71 (0.49)	0.140
Physical Therapist	2.69 (0.95)	4.13 (0.81)	0.000**	2.77 (1.24)	3.85 (0.90)	0.009*	2.71 (1.16)	3.47 (0.87)	.028*	2.93 (1.07)	4.00 (0.78)	0.001**	2.44 (1.24)	4.11 (1.17)	0.000**	2.50 (0.93)	4.25 (0.89)	0.017*
Physician	4.16 (0.69)	4.53 (0.51)	0.069	3.67 (0.62)	4.40 (0.51)	0.001**	3.50 (1.02)	4.14 (0.77)	.069	3.44 (1.04)	4.06 (0.94)	0.045*	3.80 (1.03)	3.90 (1.29)	0.591	3.70 (0.95)	4.10 (0.88)	0.269
Public Health Professional	2.50 (1.24)	3.80 (0.77)	0.000**	1.72 (0.83)	2.67 (0.97)	0.000**	2.29 (0.69)	3.06 (0.90)	.011*	2.58 (0.96)	2.95 (1.27)	0.130	2.00 (1.07)	2.88 (1.25)	0.006**	2.00 (0.82)	3.57 (0.98)	0.052*
Social Worker	2.41 (1.01)	3.50 (0.74)	0.000**	2.22 (1.06)	2.72 (0.90)	0.024*	N/A	N/A	N/A	2.56 (1.04)	3.39 (0.98)	0.001**	2.40 (1.43)	3.00 (1.25)	0.239	2.40 (0.84)	2.40 (1.08)	1.000
Speech Pathologist	2.85 (1.23)	3.95 (0.76)	0.000**	2.39 (1.15)	2.83 (0.79)	0.042*	2.29 (1.05)	3.41 (0.87)	.005**	2.50 (1.15)	3.61 (1.15)	0.000**	2.33 (1.12)	3.78 (0.83)	0.003**	2.30 (0.95)	2.10 (0.88)	0.509

*Statistical significance (*P*<0.05) before Bonferroni correction. **Statistical significance after Bonferroni correction. (SD): Standard deviation. Scale: 1= nothing at all to 5= the most. All data for spring semester except where otherwise noted. Not all professions represented in evaluations all years.

Table 6. Results for Knowledge of Other Professions' Scopes of Practice

Profession	Scope 2015			Scope 2016			Scope 2017			Scope 2018			Scope 2018-Fall			Scope 2019-Fall		
	Pre	Post	*P*	Pre	Post	*P*	Pre	Post	*P*	Pre	Post	*P*	Pre	Post	*P*	Pre	Post	*P*
Nurse	4.05 (0.90)	4.36 (0.85)	0.090	3.71 (0.91)	4.07 (0.83)	0.136	3.44 (0.63)	3.88 (0.81)	0.004**	3.65 (0.61)	4.12 (0.86)	0.72	3.33 (1.00)	4.22 (0.67)	0.052*	3.67 (0.87)	4.33 (0.87)	0.111
Dentist	3.59 (1.01)	4.27 (0.77)	0.001**	3.24 (1.09)	3.88 (0.93)	0.037*	3.32 (0.82)	3.26 (1.10)	0.790	3.47 (0.62)	4.06 (0.75)	0.008*	4.22 (0.97)	4.33 (0.87)	0.760	3.67 (1.23)	4.11 (0.78)	0.272
Physician Assistant	3.77 (0.87)	3.77 (0.87)	1.000	3.11 (0.83)	4.11 (0.68)	0.000**	2.94 (0.73)	3.72 (0.75)	0.000**	3.24 (0.90)	3.88 (0.86)	0.007*	3.22 (1.48)	3.44 (1.13)	0.347	3.50 (1.08)	3.60 (1.27)	0.864
Pharmacist	4.00 (1.00)	4.38 (0.81)	0.057**	3.46 (0.97)	4.23 (0.73)	0.018*	3.80 (0.86)	4.13 (0.92)	0.265	3.57 (0.65)	4.14 (0.66)	0.014*	3.17 (0.98)	4.17 (0.98)	0.111	3.14 (1.35)	4.14 (0.90)	0.134
Physical Therapist	3.45 (1.30)	4.32 (0.84)	0.003**	3.33 (1.16)	3.83 (0.94)	0.082	3.18 (0.73)	3.88 (0.60)	0.001**	3.21 (0.70)	4.07 (0.62)	0.003**	3.33 (1.23)	4.00 (1.23)	0.081	2.50 (0.93)	4.13 (0.84)	0.029*
Physician	4.36 (0.85)	4.55 (0.74)	0.257	4.13 (0.64)	4.40 (0.91)	0.301	3.93 (0.73)	4.21 (0.70)	0.165	3.83 (0.99)	4.39 (0.61)	0.008*	4.10 (1.10)	4.30 (0.82)	0.443	3.70 (1.25)	4.10 (0.99)	0.373
Public Health Professional	2.77 (1.38)	3.59 (1.14)	0.005**	2.00 (1.03)	2.78 (0.88)	0.009*	2.29 (0.69)	3.12 (0.99)	0.018*	2.68 (0.89)	2.95 (1.18)	0.331	2.00 (0.93)	3.25 (1.17)	0.002**	2.14 (0.90)	3.71 (1.11)	0.062
Social Worker	2.82 (1.01)	3.45 (0.74)	0.007*	2.44 (0.98)	3.11 (0.83)	0.055	N/A	N/A	N/A	2.67 (0.84)	3.67 (0.69)	0.001**	2.40 (1.43)	3.00 (1.25)	0.239	2.60 (1.17)	2.70 (0.95)	0.823
Speech Pathologist	3.32 (1.04)	3.86 (0.89)	0.011*	3.00 (0.97)	3.22 (1.00)	0.466	2.41 (0.94)	3.65 (0.86)	0.000**	2.78 (0.94)	3.61 (0.92)	0.001**	2.33 (1.12)	3.78 (0.83)	0.003**	2.50 (0.97)	2.30 (1.06)	0.662

*Statistical significance (*P*<0.05) before Bonferroni correction. **Statistical significance after Bonferroni correction. (SD): Standard deviation. Scale: 1= nothing at all to 5= the most. All data for spring semester except where otherwise noted. Not all professions represented in evaluations all years.

Table 7. ICCAS Items Pertaining to Roles and Leadership Skill Development

Item "I was able to…"	2017			2018			2018-Fall			2019-Fall		
	Pre	Post	*P*	Pre	Post	*P*	Pre	Post	*P*	Pre	Post	*P*
Understand the abilities and contributions of interprofessional team members.	5.18 (1.43)	6.41 (0.80)	0.003**	5.25 (1.33)	6.50 (0.69)	0.000**	4.00 (1.10)	6.36 (0.81)	0.000**	5.40 (1.08)	6.60 (0.84)	0.005**
Identify and describe my abilities and contributions to the interprofessional team.	5.18 (0.95)	6.53 (0.80)	0.000***	5.35 (1.09)	6.45 (0.69)	0.000**	4.18 (1.25)	6.09 (0.83)	0.001**	5.80 (0.92)	6.70 (0.68)	0.004**
Recognize how others' skills and knowledge complement and overlap with my own.	5.24 (1.03)	6.65 (0.70)	0.000**	5.05 (1.32)	6.50 (0.69)	0.000**	4.27 (1.19)	6.64 (0.51)	0.000**	5.60 (1.35)	6.70 (0.68)	0.024*
Provide constructive feedback to IP team members.	5.41 (1.18)	6.65 (0.70)	0.000**	5.40 (1.43)	6.45 (0.70)	0.002**	3.73 (1.79)	5.82 (1.08)	0.001**	5.10 (1.60)	5.90 (1.10)	0.153
Take into account the ideas of IP team members.	5.71 (0.77)	6.65 (0.49)	0.000**	5.75 (0.97)	6.45 (0.61)	0.002**	5.27 (0.91)	6.18 (0.98)	0.010**	5.70 (1.06)	6.80 (0.63)	0.003**
Address team conflict in a respectful manner.	5.47 (1.13)	6.88 (0.49)	0.000**	6.05 (0.89)	6.40 (0.82)	0.015*	4.64 (1.43)	5.82 (1.17)	0.005*	5.60 (1.35)	6.50 (0.71)	0.019*

*Statistical significance (*P*<0.05) before Bonferroni correction. **Statistical significance after Bonferroni correction. (SD): Standard deviation. Scale: 1=Strongly Disagree to 7= Strongly Agree. All data for spring semester except where otherwise noted. Not all professions represented in evaluations all years.

Executive Report

Background: In completion of a Doctor of Public Health degree, a program evaluation of Leadership Legacy was conducted by DrPH student and Center for Interprofessional Health Education Health Education (CIHE) Coordinator Madeline Aulisio. The evaluation first considered the history and evolution of Leadership Legacy since its inception in the UK College of Medicine in 2009 to the present day as an elective offering of CIHE. Stakeholders from the Leadership Legacy course committee, Leadership Legacy student alumni, and CIHE staff provided valuable input to guide the evaluation.

Data obtained from stakeholder feedback informed development of an initial logic model of Leadership Legacy depicting its inputs (the resources necessary for its implementation), activities (the actual interventions used to achieve outcomes), outputs (the direct products obtained as a result of program activities), and outcomes (the short-term, intermediate, long-term, and distal results from the program's activities and outputs), as well as the environment in which the course operates including the factors that facilitate its continuation and those that hinder it. Examination of the logic model and consideration of the program's age and place within the Center's offerings focused the evaluation on two questions about the types of outcomes Leadership Legacy was producing: 1) whether there was evidence that Leadership Legacy was graduating learners who had a better understanding of their own future roles as well as those of their colleagues in other health professions and 2) whether these students were also graduating from the program with enhanced leadership capabilities.

Evaluation Methods: The six-step Centers for Disease Control and Prevention Evaluation Framework, a trusted approach appropriate for use with programs as large as those at the federal level to those that are smaller and local, was utilized to guide the evaluation process. Stakeholders (student alumni, course committee faculty, CIHE staff members) were first engaged and then asked to contribute to the development of a description of Leadership Legacy via the logic model. This description of the program directed the focus of the evaluation to examination of whether desired outcomes were being achieved.

Gathering credible evidence both from stakeholders and previous Leadership Legacy evaluation responses then commenced. After evidence gathering was complete, conclusions were drawn and justified, prioritizing stakeholder values of Leadership Legacy not only facilitating positive change for students but also producing change that was measurable and thus more robust. The final step, ensuring the use of evaluation findings and sharing lessons learned, was addressed in the sharing of the evaluation with CIHE leadership, the creation of this report, and discussion of this report during a course committee meeting.

While adhering to the six steps of the CDC Framework and prioritizing stakeholder values, four standards were also at the forefront of each phase of the evaluation: utility (ensuring that the evaluation produced relevant, timely information to the appropriate audience), feasibility (ensuring that completion of the evaluation steps was realistic given available time, resources, and evaluator expertise), propriety (ensuring that the evaluation engaged those most directly affected by Leadership Legacy), and accuracy (ensuring that the evaluation findings were valid and reliable, given the needs of stakeholders).

Results: With regards to whether students graduate from Leadership Legacy with a better understanding of their own future professional roles and those of their colleagues, stakeholders provided affirmative responses such as "[upon completion of Leadership Legacy] there is a better understanding of what the various disciplines do and how they interact with each other in practice". Analysis of course evaluations determined that this enhanced understanding was addressed by items inquiring about the extent of one's knowledge about the educational requirements and scopes of practice for participating professions (measured by Likert scale). In addition to these items, enhanced understanding was also measured by items from Archibald's (2014) Interprofessional Collaborative Competency Attainment Survey (ICCAS) examining ability to understand the capabilities and contributions of interprofessional team members (others' roles), the ability to identify and describe

one's capabilities and contributions to the interprofessional (IP) team (own role), and the ability to recognize how others' skills and knowledge complement and overlap with one's own" (both one's own role and the roles of others). Several academic years of statistically significant positive shifts in mean scores for these items indicated that students have likely been learning about their own future professional role as well as the roles of others. However, this evidence is derived from analysis of the ICCAS items. The analysis of non-ICCAS items has historically been removing responses from students about their gains in knowledge of their own profession's educational requirements and scopes of practice in an effort to focus on the role learning of others, given that students entered Leadership Legacy at various points in their didactic training and thus had great variability in the development of the understanding of their own role. Therefore, the analysis of non-ICCAS items only indicated positive mean shifts for knowledge gains in the roles of others.

When asked about Leadership Legacy's ability to facilitate leadership skill development among participants, stakeholders described outcomes such as "improvements in leadership, communication, and collaboration across the health professions" and "a group of well-rounded leaders". Data from previously completed course evaluations, however, indicated that efforts to assess the development of individual leadership skills on the survey instruments did not begin to occur until the 2017-2018 academic year. ICCAS items measuring skills identified in the literature as distinctly pertaining to leadership such as conflict resolution and feedback agility were added to the evaluation. Although statistically significant positive mean shifts on many of these items for several academic years similarly indicated that students were developing select leadership skills, it became apparent that the evaluations did not have the ability to make the broad claims that the student graduates had developed a more complete leadership skillset and were exercising what they had learned from the class.

In summary, an opportunity emerged during this evaluation to better align what the course learning outcomes stated the course would achieve, what students actually learned, and what the

evaluation items measured. For example, the most recent learning outcomes reflected an intention that learners will "respect the unique cultures, values, roles/responsibilities, and expertise of other health professions…"; "listen actively and encourage ideas and opinions of other team members"; "give timely, sensitive, instructive feedback to others about their performance on the team…"; and "apply leadership practices that support collaborative practice and team effectiveness" upon completion of the course. These competencies are reflected in individual course evaluation items; however, this reflection does not indicate measurement of a robust arsenal of leadership skills. Although the evaluation was potentially limited by a somewhat small number of participating stakeholders as well as missing data from the earliest years of the course, it provided insights that are useful for stakeholders and the ultimate preservation of Leadership Legacy.

Discussion and Recommendations: It cannot be stressed enough, however, that despite identification of opportunities for improvement, multiple students reported positive experiences and development through Leadership Legacy, indicating that the program was and continues to be valuable for participants. With that in mind, course objectives, student experiences, and course evaluations could be more closely aligned for future iterations of the course via the following recommendations: 1) stakeholders first determine if the course should continue to emphasize leadership 2) if the stakeholders choose to continue emphasizing Leadership Legacy's potential for improving participants' leadership skillsets, a review of the activities within Leadership Legacy should be conducted and leadership skills most likely to emerge within each activity identified, as informed by the literature 3) this review should then inform an update of course competencies in a broader effort to standardize the skill development of course participants 4) students should then be primed to connect these skills to the actual activity by the addition of pre-work (for example, reading an article about the skill development) 5) the facilitators of the activity such as the leader of the Herd Dynamics activity should also be made aware that certain skills have been distinctly connected to the course and asked to tailor and standardize their

presentations to more explicitly include them where appropriate 6) the reflection assignments students complete after each activity should also be updated to inquire more specifically about the intended skills development during the activity 7) finally, the evaluation instruments themselves will better serve the measurement of these updates if they more intentionally address course outcomes and incorporate tools useful to the evaluation of emerging leadership skillsets. Although the ICCAS has items that can pertain to the development of leadership competencies, it is admittedly an instrument intended to measure interprofessional teamwork that is being adapted for a use outside its purpose. Additionally, updates to the yearly evaluation processes should also include analysis of students' responses to knowledge gains for their *own* roles to provide additional data about whether they are in fact learning more about their own roles.

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