Leadership Development: Transitioning Scientists into Non-technical Leadership Roles

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DISSERTATION

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DISCLAIMER

The findings and conclusions in this report are those of the author(s) and do not necessarily represent the official position of the U.S. Centers for Disease Control and Prevention.
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# TABLE OF CONTENTS

I. Chapter 1: Background and Problem Statement
   A. Background
      i. The Silver Tsunami
      ii. Leadership Development
      iii. Context: A Federal Public Health Agency
   B. Statement of the Problem
   C. Research Questions
   D. Leadership Implications

II. Chapter 2: Theoretical and Conceptual and Framework
   A. Literature Review
      i. A Focus on Public Health Supervisors
      ii. Transitioning from Technical Experts to Supervisory Leader
      iii. Technical Experts at CDC
      iv. Performance Measurement and Management
   B. Conceptual Model

III. Chapter 3: Study Design, Data, and Methods
   A. Research Design and Methodology
      i. Description of Cases
   B. Data Collection and Analysis Plan
      i. Data Analysis
      ii. Data Management
   C. Validity Considerations

IV. Chapter 4: Results

V. Chapter 5: Discussion
   A. Conclusions and Recommendations for Change
   B. Leadership Development Framework
   C. Leadership Implications for Public Health
   D. Generalizability
   E. Strengths and Limitations
   F. Next Steps

Cited Literature
TABLE OF CONTENTS (continued)

Vita........................................................................................................................................140
Appendices..........................................................................................................................147
  Appendix A.......................................................................................................................147
  Appendix B.......................................................................................................................159
  Appendix C.......................................................................................................................164
  Appendix D.......................................................................................................................168
  Appendix E.......................................................................................................................169
  Appendix F.......................................................................................................................170
  Appendix G.......................................................................................................................171
  Appendix H.......................................................................................................................175
  Appendix I.......................................................................................................................184
LIST OF ABBREVIATIONS

ATSDR (Agency for Toxic Substances and Disease Registry)
CDC (U.S. Centers for Disease Control and Prevention)
CIO (Centers, Institutes, and Offices)
CSELS (Center for Surveillance, Epidemiology, and Laboratory Services)
DHHS (Department of Health and Human Services)
DrPH (Doctorate in Public Health)
EEI (Employee Engagement Index)
EVS (Employee Viewpoint Survey)
FTE (Full Time Employee)
GAO (Government Accountability Office)
GS (General Series)
HRO (Human Resources Office)
HRSA (Human Resources and Services Administration)
IDP (Individual Development Plan)
IOM (Institute of Medicine)
ILEAD (Initiative for Leadership Enhancement and Development)
IRB (Institutional Review Board)
LMI (Leadership Management Institute)
NCBDDD (National Center on Birth Defects and Developmental Disabilities)
NCCDPHP (National Center for Chronic Disease Prevention and Health Promotion)
NCEH (National Center for Environmental Health)
NCEZID (National Center for Emerging and Zoonotic Infectious Disease)
NCHHSTP (National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention)
NCHS (National Center for Health Statistics)
NCIPC (National Center for Injury Prevention and Control)
NCIRD (National Center for Immunization and Respiratory Diseases)
OPM (Office of Personnel Management)
PMAS (Performance Management Appraisal Process)
SOAR (Strengths, Opportunities, Aspirations, and desired Results)
LIST OF TABLES

TABLE I: C-coefficients for self-efficacy and most strongly select co-occurring facilitators ............50
TABLE II: C-coefficients for willingness and most strongly select co-occurring facilitators ............51
TABLE III: C-coefficients for taking initiative and most strongly select co-occurring facilitators .......53
TABLE IV: C-coefficients for personal facilitators (bold) and select co-occurring facilitators ............54
TABLE V: C-coefficients for mentor and co-occurring facilitators..................................................68
TABLE VI: C-coefficients for leadership support and co-occurring facilitators..............................72
TABLE VII: C-coefficients for leading an activity and co-occurring facilitators..............................77
TABLE VIII: C-coefficients for opportunity and co-occurring facilitators.......................................78
TABLE IX: Document review of hard copy documents and web pages related to leadership development to address research sub-question Q1e: What existing systems-level supports and processes can help promote the transition from technical expert to non-technical supervisory leader?.........................93
LIST OF FIGURES

FIGURE 1: CDC organizational structure, September 2015 ......................................................... 6
FIGURE 2: CDC’s NCBDDD Organizational Chart, Center, Division and Branch levels ................. 7
FIGURE 3: CDC, I LEAD Leadership Tiers .................................................................................. 19
FIGURE 4: The Performance Management Cycle; Armstrong, 2009 ........................................ 24
FIGURE 5: Conceptual Model: Transitioning Technical Experts into Successful
Non-technical Leaders .................................................................................................................. 26
FIGURE 6: Analytical approach: Descriptive embedded single case study .................................. 29
FIGURE 7: 4D cycle of appreciative inquiry ............................................................................... 31
FIGURE 8: Revised Conceptual Model: Transitioning Technical Experts into Successful
Non-technical Leaders .............................................................................................................. 96
FIGURE 9: Leadership Development Framework: Creating a Leadership Development Culture at CDC
by Maximizing and Enhancing Existing Platforms .................................................................. 115
# LIST OF APPENDICES

Appendix A: Document review, IPHS 699 ................................................................. 147  
Appendix B: Measurement table ................................................................................. 159  
Appendix C: Interview guide ...................................................................................... 164  
Appendix D: Critical incident form .............................................................................. 168  
Appendix E: Document review template ................................................................. 169  
Appendix F: SOAR assessment guide ...................................................................... 170  
Appendix G: A-priori codebook .............................................................................. 171  
Appendix H: Codes, Defined, Relevant Family (Personal and Cultural Facilitators only) ... 175  
Appendix I: Generic Leadership Development Framework ...................................... 184
SUMMARY

In a time of mass retirements, emerging public health issues crossing global boundaries and requiring rapid response, and an entry level workforce demanding investments in their development, the need for leaders who are ready and able to meet these challenges is salient. This changing landscape of the public health workforce provided the impetus for an examination of the personal and cultural facilitators that successful public health leaders who have transitioned from roles as technical experts to non-technical leaders, perceive as having been pivotal in their success. An appreciative inquiry, strengths-based approach guided this DrPH research. Twenty-one individual in-depth interviews, document reviews, and critical incident reports, as well as reflective journaling were utilized to gather data. A series of a-priori codes were developed, although emergent codes arose out of the analysis process.

There were several constructs that emerged from the analysis, underscoring the uniqueness of leadership trajectories at CDC. There were also many convergences. Mentors appeared to play important roles for many respondents, as did the willingness of the respondent to take on new roles and his/her initiative for these roles, such as volunteering for opportunities. Leadership support, Opportunities, and Leading an Activity emerged as the three constructs that, when co-occurring, appeared to be most strongly tied to the respondents’ transition experiences. The uniqueness of leadership development among laboratorians also emerged from this DrPH research, and further research into this sub-set of employees is warranted.

Organizations of all kinds that do not ensure for succession of their leaders at all levels of the organization run the risk of making themselves irrelevant in a changing landscape. Implementing a thoughtful and strategic leadership development program focused on developing multiple levels of leaders can be one way to help ensure that organizations remain relevant. The findings from this study highlight ways that CDC and other organizations can move forward with leadership development in a
SUMMARY (continued)

strategic way to help ensure that leadership development becomes a part of the organizational culture, rather than a check-the-box activity.
I. CHAPTER 1: BACKGROUND AND PROBLEM STATEMENT

A. Background

“By the end of 2015, more than 50 percent of the 7,746 senior executives in place at the beginning of 2011 will have left government, taking with them key institutional knowledge and critical skills.”
(Partnership for Public Service & Booz Allen Hamilton)

i. The Silver Tsunami

Although the economic recession during 2007-2009 slowed the retirement wave, retirements (U.S. Government Accountability Office (GAO), 2014; Maciag, 2013) have once again increased with improved economic times within all sectors of the workforce. Termed the *silver tsunami*, a simple query of this topic on the Internet yields almost two million results – indicating a heightened awareness of, and concern for, the mass retirement of an aging workforce and what this can mean for the structure and function of the future workforce.

By 2016, the numbers of individuals in the workforce under age 54 is expected to grow by only 2%, while those 65 years or older are expected to grow by 75%, resulting in one-third of the total U.S. workforce aged over 50 years (Heidkamp, 2012). Predictions released by the U.S. Census Bureau indicate that, by 2050, nearly 20 million U.S. workers will be aged 65 years or older. This represents an estimated 19% of the total U.S. workforce (Heidkamp, 2012). Additionally, organizations with large numbers of individuals born in the late 1960s and early 1970s, who fall just outside of the baby-boomer generational lines, are also not far from being eligible for retirement (Davidson et al, 2007). When including these individuals, many organizations face staggering numbers of retirement eligible employees who can walk out their doors at any moment, taking with them a depth and breadth of institutional memory and leadership.

The federal workforce is not exempt from this looming shift in the workforce landscape. According to the Government Accountability Office, over one-third of the federal government workforce, or an estimated 600,000 employees, will be eligible to retire by early Fall 2017 (GAO,
2014). When examining the public health workforce, almost half will be eligible to retire by 2020 (Center for State and Local Government Excellence, 2008), with the percentage of state health agency employees who are eligible to retire expected to increase to 25% by fiscal year 2016 (Association of State and Territorial Health Officials, 2014), and similar trends at the local level (National Association of County and City Health Officials, 2010). A recent study found the average worker to be aged 48 years and an estimated 38% reported having plans to leave governmental public health service by 2020 (Sellers et al, 2015). A recent survey conducted to identify what public health leaders viewed as critical skills needed to address the changing public health landscape found “systems thinking, communicating persuasively, change management, information and analytics, problem solving, and working with diverse populations as the top 6 competencies needed” (Kaufman 2014). Finally, central to the concern around the massive numbers of retirement-eligible staff within the federal public health system, is that many of these individuals are serving in key leadership roles within their organizations (Partnership for Public Service & Booz Allen Hamilton, 2011; Heishman, 2007).

A recent report on succession planning in the federal system found that “by the end of 2015, more than 50 percent of the 7,746 senior executives in place at the beginning of 2011 will have left government, taking with them key institutional knowledge and critical skills” (Jarris & Sellars, 2015; Partnership for Public Service & Booz Allen Hamilton, 2011). This loss of key skills is of vital significance since a loss of leadership, often with a wealth of experience, can have serious deleterious effects on an organization’s ability to continue functioning at high levels (GAO, 2014; MacDonald, 2013; Davidson et al, 2007; Mamprin, 2002). In an effort to address this, some federal agencies (PriceWaterhouseCoopers, 2006; GSA Office of Governmentwide Policy, 2001) have undertaken succession planning activities to identify ways to ensure continuity in leadership and other key positions; however, many agencies still do not have plans in place (Devlin, 2014). According to a recent survey, “federal agencies lack a unified succession planning strategy, do not align their program investments to
support human capital priorities, and operate in a culture steeped in outdated ways of addressing agency jobs and employee engagement. It is clear that agencies are neither preparing their workforces for the mission demands of tomorrow, nor putting steps in place to address the short-term challenges such as managing staff turnover, identifying high-potential employees and filling leadership voids” (Devlin, 2014). Having processes (Coonan, 2005; Mamprin, 2002) in place that include the development of leaders at all levels, then, can help provide the continuity in infrastructure for leadership and key positions.

ii. Leadership Development

“This shortage of leaders with relevant skills will not be remedied simply. What is needed is not a modest increase in the number of willing and able leaders for the field of public health, but rather a giant pool of qualified leaders from which to draw. The next generation of public health leaders should be readily visible among our younger colleagues today.”– William Roper, Leadership in Public Health

A sentinel report by the Institute of Medicine (IOM) in 1988 (Institute of Medicine, 1988) found deficiencies in the public health infrastructure, including workforce, and recommended that an overhaul of leadership training should be a priority. This report was followed by subsequent IOM reports (Institute of Medicine, 2007; Institute of Medicine, 2003), all emphasizing the importance of public health infrastructure development. Moreover, this focus on leadership development as essential to building and maintaining public health infrastructure has been a focus of other (Grimm et al, 2015; Perlino, 2006; Saleh et al, 2004; Halverson et al, 1997; Roper et al, 1992) publications since the initial IOM report was issued. In particular, public health researchers have expressed the need for ongoing development in management and leadership competencies (Burke et al, 2011; Porter et al, 2002; Roper et al, 1992), while structuring such development programs to ensure personal relevance and application of knowledge gains (Olson, 2013; Graham, 2005).

Given that there are various publications in the literature highlighting the need for public health leadership development, as well as the pointed IOM reports which provide a call to action for such programs, it is interesting that a recent publication by Grimm et al (2015) notes a gradual decline in the
number of leadership development program offerings since 2012 – a decline attributed to the “lack of outcome-based results and the lack of a manageable set of standardized skills needed for public health leadership.” In their publication, the authors cite the need for such programs to move beyond individual knowledge gains to identification of more broad-based pivotal leadership skills (Grimm et al, 2015). These authors, and others (Miner et al., 2005), go on to note that there has been a move toward competency-based approaches to leadership development, however, these approaches are not always effective at measuring performance since they do not assess application of competency to the individual’s current role (Grimm et al, 2015; Buckingham, 2003). This was echoed in a workforce report that found many public health employees view training opportunities as not aligning with position roles and responsibilities, or helping them to improve in their current roles (Davidson et al, 2007). It does not seem to be sufficient, then, to rely on a set of core public health leadership competencies (Public Health Foundation, 2014) that might not be relevant for the roles and responsibilities of individuals functioning in leadership capacities. Assessing those skills and behaviors that are critical to particular roles and then integrating these skills into leadership development programs can be one way to address this.

Finally, while public health infrastructure development is critical in all public health sectors, the 2014 State of Human Capital Report (Cornerstone, 2014) noted a particular lack of adequate leadership preparation among federal agencies. This finding was echoed by Dean et al (2014) who found that many development and capacity building initiatives have focused primarily “on state and local public health workers, and to a less extent on existing federal workers.” (Dean et al, 2014). With continuing waves of retirees, there is a need for many federal public health workers to step into leadership roles left vacant by retirees. Identifying and understanding factors that impact success in these roles, beyond stated competencies, seems of vital importance to be able to continue to enhance leadership development efforts for this workforce.
iii. Context: A Federal Public Health Agency

The U.S. Centers for Disease Control and Prevention (CDC), headquartered in Atlanta, Georgia, and one of 13 components under the Department of Health and Human Services (DHHS), is the nation’s premier public health agency (CDC, 2008). CDC first opened as the Communicable Disease Center on July 1, 1946. Since then, it has grown to employ an estimated 14,000 staff in over 170 occupations (CDC, 2015). CDC has expanded from an organization combatting the spread of malaria, to a public health agency with offices all over the world and made up of 10 distinct Centers focused on addressing a variety of health topics ranging from bioterrorism safety and security, chronic disease prevention and health promotion, and HIV/AIDS prevention, to obesity and overweight prevention, birth defects surveillance, and global health.

Approximately 25% of CDC’s Full Time Employee (FTE) population was eligible for retirement in fiscal year 2014 (personal communication, K.J., Human Resources Office (HRO), May 13, 2015), and an estimated 37% were eligible by 2020 (personal communication, K.Q., Human Resources Office, November 24, 2015). As a semi-hierarchical organization, CDC has several tiers of official leadership. There is an appointed Agency leader, under whom there are Centers, Institutes, and Offices (CIO) (FIGURE 1).
Each CIO has a director, under whom sit Division Directors, who supervise Branch Chiefs, who supervise Team Leaders (FIGURE 2: National Center on Birth Defects and Developmental Disabilities (NCBDDD), example of organizational structure at the Center level). Over the years, CDC has undergone several reorganizations in order to better align funding allocations with programmatic activities, and maximize its ability to provide public health services both effectively and efficiently. Although the administrative structure of the individual CIO can vary slightly, the leadership structure is essentially the same throughout the agency.
It is important to note that, as a federal agency, CDC is under a mandate by The Federal Workforce Flexibility Act of 2004 (GAO, 2005; GPO, 2004) to implement a succession program, in consultation with the Office of Personnel Management (OPM). A review of available human resources documents revealed that, although work has been done at CDC to date to address the mandate’s workforce planning directive, there is not yet a formal plan implemented or successes noted (Appendix A). The documents reviewed span as far back as 1999, and indicate that, over this time period, several working groups were formed, both at the broader CDC level and at the individual CIO levels, gaps and needs were identified and described, and plans and recommendations were developed for moving forward; however, there is no indication that follow through was given on these items. Further, many of
the individuals originally involved in those discussions have since retired from CDC and leadership has changed.

The Federal Workforce Flexibility Act of 2004 mandate is still in place, however, and CDC has continued to mobilize working group efforts to try and address the mandate. A primary focus of the mandate is the training of employees for the development of future managers (GAO, 2005) within the federal system. Given the numbers of retirees on the horizon, and the hierarchical organization of CDC requiring supervisory roles at all levels, this emphasis on training and development for managerial roles seems particularly relevant to CDC’s ongoing needs and the needs of the overall federal public health workforce noted in the broader literature.

Current leadership development at CDC is competency-based. Employees serving in a supervisory capacity are required to take leadership training every year. There is an introductory supervisory skills course offered for new supervisors as well. There are a wide number of leadership trainings available, yet, the majority are only available for individuals in team leader roles or above (Dean et al, 2014). Finally, an Agency-wide workforce need assessment completed in 2008 (CDC, 2008) that was included in the document review found concerns about the lack of adequate and timely training needed to move technical staff into leadership roles, and the interest of some of these staff in making this transition.

B. Statement of the Problem

Since its inception in 1946 as the Communicable Disease Center, CDC has grown to become the nation’s premier public health agency, recognized for its wealth and breadth of scientific expertise. As such, CDC’s workforce has become highly specialized in specific scientific areas. Scientific expertise has historically been the focus for recruitment, retention, and development of scientists—not leadership and managerial skills. Although CDC has excelled at developing scientists, many supervisory leaders
indicate not being adequately prepared for managerial responsibilities. With an estimated 25% of its current FTE workforce eligible for retirement, several years of flat funding levels, increased workloads, and fewer hires resulting in a smaller middle level of staff sandwiched between much larger numbers, it is necessary for many CDC scientists to quickly transition into non-technical leadership roles requiring traits, skills and knowledge beyond that of their current positions, training, and, at times, personalities. Identifying personal and contextual factors that are perceived as pivotal in transitioning scientists to successful non-scientific leaders is needed in order to better align human resources and training and development processes with the strengths and needs of employees at all levels. In addition, having a better understanding of what early public health career professionals perceive as the personal and contextual factors needed to successfully transition into non-technical leadership positions, and the availability and accessibility of systems supports, can inform CDC’s efforts to more strategically develop the leadership pipeline.

C. Research Questions

Because an exploration of public health leadership can take many roads, for purposes of this proposal, the focus will be on public health leadership development for supervisory roles within a federal context. With such large numbers of federal public health employees retiring within the next few years, the need to critically examine leadership development within this setting is of vital significance. As a scientific institution, a large percentage of staff are technically trained, and these staff are moving into non-technical supervisory roles – often demanding a new set of skills and behaviors.

The primary goal of this qualitative study is to identify and better understand how non-technical leaders who have transitioned from highly technical roles describe the facilitators that promote success in the leadership position. The primary study question was: Q1. How do non-technical leaders who have transitioned from highly technical roles describe the facilitators that promote
success in the leadership position? To assist in the exploration of this question, the following sub-questions were developed:

Q1a. What personal facilitators are pivotal in the transition from scientist to successful non-technical leader within a federal scientific organization?

Q1b. How have personal facilitators been pivotal in the transition from scientist to successful non-technical leader within a federal scientific organization?

Q1c. What cultural facilitators are pivotal in the transition from scientist to successful non-technical leader within a federal scientific organization?

Q1d. How have cultural facilitators been pivotal in the transition from scientist to successful non-technical leader within a federal scientific organization?

Q1e. What existing systems-level supports and processes can help promote the transition from technical expert to non-technical supervisory leader?

This study has five objectives. These are to: 1) identify personal facilitators perceived as pivotal in transitioning from technical expert to successful non-technical supervisory leader; 2) identify cultural facilitators perceived as pivotal in transitioning from technical expert to successful non-technical supervisory leader; 3) describe how identified personal and cultural facilitators promote success in the transition from technical expert to successful non-technical supervisory leader; 4) describe existing systems-level supports and processes that can promote the transition from technical expert to non-technical supervisory leader and; 5) provide recommendations to CDC’s HRO and individual Centers for integration into staff development, succession planning, and workforce planning initiatives. This final objective is key since CDC’s HRO is committed to continuing to advance workforce planning across CDC and support individual Centers in their efforts to do so. Immediate application of findings, then, is possible and feasible given the ongoing work in this area.
D. Leadership Implications

“The sooner leaders are developed, the more the organization benefits from all that they can contribute.” (GAO, 2008)

In 2003, the IOM released a report, The Future of the Public’s Health in the 21st Century (IOM, 2003). Through this report, the committee recommended that “leadership training, support and development should be a high priority for public health agencies and other organizations”; however, training needs still exist, opportunities appear piecemeal, and evaluation of existing programs has not been consistent. Further, although core leadership and management competencies exist, they only serve to provide a foundation for building additional development opportunities. The large numbers of retirees exiting public health organizations over the next few years’ provides the opportunity for a re-examination of how public health leaders are being developed at all levels.

Of note, scientific organizations, such as CDC, will likely need to fill many leadership vacancies with individuals who might be more technically trained rather than trained in supervision or non-scientific leadership. This presents several unique challenges; namely, how does an agency the size and scope of CDC identify high potential employees who are interested in moving beyond technical roles, provide effective developmental opportunities for these individuals who might not be trained in public health or in leadership or management or who might not have been exposed to these in their technical roles, and develop them early in their careers before they actually find themselves in a non-technical leadership role? Lastly, what can we learn about pivotal success factors from those technical staff who have transitioned into non-technical leadership roles, and how can we build upon these strengths to develop effective training and development opportunities for leaders at all levels?
II. Chapter 2: Theoretical and Conceptual Framework

A. Literature Review

i. A Focus on Public Health Supervisors

“The problems in supervisory selection reported over the past 30 years appear to persist. Supervisory selection is often based more heavily on technical expertise than on leadership competencies. Technical skills appear to be much more strongly emphasized than are supervisory skills in both job announcements and assessments.” - U.S. Merit Board report

Why is a focus on public health supervisors critical to public health infrastructure development? The National Academy of Public Administration (2003) issued a report indicating that front line supervisors within the Federal Service “are at the center of the Federal government’s leadership issues”, and “supervisors are the Federal government’s largest corporate leadership asset in sheer numbers and direct impact, yet they must be more adequately prepared and supported to perform at the level that current and future needs require.” Moreover, a body of research indicates that supervisory proficiency ranks among the key predictors of agency performance (Brewer, 2005; National Academy of Public Administration, 2003; Buckingham, 1999), while an extensive literature review found that “the most effective way to improve organizational performance is to improve first-level supervisors.” (Van der Waldt, 2004; Fuller, 2003) While investing in supervisory level development can improve work performance, morale, productivity, and overall employee engagement (Van der Waldt, 2004), a plethora of studies points to poor supervisory or management as the most common reason for employee attrition (National Academy of Public Administration, 2003), with “deficiencies in federal agency performance” reflecting more of a deficiency in supervision than in the employee (National Academy of Public Administration, 2003). With the current and looming exodus of retirees from the federal system, there is a need to grow and retain mid and junior level high-performing staff. If poor supervision and management, then, is resulting in employee attrition and loss, it appears that this area of workforce development would be a key area of examination.
Concerns around the *Silver Tsunami* has brought workforce development – and in particular leadership development at all levels - into the forefront. A 2010 report by the U.S. Merit System (U.S. Merit Systems Protection Board, 2010) covering a span of federal agencies found that only approximately one-third have invested in training and other activities to develop supervisory leaders, less than 2/3 of federal employees indicate having received training prior to, or during, their first year in new position, and of those who received training, almost half only received one week or less. Over three-quarters of individuals newly hired into supervisory roles indicated not receiving any training whatsoever in the foundational areas related to performance management. Moreover, the type of training was reported as either being insufficient in scope or too broad to meet the specific needs of the individual’s position (U.S. Merit Systems Protection Board, 2010) or helping them to grow their skills necessary in their current roles (Davidson, 2007). This has resulted in an inadequate numbers of employees ready and able to step into vacant key supervisory leadership positions (Coye, 1994). Not only does the lack of attention being given to the development of supervisors within the federal system negatively impact employee retention and result in the potential loss of high performing staff, but it can also have long term ramifications for successful succession planning initiatives and overall federal workforce infrastructure development. Finally, although this report covered the spectrum of federal agencies, a particular concern was noted for scientific/technical institutions; namely, the need to transition highly technical staff into management and leadership positions.

**ii. Transitioning from Technical Expert to Supervisory Leader**

“Leadership development is one of the single biggest challenges facing executives today. How can you decide who is ready to supervise others? What are the necessary character traits?” (Edizen Insights #8, 2001)

Not all public health employees have academic degrees in public health or have received formal public health training (CDC, 2001). Instead many have entered into the system from a variety of fields.
Moreover, technical areas, such as biostatistics and epidemiology, remain the core competency areas for these programs (Gebbie & Turnock, 2006). While an evolving population with changing public health demands (Grimm et al; 2015; National Association of County and City Health Officials, 2007) has created the need for a diversified public health workforce with crosscutting skills beyond those of a traditional discipline-specific approach (Kaufman, 2014), “decades of categorical funding have created a highly specialized and knowledgeable workforce that unfortunately lacks many of the foundational skills now most in demand”. Further, Gebbie and Turnock (2006) note that past approaches at workforce development have focused on a “pipeline model” that emphasizes the development of staff in specific disciplines and occupational series. As vacancies from retirees begin to emerge, many of which are in leadership positions, the next generation of employees in line to fill these roles appear to be highly technically skilled (Kaufman, 2014) but with little, if any, prior leadership development or hands-on leadership experience (Coye, 1994). As noted by the Thompson (2007), “unfortunately, those with the best ‘hard’ technical skills do not always make the best leaders.”

In the federal system, supervisors serving in scientific institutions are often selected based on years of technical achievements and expertise in a specific discipline rather than on demonstrated achievement of broad-based leadership competencies (U.S. Merit Systems Protection Board, 2010). Because the majority of federal career paths do not systematically provide for advancement in status or salaries for technical tracks, these individuals often seek advancement through supervisory positions (U.S. Merit Systems Protection Board, 2010). This finding was complemented by a review of supervisory position announcements by the U.S. Merit System (2010) which found that the need for technical skills was presented as the priority in position announcements, as compared to those related to supervisory skills. Because these positions are often written to be heavily technical, the dominant skills of technical applicants align with those in the announcement, resulting in “technical experts without an interest or aptitude in leadership being selected for supervisory roles” (U.S. Merit Systems Protection
Board, 2010). Once they enter the position, however, they find themselves in roles that require more leadership and management skills, and less or no technical skills. These “skill deficiencies amount to significant hurdles for technical experts as they try to become effective frontline leaders” (Lang, 2013).

A review of the literature examining the challenges faced by technical experts transitioning into leadership roles noted several similarities; namely, the need for them to draw on skills for their new leadership roles that they might not have developed through a career working in a highly technical area. As Eiser (2008) notes, as technical individuals move into leadership roles, “challenges largely arise from the fact that in their previous roles they put a strong emphasis on using data and logical reasoning. Learning the soft skills leaders use to manage people and teamwork – such as showing empathy and listening well – is typically not part of their education or training, and in many case these skills do not reflect their natural preferences.” Many of the skills that proved key to a technical position do not transfer in applicability to a leadership role in a non-technical position (Hurd, 2009; Sapienza, 2004). A report by the National Academy of Arts and Sciences (1995) found that scientists were highly specialized in their technical areas of interest and could not successfully adapt to broader role demands, while a report by Keegan (1997), and echoed by Brickley (2001), found that highly technical staff had to learn many non-technical skills once they were in a leadership role since these were not part of their technical career development to date.

Although the literature was scant in the area of transitioning technical staff into leadership roles, almost all documents reviewed emphasized the need for training and development. Federal agencies (Cornerstone, 2014) are not adequately preparing staff to step into leadership roles, and as Lichtveld and Cioffi note, the “public health workforce is not well served when workforce development is equated with random access to courses lacking substantive performance measures.” For scientific institutions, there is the added concern for how to prepare highly technical staff to step into non-technical leadership roles. As Hurd (2009) notes, “organizations must recognize both the needs of scientists in assuming
leadership roles and the value of leadership development for addressing those needs. The sooner leaders are developed, the more the organization benefits from all that they can contribute.” In this way, understanding what successful leaders identify and describe as those factors, beyond broad based leadership and management competencies, which promote success and build them into development programs for early career technical professionals can help complement and augment existing public health leadership development efforts within highly technical organizations.

iii. Technical Experts at CDC

“Scientists and technical professionals …typically have minimal experience, if any, in leading a team or overseeing the work of others.” CDC Competency Gap Assessment Report of Tier II Leadership; Technical Report. 2011

The development of an effective framework for leadership and management within the federal system has been a challenge for many organizations (Scott et al., 2011). OPM has attempted to address this challenge through the development of government-wide initiatives aimed at leadership development for federal government leaders, which include all major aspects of workforce planning (OPM, 2015). Based on the broader OPM initiatives, the Department of Health and Human Services (DHHS) developed a competency-based framework to address core and leadership competencies. CDC then tailored this DHHS framework to meet the needs of its own employees. The resulting CDC framework is called the Initiative for Leadership Enhancement and Development (ILEAD) framework. This framework is a CDC-developed competency-based framework of cross-cutting core competencies identified as necessary for success in leadership roles regardless of occupation. These competencies provide a basis for which CDC has developed and implemented a variety of training and learning opportunities.

In 2011, an assessment was conducted to better understand whether these training and learning opportunities had been successful in addressing the needs of CDC’s Tier II leadership, and in particular,
identify gaps in competencies that exist for Tier II leaders. In the ILEAD framework, Tier II leaders are defined as front-line supervisors and team leaders, and this is the level at which staff are considered to have entered into leadership ranks (Scott et al., 2011) at CDC.

The assessment found gaps due primarily to current promotion and leader selection processes that greatly emphasized technical expertise with less emphasis on demonstrated leadership ability, potential, and knowledge and skills for supervisory and leadership duties of these roles (Scott, 2011). The report found that many candidates applying for leadership positions had not had many opportunities to develop leadership skills in their more individualized team member role. The report (Scott et al., 2011) also found that position descriptions for leadership positions often attracted individuals with highly technical skills rather than broader leadership skills. This finding was similar to those found in the literature review as noted earlier. Also complementary to the broader literature review on this topic described earlier, this gap analysis (Scott et al., 2011) revealed that scientists and technical staff moved into leadership positions based more on their technical achievements than demonstrated leadership capacity to carry out the requirements of their new supervisory roles successfully.

An additional area explored in this assessment was that of CDC training alignment with identified gaps. Although the leadership roles require mastery of non-technical skills, the availability of such courses was lacking. Moreover, a recommendation was made to provide such training opportunities to individuals in the Tier I group who were identified as high potential for a future leadership position (Scott et al., 2011). Finally, an overarching recommendation was made for CDC to re-evaluate its current training offerings to ensure they are meeting the needs of an evolving workforce.

Although assessments done at CDC have aimed to better understand the challenges and gaps facing the technical workforce as they transition into non-technical roles, these assessments have not examined those factors that have actually promoted success in these transitions. With large numbers of retirees, there is a need to transition many technical staff into leadership roles that require skills beyond
their technical expertise. Being able to better capture the experiences of individuals who have successfully made that transition can provide valuable information to those working to advance leadership development activities at CDC.

iv. Performance Measurement and Management

“Individual performance is influenced by systems factors as well as person factors.” – Cardy & Dobbins, 1994.

In 2011, the Health Resources and Services Administration released a module introducing the concepts of performance measurement and management within the federal system (HRSA, 2011). In this module, performance measurement was defined as “a process by which an organization monitors important aspects of its programs, systems, and processes”, while performance management was defined as “a forward-looking process used to set goals and regularly check progress toward achieving those goals.” Both of these concepts were presented in the context of an overall quality improvement plan – in that data measures are collected that examine how well an organization is meeting, and acting upon, its intended goals.

Armstrong (2015) defines performance management as “the continuous process of improving performance by setting individual and team goals which are aligned to the strategic goals of the organization, planning performance to achieve the goals, reviewing and assessing progress, and developing the knowledge, skills, and abilities of people.” Two major components of performance management as outlined by Armstrong (2009) relate to defining roles and responsibilities and necessary skills and behaviors, and enabling individuals to develop their skills and competencies. However, Armstrong and Baron (1998) note that, "if competencies are not defined to determine which of them are associated with effective performance, then there is a danger that the competencies in themselves will lack validity and the assessments made by managers may lack reliability and validity.” In this way, not only is performance management concerned with achieving results but it also takes into account the
expectations of employee capabilities, in terms of the knowledge and abilities (Armstrong & Baron, 1998) necessary to achieve these results.

Performance management has evolved over time. Earlier attempts to manage performance, such as merit rating or management by objectives, were approaches that tended to be more of a one-time top-down appraisal based out of HR (Armstrong, 2015). More recent performance management approaches are future focused, in that they focus on continuous development of the individual and the evolution of the broader organization. As shown in FIGURE 4, performance management has been described as a cycle which allows for assessment and growth at multiple points in the process.

FIGURE 4: The Performance Management Cycle; Armstrong, 2009

Enhancing and managing performance is of great importance for high performing organizations, and for all levels of employment (Pulakos, 2004). In a 1957 sentinel article, Douglas MacGregor suggested a shift in how performance is viewed- a shift away from the view that the supervisor analyzes his/her employee, but rather that the employee “is examining himself in order to define not only his weaknesses but also his strengths and potentials.” This definition does not include the systems factors within which the individual’s performance takes place, however. Similarly, Cardy and Dobbins (1994)
note that performance appraisals generally address personal factors, or the lack thereof, as responsible for performance without accounting for the situational or contextual factors surrounding the individual. In this way, Armstrong and Baron (1998) note that a comprehensive approach to appraising employee performance must account not only for the individual’s performance but also for the context in which he or she has performed- “and importantly, this analysis should extend to the performance of the manager as a leader” (Armstrong & Baron, 1998). Because every organizational context, culture, and system is different, it is important to examine and identify those contextual factors that impact individual and collective performance in each unique setting.

Understanding what factors impact performance, then, can be necessary to promote success. A review of the performance management literature found that a number of authors (Armstrong, 2015; Armstrong & Baron, 1998; Harrison, 1997; Cardy & Dobbins, 1994; Vroom, 1964) have identified a set of factors that either influence or affect performance. In their 1998 sentinel work, performance management researchers Armstrong and Baron outline factors that affect performance and which should be accounted for in a performance management system. These factors are identified as 1) personal factors, or “the individual’s skill, competence, motivation, and commitment”; 2) leadership factors, or “the quality of encouragement, guidance, and support provided by managers and team leaders; 3) team factors, or “the quality of support provided by colleagues”; 4) systems factors, or the system of work and facilities provided by the organization, and; 5) contextual (situational) factors, or “the internal and external environmental pressures and changes”. These factors, both personal and external, account not only for “what individuals have done, but also the circumstances in which they have had to perform” (Armstrong & Baron, 1998).

For purposes of this DrPH research, personal factors were left as an individual category, while the factors of leadership, team, and context were linked under the sub-heading of cultural factors.
Further, the term *facilitators* rather than *factors* is used to describe the personal and culture variables in the conceptual model. This is to keep in alignment with a strength-based approach to this research.

**Personal Facilitators**

Armstrong and Baron identify personal factors impacting performance. As indicated earlier, these factors include an individual’s skill, competence, motivation, and commitment. A review of the literature was undertaken to further define each of these factors, keeping within the structure of this DrPH research. Skills as defined for this research are divided into both technical, scientific skills – those needed for a particular job function and non-technical skills (Hewes & Patterson, 2011). Motivation can be either intrinsic, like wanting to learn something new, or extrinsic like incentives (Müller et al., 2004; Ryan & Deci, 2000). Vroom (1964) depicted performance as an interaction between motivation and ability, indicating that individuals could not perform well without both of these. Competence (Hugees et al, 2011) is defined as the perceived self-efficacy or beliefs in one’s abilities. For purposes of this DrPH research, commitment (Workgroup for Community Health and Development, 2015) is defined a dedication to individual or organizational values.

**Cultural Facilitators**

Armstrong and Baron (1998) also identify contextual factors impacting performance. As indicated earlier, these factors include leadership, team, systems, and contextual factors. A review of the literature was undertaken to further define each of these factors, keeping within the structure of this DrPH research. Leadership as defined for this research refers to the presence of mentorship and coaching (Deans et al, 2007), and the provision of support (National Seminars Training, 2015; CDC, 2013). Team factors are defined by those ways in which team members and collegiality support leadership success (Stoner, 2015). For purposes of this DrPH research, systems are defined as the...
processes and policies in place, both within (i.e., details, job shadowing, and hiring processes) and external to CDC (i.e. fellowship opportunities with policies that require field placements), which support supervisory leadership success. Finally, contextual factors are those both in the internal CDC environment, such as trainings and development programs for leaders, and external CDC environment (i.e., external conferences, workshops, and training opportunities) that support supervisory leadership success.

**Systems Theory: What does this all mean?**

Systems theory posits that the world is made up of many interrelated systems, and views these systems both as individual pieces as well as complex integrated parts (Laszlo & Krippner, 1998). When applied to performance management, this theory forms the foundation for the belief that managing performance of individuals cannot be done in isolation, but rather needs to account for those systems and contextual factors that impact, and are impacted by, individual behavior. Although performance management per se, is not the central focus of this DrPH research, this field does lend the view of supervisory success as emanating both from individual action and contextual support. For this research, then, the individual’s success is viewed within his/her organizational culture, rather than solely as a product of his/her actions. How did the culture and individual interact to create success? What individual factors and systems factors were present? When and how were these created? And most importantly, how can an organization use this information to continue to build strengths within an organizational system.

As Coens and Jenkins (2002) indicate, “An organizational system is composed of the people who do the work but far more than that. Each part of the system has its own purpose but at the same time is dependent on the other parts. When combined with serious efforts toward improving the system and work environment, such initiatives (aimed at individual improvement, personal development, and goal
attainment) can significantly bolster organizational transformation.” To date, CDC has not attempted to examine how and why successful supervisors are achieving success. Understanding what factors exist in the organizational culture, and how they interact with those individual-level factors and vice versa, can allow for a more comprehensive and robust approach to positive systems change.

As mentioned earlier, CDC is under a federal mandate to implement succession planning. At the heart of succession planning is leadership development. This is a daunting task, and one that perhaps requires an innovative approach at how we view leadership development – a view less focused solely on the achievement of broad competencies, but rather on identifying how individuals have been able to be successful within their context and building those success factors into a leadership development scheme.

B. Conceptual Model

The conceptual model shown in FIGURE 5 provides a visual depiction of the process of identifying and describing those facilitators that positively impact success for technical experts who have transitioned into non-technical leadership roles. The model stems from the concept of leadership development, a central focus of both succession planning and, ultimately, workforce planning. The model highlights the factors identified in the performance management literature, which, for the purposes of this research, will serve as guideposts and ground the research in an existing frame; however, the presence of the other also allows for additional facilitators to emerge from the research.

As noted in the conceptual model, the line of inquiry for this research will be rooted in a strengths-based approach. An observation that emerged from the literature review, both broadly and from the documents available from CDC, was that much of the emphasis around workforce development for supervisors and for technical experts is on what is lacking, what needs improvement, or what the gaps are. Driving resources toward correcting problems and filling gaps can lead to a spiral of negativity (Cooperrider & Whitney, 2005). A strengths based approach flips the paradigm to one that approaches
what is going well in an organization rather than a focus on gaps (Cooperrider & Whitney, 2005). As stated by Peter Drucker, “The task of organizational leadership is to create an alignment of strengths in ways that make a system’s weaknesses irrelevant” (Cooperrider & Whitney, 2005). Further, discussion among workforce development working groups at CDC (CDC’s Diversity and Inclusion Executive Committee meeting notes; September 9, 2015) indicates that there is currently momentum at CDC to look at strengths and capitalize on what is being done well. In this way, a strengths-based approach would likely be viewed as a welcome design. A more in-depth discussion around the strengths-based design that will be utilized for this research will be discussed in Chapter 3.

The model depicts a component surrounded in dotted lines. This indicates a component that is directly relevant to the work undertaken in the model, but is outside the current scope of the research. The Lewin model (1947) is relevant to this action research stage in that it allows for a new social norm to be integrated into the current processes CDC utilizes for developing technical experts into leaders.

**FIGURE 5: Conceptual Model**
Technical experts face many challenges when transitioning into a non-technical leadership role. When considering the factors outlined by performance management researchers, how successful these experts are in their performance, then, could be impacted by both personal factors as well as those in the expert’s surrounding organizational and situational contexts. Because it is unclear how and whether all of these factors play a role, whether some are more dominant among technical experts or within scientific organizations, and when and how they were developed, a closer examination is needed.
A. Research Design and Methodology

A descriptive case study approach is employed to address the study questions. According to Bloomberg and Volpe (2012), a case study is “an intensive description and analysis of a bounded social phenomenon, be this a social unit or a system such as a program, an institution, or a process”, and “involves a detailed description of a setting and its participants accompanied by an analysis of the data for themes, patterns, and issues.” The focus of this DrPH research, then, aligns well with the case study approach as it provides a deeper look at positive behaviors of individuals in the organization and the supportive culture of the organization (FIGURE 5).

FIGURE 5: Analytical approach: Descriptive embedded single case study
This DrPH research was framed in a qualitative design. Qualitative research has been described as aiming to “understand and represent the experiences and actions of people as they encounter, engage, and live through situations” (Elliott et al., 1999). This design allows for exploration of a topic that might not be well understood or examined (Fitzgerald et al., 2008). As was indicated in Chapter 2, there is a limited amount of information related to the transition of technical staff into non-technical roles, and no research was found that examined personal and cultural facilitators that impact the success of these individuals. Using an approach that allows for the identification and description of these facilitators then, supports a qualitative frame as a positive fit for this DrPH research.

Participant observation, interviews, and focus groups are the three most often used forms of qualitative methods (Fossey et al., 2002). Qualitative interviews allow for a researcher to gain a deeper understanding of an individual’s views, attitudes, or beliefs, and can be guided by an interview instrument that can help facilitate a discussion (Fossey et al., 2002; Rice et al., 1999). Interviews are “optimal for collecting data on individuals’ personal histories, perspectives, and experiences, particularly when sensitive topics are being explored” (FHI360, 2005). Patton (2002) identifies three approaches to qualitative data collection via interviews. One of these is the utilization of an interview guide. The interview guide provides just that - a guide by which the researcher can follow the same line of inquiry for each respondent – and help ensure that each respondent is asked about the same topics. However, within each topic area, the interviewer can branch from what the respondent is saying to “elucidate and illuminate that particular subject” (Patton, 2002). This DrPH research utilized semi-structured interviews in that an interview guide with primary questions and relevant sub-questions and prompts were used to guide the inquiry.
Appreciative Inquiry and Strengths-based Design

“The task of leadership is to create an alignment of strengths in ways that make a system’s weaknesses irrelevant.” – Peter Drucker

The semi-structured interviews used for this DrPH research were informed by an Appreciative Inquiry approach. “Appreciative inquiry is a positive, strength-based, participatory methodology that seeks to discover the best in people and their organizations” (Stratton, 2010). An Appreciative Inquiry approach to data collection was chosen to guide this DrPH research because of its focus on eliciting the strengths of an individual and organization to guide change. This approach to inquiry aligns well with a qualitative design, as it uses recounting of thoughts and experiences to examine how a successful event or behavior occurred so that it could be repeated (Hammond, 2013). According to Burkus (2011), appreciative inquiry aims “to bring out the best in people, organizations, and the world around them and to do so by developing a culture that appreciates strengths.” Although research has found that the majority of individuals indicate working in a position that does not regularly utilize their strengths (Buckingham, 2008), many also do not realize the value of growing their strengths (Burkus, 2011). Further, although the likelihood of employee engagement increases within a strengths-based organization (Rath & Conchie, 2008), most are not employing strengths-based approaches to developing staff (Burkus, 2011). Documents reviewed (Appendix A) indicate that CDC has employed more of a gaps-centric approach to organizational change. This DrPH research, then, provided an alternative design to what has been used in the past.

Central to Appreciative Inquiry is the 4-D model (FIGURE 6) of Discovery, Dream, Design, and Destiny. The constructs of Discovery and Dream from this 4-D model were used to guide the interview guide tool for this DrPH research. The Discovery construct encourages the interviewee to consider his/her strengths and how these have contributed to his/her success in transitioning from a technical staff role to a non-technical supervisory leader at CDC. The Dream construct encourages the interviewee to
envision what is possible with a strengths-based approach to developing technical staff into non-technical supervisory leaders, what would this look like, and how would it be implemented and sustained.

**FIGURE 6: 4D cycle of appreciative inquiry**

![](image)

**i. Description of Cases**

The cases for this DrPH research were full time employees (FTE) at CDC who have transitioned from technical roles into non-technical supervisory leadership roles. To determine interviewee eligibility, the following steps were employed:

First, the Employee Viewpoint Survey (EVS) 2015 was used to identify CIOs with overall employee engagement scores of 70% or greater on the Employee Engagement Index (EEI). This percentage was chosen by collaborators in the CDC Human Resources office. It was chosen both to
provide a manageable number of CIOs from which to draw respondents, while also being a percentage thought to represent a high level of engagement. The EEI is determined via a set of 15 questions in 3 categories: 1) “Leaders Lead: ‘Employees’ perceptions of leadership’s integrity as well as leadership behaviors such as communication and workforce motivation, Supervisors: Interpersonal relationship between worker and supervisor, including trust, respect, and support, and Intrinsic Work Experience: Employees’ feelings of motivation and competency relating to their role in the workplace”– factors that serve as proxies for measures of an engaged workforce (OPM, 2014).

Once those CIOs were identified, the use of four primary data sources, spanning from 2014 to 2015, were employed to determine ‘successful’ supervisors within those CIOs. Additional segmentation of personnel data were available upon request; however, was not utilized for this DrPH research.

B. Data Collection and Analysis Plan

As indicated in the measurement table (Appendix B), this DrPH research has the following overarching research question:

**Study Question 1: How do non-technical leaders who have transitioned from highly technical roles describe the facilitators that promote success in the leadership position?**

Data triangulation, or the use of different data sources, is one type of triangulation that can help strengthen a study (Patton, 2002; Denzin 1978). According to Patton (2002), “triangulation within a qualitative inquiry strategy can be attained by combining both interviewing and observations”. For this DrPH research, semi-structured interviews, a critical incident report, and document reviews were all used as data sources. Reflective journaling was integrated throughout the entire research process as a way to help ground the data contextually and provide meaning to the data as it emerged.

**Semi-Structured Interviews**

The first data source used for this DrPH research was qualitative data collected via semi-structured interviews (Appendix C) with selected CDC supervisors identified as ‘successful’. The
The overall goal of these interviews was to assess both the personal and cultural facilitators that the respondent perceives as having been critical in promoting success in his/her transition from a technical position into a non-technical leadership role. Although the literature was used to guide the identification of the facilitators, as mentioned earlier, the qualitative approach to data collection for this DrPH research allowed for an exploration of emergent themes and topics.

**Critical Incident Report**

The second data source used for this DrPH research was a critical incident report. In its strictest form, the critical incident approach, developed by Flanagan in 1954, is used as a way to directly observe behavior with the aim of making improvements or solving problems. It has been used in a wide variety of settings and is a way to describe a situation that might have unique relevance to the individual (Monash University, 2007). “A critical incident need not be a dramatic event: usually it is an incident which has significance for you. It is often an event which made you stop and think, or one that raised questions for you. It may have made you question an aspect of your beliefs, values, attitude or behavior. It is an incident which in some way has had a significant impact on your personal and professional learning” (Monash University, 2007). For this DrPH research, a critical incident report was not used as a direct observation, but rather was employed as a self-administered written data collection tool meant to complement the semi-structured interview. Because the interviews used in this DrPH research were designed to solicit responses via storytelling and reflection of past experiences, they were lengthy in scope. The two critical incident questions asked the respondent to identify a personal or cultural facilitator that contributed to his/her success in their transition to a non-technical leadership role, and describe how it contributed to this success. In this way, the use of a critical incident instrument for this DrPH research was designed to not only provide additional data, but also to potentially provide additional richness since the respondent has more time to reflect upon their experiences with
transitioning into a leadership position than they would have from the more on-the-spot reflection in an interview setting. During the scheduling of the interview, the interviewer notified the interviewee of this process, and the interviewee was again reminded of it before the interview began. According to FitzGerald et al (2008), “memory is improved if the observers know in advance that they will need to make the reports.” The completion of the form was optional.

The critical incident was documented by the respondent on a pre-developed form (Appendix D) that was left behind by the researcher following the interview. An interoffice envelope with the researcher’s name and mailstop was left with the form so, once completed, the respondent could return to the researcher via interoffice mail. The interoffice mail envelopes do not indicate from where the envelope originated, so the form did not provide potentially identifiable information.

Document Reviews

The third data source used for this DrPH research was a document review of existing assessments and reports – both hard copy and electronic-based (CDC, 2009) (Appendix E). In addition, web-based workforce development and succession planning information was reviewed. “For case study research, the most important use of documents it to corroborate and augment evidence from other sources” (Yin, 2014). For this DrPH research, emphasis was placed on documents and reports that discuss succession planning, workforce development, and leadership development, in particular within the frame of the transition of technical staff. The documents were reviewed for content that discusses facilitators impacting the transition of technical staff into leadership roles at CDC.

The structure for the data captured via document reviews was informed by the SOAR approach, which stands for Strengths, Opportunities, Aspirations, and desired Results, and is rooted in the Appreciative Inquiry approach (Stavros, 2009). It focused on the ways the organization’s structure and culture are strengths and create opportunities for the transition of technical staff into non-technical
supervisory leadership roles. SOAR assessments are generally applied to strategic planning purposes, but because of the strengths-based approach of this DrPH research study, the structure of a SOAR assessment was deemed to be an appropriate guide for the development of categories utilized for the document review.

In *The Thin Book of SOAR* (Stavros, 2009), the authors note that “SOAR has been use to complete environmental scans of an organization’s internal strengths and external opportunities”. Although the document review for this DrPH research was limited in scope by focusing only on the examination of the *strengths* and *opportunities* that support the transition of technical staff into non-technical supervisory leadership roles, it helped to provide information as to the facilitators impacting this transition and triangulate the data emerging from the other data sources. SOAR is a scalable process that can be either a “quick” process or a more in-depth strategic planning effort (Stavros, 2009).

*Reflective Journaling*

Reflective journaling was used as a validation tool, in that it added contextual meaning to the data that emerged and grounded the data in the context of CDC succession planning and leadership development activities. Because the researcher in this case is an “insider-researcher”, that is a researcher who is also part of the group being interviewed, it was valuable to collect reflections on interviews, non-verbal responses, and the overall research process. Bonner and Tolhurst (2002) note that insider-researchers better understand the culture under study, and the reality of how the systems within the organization function. Insider-researchers “know how to best approach people. In general, they have a great deal of knowledge, which takes an outsider a long time to acquire” (Smyth & Holian, 2008; Angrosino, 2005). As a result, reflections following interviews were important complementary information that helped ground the qualitative data collected through the interview process.
As noted in Ortlipp (2008), “whilst keeping a reflective journal is a common practice in qualitative research, particularly reflexive research (Etherington, 2004), there is relatively little literature on the use of reflective journals in the research process, and limited guidance for novice researchers as to the purpose of keeping a reflective journal from a methodological perspective and how to use their reflections as an integral part of the research process.” Further, as Ortlipp (2008) noted, “keeping and using reflective research journals can make the messiness of the research process visible to the researcher who can then make it visible for those who read the research and thus avoid producing, reproducing, and circulating the discourse of research as a neat and linear process.” A review of the literature on this topic yielded a handful of publications, most relating to the use of journals in a university classroom setting (Sheridan et al, 2012; Power, 2012; O’Connell, 2011; Boud, 2002), or in a therapeutic setting (Harrawood, 2011). Patton (2002), however, does discuss the time following the interview as a critical component of the research process, as it “is a time of quality control to guarantee that the data obtained will be useful, reliable, and authentic.”

A search of the literature using the term ‘field notes’ yielded some information on the use of field notes during ethnographic research (RWJ, 2008; Wall, 2006). These notes can include descriptions of the research context and conversations, as well as “researcher reflections regarding analysis, ethics, methods, or the researcher herself”, and can be a primary mode of data collection (Kuttner, 2008). While observation can serve as the main mode of collecting data for a study, it can also serve a supplementary function. Biklen et al (2007) note that “observation might be used to document body language and setting, offering contextual data that would be lost in the recording and transcription process.” Further, Patton (2002) notes that time should be allotted to “make observations about, reflect on, and learn from each interview.” The utilization of reflective journaling following the data collection processes used in this DrPH research, then, provided additional understanding to the data collected, while also potentially contributing to the body of literature on the process of reflective journaling in this context.
i. **Data Analysis**

As Patton notes, “triangulation can be used in determining the strength of evidence in support of a finding” (Patton, 2002). In this DrPH research, data were triangulated (FIGURE 8) via the application of a-priori codes applied to the data collected via interviews, critical incident reports, and document reviews. Moreover, new insights that emerged from the reflective journaling process, along with written memos during the analysis process, provided an expansion of understanding of the constructs outlined in the conceptual model.

**FIGURE 8: Data Sources Triangulation**

“Qualitative content analysis involves a process designed to condense raw data into categories or themes based on valid inference and interpretation. This process uses inductive reasoning, by which themes and categories emerge from the data through the researcher’s careful examination and constant comparison.” (Zhang, 2009). For this DrPH research, data collected were analyzed for both patterns and themes – pattern and theme analysis (Patton, 2002). By utilizing the application of a-priori and emergent codes, the data were also analyzed for “core consistencies and meanings” (Patton, 2002).
**Emergent Codes**

As will be shown in Chapter 4, the majority of the codes used in this DrPH research were emergent codes. This was of particular importance given that this DrPH research was guided by a qualitative approach. Because the topic of this research had not been explored before, it was important to design the study to be as open as possible in order to capture the individual, unique experiences of the respondents as well as their commonalities. In this way, a combination of a-priori and emergent codes were thought to be the best way to both have some semblance of structure while also allowing for new ideas to emerge.

**Semi-Structured Interviews**

The qualitative data obtained during interviews were transcribed and entered into Atlas.ti 7© qualitative analysis software program. Because this DrPH research employed a hybrid approach to data collection and analysis rather than a purely qualitative design, a-priori data codes were developed (Appendix F). Utilizing a mix of a-priori codes with emergent codes can provide direction for themes or topics that will be looked for in the data while also allowing for the flexibility of themes or ideas that had not been considered previously (Taylor-Powell & Renner, 2003). A number of emergent codes arose from the analyses, which allowed for the emergence of non- Previously coded data.

The first step in the analysis was to assign a-priori codes to the text. The codes were based on the questions in the interview tool and the constructs in the conceptual framework. Throughout the course of coding, several emergent codes arose and were applied to the data. The emergent codes were primarily related to more of the personal or unique facilitators that were deemed pivotal to the interviewees’ transition experiences. Subsequent reviews of the data resulted in many of these codes being merged or collapsed into similar codes as is expected from this type of process (Friese, 2012). As the codes were
being developed, the researcher also defined them in the Comment field available in Atlas.ti 7©. A listing of codes related to Personal and Cultural Facilitator families and their definitions is provided in Appendix H.

The second step in the analysis was to create code families based on related codes. Five code families were developed which aligned with both the interview guide and the interview instrument. These families were: 1) Personal Facilitators, 2) Cultural Facilitators, 3) Technical Strengths, and 4) Dream. The fifth family, Codes for Leadership, were those codes which were related to discussions around strengths, facilitators or issues encountered by the interviewee once he/she was already serving in a leadership role and thus out of scope for this DrPH research. Coded text was then put into one of these families.

Throughout the course of the analysis process, extensive memos were written both for each individual interview as well as to highlight notable areas throughout the interviews. Friese (2012) describes memos as “benches of reflection” that are important throughout the entire analytical process.

Once all items had been coded and families created, multiple networks were created, co-occurrences run, and further revising of codes was conducted. Networks and co-occurrences were used to point toward additional areas of possible exploration.

Atlas ti © “has a powerful tool that helps reveal associations between concepts, their intensity, their meanings, and their role in constructing the phenomenon under study” (Contreras, 2011). This is known as running co-occurrences. A co-occurrence analysis was run for all variables against one another. Large co-efficients signaled further areas of examination. As major relationships emerged from the text, co-occurrence analyses were run to further examine these relationships. Co-occurrences were also run on the most grounded variables (i.e., Opportunities, Leadership Support, Leading an Activity, Technical Skills), as well as those often mentioned in the text (i.e., Willingness, Taking Initiative).
Additional co-occurrence analyses were run on variables that emerged strong in the text or that co-occurred strongly with primary or pivotal variables.

Although c-coefficients that emerged from the co-occurrences are noted in table format throughout Chapter 4, these co-efficients were approached with caution. Because applying quantitative measures such as co-efficients to qualitative data might not always yield accurate information, co-efficients were used to highlight potential areas of exploration rather than to draw definitive conclusions about the relationships between constructs. Sections of text with constructs that strongly co-occurred were reviewed closely to ensure the co-occurrence was accurate rather than just randomly co-occurring.

**Critical Incident Reports**

Similar to the interview analysis process, data retrieved from the critical incident reports were analyzed by themes, sub-themes, and any emergent topics. Critical incident data were maintained in a separate data file to analyze these data independently from interview data. The utilization of the same a-priori codes allowed for the ability to merge the datasets and analyze the broader pool of data (interviews plus critical incident data) as desired.

**Document Reviews**

Documents available for analysis were provided to the researcher by collaborators at HRO and via the CDC Community of Practice working group. Available CDC web-based workforce development and succession planning information were also used. Although the researcher acknowledges the potential limitations inherent with the review of documents, such as limited access to those documents provided to the researcher or those available via the CDC website, and challenges of linking content to current research (Miller, 1997), because there has been little documented discussion around the topic of
this DrPH research at CDC, existing documentation still proved to help validate what was heard in the
interviews and enhanced the understanding of this topic within the context of the organization.

The codes that were applied to the interviews were also applied to content analysis of documents
during the document review analysis process. Documents were reviewed for themes, sub-themes,
patterns, and emergent topics. A particular contribution of the document analysis is the application and
understanding of the topic within the organizational context.

ii. Data Management

All interviews were audiotaped and transcribed. Hard copies of notes or transcriptions were kept
in a secured cabinet in a locked office and will be destroyed after the project period. Audio-recordings
and electronic transcriptions were kept in a password protected file in a locked office and destroyed after
the project period. No names were used in the transcriptions. Participants and transcripts were assigned a
unique identifier. All data gathered during this DrPH research was coded by A. Flores (primary coder).

C. Validity Considerations

Maxwell (1996) refers to the strategies of triangulation, feedback, and “rich data” as ways to
avoid potential validity threats. Multiple data sources were used for this DrPH study, along with the use
of “interview transcripts (that) capture details that can be found and referred to long after the interview
has taken place. (Further) writing memos creates additional ‘rich data’ because reactions and initial
theories and conclusions are documented before the actual analysis of the data” (Maxwell, 2013).
Purposive sampling was used to select participants for interviews. This was done to minimize bias.
Participants were selected based on multiple criteria and all identified potential participants were given
an equal opportunity to participate with standardized recruitment tools and methods.
Two secondary coders used the a-priori codes to independently code two interviews. The researcher and two secondary coders then met to conduct a parallel comparison of results. Any areas of discrepancy were discussed and an agreement was reached on the appropriate code(s). According to Friese (2012), convergent validity can be achieved by discussing differences in coding assignation until there are no differences in coding.

Reflective journal writing and documenting reflections on the analytical process through the use of written memos in Atlas.ti 7 © were also used which provided “transparency of method” (Ortlipp, 2008; Merriam, 2002). Further, as Yin (2014) notes, utilizing multiple sources of data can also help to minimize the potential for validity threats. The primary reviewer clarified her assumptions before onset of data collection, utilized two secondary independent coders, and used consistent coding schemes and categories to further reduce the potential for validity concerns.

Although this work was done in the context of a federal agency, Patton (1990) talks about ‘context bound extrapolations’ in which findings can be applicable to other similar, but not identical, conditions. Other scientific agencies, academic institutions, and research organizations can potentially find relevance and applicability to the findings of this DrPH research. The qualitative approach, if carried out systematically and thoroughly, can allow for what Schram (2003) terms as “transferability” - “Depth, richness and detailed description provide the basis for a qualitative account’s claim to relevance in some broader context”.

Yin (2014) describes pattern matching as the comparison of a pattern based on your findings with predictions made prior to data collection. This technique can be used to address construct validity (Trochim, 2006). Yin (2014) notes that this technique is still valid with descriptive studies, such as this DrPH research, “as long as the predicted pattern of important descriptive condition was defined prior to data collection.” Researcher assumptions about what and how the critical personal and cultural
facilitators are impacting supervisory success at CDC were integrated into a conceptual model (FIGURE 5) and discussed with the committee prior to data collection.
IV. Chapter 4: Results

This DrPH research had one primary research question, followed by five individual sub-questions. Three methods were employed to address these questions: Semi-structured Interviews, Document Reviews, and Critical Incident Reports. In addition, Reflective Journaling was utilized following each interview to help contextually ground the data. Findings from each of these methods, and the research question(s) they addressed, are presented in this chapter.

Semi-structured Interviews

Twenty-one in-depth semi-structured interviews were conducted with successful CDC FTE supervisory staff currently serving in a pre-determined leadership role from February 3 through March 23, 2016. Each interview took between 60 and 90 minutes to complete. The interviews aimed to address the primary research question Q1 and research sub-questions Q1a-Q1d:

Q1. How do non-technical leaders who have transitioned from highly technical roles describe the facilitators that promote success in the leadership position?

Q1a. What personal facilitators are pivotal in the transition from scientist to successful non-technical leader within a federal scientific organization?

Q1b. How have personal facilitators been pivotal in the transition from scientist to successful non-technical leader within a federal scientific organization?

Q1c. What cultural facilitators are pivotal in the transition from scientist to successful non-technical leader within a federal scientific organization?

Q1d. How have cultural facilitators been pivotal in the transition from scientist to successful non-technical leader within a federal scientific organization?

Findings from the interviews are presented by research question/sub-question.
Research Question 1: How do non-technical leaders who have transitioned from highly technical roles describe the facilitators that promote success in the leadership position? and Research Question Q1a. What personal facilitators are pivotal in the transition from scientist to successful non-technical leader within a federal scientific organization? and Q1b. How have personal facilitators been pivotal in the transition from scientist to successful non-technical leader within a federal scientific organization?

Personal facilitators Identified in Original Conceptual Model (FIGURE 5): Skills, Motivation, Commitment, Competence

Personal facilitators were defined as those constructs potentially unique to the individual which were pivotal to his/her transition into a leadership role. The personal facilitators were identified in the original conceptual model (FIGURE 5) as skills, motivation, commitment, and competence. An exploration of each of these follows.

Skills

The construct of skills was identified as a personal facilitator in the original conceptual model (FIGURE 5); however, this construct was eliminated as a construct during data analysis. It was determined to be too broad a code, in that respondents discussed more specific constructs such as technical skills or non-technical skills. Thus skills was too broad to provide real meaning or understanding to the segment of the text that it would have been linked to. For purposes of this DrPH research, technical skills were defined as those related to an individual’s educational background, scientific expertise, subject matter expertise, or content expertise (i.e., clinical skills, medicine, epidemiology, statistics), while non-technical skills were defined as those broader skills less applicable...
to a specific subject area and more to leadership positions at CDC (i.e., flexibility, resilience, ability to lead, big picture thinking).

**Technical Skills**

The first question in the interview guide asked the respondent to think about a time when he/she used technical skills to make a difference at CDC. Often, respondents began the interviews by talking about their subject matter expertise or educational backgrounds (i.e., epidemiologist, microbiologist) as the skills they brought to CDC, and how they utilized these skills.

*I spent most of my career in public health surveillance and so those were the skills that I brought to the table. (Construct: Technical Skills)*

*I have a Ph.D. in epidemiology so the technical skills are what CDC needs and uses a lot, so that was a good match. (Construct: Technical Skills)*

All 21 respondents indicated having technical skills, which was not surprising given that CDC’s foundational work is technical. Some of the respondents were currently serving in leadership roles that still required significant use of technical skills. This appears appropriate for specific leadership roles – in particular for those serving in Associate Director for Science roles.

*I still do a lot of scientific work...I am still engaged in active scientific work, a lot of collaborative work both inside our center and with people outside our center as well as outside of CDC, and that’s been real important to me that I be able to continue an active scientific portfolio in addition to leading science being done by others.*

Of note, the Technical Skills construct co-occurred strongly with the constructs of Technical Credibility (defined as the quality of having one’s technical or scientific skills trusted, valued and believed in) (c-coefficient .07), Background (defined as the educational or work-related background of the respondent; discipline to which the respondent belongs) (c-coefficient .08), and Attention to Detail (defined as being detailed, paying attention to the finer points, coordinating many moving parts) (c-coefficient .07). In the interview text, these constructs all helped to support discussions around the respondent’s technical skills.
Technical Credibility was an emergent code that arose from mentions regarding the value of remaining technically credible, in particular in certain roles (i.e., Associate Director for Science) or settings (i.e., laboratories). Once again, this seems appropriate given the amount of highly technical work conducted by certain positions and certain settings.

So that was a real chance to show my ability to conduct a needs assessment, develop a comprehensive report with solid recommendations that were very actionable but do it in a way that was sort of clean, tight, non-abstract, very pragmatic. (Constructs: Technical Skills, Technical Credibility)

It is important to note that all four times that the construct of Attention to Detail was mentioned, it was in the context of technical skills, which for purposes of this DrPH research were seen as more related to scientific than leadership roles. However, there was one instance when Attention to Detail was mentioned by a laboratorian, who indicated that this was a critical skill for leadership in a laboratory setting.

...you need—from what I’ve found I think people appreciate is that from a laboratory standpoint you have a lot of attention to detail and the devil is in the details in any of these positions you’re moving into on the administrative side. So if you’re not paying attention in the lab and you’re not a good lab person, you’re probably not gonna be successful in a transition because there are a lot of moving parts. I mean it’s constant. (Constructs: Attention to Detail, Technical Skills)

The uniqueness of the laboratory setting emerged from this DrPH research as potentially requiring special attention. This is explored in more detail in Chapter 5.

Overall, Technical Skills was among the most grounded, frequently mentioned constructs, however, given that all respondents had technical skills and the Agency’s focus on hiring technical expertise, this construct was not deemed to be meaningful for this DrPH research. It was important to note, however, that some respondents discussed having to leave behind more technical duties when transitioning into non-technical leadership roles, in order to do the latter well. This was an important area of mention that was echoed in earlier document reviews (Appendix A). This will be explored in more detail in Chapter 5.
The other thing he told me which is quite useful is you have to be willing to give up the thing you love most. So for me it was the economic modeling and basically acknowledge that even if I could do it better than anybody as branch chief... I had to give it up. I had to step away from it...(Constructs: Sacrifice, Willingness)

I think it’s impossible to be a successful leader and have a very robust portfolio of scientific work so people need to know that to be a really good leader at CDC, you need to know that you’re gonna sacrifice something and if you try to do too much, you’re gonna hurt the people that report to you or your science is gonna be shoddy, or probably some combination thereof because you realize very quickly it’s hard to do both so you need to be comfortable...(Constructs: Sacrifice, Missing the Science, Willingness)

**Motivation**

The construct of Motivation, defined as the reason(s) one has for acting or behaving in a particular way, was identified as a personal facilitator in the original conceptual model (FIGURE 5), and mentioned by 15 respondents. This construct most often co-occurred with the constructs of Commitment and Desire to Succeed (defined as expressing a desire to advance, grow, take on new roles and responsibilities). Mentions of motivation tended to relate either to having the motivation to do well and be successful, or to have a bigger impact on a broader level. The latter appears more closely tied to the transition into a non-technical leadership role.

*I think motivation has always been a big thing for me. Whatever I do I try to do my best at and I feel really highly motivated to succeed at what I’m doing so I guess that’s part of it.* (Constructs: Motivation, Desire to Succeed)

*What made me want to move to a leadership position? I was so tired of same thing, same things, I can’t fix it. I wanted to be the person who fixed the darn problem. I wanted to have a seat at the table and then when I got a seat at the table, another mentor, somebody said to me, you not only just want to have a seat at the table, you also want to have presence at the table. And I learned that here. I have to figure out how am I gonna get a seat at the table so when the meeting is called my name gets called to be at the meeting, and that when I say something it has just as much impact on whoever is heading the meeting or funding it or whatever as anybody else. So a seat at the table and presence were two things that I learned.* (Constructs: Career Aspirations, Motivation, Desire to Succeed, Discover Aspirations)

**Commitment**

The construct of Commitment was defined as the state or quality of being dedicated to a cause or
activity, including commitment to growth, to a role, to advancing, to leaving behind science, and to making a choice to pursue a leadership path. *Commitment* was identified as a personal facilitator in the original conceptual model (FIGURE 5). This did not emerge as a major construct, however, in this data analysis, mentioned by only eight respondents, and generally referred to in a way unrelated to transitioning. This construct primarily co-occurred with the construct of *Motivation* (c-coefficient .17).

> So I would say probably motivation and commitment more than anything else in my particular career ladder because I have become such a generalist.

Mentions of *Commitment* were most often related to the respondent’s sense of commitment to CDC, public health, or to one’s work, rather than a commitment to transitioning into leadership.

> I basically am committed to public health, public health performance, problematic performance. These are the things I pay attention. And at the same time my own performance.

> I think the things that I would say probably have helped me is first of all the reason I wanted to be at CDC was because of the mission. I had a big commitment to the mission of public health and to doing something that had potential for broad impact.

> So I think over the years that’s been an important part of the commitment to my job and to the place I’m working, for as long as it’s possible. Actually in both places I went I felt like I got to where I wanted to be at a level of accomplishment and it was time to move.

**Competence**

Competence was identified as a personal facilitator in the original conceptual model (FIGURE 5); however, this construct was re-classified as *Self-efficacy* during data analysis. *Self-efficacy* was a new construct that emerged during data analysis, and was tied to *Competence* in the conceptual model (FIGURE 5). However, upon reflection, it was determined that *Competence* was more of an objective measure and less about personal beliefs in one’s skills, which was what was emerging from the data, so this was re-coded as *Self-efficacy* and defined as the respondent's beliefs in his/her own ability to succeed in reaching a specific goal. This construct included specific mentions of competence, being able to do something, and self-confidence. *Self-efficacy* was tied to the construct of *Competence* in the
original conceptual model (FIGURE 5), which had been assigned an a-priori code by virtue of its place in the model.

**Primary Personal Facilitators: Self-efficacy, Willingness, Taking Initiative**

Overall, there were three most frequently mentioned personal facilitators – Self-efficacy, Willingness, and Taking Initiative. It should be noted that all of these constructs were defined by emergent codes rather than a-priori codes. These codes are noted as primary facilitators in that, although not directly tied to a respondent’s transition experience, they emerged as important, frequently mentioned constructs.

**Self-efficacy**

Self-efficacy emerged in 15 interviews. This construct strongly co-occurred with the construct related to the respondent’s ability to Connect both Technical and Non-technical Skills (defined as bridging technical work with non-technical, in this case leadership, work). Not surprisingly, then, respondents with high self-efficacy reported having both Technical Skills and Technical Credibility, as well as, more adaptive skills such as Big Picture Thinking, Flexibility, Emotional Awareness (EQ), and the Ability to Lead (TABLE I).

As an epidemiologist I had the understanding of data, its limitations, what it can be used for, and I also had the leadership ability and the vision to think about what this could look like, bring together the right people, contract with a web developer and basically get it done within a fairly short period of time. (Constructs: Self-efficacy, Big Picture Thinking, Able to Lead, Broad Skillset, Technical Skills, Connect Technical and Non-technical Skills)

I think the balance between rigor and practicality, I think that’s just me. I think that’s just kind of a thing I have. (Constructs: Self-efficacy, Flexibility)

My strength is I have both analytical and conceptual understanding. For any specific topic I think of that way. I have both skills, a strong conceptual understanding, at the same time analytical
understanding and analytical skills. (Constructs: Self-efficacy, Big Picture Thinking, Technical Skills, Connect Technical and Non-technical Skills)

So a big thing was I had a lot of responsibility early on but there’s a lot of stuff that I think I just sort of know how to do, like—not that I didn’t make a lot of mistakes because I did, but I never was assigned to work in the field and yet people always looked at me as somebody who really understood what the field was going through, and so somehow me being able to put my feet in their shoes with our TB controllers in the field helped me get a lot done that I might not have gotten done otherwise. (Constructs: EQ, Self-efficacy, Technical credibility)

| TABLE I: C-COEFFICIENTS FOR SELF-EFFICACY AND MOST STRONGLY SELECT CO-OCCURRING FACILITATORS |
|-----------------------------------------------|--------------------------------------------------|
| Self-efficacy                               |                                                   |
| Able to Lead                                | 0.07                                             |
| Big Picture Thinking                        | 0.12                                             |
| Career Aspiration                           | 0.06                                             |
| Connect Technical and Non-Technical Skills  | 0.14                                             |
| Demonstrate Strength                        | 0.11                                             |
| Discover Strengths                          | 0.10                                             |
| EQ                                          | 0.06                                             |
| Flexibility                                 | 0.11                                             |
| Motivation                                  | 0.10                                             |
| Resilience                                  | 0.08                                             |
| Technical Credibility                       | 0.08                                             |
| Technical Skills                            | 0.08                                             |

Although self-efficacy did not appear to emerge as directly tied to an individual’s transition, as noted above, it was most often mentioned during discussions around being able to connect technical and non-technical skills. As a result, it was determined that Self-efficacy was more of a foundational trait, similar to technical skills, which, generally speaking, the respondents had. This self-efficacy allowed the respondent to be able to demonstrate both technical and non-technical skills.

**Willingness**

As noted above, the construct of Willingness, defined as the quality or state of being prepared to do something, openness to doing something new or different, and readiness to take on something new or different, emerged as a primary construct from this analysis. Willingness also included the individual being open to stepping outside of his/her area of expertise or comfort, taking risks, and being comfortable making mistakes. Throughout the interviews, there were several mentions of volunteering.
to lead an activity, which then often led to either a new or expanded role or set of responsibilities – an
Opportunity. This construct of Opportunity will be discussed in more detail later in this chapter.

But also for the support, when our team leader left, I became the acting team leader. They asked me if I would do that and I said sure. (Constructs: Opportunity, Willingness)

But in general I think opportunities have been made available and I’ve welcomed them. So by their very nature the opportunities have required either management and/or leadership skills. (Constructs: Opportunity, Willingness)

Moreover, several respondents discussed actively volunteering, another way they showed their willingness to try a new role or learn new skills.

Somebody said to me, do you want to help with this? And I said, oh sure. And oh my God, I learned so many things that I never would’ve learned any other way. I mean technically and collaboratively and leadership and everything I learned. So that was a really big experience for me. (Constructs: Opportunity, Willingness)

As would be anticipated, the construct of Willingness also co-occurred strongly with those of Wanting to Learn (defined as having a desire to gain or acquire knowledge of or skill by study, experience, or being taught) (c-coefficient = .13) and Taking Initiative (defined as an individual taking action of his/her own accord and not because another individual told him/her to do so) (c-coefficient = .10) (TABLE II).

... and they said, oh, yeah I’m thinking we should revise those guidelines. And I said, I’ll help with that. And I had no idea what I was getting myself into. But it sounded interesting and a way for me to learn and so that’s what I tell people; just don’t over think it too much, just try to be involved. Especially when it’s somebody—I hadn’t thought about it until just this minute. I had a sense that I was gonna learn something from that guy...he was smart and I was gonna probably learn something from him. (Constructs: Opportunity, Willingness, Interest, Taking Initiative, Wanting to Learn)

<table>
<thead>
<tr>
<th>Willingness</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Career aspiration</td>
<td>0.08</td>
</tr>
<tr>
<td>Taking Initiative</td>
<td>0.10</td>
</tr>
<tr>
<td>Wanting to learn</td>
<td>0.13</td>
</tr>
</tbody>
</table>
Although willingness to step out of one’s comfort zone and take on an opportunity to lead an activity often resulted in the individual being able to transition into a leadership role, these decisions were not always easy to make. Some of these opportunities required the individual to do something different from what they had been trained to do or what they had been doing up until that time:

So I think it was just taking advantage of those positions. I would say that position I was not naturally suited for. I would’ve been best to stay in my technical role, and it was an opportunity but a whole different skill set, and sort of felt like you went from being really kind of technically what I was doing to a place where I felt like a fraud for the first six months. (Constructs: Opportunity, Willingness, Taking Initiative, Differences from Technical Role)

Yeah, then all the team members said we want you to stay. And I thought, okay, that actually wasn’t my plan. So it wasn’t my plan and I wondered if they had talked to her about that before we got into the room because I was a little stunned and it took me a while. She’s like, okay, I’d be really happy, said you need to think about it, and I said, I need to think about it. I don’t know about this because then what it does is it leaves you less time to do your own studies and that kind of thing. I mean you have to add these other tasks like supervision that none of us are typically trained to do. None of us like to do things we’re bad at, right? So I thought about it for a while and I caved and I said I would do it. (Constructs: Willingness, Opportunity, Missing the Science, Differences from Technical Role)

Mentions related to Willingness often centered on opportunities emerging for which the respondent was either asked or volunteered to lead or be a part of. Earlier document reviews (Appendix A) indicated that technical staff were often promoted into leadership roles without necessarily being willing to take on these new responsibilities. As such, Willingness is a key construct and one that will be discussed in greater detail in Chapter 5.

**Taking Initiative**

The construct of Taking Initiative was defined for purposes of this DrPH research as an individual taking action of his/her own accord. Similar to the Self-efficacy and Willingness constructs, Taking Initiative emerged as a primary construct from this analysis. As noted in the Willingness section above, many respondents discussed volunteering for activities, opportunities, or to take on additional or new responsibilities. Similarly, volunteerism can be viewed under the construct of Taking Initiative. As
a result, in many instances when volunteerism was mentioned, both Taking Initiative and Willingness constructs were noted (TABLE III).

So I did that for a little while and then a big turning point, which I think is relevant to some of this discussion, is I volunteered early on to be part of a rewrite of the TB Infection Control Guidelines. That turned out to be a two-year huge process that I learned so much from because it was really hard, and I think that that is where I sort of cut some of my leadership teeth on. (Constructs: Opportunity, Willingness, Taking Initiative, When Strength Developed, How Strength Developed)

...and at that point that’s when I stepped forward and said I’m interested in possibly transitioning to the deputy role. I had some management training as part of my undergraduate degree and I was kind of getting to the point where it’s like I know the science, I can do this. The challenge was interesting at times but it was like I was ready to make a move and do something different. (Constructs: Willingness, Taking Initiative, Opportunity, Self-efficacy, Wanting to Learn, Broad Skillset, Motivation, Interest, Career Aspiration, Connect Technical with Non-technical, Technical Credibility)

### TABLE III: C-COEFFICIENTS FOR TAKING INITIATIVE AND MOST STRONGLY CO-OCCURRING FACILITATORS

<table>
<thead>
<tr>
<th>Taking Initiative</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Able to lead</td>
<td>0.08</td>
</tr>
<tr>
<td>Career aspiration</td>
<td>0.07</td>
</tr>
<tr>
<td>Drive</td>
<td>0.05</td>
</tr>
<tr>
<td>Interest</td>
<td>0.05</td>
</tr>
<tr>
<td>Wanting to Learn</td>
<td>0.09</td>
</tr>
<tr>
<td>Willingness</td>
<td>0.10</td>
</tr>
</tbody>
</table>

Additional Personal Facilitators: Career Aspirations, Demonstrate Strength, Desire to Succeed, Drive, Interest, and Wanting to Learn

Other personal facilitators that were mentioned as impacting transitions into non-technical leadership roles included Career Aspirations, Demonstrate Strength, Desire to Succeed, Drive, Wanting to Learn, and Interest. These were all emergent constructs that arose out of respondents’ mentions. Definitions of these constructs can be found in Appendix H. Co-occurrences were run with these facilitators and the stronger c-coefficients are shown in TABLE IV, and each is individually discussed below.

### TABLE IV: C-COEFFICIENTS FOR SELECT PERSONAL FACILITATORS (BOLD) AND SELECT CO-OCCURRING FACILITATORS
**Career Aspiration**

<table>
<thead>
<tr>
<th>Skill</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connect technical and non-technical skills</td>
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</tr>
<tr>
<td>Desire to succeed</td>
<td>0.08</td>
</tr>
<tr>
<td>Discover aspirations</td>
<td>0.09</td>
</tr>
<tr>
<td>Drive</td>
<td>0.14</td>
</tr>
<tr>
<td>Emulation</td>
<td>0.08</td>
</tr>
<tr>
<td>Motivation</td>
<td>0.10</td>
</tr>
<tr>
<td>Wanting to learn</td>
<td>0.14</td>
</tr>
<tr>
<td>Willingness</td>
<td>0.08</td>
</tr>
</tbody>
</table>

**Demonstrate Strength**

<table>
<thead>
<tr>
<th>Skill</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Able to lead</td>
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</tr>
<tr>
<td>Big Picture Thinking</td>
<td>0.08</td>
</tr>
<tr>
<td>Flexibility</td>
<td>0.12</td>
</tr>
<tr>
<td>Resilience</td>
<td>0.10</td>
</tr>
<tr>
<td>Self-efficacy</td>
<td>0.11</td>
</tr>
</tbody>
</table>

**Desire to succeed**

<table>
<thead>
<tr>
<th>Skill</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Career aspiration</td>
<td>0.08</td>
</tr>
<tr>
<td>Discover aspirations</td>
<td>0.11</td>
</tr>
<tr>
<td>Drive</td>
<td>0.17</td>
</tr>
<tr>
<td>Emulation</td>
<td>0.10</td>
</tr>
<tr>
<td>Motivation</td>
<td>0.12</td>
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</tbody>
</table>

**Drive**

<table>
<thead>
<tr>
<th>Skill</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Career aspiration</td>
<td>0.14</td>
</tr>
<tr>
<td>Desire to succeed</td>
<td>0.17</td>
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<td>Emulation</td>
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<tr>
<td>Motivation</td>
<td>0.08</td>
</tr>
<tr>
<td>Wanting to learn</td>
<td>0.12</td>
</tr>
</tbody>
</table>

**Interest**

<table>
<thead>
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<tr>
<td>Wanting to learn</td>
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**Wanting to learn**

<table>
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<td>Interest</td>
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<tr>
<td>Taking Initiative</td>
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</tr>
<tr>
<td>Willingness</td>
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</tr>
</tbody>
</table>

**Career Aspirations**

The emergent construct of *Career Aspirations* was mentioned by six respondents, and defined as the career goals that the respondent has for himself/herself. Discussions around *Career Aspirations* were often related to the respondent’s drive or desire to learn something new, explore a new area of work, or
gain a new skill set. For some, career aspirations seemed more deliberate – the respondent seemed to have provided a good bit of thought toward how to achieve his/her career goals.

“It’s like folks who I really respected and I tried to see what made them successful, and also people who had jobs that I thought might be interesting. I actually thought this was a job I looked at and thought, I could see me doing that by the end of my career. I got here faster than expected, so then you say, okay, if I did this 10 or 15 years from now, what would I need? And I typically went five years out. Like I’d love that job in five years, what would it take for me to get there. (Constructs: Career Aspirations, Discover Aspirations, Emulation, Desire to Succeed, Drive)

I think initially stepping out of that lab - that was drive, because I wanted to get into something a little bit different and use a different skill set. Beyond that, my next transition was also kind of driven by my own personal thoughts that I kind of needed to broaden my horizons a little bit. (Constructs: Career Aspirations, Drive, Exposure, Wanting to Learn, Taking Initiative)

And this job, when it was offered, I knew there would be a lot less on the analytic end to do but there would be a lot more on the people end, managing, doing strategy for programs, a lot of work I really hadn’t done so much before. But I was excited about it because I just figured it would take me to the next level. (Constructs: Career Aspirations, Wanting to Learn, Taking Initiative, Willingness)

...well, the decision is whether you want to stay in [state] and be a big fish in a small pond or stay at CDC and be a small fish in a big pond. I said, it wasn’t so much about ego and personality narcissistic...It was more in terms of your ability to accomplish things that were crosscutting that would position you for greater things later. And I thought about that and he said the reason is if you stay at CDC, you are a subject matter expert, you know a lot more than anybody else in the whole wide world about one thing; whereas when you’re in the state you are the only person who does it and then you develop a broader set of skills. Don’t be afraid because things you don’t know, help is only a phone call away. (Constructs: Career Aspirations, Mentors, Willingness)

For others, career changes seemed to just occur more happenstance, and with less deliberation. However, the respondent still had to have been open and willing to take on these new roles.

“It’s kind of funny, if you look back on your career, there were a number of decisions early that seemed maybe important at the time but not life changing. Then you realize that they really were life changing and if you made them differently would be a completely different person. So I think there’s a lot of chances as well. (Constructs: Career Aspirations, Luck)

Of note, was a respondent who mentioned the importance of being able to bring her technical expertise into her new non-technical position and ensuring that she could blend the two. This respondent felt that she was a better candidate for her career aspirations by being both strong technically and also having non-technical skills.
I could sidestep and learn this other skill set to move forward. Also, you don’t dump that skill set. You take it with you and you can be of more service to the organization as a whole sometimes when you can speak the right language but you understand what the administrators need, and so you can bridge that gap and I felt like I had a skill set strong enough to do that. I had been doing some of the laboratory procurements but I didn’t have a personnel side to the equation to pull it all together and that’s when the opportunity came forward. (Constructs: Career Aspirations, Self-efficacy, Connect Technical and Non-technical Skills)

Demonstrate Strength

Nine respondents discussed the construct of Demonstrate Strength, defined as demonstrating both technical and non-technical strengths, skills, and value added over time. Overwhelmingly, this construct emerged around discussions related to times when the respondent was able to show a particular leadership skill or trait, such as flexibility and adaptability.

I think over the years I think people have come to understand they can sort of throw me into anything. I’ll swim. I don’t get too flustered. (Constructs: Demonstrate Strengths, Self-Efficacy, Resilience, Flexibility)

In hindsight, at the time I didn’t know but I think that could—because you didn’t go through a day without thinking about I’m leading and I need to lead, and you’re in other environments where that is not kind of at the forefront of your mind every single day, and he made sure it was at the forefront and I think that meant I was interacting with other leaders in a different way and it actually made me put emphasis there in terms of thinking what should my action be, I’m leading, we’ve gotta deal with something, how do I do this. (Constructs: Able to lead, Demonstrate Strengths, Exposure, Peers, Role Models, Supportive Infrastructure)

So that was very much a growth opportunity for me because it’s kind of like you’re parachuted in the middle of a situation and you have to think and you have to put everything together and it’s similar but it’s not the same, so it was a little bit of a stretch. I think I did quite well there and well enough that when I got back, I was offered a position as a lateral position moving over to the group that I’m currently with because their branch deputy was moving on to another position and that left that vacancy and said we’d love to have you. (Constructs: Demonstrate Strengths, Opportunity, Flexibility)

Volunteer to do stuff that doesn’t seem so glamorous because then you get at the table and then when people see that you deliver, then they’ll ask you to do something that has more responsibility. I went through 3,500 comments and summarized them. That’s gut work. I mean would you say you need to be a physician to do that? Maybe not but then if I do a nice job and I summarize it the way people think is good, then the next time they’ll ask me to whatever, do the next thing. So I felt like that, since it was a long process and there was lots of opportunities to step up, I was able to do that. And then the more I did it, the more people saw me as having—and also when you’re a junior you have a little more time so you can—people who are busy leaders look for somebody they can trust to do a little bit more and then you have more opportunities. So I grew a lot in that one. (Constructs: Demonstrate Strengths, Able to Lead, Willingness, Taking Initiative, Opportunity)
The ability to showcase one’s strengths seems to be closely tied to a respondent’s transition, in that it gave him/her the chance to show his/her skills which led to additional, often more challenging roles. This construct was noteworthy, however, in that some respondents actively sought opportunities to demonstrate these skills (i.e., volunteer), while others seem to demonstrate these skills either by virtue of the surrounding environment that emphasizes leadership or by virtue of simply being successful in a role that they were placed in. Perhaps this speaks to the concept of the adaptive leader – one who can find a way to show he/she adds value. This construct will be examined further in Chapter 5.

**Desire to Succeed**

The construct of *Desire to Succeed* was mentioned by eight respondents, and defined as expressing a desire to advance, grow, and take on new roles and responsibilities. As noted in TABLE IV, this construct strongly co-occurred with those of *Motivation, Discover Aspirations*, and *Drive*. This is not surprising given that all of these constructs relate to wanting to grow and advance. A desire to succeed can be anticipated from a technical perspective in a highly scientific Agency such as CDC; however, this construct was identified by respondents during discussions around those facilitators that were critical to transitioning into a leadership role.

*Well, I’m very achievement oriented and goal oriented. So I think if I’m put in a position and expected to do something, I’m gonna just do the best I can and I’m intrinsically motivated to do the job right and to have those above me be happy and satisfied with the work as well as having those that are below me or working with me feeling good about the work they’re doing and having a sense of we’re doing the right thing. So that’s where I get my motivation. (Constructs: Desire to Succeed, Motivation, Self-Efficacy)*

*I think the thing with me is that I have a tendency of—well, I’m probably very extreme on it and that is to keep doing it until I will succeed. (Constructs: Desire to Succeed, Drive)*
**Drive**

The emergent construct of *Drive*, mentioned by seven respondents, was defined as an innate want or need to attain a goal. As noted in TABLE IV, this construct most strongly co-occurred with the constructs of *Career Aspirations, Desire to Succeed, and Wanting to Learn*.

*So for me, when we had a transition, our branch chief left, actually is a center director now, and there was some scuttle about that our acting was going to retire soon so I knew there was a potential for this position to come open. I’m not trying to answer like Miss America questions but I felt a responsibility. I felt like I could do the job and I think there is a certain level of intrinsic drive and motivation but a certain level of responsibility that I felt as well. I really cared about the branch, I cared about the work we do and the people here, and I thought I could do a really good job. (Constructs: Drive, Career Aspirations, Motivation, Self-Efficacy)*

True to its definition, when drive was mentioned, it was generally in the context of being an intrinsic factor, and not a strength that was learned or developed over time.

*...hard work. So nothing’s coming to you. You go out and get it. You do what you can do. So it’s a little bit of my own professional drive I guess. (Constructs: Drive, Taking Initiative)*

*One part of it is definitely what you’re born with, you have that drive to do things. (Constructs: Drive, Motivation)*

Finally, with the exception of one respondent, when drive was discussed it was not in the context of being directly related to the respondent seeking to transition into a leadership role. However, because of its close relationship to other personal facilitators, such as career aspirations, desire to succeed, and motivation which do appear more closely tied to transition experiences, it is noted as an important facilitator.

**Interest**

The emergent construct of *Interest*, mentioned by five respondents, was defined as wanting to know more about something new. As noted in TABLE IV, this construct, not surprisingly, most strongly co-occurred with the constructs of having a *Broad Skillset* and *Wanting to Learn*.

*So part of what I was looking to do was to move outside my group and the first part of that was I wanted to also find out what CDC was doing more globally and kind of getting back to that tangible*
aspect where in a lab you’re kind of isolated, you don’t see that, but I wanted to see it from a different perspective...(Constructs: Interest, Wanting to Learn, Discover Aspirations, Exposure)

So for me, I kind of shifted away from—because since I was a generalist, you know, kind of touched the surface with different public health content issues and here at CDC either you go deep or you’re broad, and for me that broad approach and then the interest in leadership kind of really skewed me away from the technical part so to speak. ...(Constructs: Interest, Broad Skillset, When Strength Developed)

Although interest was not often mentioned, when it was, it appeared to be directly linked to a transition experience. For those respondents who discussed interest, it was in the context of wanting to step out of their work area and experience something new, or feeling it was time to make a career change. As such, it is considered a pivotal personal facilitator.

**Wanting to Learn**

The emergent construct of *Wanting to Learn* was defined as having a desire to gain or acquire knowledge of or skill by study, experience, or being taught. This was an often-mentioned construct, discussed by 14 respondents. As noted in TABLE IV, this construct was very strongly related to *Interest, Career Aspirations,* and *Willingness*. When mentioned, this construct related both to learning about leadership skills and how to be a good leader, as well as, learning new skills and new roles.

* I go to conferences, I hear somebody presenting. I try to extract all the good things. And then I also try to be cognizant of the things I don’t feel so good about because you see that a lot as well, as you know. So I try to learn from that as well. Okay, that’s not the way you want to present yourself when you are presenting before a big group, or if you’re starting a meeting. This is not the way to do it. Or if you have a disagreement with somebody, maybe that’s not the way you want to manage it, this is a much better way to manage it. You know, stuff like that. I try to learn. (Construct: Wanting to Learn, Emulation, Exposure)

* I spend most of my time...learning another area. So I’m always interested to learn new things. That was one of my driving forces. (Construct: Wanting to Learn)

* I would volunteer for different things because I wanted to learn and they needed a project officer to cover their portfolio which was pretty robust and I volunteered for it. (Constructs: Wanting to Learn, Opportunity)

Of note, were mentions around upbringing that emerged as related to this construct.
Also I think just learning something new is important. That was kind of like shared with me with my parents. They both were educators and valued traditional school and nontraditional. So those were some of the drivers. They always pushed me to be the best person I’d want to be and, like said, being a people person I was always looking for ways to grow and advance. (Constructs: Wanting to Learn, Upbringing, When Strength Developed)

One respondent also mentioned CDC directly supporting his continuing education, which aligned directly with what he termed a ‘growth mindset’. CDC occasionally supports individuals for ongoing education; however, with limited funding and competing priorities, this is not often a possibility for most.

I think one of the real keys to successful ascension into leadership opportunities is this growth mindset, sort of continuous learning and so they were very supportive of me continuing to pursue my education. (Constructs: Wanting to Learn, Leadership Support)

Wanting to Learn emerged as a strong construct and one directly supportive of the transition experience of several respondents.

There were several ‘smaller’ constructs that emerged from the data. Although they did not appear to directly impact a respondent’s transition experience, they still seemed notable to the respondent. For example, only a handful discussed a construct termed as Upbringing, but when it was discussed, it was often profound. Respondents mentioned having been a quiet child and learning to speak up and be heard, belonging to a sub-minority group within a larger minority group and learning how to develop commonalities to be able to lead, and growing up in an impoverished town impacting one’s desire to make a difference all emerged as important facilitators that, although not common to many, were still important to some.

Research Question 1: How do non-technical leaders who have transitioned from highly technical roles describe the facilitators that promote success in the leadership position? and Research Question Q1c. What cultural facilitators are pivotal in the transition from scientist to successful non-technical leader within a federal scientific organization? and Q1d. How have cultural facilitators been
pivotal in the transition from scientist to successful non-technical leader within a federal scientific organization?

Cultural facilitators were defined as those constructs existing in the respondent’s internal or external environment, including those contextual or systems level supports, or team or leadership supports, which facilitated his/her transition into a leadership role. The primary cultural facilitators were identified in the original conceptual model (FIGURE 5) as team, system, context, and leadership. An exploration of each of these, as well as an exploration of constructs that emerged from the data analysis, follows.

Team

The construct of Team was identified as a cultural facilitator in the original conceptual model (FIGURE 5); however, it did not emerge as a facilitator related to a respondent’s transition experience in this data analysis, mentioned by only 4 respondents. Team was defined as a formal peer group of individuals all working toward a common goal; however, it was distinct from the construct of Peers which related more to the individuals or groups who were not part of the respondent’s immediate team.

When Team was mentioned, it was primarily in the context of team member support and positive feedback. This construct most strongly co-occurred with the construct of Supportive Infrastructure which could be anticipated given that, at CDC, teams are constructed as part of the infrastructure.

Yeah and I think the other support from [a team member] was the ability to run ideas by her, able to present the information and get feedback. I think that was supportive, too. (Construct: Team, Supportive Infrastructure)

One individual also mentioned teams in the context of seeing how teams worked before he entered into a leadership role. Although the majority of staff at CDC work as part of a team, viewing the team structure from an operational perspective instead of simply as a team member, can be a valuable experience for an aspiring leader.
I guess being part of teams at work has been helpful. I’ve been part of teams...as I learn how teams operate in the years before I was a team lead was helpful. (Construct: Team, Supportive Infrastructure, When Strength Developed)

**System**

The construct of System was identified in the original conceptual model (FIGURE 5); however, this construct was eliminated during data analysis. System was defined as the processes and policies in place, both within (i.e., details, job shadowing, and hiring processes) and external to CDC (i.e. fellowship opportunities with policies that require field placements), which support supervisory leadership success. Similar to the Skills construct mentioned earlier, System was determined to be too broad a code. It was determined to be too broad a code, in that respondents discussed more specific constructs such as Details, which emerged as a distinct construct. Thus System was too broad to provide real meaning or understanding to the segment of the text that it would have been linked to. Thus, such a broad construct as System was deemed too broad to be meaningful. An exploration of the construct of Details follows.

Details are well-known and seemingly well utilized processes available to staff at CDC. This construct was defined as the formal detail process at CDC, and text coded with this construct had explicit mentions of the respondent having participated on a work-related detail. This construct was mentioned by ten respondents. Details provided a way for the respondent to develop a strength or demonstrate a strength. In this way, details appeared to often lead to a leadership position or new roles and responsibilities. It is important to note that, although details are contextual supports in the sense that they are processes available to CDC staff as part of the infrastructure, they did not co-occur during interviews with the Supportive Infrastructure construct (described below), but rather were more often mentioned in the context of being able to develop or demonstrate a strength.

So the two years (of the detail) was actually a really tough job but what it did was it, again, got me my foot in the door at the state department which runs this whole initiative and eventually get into trusted positions within that office. (Constructs: Details, Demonstrate Strength, How Strength Developed, Opportunity)
Context

The construct of Context was identified in the original conceptual model (FIGURE 5); however, this construct was eliminated during data analysis. Once again, similar to both Skills and Systems constructs mentioned earlier, Context was determined to be too broad a code.

In the original conceptual model (FIGURE 5), Context encompassed the sub-constructs related to the internal and external environments of the individual. This included the presence of a supportive infrastructure, as well as training opportunities and course offerings both internal and external to CDC. Because these constructs were mentioned specifically rather than the broader construct of Systems, this broad construct was not deemed meaningful. Instead, the constructs related to Supportive Infrastructure, Training Opportunities and Courses-CDC and Courses Non-CDC were explored.

Supportive Infrastructure was a construct that was mentioned in six interviews, and overwhelmingly co-occurred with the construct of Team (C-coefficient = 0.22). Supportive Infrastructure was an emergent construct that aligned with the internal environment construct identified as part of Context in the original model. This construct was defined as having the infrastructure ready and available to support professional development and career change and advancement. Because as mentioned earlier, teams are a part of the CDC culture that provide professional, collegial support to employees, the definition of this construct included mentions of a supportive team structure.

...we had a really good team who were experts in the field, so going out on site visits with them helped and just kind of learning as you go. (Constructs: Supportive Infrastructure, Team, Hands-on Learning)

CDC University, under the direction of the Human Resources Office of CDC, offers a myriad of courses and training opportunities for staff. Because leadership courses and longer term training opportunities are part of these offerings, both courses and training opportunities aligned with the internal environment construct identified as part of Context in the original model.
Training Opportunities were defined as having the chance to attend or receive formal training and instruction. These opportunities are longer term in duration, rather than a one-time, short-term course (Courses-CDC and Courses Non-CDC constructs). This construct included both technical and non-technical training, and classroom and on-the-job training; however, it excluded informal training. Training opportunities did not emerge as a major construct, mentioned by only 3 respondents, and did not strongly co-occur with any other construct.

Overwhelmingly, the mentions around to Training Opportunities were related to CDC’s offering of the Leadership Management Institute (LMI). It should be noted, however, that in order to attend LMI, an individual must be nominated by his/her leadership, and apply for admittance to the program. It is offered by an external vendor and can be costly, potentially making it cost-prohibitive over the long-term.

I attended the LMI. I was nominated and applied to that. That’s a great course to kind of like develop your leadership skills and back then we didn’t have that mandatory training now like new supervisors have to have 60 hours of mandatory training, and we didn’t then but there’s a class they teach that took that was really helpful in learning all the policies and procedures. So I think with all of that and on-the-job training really helped me transition. (Constructs: Training Opportunities, Hands-on Learning, Leadership Support)

I’ve taken emotional intelligence courses, Seven Habits of Highly Effective People. Those are things that resonated well with me because in LMI I was exposed to training on servant leadership and I did some extra research on that. I think the more you learn about yourself you can be more effective. So those were some of the trainings that really resonated with me and they happened over the years. (Constructs: Training Opportunities, Courses-CDC)

Similar to Training Opportunities are those course offerings made available both internally at CDC and externally for which staff have historically been able to use their individual learning accounts to cover the costs for. As a result, the constructs of Courses-CDC and Courses Non-CDC were explored. The construct of CDC Courses was defined as those short-term course offerings supported by CDC and included off-site courses that are CDC led. The construct of CDC Courses was mentioned by eight
respondents, but did not strongly co-occur with any other construct. Mentions of CDC-offered courses were primarily around those taken once the respondent was in a leadership position.

I’ve taken courses. I’ve taken courses on speak so people listen. Done that twice. I’ve taken leadership courses and courses on consulting because part of what you do is provide consultation to people who can benefit from whatever skill you have to offer. So I’ve taken those courses. (Constructs: Courses-CDC)

It was just really a lot of on-the-job training. I can’t say that a lot of the trainings I took—you know, some were good, some stand out. Some I wouldn’t have learned like appropriations law was kind of interesting, I wouldn’t have learned that anywhere else. It’s useful to know something about that. (Constructs: Hands-on Learning, Courses-CDC)

The construct of Courses Non-CDC was mentioned by six respondents, and similar to CDC Courses, did not strongly co-occur with any other construct. Similar to the CDC Courses construct, mentions of non-CDC courses were primarily around those taken once the respondent was in a leadership position, and overall seemed more positive than CDC-offered courses. One mention was around a course taken to enhance technical skills.

So frankly the best training I ever had was I went to the Academy School and I had a supervisor, somebody who was very supportive of me and we had money...because it cost $6,000 to go for a week. This one that’s called Leadership for the 21st Century. Best thing I ever took. (Constructs: Courses Non-CDC)

I’ve done stuff in D.C. like learning about how does government work and the Brookings Institution on a week-long thing. I went for that. (Constructs: Courses Non-CDC)

Overall, courses mentioned as being of value were more often related to leadership and management courses taken once the individual was in a leadership role, and even these mentions were minimal. As a result, a construct Courses CDC-Not Useful was developed to ensure this was captured for further discussion.

I’ve always regretted not actually doing some leadership training. Very few of the required supervisory trainings are helpful. We don’t do real well in terms of leadership development in terms of having sort of formal like getting people into—you know, there’s programs at Harvard that we would do for some senior executive service...I sort of did it all ‘seat of the pants’....(Construct: Courses CDC-Not Useful, Hands-on Learning, Courses Non-CDC)
Zero. (Constructs: Courses Non-CDC)

I actually don’t think that they were that helpful. (Construct: Courses CDC-Not Useful)

I have not found the other stuff that the agency offers all that particularly useful. You know, things like the management, the required management training, the mandatory stuff. We have so many mandatory requirements. You know, you’ve got this for travel, you’ve got this for this, you have this for that, you have this for—for a while we had—it’s just I do them because they’re required. A few of them are actually worthwhile. I’m not convinced that a lot of them are all that worthwhile. (Construct: Courses CDC-Not Useful)

Concerns with the timing, eligibility, and availability of the leadership and management courses were mentioned. This will be further explored in the analysis of the items related to the Dream questions that will be explored later in this chapter.

Some of this stuff I took last year actually in CDC University about being a team leader and team leadership. I found that useful, I found that helpful. I thought to myself, gee, I should’ve taken that a while back but I was looking for courses to take at the end of the year because they’re required and I had like four hours left when I found these thing. I said, I took them and they were actually useful. (Constructs: CDC Courses)

Leadership

The construct of Leadership was identified as a cultural facilitator in the original conceptual model, and was inclusive of the sub-constructs of Mentor, Support and Coaching (FIGURE 5). Leadership in itself was deemed to be too broad a construct during analysis, although the sub-constructs of Mentor, Leadership Support, and Coaching all emerged as strongly grounded constructs. A review of the mentions surrounding Coaching indicated that all were related to coaching the respondent had received once he/she was in a leadership role. As a result, this construct was not further examined in relation to this DrPH research.

Mentor

The construct of Mentor, defined as an experienced and trusted adviser, including both formal mentoring through the CDC mentorship program and informal mentoring, and both technical and non-
technical mentors, was mentioned as a personal facilitator in 16 of the 21 interviews. This appeared to be a primary construct as it was closely tied to the transition experience of many respondents. Mentors were discussed as critical to the respondent being able to learn new skills, gain experience, or take advantage of an opportunity to lead.

Overwhelmingly, mentors were informal mentors and not part of the formal CDC mentorship program. Only one respondent mentioned having been part of the mentorship program, and it had not been a positive experience.

*I was involved in the mentorship program but, again, I don’t think it worked out great.*

*(Constructs: Mentor)*

During analysis, the construct of Technical Mentors was separated from other mentions related to mentorship.

*I had one of the best mentors in my whole career. He was at one point of time my boss [outside of CDC] and then he became my boss when I came to CDC as an epidemiologist. He was one of the persons encouraging me to build that analytical skill and scientific skill if I want to work in the TB area or infectious disease.* *(Constructs: Technical Mentors)*

It is important to note this distinction between technical mentors and mentors who provided guidance for the development of more leadership roles. This separate construct, termed Technical Mentors, was broken out to clarify that role distinction. For purposes of this DrPH research, however, discussion around technical mentorship will not be explored, as the focus is on non-technical leadership roles.

*Mentor* most strongly co-occurred with the constructs of Opportunity, Leadership Support, and not surprisingly, Emulation, and Role Models (TABLE V).

**TABLE V: C-COEFFICIENTS FOR MENTOR AND CO-OCCURRING FACILITATORS**

<table>
<thead>
<tr>
<th>Mentor</th>
<th>Co-efficient</th>
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<td>Career aspiration</td>
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<td>Discover aspirations</td>
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<tr>
<td>Emulation</td>
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<tr>
<td>Exposure</td>
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<tr>
<td>How strength developed</td>
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</table>
Mentors were often mentioned as individuals serving in leadership roles. In this way, these individuals were often CDC-savvy and able to help the respondent navigate through the often complicated CDC-system. This appeared to be a distinct type of mentor – one who provided guidance around the bureaucracy of a federal system. This can be a very valuable relationship as individuals who aren’t familiar with these systems might have a more difficult time growing and advancing within it. This could be particularly true of those individuals who have served in more technical roles for the majority of their careers, and have not had to deal with much of the more administrative bureaucracy that takes places within federal systems.

One of the other keys to transition, too, was having a good mentor in place because I had worked under my branch chief for several years and she was the first person to hire me into a management position and she had been at CDC for the longest. So I think those are some of the best nuggets, like if you have a mentor who really knows the system back and forth, they can help you navigate. So without that it would’ve been a lot more bumpy. (Constructs: Mentor)

There was a mentor at the time that I did come back to. He was in this role actually at the time, in my current role, and just very wise and very high in the emotional intelligence as well. Sort of savvy in terms of CDC program. I always just asked for feedback and he gave very gentle but incredibly deep and perceptive observations about how I could strengthen what I was doing. (Constructs: Mentor)

I think mentors are excellent, particularly when you’re a young professional. Being smart is the first thing but if you have a master’s, a Ph.D., an MD, you’ve sort of earned that you’re somewhat smart, right. And then you quickly realize that just opens the door, what gets you through the door and what keeps you there, and mentorship I think is important to give you guidance, to help you avoid those landmines and if you fall into a landmine or encounter one as a supervisor or something else, how to negotiate and get out of those things. I think mentors are important for when it just seems like nothing’s happening. (Constructs: Mentor)

Of note were mentions by respondents who were based in a laboratory. These respondents discussed the value of having a mentor who would provide guidance on something as seemingly
mundane as sending emails. For laboratory staff, however, who perhaps spend the majority of their time at the bench instead of sending emails, being able to communicate effectively via email could be a very valuable skill necessary to transition successfully into leadership roles at CDC.

But he was here for about three years but looking back on that, I learned a lot from him in skills that I would not have otherwise—he would let me sit with him sometimes and how he would craft an email and the thinking that went behind words he would use or who he might copy on an email and why. And he took a lot of time to walk me through those approaches which I’m very thankful for because it’s been helpful now in this position. And sort of his approach to how he would review a manuscript. Things that otherwise I would not have had that opportunity. So he brought to my development I think a whole different set of skills. I would not have said at the time would’ve turned out to be…taught me a lot. (Constructs: Mentor, Observe Other Leaders, Opportunity)

Right and he would talk to me, he would give me his strategy, this is what I’m thinking about doing this. Or there would be times where I would get an email from him and I would come over and say, okay, I’m trying to figure out why you wrote it this way and this is what I’m thinking. Is this right or am I wrong? So he would sort of walk me through it. That was invaluable. He would let me sit when he would make conference calls just to observe and, wow, that was so, so helpful. (Constructs: Mentor)

Respondents discussed the value of a mentor as pointing the way for them regarding their career aspirations.

And I wouldn’t be where I am without the mentors that I had. I think a number of things or skills that you may have, but then it’s also circumstances that you by luck made discoveries or that project you on the path you end up on. But then it’s mentors and people that came along that helped. (Constructs: Mentor, Self-Efficacy)

And the thing that probably made it for me in terms of my career was exactly that. The people that hired me, the people that mentored me—not formally but informally—the people that facilitated my work, the people that promoted me, the people that gave me opportunities. And there are probably three or four people that I can name by name without whom my career could’ve easily taken a very different path, and not for the better. I have those people to thank...I still thank them regularly for the opportunities that they gave me and the sort of career path that they helped create. I mean without them I could’ve been in a very different place. (Constructs: Mentor, Leadership Support, Opportunity)

One noteworthy discussion centered around the role of a mentor in advising the respondent about the different career paths that could emerge if the respondent decided to stay at a state department rather than go directly to CDC.
The issue at that time was...should I go with my original plan of always wanting to be at CDC headquarters or should I stay in my state assignee role? I was based in [state] and a mentor at the time, as mentors are a good thing, said to me, well, the decision is whether you want to stay in [state] and be a big fish in a small pond or stay at CDC and be a small fish in a big pond. (Constructs: Mentor, Career Aspiration)

So even though you have the technical skill—a mentor told me, because I could've come here a long time ago in a GS 12 or 13. No way I'm gonna do that because, great, you get in but you don't stay there and it's a fight. Get all the experience at a state and come in at the highest level. Thank God that I did that because it ain't so easy to move up. (Constructs: Mentor, Career Aspiration)

Others talked about how these mentors served as role models for them, and provided a leadership style or career path that the respondent wanted to emulate.

He was the state epidemiologist at the time and he had a great influence on my career direction. I become Associate Director of Science just like he did. So I admired his organized way of approaching scientific inquiry and he was a very strong writer so I wanted to learn how to write like him, and I sort of followed his example. (Constructs: Mentor, Emulation)

**Leadership Support**

The construct of Leadership Support, originally identified in the conceptual model (FIGURE 5) simply as Support, was defined as indications that the respondent felt his/her leadership supported him/her, including mentions of having confidence in the respondent. Leadership Had Confidence in Me was originally a separate construct, but upon reflection, was deemed to be a type of leadership support and so was collapsed into the broader Leadership Support construct.

[Leadership] spent enough time with me to understand what I needed to understand about what they were trying to do, and gave me feedback and gave me exposure and time with them and brought me into meetings. The meetings I would never have been brought into before. And kind of expressed one-on-one and publicly great confidence in me which does wonders for anybody. (Constructs: Leadership Support, Exposure, Mentor, Opportunity)

A lot of it was their confidence in me. I mean they had confidence that I didn’t even have. (Constructs: Leadership Support)

...you know, and they all just had confidence and wanted me in the position. They just put me out there and they were not micromanaging, they were not hovering. (Construct: Leadership Support, Opportunity)
...it was just, you know, you can do this and let me know how it goes. (Construct: Leadership Support)

It kind of happened. And I would go in and say, I don’t think I can do this and they would say, yes, you can. I’m like, okay. (Constructs: Leadership Support)

It’s about having people say to you, hey, I think you can do this. I see something in you. (Constructs: Leadership Support)

Although there were a few mentions of leadership support for technical advancement, the majority of respondents only talked about support for development of non-technical leadership skills, or advancement in leadership roles. Perhaps this is because these individuals were already strong technically, or perhaps their leadership potential was recognized as something that could be fostered.

You know, a little bit I had some holes that I felt—areas that I had holes in and I asked and people were nice enough to make arrangements for me. For example, when I first came here, I wanted a little more beefing up on my epi and surveillance skills so they sent me for a summer institute for a month ... and it was full-time. So it was a big commitment on the part of the agency to send me off for a month so that I could do this training program, and it was very good. It was very good, very helpful. (Constructs: Leadership Support, Opportunity, Technical Training Opportunities, Taking Initiative)

I received technical support if I needed it. (Constructs: Leadership Support, Technical Training)

Well, certainly the division and the branch at the time were very supportive of pulling the community of practice as well as the research study together. There was a lot of good technical input from the division. (Constructs: Leadership Support)

There was a colleague who actually now works for me, which is kind of interesting, who was very good and is probably one of the brightest individuals I’ve ever met who really was a sounding board for many of the ideas and was very supportive. And then at that time we also had a deputy branch chief who was a renowned scientist in her own right who was also very supportive and took interest in the work and provided resources and input. (Constructs: Leadership Support, Peers, Technical Skills)

Leadership Support was the second most grounded construct that emerged from this analysis. It was mentioned in 16 of the 21 interviews, and was strongly related to the respondents’ transition experiences. It strongly co-occurred with the constructs of Opportunity and Leading an Activity (TABLE VI).
<table>
<thead>
<tr>
<th>Leadership Support</th>
<th>Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Career aspiration</td>
<td>0.01</td>
</tr>
<tr>
<td>Commitment</td>
<td>0.01</td>
</tr>
<tr>
<td>Communication</td>
<td>0.01</td>
</tr>
<tr>
<td>Connect technical and non-technical skills</td>
<td>0.02</td>
</tr>
<tr>
<td>Demonstrate Strength</td>
<td>0.01</td>
</tr>
<tr>
<td>Detail</td>
<td>0.03</td>
</tr>
<tr>
<td>Differences from technical role</td>
<td>0.04</td>
</tr>
<tr>
<td>Discover aspirations</td>
<td>0.01</td>
</tr>
<tr>
<td>Emulation</td>
<td>0.01</td>
</tr>
<tr>
<td>EQ</td>
<td>0.01</td>
</tr>
<tr>
<td>Exposure</td>
<td>0.03</td>
</tr>
<tr>
<td>Flexibility</td>
<td>0.01</td>
</tr>
<tr>
<td>Hands-on learning</td>
<td>0.03</td>
</tr>
<tr>
<td>How strength developed</td>
<td>0.02</td>
</tr>
<tr>
<td>Leading an Activity</td>
<td>0.11</td>
</tr>
<tr>
<td>Luck</td>
<td>0.01</td>
</tr>
<tr>
<td>Mentor</td>
<td>0.06</td>
</tr>
<tr>
<td>Opportunity</td>
<td>0.20</td>
</tr>
<tr>
<td>Peers</td>
<td>0.01</td>
</tr>
<tr>
<td>Resilience</td>
<td>0.01</td>
</tr>
<tr>
<td>Role models</td>
<td>0.02</td>
</tr>
<tr>
<td>Self-efficacy</td>
<td>0.02</td>
</tr>
<tr>
<td>Supportive Infrastructure</td>
<td>0.06</td>
</tr>
<tr>
<td>Taking Initiative</td>
<td>0.02</td>
</tr>
<tr>
<td>Team</td>
<td>0.03</td>
</tr>
<tr>
<td>Technical mentors</td>
<td>0.02</td>
</tr>
<tr>
<td>Technical Training Opportunities</td>
<td>0.04</td>
</tr>
<tr>
<td>Training opportunities</td>
<td>0.03</td>
</tr>
<tr>
<td>Wanting to learn</td>
<td>0.01</td>
</tr>
<tr>
<td>Willingness</td>
<td>0.05</td>
</tr>
</tbody>
</table>

There were distinct differences in the way leadership support was expressed. Upon reflection, these were characterized as either active or passive support. Mentions of more active forms of support were described as the respondent’s leadership actively providing guidance, publicly crediting him/her with achievements, or nominating him/her for trainings or opportunities.

...I’ve been very fortunate because my bosses don’t just take it and run with it and it’s their thing. They’re always very transparent and open about sharing up the chain the work that I do so that it’s my work that got it done. (Construct: Leadership Support)

Frankly, it’s been more of like what I think the heads of some of these organizations will call me, my center director will kind of reach out to me individually is because of the relationship and the doability I’ve been able to do with things. It’s kind of the performance probably that they’ve seen. (Construct: Leadership Support)

I attended the LMI. I was nominated and applied to that. That’s a great course to kind of like develop your leadership skills and back then we didn’t have that mandatory training now like new.
supervisors have to have 60 hours of mandatory training, and we didn’t then but there’s a class they teach that took that was really helpful in learning all the policies and procedures. So I think with all of that and on-the-job training really helped me transition. (Construct: Leadership Support, Training Opportunities, Hands-on Learning)

And my team lead would nominate me for a lot of things. I guess he saw some organizational skills that I had that he liked. (Construct: Leadership Support, Opportunity)

Conversely, mentions of more passive forms of leadership support were described as the respondent’s leadership providing more of a hands-off approach to support – creating a supportive environment where the respondent could develop skills, be autonomous, and make mistakes without fear of repercussion.

... there was always an eye towards we all need to learn and improve our leadership skills. It was just kind of like permeated throughout my early days where there was this intense focus on let’s be the best leadership team we can be, and I think that just kind of meant you’re surrounded by people who are always trying to do the right thing from a leadership perspective and I think that helped. (Constructs: Leadership Support, Supportive Infrastructure, Exposure, Role Models)

I’d say probably flexibility and resilience and like openness to fail, which I have to say the program was good I think in terms of I didn’t have too many moments where you felt like you could go out on a ledge and they wouldn’t leave you. If you screwed up, you wouldn’t get left hanging. (Constructs: Leadership Support, Flexibility, Resilience)

...managerial style having leadership that did the same thing; that you felt like you weren’t gonna be left hanging. So it allowed you to be entrepreneurial and risk taking, not fearing that it would destroy your career, that more often or not you succeeded. And we had inspiration, inspired leadership in the division. (Constructs: Leadership Support)

Also my first supervisor at CDC, he was really good. His approach was sort of I’ll let you know if you’re not doing well. Because he was like I want you to get in and develop your own style. (Constructs: Leadership Support)

I was never in a formal mentorship relationship but I’ve always had senior people that noticed me and looked out for me, and I’ve been grateful for that. (Constructs: Leadership Support, Mentor)

...I like an environment where I’m given autonomy and where I have the ability to sort of—you know, I can make mistakes but then I have the freedom to troubleshoot and to correct and move in a different direction. (Constructs: Leadership Support, Supportive Infrastructure)

Well, I knew that they were supportive, I knew who my supervisor would be. So it wasn’t like moving into a new place and I didn’t know what was going to happen. I pretty much knew what was
Although Leadership Support appeared to be a primary construct related to a respondent’s transition, it did not seem to be, in and of itself, sufficient for a respondent’s transition. Instead, when this construct appeared directly related to a respondent’s transition experience was primarily when it co-occurred with the constructs of Opportunity and Leading an Activity.

She wanted this whole thing and she said with your teaching background, and I like people, and the fact that you like people, do you think this is something you would be interested in? So that was a little scary for me because it was moving away from a bench scientist position, but I thought, wow. Again, it was this opportunity to have autonomy, to build something in this branch and in our division that had never been built before. I had free reign in terms of how I wanted that to look and I thought what an opportunity. So I said of course I would like to do that. So then I transitioned away from the purely research aspect and moved into what is our reference laboratory team, this little activity sort of resided there. (Constructs: Leadership Support, Opportunity, Leading an Activity, Career Aspiration, Discover Aspirations, EQ)

It wasn’t for that, it was just that they needed somebody to coordinate all this. So that was sort of the first thing and that was a decision I think made by the center director and my division director. I think they felt the need and they sort of looked around and said, hey, looks like you’ll do a good job. He doesn’t complain too much so why not. (Constructs: Leadership Support, Opportunity, Leading an Activity)

I was in that for maybe four, five years and then same thing, I was doing some work overseas; not physically overseas but doing some global work, a little bit of global work, and some of the people I was working with from the injury center thought that I would be able to help them in trauma care systems, injury prevention, injury response kinds of activities. So they asked me, hey, we have this opening, it’s for an associate director for science position, would you be interested in applying for it? So I said, okay, I’ll apply for it. Sounds kind of fun. I enjoy doing it. I have my previous training in medicine was in emergency medicine so it was very relevant. So I applied for that job, so they offered me that position and I took it. So I did that for three, four years. (Constructs: Leadership Support, Opportunity, Willingness)

Then there was a change in leadership at my old center and the new center director. I continued to do some work with them and it was the same kind of story. They approached me about that associate director for science position at the center level and I think it was same scenario, again, increasing level of responsibility. (Constructs: Leadership Support, Opportunity)

So I can probably go through all of them. I don’t have to go through all of them in detail but I can tell you what they were. So when I was first hired, I was hired to basically kind of do the work for the agency out in [state] on this exposure in [state] and within about a year it became pretty clear I think to the center director and my division director that there was a need to—it was a very complicated set of events and it became clear to them that there had to be somebody in place to sort of serve in a coordinating role for the agency to deal with all the internal stuff between divisions and between centers
and to deal with HHS and to deal with the state and to deal with the community, and somebody who would sort of be seen as the face of CDC’s response to that problem, and that went on for years. So they asked me I think after about a year that I had been here, they asked me if I would take on this expanded role. (Constructs: Leadership Support, Opportunity, Leading an Activity)

These Opportunity and Leading an Activity constructs, and their relationship to Leadership Support and other constructs, are explored further below.

**Leading an Activity**

The construct Leading an Activity was defined as discussions around leading an activity that took a respondent out of his/her exclusively technical role. Some roles could still include technical elements, however, the respondent was coordinating or leading the process. This construct was mentioned by 17 of the 21 respondents.

I guess the first real leadership opportunity that I had which I think is probably true of many folks here at CDC was being principle investigator on this multi-country study because it was basically doing soups to nuts. At that time I had to do the whole budget, the contracting work, all that stuff. I was learning all that stuff for the first time. (Constructs: Leading an Activity, Opportunity, Technical Skills)

But because I had to work with four different programs and get them to all work together, it required me to kind of step up to a leadership role in that activity even though those were grantees, so they weren’t direct line of authority but they still had oversight of them and when you’re trying to get four different groups to work together and do the same type of thing, it requires you to take on more of a leadership role because sometimes you’re not gonna agree and someone has to make a decision and move things forward. And then also part of that job was oversight of the field medical officers, so this was the first time I really had more senior technical people—oversight of more senior technical people. (Constructs: Leading an Activity, Self-efficacy)

For many respondents, this chance to lead an activity was directly related to their transition experience. Respondents were often chosen for leadership as a result of their skills, or this new role was a chance for them to demonstrate their abilities, which then led to increasing levels of responsibility.

Okay, pivotal in my changing from the laboratory to this was I went during Anthrax, when the whole anthrax thing happened, to work in what was a makeshift emergency operations office at the time. They needed somebody who could answer laboratory questions. So I was on sort of a laboratory management—well, it was a group that helped advise other people in the emergency operations center. So it was an advisory group and actually I say laboratory but I was the laboratory person but there
were people for different topics, areas. (Constructs: Leading an Activity, Opportunity, Leadership Support)

As a result, I got asked to go ... do a [detail]. I agreed to one year of detail ... but was up there as the senior scientific advisor leading implementation for public health evaluation which became implementation science activities... Again, that was an opportunity just to get—this was tough space. I won’t go into all that. So the two years was actually a really tough job but what it do was it, again, got me my foot in the door ...and eventually get into trusted positions within that office. (Constructs: Leading an Activity, Opportunity, Detail)

Not surprisingly, this construct co-occurred most strongly with the construct of Opportunity, as it essentially was an opportunity for the respondent to lead an activity. There was also strong co-occurrence with the construct of Leadership Support (TABLE VII).

Similar to Leadership Support, in most cases this construct, in and of itself, did not appear sufficient to transition an individual into a non-technical role where he/she could be successful. Rather, this construct, when co-occurring with either Leadership Support, Opportunity, or both constructs, did appear to be strongly related to this transition experience. Further, for some respondents, their technical strengths garnered them visibility and they were given leadership opportunities based on their technical achievements. This echoes earlier document reviews (Appendix A) that discussed how some leaders at CDC enter into those positions as rewards for technical achievements. Thus, although not sufficient for transitioning, some respondents’ technical skills – when coupled with leadership support and an opportunity to lead, were closely related to their transition experiences.

So [name] recruited me back because the mandate was to stand up a regulation within 180 days which anyone who does regulations know that’s an extremely impressive timeline. And we did it and very successful. But he asked me to come back to the program to be the chief of operations and so my experience as a microbiologist was I think utilized very effectively because I put in place all the operations required for instituting, implementing the new regulation. (Constructs: Leadership Support, Leading an Activity, Technical Skills)

TABLE VII: C-COEFFICIENTS FOR LEADING AN ACTIVITY AND CO-OCCURRING FACILITATORS

<table>
<thead>
<tr>
<th>Leading An Activity</th>
<th>C-Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Able to lead</td>
<td>0.08</td>
</tr>
<tr>
<td>Attention to detail</td>
<td>0.02</td>
</tr>
<tr>
<td>Background</td>
<td>0.02</td>
</tr>
</tbody>
</table>
Opportunity

The construct of Opportunity was defined as a set of circumstances that makes it possible to advance, try something new, or be promoted. This was the most grounded construct in this data set, and mentioned by 17 of the 21 respondents. An Opportunity was seen as a deliberate action by an individual to open up a chance for the respondent to do something new, step into a different role, or demonstrate a strength or skill. It was different from the construct of Leading an Activity as the opportunity did not have to entail a leadership role. Opportunities included those times when the respondent volunteered for a role – in this way, it often co-occurred with Willingness and Taking Initiative.

Opportunity most strongly co-occurred with the constructs of Willingness, Leading an Activity, Leadership Support, and Taking Initiative (TABLE VIII). The co-occurrence with Willingness was notable given the concerns mentioned in the document reviews (Appendix A) about a potential lack of willingness of certain individuals to take on non-technical leadership duties.

<table>
<thead>
<tr>
<th>Opportunity</th>
<th>C-Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Able to lead</td>
<td>0.02</td>
</tr>
</tbody>
</table>

TABLE VIII: C-COEFFICIENTS FOR OPPORTUNITIES AND CO-OCCURRING FACILITATORS
Respondents talked of opportunities throughout the interviews. Many discussed being given opportunities to lead technical efforts, while others discussed leadership roles they were given or volunteered for. Some opportunities were smaller and did not appear to be directly tied to a transition experience – being asked to lead a working group, being supported to attend a longer-term training, or being given the chance to present in important meetings and increase his/her visibility and credibility. These smaller opportunities were important for the respondent to be able to gain leadership experience or visibility in front of other leaders, but did not emerge in the interviews as directly related to a respondent’s transition.
Opportunities that were larger in scope that allowed the respondent to step into a visible leadership role appeared to be those opportunities that launched the respondent into a non-technical leadership role. A review of the mentions around these larger opportunities showed that they were most often related to either the construct of Leadership Support or Leading an Activity.

There were a total of 75 mentions of Opportunity by respondents. An estimated one-third of these included the constructs of either Leadership Support, Leading an Activity, or both concurrently.

Of the 75 total mentions, 16 also included the construct of Leadership Support.

So I think that was very key and so I learned about a lot of things that had nothing to do with my job but were important in managing the division, and I think there’s that part of it and the fact that the division director also served as a key mentor in that portion and he also very much encouraged kind of being his surrogate or extender related to scientific leadership issues and tried to find opportunities for me on various international committees or expert panels or things to develop more visibility and help develop leadership skills. (Constructs: Opportunity, Leadership Support)

Seven mentions of Opportunity also included the construct of Leading an Activity.

So I did that for a little while and then a big turning point, which I think is relevant to some of this discussion, is I volunteered early on to be part of a rewrite of the TB Infection Control Guidelines. That turned out to be a two-year huge process that I learned so much from because it was really hard, and I think that that is where I sort of cut some of my leadership teeth on. (Constructs: Opportunity, Leading an Activity)

Eight mentions included both constructs, Leadership Support and Leading an Activity.

...It wasn’t for that, it was just that they needed somebody to coordinate all this. So that was sort of the first thing and that was a decision I think made by the center director and my division director. I think they felt the need and they sort of looked around and said, hey, looks like you’ll do a good job. He doesn’t complain too much so why not. (Constructs: Leading and Activity, Opportunity, Leadership Support)

Opportunities were either driven by the individual respondent as with those he/she volunteered for, or others were involved in helping the respondent obtain that opportunity. The latter represented the large majority of situations, and the ones that resulted more readily in transitions into leadership roles.

But more importantly, and I can’t emphasize how important this was and how much I appreciate it and still to this day appreciate it. I’ve told them several times over the years is that when your boss comes to you and says, I have a meeting with [leader] day after tomorrow on this topic and I would
really like you to go with me and present the overview and then I’ll be there with you—as opposed to a
different approach which would be can you please give me a briefing document because I’m gonna go
and present this. It’s huge, it’s huge. And it’s not just going in front of the boss to present. It’s also,
okay, I have this request at this conference and they’d really like to hear about our work … and it’s in
Sydney, Australia and I’m gonna go, would you make me some slides? Or, you know, I really think this
would be a good opportunity for you to present at this international conference and would you like to
go. Creating Opportunities. It’s huge. It’s huge. (Constructs: Leadership Support, Opportunity)

And those experiences—I’ve been very fortunate in most of my careers, in most of my jobs both
in government and even outside of government. I’ve had very good facilitative bosses and superiors, for
the most part. I’d say 95% of the work that I’ve done in my career—not all but mostly and that really
stays with you. So I see those people still regularly all the time. I told you a couple of them actually
work for me now and I tell them you really helped me get sort of settled here at CDC and you helped me
a lot in terms of my career advancement. Because if you don’t have those opportunities, no matter how
good you are… (Constructs: Leadership Support, Opportunity, Mentor)

I mentioned the deputy branch chief that we had before. She was very, very supportive and like I
said, provided a lot of opportunities that when I was in that position might not have given. (Constructs:
Leadership Support, Opportunity)

**Research Question: Q1a. What personal facilitators are pivotal in the transition from scientist to
successful non-technical leader within a federal scientific organization? and What existing systems-
level supports and processes can help promote the transition from technical expert to non-technical
supervisory leader?**

For the final interview question, respondents were asked to imagine that CDC had developed an
innovative and strategic program aimed at developing technical staff into successful non-technical
supervisory leaders. The question was what they perceived as key aspects of such a program.

The most often-mentioned constructs were opportunities, mentors, a stepwise approach to
advancement, and training. Each of these constructs, along with others that also emerged, is presented in
more detail below.

**Opportunities**

Respondents mentioned providing opportunities to staff prior to entering into a non-technical
leadership role in order to provide them with the skills needed to succeed in these types of positions.

Further, respondents indicated these opportunities would expose staff to the requirements of the position
in order to make an informed decision about whether or not this is the path they want their careers to take. This can be particularly challenging in hierarchical organizations such as CDC where many staff do not reach a visible leadership position until much later in their careers. The construct of

*Opportunities* was mentioned by nine of the 21 respondents.

*Now they’ve gotta worry about travel and budgets and personnel and all that stuff and they’ve never had to deal with this before. They have no experience and I think maybe there almost needs to be some kind of pathway or something where they can start learning about those things earlier on. I think two reasons. One is they’ve sort of developed the skills and knowledge and competence but also decide if they really like this type of stuff or they can deal with it because sometimes they think you go to be a branch chief and it’s kind of the same thing with bigger projects and more people and don’t take into account all the other stuff that as a scientist they never had to deal with. And there are some who really don’t want to deal with it and they will do everything possible when they get in those positions to avoid dealing with it and that is, I think, where we run into problems.*

(Constructs: Dream_ID high potentials, Dream_Stepwise Approach, Dream_Opportunity, Dream_New Responsibilities)

*...one of the things I thought about here was having—when I was in [Center] for years and they have a six-week rotation so we had a new person every six weeks and they come and meet people and take on a project. If we could do that in our [Center], I think that would—and sometimes people see what happens and they think, hmm, that’s not what I want to do. (Constructs: Dream_ID high potentials, Dream_Stepwise Approach, Dream_Opportunity, Dream_New Responsibilities)*

*I also think a lot of the 360 assessments and different personality assessment tools, those would be things that we should do beforehand because some people may determine I’m not interested after they go through all of that, you know, I don’t know if I want to go down this path. But having those type of opportunities.*

(Constructs: Dream_Opportunity)

*Of note were discussions related to opportunities for laboratory staff in particular. These discussions centered on the need for laboratorians to obtain exposure to work outside of the laboratory setting. The laboratorians, former and current, interviewed for this DrPH research made special mention of the uniqueness of the challenges faced by laboratory staff. This will be discussed further in Chapter 5.*

*That’s something looking at now I think would be a great thing for laboratory people in particular to have opportunities to either work in other laboratories to learn technical skills that they could bring back to their own labs and also to detail to other physicians in the agency to, again, see what it is that other people do.*

(Constructs: Dream_Opportunity)

*So I’d say that would be the most important thing. I encourage people now, and fairly often has somebody asked me if I want to get out of the lab. I tell them volunteer for things even if it doesn’t sound like something you really want to do like reviewing grant proposals. You learn what other people*
do, you meet other people, you find people that do things you might be interested in or know people that you’d like to know. (Constructs: Dream_Opportunity, Dream_Exposure, Dream_Hands-on Learning)

Along with the discussion of opportunities, was the discussion around how to provide fair and equitable opportunities to all staff. Some respondents struggled with that question, while others felt that opportunities don’t have to be equitably distributed. How and whether to be equitable is an important point of consideration, in particular for organizations the size and scope of CDC, and one that will be discussed further in chapter 5.

You have a completely different system here when it comes to positions. I understand that and that’s the way it should be but when we’re talking about opportunity at the lab to work on a certain project, I think that needs to be earned because you’re gonna give everyone equal opportunity, things will be there, but some projects are more challenging and require something extra and you would put the good person in that project. They have demonstrated they can do it and you may also reassign a person if it doesn’t work out. That’s what I’m talking about and that is crucial that you need to see that but also you shouldn’t give the same person the good opportunities all the time because that builds problems, too. So you need to be fair and equitable how you do it. In a lab you can do things—there are many different levels you can do things. So what I’m trying to do is for a method development project...may be very, very simple and they may go to this person here. Maybe they’re very happy to get that because ... they can do it and they can report it and they’re gonna get it done. But you may then have another project that is—it’s a nightmare project and I’m obviously probably more involved in the nightmare project to make sure that that project actually is going to work. So there would be different opportunities but we’re now talking about basically the same GS level positions even at the scientist project, differently. But I think everyone needs to get that acknowledgment that I think what you’re doing is important and I want to sit down and talk to “you” about this project here and it may be a fairly mundane project but I still want to sit down with you and talk about it and explain why this is important and why we need to do this and do it well. That’s how you develop people to be able to do more difficult things, and that takes time. (Constructs: Dream_Opportunity)

... but what I think is important when building leaders that, sure, opportunities come along but we are not entitled to those opportunities. Opportunities need to be earned and that’s the way I’m trying to build the people in my lab. There’s of course people in there that they’ve been doing it for a long time and those have slowly been progressing because they put in the extra effort, within reason, eight hours a day here. But they keep driving. So everything, there’s motivation that gives you the opportunities. It’s not an entitlement that I’ve been here this many years and I’m entitled to a leadership position. I think that’s a horrible way of thinking. You’re not saying that but I’ve heard that and that’s a culture I think we have here that I don’t agree with at all. (Constructs: Dream_Opportunity, Dream_Stepwise Approach)

I think people need to have the opportunity to do it. They have to do it. They have to do the role and that’s hard to kind of figure out how to make that happen in a succession planning kind of way in such a big agency. But I think they have to have the experience. (Constructs: Dream_Opportunity)
So I think you ought to be able to sign up for this leadership track. I don’t know how you would do it in a fair way and you ought to say over the next five years you have self-study or whatever and you have a way to find a good mentor. And I think people who have that interest ought to be able to be nurtured somehow and I understand that you have to be—sometimes we’re so careful about being fair that nobody gets it right. So I don’t know how you’d do that. You’d have to have some way or maybe make it open to everybody but you have a certain... (Constructs: Dream_Opportunity, Dream_Stepwise Approach)

**Training**

The importance of training was mentioned by eight of the 21 respondents. Although most respondents did not mention having had formal training themselves prior to transitioning, or the training was not very helpful or memorable, they indicated the need for staff transitioning into non-technical leadership roles to be prepared for this move. Many of them noted that CDC falls short in this area.

You’ve gotta have training. You have to have real-life, on-the-job, hands-on training and that’s the piece I think we’re lacking and people muddle through it for the first 5, 10, 15 years of their career and some of them come out really good and strong on the other end, and others just sort of fizzle and die. (Constructs: Dream_Training, Dream_Hands-on Learning)

I would like to see formal curriculum that is carefully thought through at the beginning where we have some understanding of what people need to make the transition. At CDC we have the best of intentions; sometimes we tend to jump right in and we don’t do the preliminary work we need to do to make sure we understand the need that we’re trying to fill and to come up with training curriculum that’s likely to meet that need, and then to try to actually implement it maybe on a smaller scale and work out the problems and the challenges before you make it large scale. (Constructs: Dream_Training, Dream_Stepwise Approach)

...I would think, of course, a robust, almost like an orientation and having like top-of-the-line leadership development courses, like a suite of courses they could pick from. (Constructs: Dream_Training)

**Stepwise Approach**

Eleven of the 21 respondents mentioned the need for a staged approached to transitioning into leadership. For purposes of this DrPH research, this construct was termed Stepwise Approach. This construct appears to be important in that it provides a way for a staff member to take on increasing levels of demand and responsibility before reaching a leadership position. This provides both the staff member and his/her leadership the chance to assess whether or not this individual will be successful in a non-technical role.
So I think number one, it would not be something quick. I don’t think it’s something like, oh, you’ll go to two weeks of classes and now you’ll be an experienced leader. That’s not my vision of this. So I think it’s something that probably for people would be a much longer term kind of thing. I think it would be something that could be at least a year or two, so that means you’d have to be thinking about people in the pipeline over a longer period of time. (Constructs: Dream_Stepwise Approach)

Phased or staged leadership development, you know, push people into situations and see how they do and then pull them out. I do like some of these training opportunities like IETA that give people temporary exposure. (Constructs: Dream_Stepwise Approach, Dream_Training)

And also (at) CDC, we sometimes bring people and grade it kind of high. You know, if we were able to kind of reset and have like a systematic way people advance in place that would be nice. You know, I’m dreaming now because a lot of people get in positions as politics, networking. It’s kind of who you know and if we had a really robust program like you have got to meet all of these different competencies before you go to that next level, that could kind of—it’s wishful thinking. (Constructs: Dream_Stepwise Approach)

In the leadership classes, that (an understanding of the bureaucratic and administrative demands of leadership positions) is talked about but also I think there’s a transition because you typically start at the bench, you excel at the bench, you get recognized and do some sort of a growth period where you get more and more responsibilities and then eventually there’s gonna be a post and an application and you get into a leadership position. So there is gray between there before you actually are in the leadership position. (Constructs: Dream_Stepwise Approach, Dream_Opportunity, Dream_New responsibilities)

**Mentor**

Seven of the 21 respondents mentioned the importance of mentorship. Much of this came in the form of an employee shadowing a mentor or having the opportunity to see what leadership roles entail prior to entering those roles. As mentioned earlier in this chapter, mentors appeared to be very important for many of the respondents’ own transition experiences, so it was not surprising that those who did mention them appeared to feel strongly about the value of mentorship.

…here you have somebody who’s got many years of experience and understands all the in’s and out’s, and if you want to have a younger mid-career person that you want to mentor and have grow into that position, what better way to do that than to have somebody work with them and work sort of as their shadow. Shadow them around for three or four months. (Constructs: Dream_Mentor, Dream_Opportunity)

…like these people, like we’re talking about this group that’s set to retire, if there would be a way that they mentor new employees. That would be a neat model to look at. (Constructs: Dream_Mentor)
I think really having them—people have an identified mentor that they work with on a more formal basis. I don’t know if formal is the right word but let’s say regular and consistent. (Constructs: Dream_Mentor)

I think one role would be mentoring. To find somebody who actually does it well and mentors well who could sort of model it for you. So maybe that’s the idea of a detail or some other way you actually get to know somebody in that role before you took on the role. (Constructs: Dream_Mentor)

I think really having them—people have an identified mentor that they work with on a more formal basis. I don’t know if formal is the right word but let’s say regular and consistent. (Constructs: Dream_Mentor)

I would do some kind of very targeted focused mentoring kind of a process. (Constructs: Dream_Mentor)

**Identifying High Potentials**

Five respondents discussed the importance of identifying high potential staff early in their careers. This would allow the chance to develop individuals earlier who show potential and interest for a career in a non-technical role.

I hope there’s some way that CDC can start to be a little more proactive and train their leaders before they get there. I talked about proactive like five years in advance or one or two years in advance, and then also about right before they start taking over to kind of get stuff in place faster. (Constructs: Dream_ID high potentials, Dream_Stepwise Approach)

I think the key aspects would be to one, find out people early in their career if they’re interested in this. Early in their career if they’re interested so that they can start to be given opportunities and responsibilities that are more than technical, and also get training in those areas. (Constructs: Dream_ID high potentials, Dream_Training, Dream_Opportunity, Dream_New Responsibilities)

Moreover, there was the acknowledgement that not everyone is suited for a non-technical leadership position at CDC. This concern was mentioned in earlier document reviews that were conducted (Appendix A).

I wonder if part of the program might be not every technical staff should be groomed in at least the type of leadership where you’re the manager, supervisor of other people because sometimes it’s just not who you are and it’s never going to be who you are. So maybe if there was a way to identify those people who would kind of excel and kind of bring them into the fold and use more energy towards
developing people with some aptitude or desire there might be one aspect of it. (Constructs: Dream_ID high potentials)

Focus on the non-technical stuff, screen people. The problem is that you sort of presume that everyone can rise into leadership and I think one of the worst things we can do is people who are technical by nature is trying to fit them sort of square peg round hole, and coaching them up on maybe you’re not gonna become a GS 15 person but a GS 14 senior scientist non-supervisory... And try to make sure people—so screening is absolutely critical...(Constructs: Dream_ID high potentials)

**Leadership Support**

Interestingly, although Leadership Support was a pivotal construct for the respondents’ own experiences, it was only mentioned by two respondents as a key aspect for a leadership development program. Perhaps they were viewing leadership support more broadly as aligning with mentors; however, this was not clear. Further, in all three cases, it was tied to an opportunity to advance.

They had no idea what the job was going in but they sort of do it for a year or two and they have a good boss and the person gives them lots of opportunities and slowly their responsibilities increase, and the next thing you know they’re off in some deputy director role or something and they’re very effective at it. (Constructs: Dream_Leadership Support, Dream_Opportunity, Dream_New Responsibilities)

The fellowship is kind of—that’s actually we have some formal structure there for the fellowship. Unless people come out of EIS or PE fellows or the like, we tend to then just let things happen organically, and it sort of depends on being lucky enough to get a good supervisor...employee manager that helps you move to the next level. (Constructs: Dream_Leadership Support, Dream_Infrastructure, Dream_Stepwise Approach)

**Staying Connected to Science**

Staying Connected to Science was defined as discussions around encouraging junior staff to do science before entering into non-technical roles, and mentions of how leaders can stay working in the science realm. Five respondents talked about the importance of staying connected to technical work before entering into a non-technical role, or even while still being in a non-technical role. This has emerged as a concern in earlier document reviews, however, and contributes to the perception noted in several of those documents about the lacking of willingness or interest of some leaders to let go of the science and focus on non-technical leadership duties.
I was asked at a recent NCIPC session what would I do differently and I think I probably would have wanted to stay a staff scientist for a little bit longer. So don’t rush it. (Constructs: Dream_ Staying Connected to Science)

Even with I-Lead, it’s about moving you towards these higher level positions and we have folks who are very stable and consistent, especially in our clinical laboratory work. They have no interest in ever becoming a manager but they are so technically competent and so valuable and have wonderful leadership skills and being able to train them into a junior scientist that we bring in. We need an opportunity to develop that more and they need to feel that that contribution is valued as an agency. So that’s the first thing that came to mind when you asked that question. (Constructs: Dream_ Staying Connected to Science, Dream_ Non-technical track)

Also trying to systematically build in a way that they can stay connected to the science like even if one of their PMAP elements was—I don’t know, I just know in these positions it’s so hard for people to find time to actually engage and do the work, because I think about my division director, he’s one of the top evaluators at CDC and he misses that so much and we’re always trying to figure out ways to restructure his work so he can have at least one evaluation project he’s working on. Like maybe having some kind of way we can build in like one project or one way for them to stay connected. (Constructs: Dream_ Staying Connected to Science)

And I said, I know I’m telling you something opposite of what you’ve heard from so-and-so but in my opinion you’ve worked your butt off, you deserve to have some fun doing science for a few years before you immediately flip into another area that you won’t—I mean she’d be using her expertise but not in a way in which she could as a technical subject matter expert. So I think if I were to go to sleep and wake up and there was this fabulous program and people came to me and would ask me what I thought, I guess the things I would be looking at is what ultimately will—how can you quantify or even quality what would be gratifying to step away from the bench or step away from the field or the computer if you’re a statistician or whatever, to do such a track? How do you describe the gratification that would come from being able to provide support and leadership to scientists as opposed to being one of those scientists, and I think you’d really need to have people who have some heuristic qualities that really want to help people and that sort of thing—heuristic maybe wasn’t the word I was looking for but anyway you know what I mean. (Constructs: Dream_ Staying Connected to Science, Dream_ Stepwise Approach)

Throughout the interviews, there was a good amount of discussion around the challenge associated with remaining in a technical track at CDC when it pertains to promotion potential. With few exceptions, individuals in leadership positions have to take on supervisory duties. This is often off-putting to many scientists, however, they end up taking this role on in order to advance grades.

Non-technical Track
This construct was very similar to *Staying Connected to Science*. It was defined both as mentions of not needing to go into management/supervision and being able to stay in technical role, or mentions of a lack of advancement opportunity for technical staff.

And here’s the other problem, and this is something that goes beyond CDC and federal government, is how the federal government, especially the civil service, is structured in terms of grades. So the reality is that if you’re gonna get to a 15, you ultimately have to take on some kind of management position and so people are driven to do that even though they have no interest in management whatsoever, none, and when those people end up in management positions, it doesn’t go well. We’ve had to deal with the issue in hiring one of the branch chiefs where there were two really good people but one was clearly much better in the management realm, the other one was an outstanding scientist. And I picked the management. Of course, the scientist is really unhappy because I’m a great scientist, why am I not in charge? But that person would just not have been good in that position and but they feel like, well it’s hopeless, I can’t advance, that’s gonna be the end of it. And I don’t know what the solution to that is. It’s not easy because even if we somehow developed some kind of track for technical expertise that will allow you to get to that level, the cost, the additional cost from personnel would be problematic. So I don’t know. Someone smarter than me is gonna have to figure out how to address that issue. (Constructs: Dream_Non-technical Track)

I mean it’s important in this agency to have ways that people can be promoted who don’t do supervision and management and that’s important. I think we could do a better job of that as an agency, we have the world’s expert or whatever, be the world’s expert, whatever. I think it’s different though. People recognize now that you can’t like not be bothered. Like there’s people here who, especially early on, like I’m a scientist, leave me alone, I don’t have to do training or whatever. I mean I think people who are certainly well rounded, that’s not the way it works. (Constructs: Dream_Non-technical Track)

Oh, one thing I think would be nice, too, is if we had a systematic way of having like graduated—where people wouldn’t necessarily have to go into management positions to advance in their career because we had talked about this with project officers like people coming in at the 9 level, meeting a certain set of competencies to advance to 11, you know, and maybe those going up to like GS15 positions. (Constructs: Dream_Non-technical Track, Dream_Stepwise Approach)

So they’re like a senior scientist, it stops at 15. That way they don’t have to necessarily go into a management position to get that GS15. That would be nice.....There should be some more incentives for them to stay in there....even if there were different monetary and non-monetary incentives because when I think about leadership and administration, management, all of that to me is almost a science in itself. So it’s sort of like you send a nice powerful message that all of these positions are valued. And also CDC, we sometimes bring people and grade it kind of high. You know, if we were able to kind of reset and have like a systematic way people advance in place that would be nice. You know, I’m dreaming now because a lot of people get in positions as politics, networking. It’s kind of who you know and if we had a really robust program like you have got to meet all of these different competencies before you go to that next level, that could kind of—it’s wishful thinking. (Constructs: Dream_Non-technical Track)
Of note, once again, there were specific mentions of how this perceived lack of advancement potential for non-technical staff impacts laboratorians.

But the opportunity has been in a management position, a supervisory position. I think that’s where the difference lies. Again, not every senior scientist needs to become a manager or supervisor and there needs to be a career progression that appreciates the contribution of the senior scientist in the absence of a management position. I don’t know how that works for epi’s but it seems like there is something, and for laboratorians it’s not there. Pretty much the only way you progress is moving into a team lead or a branch chief position and that’s unfortunate because those people get in them and stay for long periods of time so you look at that and think, well, there’s nothing here for me. That’s a problem. I’m very concerned that there’s gonna be a brain drain if we don’t get this fixed because I hear it among staff. (Constructs: Dream_Non-technical Track)

Critical Incident Reports

Only one critical incident report was returned. Although this was disappointing, it was not unexpected. The interviews lasted between 60 and 90 minutes in length and provided very rich data. There was likely not much left to say about the topic once the interview ended. Nonetheless, a-priori and emergent codes were applied to the data gathered via the single returned report.

The findings from the critical incident report address questions **Q1a. What personal facilitators are pivotal in the transition from scientist to successful non-technical leader within a federal scientific organization?** and **Q1c. What cultural facilitators are pivotal in the transition from scientist to successful non-technical leader within a federal scientific organization?**

The single critical incident report received discussed the importance of indicators of success. As this had not emerged in earlier interviews, this line of discussion was applied an emergent code of *Indicators of Success*. The respondent discussed having indicators of success for when one is serving in a particular capacity. For example, he/she discussed indicators of success for a technical role as well as those for a non-technical leadership role. The two questions used on the critical incident report and the responses provided are shown below:

1. **Question**: Describe the facilitator which you feel was critical in your success in your transition from a technical role into a non-technical leadership role.
Response: Recognizing the differences between indicators of success as an individual scientist in a technical role and indicators of success in leading a group of people (team, branch, or office). Indicators of success in a technical role include knowledge, skills, expertise, and credibility. Indicators of success in a non-technical leadership role include survival and growth of the organization in size, productivity, morale, and reputation; absenteeism and staff turnover.

2. Question: Describe how this facilitator contributed to your success when transitioning from a technical role to a non-technical leadership role.

Response: First, I recognized the importance of the indicators of success in leadership. Second, I set goals and objectives for improving these indicators. Third, I evaluated the program toward these goals and objectives. Lastly, I used the results of periodic evaluation to improve my performance going forward.

This notion of indicators of success at varying levels of leadership are similar to the Center for Public Leadership’s leadership development framework. This framework presents leadership in a 3-stage process: 1) leadership of self; 2) leadership of teams, and 3) leadership of organizations. (CPL, 2015). CDC has a similar staged approach with their I-LEAD program; however, how much it is understood and used as intended would be an important area of further exploration.

Document Reviews

A document review was conducted to in response to sub-question Q1e: What existing systems-level supports and processes can help promote the transition from technical expert to non-technical supervisory leader? In order to address this question, document reviews of a limited amount of CDC workforce development-related documents (N=15) were conducted. These included hard copies of documents that were made available to the researcher (N=10), and CDC internal web pages for CDC staff (N=6). The documents reviewed ranged by year, from 2003 to 2016, and all of the hard copy documents were related to succession planning, broader workforce development or workforce assessment reviews or assessments that had been conducted over the years. Only four of the hard copy documents made some reference to leadership development, although not a focus of the document. The
five web pages reviewed were primarily related to specific programs available to CDC employees, such as coaching or mentoring, that were related specifically to leadership development.

Because the researcher was only able to review those documents that were available to her and of which she had knowledge, these were limited in scope. However, the document review process was helpful in validating what was expressed by interview respondents and in providing additional insights into opportunities mentioned by interview respondents (i.e., coaching program, mentoring program).

As noted in Chapter 3, the document review was structured according to SOAR. This meant that the researcher reviewed the documents with an eye toward capturing mentions of strengths and opportunities. The majority of the hard copy reports reviewed were gap-centric, as the underlying purpose of the report was to assess areas of need or gap, or to assess areas for improvement. As a result, it was difficult in these instances to extract strengths-based information. For opportunities, the researcher primarily used a combination of information solicited from the reports coupled with reflection on what opportunities would be available based on information provided in the reports. Therefore, although opportunities might not have been directly mentioned, the reflection component allowed for speculation of potential areas of opportunities to be explored. Finally, because only four of the hard copy documents discussed leadership development specifically, the direct relevance of the remaining 6 hard copy documents to the dissertation topic was low.

As noted in Chapter 3, the methodology proposed to be applied to the analysis of the document review was the use of a-priori codes and emergent codes to a content analysis of documents. Because the documents were so limited in scope, and primarily only focused on gaps, upon completion of the review process, it did not seem to be useful to apply coding to all documents. Instead, TABLE IX presents the findings and relevant codes applied to the documents (N=10) that contain strengths-based information relevant to leadership development and transition of scientists into non-technical roles, in support of research sub-question Q1e.
## TABLE IX: DOCUMENT REVIEW OF HARD COPY DOCUMENTS AND WEB PAGES RELATED TO LEADERSHIP DEVELOPMENT TO ADDRESS RESEARCH SUB-QUESTION Q1E: WHAT EXISTING SYSTEMS-LEVEL SUPPORTS AND PROCESSES CAN HELP PROMOTE THE TRANSITION FROM TECHNICAL EXPERT TO NON-TECHNICAL SUPERVISORY LEADER?

<table>
<thead>
<tr>
<th>Document Focus/Year</th>
<th>Strengths Mentioned</th>
<th>Opportunities Mentioned</th>
<th>Relevant Code(s)</th>
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<tbody>
<tr>
<td>Framework for mentoring, coaching, and training program/2003</td>
<td>This report provides a review of mentoring from the literature, and briefly touches upon mentoring at CDC. There is also discussion of specific programs which can contribute to leadership development.</td>
<td>There is an opportunity to enhance a mentorship program at CDC and make it a more structured component of senior scientist and leadership positions. In this way, CDC can help to guarantee institutional memory – both science and leadership.</td>
<td>Mentor Details Supportive infrastructure</td>
</tr>
<tr>
<td>Report: Workforce Development and Succession Planning Program (Draft)/2005</td>
<td>This report was specific to one Center within CDC. There was some mention of programs, strategies, and best practices for workforce development and succession planning – in particular, coaching, leadership training, job sharing, and shadowing.</td>
<td>This report highlights opportunities within CDC for an employee to gain experience and exposure to leadership positions and roles. These also already exist at CDC so would not require additional processes to put them into place, but rather ensure that they are utilized.</td>
<td>Training Opportunities Supportive infrastructure Details Context</td>
</tr>
<tr>
<td>Report: Capacity Building in Key Positions &amp; Leadership Development/2006</td>
<td>This report outlines a competency framework. It includes a system for employees to assess the level of relevance that competencies identified for their job series or occupation are to their current job and whether or not they have a training need relevant to the competency.</td>
<td>Training opportunities are available and intended to address foundational, technical, and leadership competencies.</td>
<td>Training Opportunities Supportive infrastructure Details Context</td>
</tr>
<tr>
<td>Strategic Workforce Plan/2008</td>
<td>This report talks about a key strength of CDC being the workforce itself, which demonstrates high levels of commitment and passion for the work of the Agency. Another mention was the staff’s great passion and dedication to their work, and that they are deeply experienced and well credentialed.</td>
<td>Many divisions recognize that leadership development has not always been a priority and that the workforce, stakeholders, and the organization at large would be well served by growing this capability. Areas of potential growth mentioned are details, pooling resources, and investing in long-term development.</td>
<td>Details Supportive infrastructure Passion Commitment</td>
</tr>
<tr>
<td>Internal web page; Mentorship/2013</td>
<td>This web page provides an overview of the mentoring program at CDC, as well as recognizes the value of informal mentoring. It provides sentinel literature related to mentoring, as well as tips for how to develop an informal mentoring relationship.</td>
<td>Because of this focus on retiring staff, perhaps the value of mentorship can be raised to a higher level of awareness among staff at all levels, and in particular, how to try and capture the benefits of informal mentorship.</td>
<td>Mentor</td>
</tr>
<tr>
<td>Internal web page; Coaching/2013</td>
<td>This web page provides an overview of coaching as a</td>
<td>The monetary cost of involvement in a coaching program is significant. This</td>
<td>Coaching</td>
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<tr>
<td>Source</td>
<td>Description</td>
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<tr>
<td><strong>Internal web page; Executive Coaching/2013</strong></td>
<td>This web page provides an overview of the Executive Coaching program for senior leaders and above. Provides an individualized, confidential coaching service to enhance their interpersonal, managerial, and leadership skills. Although this program is available only to individuals already serving in a leadership capacity, it can be very helpful for those wanting to apply new skills or enhance existing ones.</td>
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<tr>
<td><strong>Internal web page; Employment/2016</strong></td>
<td>This web page provides different employment options for FTEs, including training opportunities such as details. Details can provide an employee with the opportunity to learn new skills and to gain exposure to new positions or work responsibilities.</td>
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<td><strong>Internal web page; Leadership Course Descriptions/2016</strong></td>
<td>This web page provides a wide variety of offerings for three established levels of leaders – from those currently in a non-supervisory position to executive leaders. Of particular note are those courses for leadership level (non-supervisory) which appear to be good introductory courses for these staff. Although there are quite a few leadership courses, most are for leaders who are already in visible leadership positions. This provides an opportunity for CDC to expand their training base to provide for more leadership training courses for staff not yet serving in a leadership role. Similarly, many of the higher level courses still appear introductory. There is an opportunity to make these more relevant, higher level, and perhaps with a requirement of demonstrated application post-training.</td>
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<tr>
<td><strong>Internal web page; Career Paths/2016</strong></td>
<td>This web page provides an interactive way to inform employees about the career paths available to them at CDC. It provides guidance on the knowledge and skills they need to progress into both technical and leadership positions. It is unclear how many employees are aware of the Career Path website as it does not seem to have been well advertised. However, it does seem like it could be a useful tool, especially if used in conjunction with PMAPs or supervisor-employee discussions around career opportunities.</td>
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V. Chapter 5: Discussion

As described in earlier chapters, all sectors of the workforce are facing losses of leadership staff with the retirement boom and changes in the workforce landscape. The federal public health system is not immune to these losses, and as such, an emphasis on leadership development is more important than ever. As a federal public health system and the nation’s premier public health agency, the Centers for Disease Control and Prevention must prioritize leadership development as a way to ensure that its workforce is prepared to address the complex public health challenges and demands faced both domestically and abroad.

As earlier document reviews noted the concerns around highly technical staff entering into non-technical leadership roles without necessarily having the skills or interest for these new roles, this DrPH research focused on examining the personal and cultural facilitators that are perceived as critical to technical staff at CDC who have risen into non-technical leadership roles. Although the duties of some of the research participants still entailed technical responsibilities, technical work was not the sole primary focus of their roles.

The findings presented in Chapter 4 and expanded upon in this chapter underscore the leadership development at CDC is not about technical fixes, but rather about changing the mindset and culture around how leadership development is perceived and implemented, and how existing platforms are utilized to be able to maximize the growth and potential of the broader workforce.

A. Conclusions and Recommendations for Change

In-depth interviews were conducted with 21 respondents. These interviews yielded a vast amount of very rich data from which several constructs emerged. It was interesting to note that, although there were certainly similarities in both personal and cultural constructs mentioned, there were also numerous differences.
The use of emergent codes was key to this data analysis. Emergent codes accounted for the vast majority of codes used, and many of the a-priori codes such as *Systems*, *Context*, and *Skills* ended up being removed from the analysis. Although a-priori codes allowed for some structure to be applied to the coding and analysis, the analysis would not have been as rich or meaningful without the application of emergent codes.

A revised conceptual model was developed as a visual representation of the findings from this DrPH research (FIGURE 8). This model will be used to guide the discussion of findings and conclusions for this chapter.

**FIGURE 8: Revised Conceptual Model: Leadership Development: Transitioning Technical Experts into Successful Non-technical Leaders**
**Foundational Skills**

Three primary skillsets emerged from the data analysis as being common to respondents: technical skills, self-efficacy, and adaptability. Each will be discussed in further detail below.

**Technical Skills**

*Skills* was identified as a personal facilitator in the original model (FIGURE 5); however did not remain. *Skills* was too broad a construct and, as such, was deemed not to be meaningful. Instead, discussions around skills centered either on technical skills or non-technical skills. Not surprisingly, all of the respondents were strong technically. As happens with many CDC employees, they joined CDC to work in primarily scientific roles. Many respondents talked at length about their technical achievements and the contributions they felt they had made scientifically to the field of public health. Mentions around technical credibility, which emerged as its own construct, led to probes around the importance of leaders at CDC being technically strong and credible. Overall, the respondents felt that it was necessary for leaders to be viewed as technically credible, in order for them to understand the work their employees were doing and be able to speak on their behalf. This sentiment seemed most strongly expressed by laboratorians and those still serving in largely technical roles, such as Associate Directors for Science. There were also mentions of the importance of attention to detail. Once again, for laboratorians this skill was perceived as important for technical roles as well as non-technical roles, because of the intricacy of their work – if one is not detail-oriented as a laboratorian, they likely won’t be successful as a leader in a laboratory since there is a need for leaders in those settings to be detail-oriented.

Although technical strengths were considered important, there were concerns mentioned in both interviews and earlier document reviews about technical achievements being viewed as a reason for advancement into leadership. Although an employee might be technically strong and credible, perhaps it is less important that CDC leadership be *the* strongest technical experts. It would appear that these
individuals would prefer, and CDC would be better served, by having strong technical staff remain in scientific roles. This underscores concerns mentioned by respondents, however, around perceived opportunities for advancement for scientists who do not take on additional supervisory or non-technical leadership duties. During discussions around the final question of the interview, when respondents were asked to consider key aspects of a leadership development program, some respondents mentioned the perceived lack of advancement for technical experts who do not want to take on non-technical leadership roles or supervisory requirements.

**Self-Efficacy**

*Competence* was identified as a personal facilitator in the original conceptual model; however, this construct was re-classified as *Self-Efficacy* during data analysis as it was determined to be more of an objective measure and less about personal beliefs in one’s skills. Many of the respondents felt highly efficacious about both their technical and non-technical skills. As noted in Chapter 4, this construct was most strongly co-occurring with the ability to connect both technical and non-technical skills. This ability to connect technical and non-technical skills would be an important trait for leadership at CDC, since it is a scientific organization and its leaders are often asked to speak to the science on behalf of their employees and programs.

An important consideration arose from the discussion with multiple respondents. This was captured in a memo and termed *Stepping Away*. The line of discussion around this topic was the importance of leaders being able to leave behind the more technical aspects of their jobs when transitioning into leadership roles. Phrases like “I was needing to broaden my horizons”, “I had to give it up, I had to step away from it”, and “I just couldn’t keep up with it” underscore how difficult it is to maintain a large technical portfolio while taking on the demands of a non-technical role at CDC. This push-pull was mentioned in the document reviews (Appendix A) as being a major concern for both
individuals transitioning into leadership as well as hiring officials. Both noted that many highly technical staff were having difficulty giving the technical work up and instead were trying to do both. This can lead to one or the other not being done well.

The position descriptions for many leadership positions at CDC are still often written in a highly technical way. This was mentioned during the document review process (Appendix A) as a primary concern – positions are written in a way that a highly technical individual will be the perfect candidate for the job; however, once they enter the job, they realize that the technical aspects are a small percentage of the actual job requirements. This can set candidates up for failure and, likely, frustration for both the candidate and his/her employees. It would appear that a simple review and rewrite of the position descriptions being used to recruit leadership positions could be done to address this issue – a technical fix on the surface. However, this in fact is not such a small change. Changing the mindset at CDC to where leaders do not necessarily have to be the top technical experts or the world-renowned scientists would require a culture shift in the way leadership is defined and thought of at CDC. This is not so black-and-white, and this definition of leadership is what guides the development of position descriptions. If CDC defines leadership as primarily encompassing strong technical traits, then leadership positions will continue to be modeled this way. Thus, in the meantime, how can CDC, and other highly technical organizations, identify a highly efficacious individual? Behavioral interviewing for positions can be one way to assess an individual’s sense of his/her ability to carry out less technical responsibilities – asking for examples of times when this individual tapped into his/her non-technical leadership strengths, providing problem scenarios requiring non-technical leadership skills and assessing the individual’s response to how they would approach these problems. These are just some examples of ways in which CDC can assess skills beyond the technical in potential leaders. Ultimately, however, beginning to change the underlying mindset at CDC about what leaders ‘should be’ is key to changing the culture about how leadership development is viewed.
The respondents in this DrPH research were prime examples of highly technical staff who had transitioned into successful non-technical leaders. This was not always an easy transition, however. Some respondents mentioned “feeling like a fraud” for a while shortly after entering a leadership role. This seemed to be due to the respondent needing to take on new skills or roles, often being transitioned quickly into a new role without much, if any, preparation or training. Nonetheless, these individuals were successful in these roles, and it appears that some of this could have been due to their self-perceived sense of ability to learn quickly and do the job well. When respondents talked about their self-efficacy, this also often co-occurred with their discovery and demonstration of new strengths. These new strengths were both technical and non-technical in nature. Self-efficacy appeared to be the bridge between a respondent’s technical skills and his/her more non-technical leadership skills. The latter was termed adaptability.

**Adaptability**

During data analysis, new constructs emerged related to adaptive leaders (Yukl & Mahsud, 2010; Goleman 2004). These were resilience, flexibility, and emotional awareness. These constructs were part of those that appeared to be foundational skills for the respondents. In a highly technical organization like CDC, it is possible that those individuals who are able to adapt to challenges and situations that might require non-technical skills, and in particular, to be able to rise above purely technical responses to problems, are better suited for leadership roles. Moreover, this benefit might be more pronounced when these individuals are also strong technically and have a high sense of self-efficacy to be able to meet the demands of non-technical leadership. One respondent captured the essence of the adaptable leader at CDC in the following quote:

*So the things that I think in these kinds of complex environments like CDC, like HHS, like federal government I think that technically you have to be competent obviously but there are a lot of people like you said that are technically competent. So the second piece is I think you have to also have a pretty*
good handle on the non-technical side of things. I mean you sort of have to understand how the system works. You have to understand how to do hiring, you have to understand how to do evaluations, you have to understand how to do disciplinary things, you have to be reasonably adept at managing your budgets. I don’t think you have to be an expert in all that stuff because you have people around hopefully that can help you, but you do have to have a handle on all of that stuff. How do you talk to employees so that you don’t run afoul of employer relations issues, how do you do hiring and firing and disciplinary actions so that you’re doing it legally. All of that stuff is sort of one bucket of things I think. So there’s technical and science competence, there’s the sort of management and administrative competence. Again, you could be the most competent in the world in all of those things and you might not—in my opinion you still might not be effective. So what are the other things? So the other things I think... that are really critical in a complex environment like this is number one, your ability to communicate with people and your interpersonal relationships and skills. So communicating with people but doing it in a way that people will listen to you and understand what you’re saying and will be responsive and all that stuff. So that’s one piece. The second thing I think is—and there’s a little difference I think in between the two, I think, is how do you lead people. So being in the supervisory role trying to get everybody moving in the same direction, trying to get everybody functioning for the common good, not only of the office but also the center, the agency, all that stuff. I think that’s also a skill, and in order to do that I think you also have to understand that any employment relationship, any workplace is a two-way street. So it’s not a one-way street...So for every employee I feel like you’ve gotta understand what their drivers are, what their needs are. And it’s very much a two-way street. So I try to really know my people. I try to understand them. I’m not necessarily like their best friend but I do try to ask them about things that impact their lives and how it might impact their work and things like that. I mean I think that stuff is important. So that whole thing about leadership so that they understand their role in the office, they understand what the role of the office is within the organization and within the bigger organization, why the work that we do is important...So I think personal connections are very important.

Once again, as with self-efficacy, it can often be challenging to capture Adaptability in an organization as large as CDC, when not everyone might not have the chance to demonstrate this strength. However, as with the discussion regarding self-efficacy above, the position descriptions are currently written very technically so that a candidate’s adaptable strengths might not have the chance to be showcased. Again, a thorough behavioral interviewing process, then, could provide the insight into whether a candidate for a non-technical leadership position has some of these more adaptable skills. Moreover, a strategic leadership development program that couples curriculum and training with hands-on opportunities to grow and demonstrate strengths can capture and grow adaptable skills as well. In an era of rapid public health responses, changing global landscapes, and an emerging workforce that views work in a new way, the need for adaptable leaders who can address these challenges and turn them into
opportunities can be key to keeping public health organizations relevant on a broader scale.

**Personal Facilitators/Personal Drivers**

There were personal facilitators that emerged from the data analysis that, although not directly critical for respondents’ transition experiences, were directly related to those constructs that were deemed critical. These facilitators were *Taking Initiative* and *Willingness*, and often came in the form of volunteering for activities or willingly taking on a new role or opportunity when asked or as necessary. There are several working groups at CDC that can provide opportunities for leadership or career growth; however, employees might not be aware of these groups or their leadership might not support their participation. Respondents who reported having the constructs of taking initiative or willingness were able to seize opportunities to join such working groups or activities where they could gain exposure. Activity in such groups can be included in an employee’s individual development plan (IDP) and provide hands-on opportunities for growth and development while also being held accountable for demonstrating and utilizing new skills.

IDPs serve as documentation of what the employee wants to learn and specific areas he/she wants to develop. Many organizations have similar documentation processes. If participation in a working group can support these learning objectives, they can be made part of the IDPs and the employee can be held accountable for demonstrating growth and learning from these experiences. This appears to be relatively simple way to provide opportunities to a broad number of staff for which they can be held accountable for demonstrating growth and acquiring skills. Once again, though, the perceptions of, and use of, IDPs varies at CDC. Some individuals and their leadership take them very seriously and utilize them well, while others might not. Utilizing IDPs more strategically, then, although seemingly a technical fix would require a shift in the way these tools are viewed and used. This presents a much greater challenge.
Some of the personal facilitators that were present in the original conceptual model (FIGURE 5) did not emerge as directly related to the respondents’ transition experiences. For example, the constructs of Motivation and Commitment, although important overall and directly related to other facilitators, were not pivotal to transition. Instead, when mentioned, commitment was more perceived as a commitment to public health or to the vision and mission of CDC, rather than to a commitment to advancing one’s career or commitment to becoming a leader. In this way, the construct of commitment emerged as more of a commonality among the respondents, and likely one that would be common to most if not all of CDC’s employees. Conversely, the role of motivation varied a bit more among respondents. Not surprisingly, it was linked to the respondent’s drive and desire to succeed. Although motivation did often co-occur with commitment, it was likely more so because these were mentioned together as part of an interview question, so might have spurred the respondent to connect the two. A review of the actual text of the interviews indicated that they were less connected than it would appear.

As noted in Chapter 4, several unique personal drivers emerged from the data analysis. Lengthy reflection was devoted to how to capture this uniqueness without diluting the data to where they would no longer be meaningful. As noted in the revised Conceptual Model (FIGURE 8), several of these more unique personal drivers were not directly related to the respondents’ transition experiences, however, they were mentioned during discussion as important to the respondents. These included career aspirations, drive, interest, and wanting to learn. These constructs were important to respondents’ careers, and many were tied to critical constructs. Similar to the construct of motivation, however, these constructs were closely linked to one another, although, individually, not critical for advancing a respondent into a non-technical leadership role. In this way, they are reflected as continuous factors circulating throughout the respondents’ professional growth and experience.

In considering what role these unique personal facilitators play in a leadership development program, a review of Kouzes and Posner’s Encouraging the Heart (Kouzes & Posner, 1999) was
conducted. In this book, the authors talk about the importance of a positive work environment where employees are recognized and rewarded for their good work. Earlier document reviews indicated that scientists often were recognized as leaders due to their scientific achievements. Instead of focusing solely on scientific accomplishments, creating a culture where the agency builds systems that support career advancement opportunities for all employees and finds ways to keep employees motivated, committed, and engaged in developing their skillsets can help foster a positive, growing environment.

Culture change is not something that happens quickly, and requires that changes occur at multiple levels – how leadership is defined, how both technical achievements and non-technical achievements are acknowledged, what training and development are offered to build or enhance skills, how recruitment occurs, how leaders view their role in developing others, and how investments in supervision and management are made.

**Cultural Facilitators/Contextual Reinforcement**

Similar to personal facilitators, there were cultural facilitators that emerged from the data analysis that, although not directly critical for respondents’ transition experiences, were directly related to those constructs that were deemed critical. These are reflected as Contextual Reinforcement in the revised conceptual model (FIGURE 8).

Throughout the interviews, there were several mentions by respondents about the importance of being able to observe other leaders, emulate leaders, or have role models to whom one could look up to for guidance on how to lead (or sometimes, conversely, how not to lead). Although more passive, these appeared to be important learning opportunities for these individuals. The chance to observe leaders-in-action or to be exposed to new ways of thinking or new areas of CDC appeared to be critical to developing a leadership mindset, and for some respondents, force them to think about how they are leading on a daily basis.
...because you didn’t go through a day without thinking about ‘I’m leading and I need to lead’, and you’re in other environments where that is not kind of at the forefront of your mind every single day, and he made sure it was at the forefront...

I thought about this a good bit over the last month and I think for me the critical things were knowing what other things there were to do at CDC and being around leadership and being able to both model them and sometimes think, this didn’t go so well and maybe I could do this differently.

This kind of exposure and ability to have role models that are in leadership roles can be critical to encouraging individuals who appear interested in these kinds of positions to seek out opportunities, or to volunteer for them when they become available. Similarly, they can also serve to underscore the roles that other individuals prefer not to pursue, which is just as important for long term success.

One of my former coworkers from the laboratory actually had spent a few months in their division office on detail and, “Hmm, uh-uh, I like being in the lab, that’s what I want to do.”

Finally, this kind of exposure seemed to be particularly important for the laboratorian respondents. As was mentioned in Chapter 4 and again in greater depth later in this chapter, laboratorians can be an isolated population at CDC, and as such, do not have many of the same exposures that others might have. This can be stifling for growth and advancement, in particular for those who are interested in rising into leadership roles within the laboratory setting. For some, it appears that leaving the laboratory is viewed as the only way to advance. This can be a major challenge to CDC’s ability to grow its laboratory leaders, which can have detrimental effects on the technical aspects of laboratory performance.

I think that is really a good question. I think that is hard. For me, it was actually getting out and being around other people.

But you never have exposure to the rest of CDC. Never knew the global picture, the other organizations, the other people. You would never have a concept of the vastness of work and activities that go on at CDC, associated with CDC. So I came out of there and just was amazed and just enjoyed seeing and knowing everything else that was going on. I think anybody should know the global picture or have some idea.
Details also emerged as opportunities that many respondents had to physically work in another role for a given period of time. Details are well-known processes at CDC, however, perceptions of them can vary. Details are sometimes perceived of as an option for moving on problem employees, and as one respondent mentioned, there are “serial detailers” who spend much of their time hopping from one detail to another because they are not satisfied with their current position.

So we have staff that are serial detailers and I’ve come into settings where people are serial detailers and put a stop to it. If the person doesn’t want to work here, they are more than welcome to go find another job. If they’re doing a detail to learn new skills, if they’re doing a detail because there is another job they’re interested in and somebody wants to try them out, I’m very supportive. But people that are just constantly going off and doing one thing or another just because they don’t want to work here but they can’t find a real job, I stop those. So I do think details are good opportunities for people to try things out and to learn new skills for the most part but there are a few people that that’s a way of life.

Overall, however, details can be very effective processes that allow for individuals to be exposed to new roles, skills, job demands, and responsibilities. They can also be ways to meet other employees who can serve as mentors or who can open up new opportunities or viewpoints.

Key to a discussion around details is that they are already existing processes at CDC, and one that many employees are familiar with and take advantage of. In this way, integrating leadership opportunities into details can serve as key ways for employees who are potentially interested in these roles to have that exposure. Providing more structure and intentionality to details, and making them a strategic component of a leadership development program, then, can be an additional way to provide exposure to leadership for a broader group of employees.

The role of a Supportive Infrastructure was discussed by many of the respondents – this became most evident in the way respondents talked about the role of their teams and peers. At CDC, the base organizational level is that of a team. Overall, team members work closely together on projects and activities, and tend to have strong ties to one another. The concept of the team is a part of the CDC culture that might not be present in other organizational cultures.
Peers can be outside partner groups who work closely on projects with team members, and these relationships can last for a very long time. As such, close professional relationships can be forged between and among team members and between and among team members and peers groups. When discussing these constructs in the context of a transition experience, some respondents mentioned that many of their peers gave them positive feedback about their leadership skills or just were overall supportive of them. As one respondent indicated

*I guess not really a projected growth path but maybe that’s when I realized that I was good at organization people to get a task done and was able to help manage personalities when you’ve got really smart, strong people with a lot to contribute. So I think that’s when I first realized that I got a lot of good feedback from people about what a good job I was doing in running those groups.* (Constructs: Peers, Discover Strengths, Able to Lead, Self-efficacy)

Team and Peers were not pivotal constructs in the transition experiences of most respondents, however, they were important to many of their professional trajectories individually. As such, they are reflected as continuous factors circulating throughout the respondents’ professional growth and experience.

Mentorship emerged as among the constructs that appeared to be of greatest value and importance to the respondents. Although not all respondents mentioned having mentors (16 of the 21 did), for those who did, mentors appeared to have played very significant roles in their professional careers. In the revised conceptual model (FIGURE 8), mentors were linked to one of the primary constructs – Leadership Support. This is because mentors were often times in leadership roles, albeit not necessarily in the respondent’s own leadership chain. However, for this reason, their support was categorized as that of leadership.

Of note was that all of the mentor relationships were informal - they had all developed organically rather than as part of a formal mentoring program. CDC has a formal mentoring program available to all staff. More information about this program is provided in the document review (TABLE
IX). During interviews, concerns were voiced about formal mentoring programs, in that the relationships felt forced and it would be awkward if the employee did not ‘click’ with the assigned mentor or did not feel that he/she was getting anything out of the relationship. Although CDC’s webpage about the mentoring program discusses the value of informal programs and provides guidance for how to develop a mentoring relationship, from the interviews for this DrPH research, it seems like the mentoring relationships just naturally evolved.

Is there a way, then, to formalize mentoring relationships at CDC in a way that promotes a win-win for both employees and mentors? When is the right time to engage potential mentors? There are many senior scientists and senior leaders at CDC who would be excellent mentors, and who likely are already mentoring many employees. However, it is also possible that they are not capturing this role anywhere. Performance elements are those items on an employee’s performance plan against which he/she’s performance is rated – those activities or responsibilities to which he/she is held accountable. This DrPH research underscored the great importance that mentors had for employees who later transitioned into successful leaders. It seems, then, that CDC would want to continue to try and retain the institutional memory of many of the senior scientists and leaders within the agency. These senior staff can include elements on their performance plans that reflect the mentorship relationships they create or are engaged in, foster, evaluate, and which can take a great deal of their time. By having these elements on a performance plan, these individuals would be held accountable to truly maximizing the impact they have on more junior staff and deliberately transferring institutional memory, while at the same time they are meeting a required element of their performance to which they are held accountable.

**Pivotal Constructs**

Throughout the interviews, there were three constructs that were most often voiced by respondents. These constructs, *Opportunity, Leading an Activity,* and *Leadership Support,* emerged as
those most grounded and most critical to respondents’ transition experiences. Many of the respondents had spent their early careers as scientists, although they had also had opportunities to lead an activity or try a new role. They almost all also noted having had leadership support throughout their careers.

Initial analyses pointed to these constructs as individually important; however, upon further reflection, analyses, and review of the data, it became clear that the constructs individually were not, in most cases, sufficient to transition an individual into a non-technical leadership role. What was pivotal was when these constructs co-occurred with one, or both, of the others.

A consideration becomes, then, how to provide opportunities to lead or grow, and how to ensure that all leaders are supportive of their staff in an agency the size and scope of CDC. The discussions surrounding the final question of the interview that asked respondents to consider components of a strategic development program yielded many interesting insights into the question of how, and whether, it is necessary to provide opportunities in a fair and equitable way.

As noted in Chapter 4, there were varying thoughts on this issue. In the end, it appears that all respondents who spoke about this issue felt that it was necessary to be able to create opportunities for employees. Many respondents felt the opportunities they had been given were critical to providing exposure and launching them into a leadership role. They felt, similarly, this would be important for others. There was discussion, however, about how to do that fairly. As one laboratorian respondent emphasized, perhaps it is less about being equitable and more about being fair – in that, everyone should have an opportunity, but at a level that is appropriate for them. Not everyone performs at an equally high level, and not everyone is ready to lead or to take on increasing responsibilities. It is important to give opportunities, but the individual must have demonstrated that they can or are ready to take on increasing or new demands.

*You have a completely different system here when it comes to positions. I understand that and that’s the way it should be but when we’re talking about opportunity at the lab to work on a certain*
project, I think that needs to be earned because you’re gonna give everyone equal opportunity, things will be there, but some projects are more challenging and require something extra and you would put the good person in that project. They have demonstrated they can do it...

For the general employee population at CDC, there are two primary times, mid-year and end of year, when performance of employees is formally reviewed. This is done through the performance management and appraisal process (PMAP) – structured staff-supervisor meetings when performance is formally discussed and ratings generated. Many organizations have similar processes. Although PMAP is meant to be a standardized process, variation in implementation can occur since the process is essentially left up to the individual supervisor. Instead of being a check-the-box activity, then, these meetings can really provide an opportune moment in the work year when supervisors can speak openly with their staff not only about performance, but about goals, aspirations, and interests. It is during these conversations that an employee can express interest in taking on more challenging or new responsibilities, be those in the technical or non-technical arenas, and supervisors can then work with the employee to find trainings or create opportunities to meet these interests. In practice, then, this would require that existing contextual supports are in place to be able to provide to employees, such as trainings, details, job shadowing, or other processes. Supervisors would also need to be aware of what is available to employees of varying levels, and be able to provide these opportunities in a timely manner.

Job shadowing and understudies were mentioned by some respondents as opportunities that can be provided in particular for employees entering into leadership positions. Job shadowing is a process available at CDC, but it is unclear how often this option is exercised and whether it’s for particular job series or responsibilities. Understudies are also available at CDC, however, the cost can be prohibitive and it is often for the highest leadership positions. This option was explored more in a document review (Appendix A); however, because it is related less to transitioning into leadership and more for those
already in leadership positions transitioning into higher leadership roles it was excluded from the final table.

Providing opportunities on a large scale can seem that an insurmountable task and one that is not realistic in large organizations. However, when viewed through the lens of organizational culture, it becomes less about the provision of opportunities and more about creating a culture of leadership development where opportunities are made available in a thoughtful, strategic way as part of an organizational emphasis on employee growth and retention.

In an informal discussion about this DrPH research, a CDC employee (non-respondent in this study) mentioned that having opportunities to grow or advance, technically or otherwise, should not depend on who you work for. This underscores the challenge mentioned earlier of how to provide opportunities to a broad group of employees, but also brings to light the issue of leadership support – a pivotal construct in this DrPH research.

As a hierarchical organization, there are various levels of non-technical leadership within CDC. The leaders most ‘close’ to the non-leadership employees are generally team leaders, many of whom have management and supervisory responsibilities. Many of the respondents talked about the support they received from their team leaders, and theoretically, team leaders would be the individuals who would know their staff best. In this way, they would be best positioned to provide support and encouragement to their staff, and guidance as to how to grow in their careers.

As with the provision of opportunities, however, the challenge in such a large agency as CDC is how to ensure that all leaders provide support and guidance to the development of their employees. Similar to the provision of opportunities, this seems that it would be less about focusing on the individual and more about creating a culture shift in how CDC views leadership development. In this way, the onus for development would not fall solely on the shoulders of the individual staff member to
seek out ways to grow himself/herself, but rather would be a collaborative effort between leaders and employees, and emphasized by the broader organizational culture.

**Unique Considerations - Laboratorians**

As mentioned earlier, there are unique challenges faced by laboratorians when trying to advance into leadership within the laboratory setting. This emerged as a noteworthy area of discussion and further area of exploration. Six of the respondents had served in a laboratorian role as a scientist, however, only two remained working in this setting. All six of the individuals discussed the challenges of advancing within the laboratory, in particular, the isolation of the laboratorians and the lack of exposure that they have to the rest of the organization. The result of these challenges was summed up nicely by one respondent when she indicated,

*That’s what I said, it’s the mantra for us. If you want to move up, get out of the lab. Go get your MPH and become an epi or public health advisor but you’re not gonna progress in the lab.*

The finding that illuminated this uniqueness of the laboratories was unexpected and eye-opening for the researcher. It appears to be an area worthy of further exploration with additional research. The laboratories are the foundation of the technical work at CDC, yet it seems like the work experiences and perceptions of career growth of the laboratorians are potentially vastly different from other settings.

**Document Reviews**

As mentioned in Chapter 4, a limited number of documents were reviewed as part of this DrPH research. Although limited in number – in fact, the most relevant finding from the document reviews for this DrPH research was the limited amount of strengths-based documentation for leadership development available to be reviewed - these documents helped to validated what was being said (or not said) in the interviews.
A prime example of this validation was those documents reviewed, and mentions during interviews, that were related to coaching services at CDC. Although coaching for non-supervisors is available at CDC, it is unclear how much awareness exists about this option, both among staff and their supervisors. Further, a review of the webpage for coaching indicates that it is a costly endeavor and likely out of reach for many programs. Perhaps for these reasons, none of the interviewees mentioned involvement in a coaching program at CDC prior to entering a leadership role. However, perhaps this could be a valuable component of a leadership development program and one that should be more readily available for non-supervisory staff.

The documents reviewed, then, noted several programs that are available to staff; however, perhaps are underutilized due to cost or lack of awareness. Finding ways to increase the utility of these programs in a thoughtful, strategic way, can help to ensure they are being maximized for leadership development.

**Reflective Journaling**

Reflective journaling was an essential element of this DrPH research process. Because no findings per se emerged from the journal entries, it was not included in Chapter 4; however, it is a noteworthy area of discussion so is included in this chapter.

As indicated in FIGURE 8, reflective journaling was used as a validation tool and a way to place what emerged from the interviews, document reviews, and critical incidents reports in the context of CDC. Because this DrPH research was led by an insider-researcher, in that the researcher was also part of the employee population from which the respondents were a part, having a way to document reactions to what was being stated in the interviews and providing additional contextual details helped to ground the information.

The reflective journaling process was also very valuable when it came to data analysis of the document reviews and interviews, in that it was a tool the researcher could refer back to when trying to
assess how or why something was said, or what it meant in the context of the larger organization. For example, a new awareness of the unique situations of laboratory personnel emerged in the journaling process. During data analysis, when discussions related to the laboratories emerged, the journals were re-reviewed and reflected upon to develop memos and constructs to apply to the interview data.

Further, the reflective journaling process was a way through which this DrPH researcher was able to state and set aside her assumptions prior to data analysis. For example, prior to the launch of the data collection process, it was assumed that CDC was one setting; however, as the issues with the uniqueness of the laboratories emerged and was reflected upon, it became evident that there might need to be a separate framework developed for laboratorians as their employee population and internal structure appears to be different.

Finally, the role of reflection in leadership development itself was an important takeaway from this DrPH research process. Although it was outside of the scope of the analysis for this DrPH research, there was a great deal of mention about the value of coaching on behalf of many of the respondents (N=11). For these respondents, the coaching relationship provided a tool through which they could reflect on their own performance, their goals and aspirations, and the ways in which they were exploring reaching those goals. For one respondent in particular, the process of reflecting on what she discussed with her coach forced her to acknowledge and embrace how stepping into a pending leadership role would impact her future career goals and plans. Similar to this coaching experience, while integrating reflection into the development and implementation of a large process like leadership development within an organization might not often be thought of as an important part of the process (or thought of at all), it can help provide an opportunity for an organization to assess how the process is progressing and make any necessary changes in a strategic, thoughtful way.
B. Leadership Development Framework

Instead of developing an entirely new system, a leadership framework was developed in an attempt to integrate findings from this research into already-existing platforms available at CDC (FIGURE 9). In this way, CDC can capitalize on these various platforms and focus on increasing and maximizing their utility and potential. These include evaluation platforms such as PMAPs and IDPs, and workforce development platforms such as trainings, curriculum, details and job sharing.

FIGURE 9: Leadership Development Framework: Creating a Leadership Development Culture at CDC by Maximizing and Enhancing Existing Platforms

Employees would enter as technical staff and progress through the leadership development framework. As both leadership support and mentorship emerged very strongly from this DrPH research, they are both seen as foundational to a development initiative. Therefore, they are shown at the base of the framework and continue throughout the entire framework. As can be seen in the framework, there
are intervals at which existing platforms are utilized to assess employee skills and interests. This is key as minimizing the need to create new or additional processes might help to increase the framework’s acceptance. All new employees are provided with technical training to support and enhance their existing skills. A lack of technical offerings, or a lack of awareness around offerings, was mentioned by the respondents, so an attempt was made to capture a need for ongoing technical training in this framework. This is critical given the changing scientific landscape that public health professionals must address – for example, the public health response to the Zika virus underscores the need for new and evolving science to address its treatment and prevention.

Critical to this framework is the provision of leadership opportunities to employees as they progress through their careers. This was a central takeaway from this DrPH research and every effort was made to highlight the importance of opportunities in the model. Once again, opportunities would be sought within the existing contextual supports available at CDC, and would be tailored to the employee. Some employees might be ready to take on more difficult opportunities than others would be. As each opportunity is provided, there is an evaluation component tied into the framework. In this way, there is accountability on both the part of the employee to demonstrate that he/she has learned and successfully applied new skills and is ready to continue progressing, as well as on the part of the supervisor to assess these strengths and provide new or additional opportunities and/or guidance.

Training and curriculum are also key components of a leadership development program. CDC is fortunate to have CDC University offerings available to all employees – most of which are right on campus – making them accessible to most employees. However, utilizing this valuable asset more strategically and making it part of an integrated leadership development program could help to make this curriculum even more beneficial to employees.

As indicated in the framework, early on there is an overlap for technical and non-technical staff. This reflects that some individuals might be leaning more toward pursuing one or the other. Trainings
and opportunities, then, are provided that help to build upon those strengths, while still providing the ‘other’ strength. In this way, although an individual might be set on pursuing a purely technical track with an eye toward becoming a scientific leader at CDC, he/she would also receive opportunities and training that would build his/her non-technical leadership skills. In this way, the agency is helping to develop well-rounded leaders who have skills both in science and non-scientific leadership. Further, it is important to note that an element of time is intentionally not included in the model. This is because employees progress through the model at different rates – some employees are ready to take on leadership duties earlier than others, some have unique skillsets that are needed for some leadership activities, while others might not be interested in branching out into more non-technical roles until later on in their careers. Moreover, it is understood that opportunities – in particular larger opportunities that can be costly to a program – cannot be offered all at the same time to a broad population of employees. In this way, elements such collaboration, open dialogue, evaluation, demonstration of strengths, and accountability are critical to overall success.

Finally, central to the framework is the development of leaders at all levels. As can be seen, there are leaders on both side of the framework, not just at the very top. This reaffirms a cultural shift in how leadership is defined at CDC. It is not a view of leadership-at-the-top, but rather a perception that anyone can be a leader from where he/she sits. This further validates the importance of a strategic development framework through which individuals are developed throughout their careers rather than once they are occupying a formal leadership role. The very top of the framework alludes to Culture Change. This framework represents a culture change in the way leadership development is perceived and practiced at CDC. It is a way to improve and enhance the utility of existing platforms while infusing a new mindset around the importance of employees and supervisors collaborating to develop organizational leaders. Although not everyone comes into CDC the same way, and not every employee enters as a technical expert, this framework is intended to address leadership development for technical
experts who enter the agency in staff scientist roles. This framework can be adapted to other types of employees, other levels of employees, and other organizations.

**Recommendations for Change**

This DrPH research has many valuable implications for leadership development at CDC, and other organizations can adapt these recommendations to their own organizational context. In a deliberate attempt to reduce costs and change-fatigue, recommendations are presented that would integrate changes into existing processes at CDC rather than require new processes. Further, although some of the recommendations might appear at first glance to be technical fixes, in order for them to be implemented and sustained, there would need to be a culture shift in how leadership development is perceived and conducted at CDC. As noted in a recent Forbes article (Hedges, 2014), “Leadership programs must integrate with the larger scope of the organization. Bringing in someone to deliver the standard pump-up-the-troops program may be briefly engaging, but not produce any behavior change.”

**Recommendation #1: Re-defining Leadership**

A finding emerged from this DrPH research about the need to re-examine how CDC, and perhaps other organizations - hierarchical, scientific organizations in particular - are defining leadership. As a hierarchical organization, CDC has various levels of formal leadership. In general, these are team leader, branch chief, division director, and center director. There are also associate directors for science – individuals in leadership positions who are responsible for the scientific integrity and ethics of the programmatic work done within the Agency. These individuals often straddle leadership in both the technical and non-technical realms. While it is true that, at CDC, one can be a leader from any position, the title of leader is generally for individuals occupying formal leadership positions and roles.
Similar to many large organizations, the culture at CDC around leadership supports more of a hierarchical perspective of leadership. Staff ‘rise into’, ‘are promoted into’, or ‘step up into’ leadership positions. This is likely due to leadership being in managerial, supervisory, or administrative positions which are at higher pay and rank levels than the general employee group. Leaders are generally scientists who move out of a technical track and into more of an administrative track, taking on additional duties. Top leadership roles are generally occupied by physicians or other highly technically skilled individuals, such as epidemiologists. Many are also Epidemic Intelligence Service (EIS) officers – individuals who are generally held in very high esteem for their technical skills.

Trainings and curriculum related to leadership at CDC are primarily for individuals already serving in leadership roles. This assumes that only those serving in these roles will need to have leadership skills. Once again, because of the way leadership is defined, it does not account for the need for all staff to be developed as leaders. This is a greatly missed opportunity to develop leaders at all levels. Finally, because of the hierarchical structure of CDC, it can take a long time to be eligible for a formal leadership position. For individuals who don’t see themselves able to be leaders, or even eligible for leadership trainings, for a long period of time, it can be very disheartening and can impact recruitment and retention. This is seen particularly with millennials (described further in the generalizability section). Redefining leadership to encompass leading from all levels would require a shift in the culture at CDC around how leadership is viewed – from one in which only a handful are leaders, to one which views all staff as leaders, and potential leaders, and develops them accordingly.

**Recommendation #2: Providing Opportunities**

There are more employees at CDC than there are formal leadership positions. This underscores the importance of developing individuals to be leaders at any and all levels. This could include leading an activity, coordinating a working group, or managing a project. These opportunities are important for many reasons. Not only do these opportunities give employees the chance to showcase their strengths,
and build new skills, but they also develop leaders at every level of the organization. In a time of many public health unknowns and need for rapid responses, such as has been seen with the recent Ebola and Zika outbreaks, it behooves public health organizations to have a deep leadership bench. In this way, any individual can be tapped to serve in a technical or non-technical leadership position at any time, and they have been fully developed to succeed in these roles.

As was discussed earlier in this chapter, concerns emerged from these findings about how to provide opportunities fairly and equitably; however, respondents also indicated that opportunities must be earned and appropriate to the level of the employee. Although not all opportunities have to be of the same magnitude, supervisors and their employees can work collaboratively to decide which opportunities would most help them grow as public health professionals. This puts the onus of responsibility on both the employee and his/her supervisor to seek out opportunities, and maintain open lines of communication about career goals.

Finally, because many formal leadership positions at CDC are generally reserved for non-technical roles, meaning individuals who have management and supervisory duties rather than (or in addition to) scientific duties, creating opportunities for individuals with strong technical skills to remain and grow within a technical role can be critical for morale, recruitment, and retention.

**Recommendation #3: Strategic Development for Technical Leadership**

The need to have a non-technical track for scientists to be able to advance was mentioned by multiple respondents. This concept was captured well by one respondent in particular when she indicated,

*I think one thing that comes to mind, when you talk about leadership, it’s sort of parsing out what that means. To me, you could be a leader in your position and it doesn’t necessarily mean progressing into a management position. To me, that’s a concept that CDC doesn’t do well with. When we talk about leadership, we are talking about—at least that’s been my experience... So one thing I would say is that there needs to be less of a focus on the progression into a management or supervisory position and more of a focus on being a leader where you are because what happens is when we encourage folks to professional development, which we do, in terms of leadership we get those*
responses back, well, there’s nowhere for me to go. So I think we need to change the concept of what we mean by leadership. So that would certainly be one thing I would suggest.

This is not a new area of discussion. Conversations by this DrPH researcher with CDC colleagues over the past several years, independent of this research, inevitably result in concerns about the perceived ceiling that exists for individuals who would prefer to stay in technical roles. During the exploration phase of this DrPH research, many CDC colleagues once again encouraged an examination of a technical track for CDC scientists. This appears to be a two-pronged ‘problem’. First, as mentioned above, how leadership is defined at CDC promotes thinking that leaders are individuals serving in more managerial and administrative positions, rather than as scientists. However, as is indicated in the document reviews (Appendix A) and mentioned throughout this report, many technical staff are promoted into non-technical leadership roles as a reward for their technical work. Essentially, then, they are scientists who have not been developed non-technically but are now thrust into non-technical positions. Many of them also seek out these positions in order to obtain a higher grade because of the perceived grade ceiling for technical roles. As noted in the document review, many of these individuals do not do well in these positions since they have not been developed on these more non-technical leadership skills and would have preferred to remain in their technical roles.

Second, not having a strategic developmental path for technical staff to continue to grow technically can impact morale, recruitment, and retention. Providing for ongoing technical development for individuals who prefer to stay in these roles could allow them to have opportunities to grow and contribute as scientific leaders, and provide for a career advancement path for scientists. Development and curriculum for scientists wanting to continue to grow in their fields or to learn other technical skills can be made available. Due to budgetary restrictions, access to conferences and meetings where scientists can showcase their work, interact with other scientists, and learn about new and emerging issues in their fields have been limited. Although it is understood that public health demands outweigh
the funding available, investing in staff development needs to also be viewed as a public health demand worthy of investment. Without a concerted investment in staff development, public health agencies potentially risk losing the best and brightest to other organizations who do invest in staff, while also risking the quality of the public health programs and science provided.

**Recommendation #4: Technical Development Curriculum**

Technical curriculum is available at CDC, although it does not appear to be tied to a strategic development program for technical staff. Many also seem unaware of available courses or applicability of additional courses to scientists as indicated by the following respondent,

*As a chemist, there really isn’t that much for courses. I think we really are expected to have the knowledge when we get here. So not really.*

Others took courses outside of CDC, or through formal training programs such as EIS, to gain additional skills as indicated by additional respondents,

*You know, a little bit I had some holes that I felt—areas that I had holes in and I asked and people were nice enough to make arrangements for me. For example, when I first came here, I wanted a little more beefing up on my epi and surveillance skills so they sent me for a summer institute for a month to the University of Michigan and it was full-time.*

*In [state], my EIS training in the field involved a lot of field work with not much statistical epidemiologic work, and I met a very kind colleague [name] who taught me how to use a personal computer to do SAS on a PC...So absent that help and support..., I don’t think my programming skills would be as good as they are today, and that was at [state department].*

CDC University has a long listing of training courses available on a variety of topic areas. An examination of this listing found a myriad of courses; however, many of them do not list a date in which they are being offered or are very basic. There does not seem to be a rationale for offerings either, in that basic courses are not followed by more advanced levels.

The development of a technical curriculum that is strategically offered to technical staff can provide them with ways to grow and advance technically. This can serve to further enhance CDC’s
science and programmatic work, and can help prepare technical leaders who can address a myriad of emerging concerns – such as seen with the recent Ebola and Zika virus responses. This can also help to address the concerns that there is no opportunity for advancement for technical staff. Instead of offering a plethora of disconnected courses, offering technical curriculum with an aim to increase and enhance technical skills can provide a way for scientists to see where they can make new and improved contributions to CDC.

**Recommendation #5: Focusing on Leadership Development not Training**

A second Forbes article (Myatt, 2012) discussed the reasons why leadership development often fails. The author notes that this is due primarily to a lack of distinction between training and development. He notes, “Training focuses on best practices, while development focuses on next practices. Training is often a rote, one directional, one dimensional, one size fits all, authoritarian process that imposes static, outdated information on people. The majority of training takes place within a monologue rather than a dialog. Perhaps worst of all, training usually occurs within a vacuum driven by past experience, not by future needs. The solution to the leadership training problem is to scrap it in favor of development. Don’t train leaders, coach them, mentor them, disciple them, and develop them, but please don’t attempt to train them. Where training attempts to standardize by blending to a norm and acclimating to the status quo, development strives to call out the unique and differentiate by shattering the status quo.”

Leadership development at CDC is guided by the ILEAD framework – a series of course offerings based on stated leadership competencies. This development is couched in a training framework, however, there does not seem to be a strategy to the offerings. Although tied to public health competencies, they appear to be a random assortment of listings. Further, on the whole, leadership-related courses are only offered for those staff currently serving in leadership roles. The general staff population is not eligible to take the majority of leadership courses. This seems highly
counterproductive to a true effort at developing leaders, and as stated in the Forbes article (Myatt, 2012), focused on the present rather than on the future. Finally, although the reference is to leadership development, a listing of course offerings would not encompass true development. A planned, strategic and targeted leadership development program is needed where leadership curriculum for leaders at all levels is offered in a way that complements hands-on workplace-based opportunities to develop leadership skills.

A strategic leadership development program would be integrated into existing platforms at CDC. A set leadership curriculum would be developed for all incoming staff that would help to form a foundation of broad-based leadership skills. This would be coupled with technical curriculum offerings that would also be available for technical staff to grow and enhance their technical skills. Over time, individuals who self-identify as interested in pursuing a non-technical track and whose supervisors concur on their demonstrated strengths and abilities, would progress through structured course offerings coupled with hands-on work-based experiences throughout which they will be held accountable for demonstrating strength, capacity, and interest in this work. As individuals progress, courses become more intense and rigorous, accountability is more stringent, and experiences escalate in responsibility.

As noted in another recent Forbes article (Hedges, 2014), “for a leader to actually learn new skills, he or she has to be put in situations that test their capacities and knowledge in order to ultimately improve.” This would all take place in addition to the individual’s existing work responsibilities, ensuring that they remain tied to the science at some level, which appears to be important per insights of respondents from this DrPH research (i.e., technical credibility, able to advocate for technical staff and programs).

Additionally, although not included in this analysis because it occurred once the individual was already in a leadership role, coaching emerged as a strong factor of leadership success for many respondents. CDC has a formal coaching program, however it is costly to the programs and therefore not readily accessible on a broad scale. Further, it appears to be an offering used in large part by leaders who
are already serving in these roles rather than as a component of a strategic leadership development program. The way that coaching is used can be re-examined to ensure that it is being used strategically to support the development of new leaders rather than solely on existing leaders.

Finally, key to a strategic leadership development program is leadership support. This was a key construct that emerged from this DrPH research and one, without which, it does not appear that a program can be sustainable in the long-term. This support needs to be provided at all levels of the organization – from the allocation of funds to fiscally support this effort, to the day-to-day supervisory leaders who would be identifying high potential employees, and providing guidance and helping to seek opportunities for and with them. Hand-in-hand with leadership support is the presence of mentors. As mentioned earlier in this chapter, informal mentors were very important to several respondents in both providing guidance and opportunities to grow and advance in their careers. Engaging senior scientists or non-technical staff who are already informally providing mentorship to many employees and capturing this as a performance element, can be one way to help ensure ongoing mentorship and support in a way that is formally recognized and for which there is accountability.

C. Leadership Implications for Public Health

Findings from this research have several implications for how leadership development is perceived and implemented not only at CDC but in other public health agencies, and even beyond the public health sector. A recent study by Bersin (2014) noted that “Organizations are struggling with leadership gaps at all levels—from first-line supervisors through top leadership. These gaps can only be filled through a sustained commitment that identifies potential leaders early on, nurtures the skills of young leaders, and continually develops midlevel and senior leaders.” This underscores that all organizations are facing challenges in regards to leadership development, not just the public health sector – and many of these have deeper pockets and have invested heavily in leadership development. It
is not the amount of the investment, then, but rather the way in which leadership development is implemented – and the way in which the surrounding context is cultivated to sustain it - that can make the difference.

In a time of mass retirements, emerging public health issues crossing global boundaries and requiring rapid response, and an entry level workforce demanding investments in their development, the need for leaders who are ready and able to meet these challenges is salient. Organizations of all kinds that do not ensure for succession of their leaders at all levels of the organization run the risk of making themselves irrelevant in this changing landscape. Implementing a thoughtful and strategic leadership development program focused on developing multiple levels of leaders can be one way to help ensure that organizations remain relevant. Further, integrating these programs into existing platforms can help to minimize the introduction of ‘new’ tasks, and maximize or improve the use of existing ones. Ultimately, this can help to ensure that leadership development becomes a part of the organizational culture, rather than a check-the-box activity.

D. Generalizability

Findings from this DrPH research were viewed primarily through the lens of how these constructs could be applied and what they mean for leadership development at CDC, given existing policies and processes. However, because organizations in all sectors are facing massive shifts in their workforce, findings are relevant and applicable to organizations beyond CDC.

The IOM reports (Institute of Medicine, 2007; Institute of Medicine, 2003; Institute of Medicine, 1988) called on all public health organizations to prioritize the development of public health infrastructure. Of particular note is the relevance of these findings in light of the wave of millennials entering the workforce, and the way this is changing the workforce landscape. The Deloitte Millennial Survey (2016) found, what they termed, a “loyalty challenge” among this cohort. Many of them think
about their professional lives in the short-term, meaning they are constantly thinking about their next move. This, the report notes, is due to their views that they “are underutilized and believe they are not being developed as leaders”. This report found that millennials rated leadership as the skill or attribute organizations most often prioritize, and acknowledge that they have a lot to learn in this area. However, they do not feel as if organizations are doing enough to develop them for leadership positions or investing in their leadership growth. Millennials are employed in every workforce sector, and as such, all sectors must face the reality that they need to develop these employees for leadership positions or risk losing them to organizations that will.

E. Strengths and Limitations

This DrPH research represents the first of its kind to be conducted at CDC. To the researcher’s knowledge, previous work related to assessing leadership development at CDC has not inquired about the personal and cultural facilitators of success of current leaders. This research also appears to be the first of its kind assess personal and cultural facilitators within a federal public health system. Moreover, the use of emergent coding for this type of qualitative research process was a critical strength of this DrPH research. Although an interview guide was used to structure the interviews, and a-priori codes were used as initial codes, it was critical to allow for emergent codes to arise from the data itself. These resulted in a vast array of constructs from which meaning could be drawn. Finally, Appreciative Inquiry has not been utilized at CDC to assess leadership development. The use of this technique for this DrPH research provided a strengths-based approach to assessing success constructs. The application of this technique to leadership development, then, appears to have been very positive in yielding a wealth of strengths-based data.

There are several limitations to this study. First, existing HR databases were used to select participants. Although these databases are valid and based on employee data, there are other markers of
successful leaders that might not have been assessed via these existing systems. Therefore, other successful leaders might not have been included because of the databases that were used. Second, demographic data were not collected from respondents. As a result, comparisons within and across employee types, and their impact on personal or cultural facilitators of success, cannot be assessed. Third, only one critical incidence report was returned. It is unknown whether important additional data would have been collected had more reports been completed and returned. Fourth, the researcher only had access to a limited number of documents for the document review component of this DrPH research. It is unknown whether additional documents would have helped to validate or counter the findings of this research.

Finally, although attempts were made to address construct validity through the use of reflective journaling and triangulating data sources, this DrPH research was subject to potential threats. First, because the respondents had all been identified as successful, there was the researcher expectation that respondents will have very strong, unique, and new ideas. Utilizing a set interview guide for all interviews so that all interviews would be similarly structured, and document reviews and reflective journaling to ground and validate responses, helped address this potential threat. Further, because of the qualitative research design and the use of emergent codes, a potential threat was that the data were subject to the researcher’s interpretation. To address this, direct quotations are presented throughout this chapter to provide evidence for researcher statements.

F. Next Steps

Presentations: Future plans for this DrPH work include conducting presentations throughout CDC to present the process and findings, and assist audiences with thinking through how findings can be applied in their respective Centers. Two such presentations have been scheduled at this time. In addition, findings will also be presented to leadership at the Office of Workforce Development and to
leadership and staff at the National Centers on Birth Defects and Developmental Disabilities with the goal of identifying ways to begin the process of implementing recommendations. Finally, findings will be presented to the Diversity and Inclusion Executive Steering Committee and CDC Succession Planning Working Groups. Both of these working groups are tasked with addressing succession planning and leadership development issues at CDC.

**Publications:** It is believed that organizations beyond CDC will be interested in this DrPH research and can benefit from both the process and the findings. In this way, a minimum of two publications are currently planned. The first publication will focus on the interview process and findings, along with implications for leadership development. It is anticipated that this publication will be submitted to either the *Journal of Public Health Management and Practice* or *The Leadership Quarterly*. The second publication will focus on the role of reflective journaling in a qualitative research process. Similar articles have been published in the *International Journal of Qualitative Methods* and *Qualitative Inquiry*. 
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Vita

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GPA: 3.92/4.00

The Pennsylvania State University, University Park, Pennsylvania
B.S.: Human Development and Family Studies
GPA: 4.00/4.00; Valedictorian

PROFESSIONAL EXPERIENCE

US Centers for Disease Control and Prevention Atlanta, GA 02/03 – Present
Health Scientist, Prevention Research Team; National Center on Birth Defects and Developmental Disabilities
- Design qualitative survey methodology and conduct formative research with Hispanic women to identify challenges and motivators for folic acid consumption
- Serve as the Acting Functional Co-coordinator for the Program and Policy activities under the Prevention Research Branch’s Global Initiative
  - Design, oversee and implement major programmatic activities related to increasing folic acid consumption globally
- Serve as a Co-lead on two main contracts with the World Health Organization and Flour Fortification Initiative to carry out the primary programmatic and surveillance activities for the Prevention Research Branch’s Global Initiative
  - Design activities, collaborate with partners, and assist with implementation and evaluation of activities
- Serve as a mentor for fellows, students, and contract staff

US Centers for Disease Control and Prevention Atlanta, GA 02/10 – 3/11; 08/12 – 01/13
Team Leader, Acting; Prevention Research Team; National Center on Birth Defects and Developmental Disabilities
- Provide programmatic oversight, direct budgetary allocation decisions, and provide supervision and leadership to team of 15 employees and contract staff
- Serve as primary programmatic liaison to domestic and global program partners
- Co-lead the development of new strategic plans to prevent folic-acid sensitive neural tube defects
- Design Small Business Innovative Research grant proposals; successfully compete two proposals for cutting-edge, innovative research and application
- Provide direct supervision to staff
US Centers for Disease Control and Prevention Atlanta, GA 03/15 – present
Coordinator, US Centers for Disease Control and Prevention Succession Planning Working Group
- Oversee 6 working group staff representatives throughout the Agency
- Design and implement working group activities and workplan development
- Lead the development and implementation of an Agency-wide succession plan utilizing
- Serve as a succession planning liaison to Agency leadership
- Maintain content for Agency-wide succession planning website

US Centers for Disease Control and Prevention Atlanta, GA 08/14 – present
Coordinator, National Center on Birth Defects and Developmental Disabilities Succession Planning Working Group
- Oversee 6 working group staff representatives throughout the Center
- Design and implement working group activities and workplan development
- Search for and synthesize workforce development literature for application to Center’s succession planning process
- Lead the development and implementation of a Center-wide succession plan utilizing innovative methodologies and techniques

US Centers for Disease Control and Prevention Atlanta, GA 9/13 – present
Coordinator, Surveillance, Training and Technical Assistance activities under the Prevention Research Branch’s global initiative
- Provide direct oversight to staff carrying out surveillance, training, and technical assistance activities
- Design birth defects surveillance trainings for country-level participants in the Branch’s priority countries
- Provide technical assistance to global and national health agencies seeking to develop and implement surveillance or training efforts

US Centers for Disease Control and Prevention Atlanta, GA 10/10 – present
Coordinator, Division of Birth Defects and Developmental Disabilities Surveillance Workgroup
- Provide direct oversight to 10 staff
- Search, synthesize and interpret surveillance information and translate it into public-friendly products and tools
- Lead the development of surveillance products and trainings

US Centers for Disease Control and Prevention Atlanta, GA 07/01 – 02/03
Associate Fellow, National Center on Birth Defects and Developmental Disabilities
- Develop, implement, and evaluate folic acid education programs on a national level and within the Hispanic community
- Assist with the development of a folic acid curriculum to be used in middle and high school classrooms on a national level

Spina Bifida Association of Georgia Atlanta, GA 05/00 – 05/01
Education Director
- Develop and Implement community awareness and outreach programs for community organizations
- Develop and Implement Hispanic Outreach Program for Georgia’s Hispanic communities
PUBLICATIONS


RECENT AWARDS AND RECOGNITIONS

- 2016 Blue Ribbon Award for Outstanding Service to the Prevention Research and Translation Branch
- 2015 Excellence in Health Communication Award
- CDC 2015 Honor Award for Surveillance and Monitoring, International
- CDC 2015 Honor Award for Excellence in Program Delivery: International
- NCBDDD Health Communications Excellence Award
- 2001-Present, yearly Performance Award
- 2014 NCBDDD Award for Outstanding Performance

LEADERSHIP AND PROFESSIONAL ORGANIZATIONS

- Mentor (2), CDC Public Health Associate Program
- Member, Honor Society
- Leadership and Management Institute graduate
- Leadership Committee; National Birth Defects Prevention Network, Neural Tube Defects/Folic Acid Committee
- Member, Behavioral and Social Sciences Working Group, Communication and Membership Subcommittee, CDC
- Member, CDC Workforce Development Community of Practice Working Group
- Member, Public Health Education Professionals Network, CDC
- Member, International Clearinghouse on Birth Defects Surveillance and Research workshop facilitators group
- Member, CDC/ATSDR Latino/Hispanic Health Work Group
- Member, NCBDDD Council on Diversity
- Lead, Spanish communications; GLOBE Academy Gazette
- Former Board Member, Healthy Mothers, Healthy Babies Coalition of Georgia

PROFESSIONAL PRESENTATIONS

- Conducting Formative Research: Concept Testing for Zika Virus in Puerto Rico; Emory University, April 2016.
- Concept Testing for Zika Virus in Puerto Rico; CDC Branch Meeting, March 2016.
- Formative Research with Women of Childbearing Age to Evaluate Existing Folic Acid Educational Materials: A Webinar; January 2013.
- Communicating and Disseminating Data for Surveillance; International Center on Birth Defects Surveillance and Research Surveillance Workshop; Geneva, Switzerland; October 2012.
- Hispanic Women’s Perceptions of Fortified Foods; Spina Bifida Association Annual Meeting; Indianapolis, IN; June 2012.
- Formative Research with Spanish-speaking Latinas of Childbearing Age; Emory University, Atlanta, GA; March 2012.
• Folic Acid and Neural Tube Defects: What has been done and Lessons learned; March of Dimes, Arizona Chapter; February 2012.
• Family/Individual Feedback for Programmatic Activities and Prevention; National Birth Defects Prevention Network Meeting; Florida; February 2011.
• Folic Acid Overview; National Black Caucus of State Legislators, Atlanta, GA; November 2010.
• Folic Acid Education for Latinas: The Role of Community Interventions; North Carolina Preconception Care Conference; Greensboro, NC, November 2009.
• Neural Tube Defects and Latinas; National Center for Farmworker Health, Midwest Stream Forum Meeting; South Padre Island, TX, October 2009.
• Folic Acid: A B vitamin for the Prevention of Neural Tube Defects; Spina Bifida Association of SouthEast Florida; Fort Lauderdale, FL, September 2009.
• Covering All Corners: A Well-Rounded Approach to Media Placements; Spina Bifida Association annual conference; Orlando, FL, June 2009.
• Developing Culturally Appropriate Folic Acid Messages: Formative Research with Latinas; 18th Annual Social Marketing in Public Health Conference; Clearwater Beach, FL, June 2008.
• Folic Acid Research Efforts with Latinas: Methodology, Results, Take-home Messages; Addressing Disparities in Folic Acid Intake by California Women meeting; Sacramento, CA, February 2008.
• Research Informing Practice: Promoting Health Behavior Change among Latinas through Culturally Appropriate Materials and Programs; Maternal and Child Health Epidemiology Conference, Atlanta, GA, December 2007.
• Using Formative Research as the Basis for a Birth Defects Prevention Campaign Among English- and Spanish-speaking Young Women; Summit on Preconception Health and Health Care; Oakland, CA, October 2007.
• Research and Policy: Tackling the NTD Disparity among Latinas; National Birth Defects Prevention Network Meeting; San Antonio, TX, January 2007.
• Formative Research with Latinas: Developing Folic Acid Messages for a High-Risk Population; Chesapeake-Potomac Spina Bifida Association Conference; Bethesda, MD, October 2006.
• Reaching Spanish-speaking Hispanic Women with the Folic Acid Message; Coordinating Center for Health Promotion Conference; Atlanta, GA, September 2006.
• Expanding the Reach of Folic Acid through Fortification of Corn Flour Products; National Council of Folic Acid Annual Meeting; Atlanta, GA, September 2006.
• Folic Acid: Improving Health Outcomes among Latinas; National Council of La Raza Conference; Los Angeles, CA, July 2006.
• Folic Acid: Making Strides towards Improving Health Outcomes; Spina Bifida Association of America Conference; Atlanta, GA, June 2006.
• Folic Acid: Making Strides towards Improving Health Outcomes; Healthy Mothers, Healthy Babies of Michigan; Mt. Pleasant, MI, June 2006.
• Educating Latinas about the Importance of Folic Acid; Workshop on Folic Acid for the Prevention of Neural Tube Defects; Costa Rica, October 2005.
• Honduras Folic Acid Supplementation Study; Minneapolis, MN, June 2005.
• Broadcasting Behavior Change; Society for Public Health Education Conference; Boston, MA, April 2005.
- Folic Acid and the Prevention of Neural Tube Defects; Train the Trainer Program, JFK Administration Center, Philadelphia, PA, September, 2003.
- Folic Acid and the Prevention of Neural Tube Defects; Train the Trainer Program, Metro State College, Denver, CO, September, 2003.
- Preventing Neural Tube Birth Defects, Children’s Hospital of Denver, Denver, CO, September, 2003.
- Reach Your Audience, Make an Impact!; Spina Bifida Association of American Conference; San Antonio, TX, June, 2003.
- Strategies for Effective Folic Acid Campaigns; Centers for Disease Control and Prevention, Women’s Health Conference; Atlanta, GA, October 2002.
- Folic Acid and the Prevention of Neural Tube Defects; Train the Trainer Program, Barrio Comprehensive Health Clinic, San Antonio, TX, May 2002.
- Get the Word Out for Recurrence Prevention; Georgia Folic Acid Task Force Train the Trainer Program, Mableton, Georgia/Macon, GA, April 2002.
- Translating Folic Acid Research to Outcomes in Women’s and Children’s Health; American Psychological Association Conference, Washington DC, February 2002.
- Get the Word Out: Folic Acid, A Vitamin for Life; Train the Trainer Program, Macon, GA, October 2000.
- Folic Acid and the Prevention of Neural Tube Defects; Train the Trainer Program, Florida International University, Miami, FL, October 2001.
- Folic Acid and the Prevention of Neural Tube Defects; Train the Trainer Program, University of the Incarnate Word, San Antonio, TX, October 2001.

**OTHER SKILLS**

Certification: Certified Health Education Specialist
Bilingual (English/Spanish)
<table>
<thead>
<tr>
<th>Date/Author</th>
<th>Document Name</th>
<th>Summary</th>
<th>Additional Citations</th>
<th>Reflections/Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1999/USDHHS</td>
<td>Building Successful Organizations: Workforce Planning in HHS</td>
<td>Guidance document for HHS Operating Divisions for workforce planning (WP); discusses SP as under WP; WP needs to document workforce analysis, competency assessments, gap analysis, and workforce transition planning; presents HHS WP Model; three levels to human capital -- approach to human capital is largely compliance-based, agency has yet to realize the value of managing human capital strategically to achieve results; existing human capital approaches have yet to be assessed in light of current and emerging agency needs.</td>
<td>There is a review from 1995, but seems outdated; GAO. Human capital; Taking steps to meet current and emerging human capital challenges GAO-01-965T (Washington DC, July 17, 2001)</td>
<td>Report provides 3 levels for each of the 8 critical success factors – I think CDC is at level 1 when it relates to SP</td>
</tr>
<tr>
<td>Year</td>
<td>Source</td>
<td>Description</td>
<td>Author(s)</td>
<td>Notes</td>
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<tr>
<td>2003</td>
<td>CDC NCCDPHP</td>
<td>Focus on coaching, mentoring, training; basic understanding of SP is vital first step; provides definitions for WD terms; job satisfaction as critical to retain high potentials; SP needs to be linked to strategic planning via leadership assessment; cites UPS and Home Depot as having robust SP</td>
<td>Karaevli A, Hall D.</td>
<td>Reinforces the importance of linking SP to an existing process like strategic planning; NCBDDD might provide a good pilot opportunity for this</td>
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<tr>
<td>2003</td>
<td>Dept of Veterans Affairs</td>
<td>Workforce and SP process is not a product or activity with a specific arbitrary end date, but is an ongoing activity; office of HR services will develop yearly plan to be updated during the second quarter; focus on both employees and leadership; outlined responsibilities for all levels</td>
<td>GAO. Major management challenges and program risks: A government perspective, GAO-01-0241 (Washington, D.C.: GAO, January 2001)</td>
<td>Need to reach out to VA to inquire about speaking with someone about, or accessing, SP report</td>
</tr>
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<tr>
<td>2003</td>
<td>DOT</td>
<td>SP falls under workforce planning and key human capital challenges initiative; focuses on critical leadership positions first; leadership pipeline is a long-term strategy to ensure a cadre of capable leaders at all levels; stresses experiential learning (mentoring, coaching); develop intermediate and long term goals; name critical success factors as: leadership commitment to SP, incentives for entering and remaining in the leadership pipeline, adequate funding</td>
<td>N/A</td>
<td>Although the document indicates it is a living document that will be undergoing revision as SP is implemented, I was unable to find any more recent documents online.; I like the idea of intermediate and long term goals – seems more realistic and tangible; found the measure of success of 'incentives for entering and remaining in the leadership pipeline' unclear.</td>
</tr>
</tbody>
</table>

Continuity, and SP; strategic human capital planning and organizational alignment; 3) acquiring and developing staffs whose size, skills, and deployment meet agency needs; creating results-oriented org cultures.
<table>
<thead>
<tr>
<th>Year</th>
<th>Source</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004/CDC LMI</td>
<td>Succession Planning: A final report and recommendations of the Leadership and Management Institute, National Public Health Leadership Institute, Corporate University</td>
<td>Integration with and participation in related departmental human capital initiatives, and close coordination with competitive sourcing initiative and continuous awareness of plans for meeting goals for that initiative; report provides components of SP systems but the implementation is still unclear – how do they link together? How are these core pieces funded?; “Workforce planning takes all employees into account. Succession planning model focuses on building a leadership pipeline to ensure that there are no gaps in critical leadership positions.”; provide examples of courses/tools being used successfully for SP</td>
</tr>
<tr>
<td>2004/CDC LMI</td>
<td>Adapted definition of SP to CDC; SP is systems-based, components: workforce planning, recruitment, retention, professional development, diversity, promotion practices; should involve stakeholders (unions); consistent with merit promotion; difficult to retain and recruit due to private sector competition, increase in outsourcing and contracting; perception of seriousness lower than current efforts; less serious in own CIO v CDC; culture, lack of resources, workload for management, systems issues</td>
<td>Remaining in leadership interesting – not sure this ensures good leadership or SP if goal is training and advancement (might just keep poor performers in their spots)</td>
</tr>
</tbody>
</table>

Our Work Force Matters: A guide to work force and succession planning for NY state agencies; Sept 2001.; GAO, Best Practices Methodology: A new approach for improving government operations; 1995; Society for HR Management; GAO, Human Capital: Key principles from Nine Need to show updated retirement eligibility/other loss among CIOs
<table>
<thead>
<tr>
<th>Source</th>
<th>Document Title</th>
<th>Summary</th>
<th>Resource</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004/CDC</td>
<td>Private Sector Orgs; 2000</td>
<td>This document is a task proposal for development of a framework and set of criteria to help assess and evaluate the CDC/ATSDR existing workforce and the future workforce needs; propose interviews with leadership and presentations to Management Council; deliverables include an assessment tool (guide/survey/questionnaire), needs assessment, cost comparison, skills assessment and match with future needs; critical job series.</td>
<td>N/A</td>
<td>Upon reflection, much of this work is contracted out; although I understand that SP is a huge task and that outsourcing components of it might be necessary, it seems like if it is not internally driven, it will not be sustained.</td>
</tr>
<tr>
<td>2004/CDC</td>
<td>Task Proposal for Workforce Planning Guide</td>
<td>This document is a task proposal for development of a framework and set of criteria to help assess and evaluate the CDC/ATSDR existing workforce and the future workforce needs; propose interviews with leadership and presentations to Management Council; deliverables include an assessment tool (guide/survey/questionnaire), needs assessment, cost comparison, skills assessment and match with future needs; critical job series.</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>2004/CDC</td>
<td>NCCDPHP (Chronic Disease Center) Succession Planning and Workforce Development Interview Guide</td>
<td>This document is an interview guide that appears to gather background information in preparation for a pilot program housed out of NCCDPHP (Chronic disease center); Questions focus on needed competencies/competency gaps; mission of organization; There is a section about factors that can influence rewards, workforce planning and capability requirements, and one question on perceptions of change.</td>
<td>N/A</td>
<td>This document could be helpful in providing ideas for interview questions.</td>
</tr>
<tr>
<td>2004/CDC</td>
<td>Sub-committee report on WD and SP for NCCDPHP</td>
<td>Target audience for workforce development program is entire NCCDPHP workforce; objectives = develop a process to maximize and create opportunities for NCCDPHP</td>
<td>N/A</td>
<td>An email attached to this meeting report indicates that two sub-committees were formed – one looking at WD and</td>
</tr>
<tr>
<td>2004/CDC Workforce Development Subcommittee</td>
<td>Sub-committee report on Workforce Development for NCCDPHP</td>
<td>This document is an outline of the charge of the subcommittee. The charge is noted as designing a WD strategy to assess current workforce capacity and needs of the Center, and provide tools and opportunities for career enhancement and progression to ensure a highly skilled, knowledge, motivated and diverse workforce. Objectives are listed focusing on a needs assessment, current skills, WD tools and programs already in existence, formulating a plan to implement WD, and presenting a summary to management.</td>
<td>N/A</td>
<td>I have spoken to individuals who were on this subcommittee and they noted that it took a lot of time and resources/personnel staff time and did not evolve</td>
</tr>
<tr>
<td>2004/Succession Planning Subcommittee</td>
<td>Sub-committee report on Succession Planning for NCCDPHP</td>
<td>This document is an outline of the charge of the subcommittee. The charge is noted as designing a SP with strategic and technical components that support the continued effective performance of mission critical activities and respond to emerging challenges through the development of knowledge, skills, and capabilities of staff in key positions. Discuss conducting focus groups, but no indication of whether these were done.</td>
<td>N/A</td>
<td>Would like to see if I can find results from interviews and focus groups; unclear whether they were carried out</td>
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<td>Date</td>
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<tr>
<td>2005/CDC</td>
<td>Preliminary Report; Workforce Development and Succession Planning Program</td>
<td>Summary of Chronic Disease CIO’s WD and SP Committee; defines SP as a key component of WD in addition to coaching, mentoring, and training; examines training programs available at CDC; conducted interviews with leadership; provide findings and recommendations</td>
<td>Although the first finding mentions the need for resources, the recs do not address funds – this seems like a major construct to be further explored</td>
<td></td>
</tr>
<tr>
<td>2005/CDC</td>
<td>Workforce Development and Succession Planning; Pilot Program</td>
<td>Developed for Chronic Disease CIO; Summary of action steps with responsibility and phases; component on SP only focuses on key leadership positions; discusses the development of a toolkit, with an instruction manual and training program; provides a website that is no longer functional</td>
<td>This report is an expansion of the above, with action plans, roles, and timelines; however, no indication that there was any follow-through; websites noted are all defunct</td>
<td></td>
</tr>
<tr>
<td>2005/CDC</td>
<td>Memo; update on SP at CDC</td>
<td>Listed 4 mission-critical occupations; notes that ‘in the future, each coordinating center and office will be responsible for identifying management, supervisory, and SES positions in their areas and will provide updates on status of SP for these key positions’; competency assessment tool is available for self-assessment and supervisory review; there is a broad timeline for SP but it seems too broad to be of any real use</td>
<td>This is just a memo document, but mentions a SP document with a timeline; the timeline in the memo is very broad and wouldn’t really allow for action.</td>
<td></td>
</tr>
<tr>
<td>2005/HHS</td>
<td>University and OPDIV Stakeholders</td>
<td>This document provides a listing of leadership competencies – brief definitions and a list of associated performance indicators</td>
<td>This could be helpful for a review of necessary competencies under leadership tracks.</td>
<td></td>
</tr>
<tr>
<td>2005/CDC</td>
<td>Enterprise Human Resources</td>
<td>This document provides an overview of the electronic personnel record-keeping and analysis system (that can help with WD and SP)</td>
<td>I am not sure which of these tools are still available at CDC and are being widely used by HR.</td>
<td></td>
</tr>
<tr>
<td>2005/CDC</td>
<td>Workforce Development and Succession Planning Tool Box (CoCHP Leadership Meeting)</td>
<td>Appears to be a section of a larger report; ‘provides a tool box of effective programs, strategies, and best practices for WD and SP’; indicates that most of these exist at CDC but are not being fully used</td>
<td>N/A</td>
<td>It seems like having an electronic, streamlined system would be necessary to be able to assess how many individuals are leaving, retiring, etc; training resources available and for whom; budget allocations for SP activities, etc.</td>
</tr>
</tbody>
</table>

2005/CDC | Strategic Succession Planning Requirements and Compliance Report | The R/C team is one of 4 workgroups created within the SP committee. They review/summarize info on various directives and mandates that may affected SP at CDC and review/summarize info on requirements/regs in developing a SP at CDC; discusses President’s Management Agenda of 2004 (couldn’t find updated one on line; last document was 2009); Notes that the PMA and the GPRA of 1993 may be drivers behind | OPM. Human Resources Flexibilities and Authorities in the Federal Government GPRA 1993 | The document is essentially a listing of available programs at CDC – although 10 years later it is unclear which are still available; also, I wonder how many managers know these programs are available and how are they funded? just having a listing of available programs is not helpful – with budgets being so tight, how will they be funded? | Very good document; outlines mandates, CDC policies, and stakeholders relevant to SP; the ‘how to’ is still missing though |
formal SP, but Title 5 of the U.S. Code Government Organization and Employees affects how the CDC implements SP; indicates that CDC has put many policies into place to address development of CDC programs to support SP; one-size-fits-all SP might not be applicable to diverse CDC workforce; President’s Management Agenda (G.W. Bush)
  - SP was identified as a core requirement in the Strategic Management of Human Capital Initiative – one of 5 initiatives
  - Government Performance Results Act (GPRA) of 1993
    - Agency executives must make a conscious effort to integrate strategic HR management into planning and decision making
  - OPM Hiring Flexibilities
    - Provides guidance to recruit and hire a diverse and high performing workforce
  - Intergovernmental Personnel Act
    - Temporary assignment of skilled personnel; provides additional pool of personnel resources from
<table>
<thead>
<tr>
<th>Source</th>
<th>Title</th>
<th>Description</th>
<th>Notes</th>
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</thead>
<tbody>
<tr>
<td>2005/CDC</td>
<td>Succession Planning Meeting Agenda</td>
<td>Minutes from meeting indicate that there will be a framework/protocol for SP implementation at CDC; document notes ‘dedicated resources – staff and dollars – are going to be a major influence/constraint on how much of the ideal framework can get implemented. Hence, thinking is that action steps for part of SP might best be ‘staged’ for different levels of resources.’</td>
<td>N/A</td>
</tr>
<tr>
<td>2005/Booz Allen Hamilton</td>
<td>OWCD Succession Planning (PowerPoint presentation)</td>
<td>This document is a discussion document for BAH’s consulting work; they asked about how SP is defined for ‘current’ OWCD/CDC efforts, challenges, goals, SOW, priorities, and timeline; present President’s Management Agenda Human Capital Standards for Success (this is a visual cycle that includes Talent, Workforce Planning and N/A</td>
<td>Highlights the discrepancies in definitions of terms; reflection again about outsourcing this work – is it sustainable?</td>
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<tr>
<td>Year</td>
<td>Document Title</td>
<td>Key Points</td>
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<tr>
<td>2006/CDC</td>
<td>Crafting a Strategic Succession Plan: A Report that Addresses Capacity Building in Key Positions &amp; Leadership Development</td>
<td>SP is defined as a 'systematic, organized, and measurable process for continued effective performance of mission-critical activities and development of knowledge, skills and capability of the entire workforce for current and future key positions and leadership'; provides list of 2006 committee members – KEY; leadership commitment, commitment of every employee, program goals must be clear and attainable, adequate resources, evaluating results, revisions as needed; 'this plan will be updated at least annually to reflect changes in requirements and the results of evaluation activities'; provides a brief summary of other agency’s activities; provides key milestones of steps that will be taken (budget allocated, build leadership commitment, etc) but no evidence it was done; developed a CDC SP model</td>
<td></td>
</tr>
<tr>
<td>2006/CDC</td>
<td>Recommendations for a Strategic Plan</td>
<td>This document is essentially just the recommendations</td>
<td>N/A</td>
</tr>
<tr>
<td>(KEY DOCUMENT)</td>
<td>Succession Plan: A Report that Addresses Capacity Building in Key Positions &amp; Leadership Development</td>
<td>that emerged from the “Crafting” document noted above</td>
<td>what appears to be a well thought out crosswalk; however, it is unclear if any of these were implemented</td>
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<tr>
<td>2006/CDC</td>
<td>CDC Talent Management Plan FY 2005-08</td>
<td>Discusses the development of a talent management plan to be reviewed annually; contains action plans and milestones to track progress; 'current challenges in recruitment of external talent are a result of HHS hiring controls'; outlines potential and existing programs to increase recruitment and retention</td>
<td>N/A</td>
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<td></td>
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<td></td>
<td>In this document, SP is presented as a small component of talent management</td>
</tr>
<tr>
<td>2006/USDHHS</td>
<td>Human Capital Management in HHS (Talent Management), Version 1.0</td>
<td>Outlines the talent management plan framework (TMP) in a balanced scorecard format; outline standards for success for workforce management, compete for talent, and develop and deploy talent categories; focus on maintaining standards of success but also on closing gaps</td>
<td>N/A</td>
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<td></td>
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<td>Doesn’t directly mention SP; relates to talent management more along the lines of performance; do mention 'bench strength' which could be related to SP depending on how it is defined; not well defined in this document</td>
</tr>
<tr>
<td>2006/CDC</td>
<td>Succession Planning Strategic Plan: Preliminary Bullet Point Outline – Goals, Objectives and Strategies Section</td>
<td>This document appears to be a skeleton outline for a plan for succession planning. It includes broad objective, sub-objectives, POCs (although most are just positions and not named individuals) and timelines (although some just indicate draft times – i.e., 20XX); Includes a logic model/roadmap that lists some framework pieces and outcomes that emerge from those; Includes a table for filling in ‘what information is available from current/prior efforts’ and</td>
<td>N/A</td>
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<td>Lack of specificity with the action plan; cannot be implemented or sustained without specific details of who will do what by when.</td>
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<td>Description</td>
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<tr>
<td>No date provided/OPM</td>
<td>Succession Management and Executive Development: Nuts and Bolts (PowerPoint presentation)</td>
<td>Provides OPM’s definition of SP, argument for importance of SP; indicates SP is a subset of Strategic Planning and Workforce Planning; provides critical performance questions related to succession research – 1) has research been conducted that measures the impact of the agency’s SP? (this seems to assume that SP has been implemented); 2) does workforce research include an analysis/conclusions about the agency’s demographics?; 3) has research been conducted which analyzes the impact of talent management; 4) does research analyze the agency’s continuity of leadership in the event of an emergency? (this seems to be overly specific to be a broad SP question); 5) is a formalized SP in place that is lined to agency’s workforce analysis and strategic plan?; 6) does the agency utilize an outreach plan to attract talent from all sectors of society?; 7) does the agency’s SP provide a continuity of leadership development from the 1st level manager to the ranks of the senior executive service; 8) has the agency crafted a shortened time frame for the filing of critical mission essential vacancies?</td>
<td>N/A</td>
</tr>
<tr>
<td>2012/Corporate Leadership Council</td>
<td>Building and Managing a Best-in-Class Talent Readiness</td>
<td>High level review of need for talent management; 3 key qualities of employees that increase likelihood of</td>
<td>N/A</td>
</tr>
<tr>
<td>Program with CLCPro (PPT presentation)</td>
<td>moving into more senior position – ability, engagement, aspiration (drill down for each)</td>
<td>2012/ Ann Pace, ASTD</td>
<td>Cultivate a Coaching Culture (magazine article)</td>
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<td>Bersin &amp; Associates, A new era of performance management; T+D, High-impact performance management: Part 1 – Designing a strategy for effectiveness</td>
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</tbody>
</table>
### Appendix B: Measurement Table

#### Measurement Table 1

**Main Question 1:** How do non-technical leaders who have transitioned from highly technical roles describe the facilitators that promote success in the leadership position?

**Sub-Question 1:** What personal facilitators are pivotal in the transition from scientist to successful non-technical leader within a federal scientific organization?

**Sub-Question 2:** How have personal facilitators been pivotal in the transition from scientist to successful non-technical leader within a federal scientific organization?

<table>
<thead>
<tr>
<th>Constructs</th>
<th>Factors</th>
<th>Measures</th>
<th>Data Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal facilitators</td>
<td>Skills</td>
<td>Qualitative Measures with a-priori coding</td>
<td>In-depth Interviews</td>
</tr>
<tr>
<td><em>In their book, Performance Management: The New Realities (1998),</em> Armstrong and Baron indicate that “Performance is affected by a number of factors, all of which should be taken into account. These comprise personal factors – the individual’s skill, competence, motivation, and commitment.”</td>
<td>Technical (defined as skills necessary for technical role)</td>
<td>Extraction of key terms and phrases</td>
<td>Reflective Journaling, Field Notes following Interviews</td>
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<td></td>
<td>Non-technical (defined as skills, beyond technical, necessary for supervisory role)</td>
<td>Collation into matrices and coded</td>
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<td></td>
<td>Competence</td>
<td>Examination for key themes</td>
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<tr>
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<td></td>
<td>Self-efficacy (defined by Bandura (1977) as an individual’s belief in his/her ability to successfully carry out a behavior)</td>
<td>Summary interpretations based on patterns of the codes, major and supportive themes, and extracted terms/phrases</td>
</tr>
<tr>
<td></td>
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<td>Motivation</td>
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<td></td>
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<td>Intrinsic (adapted from Oxford dictionary; defined as the reason or reasons, that emanate from within the</td>
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</tbody>
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*Brumbrach (1988) states that “Performance means both behaviours and results. Behaviours emanate from the performance and transform performance from abstraction to action. Not just the instruments for*
results, behaviors are also outcomes in their own right – the product of mental and physical effort applied to tasks - and can be judged apart from results.”

- Individual, that explain why an individual acts or behaves in a certain way
  - Extrinsic (adapted from *Oxford dictionary*; defined as the reason or reasons, that emanate from sources external to the individual, that explain why an individual acts or behaves in a certain way)
  - Commitment
    - Values (defined by *Armstrong and Baron* (1998) as factors that are expressed as beliefs in “what is good for the organization and what behaviors are desirable”; commitment can be defined as how much an individual’s values align with their performance)
  - Other factors that emerge

<table>
<thead>
<tr>
<th>Sub-Question 3: What cultural facilitators are pivotal in the transition from scientist to successful non-technical leader within a federal scientific organization?</th>
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<table>
<thead>
<tr>
<th>Sub-Question 4: How have cultural facilitators been pivotal in the transition from scientist to successful non-technical leader within a federal scientific organization?</th>
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</thead>
<tbody>
<tr>
<td>Constructs</td>
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<td>------------</td>
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</tbody>
</table>
| • Cultural facilitators | • Team  
  o Collegial support (defined as the extent and quality of support from an individual’s same-level colleagues) | • Qualitative Measures with a-priori coding  
  • Extraction of key terms and phrases  
  o Collation into matrices and coded  
  o Examination for key themes  
  o Summary interpretations based on patterns of the codes, major and supportive themes, and extracted terms/phrases  
  • Researcher observations | • In-depth Interviews  
  • Reflective Journaling, Field Notes following Interviews  
  • Document reviews  
  • Critical incidence report  
  • Descriptive internal environmental scan (informed by SOAR) of existing training, developing, HR programs |
| In their book, *Performance Management: The New Realities* (1998), Armstrong and Baron indicate that there are additional factors, other than personal, that impact performance. These are leadership factors, defined as the “quality of encouragement, guidance and support provided by managers and team leaders”; team factors, defined as “the quality of support provided by colleagues”; systems factors, defined as “the system of work and facilities provided by the organization”; and contextual, defined as “the internal and external environmental pressures and changes”. | • System  
  o Processes (defined as workforce development processes that support workforce career progression, advancement, and development – Guest (1996))  
  o Policies (defined as rules and regulations in place to support workforce career progression, advancement, and development – Guest (1996))  
  |  |  |
| Cardy and Dobbins (1994) indicate that “traditional approaches to performance appraisal attribute variations in performance to personal factors, | • Context  
  o Internal environment (defined as forces emanating from within CDC that positively impact the organization and workforce |  |  |
when they could be caused in part or entirely by situational or systems factors.”

Armstrong and Baron (1998) go on to note that performance must not only account for what “individuals have done but also the circumstances in which they have had to perform. And importantly, this analysis should extend to the performance of the manager as a leader.”

- Leadership
  - Coaching (defined by Armstrong and Baron (1998) as a “person-to-person technique designed to develop individual knowledge, skills, and attitudes; for purposes of this research, the coaching could have taken place internal or external to CDC)
  - Mentorship (defined as a formal or informal guidance or advisory relationship (defined by Merriam-Webster) with
<table>
<thead>
<tr>
<th>Mentor external or internal to CDC</th>
<th>Support (defined as being encouraged and facilitated to grow and advance in one’s career by those in an individual’s leadership chain; in a sentinel paper by MacGregor (1957) he writes that leaders should support employees in reaching the goals they set for themselves)</th>
</tr>
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<tbody>
<tr>
<td>Other factors that emerge</td>
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Appendix C: Interview Guide


I. Introduction

Semi-structured In-Person Interview; Informed by Appreciative Inquiry strengths-based approach

Hello, [respondent name]. My name is Alina and first, I wanted to thank you for taking the time to speak with me today. I know you have a lot of other work going on and really appreciate the time you are taking to speak with me. I am a student in the DrPH program at the University of Illinois, Chicago and a co-lead for a working group here at CDC called the Community of Practice working group. This group is made up of representatives from different CIOs who are interested in getting succession planning efforts off the ground at CDC. As both a student and as co-lead of this working group, I am interested in speaking with successful supervisors such as yourself, who have transitioned into these roles from a highly scientific or technical role. This will help us better understand how to better think through leadership development as part of an overall succession planning effort.

This interview should take approximately 90 minutes – there will be some moments of silence for you to reflect on a question, and that is totally OK. Please take your time to think. So many time we focus on our gaps, what we need to fix, but today, the types of questions I am going to ask are called appreciative questions, in that they get at our strengths, the things we do well, those things which are positive within ourselves and within the organization. For the next hour, I'd like you to toss humility out the window and really speak honestly and openly about your strengths and successes.

Do you have any questions for me before we begin?

Lead-In Statement

II. Focus 1: Technical strengths (Discover); [X minutes]
Many of us began at CDC as technical staff, working on projects that helped to advance science and public health. As the premier public health agency, the backbone of CDC are its technical workers, and they have the opportunity to use their strengths every day to make a difference in the lives of people all over the world. It’s a very humbling thought to consider that our science can improve people’s lives. I work with a scientist who conducted the sentinel study that linked a micronutrient to the prevention of up to 70% of some serious birth defects – working with him and learning from him has been an honor for me. Another scientist developed a surveillance template to help countries input surveillance data more easily. As technical experts in our own rights, we have all made contributions to the field of science, no matter how small they might seem. I’d now like to ask you about your technical expertise. Take a minute to recall an experience when you were able to use your technical strengths to make a difference through your work here at CDC.

a. Tell me that story
b. What strengths did you use to be successful?
   i. Follow up: Is there another strength that you haven’t mentioned yet – maybe one you aren’t sure about acknowledging?
c. What made it stand out for you as a memory you could share?
d. Who was involved?
   i. What did they do to support you and how did they do it?
e. How was the surrounding context supportive of your success?
f. What is most fulfilling about your role in this story?
   i. Follow up (if not mentioned): What made it so fulfilling?

Lead-In Statement

III. Focus 2: Exploring a new path (Discover) [X minutes]

Many of us have taken on leadership roles at one time or another. This is not always a formal role in a leadership chain, but rather having the opportunity to lead on a project or activity. Either way, we are still leading. The decision to take on this leadership often comes from a mix of factors – Do our skills match the needs? Do I have the right personality for this role? Are we willing to take on additional or different duties? Are we looking for a change? For this next inquiry, I’d like you to recall a time when you took on a leadership role while still in your technical position. Let’s explore the factors that played into your decision to take on this new or additional responsibility.

a. Tell me about a time when you successfully took on a leadership role while in your technical position.
b. Describe some of the ways in which this role was different from what you had been doing up until this time.
c. Did you discover something new about yourself?
i. **Probes:** What new strengths or abilities did you discover you had? What new interests did you discover you had? What new aspirations did you have for your career growth?

d. What happened contextually that was supportive of your success in this role?

e. What role did your own leadership chain, such as your team leader or others, play in your success?

   i. **Probe:** How did your leadership chain help you tap into your strengths?

**Lead-In Statement**

**IV. Focus 3: Uncovering our personal drivers (Discover) [X minutes]**

In our professional lives, we all have a-ha moments that we can view in hindsight as turning points in our careers. For me, it was the opportunity to serve in an acting role as team leader. Although the most challenging work experience I ever had, it was also by far the most rewarding. I was able to discover strengths I never thought I had, and realized that my strengths were best aligned with supervision and management. As you know, not all scientists at CDC choose to transition into a supervisory role however, and for many that do, this change in role is not always positive. For this inquiry, I’d like you to think about your own transition experience. For this inquiry, I’d like you to think about your strengths that we’ve been discussing, your talents, your skills, as well as those factors, perhaps intrinsic, that you perceive as having been pivotal in your success.

a. Tell me the story of your transition into a supervisory role.

b. Describe what you perceive as those things, unique to you, which were critical in promoting success when leaving a technical role and entering a non-technical leadership role. This might require some reflection, so please take a few moments to think through this if you need to.

   a. **Probe:** Personal facilitators are not necessarily learned, they can be intrinsic or extrinsic – something like *drive*, for example?

   b. [For each identified facilitator, ask:]

      i. Tell me how [facilitator] contributed to your success when transitioning from a technical to non-technical role?

      ii. When do you think you developed [facilitator]?

      iii. How do you think it was developed – perhaps something in your life or in your professional career path helped you develop this facilitator?

c. The literature on performance management talks about how performance is impacted by a number of factors. Among them are skills, competence, motivation, and commitment. [If applicable, say: you have already talked about [facilitator] as being pivotal in your success in transitioning from a technical to a supervisory role. What do you think about [skills/ competence/motivation/commitment]? Do you think this played a role in your particular situation?]

   a. [If yes, ask:] When do you think you developed [facilitator]?

   b. [If yes, ask:] How do you think [facilitator] was developed?

      i. Can you provide an example of when [facilitator] was pivotal in your supervisory success?
Lead-In Statement

V. Focus 4: Utilizing cultural supports (Discover) [X minutes]

Now, I’d like to turn our discussion away from personal facilitators and discuss those cultural facilitators both at CDC as well as in our lives outside of work that you feel were pivotal in your success when making the leap from a technical expert to a non-technical supervisor. For example, I have a colleague who regularly meets with a life coach. Through these sessions, she has been able to think through what she wants her professional path to be and figure out what she needs in her work and in her life to help her achieve her goals. For this inquiry, I’d like you to think about those supports around you – they can be people, or processes, or other kinds of resources that you feel were pivotal in your success.

a. In trying to better understand what facilitated your success in transitioning from a technical role to a supervisory role, what do you perceive as the facilitators present in the CDC culture or in the external environment that have been pivotal to your success.
   a. Probe: Cultural facilitators can include the people around you, policies within the CDC environment like management-related trainings, processes involved with hiring of leadership positions, or anything in the external environment like an outside life coach or even a supportive family member or spouse.
   b. [For each identified facilitator, ask:] i. Tell me how [facilitator] contributed to your success when transitioning from a technical to non-technical role? ii. When did this facilitator contribute to your success when transitioning from a technical to non-technical role?
   c. [If identified facilitator is a person, ask:] How did you meet? What role did this person play that you feel was pivotal in your success? What guidance did he/she provide?

b. The literature on performance management that I mentioned earlier talks about how performance is impacted by a number of factors. Among them are leadership, team, systems, and context. [If applicable, say: you have already talked about [facilitator] as being pivotal in your success in transitioning from a technical to a supervisory role. What do you think about [leadership/team/systems/context]? Do you think this played a role in your particular situation?
   i. [If yes] Tell me how [facilitator] contributed to your success when transitioning from a technical to non-technical role?
   ii. [If yes] When did [facilitator] contribute to your success when transitioning from a technical to non-technical role?

VI. Lead-In Statement [5 minutes]

Focus 5: Envisioning what could be (Dream)

Imagine just waking up from a 5 year nap to find that CDC had developed an innovative and strategic program aimed at developed technical staff into successful supervisors. This is your opportunity to dream of what could be.
a. What might be key aspects of such a program?

VII. Closing [5 minutes]

We have reached the end of our discussion today. [NAME] - thank you so much for your time today! I hope you enjoyed this opportunity to think back on how your strengths and the supportive environment have helped you arrive to where you are. I really enjoyed hearing about your experiences, and thank you again for your willingness to share them with me.

Appendix D: Critical Incident Form

As we have discussed, not all technical staff who transition into supervisory roles succeed in these positions. You have been identified as someone who has been successful. I want you to think of the one facilitator, it can be something personal to you, intrinsic or developed, or something in the context around you, within or external to CDC, which you feel was critical in your success in this transition.

1. Describe the facilitator which you feel was critical in your success in your transition from a technical role into a non-technical supervisory role.

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2. Describe how this facilitator contributed to your success when transitioning from a technical to a non-technical role?

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Appendix E: Document review template

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<th>Summary</th>
<th>Additional Citations</th>
<th>Reflections/Notes</th>
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**Summary and Reflection**
Appendix F: SOAR Assessment Guide
(based on The Thin Book of SOAR)

1. What are we doing really well?
   a. What policies support the transition of technical staff into non-technical supervisory leadership roles?
   b. What processes support the transition of technical staff into non-technical supervisory leadership roles?
   c. What training and development programs support the transition of technical staff into non-technical supervisory leadership roles?

2. What are CIOs doing around leadership development to support the transition of technical staff into non-technical supervisory leadership roles?

3. What do our strengths tell us about our leadership development efforts support the transition of technical staff into non-technical supervisory leadership roles?

4. What programs exist that can foster collaboration across the Agency to support the transition of technical staff into non-technical supervisory leadership roles?

5. How can we apply our strengths to an improved system for leadership development to support the transition of technical staff into non-technical supervisory leadership roles?
### Appendix G: A-priori Codebook

Attributes: Respondent series, Years in Supervisor position

<table>
<thead>
<tr>
<th>CODES</th>
<th>NOTES/DEFINITIONS</th>
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<tbody>
<tr>
<td>TECHNICAL STRENGTHS</td>
<td>The TECHNICAL STRENGTHS code relates to any discussion around what the respondent identifies as strengths or necessary skills to be successful in a technical role; Primary codes and sub-codes include how the respondent defines success in the example(s) provided; specific discussion around scientific strengths and skills needed, technical skills, and subject matter knowledge the respondent feels were necessary for success in a technical role; role, level of support, impact, and manner in which support was provided by other players respondent names as having been involved in his/her technical success; context in which technical strengths emerged, when they emerged, the impact of context on success, and the level of impact of context on success. Finally sub-codes also include description of what was most fulfilling about respondent’s role in technical success. Emergent codes has been included as a primary code to align with a qualitative approach to inquiry in that codes are allowed to emerge from the inquiry process.</td>
</tr>
<tr>
<td>Primary codes and Sub-codes:</td>
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<tr>
<td>• Definition of success</td>
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<tr>
<td>• Scientific strengths needed</td>
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<tr>
<td>• Skills Needed</td>
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<td>o Technical Skills</td>
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<tr>
<td>o Subject matter knowledge</td>
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<tr>
<td>• Players involved</td>
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<tr>
<td>o What players</td>
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<tr>
<td>o Role</td>
<td></td>
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<tr>
<td>o Impact on success</td>
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<tr>
<td>o Level of support</td>
<td></td>
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<tr>
<td>o How support</td>
<td></td>
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<tr>
<td>• Context</td>
<td></td>
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<tr>
<td>o Timing of emergence of strengths</td>
<td></td>
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<tr>
<td>o Positive impact on success</td>
<td></td>
</tr>
<tr>
<td>o Level of impact</td>
<td></td>
</tr>
<tr>
<td>• Personal fulfillment</td>
<td></td>
</tr>
<tr>
<td>• Emergent codes</td>
<td></td>
</tr>
<tr>
<td>EXPLORING LEADERSHIP</td>
<td>The EXPLORING LEADERSHIP code relates to any discussion around what the respondent identifies as a time when he/she successfully took on a leadership role while still maintaining a technical position (i.e.,</td>
</tr>
</tbody>
</table>
- Differences from technical role
- Discover strengths
- Discover abilities
- Discover aspirations
- Context
  - Positive impact on success
  - Level of impact
- Leadership
  - What leadership
  - Role of leadership in success
  - Impact on success
  - Level of support
  - How support
- Emergent codes

**PERSONAL FACILITATORS**

**Code families and Sub-codes:**

- Skills
  - Technical skills
  - Non-technical skills
  - Emergent codes
  - Role in success
  - When facilitator developed
  - How facilitator developed
- Motivation
  - Intrinsic
  - Extrinsic
  - Emergent codes
  - Role in success
  - When facilitator developed
  - How facilitator developed
- Commitment
  - Values
  - Emergent codes
  - Role in success

not in a formal CDC leadership position); Primary codes and sub-codes include how the respondent defines success in the example(s) provided; differences in this role versus technical role; discovery of new strengths and/or abilities and/or aspirations respondent might not have realized in a purely technical role; level of support, impact, and manner in which support was provided by respondent’s leadership chain as having been involved in his/her technical success; context in which technical strengths emerged, when they emerged, the impact of context on success, and the level of impact of context on success.

Emergent codes has been included as a primary code to align with a qualitative approach to inquiry in that codes are allowed to emerge from the inquiry process.
- Competence
  - Self-efficacy
  - Emergent codes
  - Role in success
  - When facilitator developed
  - How facilitator developed
- Emergent codes
  - When facilitator developed
  - How facilitator developed

### CULTURAL FACILITATORS

**Code families and Sub-codes:**

- **Team**
  - Collegial support
  - Emergent codes
  - Role in success
  - When facilitator contributed to success
  - How facilitator contributed to success
- **System**
  - Policies
  - Processes
  - Emergent codes
  - Role in success
  - When facilitator contributed to success
  - How facilitator contributed to success
- **Context**

The CULTURAL FACILITATORS code relates to any discussion around what the respondent identifies as cultural factors critical in promoting his/her success in the transition from technical role to non-technical leadership role; Primary codes and sub-codes include team and collegial support; system facilitators, including process and policies; context facilitators, both internal and external; and leadership, coaching, mentorship, and leadership support. For each primary code, there is also a sub-code for emergent codes that can develop from the review of the data. Additional sub-codes include the role of each facilitator in success, when each contributed to success, and how each contributed to success. Emergent codes has been included as a primary code to align with a qualitative approach to inquiry in that codes are allowed to emerge from the inquiry process.
<table>
<thead>
<tr>
<th>Internal</th>
<th>External</th>
<th>Emergent codes</th>
<th>Role in success</th>
<th>When facilitator contributed to success</th>
<th>How facilitator contributed to success</th>
</tr>
</thead>
</table>

- **Leadership**
  - Coaching
  - Mentorship
  - Leadership Support
  - Emergent codes
  - Role in success
  - When facilitator contributed to success
  - How facilitator contributed to success

- **Emergent codes**
  - When facilitator contributed to success
  - How facilitator contributed to success
Appendix H: Codes, Defined, Relevant Family (Personal and Cultural Facilitators only)

**Able to lead**  
Families (1): Personal Facilitators  
Comment: Defined as demonstrating potential to lead, coordinate, be in charge; both view of self as having the potential to lead as well as others indicating that the individual can lead; includes references of being the go-to person.

---

**Attention to detail**  
Families (1): Personal Facilitators  
Comment: Defined as being detailed, paying attention to the finer points, coordinating many moving parts

---

**Background**  
Comment: Defined as the educational or work-related background of the respondent. Different from technical skills in that it doesn’t specify particular skills but rather more of a discipline to which the respondent belongs.

---

**Big picture thinking**  
Families (1): Personal Facilitators  
Comment: Defined as being able to get out of the weeds, see the big picture; includes mentions of thinking of and working toward a future goal; includes systems-level thinking, end products

---

**Broad skillset**  
Comment: Defined as having a broader set of skills rather than skills that are just focused in one area. Includes being adaptable, being a generalist -- these can be viewed as very strong skills at CDC because it makes it easier for an individual to move around.

---

**Career aspiration**  
Families (2): Personal Facilitators, Cultural facilitators  
Comment: Defined as the career goals that the respondent has for him/herself

---

**Commitment**  
Families (1): Personal Facilitators  
Comment: Defined as the state or quality of being dedicated to a cause, activity; includes commitment to growth, to a role, to advancing, to leaving behind science; includes making a choice to pursue a leadership path; includes mention of dedication
Communication
Families (1): Personal Facilitators
Comment:
  Defined as written and oral communication skills with individuals at all levels

Connect technical and non-technical skills
Comment:
  Defined as bridging technical work with non-technical, in this case leadership, work

Courses CDC
Families (1): Cultural facilitators
Comment:
  Defined as course offerings supported by CDC; includes off-site courses that are CDC led

Courses Non-CDC
Families (1): Cultural facilitators
Comment:
  Defined as course offerings that are not supported by CDC; includes off-site courses that are not CDC led

Cultural facilitators
Comment:
  Family code; Defined as any discussion around what the respondent identifies as cultural factors critical in promoting his/her success in the transition from technical role to non-technical leadership role; Primary codes and sub-codes include team and collegial support; system facilitators, including process and policies; context facilitators, both internal and external; and leadership, coaching, mentorship, and leadership support

Demonstrate Strength
Comment:
  Defined as demonstrating strengths, skills, value added; includes both technical and non-technical strengths; includes growth in strength over time

Desire to succeed
Families (1): Personal Facilitators
Comment:
  Defined as expressing a desire to advance, grow, take on new roles and responsibilities

Detail
Families (1): Cultural facilitators
Comment:
  Defined as the formal detail process at CDC; coded for explicit mentions of having participated on a work-related detail
Differences from technical role
Comment:
Defined as doing work that is different from the respondent’s technical work; includes responses to question about how work is different from what the respondent had been doing up until the time of the leadership activity

Discover aspirations
Comment:
Defined as discovery of new interests, desires, and views of one's professional path and growth

Discover strengths
Comment:
Defined as discovery of new strengths as they relate to non-technical roles; includes both those required for new roles as well as those discovered through reflection

Drive
Families (1): Personal Facilitators
Comment:
Defined as an innate want or need to attain a goal

Emulation
Comment:
Defined as effort to match or surpass a person or achievement, typically by imitation

EQ
Families (1): Personal Facilitators
Comment:
Defined as one's emotional quotient, a measure of a person's self-awareness, empathy, and dealing sensitively with other people; includes how you see yourself and how others see you; other's perceptions of you; includes mentions of things that might be personal to the respondent.

Exposure
Comment:
Defined as the state of being exposed to leaders, leadership roles, opportunities, or leadership characteristics; is more passive in nature (more active would be coded as opportunity) but can be co-occurring with Opportunity code; Excludes exposures that occur on detail

Flexibility
Families (1): Personal Facilitators
Comment:
Defined as not being wedded to one particular way of being; includes being adaptable, able to change quickly, go with the flow

**Hands-on learning**
Comment:
Defined as involving active participation rather than theory

**How strength developed**
Families (1): Personal Facilitators
Comment:
Defined as the facilitators that contributed to the development of strengths; applicable to both technical and non-technical strengths

**Interest**
Families (1): Personal Facilitators
Comment:
Defined as the state of wanting to know more about something new

**Interpersonal relationships**
Families (1): Personal Facilitators
Comment:
Defined as of or relating to relationships; includes awareness of others similarities and differences

**Intrinsic**
Families (1): Personal Facilitators
Comment:
Defined as naturally occurring within an individual; includes personality traits considered to be something the individual is born with or that comes naturally

**Leadership Support**
Families (1): Cultural facilitators
Comment:
Defined as indications that respondent felt his/her leadership supported him/her; includes mentions of confidence

**Leading an activity**
Comment:
Defined as discussions around leading an activity, stepping out of exclusively technical role although can still
include technical elements

**Literature**
Families (1): Cultural facilitators
Comment:
  Defined as reading leadership literature to learn more

**Luck**
Comment:
  Defined as success apparently brought by chance rather than through one's own actions:

**Mentor**
Families (1): Cultural facilitators
Comment:
  Defined as an experienced and trusted adviser; includes both formal mentoring through the CDC mentorship program and informal mentoring; includes both technical and non-technical mentors

**Missing the science**
Comment:
  Defined as references to the respondent's feelings of missing the scientific and/or technical work and responsibilities as a result of transitioning out of technical role

**Motivation**
Families (1): Personal Facilitators
Comment:
  Defined as the reason or reasons one has for acting or behaving in a particular way; includes the general desire or willingness of someone to do something

**Network**
Families (1): Cultural facilitators
Comment:
  Defined as a group or system of interconnected people; can be made up of colleagues from all levels; different from peers code in that a network is a more formalized structure

**Observe other leaders**
Comment:
Defined as watching individuals in leadership positions to assess their actions and behaviors; includes watching from a distance, not a formal mentorship relationship

Opportunity
Comment:
Defined as a set of circumstances that makes it possible to advance, try something new, be promoted; deliberate action to open up a chance for another individual; excludes passive behavior (passive included as exposure code) but can be co-occurring with Exposure code; includes the act of volunteering since that can provide leadership experience

Passion
Families (1): Personal Facilitators
Comment:
Defined as a strong emotion or desire for one's work or for a cause

Peers
Families (1): Cultural facilitators
Comment:
Defined as colleagues, those in one's professional environment that are on the same level as the individual

Personal Fulfillment
Comment:
Defined as a feeling of contentment, satisfaction, achievement, or happiness as a result of one's work

Problem Solving
Families (1): Personal Facilitators
Comment:
Defined as the process of finding solutions to difficult or complex issues

Resilience
Families (1): Personal Facilitators
Comment:
Defined as the ability to recover quickly from difficulties; toughness, maintain composure

Role models
Comment:
Defined as a person looked to by others as an example to be imitated

---

**Sacrifice**
Families (1): Personal Facilitators
Comment:
Defined as putting aside particular behaviors, roles, or responsibilities in order to take on other ones

---

**Self-efficacy**
Families (1): Personal Facilitators
Comment:
Defined as the respondent's beliefs in his/her own ability to succeed in reaching a specific goal; includes specific mentions of competence, being able to do something, self-confidence

---

**Spousal support**
Families (1): Personal Facilitators
Comment:
Defined as support provided by a spouse that is needed in order to devote time to one's professional career growth

---

**Supportive Infrastructure**
Families (1): Cultural facilitators
Comment:
Defined as having the infrastructure ready and available to support professional development and career change and advancement

---

**Taking Initiative**
Families (1): Personal Facilitators
Comment:
Defined as an individual taking action of his/her own accord and not because another individual told him/her to do so

---

**Team**
Families (1): Cultural facilitators
Comment:
Defined as a formal peer group of individuals all working toward a common goal; excludes peers who might be within different areas and working on different activities

---

**Technical credibility**
Families (1): Technical strengths
Comment:

Defined as the quality of having one's technical or scientific skills trusted, valued and believed in

Technical fulfilling
Families (1): Technical strengths
Comment:

Defined as scientific or technical work that makes an individual feel satisfied, happy, or as having achieved something

Technical mentors
Families (1): Technical strengths
Comment:

Defined as individuals who provide close guidance and support for growth in technical areas; excludes mentorship for non-technical areas

Technical skills
Families (1): Technical strengths
Comment:

Defined as ability to do technical work or science well, usually gained through training or experience

Technical Training Opportunities
Comment:

Defined as training opportunities geared toward enhancing technical skills.

Training opportunities
Families (1): Cultural facilitators
Comment:

Defined as having the chance to attend or receive formal training and instruction; includes both technical and non-technical; includes classroom and on-the-job training; excludes informal training

Understanding leadership
Families (1): Personal Facilitators
Comment:

Defined as having insight into what is needed for leadership roles or learning what is needed for leadership roles

Understanding of the CDC system
Families (1): Personal Facilitators
Comment:
Defined as having insight and awareness about the way in which the CDC policies, procedures and overall organization works

**Upbringing**
Families (1): Personal Facilitators
Comment:
- Defined as the experiences from one's childhood/youth that impact his/her professional choices and growth

**Wanting to learn**
Comment:
- Defined as having a desire to gain or acquire knowledge of or skill by study, experience, or being taught

**When strength developed**
Comment:
- Defined as the timing during which there occurred a development of strengths; applicable to both technical and non-technical strengths

**Willingness**
Families (1): Personal Facilitators
Comment:
- Defined as the quality or state of being prepared to do something, openness to doing something new or different, and readiness to take on something new or different; includes stepping out of one's comfort zone, taking risks; includes being OK with making mistakes
Appendix I: Generic Leadership Development Framework