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County Health Leadership and Readiness for Noncommunicable Disease Services

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Abstract

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MBA, Kenya Methodist University, 2008

MBchB, University of Nairobi, 2003

Dissertation Submitted in Partial Fulfillment

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Abstract

Premature mortality resulting from the growing global burden of noncommunicable diseases (NCDs) is a contemporary development challenge. Low-income and lower-middle-income countries are disproportionately affected, with the poorest in society considered the most vulnerable. A paucity of literature exists on how leadership practices at the implementation level relate to ensuring readiness for NCD services. The purpose of this study was to investigate whether any relationship exists between leadership practices at the county level and readiness for NCD services in Kenya. Path-goal and adaptive leadership theories were used to guide this quantitative correlational study, using secondary data from a 2013 Service Availability and Readiness Assessment survey. Correlation and multiple linear regression tests were used to determine the strength and direction of any relationship between the independent variable of leadership practices (annual work planning, therapeutic committees, and supportive supervision), and the dependent variable of NCD readiness (county readiness score). The results indicated a statistically significant relationship between therapeutic committee ($p = .002$) and supportive supervision practices ($p = .023$) and NCD readiness. Leadership practices also had a statistically significant predictive relationship with NCD readiness ($p = .009$). This study may be significant to county health leaders in relation to their efforts to ensure proximal access to quality NCD services in Kenya. The results of this study may help to promote the development of capacity-building programs targeting health leadership and prioritization of actions to ensure access to NCD prevention and treatment services at the county level in Kenya.

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Chapter 1: Introduction to the Study

Introduction

Worldwide, noncommunicable diseases (NCDs) resulted in 16 million deaths of individuals under the age of 70 in 2012. In low-income and lower-middle-income countries, individuals with NCDs have a 1 ½ times higher risk of death before the age of 70 compared to those from high-income countries (Allen, Cobiac, & Townsend, 2017). Given their growing and disproportionate global burden, NCDs are argued to be an important global social justice issue (Allen et al., 2017).

In 2012, the World Health Assembly targeted a 25% reduction in preventable deaths from NCDs by 2025. The focus of this effort has been on cardiovascular diseases, cancers, diabetes, and chronic respiratory diseases, which cause 87% of all NCD deaths (Pearce et al., 2014). In 2015, reduction of premature NCD mortality was also prioritized as a sustainable development goal (Ralston, Reddy, Fuster, & Narula, 2016). Recent arguments have advanced the need to reconceptualize NCDs as socially transmitted conditions to recognize societal factors as determinants of NCDs beyond individual-level factors (Allen & Feigle, 2017; Kozelka & Jenkins, 2017; Zou, Decoster, McPake, & Witter, 2017). These developments emphasize health services for NCDs as a contemporary leadership issue.

This study focused on investigating the relationship between leadership practices at a county level and readiness for NCD services in Kenya. Three leadership practices were investigated to determine relationships with NCD readiness. These were planning, therapeutic reviews, and supervision. Outcomes from this study may contribute to social

change by prioritizing leadership as it relates to reducing premature mortality caused by NCDs in Kenya.

In Chapter 1, I discuss the background, problem statement, and purpose of the study. The research questions, hypotheses, and theoretical framework of the study are discussed. The chapter also includes definitions of terms used in the study, along with assumptions, limitations, scope, and significance of the study.

Background of the Study

Health facilities in sub-Saharan Africa were historically designed to manage acute infectious diseases (Peck, 2014). The burden of acute infectious diseases is declining, while that of chronic NCDs is increasing (Geldsetzer, Ortblad, & Bärnighausen, 2016). With this epidemiological transition, an increasing number of people requiring chronic disease management for NCDs will seek health services (Geldsetzer et al., 2016).

Unlike acute care, chronic care requires investments in services such as screening, primary prevention, linkage to care, medication adherence, and longitudinal follow-up to monitor therapeutic success (Geldsetzer et al., 2016). These interventions are required for the health system to respond to the growing NCD burden. However, the capacity of the health system in countries within sub-Saharan Africa is generally weak, fragmented, and varying in quality (Ali et al., 2013).

In Kenya, there is evidence of a growing NCD epidemic. The World Health Organization (WHO) reported an increase in NCD-related mortality in Kenya, from 99,630 deaths to 105,900 between 2012 and 2015 (WHO, 2016). An estimated 18% of these deaths affected adults below 70 years of age and were considered premature and

largely preventable (Phillips-Howard et al., 2014). Years of healthy life lost due to disability or mortality caused by NCDs, expressed as disability-adjusted life years (DALYs), were 6.54 million in 2015 (Devleesschauwer et al., 2014; WHO, 2016).

About half of hospital admissions are NCD-related. By 2025, it is projected that NCD-related admissions will exceed those from communicable diseases. Most of these admissions occur at tertiary health facilities (Some et al., 2016). Because out-of-pocket payments for health care are most common in Kenya, most households are vulnerable to being exposed to poverty as a result of NCDs (Barasa, Maina & Ravishankar, 2017). Poor Kenyan households spend a third of their budgets on health care; for this reason, 1.48 million Kenyans are exposed to poverty each year (Chuma & Maina, 2012).

Screening for NCDs is suboptimal in Kenya (Some, 2016). According to the country's Ministry of Health (MOH, 2015), more than half of the adult population has never received a blood pressure measurement to evaluate cardiovascular risk. Other risk factors for cardiovascular disease are also prevalent, including high dietary salt intake, obesity, smoking, and inadequate physical activity (MOH, 2015). Rates of adherence to treatment are also low as a result of costs and low perception of risk (Oti et al., 2016). Investing in cardiovascular disease prevention and treatment would be cost effective and could avert between 249 and 391 DALYs and reduce the cost of patient care (Oti et al., 2016; van de Vijver et al., 2013).

Capacity for cancer care is limited in Kenya. Access to specialist care is limited by inadequate access to oncologists and radiotherapy services (Malloy et al., 2017; Topazian et al., 2016). Access to treatment services for infectious causes of cancer that

are treatable is limited, affecting prevention and control efforts (Menon, van den Broeck, Rossi, Ogbe, & Mabeya, 2017; Ochwoto et al., 2016). Access to care is also limited by the cost of diagnosis and treatment (Topazian et al., 2016). Because of these barriers, 80% of cancer patients are diagnosed with advanced disease, contributing to poor disease outcomes and mortality (Malloy et al., 2017).

Demographic and lifestyle changes have contributed to a growing prevalence of diabetes mellitus in Kenya. By 2025, an estimated 1.8 million people will be living with diabetes in Kenya (Mwavua, Ndungu, Mutai, & Joshi, 2016). According to the International Diabetes Federation (IDF, 2014), three out of every four cases of diabetes remain undiagnosed. Lack of access to screening and diagnostic services contributed to late presentation with end-organ complications of diabetes (Hall et al., 2011). Appropriate health system investments would therefore be necessary to ensure early diagnosis and access to care.

Chronic obstructive pulmonary disease (COPD) was the commonest cause of mortality from respiratory causes in 2015 in Kenya. However, there is limited investment in the management of COPD, and it remains underresearched (Nturibi, Kunda, & Kamau, 2016). Risk factors for COPD are prevalent, particularly as a result of secondhand smoke at home and at work and household air pollution particularly affecting women (MOH, 2015; Pinkerton et al., 2015).

Problem Statement

It is not currently known whether the implementation practices of health leaders at the county level in Kenya have any correlation with NCD readiness. Another unknown is

whether any of these practices have a predictive relationship with NCD readiness at the county level. Whereas the role of leadership action at the political level has been investigated, a gap exists regarding how actions and practices at the implementation level translate to NCD readiness (Bonita et al, 2013).

The problem is that there is a gap in the literature regarding the effectiveness of NCD program leaders at the county level in executing planning, therapeutic reviews, and supervision to ensure success in NCD programs. This study investigated the relationship, if any, between county leadership practices through the execution of planning, therapeutic reviews, and staff supervision and NCD readiness in Kenya. Data were collected from all 47 counties in Kenya for this study.

Responding to this epidemiologic transition requires leadership. Leadership is an essential building block of the health system, with the important role of defining a vision, prioritization, stewardship, and accountability for health services (Monroe-Wise et al., 2016; Mounier-Jack, Griffiths, Closser, Burchett, & Marchal, 2014). Leadership has been associated with outcomes such as provision of high-quality health services, patient satisfaction, reduction in mortality, responsiveness, and improved service coverage rates (Curry, Taylor, Chen & Bradley, 2012; La Rue et al., 2012; Wong, 2015; Wong & Giallonardo, 2013). This study investigated any relationship between leadership activities and readiness for NCD services. A detailed review of existing research studies indicated that none had completely investigated the relationship between county leadership practices and readiness for NCD services in Kenya.

A gap in the literature exists concerning the relationship between leadership practices and NCD services in Kenya, particularly at the county level, where the responsibility of service delivery is vested (Samadi, Keshtkaran, Kavosi, & Vahedi, 2013). This study may fill the gap in the literature by providing evidence on how specific leadership practices relate to county-level readiness for NCD services in Kenya. Leadership practices that have a predictive relationship with NCD readiness were also identified.

Purpose of the Study

The purpose of this study was to examine the relationship between county leadership practices and health facility readiness for NCD services. The study approach was quantitative. Secondary data from the Kenya Service Availability Readiness Assessment (SARA) mapping of 2013 with leadership and service readiness variables were used for this study. The independent variables included availability of annual work plans, quarterly therapeutic committee meetings, and supervision visits from health leaders reflecting leadership practices. The dependent variable constituted the county readiness index scores for NCD readiness. Data from the SARA surveys have been used to determine service-specific readiness scores. The readiness scores indicate availability of various items that would be necessary for providing disease-specific health services, such as NCDs (Spiegel et al., 2017). Data from all 47 counties were used for this study.

Research Questions and Hypotheses

In this study, I sought to answer the following research questions and hypotheses.

RQ1: What is the relationship between leadership practices and county readiness for NCD services?

*Ho*1: There is no statistically significant relationship between leadership practices and county readiness for NCD services.

*HA*1: There is a statistically significant relationship between leadership practices and county readiness for NCD services.

RQ2: Can leadership practices predict county readiness for NCD services?

*Ho*2: Leadership practices do not have a statistically significant predictive role in relation to county readiness for NCD services.

*HA*2: Leadership practices have a statistically significant predictive role in relation to county readiness for NCD services.

Theoretical Framework

Path-goal theory and adaptive leadership theory provided the underlying theoretical foundation to frame this study. Path-goal theory explains leadership effectiveness based on how leaders' actions and behaviors affect performance (House, 1971). Leaders have an important facilitative role in ensuring a clear path with well-defined goals, free from obstacles, with an assurance of support (Hendry, 2013). Through a prescriptive framework focused on the guidance and coaching role of leaders, the theory provides a practical purpose to leadership and has been applied across various leadership settings (Dihn et al., 2014; Hendry, 2013; Phillips & Phillips, 2016).

The theory posits the role of four leadership behaviors in achieving subordinate motivation and performance: directive, supportive, participative, and achievement-

oriented behavior (House & Mitchell, 1974). Directive and supportive leadership behaviors expressed through leadership practices included in the independent variables were evaluated in this study.

Adaptive leadership theory focuses on change and the adaptations required to respond. Such changes would be categorized as either technical or adaptive (Bailey, 2012). The response to technical changes would be different from the response to adaptive changes. Matching specific changes with the most appropriate responses would be considered a leadership responsibility (Northouse, 2016). This theory provided a foundational reference for the outcomes of this study.

In summary, the described theoretical framework anchored this study to the existing body of knowledge. The independent and dependent variables were evaluated based on the foundation of the mentioned theories. A more detailed explanation of the theoretical framework is presented in Chapter 2.

Nature of the Study

The nature of this study was quantitative. Using quantitative methods was consistent with analysis of leadership practices and NCD readiness variables to evaluate the conjectured relationship between the variables, which was the focus of this study. Statistical analyses were used to determine the existence of any significant relationships as well as the strength and direction of any such relationships.

Secondary data from the 2013 Kenya (SARA) survey were used. The SARA survey was conducted as a national census by the MOH, WHO, and U.S. Agency for International Development (USAID). Service availability and service readiness data was

collected in the survey (MOH, 2013). In this study, leadership variables relating to work planning, support supervision, and therapeutics committee activities constituted the independent variables. The dependent variable was the county NCD readiness score index.

This was a cross-sectional correlational study to investigate any relationship between county leadership practices and readiness for NCD services. Availability of secondary data provided a viable basis to effectively investigate the research questions. The use of secondary data also presented a less costly and time-consuming approach to answer the research questions, using a large, high-quality dataset (Johnston, 2017).

Statistical analyses were done using a statistical processing and analysis software package (SPSS 24). Data were analyzed and presented using descriptive and inferential analysis. Because I sought to investigate a conjectured relationship between leadership practices and NCD readiness, multiple linear regression analyses were used to determine the magnitude and direction of any such relationship (Field, 2013). A detailed discussion of data analysis is presented in Chapter 3.

Definitions

Annual work planning: The work plan is a performance monitoring document that highlights performance benchmarks and facilitates evaluation of progress and effectiveness of interventions (MOH, 2013).

Leadership: A primary mechanism for influence, motivation, and coordination of groups toward attainment of defined group or organizational goals (von Rueden & Van Vugt, 2015).

Noncommunicable diseases (NCDs): A group of diseases that mainly result from changes in lifestyle of individuals and populations fueled by social, political, infectious, and economic trends. Cardiovascular disease, cancers, chronic obstructive respiratory disease, and diabetes are among the most common NCDs (Allen, 2017; Kengne, Mchiza, Amoah, & Mbanya, 2013).

Service Availability and Readiness Assessment (SARA): A comprehensive facility-based assessment tool used to evaluate the availability of health services based on a standard set of indicators and measures to determine the extent to which required minimum criteria for health services are met (O'Neill, Takane, Sheffel, Abou-Zahr, & Boerma, 2013; Spiegel et al., 2017).

Service readiness: Readiness for health services such as NCDs refers to the presence of specific items that would be required for offering NCD services at health facilities (Spiegel et al., 2017).

Supportive supervision: This is a process aimed at promoting quality care within the health system through a focus on problem solving, enhancing teamwork, and optimizing resource allocation and utilization. Supportive supervision is conducted primarily by supervisors as a form of leadership support to empower health care workers to improve their performance (Vasan, Mabey, Chaudhri, Brown Epstein, & Lawn, 2017).

Therapeutic committee: A team of experts responsible for ensuring availability of cost-effective, quality medications for quality care of patients (Hoffmann, 2013).

Assumptions

This study had some assumptions. One assumption related to the use of secondary data. Data from the SARA survey in Kenya included variables relating to leadership as well as data used to determine an overall readiness score for NCD care, among others. It was assumed that there may exist a relationship between the leadership practices and NCD readiness scores. Another assumption was that accurate information was collected during primary data collection. Because the overall readiness scores included an index of various subscores, it was assumed that all data used to determine the overall readiness scores were accurate.

Scope and Delimitations

The scope of this study was limited to investigating leadership practices and how these related to NCD readiness. The secondary data used in this study were collected from public and private health facilities located within all 47 counties in Kenya. Leadership data were collected from health leaders based at county health facilities (MOH, 2013).

This study did not focus on specific leadership approaches, but on actions and practices aimed at stewardship of health services. The process of determining NCD readiness did not include any review of patient-level outcomes. Readiness was determined primarily by the availability of specific items that would be required for NCD services at health facilities (Spiegel et al., 2017). Because the data to be analyzed in this study were collected as a census of all health facilities at county level, it is likely that the findings from this study will be generalizable.

Limitations

This study was limited to readiness scores relating to NCDs. Additionally, whereas data on seven leadership variables focusing on the stewardship role were collected, the study was limited to three variables. The selected three variables were considered most relevant to this study. The use of the survey instrument to measure these concepts could present content validity issues. These would relate to the extent to which the survey instrument accurately represented the concepts measured (Frankfort-Nachmias & Nachmias, 2015). Self-reported data, particularly relating to the leadership variables, may have been subject to bias during data collection. However, this was minimized by verification of responses with a review of existing documentation as an approach to SARA data collection (MOH, 2013).

Significance of the Study

This research may fill a gap in the literature by focusing on leadership as a priority action in the NCD response (Beaglehole et al., 2011). By investigating how leadership practices relate to the NCD response, this study may support the development of leadership-capacity-building programs targeting health leaders at the nascent county governments in Kenya. Highlighting the role of leadership could contribute to prioritization and planning at county health departments in Kenya toward readiness for NCD services at health facilities.

Positive social change could result from an enhanced understanding of how county departments of health could evaluate their leadership practices and how they relate to NCD readiness. This could be useful in ensuring county self-assessments and

adjustments to ensure prioritization of best practices. Such changes would benefit citizens at the county level through enhanced leadership action to ensure proximal access to quality health services, in addition to potentially contributing to the reduction of NCD-related premature mortality, preventable morbidity, and disability (Beaglehole et al., 2011).

Summary

This chapter has presented an overview of the burden of NCDs globally, as well as in sub-Saharan Africa and in Kenya. Barriers to an appropriate response to the growing epidemic were also presented, with a discussion focused on the potential role of leadership in the NCD response. This quantitative correlational study investigated any conjectured relationship between leadership practices and county NCD readiness. The study's purpose, theoretical framework, research questions, hypothesis, scope, and limitations were introduced in this chapter. Chapter 2 presents a review of relevant peer-reviewed literature that relates to this topic.

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Chapter 2: Literature Review

Introduction

NCDs result in over 36 million deaths annually, representing 63% of all deaths globally. NCDs also result in 52% of premature mortality, which refers to deaths occurring before 70 years of age. Out of all premature deaths caused by NCDs, 75% are from cardiovascular diseases, cancers, diabetes, and chronic respiratory diseases (WHO, 2016). These diseases are largely preventable; when uncontrolled, they result in morbidity, mortality, economic loss, and poverty. For example, NCDs result in 28 times more mortality compared to human immunodeficiency virus (HIV)-related deaths (Allen, 2017). The resultant global economic burden is projected to double to $13 trillion from the 2010 baseline, with a 0.5% drop in gross domestic product for each 10% increase in prevalence (Atun et al., 2013). This realization has prompted the global community to act.

The United Nations (UN) is leading the global response to this growing epidemic. The UN galvanized world leaders to make a political declaration on NCDs at the general assembly in 2011 (Schmidt & Barnhill, 2015). Through the WHO, countries committed to reduce premature mortality from NCDs by 25% by 2025 (Norheim et al., 2015). Another first was the inclusion of NCDs in the global agenda as part of sustainable development goals (SDGs), with targets to reduce NCD mortality and NCD-related risk factors by the year 2030 (Ralston, Reddy, Fuster, & Narula, 2016). Approaches to achieve these targets are likely to be varied because the burden of NCDs varies by region and country.

Low-and middle-income countries bear the greatest mortality burden, contributing 86% of all NCD-related premature deaths (WHO, 2014). In these countries, premature mortality from NCDs is 1.5 times more likely than it is in high-income countries (Allen et al., 2017). In some countries, this represents a dual burden of disease. For example, countries in sub-Saharan Africa (SSA) are experiencing an epidemiological transition with a growing burden of NCDs over and above the burden of communicable diseases such as HIV/AIDS, tuberculosis, and malaria (Ebrahim et al., 2013). By geographic location, 48 countries in eastern, western, central, and southern Africa are considered part of SSA. In SSA, NCDs were estimated to contribute a third of disability-adjusted life years, yet in these countries, health-system-capacity gaps exist (Ebrahim et al., 2013; Geldsetzer, Ortblad, & Bärnighausen, 2016).

Disability-adjusted life years (DALYs), used as a public health metric, quantify the loss of healthy life expressed in years because of illness as well as mortality occurring before a referenced life expectancy (Devleesschauwer et al., 2014). This figure is calculated as a sum of years an individual lives with disability from a disease and years of life lost resulting from premature mortality. Using DALY therefore quantifies the public health burden of disease. At a population level, diseases representing a higher burden account for more DALYs than others (Devleesschauwer et al., 2014). These outcomes therefore indicate the urgency required for appropriate responses from the affected countries.

Kenya is among countries in SSA that have adopted global recommendations to respond to the NCD burden. The response of Kenyan leaders has included the

establishment of a division of NCDs within the MOH to develop required policies. In 2015, the division led the development of the first NCD strategic plan (Vedanthan et al., 2015). In the same year, the division conducted the first national survey to identify risk factors predisposing adults aged 18 to 69 years to NCDs (MOH, 2015). Effective leadership is a priority in NCD response success. The problem is that little is known regarding the effectiveness of leadership in the NCD response at the county level. This study was designed to investigate the relationship, if any, between county leadership practices and NCD readiness in Kenya.

Literature Search Strategy

This section presents the approach used in searching for literature relevant to the study. The search focused on available literature relating to leadership and health outcomes, particularly related to NCDs. Databases used included EBSCO Host, PubMed, Med-Line with Full Text, and CINAHL, as well as academic books and WHO publications. Scholarly peer-reviewed articles were selected based on the specific requirements of the study. Articles were drawn from journals including *Lancet*, *PLoS Medicine*, *BMC Medicine*, *BMC Public Health*, *BMC Research Notes*, *BMC Health Services Research*, *International Journal of Health Policy and Management*, and *Leadership Quarterly*.

The scope of the search included current literature published between 2012 and 2017. Seminal literature published more than 10 years prior was also included, particularly relating to the theoretical foundation of the study. Table 1 provides a summary of the literature search approach used.

Table 1

Summary of Literature Search Terms and Databases

Topic	Search terms	Databases and journals	Selected references
Definitions of leadership	Leadership	Literature search using the Walden University library	19
Leadership and health	Leadership, health outcomes, health system building blocks	EBSCO Host, PubMed Medline with full text	12
Leadership theories	Trait theory, situational approach, leader-member exchange, transformational, authentic, servant	CINAHL with full text Google Scholar	6
Noncommunicable disease burden	Noncommunicable diseases, global burden, sub-Saharan Africa, Kenya, cardiovascular diseases, cancer, diabetes mellitus, chronic obstructive pulmonary disease	Centers for Disease Control and Prevention (CDC)	34
Decentralization	Decentralization, devolution, health services		7

Understanding the Burden of Disease in Kenya

Kenya, located in East Africa, is classified as a lower middle-income country. In 2015, the estimated population was 46.05 million, with 6 out of every 10 citizens living in rural areas and with the poverty level estimated at 45.9%. The life expectancy in 2014 was 61.58 years, which represented an improvement over two decades (World Bank, n.d.). Kenya has a devolved system of government, with a national government and forty seven semiautonomous and decentralized county governments (National Council for Law Reporting, 2010).

Half of health services in Kenya are provided by the public health system, while the other half are performed by private providers. Health services in the public sector are organized into four tiers, namely, community services, primary health care, county referral services, and national referral services. Except for national referral services, the other three tiers are managed by the subnational and decentralized county governments (Barasa, Maina, & Ravishankar, 2017). This system therefore vests health service delivery primarily at the county level.

Understanding the burden of disease nationally and at the county level has several limitations in Kenya. According to the Kenya National Bureau of Statistics (KNBS, 2016), the coverage rate for registration of deaths was only 45.2% at the county level in 2015. As shown in Table 2, coverage ranged from the highest at 80.4% in Embu County to the lowest at 5.1% in Mandera County, limiting the understanding of overall mortality (KNBS, 2016).

Table 2

Death Registration Coverage by County by Percentage, 2013 to 2015

County	Year		
	2013	2014	2015
		Top three	
Embu	75.4	74.7	80.4
Nairobi City	80.1	77.6	73.6
Vihiga	47.2	42.4	63.5
		Bottom three	
West Pokot	11.8	14.2	13.6
Wajir	12.2	12.5	8.4
Mandera	3.1	7.5	5.1

Note. Data from the Civil Registration Services.

Mortality data relating to NCDs are not optimally reported. While the Civil Registration Services collect data on causes of mortality, only two of the four major NCDs are reported (KNBS, 2016). Aggregate mortality data on cancer and heart disease are available; however, these data are not disaggregated by county, limiting the quantification of the burden of NCDs at county level. This means that available estimates of NCDs are based on national-level data.

Noncommunicable Diseases in Kenya

In 2015, NCDs resulted in 105,900 deaths in Kenya (WHO, 2016). This estimate represented an increase from 2012, when NCDs contributed 27% of the 369,000 deaths in Kenya (WHO, 2014). The most prevalent NCDs included cardiovascular diseases, cancers, diabetes, and chronic obstructive pulmonary disease, which contributed 50% of all hospital admissions (Some et al., 2016).

Out of all deaths in Kenya, proportional mortality from the four main NCDs increased from 2010 to 2015—cardiovascular disease from 8.2% to 9.5%, cancers from 7.5% to 9.9%, diabetes from 0.97% to 1.17%, and chronic respiratory diseases from 1.52% to 1.7%—suggesting a growing epidemic. Mortality data, however, are limited to national-level aggregates because NCD data are not yet routinely collected at the county level. Table 3 provides a summary of NCD mortality data in Kenya. Importantly, NCDs resulted in an 18% probability of premature mortality among those aged between 30 to 70 years in 2012 (WHO, 2014). Without intervention, the proportion of premature mortality from NCDs could increase.

Table 3

NCD-Related Mortality in Kenya

Disease	Year			
	2010		2015	
	Total	Percentage (%)	Total	Percentage (%)
Cardiovascular disease	27,000	8.2	30,100	9.5
Cancers	24,600	7.5	31,300	9.9
Diabetes	3,200	0.97	3,700	1.17
Chronic respiratory diseases	5,000	1.52	5,400	1.7

Note. Total deaths in Kenya were 328,000 in 2010 and 317,200 in 2015 based on WHO global health estimates data.

NCDs could affect Kenya's economic development. In 2015, NCDs accounted for 6.54 million DALYs. The greater portion of DALYs was from adults aged between 30 and 49 years (1.5 million DALYs), followed by those aged 15 to 29 years (1.2 million DALYs; WHO, 2016). These two groups represent the most productive age groups, pointing to the potential impact of NCDs on Kenya's economic development, and the need for prioritization of NCD services at the leadership level.

There is, however, limited literature on the specific economic burden of NCDs in Kenya. One unpublished dissertation study suggested that household incomes were impacted by NCDs more than by other diseases. Households that had an individual with NCDs were 51% more likely to incur catastrophic health expenditures compared to those

with an individual with a communicable disease (Mwai, 2014). Out-of-pocket health expenditure is considered catastrophic when it exceeds 40% of annual nonfood expenditure (Barasa et al., 2017). As a result, where there were NCDs, the odds of household impoverishment increased by 48% (Mwai, 2014). It is therefore important to understand the burden of the four most common NCDs and associated risk factors in Kenya.

Cardiovascular Diseases in Kenya

In 2015, cardiovascular diseases resulted in 30,100 deaths in Kenya. Two thirds (67%) of these deaths resulted from atherosclerotic cardiovascular disease, such as stroke and ischemic heart disease. Hypertension, which is a risk factor for cardiovascular complications, was a factor in 12% of these deaths, while the rest resulted from nonatherosclerotic cardiovascular disease, including rheumatic heart disease (WHO, 2016). Behavioral and biochemical risk factors prevalent among adults fuel cardiovascular disease in Kenya.

Such risk factors include smoking and raised blood pressure. Raised blood pressure or *hypertension* is defined as systolic blood pressure of 140mmHg or higher or diastolic blood pressure of 90mmHg or higher (Non-Communicable Disease Risk Factor Collaboration [NCD-RisC], 2017). Blood pressure is affected by several factors throughout the course of life. Fetal and early childhood nutrition, sodium and potassium levels in the diet, and behavioral factors such as smoking, alcohol consumption, and physical activity have an impact on blood pressure levels. In addition, environmental

factors such as air pollution, lead pollution, and psychosocial stress affect blood pressure (NCD-RisC, 2017).

In Kenya, the prevalence of smoking is 13% overall and is higher among men at 23%. Among smokers, 8% smoke an average of seven cigarette sticks per day. High dietary salt intake is prevalent in 23.2% of the population (MOH, 2015). Whereas such risk factors are prevalent, evaluation of raised blood pressure is nonroutine, with more than half of adults (56%) never receiving a blood pressure assessment. Among those assessed and diagnosed with hypertension, only 23.3% take antihypertensive medications (MOH, 2015).

Another risk factor is being overweight or obese. Measured using body mass index, overweight is defined as a height and weight score above 25kg/m2, and obesity includes scores above 30kg/m2. Obesity scores between 30 and 35kg/m2 define Class 1 obesity, and scores between 35 and 40kg/m2 and above 40kg/m2 define Class 2 and 3 obesity, respectively (Müller, Braun, Enderle, & Bosy-Westphal, 2016). In Kenya, 1 in 4 adults is either overweight or obese. Obesity is more prevalent in women and among those living in urban areas (MOH, 2015).

Low levels of physical activity constitute another behavioral risk factor. Physical activity is considered low when there is less than 150 minutes of moderately intense activity per week, or less than 75 minutes of vigorously intensive physical activity per week (MOH, 2015). The majority of Kenyans achieve the recommended levels of physical activity through work-related activities involving physical labor. However, 6.5% do not engage in the recommended levels of physical activity (MOH, 2015).

One in every four adult Kenyan aged between 45 and 69 years had at least three risk factors for cardiovascular disease. Limited access to prevention and treatment services increases the likelihood of developing disease and its sequelae. Lack of such interventions would be costly requiring an estimated US$ 3,205 per person to achieve blood pressure control (Oti et al., 2016). Yet, intervening early through prevention interventions could reduce costs to US$ 1 per person in the community and avert 248 – 391 DALYs (van de Vijver et al., 2013). Therefore, understanding county level readiness for the NCD response would be an important leadership issue.

Cancers in Kenya

Cancers resulted in 31,300 deaths in Kenya in 2015. An estimated 84% of the cancer related deaths were from malignant neoplasms (WHO, 2016). In 2015, esophageal cancer had the highest mortality of the malignant neoplasms at 11.5% followed by cervical and breast cancer at 8.6% and 7.7% respectively (WHO, 2016). Overall, mortality from the common cancers increased between 2010 and 2015, with marginal changes in proportional mortality in the two years as shown on Table 4. Among women, breast and cervical cancer were most prevalent at 34 and 25 per 100,000 population respectively, while among men, the most prevalent cancers were esophageal, prostate, and Kaposis sarcoma at 17.2, 15.2 and 9.2 per 100,000 population respectively (MOH, 2015).

Table 4

Cancer-Related Deaths in Kenya (Above 1,000)

Cancer	Year 2010 total	Percentage (%)	2015 Total	Percentage (%)
Esophagus	2,800	11.4	3,600	11.5
Cervix	2,200	8.9	2,700	8.6
Prostate	1,900	7.7	2,300	7.3
Breast	1,700	7	2,400	7.7
Stomach	1,600	6.5	1,900	6.1
Lymphomas, multiple myeloma	1,400	5.7	1,700	5.4
Mouth and oropharynx	1,200	4.9	1,600	5.1
Colon and rectum	1,100	4.5	1,500	4.8
Leukemia	1,000	4.1	1,200	3.8
Liver	1,000	4.1	1,200	3.8

Note. Cancer-related deaths were 24,600 in 2010 and 31,300 in 2015.

While it is possible to get an idea of the cancer situation in Kenya using such data, systemic gaps limit an understanding the full picture. For example, Kenya only has three population-based cancer registries in Nairobi, Kisumu, and Eldoret towns (Topazian et al., 2016). As a result, cancer records are limited to the capital city Nairobi and its environs and western Kenya. The registries also lack full-time staff limiting their operations. Hospital-based cancer registries do not exist and there is no central data center to collate all cancer data (Topazian et al., 2016). Yet, there is increasing need for cancer services in Kenya.

Kenyans were exposed to various risk factors that predispose the population to cancers. These include genetic predispositions, environmental exposure to carcinogens such as asbestos, aflatoxins and infections (MOH, 2015). Examples of infections that predispose to cancer include Human papilloma virus (HPV) infection resulting in cervical cancer, hepatocellular carcinoma from hepatitis B and C infection, Helicobacter pylori (H pylori) infection causing stomach cancer and HIV infection increasing the risk of Kaposis Sarcoma (MOH, 2015).

Human papilloma virus (HPV) infection has an established etiological association with the development of cervical intraepithelial neoplasms (CIN). High risk genotypes of HPV are prevalent among subpopulations such as sex workers in Kenya (Menon, van den Broeck, Rossi, Ogbe, & Mabeya, 2017). Hepatitis B infection, which is etiologically associated with hepatocellular carcinoma has an 8% prevalence in Kenya with high positivity rates reported in western Kenya, Mombasa, and Nairobi cities (Ochwoto et al.,

2016). Access to treatment services for these infections could promote NCD control efforts in Kenya.

Access to cancer prevention and treatment services is limited. Only one public hospital in Kenya has radiotherapy resources for cancer treatment (Topazian et al., 2016). This limitation means that only 1,800 cancer patients can access radiotherapy services each year (Malloy et al., 2017). Oncology specialists are too few to serve the country's population. For example, in 2012, there were only four medical oncologists, four radiation oncologists, and three oncology nurses in the country (Topazian et al., 2016).

Financial barriers also affect access to care. Patients would have to pay between US$ 100 and 300 to access computerized tomography (CT) scans and magnetic resonance imaging (MRI) for diagnosis, and up to US$ 300 per course of chemotherapy. Accessing these services would be more costly at private hospitals, which charge up to US$ 800 per week per bed (Topazian et al., 2016). Understanding and addressing these issues presents important leadership challenges for the cancer response.

Diabetes Mellitus in Kenya

In 2015, 3,700 Kenyans died as a result of diabetes mellitus, up from the 2010 figure of 3,200 (WHO, 2016). The MOH reported a growing burden of diabetes driven by demographic and lifestyle changes including an aging population, consumption of unhealthy diets, physical inactivity, and alcohol consumption (MOH, 2015). The prevalence of diabetes mellitus is estimated to range from 4.2% to 5.3% in studies conducted at both rural and urban settings in Kenya with limited access to prevention and care services (Ayah et al., 2013; Sokwalla et al., 2017). By 2030 the prevalence of

diabetes is projected to increase to 6.3% with an estimated 1,683,000 cases (Whiting, Guariguata, Weil, & Shaw, 2011).

According to the International Diabetes Federation (IDF), Kenya had 749,250 diabetes cases among adults aged between 20 and 79 years in 2013. From this number three out of every four individuals had not been diagnosed (IDF, 2014). As shown in Table 5, the prevalence of diabetes was higher in urban areas. The prevalence of impaired glucose tolerance was also higher in urban areas and among females (Christensen et al., 2009). Impaired glucose tolerance is characterized by blood glucose levels above 7.8 millimoles per liter but below 11.1 millimoles per liter two hours following an oral glucose tolerance test. Up to 70% of those with impaired glucose tolerance could develop diabetes (Christensen et al., 2009).

Table 5

Age-Adjusted Prevalence of Diabetes and Impaired Glucose Tolerance

Residence and gender	Prevalence (%)	
	Diabetes	Impaired glucose tolerance
Male	4.5	6.1
Female	4.2	13.1
Urban	12.2	13.2
Rural	2.2	8.6

Note. Prevalence data from cross-sectional surveys.

Diabetes prevention and care is however limited by gaps in access to prevention and treatment services. Lack of access to diagnostic and screening tools for diabetes contributes to late diagnosis and eventually the development of complications (Hall, Thomsen, Henriksen, & Lohse, 2011). Poorly managed diabetes could result in end-organ complications such as neuropathy, foot ulcers, retinopathy, microalbuminuria, and coronary heart disease. For example, previous studies demonstrated a 7 to 22% prevalence of retinopathy among diabetes patients in hospital outpatient settings. In the same setting, microalbuminuria occurred as a complication in one out of every four diabetic patients (Hall et al., 2011).

In settings where patients could access diabetes care and prevention services, glycemic control was suboptimal with less than 20% achieving control. Despite attending regular clinic appointments, there were reports of stock outs of medicines and poor adherence to medication by patients (Mwavua, Ndungu, Mutai & Joshi, 2016). Findings from the 2015 stepwise survey indicated that 40.1% of diabetic patients were nonadherent to their medication, increasing the risk of poor glycemic control and long-term sequelae of uncontrolled diabetes (MOH, 2015).

Diabetes is an expensive disease to treat especially when poorly managed. The direct cost of treating one person was estimated to range from US$2,302 to US$3,207 based on data from African countries (Hall et al., 2011). There is no recent Kenyan costing data for diabetes treatment. According to the IDF, African countries spend only US$111 per person for diabetes treatment, suggesting inadequate funding for the management of patients (Hall et al., 2011). These findings suggest the need to prioritize

diabetes care and control especially at the service delivery level to minimize the additional expenses arising from the management of complications.

Chronic Obstructive Pulmonary Disease

In Kenya, chronic obstructive pulmonary disease (COPD) resulted in 61% of all respiratory disease related mortality in 2015 (WHO, 2016). In the same year, DALYs from COPD exceeded those of ischemic stroke and hypertensive heart disease at 106,800, 96,600 and 96,300 respectively, indicating the need for investment in diagnosis and treatment (WHO, 2016). This life-threatening condition has been underdiagnosed in Kenya.

According to the Global Initiative for Chronic Obstructive Lung Disease, COPD presents as persistent obstruction of the airways occurring progressively as a result of chronic inflammation of the lungs and airways (Nturibi, Kunda, & Kamau, 2016). The risk of COPD increases where there is exposure to tobacco smoking. Whereas there is an 8% prevalence of daily tobacco smokers in Kenya, the rate of exposure to second-hand smoke at work and at home is even higher at 20.9% and 24% respectively (MOH, 2015).

Air pollution also increases the risk of COPD. Prevention of COPD would include measures to reduce household air pollution from the use of solid fuels like biomass or charcoal for cooking and heating. Such measures would particularly benefit women, who are 37% more likely to get COPD compared to men (Pinkerton et al., 2015). Checkley et al. (2014) also argued that the management of COPD using inhaled bronchodilators would present a cost-effective approach to the reduction of COPD-related DALYs in low and middle income countries (LMIC) such as Kenya.

There is however, limited literature on COPD in Kenya. A recent review of literature on COPD based in Kenya did not reveal any relevant articles relating to the epidemiology of the disease (Nturibi et al., 2016). However, there was literature relating to the sequelae of COPD in Kenya. Langat et al. (2014) argued that COPD was a causal factor for isolated right heart failure among adult women in western Kenya. Such comorbidities contribute to the severity of disease and risk of mortality (Nturibi et al., 2016).

In summary, NCDs are prevalent in Kenya. The burden of the four most prevalent NCDs namely, cardiovascular diseases, cancers, diabetes mellitus, and chronic obstructive pulmonary disease is increasing in the country. These four NCDs result in morbidity and mortality affecting the most productive age groups among adults. These NCDs are however preventable and controllable, and this study could present evidence on the role of leadership, if any, in the NCD response.

Leadership has been an evolving concept. Earlier concepts of leadership were based on actions and styles portrayed by leaders. In the early twentieth century leadership was explained on the basis of the heroic actions of leaders as depicted in Thomas Carlyle's Great Man Theory (Northouse, 2016). The trait approach is among the earlier concepts of leadership.

The Trait Approach to Leadership

Francis Galton in 1869 advanced arguments on the role of traits in leadership. Through his book titled hereditary genius, leadership was considered unique to certain extraordinary individuals. Leaders were considered to have unique attributes that were

naturally endowed and could be inherited through genes (Galton, 1869). These arguments guided leadership research in the early twentieth century (Zaccaro, 2007).

Arguments against the trait approach emerged in the 1940s (Zaccaro, 2007). Strogdill (1948) questioned the existence of specific traits that would differentiate leaders from non-leaders across different situations. Other researchers also demonstrated that the use of traits was insufficient to explain leadership and the effectiveness of leadership (Lord, De Vader & Alliger, 1986; Mann, 1959). These arguments limited the use of the trait approach to explain leadership effectiveness. However, recent leadership theories have relied on individual traits to explain leadership effectiveness.

Transformational and Charismatic Leadership

Transformational and charismatic leadership theories focus on the importance of symbolic behavior of leaders and their values. Through the example of leaders, followers would be motivated to achieve more, even in difficult situations (Yukl, 1999). Described by Bernard Bass, Transformational leadership theory focused on the effect of leaders and their adoption of behaviors that elicit trust, admiration, respect and motivation of followers to exceed expectations (Bass, 1995). Leaders would be evaluated across four domains on their idealized influence, intellectual stimulation, inspirational motivation and individual consideration (Olu-Abiodun & Abiodun, 2017).

Charismatic leadership by Max Weber described the attribution of extraordinary qualities to leaders by their followers (Weber, 1947). Through these qualities, leaders influence their followers by developing specific leader-follower relationships (Yukl, 1999). Establishing a charismatic relationship between the leader and followers emerges

from the leader being perceived as a role model, which enables followers to internalize and adopt their vision, mission and values (Gebert, Heinitz, & Buengeler, 2016).

Situational Leadership and Path-Goal Theory

Leadership has also been conceptualized based on the followers and the context. The Situational Approach defined by Hersey and Blanchard provided a prescriptive approach defining leadership based on the adaptability to various situations (Northouse, 2016). The theory was based on the 3-D management style theory, with a premise that different situations would require different leadership approaches (Hersey & Blanchard, 1969). The leader would adopt a relationship or task-focused approach based on the level of maturity of the follower (Thompson & Vecchio, 2009).

The Path-Goal Theory described in the early 1970s as a contingency approach to leadership, focused on the need to motivate followers to ensure their productivity and satisfaction. Described by House and Mitchell (1974) the theory focused on the motivating role of reward and clarity of the path to the attainment of goals. Making the path to attainment of defined goals clear could be achieved through coaching, providing direction, and removing obstacles to motivate followers (House & Mitchell, 1974).

Leader-Member Exchange Theory

Understanding the specific interactions between leaders and followers has also been used to understand leadership. Through the Leader-Member Exchange Theory, leadership was viewed as a process with a focus on the dyadic relationships between leaders and followers (Northouse, 2016). Leadership emerged from the quality of the dyadic exchange. Where the exchange is considered of high quality, it would be

characterized by mutual respect and trust (Erdogan & Bauer, 2014). This theory therefore emphasizes on the quality of the exchange between leaders and their followers.

Servant Leadership and Authentic Leadership Theory

Following seminal work by Robert Greenleaf, Servant leadership was described based on the focus on the leader's attention to the needs of followers and efforts to empower them to achieve their potential (Greenleaf, 1970). Servant leadership described the paradox of a leader's desire to serve others first. This theory focuses on the need for leaders to pay attention to their followers' desires, goals and abilities to enable them achieve their potential. The theory emphasizes integrity and the leader's influence goes beyond the organization to the community (Liden, Wayne, Zhao, & Henderson, 2008).

Authentic leadership theory conceptualized leadership based on morality, transparency, and values. This approach to leadership was conceptualized by Bill George (George, 2003). Authentic leadership was argued to enhance followership. Leaders are considered authentic based on their championing the collective interests of their followers (Steffens, Mols, Haslam, & Okimoto, 2016).

All these concepts of leadership describe the foundational basis of leadership. Leadership through the characteristics or actions of leaders, influences followers and outcomes. These concepts therefore suggest the likely influential role of leadership in various settings including health care.

Leadership and Health Outcomes

Leadership is an essential building block of the health system. While leadership is included as one of six building blocks of the health system as described by the WHO, it

has been argued to best fit at the core of the health system (Mounier-Jack, Griffiths, Closser, Burchett, & Marchal, 2014). Leadership has a role in ensuring stewardship, participation and accountability for the delivery of health services (Monroe-Wise et al., 2016). Leadership would also be required to ensure collaboration, innovation, and systems thinking (Weberg, 2012).

Authentic leadership demonstrated by managers increased the likelihood of a trusting work environment, reduced adverse patient outcomes, and increased job satisfaction (Fallatah & Laschinger, 2016; Wong & Giallonardo, 2013). Leadership approaches such as servant leadership have been associated with the empowerment of the patient and provider relationship with a likelihood of lower costs and high-quality care (Trastek, Hamilton, & Niles, 2014). Overall, leadership has been argued to have the important role of defining a vision for the future while guiding action in the present (Curry, Taylor, Chen, & Bradley, 2012).

Leadership has been associated with patient outcomes. Supportive leadership approaches have been associated with a reduction in incidences of medication errors and nosocomial infections. Leadership has also been associated with a higher likelihood of patient satisfaction (Wong, 2015). Patient satisfaction was associated with relational approaches to leadership at acute and home care settings. Family satisfaction with patient care was also positively associated with a task-oriented leadership approach (Wong, 2015). Adverse patient outcomes were also minimized where leadership activities cultivated a greater person-to-job match among nurses, lowering the incidence of adverse

patient outcomes (Wong & Giallonardo, 2013). Leadership was also associated with a 13% improvement in average service coverage rates (La Rue et al., 2012).

Leadership has also been associated with patient mortality. Thirty-day mortality rates were lower in settings where nurse leadership demonstrated high resonant leadership activities that focus on an affiliative, coaching, and democratic approach (Cummings, Midodzi, Wong, and Estabrooks, 2010). Patient mortality was also lower in settings with transformational leaders. Such leaders fostered an environment that increased staff satisfaction leading to retention of high performing staff (Wong, 2015). Through retention of such staff, the risk of patient mortality reduced.

The role of leadership for health services has also been reviewed in the context of countries in Sub Saharan Africa (SSA). Providing leadership training targeting health care professionals in Africa has been noted to have the potential to impact performance and institutional capacity (Monroe-Wise et al., 2016). In Kenya, uptake of services at health facility level was improved and sustained following a leadership development program targeting health workers (La Rue et al., 2012). Relational aspects of leaders particularly regarding conflict management, accountability, and responsiveness were notable as important to the success of leadership in health care settings in SSA (Curry et al., 2012).

Overall, these findings point to the role of leadership in the health sector. Leadership styles and activities influenced the achievement of various outcomes that were important to the health sector. Since leadership for health service delivery was decentralized to county governments in Kenya, it would be necessary to understand the

influence of leadership at these decentralized levels on the achievement of health outcomes in Kenya.

Decentralized Health Services

In 2010, Kenya promulgated a new constitution that decentralized authority to 47 subnational county governments. Decentralization involved the delegation of political, fiscal and administrative responsibilities to the county level with the aim of promoting efficiency, equity, and accountability of public services (Samadi, Keshtkaran, Kavosi & Vahedi, 2013). One of the decentralized public services was the delivery of health services. Through the fourth schedule of the new constitution, the national government retained policy development and referral functions, while county governments were allocated health service delivery functions (Wakaba et al., 2014).

Implementing shared governance through decentralization could have benefits to the health system. Decentralization could broaden the decision space at local levels. This would facilitate decision-making, flexibility to respond based on local needs and improved productivity (Panda & Thakur, 2016; Samadi et al., 2013). Whereas decentralization would offer some advantages over centralized systems, it could result in inequity in the delivery of health services (Oleribe, Oladipo, Ezieme, Crossey, & Taylor-Robinson, 2016). There should therefore be a focus on evaluating the effects of decentralization at health facility and patient-level (Panda & Thakur, 2016). This study proposes to investigate any relationship between leadership practices at county level and desired health outcomes relating to NCD services.

Theoretical Framework

The theoretical foundation for this study was Robert J. House's Path-Goal Theory. Developed in 1971, the Path-Goal Theory was formulated as a dyadic theory of supervision (House, 1996). This theory sought to explain the relationship between leaders and subordinates and how leadership behavior affects motivation, satisfaction and performance (House, 1971). Leadership effectiveness is an important paradigm in this theory with a focus on task and person oriented supervisory behavior.

House and Mitchell (1974) later advanced the motivational role of leadership posited by the theory. This version emphasized coaching, guidance, and the reward role of leadership to ensure performance by subordinates. Leadership included providing cognitive clarifications to ensure attainment of goals. In addition, leaders had the responsibility of providing any necessary support, resources, and incremental information over and above what may be in the work environment of subordinates to ensure satisfaction and performance (House, 1996).

Based on this theory, leadership would be expressed through four key behaviors. First is directive behavior. Directive behavior would be demonstrated through planning, scheduling and clarifying policies and procedures. Such actions would minimize role ambiguity and define successful performance and reward (House & Mitchell, 1974). Directive behavior would therefore provide structure, standards, and performance expectations to followers. Second is supportive behavior. Leaders would demonstrate supportive behavior through portraying concern for their subordinates' needs and well-

being. Supportive leaders would also respect their followers, treat them as equals and remain approachable towards them (House & Mitchell, 1974).

The third is participative behavior. Participative behavior would encourage subordinate influence in decision-making. Subordinates would also be treated as team members including providing feedback to inform decision-making. Embracing a participative approach would also promote creative thinking (Vandegrift & Matusitz, 2011). Fourth is achievement-oriented behavior. Achievement-oriented behavior would promote a culture of excellence (House & Mitchell, 1974). Leaders would achieve this through setting challenging goals and demonstrating confidence in their followers to achieve set goals. Setting challenging goals would also increase follower interest in their tasks (Vandegrift & Matusitz, 2011).

Another theory was Robert Heifetz's Adaptive leadership theory. Heifetz (1994) conceptualized this theory as derived from the concept of biological evolution. The theory focused on changes in the environment and the adaptations required to respond to such changes. The theory considers changes or challenges as occurring in two broad areas, primarily being technical or adaptive in nature (Bailey, 2012).

Technical challenges are viewed as prescriptive. These challenges would generally be clearly defined, and with known solutions. Such solutions could be implemented by experts through set rules and procedures (Bailey, 2012). However, adaptive challenges represented problems that may not be easily identified. Such challenges would require the implementation of changes in perceptions, attitudes, and

behaviors to solve problems. Such changes would affect the normal operations of organizations and would often be resisted (Bailey, 2012).

The responsibility of leadership would therefore include defining the challenge as either technical or adaptive. Technical challenges would then be addressed based on the leader's authority. However adaptive challenges, would require the leader to focus on actions that would enable an adaptive process beyond the normal working conditions that would create the desired change (Northouse, 2016).

Independent Variables for the Study

The independent variable in this study was leadership practices. The path-goal theory supported two sets of the independent variable. The leadership practices measured in the Kenya service availability and readiness assessment included planning activities at facility level, annual work plans and therapeutic committees. These practices were supported by the directive leadership behaviors defined in the path-goal theory (Vandegrift & Matusitz, 2011).

Planning activities provide an opportunity for leaders to explain how tasks should be performed. Such directive leadership practices would clarify roles and define the pathway for future rewards (Vandegrift & Matusitz, 2011). Directive leadership practices would also enhance the understanding of assignments, and enhance ownership of set goals particularly by less experienced followers (Vandegrift & Matusitz, 2011).

Supportive leadership behaviors was also demonstrated through independent variables relating to supportive supervision activities at health facilities as measured in the assessment. Supportive leadership practices demonstrate the leader's concern for the

welfare of followers (House & Mitchell, 1974). This would be particularly useful for follower or subordinates performing tasks that would be considered stressful and uninteresting. Supportive leadership practices would therefore enhance togetherness and appreciation among subordinates (Vandegrift & Matusitz, 2011). These behaviors are similar to the ones evaluated in this study.

Dependent Variable for the Study

The dependent variable in this study was county readiness for NCD services. Adaptive leadership theory was used to provide the foundational explanations for the outcomes of the study. Leaders would be required to understand and respond to both technical and adaptive challenges to achieve desired outcomes. Adaptive leadership theory has also been used to enhance understanding and explain health care interventions for the management of chronic illnesses such as NCDs (Anderson et al., 2015). This theory was therefore be used to explain the outcomes of this study.

Summary

Noncommunicable diseases are a cause of global concern. The World Health Organization (2016) presented evidence of the predominant burden of cardiovascular diseases, diabetes, cancers and chronic respiratory diseases. Sub-Saharan African countries with weaker health systems bore the greatest NCD burden (Geldsetzer et al., 2016; WHO, 2016). Kenya is among countries with a growing NCD epidemic that is uncontrolled. The ministry of health in Kenya presented evidence of increasing risk factors, morbidity, and mortality from NCDs mostly affecting the productive adult population (MOH, 2015; WHO, 2016).

Mounier-Jack et al. (2014) demonstrated the central role of leadership in health service delivery. Researchers have also demonstrated associations between leadership and the achievement of positive health outcomes (Fallatah & Laschinger, 2016; Wong & Giallonardo, 2013). Further, decentralization of leadership to subnational levels, has been promoted as an approach to improve planning, decision-making, and implementation of health services (Panda & Thakur, 2016; Samadi et al., 2013).

While associations between leadership and health outcomes have been demonstrated in general, little is known of any associations with NCD-specific service outcomes. This is particularly the case in Kenya, where there is a paucity of such literature. In addition, little is known of decentralized county-level leadership and any associations with the NCD outcomes at subnational settings such as counties in Kenya. Therefore, this review provided justification for this study to contribute literature specific to these gaps.

Chapter 3: Research Method

Introduction

The purpose of this quantitative correlational study was to investigate the relationship between county-level leadership practices and readiness for NCD services. In Chapter 3, I discuss the research design and the rationale for the design. Details of the methodology such as the study population, sampling, and sampling procedures are discussed. This chapter also includes a description of the procedures used for recruitment, participation, and data collection for the secondary data used in this study. Instrumentation and operationalization of constructs, threats to validity, and ethical procedures are discussed. A summary concludes the chapter.

Research Design and Rationale

Research Design

This study was a quantitative correlational study. Quantitative research uses numerical data to investigate the relationship between variables. Variables are measured using instruments to determine numerical values that, in turn, are analyzed using statistical procedures (Creswell, 2009). Selecting this approach was in line with other leadership research, which commonly uses quantitative methods (Day, Fleenor, Atwater, Sturm, & McKee, 2014).

The correlational design is appropriate when investigating the conjectured relationship between independent and dependent variables. The correlational design is appropriate for determining a statistical relationship between two or more variables, which was the focus of this study. Using this design, it is also possible to determine the

direction and magnitude of any relationship as well as identify predictive relationships, which is consistent with the second research question in this study (Field, 2013).

Variables

The independent variable for this study was leadership practices. Specific practices to be evaluated included annual work planning, therapeutic committee meetings, and supportive supervision visits by health leaders. These were also the predictor variables in the study. The dependent variable was county NCD Readiness Index scores. The county-level NCD readiness scores from the SARA survey were used for this variable.

County NCD Readiness Index scores from the SARA survey were determined through an assessment of the availability of tracer elements that would be essential for providing NCD services, including diagnostic capacity, functioning equipment, availability of specific essential medicines, and relevant guidelines (MOH, 2013; O'Neill et al., 2013). Service-specific readiness scores have been used in literature as indicators of health-facility capacity to provide various essential health services (O'Neill et al., 2013; Peck et al., 2014; Speigel et al., 2017).

There were no anticipated time or resource constraints with the use of this study design. Secondary data were used for this study. With the use of the secondary dataset, time and resource requirements for activities such as recruitment of participants and data collection were not applicable.

Methodology

In this methodology section, I discuss the population of the study, as well as sampling and data collection processes for the study.

Population

The target population for this study included the county departments of health in Kenya. Kenya has 47 county departments of health, and all were included in this study. Since 2010, Kenya has transitioned to a devolved system of government that created 47 semi-autonomous units called *counties*. Each county has the responsibility of health service delivery through a department of health; thus, the counties were an appropriate finite population for this study (Barasa, Cleary, Molyneaux, & English, 2017). This study included all of the possible sampling units representative of the population, which enabled generalization of the study findings (Frankfort-Nachmias & Nachmias, 2015).

Sampling and Sampling Procedures

The sampling strategy for this study was nonprobability sampling. Nonprobability sampling was used because of the small study population. The specific sampling design for this study was purposive sampling. Using this sampling design, sampling units were not selected based on predetermined parameters; rather, because of the small study population, all units were included in the sample. Selecting this sampling design did not present any disadvantages in cost and time (Frankfort-Nachmias & Nachmias, 2015).

Snowball and quota sampling designs were not considered appropriate for this study. Snowball designs are suitable when targeting hard-to-reach or hidden populations, which was not the case in this study. Quota sampling design would also not have been

appropriate because there was no requirement for proportional representation of sampling units within the population (Frankfort-Nachmias & Nachmias, 2015).

Probability sampling designs such as random and stratified sampling would not have been appropriate for this study. This is because there would have been no requirement to define the likelihood of drawing a sample from the population in this study (Frankfort-Nachmias & Nachmias, 2015). The county was the sampling unit for this study, with the inclusion of all 47 counties in the sample.

Power Analysis and Sample Size Estimation

The required sample size was calculated using G*Power software. Using the software, *F*-test was selected, and the multiple linear regression model *R* deviated from zero option was selected (Green & Salkind, 2014). The selected a priori power level was 80% with an alpha level of .05 and three predictor variables. Using the determine function, the calculated effect size was 1.0. The calculated sample size indicated that there would be an 80% chance of rejecting the null hypothesis with a total sample size of 16 participants. This study included all 47 counties in the sample.

Procedures for Archival/Secondary Data

Recruitment Procedures

All health facilities and their leaders within all 47 counties were recruited for the SARA survey. The health facilities included publicly owned and privately owned health facilities operating within each county (MOH, 2013). Recruitment of health facilities was based on an existing master health facility list. The master facility list is considered an essential public health tool that contains facility identification information, including the

name, address, and geolocation codes of all public, private for-profit, private non-profit, and faith-based health facilities. Listed health facilities include hospitals, dispensaries, health centers, and clinics. The master facility list also includes information such as staffing, number of hospital beds, and services provided at each facility (Makinde et al., 2014; MOH, 2013; O'Neill et al., 2013).

Participation Procedures

The 2013 SARA was designed to obtain health facility data at the subnational or county level. In order to achieve this objective, the participation of all units in a full census was required (WHO, 2013). All units involved in health services as well as management levels across the sampling frame provided in the master facility list were considered participants in the national census (MOH, 2013).

Data Collection

Secondary data from the SARA survey were used for this study. Data were collected based on zones organized conveniently to ensure coverage across the country. The zones included Nairobi, Central, Eastern North, Eastern South, Coast, Upper Rift, Lower Rift, Nyanza, and Western zones. County-level data included aggregated scores from each health facility contributing to a county-specific composite score (MOH, 2013).

Data collection for SARA was automated using handheld devices containing the Census and Survey Processing System (CSPro) software. Data collection involved interviews with key informants and verification of any available and functioning equipment, supplies, and commodities. The electronic data collection system would

facilitate concurrent data verification by the coordinating team at the national level to minimize errors (MOH, 2013; O'Neill et al., 2013).

Accessing the Data

Conducting the SARA survey involved a collaborative effort between the MOH in Kenya, the WHO, USAID, and the United Kingdom's UK Aid. The primary custodian of all survey data is the MOH. Permission for use of the data was obtained from the Principal Secretary of the MOH in Kenya (MOH, 2013).

Reputability of the Sources

The source of the secondary data used in this study was the most reputable and sole source of subnational data on readiness for NCD services at the county level in Kenya. The data were also collected using a standardized approach developed by the WHO for routine use at national and subnational levels (Speigel et al., 2017). Secondary data from similar SARA surveys have been analyzed and published in various peer-reviewed journals, highlighting the reputation and use of such secondary data in this study (Katende et al., 2015; O'Neill et al., 2013; Speigel et al., 2017).

Instrumentation

The SARA questionnaire was used in the survey. The SARA questionnaire was developed by the WHO in collaboration with USAID in 2008. This questionnaire was developed as an improvement that included best practices from the use of other tools such as the service availability mapping tool and service provision assessment tool developed by WHO and ICF International, respectively (WHO, 2013).

The tool includes questions relating to the readiness of health facilities to provide specific services including NCDs, as well as leadership-specific variables, making it appropriate for answering the research questions in this study (MOH, 2013; Speigel et al., 2017). The SARA questionnaire is a validated tool that has been used in other countries in SSA such as Burkina Faso, United Republic of Tanzania, Zambia, Democratic Republic of Congo, Togo, and Uganda. The tool has also been used in countries outside Africa, such as Haiti and Cambodia (O'Neill et al., 2013; Speigel et al., 2017).

Operationalization

The use of the SARA questionnaire requires a 2- to 4-hour visit to each health facility. During these visits, key informants based at the facilities are interviewed, followed by actual verification of the availability and functionality of equipment, supplies, and commodities required to determine readiness for health services (O'Neill et al., 2013). Scores for each tracer element are weighted equally across the readiness domains, and a mean score for each domain is determined. From the domain scores, a composite readiness index is calculated based on the mean availability scores of tracer items for each domain (O'Neill et al., 2013).

The independent variable included variables measuring availability of annual work plans, quarterly therapeutic committee meetings, and supervision visits from health leaders. The first independent variable measured the availability of the annual work plans for the period 2012 to 2013. The second measured whether quarterly medicine and therapeutics committee meetings were held, and the third measured whether four supervision visits had been held in the past year. These variables collected at the health-

facility level were aggregated to a county-level score presented as a percentage. The independent variables were continuous variables. The dependent variable was the county NCD Readiness Index score presented as a percentage score for each county. The percentage score was derived from aggregating health facility scores to determine the county score. The dependent variable was a continuous variable. Table 6 provides variables from the SARA survey that were used in this study.

Table 6

Variables From the SARA Questionnaire

Variable	Data type
Leadership questions (Independent variables)	
Does this management unit have an annual work plan for the period July 2012 to June 2013? (Question #7002)	Nominal (Yes/No)
In the past 12 months did this facility have all the four medicines and therapeutic committee meetings it should have held? (Question 7004)	Nominal (Yes/No)
In the past 12 months did this management unit receive at least four supervision visits from higher level? (Question #7006)	Nominal (Yes/No)
County NCD readiness questions	
Do providers in this facility diagnose and/or manage diabetes in patients? (Question #2001)	Nominal (Yes/No)
Do you have national guidelines for the diagnosis and management of diabetes available in this facility today? (Question #2002)	Nominal (Yes/No)
Have you or any provider(s) received any training in the diagnosis and management of diabetes in the last two years? (Question #2003)	Nominal (Yes/No)
Do providers in this facility diagnose and/or manage cardiovascular diseases such as hypertension in patients? (Question #2004)	Nominal (Yes/No)
Do you have national guidelines for the diagnosis and management of cardiovascular diseases available in this facility today? (Question #2005)	Nominal (Yes/No)
Have you or any provider(s) of services for cardiovascular diseases received any training in the diagnosis and management of cardiovascular diseases in the last two years? (Question #2006)	Nominal (Yes/No)
Do providers in this facility diagnose and/or manage chronic respiratory diseases in patients? (Question #2007)	Nominal (Yes/No)
Do you have national guidelines for the diagnosis and management of chronic respiratory diseases available in this facility today? (Question #2008)	Nominal (Yes/No)
Have you or any provider(s) of services for chronic respiratory diseases received any training in the diagnosis and management of chronic respiratory diseases in the last two years? (Question #2009)	Nominal (Yes/No)
County NCD service readiness index score (Dependent variable)*	Continuous (Percentage)

*The county readiness score is a percentage score derived from scores from all health facilities within each county.

Data Analysis Plan

Secondary data used in this study were available in Excel format. Data from the Excel sheets were transferred to IBM SPSS Statistics Version 24 software for analysis. The SPSS software was used to analyze the independent and dependent variables to investigate any relationship between the variables. Multiple linear regression tests were run between the three independent variables and the dependent variable. Multiple linear regression tests were used to determine the strength of the relationship between each independent or predictor variable and the dependent variable.

Research Questions and Hypotheses

This study sought to answer the following research questions and hypotheses.

RQ1: What is the relationship between leadership practices (annual work planning, therapeutic committees, and supportive supervision) and county readiness for NCD services?

*Ho*1: There is no statistically significant relationship between leadership practices (annual work planning, therapeutic committees, and supportive supervision) and county readiness for NCD services.

*HA*1: There is a statistically significant relationship between leadership practices (annual work planning, therapeutic committees, and supportive supervision) and county readiness for NCD services.

RQ2: Can leadership practices (annual work planning, therapeutic committees, and supportive supervision) predict county readiness for NCD services?

*Ho*2: Leadership practices (annual work planning, therapeutic committees, and supportive supervision) do not have a statistically significant predictive role in relation to county readiness for NCD services.

*HA*2: Leadership practices (annual work planning, therapeutic committees, and supportive supervision) have a statistically significant predictive role in relation to county readiness for NCD services.

Threats to Validity

Evaluating threats to external validity was important in this study. Threats to external validity could occur when inappropriate inferences are drawn from sample data relating to other persons, settings or situations (Creswell, 2009). In this study, the threats of interaction of selection and treatment and interaction of setting and treatment are addressed by including the entire sampling frame in this study. However, the threat of interaction of history and treatment could be relevant indicating some caution in generalizing study results to past or future situations (Creswell, 2009).

Threats to internal validity relate to study procedures and approaches that could affect the ability to make correct inferences from the data (Creswell, 2009). Threats to internal validity that involve study participants include history, maturation, selection, regression, and mortality. Other threats could involve experimental treatment, such as diffusion of treatment, compensatory demoralization, and compensatory rivalry or could affect procedures, such as instrumentation and testing (Creswell, 2009). The study design

and methodology proposed for this study limit the effect of these threats to internal validity.

Ethical Procedures

All required concurrences and agreements were obtained prior to access to study data. A review of ethical procedures and protections of human subjects was obtained from the Walden University Institutional Review Board. Anonymity and confidentiality of data was strictly maintained. Identifier information relating to individual health facilities was removed, retaining only relevant results. Exchange of data was done through secure, password protected email, and storage encrypted. There was no use of human subjects in this study and no cost to participants.

Summary

The purpose of this quantitative correlational study was to investigate the relationship between county leadership practices and readiness for NCD services. In this chapter, I discussed the study design and rationale. The methodology was also discussed in detail, including the study population, sampling, and sampling procedures, recruitment, participation, data collection, and analysis procedures. In addition, threats to validity and ethical procedures were discussed. In Chapter four results of data analyses will be presented and described.

Chapter 4: Results

Introduction

The purpose of this nonexperimental quantitative correlational study was to investigate the relationship between county-level leadership practices and readiness for NCD services. The aim of the study was to gain an understanding of health leadership practices at the county level in Kenya and their impact on readiness for NCD services.

Secondary data from the 2013 Kenya SARA that included leadership and NCD-readiness variables were used in this study. The SARA survey is a comprehensive health-facility-based assessment tool used to evaluate the availability of health services based on a standard set of indicators and measures to determine which minimum criteria for health services are met (O'Neill et al., 2013; Spiegel et al., 2017).

In Chapter 4, I present the results of the study. This chapter includes a description of the data collection process, data analysis, and results, concluding with a summary. Details of the descriptive and demographic characteristics of the sample are presented, followed by findings from statistical analysis presented according to the research questions and hypotheses. Data analyzed from the SARA survey will be used to answer the following research questions and corresponding hypotheses:

RQ1: What is the relationship between leadership practices and county readiness for NCD services?

*Ho*1: There is no statistically significant relationship between leadership practices and county readiness for NCD services.

*HA*1: There is a statistically significant relationship between leadership practices and county readiness for NCD services.

RQ2: Can leadership practices predict county readiness for NCD services?

*Ho*2: Leadership practices do not have a statistically significant predictive role in relation to county readiness for NCD services.

*HA*2: Leadership practices have a statistically significant predictive role in relation to county readiness for NCD services.

Data Collection

Secondary data from the 2013 SARA survey were used in this study. The SARA survey data were collected between April and May 2013. Following Walden University IRB approval (number 01-08-18-0521563) in January 2018, I abstracted deidentified data from all eight study regions containing data from the 47 counties. The next step was to identify the variables of interest for this study to complete a clean dataset containing the independent variables—namely, annual work planning, quarterly therapeutic committee activities, and supportive supervision visits—and NCD readiness scores, the dependent variable.

All 47 county departments of health participated in the survey. Fourteen counties (29.8%) were located in one region, which had the most counties of the eight regions, as shown in Table 7. There were 8,401 health facilities located within all 47 counties, with 5,471 (65.9%) in rural areas. The county with the highest number had 875 (10.4%) health facilities. Out of all of the health facilities, 7,396 (88%) participated in the survey (MOH, 2013). Out of those that did not participate, 599 (60%) did not complete the survey

questionnaire in full, 64 (6%) had no respondent, and 22 (2.2%) opted not to participate in the survey (MOH, 2013).

Table 7

Counties by Region (Province)

	Frequency	Percent
Central	5	10.6
Coast	6	12.8
Eastern	8	17.0
Nairobi	1	2.1
North Eastern	4	8.5
Nyanza	5	10.6
Rift Valley	14	29.8
Western	4	8.5
Total	47	100

Health facilities were categorized by tier and ownership. All hospitals were categorized as Tier 1, while health centers, dispensaries, and medical clinics, including other stand-alone facilities, were categorized as Tiers 2, 3 and 4, respectively. Most of the health facilities were dispensaries, totaling 3,849 (45.8%). By ownership, health facilities were categorized as public, private not-for-profit, private for-profit, or other. The public category had 4,098 (48.8%) health facilities, as shown in Table 8.

Table 8

Type of Health Facility

	Frequency	Percentage
Hospitals		
National referral	5	0.1
Provincial	10	0.1
District	138	1.6
Subdistrict	135	1.6
Other	326	3.9
Maternity	305	3.6
Health centers	1,072	12.8
Dispensaries	3,849	45.8
Medical clinics	2,444	29.1
	Health facility ownership	
Public (Government)	4,098	48.8
Private for-profit	2,746	32.7
Private not-for-profit	1,375	16.4
Other	182	2.2
	Health facility location	
Rural	5,471	65.9
Urban	2,834	34.1

Because all possible units in the population were included, the sample was considered representative of the population.

SPSS version 24 was used for data analysis. Initial analysis included frequencies and descriptive statistics. Correlation analysis was used to analyze relationships between variables, and multiple linear regression analysis was used to test the predictive model. The level of statistical significance accepted for all tests was $p \leq .05$.

The independent variable for this study was leadership practices. The specific practices evaluated included annual work planning, therapeutic committee meetings, and supportive supervision visits by health leaders. These were the predictor variables in the study. The dependent variable was county NCD Readiness Index scores.

Results

Descriptive statistics including mean and standard deviation for the independent variables are presented. As shown in Table 9, annual work planning had the highest mean, and quarterly medicine and therapeutics committee meetings had the lowest. Based on the means, it appears that health leaders performed medicine and therapeutic committee activities least.

Table 9

Descriptive Statistics for the Independent Variables

	N	Mean	Std. deviation
Medicine and therapeutics committees	47	16.74	9.124
Annual work planning	47	63.89	15.646
Supervisory visits	47	62.62	15.159

Descriptive statistics including means and standard deviations are presented for the dependent variable, county NCD readiness. As shown in Table 10, the mean county NCD readiness score was 44.06. County health facilities categorized as Tier 1 (hospitals) had the highest mean NCD readiness, whereas Tier 4 health facilities had the lowest. Based on ownership, publicly owned county health facilities had the highest mean NCD readiness scores, whereas those categorized as *other* had the lowest scores.

Table 10

Descriptive Statistics for the Dependent Variable

	N	Mean	Std. deviation
NCD readiness	47	44.06	16.263
NCD Readiness by Tier of County Health Facilities			
Readiness by Tier 1	47	57.23	21.697
Readiness by Tier 2	47	47.70	17.865
Readiness by Tier 3	47	36.11	15.287
Readiness by Tier 4	47	23.70	11.786
NCD readiness by ownership of county health facilities			
Ownership—Public	47	41.02	16.426
Ownership—Private not-for-profit	47	35.19	13.925
Ownership—Private for-profit	47	24.23	12.532
Ownership—Other	47	17.51	25.079

Statistical Assumptions

Inferential analysis for this study included correlation analysis and multiple linear regression. Five assumptions were relevant for this analysis: additivity and linearity, independence of errors, homoscedasticity, normal distribution of errors, and multicollinearity. The additivity and linearity assumptions require that the relationship between the predictor and outcome variables be described using a linear model. Further, the effect on the outcome variable of several predictor variables should be additive (Field,

2013). This assumption was tested using scatterplots. The independence of errors assumption indicates the lack of correlation of residual terms for any two observations. In case this assumption is violated, model parameters may hold; however, confidence intervals and significance would not be valid. The Durbin-Watson test was used to test this assumption (Field, 2013). This assumption was not met with a Durbin-Watson test value of .852. This was corrected using SPSS through the heteroscedasticity consistent covariance matrix, HC3 procedure recommended for sample sizes less than 250 (Darlington & Hayes, 2016; Hausman & Palmer, 2012; Long & Ervin, 2000).

Residual plots were used to test the assumption of homoscedasticity, which was not detected in this analysis. Where there is homoscedasticity, there is a constant variance between residuals at each level of the predictor variable (Field, 2013). To satisfy the assumption of normally distributed errors, the differences between the model and observed data should be zero or close to zero. This assumption was tested by creating a histogram (Field, 2013).

Because the model used more than one predictor variable, it was important to check for multicollinearity. Where multicollinearity exists, there is a strong correlation between two or more predictor variables. Variance inflation factor (VIF) and tolerance diagnostics were used to check for this assumption, indicating no multicollinearity.

Research Question 1

RQ1: What is the relationship between leadership practices and county readiness for NCD services?

*Ho*1: There is no statistically significant relationship between leadership practices and county readiness for NCD services.

*HA*1: There is a statistically significant relationship between leadership practices and county readiness for NCD services.

Investigating any conjectured relationship between leadership practices and county readiness for NCD services was the focus of the first research question. Correlation analysis was used to investigate any relationship between each leadership practice variable—namely, annual work planning, therapeutic committees, and supportive supervision—and whether any relationship existed with NCD readiness.

Pearson correlation coefficient tests were performed in SPSS for each variable pair. As shown in Table 11, quarterly medicine and therapeutic committees and supportive supervision correlated significantly with the dependent variable, NCD readiness. Annual work planning as a leadership practice did not correlate significantly with NCD readiness. Therefore, the null hypothesis was rejected.

Table 11

Correlations of Leadership Practices and NCD Readiness

Correlations					
		NCD readiness	Medicine and therapeutic	Annual work plan	Supportive supervision
NCD readiness	Pearson correlation	1	.438**	.286	.330*
	Sig. (2 tailed)		.002	.051	.023
	N	47	47	47	47
Medicine and therapeutic	Pearson correlation	.438**	1	.629**	.625**
	Sig. (2 tailed)	.002		.000	.000
	N	47	47	47	47
Annual work plan	Pearson correlation	.286	.629**	1	.833**
	Sig. (2 tailed)	.051	.000		.000
	N	47	47	47	47
Supportive supervision	Pearson correlation	.330*	.651**	.833**	1
	Sig. (2 tailed)	.023	.000	.000	
	N	47	47	47	47

*Correlation is significant at the 0.05 level (2-tailed). **Correlation is significant at the 0.01 level (2-tailed).

Research Question 2

RQ2: Can leadership practices predict county readiness for NCD services?

*Ho*2: Leadership practices do not have a statistically significant predictive role in relation to county readiness for NCD services.

*HA*2: Leadership practices have a statistically significant predictive role in relation to county readiness for NCD services.

A multiple linear regression analysis was conducted to investigate the predictive role of leadership practices namely annual work planning, therapeutic committees and supportive supervision on the dependent variable, county NCD readiness. The set of predictor variables was related to county NCD readiness at a statistically significant level, $F(3,3.519) = 43$, $p < .05$, $R^2 = .197$, Adj. $R^2 = .141$).

Both quarterly medicine and therapeutic committee activities and supportive supervision visits were positively related at a statistically significant level to county NCD readiness. Quarterly medicine and therapeutics committee activities ($\beta = .438$) was however a better predictor than supportive supervision ($\beta = .330$) as shown in table 12. Therefore, the null hypothesis that leadership practices do not have a statistically significant predictive role on county readiness for NCD services was rejected.

Table 12

Linear Model of Predictors of NCD Readiness

Model	*SE B*	β	95% confidence interval for *B*	
			Lower bound	Upper bound
Medicine and therapeutic	.438	.438**	.300	1.262
Annual work plan	.286	.286	-.002	.596
Supportive Supervision	.330	.330*	.050	.658
R^2		.197		
F		3.519*		

* $p < .05$. ** $p < .01$.

Summary

Chapter four included a detailed discussion of the results of the study and interpretation of the findings. There were two research questions and corresponding hypothesis statements to be tested in this study. The first research question focused on investigating any relationship between leadership practices and county NCD readiness. The results indicated that there was a statistically significant relationship between leadership practices and NCD readiness. Quarterly medicine and therapeutic committee activities and supportive supervision visits were positively correlated with NCD readiness.

The second research question focused on investigating any predictive relationship between leadership practices and county NCD readiness. The predictive model with leadership practices had a statistically significant relationship with NCD readiness.

Quarterly medicine and therapeutic committee activities and supportive supervision visits were positively related with NCD readiness with the former being a better predictor. Chapter five will present a discussion of these findings.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

The purpose of this quantitative correlational study was to investigate the relationship between county-level leadership practices and readiness for NCD services. In this study, I investigated the role of specific leadership practices used by county health leaders, including annual work planning, medicine and therapeutic committee activities, and supportive supervision visits. These variables were collected from the Kenya SARA census conducted in 2013 (MOH, 2013).

Two research questions and corresponding hypothesis were tested. Data were analyzed using correlation and multiple linear regression. The aim was to understand health leadership practices at the county level and how these relate to readiness for NCD services. The results indicated a statistically significant positive correlation for leadership practices relating to medicine and therapeutic committee activities, supportive supervision, and county NCD readiness.

Interpretation of Findings

The theoretical foundation for this study was path-goal theory. This theory was formulated in 1971 by House as a dyadic theory of supervision to explain leadership actions and how these affect performance. Later versions of the theory advanced motivational actions of leaders through coaching, guidance, and reward, in addition to providing cognitive clarifications to ensure attainment of set goals. The four leadership behaviors suggested were directive, supportive, participative, and achievement-oriented behaviors (House, 1996).

In this study, I focused on leadership practices aligned to two of the posited behaviors. Planning and therapeutic committee practices aligned with directive behavior aimed at providing structure, standards, and performance expectations. Supportive supervision practices aligned with supportive leadership behaviors aimed at demonstrating concern for the wellbeing and needs of subordinates (House, 1996).

Literature exists on the relationship between leadership and health outcomes. For NCD services, whereas literature focuses on leadership actions at the political and global levels, there is a paucity of research on leadership actions and practices at the implementation level (Bonita et al., 2013). This study focused primarily on leadership practices at the implementation level.

It was important to investigate whether any relationship exists between health leadership practices and county readiness for NCD services. The first hypothesis (*Ho*1) was that there would be no statistically significant relationship between leadership practices and county readiness for NCD services. Leadership practice variables except annual work planning correlated significantly with county NCD readiness. Therapeutic committee (.438) and supportive supervision (.330) correlated positively with the dependent variable, county NCD readiness. Based on these findings, I concluded that there was a statistically significant correlation between leadership practices and readiness for NCD services.

The second hypothesis (Ho2) was that leadership practices had no statistically significant predictive role in relation to county readiness for NCD services. The leadership practice variables were related to NCD readiness at a statistically significant

level, $F(3,3.519) = 43$, $p < .05$). Therapeutic committee activities ($\beta = .438$) were a better predictor than supportive supervision ($\beta = .330$). The null hypothesis that leadership practices had no statistically significant predictive role in relation to county readiness for NCD services was therefore rejected.

These findings are consistent with existing literature. This study demonstrated a relationship between leadership and NCD services that aligns with existing literature that posits the importance of prioritizing leadership interventions for NCD response (Allen et al., 2017; Atun et al., 2013; Beaglehole et al., 2011).

Wong (2015) argued that supportive leadership approaches and practices were related to positive patient outcomes. Although this study did not focus on direct patient outcomes, findings supported a positive relationship between supportive leadership practices and readiness for health services. Specifically, Vasan et al. (2017) argued that there were positive effects of leadership practices such as supportive supervision on health services such as immunization, management of childhood diarrhea, and malaria services. This study adds to the literature on the positive relationship between supportive supervision practices and NCD service readiness.

Limitations of the Study

Limitations for this study align with the limitations of secondary analysis. The available data used to investigate the research questions and hypotheses were not specifically collected for this purpose. Content validity issues relating to the extent to which survey instruments represented study concepts could apply (Frankfort-Nachmias & Nachmias, 2015).

Additionally, other variables that might have been useful for this study may have been omitted (Cheng & Phillips, 2014). The selection of variables was based on the available variables collected during primary data collection. The selection of predictor variables for this study was also limited to the three considered most relevant. With this limitation, other potentially confounding variables were not included in this study. Moreover, the reliability of the findings and conclusions of this study was dependent on the rigor of the methods used in collecting the primary data.

Recommendations

The results of this study support a positive relationship between leadership practices by health leaders and county readiness for NCD services. These findings suggest that certain actions by health leaders could be associated with achieving service readiness for the provision of NCD services. The emerging evidence of an epidemiologic transition from communicable diseases to NCDs in Kenya suggests the importance of leadership actions to ensure stewardship, accountability, and prioritization for access to required health services (Monroe-Wise et al., 2016).

Quarterly medicine and therapeutic committee activities and supportive supervision had a positively predictive relationship with county NCD readiness. Of the two, medicine and therapeutic committee actions were a better predictor. These findings suggest the importance of these two leadership practices in achieving readiness for NCD services.

However, while the positive relationship between NCD readiness and therapeutic committee activities was demonstrated, it was notable that this leadership practice was on

average least accomplished by health leaders at county level, with a low mean score of 16.74%. Based on the findings of this study, it is recommended that county health leaders prioritize the accomplishment of quarterly therapeutic committee activities to enhance readiness for NCD services.

More than 60% of county health leaders had accomplished annual work planning requirements and quarterly supportive supervision activities. Of these two, supportive supervision activities were positively related with NCD readiness. It is recommended that supportive leadership actions demonstrated by supportive supervision activities be enhanced toward NCD readiness at the county level.

Although annual work planning activities were most practiced by health leaders, this practice did not have any statistically significant correlation with NCD readiness. It was not within the scope of this study to evaluate the contents of the work plans and their alignment to NCD readiness. Further research is therefore recommended to investigate the alignment of county annual work planning to NCD readiness.

Implications

The outcome of this study has broad implications for the NCD response in Kenya. First, this study adds to the body of knowledge relating to leadership practices and how these relate to readiness for NCD services, a health system outcome. This study adds depth to the understanding of how leadership practices at implementation relate to ensuring readiness for NCD services, on which limited literature exists (Bonita et al., 2013).

Positive Social Change

NCDs account for more than half of hospital admissions in Kenya, and mortality from NCDs is projected to exceed that from communicable diseases by 2025 (Some et al., 2016). Responding to this epidemiological transition will require leadership. Health leaders have a role in ensuring access to appropriate prevention and treatment services.

The positive social change implications of this study include providing evidence that could be used by county departments of health to evaluate their leadership practices and how they relate to readiness for NCD services. Through these county self-assessments, it would be possible to ensure prioritization of practices most aligned to achieving readiness for NCD services. The findings of this study could also be used to develop capacity-building programs targeting health leaders at the county level.

The results of this study indicate that therapeutic committee and supportive supervision activities had a positive relationship with readiness for NCD services. However, what was implemented was not aligned, in that therapeutic committee activities were least practiced by county departments of health. At the individual level, health leaders could use the findings of this study to reflect on their own leadership practices and how they relate to readiness for NCD services in their counties.

Prioritizing leadership practices and actions for NCD readiness could have benefits for society. A better understanding of the leadership role could support the prioritization of actions that support proximal access to health services for NCDs. Where this occurred, improved readiness for NCD services would ensure access to required prevention and treatment services.

This study focused on two key behaviors posited by House's path-goal theory, namely, directive and supportive leadership behaviors (House & Mitchell, 1974). Participative and achievement-oriented behaviors were not within the scope of this study. Future research could investigate any relationship between these two or among all four behaviors and health outcomes. Additionally, future research is needed to investigate the specific leadership challenges affecting the achievement of readiness for NCD services, in line with the adaptive leadership theory's broad categories of technical and adaptive challenges (Bailey, 2012). Understanding the specific challenges would help to inform leadership interventions aimed at achieving service readiness.

Conclusion

The purpose of this study was to investigate the relationship between leadership practices and county readiness for NCD services. Understanding this relationship was important because of evidence of a growing NCD epidemic coupled with an emerging epidemiological transition from communicable diseases to NCDs in Kenya (Some et al., 2016). As one of the essential pillars of the health system, understanding existing practices by health leaders was important to improve the level of readiness of nascent county departments of health in the NCD response (Mounier-Jack et al., 2014).

Leadership practices were demonstrated to have a significant positive relationship with county readiness for NCD services. Leadership practices also had a predictive relationship with county readiness for NCD services. Specific leadership practices including quarterly medicine and therapeutic committees and supportive supervision activities were positively related with readiness for NCD services.

County departments of health should review existing leadership practices to prioritize those that correlate with NCD readiness. Health leaders should also ensure that leadership practices that have a predictive relationship with NCD readiness, such as therapeutic committee activities and supportive supervision visits, are implemented appropriately. Further, county health leaders should pay particular attention to the implementation of these leadership practices at nonpublic and Tier 2, 3, and 4 health facilities that had lower NCD readiness scores. Despite the limitations of this study, the findings could be used to enhance practice and to further investigate ways to enhance county readiness for NCDs and other health services.

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