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## Planned Behavior and Congolese Physicians' Practice: Predicting Advanced Preventive Health Services Provision

Jean-Clément Milabu Mumbusi  
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# Walden University

College of Health Sciences

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Jean-Clément Milabu Mumbusi

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Walden University  
2020

Abstract

Planned Behavior and Congolese Physicians' Practice: Predicting Advanced Preventive

Health Services Provision

by

Jean-Clément Milabu Mumbusi

MPA, University of San Francisco, 2013

MD, University of Kinshasa, 1979

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Public Health

Walden University

May 2020

## Abstract

The provision of preventive services, health promotion, and health maintenance has become the cornerstone of primary care practice in the United States and other Western countries to prevent morbidity and premature mortality and to increase the quality and years of a healthy life. Unfortunately, the delivery of these advanced preventive health services (APHS) has been sporadic in the Democratic Republic of Congo, a country with poor health indicators. The purpose of this cross-sectional mixed-method study was to apply Ajzen's theory of planned behavior (TPB) to predict the intention of Congolese primary care physicians (PCPs) in the provision of APHS. Using a self-administered 24-item survey from the Francis' instrument, primary data were collected from May to November 2019 from a purposive sample of 173 consenting PCPs aged 24–69 years old practicing in Kinshasa, Kongo Central, and Kwilu provinces. Multiple regression was used to analyze the data. The findings revealed that Congolese PCPs' intention to provide APHS was statistically significantly predicted by their attitudes ( $\beta = .183$  at  $p < 0.05$ ), subjective norms ( $\beta = .209$  at  $p < 0.01$ ), and perceived behavioral control ( $\beta = .198$  at  $p < 0.01$ ). After controlling for age and gender, all 3 predictor variables explained 10.9% variance on the dependent variable intention at the significance level of  $< 0.01$ . Despite the low variance, these findings suggested that TPB was a suitable theory model for predicting the intention of Congolese PCPs to provide the APHS. However, a countrywide randomized study is recommended to generalize the results. This study may provide positive social change by standardizing and enhancing the quality of primary care in Congo, by preventing morbidity and premature death, decreasing healthcare costs, and promoting a healthy lifestyle and long productive life of Congolese people.

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## Dedication

I dedicate this dissertation to the lasting memory of my beloved son, Tony Mergeai Milabu Mumbusi, who left us so prematurely. To my cherished parents, Pauline and Clément Mumbusi, who sacrificed so much for my earlier education, I dedicate this dissertation to their memory as the pinnacle of their effort and commitment to my education and success. Furthermore, I dedicate this dissertation to my dear siblings, who passed away prematurely before reaching the age of 45 and from preventable noncommunicative diseases: my older brother Bonard (41), my older sister Clémentine (44), Marie-Therese, Jaddy (40), and Nelitta (30). Although their deaths were painful and devastating, their premature departures provided me with the inspiration and devotion to conduct this noteworthy academic study.

From my dreams as a young boy growing in Vanga, DRC, to study in the United States, and through the Grace, Power, Blessings, and Love of my Lord and Savior Jesus-Christ; and the hard work I put in while navigating and negotiating through the peaks and valleys of the life journey and internal medicine residency, to the completion of a Ph.D. in Public Health/Epidemiology.

To my precious children Mary-Lou, Jeremiah, and Johnny:  
I hope this scientific research reflects my benediction, support, and encouragement to you for higher education so that you will one day become cornerstones and agents of positive social change in our society.

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## Chapter 1: Introduction to the Study

The provision of preventive services, health promotion, and health maintenance has become the cornerstone of primary care practice in the United States and other industrialized nations with the goals to prevent morbidity and premature mortality, and to increase the quality and years of healthy life (Hurley et al., 2016; Salazar, Crosby, & DiClemente, 2015). Moreover, Healthy People 2020 set similar goals of attaining high-quality, longer lives free from preventable disease, disability, injury, and premature death; and promoting quality of life, healthy development, and healthy behaviors across all life stages for the American people (Healthy People, 2014; Sharma & Petosa, 2014; U.S. Department of Health and Human Services, 2010). Most significantly, the crucial role of healthcare professionals in the delivery of advanced preventive health services (APHS) cannot be overstated; studies have shown that a recommendation from a healthcare professional is the most influential predictor of individuals getting needed vaccines and other preventive services (Strikas, 2017).

According to the World Health Organization (WHO), noncommunicable diseases (NCDs) that encompass heart disease, stroke, cancer, diabetes, and chronic lung disease, are jointly accountable for roughly 70% of all deaths worldwide (WHO, 2018a). Unfortunately, the majority of all NCD deaths (nearly three quarters), and people who died prematurely or before reaching 70 years of age (about 82% of the 16 million), were in low- and middle-income countries such as the Democratic Republic of Congo (WHO, 2018a). Indeed, NCD deaths represent 28 % of all causes of mortality in the Democratic Republic of Congo (WHO, 2018a). Four major risk factors, namely tobacco use, physical

inactivity, the harmful use of alcohol, and unhealthy diets, have been the driving force behind the upsurge of NCDs in these developing countries (WHO, 2018a). The WHO has recommended its country members to provide APHS to ensure healthy lives and to promote the well-being of all at all ages through the sustainable development Goals (SDGs) (WHO, 2015a) and the STEP approach to Surveillance (STEPS) (WHO, 2018b). However, the Democratic Republic of Congo has posted an index of 39 %, which is insufficient progress toward meeting the SDGs and universal health coverage (UHC) of its citizens (WHO, 2018a). The United Nations SDGs comprise 17 goals and 169 targets to attain by the year 2030; SDG 3 is related to health and has a central goal to safeguard healthy lives and to foster well-being for all at all ages in each country member. The other 16 goals are directly correlated to health or will further health (WHO, 2015a).

Unfortunately, healthcare delivery in the Democratic Republic of Congo has remained reactive to outbreaks such as Ebola virus, yellow fever, cholera, and human immunodeficiency virus (HIV), with mostly international support (Maganga et al., 2014; Muyembe-Tamfum et al., 2012; Otshudiema, 2017; Program for Appropriate Technology in Health [PATH], 2016). There is no national policy for APHS such as colon and cervical cancer screening and a healthy lifestyle to guide healthcare professionals in the provision of APHS (Ali-Risasi, Verdonck, Padalko, Broeck & Praet, 2015). As a result, the Democratic Republic of Congo has poor health outcomes with high under-five mortality rate of 94.3 per 1,000 live births, elevated mother to child transmission of HIV at 4.4% (Ghanotakis, Miller, & Spensley, 2012; United Health Foundation, 2014; World Health Organization, 2018a), and a short life expectancy at birth for Congolese men and



women at 60.5 years (WHO, 2018a). Congolese life expectancy is nearly 20 years shorter than their U.S. counterparts at 79.3 years (WHO, 2018a).

Researchers conducting studies in the Democratic Republic of Congo have focused solely on patients as the target population, and healthcare providers' behavioral intention in providing preventive services is not well-known to explain these poor health outcomes. Therefore, my goal for this study was to apply the theory of planned behavior (TPB) to predict and explore the behavioral intention of Congolese primary care physicians (PCPs) in providing APHS as directed by the United States Preventive Services Task Force (USPSTF) guidelines and Advisory Committee on Immunization Practices' (ACIP) recommended vaccines in the Democratic Republic of Congo as suggested by Hurley et al. (2016). Of note, the STEPS approach is a simple, standardized method developed by the WHO to allow healthcare professionals to collect, analyze and disseminate data on NCD and stroke among countries associated with the WHO (WHO, 2018). The STEPS instrument encompasses three different levels of "steps" of risk factor assessment and covers, to some extent, essential USPSTF guidelines (WHO, 2018). These steps include Step 1: Demographic and behavioral (age, sex, literacy, highest level of education, tobacco use, alcohol consumption, fruits and vegetable consumption, physical activity); Step 2: Physical measurements (weight, height, waist circumference, blood pressure); and Step 3: Biochemical measurements (fasting blood sugar, total cholesterol) (WHO, 2018). Unfortunately, the STEPS approach does not include the screen for colon and cervical cancer in comparison to USPTF guidelines (WHO, 2018).

This study has the potential to induce positive social change by improving the quality of preventive care delivered by Congolese PCPs and by assisting Congolese public health officials in devising national health policy for widespread implementation of APHS in the Democratic Republic of Congo. Furthermore, the findings of this study can foster ownership and empowerment of Congolese PCPs as crucial derders in developing health promotion programs, in encouraging patient health education, in promoting the delivery of high quality of care, and in advocating the healthy lifestyle of the Congolese. Ultimately if fully implemented, the provision of APHS by Congolese PCPs will decrease the cost of healthcare by reducing the morbidity and mortality of preventable diseases and cancers (Koh & Parekh, 2018) and eventually for enhancing the quality of life and life expectancy of the Congolese people. Healthy people are generally happy and productive by contributing to their family's financial stability and the local and national economy. Other key stakeholders who would benefit from this study include Congolese people, public health officials, the D.R.C. government, and international organizations such WHO, the World Bank and the Centers for Disease Control and Prevention (CDC) who are funding preventive health services and fights against several disease outbreaks in Democratic Republic of Congo.

In this chapter, I discussed the background of the study, the problem statement, the study's purpose, the study's significance, and the research questions and hypotheses. I also discussed the theoretical foundation of the study, the nature of the study, the measurement of variables, the operational definitions, some assumptions, the scope and

delimitations of the study, and the limitations of the study. I ended the chapter with a brief summary of the pertinent concepts.

### **Background**

Situated in Central Africa, the Democratic Republic of Congo is a vast country of 2,345,409 km squared, four times the size of France, with 81 million inhabitants (See map in Appendix A; CDC, 2019; PATH, 2016; The World Bank, 2020). Despite its immense natural resources, the Democratic Republic of Congo has serious health challenges with exceedingly feeble health indicators, namely, high infant mortality of 67 deaths per 1,000 live births, maternal mortality estimated at 693 deaths per 100 000 live births and under-five mortality at 94.3 deaths per 1000 live births and short life expectancy of 60.5 years (Bertone, Lurton, & Mutombo, 2016; CDC, 2019; Mpunga et al., 2017; WHO, 2016; WHO, 2018a). Furthermore, the Democratic Republic of Congo has been known as the origin and the epicenter of the HIV outbreak back in 1920 (Faria et al., 2014; Kelland, 2015) and the origin and site of several Ebola virus disease outbreaks since 1976 (Mbala Kingebeni et al., 2018; Nkengasong & Onyebujoh, 2018).

In addition to infectious diseases, NCDs such as cancers and preventable chronic western-type diseases such as coronary artery disease, stroke, diabetes, hypertension, obesity, and kidney disease have become the leading causes of morbidity and mortality among the Congolese people, accounting for 28 % of causes of death with cardiovascular disease at 10% and stroke at 4 % (Ali-Risasi et al., 2015; Bayauli et al., 2018; Desire et al., 2016; CDC, 2019; Lulebo et al., 2016; Mvila et al., 2015; WHO, 2018a). Moreover, Longo-Mbenza et al. (2008) noted in their cross-sectional study with more than 2000

participants in Kinshasa and using the WHO STEPS approach instrument that prevalence of hypertension, obesity, and diabetes mellitus (DM) were rising. The authors reported that the weighted prevalence of hypertension, DM, overweight status, general obesity, and abdominal obesity were 15.2, 140.2, 13.5, 4.8, and 7.5%, respectively (Longo-Mbenza et al., 2008). More recently, Mabele, Ekisawa, Delecluse, Bompeka, and NkodilaNatuhoiyila (2018) found in their cross-sectional study conducted on workplaces in Kinshasa among 210 workers that the overall prevalence of hypertension was 41.9% with 45.4% men and 37.4% women ( $P < 0.153$ ). Still, as reported by Xie, Xu, and Boping (2015), the Democratic Republic of Congo had the ninth highest incidence of DM among Central African countries with the prevalence at 10.1 % in comparison to a regional prevalence of DM estimated at 7.7%. Furthermore, DM and other endocrine disorders represented 7.9% of all deaths in the Democratic Republic of Congo (Jacques et al., 2015).

In the United States, the provision of preventive services, health promotion, and health maintenance has become the cornerstone of primary care practice; moreover, Healthy People 2020 and several provisions in the Affordable Care Act designed to promote the delivery of preventive services had common goals to prevent morbidity and premature mortality, and to increase the quality and years of healthy life (Chait & Glied, 2018; Healthy People, 2020; Hurley et al., 2016; Sharma & Petosa, 2014; Salazar et al., 2015; U.S. Department of Health and Human Services, 2010). Moreover, in the United States, the USPSTF and the ACIP provide two extensively used sets of national recommendations to guide the delivery of preventive care by healthcare professionals

such as PCPs (Hurley et al., 2016). Fortunately, the provision of disease prevention services, health promotion, and periodic health checks was not unique to the U.S. healthcare system; PCPs from Eastern Mediterranean Region countries have been providing similar APHS to their populations to a certain degree (Qidwai et al., 2015).

Most significant is the role of PCPs in the delivery of APHS, and studies have shown that a recommendation from a healthcare professional was the most influential predictor of individuals getting needed vaccines and other preventive services (Strikas, 2017). Although the most important determinants of patients' health occur outside of healthcare settings and that their health habits and health risks at home, work, school, and elsewhere are crucial to longevity and health-related quality of life, Koh and Parekh (2018) suggested that healthcare professionals can guide patients through evidence-based disease prevention and early intervention. In the United States, these undertakings have resulted in decreased death rates from cancer and cardiovascular disease (including stroke) over the past 26 years (Koh & Parekh, 2018; Mokdad et al., 2018). Most notably, Americans have enjoyed an upswing in life expectancy from 47.3 to 77.9 years during the last century due mostly to the adoption of APHS such as: health maintenance in primary care, preventive services at recommended intervals, improved sanitation, widespread immunization, decreased use of tobacco, and improvement of safety in motor vehicles and the workplace (Aschengrau & Seage, 2014; Getzen, 2013).

Ali-Risasi et al. (2015) reported that only 17% of African countries have a national program and a specific budget for fighting cervical cancer, and unfortunately, because of several complex health problems facing the Democratic Republic of Congo

simultaneously, cervical cancer is not getting the attention that would be required for adequate disease control. Furthermore, Ali-Risasi emphasized the lack of coordinated control strategy in Democratic Republic of Congo despite a genuine interest and willingness expressed by women in Kinshasa to participate in cervical cancer prevention and control activities and the burden caused by cervical cancer in the Democratic Republic of Congo. According to PATH (2016), immunization in the Democratic Republic of Congo has been hailed as one of the most crucial public health interventions for mothers, newborns, and children; the Expanded Program on Immunization (EPI) conducts the immunization at the central level with the assistance of UNICEF which provides traditional vaccines and immunization supplies and of the Global Alliance for Vaccine and Immunization (GAVI) which purchases new vaccines. However, fewer than half of children aged 12 to 23 months received vaccinations in 2012, and one out of seven died from vaccine-preventable diseases before age five (PATH, 2016). Furthermore, there is no a national program for vaccination of adults; the vaccines used in the Democratic Republic of Congo include Bacillus Calmette-Guérin for tuberculosis, diphtheria, tetanus, and pertussis (DTP), Hepatitis B, Polio, Varicella for chickenpox, and measles are supplied by UNICEF (PATH, 2016). More recent vaccine additions from GAVI include pentavalent pneumococcal and yellow fever vaccines (PATH, 2016). Kalisya, Bake, Bigabwa, Rothstein, and Cairo (2017) reported that higher mortality due to cancers in Democratic Republic of Congo and Africa compared to other regions of the world, could be explained partially by the limited availability of screening and early detection systems, as well as more inadequate access to treatment. Therefore, based on

the poor showing of the Democratic Republic of Congo toward meeting the SDGs and the study findings of Ali-Risasi et al. (2015) on cervical cancer in Kinshasa and that of Kalisya et al. (2017) on cancers, and the report of PATH (2016) on the state of immunization in Democratic Republic of Congo; I came to the conclusion that Congolese PCPs were not providing APHS and appropriate vaccines to the Congolese people. Even after I conducted an extensive literature review on why Congolese PCPs were not dispensing APHS; still, I was not able to find a definite explanation; little was known about the Congolese PCPs' behavioral intention toward the delivery of APHS to explain these poor health indicators and shortcomings. Therefore, to examine the behavioral intention of Congolese PCPs in the delivery of APHS, I conducted this study to test the pertinence of TPB to predict the provision of APHS by Congolese PCPs by examining the relationship between its constructs of attitude, subjective norms, and perceived behavior control and behavioral intention of Congolese PCPs (Sharma, 2017). TPB has been applied in several preventive studies to establish a relationship between attitude and behavioral intention to engage in a preventive behavior (Sharma, 2017); for example, Ayodele (2017) conducted a cross-sectional study among Nigerian university undergraduate students to test the TPB as a predictor of HIV testing intention.

Moreover, it was essential to conduct this study in the Democratic Republic of Congo because of the uniqueness of attitude, subjective norms, perceived behavioral control, and behavioral intention of different PCPs across the world and the presence of local facilitator and inhibitor factors (Labat & Sharma, 2016; PATH, 2016). For instance, Hurley et al. (2014, 2016) reported that the low vaccination rate uptake in the United

States was due to several factors including attitude toward and the behavioral intention of PCPs in providing APHS while dealing with the complexity of a vaccination schedule, a lack of regular assessments of vaccine status, insufficient stocking of some vaccines, and financial disincentives for vaccination in the primary care setting. The human papillomavirus (HPV) vaccine uptake in the United States remained suboptimal mostly because of uncomfortable discussions between parents and providers regarding sexual practices of adolescents, resulting in the delay and or refusal of the vaccine (Porter, Amin, Bednarczyk, & Omer, 2018). On the other hand, Botha and Richter (2015) argued that in South Africa the unacceptable low HPV vaccination and cervical cancer screening were primarily due to a low doctor/population ratio, inadequate training of healthcare professionals, a high prevalence of HIV infections, competing healthcare needs, and sparse population health literacy. In Middle Eastern countries, for religious and cultural reasons, only female general practitioners were allowed to collect sensitive data in breast cancer screenings in Riyadh, Saudi Arabia, excluding male PCPs from providing APHS to female patients (Saeedi, Al Amri, Ibrahim, & Kassim, 2014). Although this study focused solely on the provision of APHS to adults, a look at the Democratic Republic of Congo children immunization coverage provided an idea about the state of immunization of Congolese people. According to Acharya, Kismul, Mapatano, and Hatløy (2018), almost two-thirds of children without immunization coverage lived in the Democratic Republic of Congo, Angola, Ethiopia, India, Indonesia, Iraq, Nigeria, Pakistan, the Philippines, and Ukraine. To be considered fully immunized, children would have received one dose of Bacillus Calmette–Guérin (BCG) vaccine, three doses of the polio



vaccine, three doses of diphtheria, pertussis, and tetanus (DPT) vaccine, and a dose of measles vaccine; hence, the authors reported that roughly 45.3% [95% CI: 42.02, 48.52] of children aged 12–23 months were fully immunized in the Democratic Republic of Congo (Acharya et al., 2018).

In the Democratic Republic of Congo for instance, cultural and religious beliefs and practices, lack of public health policy, lack of government support, the socioeconomic burden on PCPs, poor remuneration, and lack of financial incentives of PCPs, the load of patients, lack of expertise and logistics, continuous wars and insecurity were potential factors that must be accounted for in the attitudes and behavioral intention of Congolese PCPs to provide APHS and other appropriate surgical and medical care (Labat & Sharma, 2016). The majority of Congolese people including physicians and patients believe in witchcraft, and as such, wizardry is blamed for premature death, infertility, accidents, and other misfortunes (Labat & Sharma, 2016; Modibbo et al., 2016). Polygamy and obesity are viewed in the Congolese society as a sign of wealth; hence, an obese and polygamous PCP would not be inclined to educate patients that obesity was a risk factor for coronary artery disease and that a polygamous relationship was a risky sexual behavior that could spread HIV and other sexually transmitted diseases (STDs) that could induce infertility (Afolabi, 2017; Inungu & Karl, 2006). Congolese women believed that the use of traditional medicine for vaginal hygiene was the cause of cervical cancer instead of HPV (Ali-Risasi et al., 2015).

The literature review has revealed that throughout the world, PCPs are facing local specific and various challenges while providing APHS to the public including

religious and cultural barriers, population poor health literacy, lack of national guidelines, lack of financial incentive, complexity of vaccination schedule, patient overload, lack of adequate training and lack of supplies and equipment. Therefore, I would not generalize the attitude, subjective norms, perceived behavioral control and the behavioral intention of American PCPs toward the delivery of APHS or that of Middle Eastern Mediterranean Region countries PCPs to the rest of the world PCPs in general or to the Congolese PCPs in particular. It was crucial that I conducted this study in the Democratic Republic of Congo not only to test the TPB in predicting the provision of APHS by examining the relationship between attitudes, subjective norms, perceived behavioral control, and behavioral intention of Congolese PCPs, and to gain insight on their practice and the possible inhibitors and facilitators in the face of poor health outcomes and short life expectancy of Congolese people, but also to devise strategies to boost positive attitude, subjective norms, behavioral control and behavioral intention of Congolese PCPs in the provision of APHS.

### **Problem Statement**

Although the provision of preventive services, health promotion and health maintenance has become the cornerstone of primary care practice in the United States (Hurley et al., 2016; Salazar, Crosby, & DiClemente, 2015), Europe and countries in the East Mediterranean Region (Qidwai et al. 2015), Congolese healthcare professionals were not providing APHS in the Democratic Republic of Congo on the consistent basis. For instance, a national program for early detection of cervical cancer did not exist (Ali-Risasi, Mulumba, Verdonck, Broeck, & Praet, 2014). As a matter of fact, out of 524

women surveyed in the capital city of Kinshasa, Ali-Risasi et al. (2014) reported that only 9% of the participating women had had cervical cancer screening. Moreover, Kalisya, Bake, Bigabwa, Rothstein, and Cairo (2018) reported on the challenges and the limited access and early prevention and treatment of cancers in the eastern Congo.

This study was essential to understand why Congolese PCPs were not providing needed preventive services to the general public to mitigate the Democratic Republic of Congo's poor health outcomes such as high infant mortality of 68 deaths per 1,000 live births, high DM prevalence at 10.1% (Jacques, Xie, Xu, & Boping, 2015), a continuous increase in the prevalence of hypertension and overweight/obesity among adult urban Congolese (Bayauli et al., 2018), high rate of premature deaths and short life expectancy at 60.5 years (WHO, 2018). Furthermore, examining the behavioral intention of Congolese PCPs in the provision of APHS was even more crucial because studies have shown that a recommendation from a healthcare professional was the most influential predictor of individuals getting needed vaccines and other preventive services (Strikas, 2017). More specifically, Gerend, Shepherd, Lustria and Shepherd (2016) have suggested that physician recommendation was one of the strongest predictors of HPV vaccination.

Unfortunately, published literature showed a gap in the behavioral intention of Congolese PCPs in the provision of preventive services; and several cancer studies conducted in the Democratic Republic of Congo had focused merely on diagnosing and treating different types of cancers (Kalisya et al., 2018). Moreover, patients have been the sole participants of these studies and scarce studies have targeted PCPs as preventive service providers (Maketa et al., 2013). Therefore, the problem that I tackled in this study

was that despite thorough and exhaustive research, there was a lack of scholarly research on the attitude and the behavioral intention of Congolese PCPs in delivering APHS in the Democratic Republic of Congo.

### **Purpose of the Study**

The purpose of this mixed-methods study was to test the TPB constructs (attitude, subjective norms, perceived behavioral control) in predicting the behavioral intention of Congolese PCPs in the provision of APHS as directed by the USPSTF guidelines and ACIP recommended vaccines. The USPSTF and the ACIP provide two extensively used sets of national recommendations to guide the delivery of preventive care (Hurley et al., 2016). In this study, I assessed the current practice of Congolese PCPs in the delivery of preventive services. My third goal was to design strategies to enhance the adoption and provision of APHS by Congolese PCPs.

Moreover, this study provided an opportunity to foster the involvement, empowerment, and ownership of the provision of APHS by crucial stakeholders (Congolese PCPs) through the decision-making process, planning, and implementation, which are vital factors for the eventual successful adoption and implementation of APHS in Democratic Republic of Congo. Finally, public health officials could use the study findings in devising APHS policy with the input of key stakeholders (PCPs) in full knowledge of barriers and facilitators to the delivery of APHS.

### **Research Questions and Hypotheses**

Research Question 1 (RQ1): To what degree can Congolese PCPs' attitudes predict their behavioral intention for the provision of the best practices in disease prevention and health promotion as set forth by the USPSTF and ACIP?

Null Hypothesis 1 ( $H_01$ ): There is no statistically significant relationship between the attitude of Congolese PCPs and their behavioral intention for the provision of best practices in disease prevention and health promotion as set forth by the USPSTF and ACIP guidelines.

Alternative Hypothesis 1 ( $H_11$ ): There is a statistically significant relationship between the attitude of Congolese PCPs and their behavioral intention for the provision of best practices in disease prevention and health promotion as set forth by the USPSTF and ACIP guidelines.

RQ2: To what degree can Congolese PCPs' subjective norms predict their behavioral intention for the provision of the best practices in disease prevention and health promotion as set forth by the USPSTF and ACIP guidelines?

$H_02$ : There is no statistically significant relationship between the subjective norms of Congolese PCPs and their behavioral intention for the provision of best practices in disease prevention and health promotion as set forth by the USPSTF and ACIP guidelines.

$H_12$ : There is a statistically significant relationship between subjective norms of Congolese PCPs and their behavioral intention for the provision of best practices

in disease prevention and health promotion as set forth by the USPSTF and ACIP guidelines.

RQ3: To what degree can Congolese PCPs' perceived behavioral control predict their behavioral intention for the provision of the best practices in disease prevention and health promotion as set forth by the USPSTF and ACIP guidelines?

*H03*: There is no statistically significant relationship between the perceived behavioral control of Congolese PCPs and their behavioral intention for the provision of best practices in disease prevention and health promotion as set forth by the USPSTF and ACIP guidelines.

*H13*: There is a statistically significant relationship between the perceived behavioral control of Congolese PCPs and their behavioral intention for the provision of best practices in disease prevention and health promotion as set forth by the USPSTF and ACIP guidelines.

RQ4: To what degree can Congolese PCPs' attitudes, subjective norms, and perceived behavioral control together while controlling for gender and age, predict their behavioral intention for the provision of the best practices in disease prevention and health promotion as set forth by the USPSTF and ACIP guidelines?

*H04*: There is no statistically significant relationship between the attitude, subjective norms, and perceived behavioral control while controlling for gender and age of Congolese PCPs, and their behavioral intention for the provision of best practices in disease prevention and health promotion as set forth by the USPSTF and ACIP guidelines.

*H<sub>14</sub>*: There is a statistically significant relationship between the attitude, subjective norms, and perceived behavioral control while controlling for gender and age of Congolese PCPs, and their behavioral intention for the provision of best practices in disease prevention and health promotion as set forth by the USPSTF and ACIP guidelines.

### **Theoretical Foundation**

This study was mainly a mixed-methods study based on TPB. Although the TPB is habitually used to help elucidate patient behavior; Roberto, Krieger, Katz, Goei, and Jain (2011) argued that the TPB should also apply to predict primary care provider behavior. According to the TPB, the best predictor of behavior (i.e., what a person does) is the behavioral intention (i.e., a person's intention to perform or not perform the behavior). The behavioral intention, in turn, is a joint function of a person's attitude toward achieving the behavior (i.e., the individual's favorable or unfavorable predispositions toward the behavior), subjective norms (i.e., the individual's perception of the behavior expected by relevant significant others), and perceived behavioral control (the degree to which a person believes he or she can control the behavior in question) (Sharma, 2017). I used TPB as a framework to explore the modulating effect of critical factors (enablers and inhibitors) of the behavioral intention of Congolese PCPs. Studies have shown that U.S. primary healthcare providers expressed some frustrations in providing preventive services mostly due to the lack of time to comply with USPSTF and ACIP recommendations, the complexity of the guidelines, and the low financial return in delivering preventive services (Hurley et al., 2016).

Professor Icek Ajzen developed the TPB in the late 1980s and early 1990s; it stems from the theory of reasoned action (TRA) to which Ajzen added the construct of perceived behavioral control (Cornally, 2014; Fitzpatrick & McCarthy, 2014; Roberto et al., 2011; Sharma, 2017). The more favorable the attitude and subjective norm, and the higher the perceived control, the stronger should be the person's intention to perform the behavior in question; the immediate precursor of behavior is the intention (Ajzen, 1991). Also, the TPB is best suited to ascertain and grasp modifiable variables that predict and elucidate a multitude of sundry behaviors, such as the provision of preventive services (Fitzpatrick & McCarthy, 2014).

According to Sharma (2017), there are 11 constructs of TPB; the first eight constructs are components of both TRA and TPB. Ajzen added three more constructs to create the TPB (Sharma, 2017). Behavior is the first construct; it is a single observable action performed by an individual (Sharma, 2017). Behavioral intention is the second construct; it is a thought to perform a behavior and is a crucial determinant of specific behavior (Sharma, 2017). Behavioral intention is considered the hallmark of the TPB (Sharma, 2017). Attitude toward the behavior is the third construct; it is the overall feeling of like and dislike toward a behavior (Sharma, 2017). Behavioral beliefs are the fourth construct; they are a determinant of attitude toward the behavior; they are beliefs that performing a specific behavior will lead to certain outcomes (Sharma, 2017). Outcome evaluations are the fifth construct; they represent the value a person places on each outcome resulting from the performance of the behavior (Sharma, 2017). Both the behavioral and outcome evaluations determine the attitude toward the behavior (Sharma,

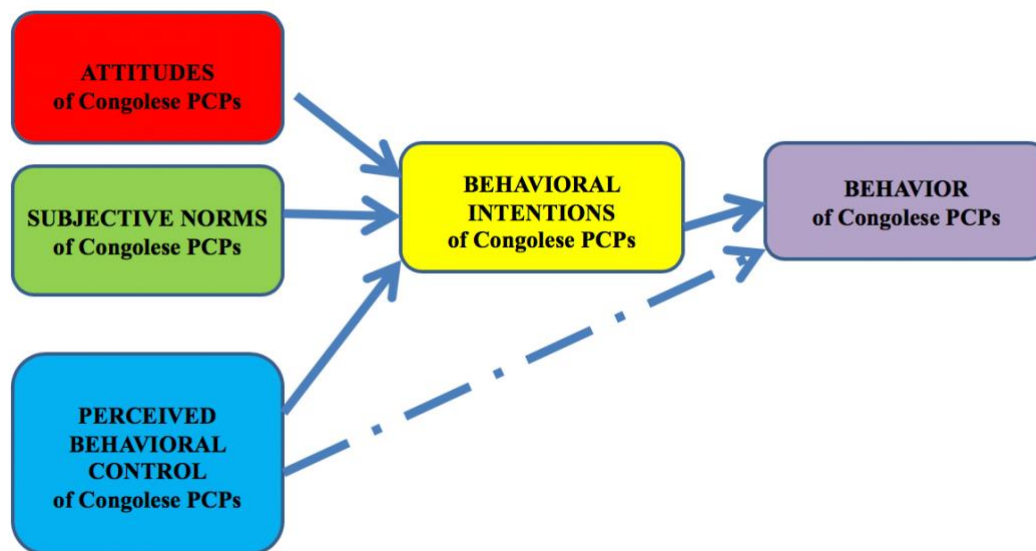


2017). The subjective norm is the sixth construct; this characterizes a person's belief that most of the significant others in his or her life think the person should or should not perform the behavior (Sharma, 2017). Normative beliefs are the seventh construct; this refers to how a person thinks others who are significant in his or her life would like him or her to behave (Sharma, 2017). The motivation to comply is the eighth construct; this represents the degree to which a person wants to act per the perceived wishes of those significant in his or her life (Sharma, 2017). Perceived behavioral control is the ninth construct; this is how much a person feels he or she is in command of enacting the given behavior (Sharma, 2017). The tenth construct is control beliefs; these are beliefs about internal and external factors that may inhibit or facilitate the performance of the behavior (Sharma, 2017). The final and eleventh construct is perceived power; this represents a person's perception of how easy or difficult it is to perform the behavior in each condition identified in that person's control beliefs (Sharma, 2017).

Of the 11 TPB constructs, I identified the following four to evaluate and predict the behavior of Congolese physicians appropriately: attitude, subjective norms, perceived behavioral control, and behavioral intention of Congolese PCPs. Attitude toward the behavior is the overall feeling of like and dislike toward a behavior (Sharma, 2017). The subjective norm characterizes a person's belief that most of the significant others in his or her life think the person should or should not perform the behavior (Sharma, 2017). Perceived behavioral control is how much a person feels he or she is in command of enacting the given behavior (Sharma, 2017). Behavioral intention is a thought to perform a behavior and is a crucial determinant of specific behavior (Sharma, 2017). To wrap-up,

the more favorable the attitude and subjective norm, and the higher the perceived control, the stronger should be the person's intention to perform the behavior in question (Ajzen, 1991). Furthermore, when given an ample degree of genuine or tangible control over the behavior, and when the opportunity crops up, individuals are more likely to carry out their intentions (Ajzen, 1991). Therefore, the immediate precursor of behavior is the intention (Ajzen, 1991).

Congolese PCPs are vital stakeholders in the provision of preventive services and would play a pivotal role in the adoption and implementation of USPSTF guidelines, and ACIP recommended vaccinations. Furthermore, Congolese PCPs are responsible for advising and providing the timely needed preventive services to their patients and the general public. With the provision of preventive services by Congolese PCPs as the planned behavior, I utilized the TPB to guide and structure the entire study and to allow for a framework to be developed for literature review as well (Fitzpatrick & McCarthy, 2014). Moreover, researchers have been able to measure both directly and indirectly all four constructs of the TPB namely attitude, subjective norms, perceived behavioral control, and the behavioral intention; in previous health studies, researchers had been able to operationalize the TPB constructs (Fitzpatrick & McCarthy, 2014).



*Figure 1.* Theory of planned behavior constructs hypothesized to examine Congolese PCPs provision of APHS

### **Nature of the Study**

As suggested by Ajzen (1991) when using the TPB as the theoretical foundation, I used a mixed-method with an elicitation study followed by a quantitative cross-sectional survey design with three independent or predictor variables (attitude, subjective norms, and perceived behavioral control) and one dependent or outcome variable (the behavioral intention to provide preventive services). The purpose of the study was to predict whether the independent variables (attitude, subjective norms, and perceived behavioral control) would impact the behavioral intention of PCPs to provide preventive services based on USPSTF and ACIP guidelines. Therefore, through this study I would establish: Whether Congolese PCPs were in favor of delivering these preventive services (‘attitude’); how

much did the Congolese PCPs feel social pressure to provide them ('subjective norm'); and whether the Congolese PCPs felt in control of the provision of preventive services (perceived behavioral control) (Ajzen, 1991; Francis et al., 2004).

After securing approval from the Walden University Institutional Review Board (IRB) and individual informed consent from participants, I collected data in the more peaceful western part of the country, among Congolese PCPs practicing in state-run hospitals and faith-based hospitals of the metropolitan area in the capital city of Kinshasa, and two western provinces of Kwilu and Kongo Central for approximately five months. See map in Appendix A. Because of a lack of internet access and an inexistent national postal service, I collected data through structured questionnaire surveys that I personally distributed to consenting PCPs and I returned to collect the filled survey a week later. I developed my survey questionnaire to encompass five significant data, namely (1) a set of demographic questions which provided information about the participants (Congolese PCPs); (2) questions about current practices of preventive services by Congolese PCPs; (3) questions which provided direct measures of all three predictor variables (attitude, subjective norms, and perceived behavioral control); (4) questions drawn from the elicitation study, which were belief-based measures of the same three predictor variables; and (5) a set of questions to assess behavioral intention (Ajzen, 1991; Francis et al., 2004; Qidwai et al., 2015).

The study participant sample was purposive, a sampling that was nonrandomized to produce further insight rather than to generalize findings (Berman & Wang, 2012). I only targeted Congolese PCPs practicing in Kinshasa and in the provinces of Kongo

Central and Kwilu for recruitment and I conducted a power analysis to determine the sample size to detect a statistically significant relationship or effect (Rudestam & Newton, 2015; Salazar et al., 2015). I calculated the adequate sample size for the study using the G\* Power 3.1; I set the alpha level at 0.05, the statistical power at .80 or 80%, medium effect size ( $R^2$ ) at .13 (Ellis, 2010), and I factored in the three predictors of the TPB and the multiple regression analysis. With a medium-size predictor effect of .0545, a medium-size multiple- $R^2$  of .13 gave me a residual variance of .87, after subtracting 1 from .13, which also yielded a  $f^2$  value of .0626. After running the numbers using G\*Power 3.1, I calculated the sample size of 128 participants (see Appendix G).

Although Francis et al. (2004) had suggested doubling the number of participants since the response rates were often around 50%; however, instead of distributing only 256 questionnaires to achieve the estimated sample size of 128 participants, I decided to recruit at least 300 participants for this study. According to Bujang, Sa'at, and Bakar (2017), the ideal sample size for multiple linear regression should be at least 300 participants; and this was pertinent for this study since the data collection was conducted in a non-random manner and also to eliminate the influence from the confounders' variables. All PCPs, men and women, aged 24 to 69 years old, and practicing in the Capital city of Kinshasa, and in the provinces of Kwilu and Kongo Central, were potential participants (See Appendix A). A PCP was defined as a general practitioner, pediatrician, obstetrician-gynecologist, internist, general surgeon, and family physician. I excluded all nurses and other non-physician public health workers from the study due to their lack of skills to conduct specific screening procedures such as the Papanicolaou test

or Pap-smear. Since French was the official language spoken in Democratic Republic of Congo, I had to translate the questionnaire survey into French. Then, I conducted a process of validation by using ‘back-translation’ methods of the translated questionnaire (translating back into the original language to establish equivalence with the original version) and a pilot study (Francis et al., 2004). I included both English and French translated versions of questionnaires and informed consent forms in my quest for IRB approval (see Appendices G & J). I ensured privacy, confidentiality, and safeguarding of sensitive health information per Health Insurance Portability and Accountability Act (HIPAA) regulations to gain the confidence and trust of physicians (Salazar et al., 2015). I analyzed data using SPSS after I input data in the computer.

I performed statistical analysis in two stages: descriptive and inferential. In the first step, I analyzed demographic data such as age and gender using descriptive statistics as suggested by Qidwai et al. (2015). In the second step, I conducted multiple regression analyses to examine the relationship between predictor variables (attitude, subjective norms, and perceived behavioral control) and the dependent variable (behavioral intention to provide preventive services). I also studied the impact of factors that promoted or hindered PCPs to deliver preventive services.

### **Operational Definitions**

*Advanced Preventive Health Services (APHS)*: For this study, I defined APHS as the combination of USPSTF recommendations A and B, ACIP recommended vaccines,

health promotion, health education and positive lifestyle modification (Aschengrau & Seage, 2014).

*Advisory Committee on Immunization Practices (ACIP):* A group of 15 experts in vaccination who review the evidence and make recommendations to the CDC on the use of vaccines (Centers for Disease Control and Prevention, 2014). ACIP publishes adult and pediatric immunization schedules annually and in 2010 adopted a framework for developing evidence-based recommendations based on the GRADE (Grading of Recommendations, Assessment, Development, and Evaluation) approach (Hurley et al., 2016).

*Attitudes:* Is the overall feeling of like and dislike toward a behavior; it is enduring belief with a firm evaluative component and an affective component as well (Sharma, 2017). Attitudes were one of the independent variables and were measured by self-reporting on a seven-point semantic differential rating scale.

*Behavior:* Refers to “any overt action, conscious or unconscious, with a measurable frequency, intensity, and duration” (Sharma, 2017, p.3); moreover, behavior is the single, observable action performed by an individual or a category of actions with a specific target, action, context, and time (TACT) (Sharma, 2017). In this particular study, the target was Congolese people; the action was the provision of APHS; the context was screening and prevention of diseases, and the time was during the consultation. Behavior is also an important indicator of change in health education and health promotion for people and in training, seminars, continuing education, and in-service programs for health professionals (Sharma & Petosa, 2014). Most significantly for this study was the concept

postulated by Ajzen and Fishbein (1980) that behavioral categories encompass sets of actions instead of a single action; therefore, the provision of APHS could be considered as behavioral categories involving sets of actions that could be predicted using the TPB (Sharma, 2017).

*Behavioral intention:* A thought to perform a behavior and is a crucial determinant of specific behavior (Sharma, 2017). Behavioral intention is the immediate precursor of a given behavior; therefore, the behavioral intention was the dependent variable, and it was measured by self-reporting on a seven-point Likert scale as a metric variable.

*Check-up examination:* Described as a health care guided by the need to evaluate general health and prevent future ailment rather than to treat symptoms (Virgini, Meindl-Fridez, Battegay, & Zimmerli, 2015). The last few decades and nowadays have seen an increase in the clinical and public health value of periodic health checks, also known as check-up examinations, or periodic health examinations (PHEs) in the daily practice of PCPs (Virgini et al., 2015). One of the provisions in the Affordable Care Act (ACA) promotes the annual wellness visit for Medicare beneficiaries, and the annual wellness visit mandates the elaboration of a preventive care plan (Hurley et al., 2016). PHEs claim to identify risk factors and initial symptoms of the disease and to preclude impending malady by early intervention (Virgini et al., 2015). Hence, each PHE should include counseling, immunization, and physical examination according to the patient's age and gender; counseling and vaccinations are the bedrocks of primary prevention (Virgini et al., 2015). Counseling about lifestyle, smoking cessation, alcohol abuse, and safe sexual



behavior are some of the examples of primary disease prevention (Virgini et al., 2015). According to the Canadian Task Force on preventive health care, the adoption of periodic preventive health visits was an adequate approach to provide preventive services instead of delivering annual checkups (Birtwhistle, Bell, Thombs, Grad, & Dickinson, 2017).

*Control beliefs:* One aspect of behavioral control; these are beliefs about internal and external factors that may inhibit or facilitate the performance of the behavior (Sharma, 2017).

*Disease prevention:* Defined as a procedure consisting of the treatment of individuals, particularly those at risk of contracting a disease and preventing disease occurrence (Sharma, 2017). Prevention methods include vaccination, lifestyle modification, health education and counseling and medication. Disease prevention typically works in tandem with health promotion programs and can be achieved at three levels namely primary, secondary and tertiary prevention (Sharma, 2017). Primary prevention consists of preventive actions undertaken before the onset of a disease or injury to get rid of the likelihood of its ever happening; secondary prevention consists of actions that impede the headway of an injury or disease at its initial phase; while tertiary prevention consists of activities undertaken after the occurrence of the illness or injury with the purpose to support an individual with the disease or disability (Sharma, 2017).

*Health literacy* refers to an individual's capacity to acquire, interpret and grasp necessary health information and services, as well as their competence to use such information and services in ways that are health enriching (Sharma, 2017). It has been propelled to the forefront of healthcare practice and has become a crucial health

determinant for achieving high-quality care (American College of Obstetricians and Gynecologists, 2014). Furthermore, improved health literacy protects and ensures the right (autonomy) of patients to provide informed consent and to empower them to participate actively in their care.

*Health promotion* has become a cornerstone of endeavors aimed at preventing morbidity and premature mortality (Smedley & Syme, 2000; Salazar et al., 2015). Staple undertakings of health promotion encompass the primary and secondary prevention of disease and health-debilitating conditions (Salazar et al., 2015). Health promotion is achieved via the provision of support in the form of educational, social, legislative, political, organizational and community-based resources (Sharma, 2017). Hence, the crux of health promotion consists of the development, implementation, evaluation, and publication of programs whose explicit aim is to improve the health of human beings (Salazar et al., 2015).

*Perceived behavioral control*: Refers to how much a person feels he or she is in command of enacting the given behavior (Sharma, 2017). It is the third independent variable and will be measured by self-reporting on a seven-point Likert scale as a metric variable (Sharma, 2017).

*Primary care physicians (PCP)*: Refers to a health practitioner who practices general medicine and delivers continuous, comprehensive medical care to his or her patients. In the context of this study, all PCPs practicing in state-run and faith-based hospitals in the metropolitan area of the capital city of Kinshasa, and in rural western provinces of Kongo-Central and Kwilu were the potential target population.

*Subjective norm*: Characterizes a person's belief that most of the significant others in his or her life think the person should or should not perform the behavior (Sharma, 2017). It is the second independent variable and was measured by self-reporting on a seven-point Likert scale as a metric variable (Sharma, 2017).

*United States Preventive Services Task Force (USPSTF)*: Refers to an independent panel of primary care providers who are experts in evidence-based medicine conducts scientific evidence reviews of clinical preventive services and grades their recommendations, based on the evidence, as A (strongly recommends), B (recommends), C (no recommendation), D (not recommended), and I (insufficient evidence to make a recommendation) (Hurley et al., 2016; Preventive Services Task Force (US), 2014). Sebo, Maisonneuve, Fournier, Senn, and Haller (2017) asserted that the USPSTF recommendations and the Canadian Task Force on Preventive Health Care (CTFPHC) provide evidence-based guidelines for the provision of preventive care by PCPs and that physicians in French-speaking countries of Europe frequently depend on these North American guidelines, in conjunction with explicit state recommendations.

### **Assumptions**

I assumed that if the majority of Congolese PCPs were trained and acquired knowledge, skills, and positive attitude (KSA) toward USPSTF and ACIP guidelines; then, there was a high probability that their behavioral intention to provide the best practices in disease prevention, health promotion, and periodic health check would dramatically improve. I also assumed that if the Congolese public health officials had formulated and enacted evidence-based preventive health policy that encompassed

USPSTF and ACIP guidelines; there would be an increased social pressure in Congolese PCPs' intention to provide the best practices in disease prevention, health promotion and periodic health check. Finally, I assumed that if the Congolese government and international organizations had provided facilitators (financial incentive, medical equipment, and supplies, vaccine supply, stocks and refrigeration, adequate transportation means, electrical power supply) and had removed potential inhibitors (administrative roadblock, religious beliefs, cultural practices, complexity of schedules, and poor PCPs/patients ratio), there was the likelihood that Congolese PCPs would acquire greater perceived behavioral control that would boost their intention to provide the best practices in disease prevention, health promotion, and periodic health checks.

However, despite more favored attitude and subjective norms and higher perceived control over the intention to deliver APHS as directed by USPSTF and ACIP guidelines; a stronger behavioral intention would not necessarily translate into the provision of the best practices in preventive services depicted in the USPSTF and ACIP guidelines. Even if all the inhibitors were removed and PCPs received an incentive to provide preventive services; there was no assurance that all PCPs would provide the best preventive care to the Congolese people. Other unforeseen conditions such as cultural, religious, and financial barriers might have precluded Congolese PCPs to provide APHS.

### **Scope and Delimitations**

Although the provision of all USPSTF Grade A and Grade B services and ACIP-recommended vaccines would be ideal for examining the Congolese PCPs' attitude, subjective norms, and perceived behavioral control in relation to behavioral intention;

however, based on the immediate impact on mortality and morbidity, the practicality on the field, and limited resources, I focused in this study on the following preventive services: cervical cancer screening, colorectal cancer screening, blood pressure screening, HIV screening, DM screening, lifestyle modification: tobacco screening, healthy diet, and physical activity counseling to prevent cardiovascular disease (CVD), and obesity screening and counseling (U.S. Preventive Services Task Force, 2018). I included the ACIP recommended vaccinations and schedules for Hepatitis B vaccine and HPV vaccine (Hurley et al., 2016); as for the other vaccines such as the Influenza vaccine, measles, mumps, and rubella (MMR) vaccine, meningococcal vaccine, Polio vaccine, and Tetanus vaccines, the Expanded Program of Immunizations (EPI) had been providing them in conjunction with UNICEF (Machingaidze, Wiysonge, & Hussey, 2013).

Although different categories of healthcare professionals including public health workers and nurses were capable of delivering preventive services, health promotion and education; for the sake of this study, I recruited only PCPs because of some technical aspect, required knowledge, and expertise to conduct specific screening procedures such as pelvic gynecologic exam to perform Pap smear and rectal exam, sigmoidoscopy, and colonoscopy to conduct colorectal cancer screening. Furthermore, more specialists were not inclined to provide preventive services; therefore, I excluded some of them for this study. I chose urban, rural, state-run and faith-based hospitals as research sites to diversify the pool of participants and to include those with different religious and cultural backgrounds.

A significant delimitation of the study concerned the restriction of the study sample pool to the PCPs practicing in the west of the country due mostly to the insecurity, violent rape, kidnappings, and killings in the eastern and central provinces of the Democratic Republic of Congo (Harvard Humanitarian Initiative, 2014; HEAL Africa, 2016; Kelly, 2010). As a result, the sample size might not be representative and adequate, and the generalization of the findings might be affected. Though, Ajzen (2006) and Francis et al. (2004) have recommended measuring attitude both directly and indirectly; however, for reasons of practicality and convenience, I only conducted direct measurement of the attitude of Congolese PCPs to respond to research questions, as well as the direct measurements of the subjective norms and perceived behavioral control of Congolese PCPs (Francis et al., 2004).

### **Limitations**

I categorized the significant limitations of this study into limitations related to TPB, to the cross-sectional design, to sampling methods, to the sample size, to the collection of data methods and logistics. The prominent limitation of using TPB to predict Congolese PCPs provision of preventive services as recommended by USPSTF and ACIP guidelines was that strong behavioral intention did not necessarily translate into actual behavior (Sharma, 2017). Despite TPB's ability to appropriately predict behavioral intention and behavior, it is unable to adequately explain behavior change. Furthermore, TPB does not consider individual personality-related factors, cultural factors, religious factors, and demographic variables that shape behavior (Sharma, 2017). Other significant limitations of TPB included the impossibility to obtain an objective

measurement of some sensitive, expensive, and time-consuming behaviors; researchers had to rely on measurement by self-report; thus, the possibility of introducing information bias such as respondent bias in the findings of the study and biases are a threat to the validity of the study (Szklo & Nieto, 2014).

Although a cross-sectional design, which is a snapshot of data at a specific time or period (day, month, or year), was suitable and cost-effective for this study; unfortunately, a cross-sectional design is subject to both selection bias and information bias (Szklo & Nieto, 2014. P.134). Moreover, a causal relationship cannot be established between independent and dependent variables; temporal order, which is one of Hill's guidelines or criteria for causality, would require the presence of a right temporal sequence such as in a prospective design (Berman & Wang, 2012; Salazar et al., 2015; Szklo & Nieto, 2014). The introduction of selection bias during the recruitment of participants was another significant weakness of cross-sectional designs and was due to a lack of accessibility to targeted population members in remote areas; selection bias might affect the validity of study findings (Salazar et al., 2015; Szklo & Nieto, 2014). Since the study did not randomize the participants and used a purposive sample of PCPs practicing in the more peaceful western part of Democratic Republic of Congo, the sample of participants was not a representative of all Congolese PCPs; thus, negatively affecting the external validity or generalizability of the study findings (Berman & Wang, 2012; Salazar et al., 2015). The use of surveys to collect data might have introduced bias due to religious beliefs and restrictions in faith-based hospitals; hence made it difficult to gather genuine attitudes and perceptions of PCPs on specific issues such as the use of condoms and oral

contraceptive pills, especially in Catholic Hospitals. Male PCPs might give up conducting cervical cancer screening in Muslim women. Cultural practice such as the archaic practice of widow inheritance might discourage PCPs to educate women in the prevention of HIV transmission from an infected brother-in-law (Inungu & Karl, 2006). The belief in wizardry and the use of traditional medicines might render PCPs helpless and forced them to lose interest and motivation in educating patients about the transmission and prevention of preventable diseases and cancers (Ali-Risasi et al., 2015; Inungu & Karl, 2006; Moddibo, 2016). The lack of adequate equipment and supplies might make it impossible for Congolese PCPs to conduct screening of cervical and colon cancers, despite their skills and willingness to perform them. However, the lack of adequate training for some physicians and the financial loss of conducting these APHS might constitute serious barriers to adopt USPSTF and ACIP guidelines.

### **Significance of the Study**

This research would fill a gap in studying the behavioral intention of Congolese PCPs in the provision of APHS as directed by USPSTF and ACIP guidelines. Moreover, I examined the impact of facilitators and barriers to the delivery of the APHS in the Democratic Republic of Congo. Most significantly, this study had the potential to drastically change and enhance the practice of preventive services in the Democratic Republic of Congo. Therefore, elucidating Congolese primary PCPs' behavioral intention toward the delivery of preventive care, and identifying potential facilitators and barriers were crucial for the successful provision of APHS per the USPSTF and ACIP guidelines.



Also, through this study I was able to elucidate the current practices of Congolese PCPs as preventive service health providers and to assess their role or lack of contribution to explaining the poor health outcomes in Democratic Republic of Congo. Policy-wise, this research has the makings of assisting public health officials in devising national health policy of developing health promotion programs, of encouraging patient health education, of promoting the delivery of high quality of care, of advocating a healthy lifestyle, of decreasing morbidity and mortality from preventable diseases and cancers, and of ultimately enhancing life expectancy of the Congolese. In a country where national healthcare expenditures are abysmal, this study had the potential to motivate policymakers and legislators to invest more in APHS since prior studies have shown that preventable diseases and modifiable risk factors skyrocketed healthcare costs (Koh & Parekh, 2018).

### **Significance to Theory**

This study provided an ideal application of the TPB in the context of a developing country with a myriad of several socioeconomic problems, political instability, deprived medical infrastructures, and potential cultural and religious challenges. Predicting the provision of APHS by Congolese PCPs using the TPB should contribute to advance knowledge to motivate Congolese PCPs effectively to prevent morbidity and premature death in Democratic Republic of Congo where infectious disease outbreaks are recurrent and where preventable chronic diseases are now affecting the quality of life and the overall life expectancy (WHO, 2018a).

**Significance to Practice**

This study has the potential to drastically change the way preventive medicine was practiced in the Democratic Republic of Congo. USPSTF and ACIP recommendations are evidence-based preventive services if fully adopted and implemented by Congolese PCPs should improve the quality of care in Democratic Republic of Congo. Since based on the TPB, this study was helpful in designing strategies to assist Congolese PCPs to enhance the uptake of USPSTF and ACIP guidelines (Francis et al., 2004).

Moreover, this study provided an opportunity for Congolese PCPs to become familiar with evidence based APHS, and to be trained and acquire new knowledge, skills, and a positive attitude (KSA) toward APHS. Furthermore, this study provided a channel for Congolese PCPs to express their feelings, enthusiasm or lack of, and frustrations toward the provision of APHS; to evoke barriers and facilitators in the provision of the APHS. Therefore, this study provided a venue to involve and empower key stakeholders (PCPs) in the decision-making process, policy creation and implementation of APHS.

**Significance to Social Change**

Congolese PCPs and policymakers can use the study findings and recommendations not only to examine why so many Congolese people still experience preventable diseases and premature death but also to support and motivate PCPs to address and mitigate these shortcomings by providing evidence-based APHS as set forth by the USPSTF and ACIP guidelines, by crafting sound public health policy, by identifying and removing barriers, and by appropriately investing in these APHS. For

instance, instead of sending government officials overseas to Europe and the United States for high-cost treatment, the Congolese government can judiciously spend and invest its scarce resources in preventive care, health promotion, and health maintenance for the entire Congolese population. Therefore, this study has the makings of providing positive social change by enhancing the quality of primary care in Democratic Republic of Congo, by promoting a healthy lifestyle, by preventing and decreasing morbidity and premature death, by decreasing cost of healthcare, and ultimately by fostering healthy and productive long life of Congolese people.

### **Summary**

The delivery of APHS, health promotion, and health maintenance has become the mainstay of primary care practice in the United States, Europe and several Eastern Mediterranean Region countries. Furthermore, studies have shown that PCPs play a key role in educating, promoting, and swaying patients and family members in getting needed vaccines and appropriate preventive services. Unfortunately, healthcare delivery in the Democratic Republic of Congo remains reactive to disease outbreaks, and scant studies conducted on cervical cancer and colon cancer, for example, have shown that Congolese PCPS were not performing screening and preventive services on the majority of the Congolese population. Moreover, an extensive literature review showed a gap in the behavioral intention of Congolese PCPs in providing APHS. The lack of comprehensive preventive care policy, and the subsequent poor health outcomes and the low life expectancy of Congolese were strong indications to conduct this study to examine the behavioral intention of Congolese PCPs in the provision of APHS.

Through this study, I tested the TPB constructs to predict Congolese PCPs' behavioral intention to deliver the best practices in disease prevention, health promotion and periodic health checks. I had hypothesized that attitudes, subjective norms, and perceived behavioral control of Congolese PCPs would predict their behavioral intention to provide APHS as directed by USPSTF and ACIP guidelines. This study has the potential to foster positive social changes by improving the quality of preventive care services and the quality of life of several Congolese by decreasing the burden of preventable diseases and cancers, by reducing premature deaths, and ultimately by increasing the life expectancy of Congolese people.

## Chapter 2: Literature Review

### **Introduction**

The aim of this cross-sectional mixed-methods study was to test the TPB constructs (attitude, subjective norms, perceived behavioral control) in predicting the behavioral intention of Congolese PCPs in the provision of APHS as directed by the USPSTF guidelines and ACIP recommended vaccines. I conducted a systematic review of the previous and germane literature to highlight the knowledge gap of this topic in order to build a solid groundwork of the study and to define the theoretical underpinning of this study. By analyzing prior relevant studies, I was able to exclude areas with a surfeit of research and concentrate on uncovering areas where the research was warranted.

A literature review can be described as the "systematic, explicit and reproductive method for identifying, evaluating, and synthesizing the existing body of completed and recorded work produced by researchers, scholars, and practitioners" (Booth, Sutton, & Papaioannou, 2016). As such, a literature review is indispensable for scholarly research since it intends to summarize the available literature on a given topic of interest (Aveyard, 2014). The literature review is used by researchers to ascertain the essence and worth of studying a given topic and bestows insight to delimit the scope of the study (Creswell, 2014).

The literature review is considered as a vitally scientific endeavor that must be systematic in nature in order to uncover the whole truth rather than just one part of it; thus, the literature review helped identify, select, and appraise peer-reviewed studies

relevant to this topic (Booth et al., 2016). A proper research synthesis is useful to identify gaps in knowledge; hence, requiring further research (Booth et al., 2016). A sound literature synthesis reveals whether findings are consistent across several studies since disagreements among findings are constructive, and a good research synthesis highlights the weakness in the evidence. Both discrepancies and deficiencies make a case for further research (Booth et al., 2016). Finally, it was pertinent that the research questions oriented the literature review; in fact, the questions, the purpose of the study, and the intended audience should shape how the data are identified, collected, and presented (Booth et al., 2016).

In this chapter, I described the literature search strategy of the study; the theoretical perspective of the study (TPB) with its constructs, its applications, and its limitations. Moreover, I portrayed an overview of screening and prevention of selective diseases in Democratic Republic of Congo, a descriptive epidemiology of selected diseases in Democratic Republic of Congo, the use of the TPB constructs in the provision of APHS, and the role of demographics in the provision of APHS in the Democratic Republic of Congo. I ended the chapter with a brief summary of salient points.

### **Literature Search Strategy**

My strategy for conducting a thorough and systematic literature review consisted of identifying peer-reviewed articles using the following search engines, databases, books, reputable journals, and university libraries such as Google Scholar, Walden University library, ProQuest, Medscape, MEDLINE, UC Davis library, New England Journal of Medicine, CDC, and the WHO. I used a combination of keywords and phrases

such as *disease prevention, Democratic Republic of Congo, life expectancy, TPB, Congolese physicians, attitudes, behavioral intention, USPSTF, and ACIP* to pinpoint the appropriate literature for this study. Once identified, I reviewed and evaluated each article's abstract to determine its consistency with the topic of and theoretical model used in the study. I then conducted a thorough and systematic review of the full articles that were deemed suitable to my research topic, and I synthesized the critical points of the articles that had relevance to the topic. Finally, I saved all pertinent citations in RefWorks along with a Microsoft Word document for future reference.

### **Theoretical Perspective**

Theory plays a key role in scholarly research; it is a conception grounded on observations that channel the research question and bestows order and structure to an array of relationships (Salazar, Crosby, & DiClemente, 2015). More specifically, in a quantitative study, a theory is defined as a correlated arrangement of constructs or variables fashioned into propositions or hypotheses that denote the association among variables in terms of magnitude or direction (Creswell, 2014). The theoretical foundation of this study was based on the TPB, as argued by Roberto et al. (2011). TPB, which is an extension of the theory of reasoned action (TRA), could also apply to predict Congolese PCPs behavior in the delivery of APHS.

Professor Ajzen (1991) put forward that the underpinnings of the TPB stressed that planned behavior is the endpoint of behavioral intention, which is a zenith of attitude, subjective norms, and perceived control (Ajzen, 1991; Sharma, 2017). The term "theory of planned behavior" was first coined by Ajzen in the late 1980s and early 1990s; it stems

from the TRA developed by both Professors Ajzen and Fishbein (Sharma, 2017). From the TRA, Ajzen added the construct of perceived behavioral control to form the TPB (Cornally, 2014; Fitzpatrick & McCarthy, 2014; Roberto et al., 2011; Sharma, 2017).

Most significantly, the TPB extends the TRA by adding a direct link from perceived behavioral control (i.e., the degree to which a person believes he or she can control the behavior in question) to both behavioral intention and behavior (Roberto et al., 2011). With the TPB, Ajzen (1991) proposed a model through which human action is guided, and the TPB can predict the occurrence of a specific, intentional action or behavior (Ajzen, 1991; Francis et al., 2004; Sharma, 2017). According to the TPB, the best predictor of behavior (i.e., what a person does) is the behavioral intention (i.e., a person's intention to perform or not perform the behavior; Ajzen, 1991; Sharma, 2017). The behavioral intention, in turn, is a joint function of a person's attitude toward performing the behavior (i.e., the individual's favorable or unfavorable predispositions toward the behavior), subjective norms (i.e., the individual's perception of the behavior expected by relevant significant others), and perceived behavioral control (the degree to which a person believes he or she can control the behavior in question; Ajzen, 1991; Sharma, 2017). The TPB provides a framework to explore the modulating effect of critical factors (enablers and inhibitors) of the behavioral intention of Congolese PCPs. In closing, Ajzen (1991) postulated that the more favorable the attitude and subjective norm, and the greater the perceived control, the stronger should be the person's intention to perform the behavior in question.



## **Constructs of the Theory of Planned Behavior**

As eloquently described and illustrated by Sharma (2017) and shown in Figure 2, the TPB encompasses 11 constructs that can be grouped into distal constructs and proximal constructs. The first eight constructs are components of both TRA and TPB. Ajzen (1991) added three more constructs to create TPB (Sharma, 2017). Behavior is the first construct; it is a single observable action performed by an individual. It is vital that the behavior be described in terms of its target, action, context, and time (TACT) (Sharma, 2017). Behavioral intention is the second construct; it is a thought to perform a behavior and is a key determinant of specific behavior (Sharma, 2017). Behavioral intention is considered the hallmark of the TPB. The behavioral intention carries the components of TACT.

Attitude toward the behavior is the third construct; it is the overall feeling of like and dislike toward a behavior (Sharma, 2017). Behavioral beliefs are the fourth construct; they are a determinant of attitude toward the behavior; they are beliefs that performing a specific behavior will lead to certain outcomes (Sharma, 2017). Outcome evaluations are the fifth construct; they represent the value a person places on each outcome resulting from the performance of the behavior (Sharma, 2017). Both the behavioral and outcome evaluations determine the attitude toward the behavior (Sharma, 2017). The subjective norm is the sixth construct; this characterizes a person's belief that most of the significant others in his or her life think the person should or should not perform the behavior (Sharma, 2017). Normative beliefs are the seventh construct; this refers to how a person thinks others who are significant in his or her life would like him or her to behave

(Sharma, 2017). The motivation to comply is the eighth construct; this represents the degree to which a person wants to act per the perceived wishes of those significant in his or her life (Sharma, 2017).

Perceived behavioral control is the ninth construct; this is how much a person feels he or she is in command of enacting the given behavior (Sharma, 2017). The tenth construct is control beliefs; these are beliefs about internal and external factors that may inhibit or facilitate the performance of the behavior (Sharma, 2017). The final and eleventh construct is perceived power; this represents a person's perception of how easy or difficult it is to perform the behavior in each condition identified in that person's control beliefs (Sharma, 2017).

Of the 11 TPB constructs, I identified the following four proximal constructs to evaluate and predict the behavior of Congolese physicians appropriately: attitude, subjective norms, perceived behavioral control, and behavioral intention of Congolese PCPs. Attitude toward the behavior is the overall feeling of like and dislike toward a behavior (Sharma, 2017). The subjective norm characterizes a person's belief that most of the significant others in his or her life think the person should or should not perform the behavior (Sharma, 2017). Perceived behavioral control is how much a person feels he or she is in command of enacting the given behavior (Sharma, 2017). Behavioral intention is a thought to perform a behavior and is a key determinant of specific behavior (Sharma, 2017). Furthermore, when given an ample degree of genuine or tangible control over the behavior, and when the opportunity crops up, individuals are more likely to carry out

their intentions (Ajzen, 1991). Therefore, the immediate precursor of behavior is the intention (Ajzen, 1991).

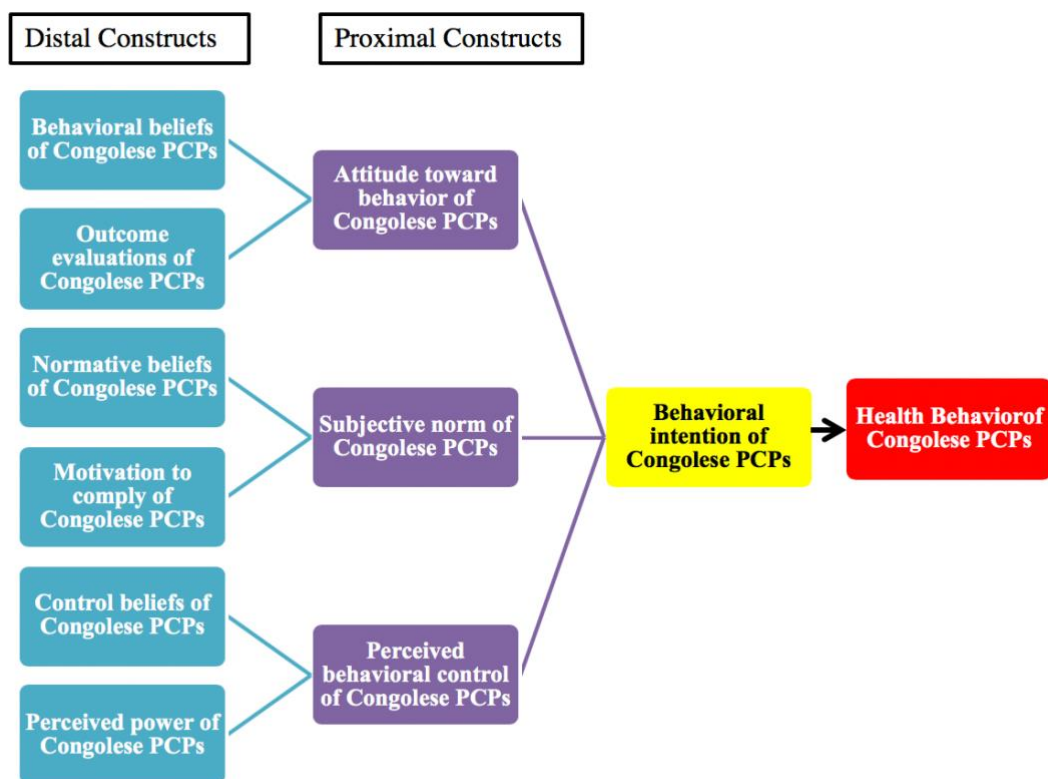


Figure 2. Theory of planned behavior

### Applications of the Theory of Planned Behavior

Although recent criticism and calls to retire the TPB have been formulated (Sniehotta, Pesseau, & Araújo-Soares, 2014), TPB has been recognized as the prevailing theoretical approach to lead research on health-related behavior since its inception most notably in health education and health promotion (Sharma, 2017). In 2008, O'Neill and his colleagues used TPB to study the behavioral intentions of participants regarding their

adherence to mammography (Sharma, 2017). Roberto et al. (2011) conducted a study to test the TRA and the TPB to predict the provision of the HPV vaccine by pediatricians in persuading parents to vaccinate their pubescent daughters. Unfortunately, despite the United States national guidelines of routine administration of HPV vaccine to 11–12 year-old girls since 2006 and later extended to boys, because of perception of parent hesitation or reluctance to have their children vaccinated against HPV, only 76% of health care providers surveyed reported routinely recommending HPV vaccine for girls ages 11–12 years, and far fewer (46%) did so for boys ( $p < .001$ ) (Roberto et al., 2011). A majority of providers reported asking questions about parent concerns (74%), but several pediatricians reported lacking time to probe reasons (47%) or believed that they could not change parent minds (55%) (Roberto et al., 2011). Furthermore, instead of educating and persuading reluctant parents about the benefits of HPV vaccine in preventing cervical cancer, primary healthcare providers become themselves hesitant and unwilling to go the extra miles with a resultant low rate of immunization of young girls and boys against HPV (McRee, Gilkey, & Dempsey, 2014).

Other applications of TPB for health education and health promotion include the use of condoms (Davis et al., 2016), the exercise/physical activity behavior (Linder, Harper, Jung, & Woodson-Smith, 2017), hand washing in health care workers, healthy eating behaviors, mammography, predicting alcohol use, predicting binge drinking behavior, predicting fruit consumption, predicting smoking among adolescents, smoking cessation, vaccination against influenza, etc. Davis et al. (2016) utilized TPB to predict condom-use resistance (CUR) amongst a community sample of 312 men who were

sexually active and nonproblem drinkers, using an alcohol administration protocol.

Beverage condition was experimentally manipulated between subjects according to the following TPB-CUR constructs: attitudes, norms, self-efficacy, control, and intentions. Is concluded that men's CUR intentions and self-efficacy increased with alcohol intoxication; however, CUR control was not altered by the alcoholic state.

Linder et al. (2017) applied the TPB to explain the physical activity among 100 students from universities in North Carolina, who had enrolled in lifetime fitness classes. The researchers were able to assess TPB determinants of attitude, subjective norm, descriptive norm, perceived behavior control, intention, and physical activity among college after administering an online Leisure-Time questionnaire over a two-week period. Partial correlation analysis revealed that the engagement of university students in exercise was greatly impacted by the intention and attitude determinants. Chevance, Caudroit, Romain, and Boiché (2017) carried out a cross-sectional survey study among 153 healthy and obese adults in Montpellier/France to explore the specific role of implicit attitudes in the prediction of the adoption of self-reported physical activity (PA) and eating behavior (EB) using the TPB framework. The authors reported a significant association between implicit attitudes with PA among obese people, but not in the general population; unfortunately, regarding EB, the authors found no significant relationship for obese persons and slightly significant for people from the general population, intentions being the only significant predictor (Chevance et al., 2017).

### **Limitations of the Theory of Planned Behavior**

One of the major limitations of TPB is the fact that strong behavioral intention does not necessarily translate into actual behavior (Sharma, 2017). Despite TPB's ability to appropriately predict behavioral intention and behavior, it is unable to explain behavior change adequately. Furthermore, TPB does not consider individual personality-related factors, cultural factors, religious factors, and demographic variables that shape behavior (Sharma, 2017). Other significant limitations of TPB include the impossibility to obtain an objective measurement of some sensitive, expensive, and time-consuming behaviors; researchers have to rely on measurement by self-reports since it is almost impossible to obtain objective measurement of some behaviors such as the use of condom; thus the possibility of introducing information bias such as respondent bias (bias of memory and overestimation) in the findings of the study and biases are a threat to validity of study (Szklo & Nieto, 2014).

Moreover, critics of TPB such as Sniehotta et al. (2014) had argued that TPB was focused mostly on rational reasoning and excluded unconscious influences on behavior; furthermore, Sniehotta et al. (2014) had suggested that TPB had a limited predictive validity in the variability of the observed behavior especially in case of 'inclined abstainers,' who are individuals who form an intention to perform a behavior, unfortunately, fall short to carry on. Finally, Sniehotta et al. (2014) claimed that experimental tests of TPB had been scarce and that the TPB was somewhat suitable to predict behavior amongst the young, fit and affluent and when predicting self-reported

behavior over a short term; however, TPB was not adequate to predict behavior change in populations in which behavior change theory was essential.

Despite these criticisms and limitations, I concluded that TPB was a judicious choice for this study and responded to Reynolds (1971) criteria to select a theory namely pertinent key concepts and constructs to explain the dynamics of the behavior, a high degree of parsimony within the theory, and multitude use of theory. As previously stated, TPB has been extensively used in health promotion and health education studies (Sharma, 2017) and has shown to be an outstanding model for investigating the relationship between behavioral intention and attitudes (Ajzen, 2011; Sharma, 2017). Furthermore, the adjunct of Perceived Behavior Control as a crucial construct of the theory has brought about the concept of the variance to the TPB (Ajzen, 2011). As illustrated in Figure 1, TPB can be viewed as a linear process in which one vital construct guides to the next construct and ultimately to the behavioral intent; therefore, TPB has a high degree of parsimony in its conceptual framework, making it easy to operationalize and visualize the variables. Some notable studies in health promotion and health education that had applied the TPB included condom use (Boer & Mashamba, 2015); controlling preschoolers' sugar snacking (Astrom & Kiwanuka, 2006); exercise/physical activity behavior (Hagger et al., 2009; Marsh, Papaioannou, & Theodorakis, 2006; Rhodes, Warburton, & Bredin, 2009); hand washing in health care workers (Whitby, McLaws, & Ross, 2006); healthy eating behaviors (Fila & Smith, 2006); mammography (O'Neil et al., 2008); organ donation (Park, Smith, & Yun, 2009); predicting alcohol use

(Park, Klein, Smith, & Martell, 2009); and vaccination against influenza (Gallagher & Povey, 2006) (Sharma, 2017).

### **Studies Related to Research Questions**

Hurley et al. (2016) described the U.S. PCPs (a) perceived importance of ACIP-recommended vaccines relative to USPSTF guidelines and the ACIP recommendations, (b) their attitudes toward the U.S. adult immunization schedule, and (c) their awareness and use of Medicare preventive service visits to explain the lower vaccination rates for many recommended vaccines for adults in comparison to other adult preventive services.

Hurley et al. (2014) reported that the delivery of the 12 vaccines for adults recommended by the ACIP was low in the US. The authors provided insight on some of the barriers that American PCPs face in the provision of ACIP recommended vaccines, including a lack of regular assessment of vaccine status, insufficient stocking of some vaccines, and financial disincentives for vaccination in the primary care setting. The authors also reported that the use of electronic tools to document and set off vaccination was trifling (Hurley et al., 2014).

Maketa et al. (2013) provided insight into the perceptions of health, health care, and community-oriented health interventions in poor urban communities of Kinshasa, Democratic Republic of Congo. The authors underscored the crucial role of healthcare professionals in educating community members about the benefits of using facility-based health services and community-oriented health interventions. Qidwai et al. (2015) provided an understanding of practices and perceptions among family medicine physicians practicing in six countries of the Eastern Mediterranean Region (EMR)



regarding health promotion, disease prevention, and periodic health checks. Saeedi, Al Amri, Ibrahim, and Kassim (2014) provided insight on how to collect sensitive data in the context of religious or cultural realities. The authors recruited only female general practitioners (GPs) who were working in primary health care centers in the Kingdom of Saudi Arabia's (KSA) city of Riyadh.

### **Screening and Prevention of Selected Diseases in the Democratic Republic of Congo**

Although the United States is well known and revered for its sophisticated curative medicine, well-trained physicians, a plethora of specialists, and high-tech medical equipment; the improvement of public health services has been credited for the United States citizens' impressive upswing of life expectancy from 47.3 to 77.9 years, mainly through health maintenance in primary care, widespread immunization, preventive services at recommended intervals, improvement of safety in motor vehicles and workplace, improved sanitation and a decreased use of tobacco (Aschengrau & Seage, 2014; Getzen, 2013, p. 38). Of note, the life expectancy of Americans increased from 62.9 years in 1940 to 76.8 years in 2000 and 78.8 years in 2014 (Li et al., 2018). Furthermore, health maintenance has become the cornerstone of American primary care and is the essence of preventing morbidity and premature mortality (Staroselsky et al., 2006); and the ACA of 2010 emphasized the pertinence of preventive and maintenance care in primary care delivery (CDC, 2011).

Though several factors such as medical care and public health, individual behaviors, social and demographic factors, and physical environmental factors have an impact on health and life expectancy (Avendano & Kawachi, 2014); still Congolese PCPs

can affect the quality of life and life expectancy positively by acting on these factors. Similarly, according to Healthy People 2020, health determinants can be defined as the hodgepodge of personal, social, economic, and environmental factors that influence health status; and these determinants can be clustered in the following categories: policymaking, social factors, health services, individual behavior, and biology and genetics. Yet, PCPs can positively affect the health status of individuals by acting on these health determinants through health education, individual counseling, the provision of preventive services, and lobbying of public health officials to formulate evidence-based health policy and funding of health promotion programs.

### **Congolese Health Care System**

According to Commonwealth Fund; long, healthy, and productive lives; quality of care; access to care; efficiency; equity; capacity to innovate and improve are the key indicators of a high performing healthcare system (Davis, Stremikis, Squires, & Schoen, 2014; Gluckman et al., 2008). The adoption and implementation of USPSTF and ACIP guidelines by Congolese PCPs can be viewed as a major step in innovating and improving the quality of care in Democratic Republic of Congo. Since its independence in 1960 from Belgium, the Democratic Republic of Congo (Democratic Republic of Congo) has been labeled "a failed state," a chronically sick country, the rape capital of the world, and site of the "Africa's first world war." There is neither universal health insurance coverage nor private insurance; patients have to pay their medical bills from their own pockets. State-run hospitals are ill-equipped and underperforming in comparison to faith-based (mostly Catholic and Protestant) facilities.

In 1984, the Democratic Republic of Congo government adopted the health policy of primary care as the foundation of its health system and established more than 500 health centers across the entire country to provide basic and preventive care to its citizens (Murru & Pavignani, 2012). The Congolese official health administration comprises three levels: the central level, constituted by the Ministry of Public Health; the mid-level is constituted by 26 provincial health directorates and 65 health districts; and the peripheral level is constituted by 515 health zones (*zones de santé*), responsible for implementing the primary health care strategy and delivering the health services listed in the Minimum Package of services (Murru & Pavignani, 2012). Each health zone (HZ) should comprise a functioning general referral hospital and be divided into health areas that should have a functioning health center. A recent official inventory counted 393 government general referral hospitals and 8,266 government health centers (Murru & Pavignani, 2012). The funding of the health care system in Democratic Republic of Congo is mostly by international organizations such as World Bank, United States Agency for International Development (USAID), European Union, Belgium cooperation (Murru & Pavignani, 2012). Most immunizations for children are free and paid for by international and nonprofit organizations (PATH, 2016). Unfortunately, despite implementing these reforms and building an ultramodern hospital in Kinshasa, the Congolese government continues to send high dignitary of the regime to western countries, South Africa and India, costing the public treasury badly needed money for social programs or to reduce poverty.

Several Congolese families still lack access to high-quality essential health services that could prevent and treat major causes of death (PATH, 2016). Inadequate resources for health remain one of the largest obstacles to further mortality reductions (PATH, 2016). In 2013, the health budget represented only 3.5 percent of the total gross domestic product, and disbursement delays and competing priorities often affect the coverage, consistency, and quality of services. The Democratic Republic of Congo's national health budget is equivalent to the \$70 million USD, among the smallest in the world, leaving basic health services inaccessible for most, and contributing to poor health, including fewer than half of children aged 12 to 23 months receiving vaccinations, and one out of seven dying from vaccine-preventable diseases before age five (PATH, 2016). The country's health system is largely donor dependent; in 2012, the government supplied only 8 percent of the country's immunization budget; the GAVI and the World Bank provided about three-fourths of immunization funding in the Democratic Republic of Congo (GAVI 49%, World Bank 25%, UNICEF 9%, Democratic Republic of Congo Government 8%, WHO 8%, and USAID 4%) (PATH, 2016).

### **Individual behaviors**

Individual behavior plays a crucial role in accomplishing healthy outcomes and expanding life expectancy; quitting tobacco smoking can tremendously reduce the risk of CVD, lung cancer, and chronic obstructive pulmonary disease (Avendano & Kawachi, 2014). Engaging in risky sexual behavior can increase the likelihood of contracting HIV, hepatitis B virus, and other sexually transmissible diseases (STDs) (Avendano & Kawachi, 2014). Thus, changing individual behaviors is the target of several public

health interventions; through health education and individual counseling, Congolese PCPs can alter unhealthy behaviors and promote healthy lifestyles and behavior among Congolese people (Avendano & Kawachi, 2014; Sharma, 2017). In the Democratic Republic of Congo, where HIV/AIDS used to be the second cause of death in 2000, CDC and Congolese public health professionals exerted a concerted effort on health education, on ending the practice of widow inheritance and polygamy, on counseling about risky sexual behavior and on prohibiting rape of young, virgin women to get rid of HIV; and now HIV is the tenth cause of death (CDC, 2016).

### **Social and demographic factors**

As Wilkinson and Pickett (2010) brilliantly noted that countries with high inequality had poor health outcome and low life expectancy; Andersen et al. (2016) argued that socioeconomic status was a "fundamental cause" of mortality disparities; and that socioeconomic disparities endured despite changing mechanisms because socioeconomic status embodies an array of resources, such as money, knowledge, prestige, power, and beneficial social connections, that protect health no matter what mechanisms are relevant at any given time. Unfortunately, the practice of widespread corruption, nepotism, and tribalism have characterized the modus operandi of Congolese political leaders; hence, there are no coherent and equitable social justice with the consequence of a society with income inequality with the majority of people living in a farthest poverty, a meager total health expenditure of 5.6% of GDP with resultant poor health outcomes, an infant mortality of 86 deaths per 1,000 live births, and a life expectancy of 59 years (United Health Foundation, 2014). Congolese PCPs can assume

their fiduciary role toward their patients and lobby government and public officials for more investment in medical care and public health and more distributive justice.

### **Physical environmental factors**

The built physical environment, such as access to recreational facilities, land use mix, transportation infrastructure, urban planning, and design, has a correlation with achieving a healthy life and long-life expectancy (Avendano & Kawachi, 2014; Healthy People 2020). Poverty is one of the social determinants of health; the World Bank and International Monetary Fund (IMF) believe that urbanization has the potential to extract people out of poverty and propel improvement toward the Millennium Development Goals (MDGs) (IMF-World Bank report, 2013). Unfortunately, when urbanization is not well planned and managed, it can result in the escalating expansion of slums, pollution, and crime (IMF-World Bank report, 2013). Kinshasa is the capital and the largest city of the Democratic Republic of Congo, with 11.1 million people (The World Factbook, 2015).

Because of crowding and poor living conditions, there is a recrudescence of tuberculosis (TB) in the Democratic Republic of Congo with 83% of all TB living in cities (WHO, 2010), and because of water stagnation, malaria is endemic and rampant in Kinshasa and the first cause of death at 7% (CDC, 2019). Congolese PCPs can affect this appalling situation positively by providing health education to the population to practice basic infection control such hand washing, boiling drinking water, exercising in a secure environment, adequate sanitation, avoidance of infested rivers, and sleeping in medicated mosquito nests; Congolese PCPs can also lobby politicians for sound urbanization

designs for major cities. Parkin et al. (2008) argued that African governments and development agencies had lowered the priority of services for the prevention and treatment of cancer, focusing instead on the more common health issues, such as communicable diseases and maternal and child mortality. The authors suggested that despite the scarcity of data, an estimated 650,000 new cases of cancer occurred in Africa in 2002, with 311,000 cases in males and 338,000 in females (Parkin et al., 2008).

### **Descriptive Epidemiology of Selected Diseases in the Democratic Republic of Congo**

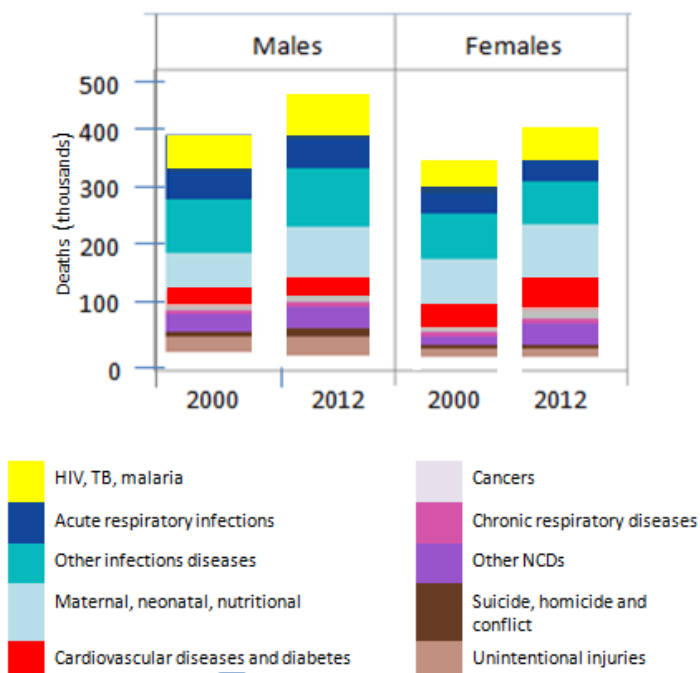
A thoughtful perspicacity of the role of diverse etiologic factors to disease burden is vital for formulating public health priorities and funneling prevention programs (Perz, Armstrong, Farrington, Hutin, & Bell, 2006). Several reputable organizations such as the World Health Organization's Global Burden of Disease (GBD) 2000 project and CDC aspire to gauge the burden of premature morbidity and mortality from over 130 major causes (Perz et al., 2006). Most recently, as of 2018, according to CDC, the top ten causes of death in the Democratic Republic of Congo include 1. Malaria, 2. Lower respiratory infections, 3. Neonatal disorders, 4. Tuberculosis, 5. Ischemic heart disease, 6. Diarrheal diseases, 7. Stroke, 8. Congenital defects, 9. Road injuries, 10. HIV/AIDS (CDC, 2019).

Although the bulk of predominant causes of death encompass infectious diseases, chronic NCDs such as CVD, DM, chronic respiratory diseases, and cancers are becoming major causes of morbidity and mortality in the Democratic Republic of Congo (WHO, 2015). The occurrence of cancer poses a mammoth affliction on society in more as well as in less economically developed nations, and the incidence of cancer has been on the

rise mainly due to the growth and aging of the population, and to the mounting predominance of well-known risk factors namely smoking, alcohol, overweight, physical inactivity, and changing reproductive patterns associated with urbanization and economic development (Torre et al., 2015). According to Global Cancer Observatory (GLOBOCAN or GCO) worldwide approximations, roughly 14.1 million new cancer cases and 8.2 million related deaths happened in 2012.

Unfortunately, over the years, less developed countries are carrying on most of the cancer burden, accounting for nearly 57% of cases and 65% of cancer deaths worldwide (Torre et al., 2015). Sadly, as previously stated by Ali-Risasi et al. (2015), experts from GLOBOCAN were unable to find data for cancer incidence and mortality for the Democratic Republic of Congo; these experts had to rely on data from three neighboring countries to estimate the cancer incidence and mortality in the Democratic Republic of Congo (International Agency for Research on Cancer [IARC], 2018). Since this study focused on preventable chronic NCDs and cancers, I reviewed some of these diseases in terms of their epidemiology in the Democratic Republic of Congo. Of note, NCDs are estimated to account for 28% of total deaths in the Democratic Republic of Congo (World Health Organization, 2018b).





*Figure 3.* Democratic Republic of Congo Deaths by Broad Cause Group

*Note.* Depicts the increase of the mortality rate from noncommunicable diseases from 2000 to 2012 in the Democratic Republic of Congo. Country Statistics and Global Health. Adapted from “Congo: WHO Statistical Profile,” by WHO and UN partners, 2015, Global Health Observatory (GHO). Copyright 2015 by the World Health Organization.

### **Cervical cancer**

Although the incidence and prevalence of cervical cancers in the United States have been in steady decline over the last 12 years; cervical cancer remains the third cause of cancer-related death worldwide (Boardman & Huh, 2019) and the leading cause of malignancy death in the Democratic Republic of Congo (Ali-Risasi, Verdonck, Padalko, Vanden-Broeck, & Praet, 2015). Karjane and Isaacs (2016) have demonstrated through randomized clinical trials of HPV DNA testing that between 99–100% of cervical cancer cases are related to 12 high-risk types of HPV (Boardman & Huh, 2019; Karjane &

Isaacs, 2016). Additionally, the prevention of HPV via vaccination and Pap smears has decreased the incidence of cervical cancer cases in the United States, demonstrating the causal relationship between HPV and cervical cancer (Boardman & Huh, 2019; Karjane & Isaacs, 2016).

Cervical cancer is a preventable disease as evidenced by the continuous dwindling of cervical cancer in the United States as a consequence of the application of preventive measures such as universal screening with Papanicolaou (Pap) test, HPV testing and the massive immunization efforts with HPV vaccine (Boardman & Huh, 2019). Worldwide, cervical cancer is responsible for 500,000 new cases of cancer and causes 200,000 deaths each year (Boardman & Huh, 2019). In African women, it is the second most frequent cancer in women. Cancer of the uterine cervix is the leading cause of cancer-related death among women in Sub-Saharan Africa (Ali-Risasi et al., 2015).

Evidence-based studies have established the causal relationship between the HPV and the occurrence of cervical cancer in 99-100 % of cases; and that only 5% of HPV infections will go on to develop cervical intraepithelial neoplasia (CIN) grade 2 or 3 lesions (cervical cancer precursor) within three years of infection (Boardman & Huh, 2019; Karjane & Isaacs, 2016). Therefore, other factors must play a pivotal role in the development of cervical cancer such as the type and duration of HPV infection ("high risk" or oncogenic types 16 and 18), the host immunologic status (poor nutrition, immune-compromise, HIV infection), environmental factors (smoking, vitamin deficiencies), and a lack of access to preventive screening services (Boardman & Huh, 2019). After conducting statistical analysis using bivariate and multivariable analyses

(logistic regression and generalized estimating equations (GEE), Ali-Risasi et al. (2015) claimed that low-grade squamous intraepithelial (LSIL+) lesions were frequent among women in Kinshasa with a prevalence of approximately 4%. In HIV-positive women, the prevalence was about eight times higher, and the traditional archaic practices of insertion of plants for vaginal hygiene and erotic pleasure might increase the risk of malignant transformation (Ali-Risasi et al., 2015).

Besides the implementation of childhood immunization in the primary care and some isolated effort to screen women for cervical cancer in four specific venues in Kinshasa (Le Gargasson, Breugelmans, Mibulumukini, Da Silva, & Colombini, 2013), there was no national policy and initiative to screen all age-appropriate women at specified intervals for cervical cancer or breast cancer in the Democratic Republic of Congo (Ali et al., 2015; Boardman & Huh, 2019). In the aftermath of the study conducted by Ali et al. (2015), I found it imperative for public health officials to implement age-appropriate cancer screening and immunization in addition to periodic health checks, health promotion and overall improved public health services in the Democratic Republic of Congo to improve the quality of life, prevent diseases and cancer and to promote health.

According to the CDC, oropharyngeal squamous cell carcinoma (SCC) has become the most common HPV-related cancer in the United States (Van Dyne et al., 2018). During the period of 1999–2015, Van Dyne et al. (2018) noted that cervical carcinoma incidence rates declined 1.6% per year, and oropharyngeal SCC incidence rates rose 2.7% per year among men and 0.8% per year among women; in fact, in 2015,

there were a total of 11,788 cervical cancers compared with 18,917 oropharyngeal SCCs. The authors suggested that this disturbing new trend of upsurge in oropharyngeal SCC was more likely due to some extent to "changing sexual behaviors," such as unprotected oral sex, especially among white men, who report having the highest number of sexual partners and performing oral sex at a younger age compared with other racial/ethnic groups (Van Dyne et al., 2018); Congolese PCPs must also be aware of this disturbing trend. Although HPV is a well-known cause of cervical cancer, as well as some oropharyngeal, vulvar, vaginal, penile, and anal cancers; population-based screening is recommended for only cervical cancer nowadays; nevertheless, HPV vaccination can prevent infection with the HPV types most strongly associated with cancer (Van Dyne et al., 2018).

### **Colorectal Cancer**

Colorectal cancer (CRC) is the second most common cancer in women worldwide, accounting for 614,000 cases, 9.2% of all cancers, and the third most common in men globally estimated at 746,000 cases, 10.0% of the total (Dragovich & Espat, 2020). In 2018, Dragovich and Espat (2020) reported the occurrence of approximately 1,849,518 new cases of CRC worldwide (10.2% of all cancers). Although the incidence varies geographically with the highest rates in Australia/New Zealand (per 100,000 population, 44.8 in men and 32.2 in women), and the lowest in Western Africa (per 100,000 population, 4.5 in men and 3.8 in women); the mortality rate is high (52%) in the less-developed regions of the world, displaying a poorer survival in these regions (Dragovich & Espat, 2020). The annual mortality rate of CRC is roughly 694,000 deaths

annually, accounting for 8.5% of cancer mortality on the whole (Dragovich & Espat, 2020). In the US, CRC remains the second most common cancer and the third leading cause of death among African-Americans (Ashktorab et al., 2014); with the mortality rate 47% higher in African American men and 34% higher in African American women compare to Caucasians; incidence rates for CRC are 24% higher in African-American men and 19% higher in African-American women when compared with white men and women, respectively (Ashktorab et al., 2014, Dragovich & Espat, 2020).

CRC is a multifactorial disease process, with etiology including genetic factors (hereditary mutation of the APC gene and Lynch syndrome or hereditary nonpolyposis colon cancer syndrome); environmental exposures (including dietary factors: diet high in red meat and animal fat, low-fiber diets, and low overall intake of fruits and vegetables; obesity and poor lifestyle choices such as cigarette smoking, alcohol consumption, and sedentary habits); and inflammatory conditions of the digestive tract (ulcerative colitis or Crohn disease) (Cho, Lee, Rimm, Fuchs, & Giovannucci, 2012; Dragovich & Espat, 2020). Age is a well-known risk factor for colorectal cancer, as it is for many other solid tumors (Dragovich & Espat, 2020). The timeline for progression from early premalignant lesion to malignant cancer ranges from 10-20 years; and the median age at diagnosis is 68 years (Dragovich & Espat, 2020).

CRC is preventable (Dragovich & Espat, 2020); moreover, Andersen et al. (2016) suggested that meeting the American Cancer Society (ACS) smoking and body weight/physical activity/dietary/alcohol guidelines for cancer prevention is associated with reductions in cancer incidence in low-income and African American populations.

Diet high in red meat and animal fat, low-fiber diets, and low overall intake of fruits and vegetables; obesity and lifestyle choices such as cigarette smoking, alcohol consumption, and sedentary habits are major modifiable risk factors for CRC that Congolese PCP can act upon to lower the incidence rate of CRC in the Democratic Republic of Congo (Andersen et al., 2016; Ashktorab et al., 2014, Dragovich & Espat, 2020).

### **Cardiovascular Diseases (Hypertension, Coronary artery disease, stroke)**

Cardiovascular disease (CVD) remains a leading cause of morbidity and mortality worldwide, despite improvements in outcomes (Hobbs et al., 2016). Although age-adjusted coronary artery disease (CAD) mortality has declined since the 1980s, particularly in high-income countries and regions as evidenced by the fact that CAD rates are now less than half what they were in the early 1980s in several countries in Europe and US, due to preventive measures such as the success of smoking legislation (Hobbs et al., 2016). Nevertheless, unequal outcomes persist among countries, and several risk factors such as obesity and DM have been rising worldwide (Hobbs et al., 2016).

The initial findings of the Framingham Heart Study have played a pivotal role in the establishment of risk factors of the CAD in the early 1960s; the understanding of such factors has been crucial in devising the prevention measures to curtail CVD morbidities and mortality (Boudi & Ali, 2019). The Framingham Heart Study (FHS) ascertained CAD risk factors in three categories: Conventional (older age: over 45 years in men and over 55 years in women; family history of CAD; and race: African American and Asians with high death rate), modifiable risk factors (high blood cholesterol level: low-density lipoprotein cholesterol; high blood pressure; cigarette smoking; DM; obesity; lack of

physical activity; metabolic syndrome; mental stress and depression) and non-traditional or novel risk factors (Boudi & Ali, 2019).

Individuals who are curbing the modifiable risk factors, for instance, with a lifestyle change, smoking cessation, adequate control of blood pressure and DM, exercise, low cholesterol, and Mediterranean diets can lower morbidity and mortality from heart disease (Mohamad & Ali, 2014). Hobbs et al. (2016) defined CVD prevention as a coordinated array of undertakings at the population level or at targeted individuals that are intended to eliminate or curtail the bearing of CVDs and their associated complications. Hence, if individuals execute the prevention as directed, the prevalence of CVD would more likely be reduced strikingly; therefore, it is crucial that PCPs adequately identify the predominant risk factors of concern and implement the preventive measures correctly as well (Hobbs et al., 2016).

Prevention should be achieved at the general population level by promoting healthy lifestyle behavior and at the individual level by confronting detrimental lifestyles (e.g., poor-quality diet, physical inactivity, and smoking) and by improving risk factors (Hobbs et al., 2016). CVD risk factors associated with lifestyle include smoking, alcohol intake, diet, and exercise (Yang, 2018). At individual level, Hobbs et al. (2016) had argued that it is of the essence that PCPs assessed correctly and rapidly the total CVD risk since atherosclerosis was usually the product of a number of risk factors; these risk factors encompassed age, sex, smoking status, blood cholesterol and systolic BP (SBP) and were helpful to estimate the 10- year risk of a first fatal or non-fatal CAD event. Moreover, Hobbs et al. (2016) advocated that individual CVD prevention should be

tailored to his or her total CV risk: the higher the risk, the more intense the action should be. Ultimately, when prevention is effective, the elimination of health risk behaviors has the potential to avert roughly 80% of CVDs, and even 40% of cancers (Hobbs et al., 2016).

Keates, Mocumbi, Ntsekhe, Sliwa, and Stewart (2017) noted that CVDs were responsible for almost half of all deaths worldwide in 2008; the majority of these deaths occurred in low to middle-income countries, with >50% occurring in those aged less than 70 years. Africa is home to more than 1 billion people and is a major contributor to the global burden of CVD (Keates et al., 2017). In 2013, an estimated 1 million deaths were attributable to CVD in sub-Saharan Africa alone, which constituted 5.5% of all global CVD-related deaths and 11.3% of all deaths in Africa (Keates et al., 2017). CVD-related deaths contributed to 38% of all non-communicable disease-related deaths in Africa, reflecting the growing threat of both non-communicable disease and CVD (Keates et al., 2017). An almost twofold increase in the overall number of CVD-related deaths since 1990 has been reported, with a >10% difference in mortality among women compared with men (Keates et al., 2017). This dramatic change in the profile of CVD in Africa can be directly linked to population dynamics and epidemiological transitions among some of the most vulnerable communities in the world (Keates et al., 2017). Indeed, the largest proportion of the poorest billion individuals on the planet reside in sub-Saharan Africa, concentrated geographically along a 'central belt' stretching from West to East Africa and incorporating several countries in Central Africa, including the Democratic Republic of Congo (Keates et al., 2017).



Tobacco smoking is a leading contributor to the global burden of disease, particularly CVD (Keates et al., 2017). The absolute number of smokers in sub-Saharan Africa alone is projected to increase by nearly 1.5-fold to >200 million people by 2030, with the prevalence of smoking among adolescents also on the rise (Keates et al., 2017). Hypertension is a major driver of CVD in Africa, especially stroke and hypertensive heart disease (Keates et al., 2017). A systematic review of 33 studies from 15 sub-Saharan African countries reported a prevalence range of 15–70% for hypertension for the period from 1999 to 2013 (Keates et al., 2017). The systematic review also highlighted the lack of hypertension awareness, treatment, and control in this region (Keates et al., 2017). Given the potential for hypertension linked to salt-sensitivity in many African individuals, excessive salt intake through the transition of diets from staple cereals, vegetables, and fruits to more processed foods pose a considerable health risk (Ataklte et al., 2014).

As shown in Figure 4, CVDs represent 10% of all causes of death in the Democratic Republic of Congo and the 5<sup>th</sup> cause of all deaths in the Democratic Republic of Congo; stroke, which is one aspect of CVDs, is the 7<sup>th</sup> cause of all deaths representing 4% all causes of death (CDC, 2019). In 2008, 29.4% of the Congolese population had elevated blood pressure (World Health Organization, 2014b). Among the risk factors of CVD, in 2011, 10% of the Congolese population were tobacco smokers, and in 2010, 3.6% of the total population was consuming alcohol (World Health Organization, 2014b).

## **Diabetes Mellitus**

Diabetes mellitus (DM) is a chronic disease of great importance in terms of its prevalence, incidence, morbidity, complications, and mortality worldwide; public health officials have an obligation to monitor its trend. DM remains the 7<sup>th</sup> leading cause of death within the United States (US) and currently affects 29.1 million Americans (Tucker, 2015). According to the International Diabetes Federation, the number of diabetics in the world had quadrupled from 5.5 million in 1980 to 21.3 million in 2012 and will balloon from 366 million in 2011 to 552 million by 2030 (Khardori & Griffing, 2020).

Peer, Kengne, Motala, and Mbanya (2014) reported that once rare in Africa, DM has seen a dramatic increase due to economic development, rapid globalization and urbanization with subsequent westernized diet and the adoption of physically inactive sedentary lifestyle. In 2013, the Democratic Republic of Congo had the 5<sup>th</sup> highest number of people with DM in Africa (Peer et al., 2014). In 2015, Xie et al. (2015) noted that the Democratic Republic of Congo had the 9<sup>th</sup> highest incidence of DM among Central African countries with the prevalence at 10.1 % in comparison to a regional prevalence of DM estimated at 7.7%. Furthermore, DM and other endocrine disorders represented 7.9% of all deaths in the Democratic Republic of Congo (Jacques et al., 2015).

Type 2 DM is described as a hodgepodge of dysfunctions typified by hyperglycemia, which results from the amalgamation of resistance to insulin action, inadequate insulin secretion, and excessive or inappropriate glucagon secretion (Khardori

& Griffing, 2020). The classification of DM has been evolving; the traditional classification evokes four types of DM including type 1, type 2, gestational diabetes, and secondary diabetes due to diseases of pancreas, hormonal syndromes that cause peripheral insulin resistance and that interfere with insulin secretion and DM due to drugs such as phenytoin, glucocorticoids, estrogens (Khardori & Griffing, 2020). Gestational diabetes mellitus is defined as any degree of glucose intolerance with onset or first recognition during pregnancy; it is a complication of roughly 4% of all pregnancies in the United States and closely associated with type 2 (Khardori & Griffing, 2020).

In order to tailor individual treatment regimens and identify individuals with increased risk of complications of DM at diagnosis; and using six variables, Ahlqvist et al. (2018) refined the classification type 1 and type 2 DM into five separate types, or clusters, of diabetes. The first cluster corresponds to type 1 diabetes, and the rest of the groups are subtypes of type 2 diabetes.

- Severe autoimmune diabetes (SAID) – corresponds to type 1 diabetes and latent autoimmune diabetes in adults (LADA), this form is illustrated by onset at a young age and patients with a relatively low body mass index (BMI), poor metabolic control, and impaired insulin production; in addition, this cluster is positive for glutamic acid decarboxylase antibodies (GADA)
- Severe insulin-deficient diabetes (SIDD) - is akin to SAID but is GADA-negative and presents with high HbA1c and the greatest risk for diabetic retinopathy among all the clusters

- Severe insulin-resistant diabetes (SIRD) – is typified by insulin resistance and with a high BMI and the most significant risk for diabetic nephropathy in patients
- Mild obesity-related diabetes (MOD) – Patients are younger, obese, and are not insulin resistant
- Mild age-related diabetes (MARD) - Patients are older, and their metabolic alterations are modest (Ahlqvist et al., 2018)

Although, there are five types of diabetes, for the purpose of this study, I focused solely on Type II, or non-insulin-dependent DM (NIDDM). The diagnosis of DM is made with one of the following: 1. two fasting glucose measurements of more than 126 mg; 2. abnormal glucose tolerance test; 3. one random glucose measurement of more than 200 mg with symptoms; and 4. an elevated hemoglobin A1c (HbA1c) (Khardori & Griffing, 2020). Hyperglycemia, dehydration, hypoglycemia (due to treatment), electrolyte imbalance, and coma due to ketoacidosis and hyperosmolarity are some of the acute complications of DM.

Chronic complications of DM include CVD, cerebrovascular disease, peripheral vascular disease, hypertension, retinopathy, nephropathy, neuropathy, gastroparesis, erectile dysfunction, decrease immunity, and infections (Khardori & Griffing, 2020). Even though type 2 DM is not as common in non-Western countries where the diet has fewer calories, and daily caloric expenditure is substantial; nevertheless, obesity and type 2 DM have become practically epidemic as a consequence of people in these countries adopting unhealthy Western lifestyles (Khardori & Griffing, 2020; Peer et al., 2014).

Unfortunately, Africa will bear the greatest percentage increase in rates of DM over the next 20 years (Khardori & Griffing, 2020; Peer et al., 2014).

Patients with Type II diabetes are at increased risk for CVD, most notably coronary heart disease (CHD), the number one leading cause of death in the United States (Boudi & Ali, 2019). Patients with type 2 diabetes should be managed as having equivalent CVD risks as patients with coronary heart disease (CHD) (Tucker, 2015); DM is an essential element of metabolic syndrome and is also the leading cause of end-stage renal failure, along with hypertension requiring dialysis and kidney transplant (Khardori & Griffing, 2020). Furthermore, DM affects the immune system making diabetics more prone to infections. Women with gestational diabetes often deliver macrosomic babies and are at increased risk of developing DM later in life (Khardori & Griffing, 2020).

The goals of treatment and management of type 2 DM aimed to reduce microvascular complications (eye and kidney disease) through control of glycemia and blood pressure, to lower macrovascular complications (coronary, cerebrovascular, peripheral vascular) through control of lipids and hypertension, smoking cessation; and to reduce metabolic and neurologic risks through control of glycemia (Khardori & Griffing, 2020). Education of patients and the general public, lifestyle modification, adherence to ADA diet, weight loss, regular exercise, oral hypoglycemic agents, and ultimately insulin therapy are some of the management tools of type 2 DM (Khardori & Griffing, 2020). It is noteworthy to acknowledge the current trend of first treating the blood pressure, then lipids, then blood sugar, as advocated by Dr. Charles Clark of the Indiana University

School of Medicine instead of focusing exclusively on tackling blood sugar fluctuations alone (Tucker, 2015).

## **Obesity**

Obesity is a substantial public health crisis in the United States and internationally, with the prevalence increasing rapidly in numerous industrialized nations (Hamdy & Khardori, 2018). The National Center for Health Statistics released a report marking a steady increase in obesity prevalence, from 19.4% in 1997 to 31.4% in the January – September 2017 period amongst U.S. individuals age 20 years or older (Hamdy & Khardori, 2018). The WHO outlined obesity classifications for obesity that have been widely by the international community, based on body mass index (BMI). The WHO categorizations are based on body mass index (BMI) and are as follows (Hamdy & Khardori, 2018):

- Grade 1 overweight (commonly and simply called overweight) - BMI of 25-29.9 kg/m<sup>2</sup>
- Grade 2 overweight (commonly called obesity) - BMI of 30-39.9 kg/m<sup>2</sup>
- Grade 3 overweight (commonly called severe or morbid obesity) - BMI  $\geq$ 40 kg/m<sup>2</sup>

Approximately 78 million adults above age 20 (37.5 million men and 40.6 million women) and 12.5 million children and adolescents (5.5 million boys and 7 million girls) in the United States are obese (Hamdy & Khardori, 2018). Nearly 20-25% of children in the United States are either overweight or obese, and prevalence rates among Mexican Americans, African Americans, Pima Indians, and some other minority groups, are even

greater (Hamdy & Khardori, 2018). A study published in the American Journal of Public Health concluded that from 1986 through 2006, overweight and obesity were associated with nearly 1 in 5 deaths (18.2%) among adults in the United States (Hamdy & Khardori, 2018).

Moreover, in black women, obesity seems to carry out an exceptionally stout impact, with 26.8% of deaths related to a BMI of 25 kg/m<sup>2</sup> or higher; in contrast, only 21.7% of deaths were associated with overweight or obesity among white women (Hamdy & Khardori, 2018). Among black men, roughly 5.0% of deaths were associated with overweight or obesity, in comparison, with 15.6% of deaths among white men (Hamdy & Khardori, 2018). The built physical environment has a correlation with overweight/obesity; in fact, Ludwig et al. (2011) conducted a randomized trial and reported that low-income individuals who were consigned to live in higher-income neighborhoods put on less weight over time and displayed a reduced risk of DM than did low-income participants who stayed put in chiefly low-income neighborhoods (Hamdy & Khardori, 2018).

Unfortunately, data from Africa were mealy; however, a patent and clear-cut inclination of significantly increased BMIs was noticed among African immigrants after they settled in the northwestern regions of the world (Hamdy & Khardori, 2018). This trend could be illustrated sadly by comparing indices among Ghanaians and Nigerians living in their native countries with indices in recent immigrants to the United States (Hamdy & Khardori, 2018). Nevertheless, Mawaw et al. (2017) conducted a cross-sectional study in 2014 in Lubumbashi, Democratic Republic of Congo. They found that

among 430 women selling in the central market of Lusonga that the prevalence of overweight and obesity was 16.51% and 13.26%, respectively. Moreover, the authors noted that a statistically significant relationship existed between marital status, education level, residence, use of oral birth control pills and consumption of fruit and vegetables, and the prevalence of obesity in this category of women (Mawaw et al., 2017). In 2008, obesity was present in 1.7% of the total population (World Health Organization, 2014b).

According to a study conducted by the NCD Risk Factor Collaboration in 2016, 124 million children and adolescents worldwide were classified as obese, compared to only 11 million in 1975 (Hamdy & Khardori, 2018). Similarly, during the same period, between 1975 and 2016, the number of obese adults worldwide climbed from 100 million to 671 million individuals (Hamdy & Khardori, 2018). In general, the prevalence of obesity worldwide was ascending, mainly in the industrialized nations of the Northern hemisphere, such as the US, Canada, and most countries of Europe; akin patterns were being observed in other parts of the world, including from several developing nations; and worldwide, women exhibited higher rates of obesity than men (Hamdy & Khardori, 2018). Interestingly, although the socioeconomic status was negatively correlated to the prevalence of obesity in most industrialized nations such as the US; nevertheless, this correlation was conspicuously reversed or positively associated in several underdeveloped countries, such as Malaysia, China, parts of South America, and sub-Saharan Africa (Hamdy & Khardori, 2018).

The association of obesity with a substantial increase in morbidity and mortality rates was supported by large, prospective cohorts, such as findings from the Framingham



and National Health and Nutrition Examination Survey (NHANES) studies, as well as data from insurance databases (Hamdy & Khardori, 2018). Although adverse effects of obesity might be attributed in part to comorbidities such as coronary artery disease, essential hypertension, stroke, cancers (endometrial, colon, breast, prostate, gallbladder), obstructive sleep apnea, increased predisposition to respiratory infections, increased incidence of bronchial asthma, and Pickwickian syndrome (obesity hypoventilation syndrome), social stigmatization and depression, gall bladder disease (cholecystitis, cholelithiasis), nonalcoholic steatohepatitis (NASH), fatty liver infiltration, and reflux esophagitis, gestational hypertension, fetal macrosomia, pelvic dystocia, type II DM, metabolic syndrome, dyslipidemia, anovulation, early puberty, infertility, hypoandrogenism, polycystic ovaries, hypogonadotropic hypogonadism, osteoarthritis, coxa vera, slipped capital femoral epiphyses, Legg-Calvé-Perthes disease, Blount disease, and chronic lumbago (Hamdy & Khardori, 2018).

However, results from several observational studies exhaustively showed that obesity on its own was associated with enhanced CVD morbidity and mortality and greater all-cause mortality (Hamdy & Khardori, 2018). Overall, obesity was estimated to increase the CVD mortality rate 4-fold and the cancer-related mortality rate 2-fold (Hamdy & Khardori, 2018). For individuals with severe obesity ( $BMI \geq 40$ ), life expectancy was reduced by as much as 20 years in men and by about five years in women (Hamdy & Khardori, 2018). The risk of premature mortality was even greater in obese persons who smoked (Hamdy & Khardori, 2018). Data also showed that obesity was associated with an increased risk and duration of lifetime disability (Hamdy &

Khardori, 2018). Furthermore, obesity in middle age was associated with poor indices of quality of life in old age (Hamdy & Khardori, 2018).

Factors that influence the morbidity and mortality associated with obesity include the following: severity of obesity, age of onset and duration of obesity, amount of central adiposity, comorbidities, level of cardiorespiratory fitness, gender, and race (Hamdy & Khardori, 2018). All obesity management approaches should include diet, exercise, and behavioral modification, particularly for those with a body mass index (BMI) of 25 kg/m<sup>2</sup> or higher (Hamdy & Khardori, 2018). Unfortunately, in the Democratic Republic of Congo and some sub-Saharan African countries, being obese is a sign of wealth, beauty, and pride. Congolese men often encourage their wives and children to gain weight and become rounded; cooked starch in the form of fufu and meals cooked with palm oil are major contributors to the obesity in the Democratic Republic of Congo.

### **Human Immunodeficiency Virus/Mother-to-Child Transmission of HIV**

The HIV and the acquired immunodeficiency syndrome (AIDS) were responsible for 3% of the deaths in the Democratic Republic of Congo in 2015, making it the tenth leading cause of death in the country (CDC, 2017; WHO, 2015). HIV is a blood-borne virus transmitted via sexual intercourse, blood transfusions, shared intravenous drug paraphernalia, and mother-to-child transmission (MTCT), which can occur during labor or during breastfeeding (Bennett & Bronze, 2018). HIV disease is caused by infection with HIV-1 or HIV-2, which are retroviruses in the Retroviridae family, the *Lentivirus* genus (Bennett & Bronze, 2018). Its symptoms include acute flu-like illness initially, then generalized lymph node enlargement, severe life-threatening infections or

opportunistic malignancies, AIDS-associated dementia/encephalopathy, and HIV wasting syndrome (Bennett & Bronze, 2018). The transmission of HIV from an HIV-positive mother to her child during pregnancy, labor, delivery, or breastfeeding is called mother-to-child transmission (MTCT) of HIV.

Several developed countries such as the United States where testing has been the cornerstone of the prevention of MTCT of HIV have made tremendous progress in the prevention of vertical transmission of HIV (Heffelfinger, Owen, Hendry, & Lansky, 2011); in these countries, testing is followed by the treatment of HIV infected pregnant women and their children with highly active antiretroviral therapy (HAART) consisting of at least three drugs of different classes. Moreover, an intense campaign of safe sex education in schools and in public sometimes by celebrities, the introduction of HAART, universal testing of all pregnant women using fourth-generation HIV testing kits, a marketed effort to retain and follow up HIV infected pregnant patients have resulted in a drastic decrease of the transmission of HIV from pregnant HIV-infected patients to their newborns in the United States to less than 1% from 1651 cases in 1991 to 127 in 2012 (CDC, 2014; Ghanotakis, Miller, & Spensley, 2012). In 2016, 99 children under the age of 13 received a diagnosis of perinatally acquired HIV (CDC, 2018). Of note, in the US, universal prenatal HIV testing was recommended to obstetricians since 1995 (Greenfield, 2013).

The Democratic Republic of Congo has always been considered as the initial source or reservoir of HIV in the world (Faria et al., 2014; Kelland, 2014). According to the CDC (2016), HIV remains the tenth cause of death (3%) in the Democratic Republic

of Congo, accounting for 19,000 annual deaths; the prevalence of HIV among pregnant women has been estimated at 4.4% (CDC, 2015). Furthermore, according to the CDC, in 2015, the Democratic Republic of Congo had an 0.8 % estimated prevalence of HIV among adults (age 15-49); 19,000 estimated deaths; 350,000 to 510,000 estimated orphans; 122,268 reported number of people receiving ART; and 170,000 to 240,000 estimated number of people needing ART (UNAIDS, 2016). The transmission of HIV among pregnant women has been made worse by the systematic violent rapes of young Congolese women perpetrated by armed militia; and sadly, rape has been used as a weapon of war in Eastern Congo for the control of minerals and power (Kelly, 2010). Unfortunately, only 1% of infected pregnant women received PMTCT in 2010 (Ghanotakis, Miller, & Spensley, 2012). Some of the causes of the scourge of HIV/AIDS are stigma about HIV/AIDS, slow government response (education, testing, and treatment), poverty, political and economic instability, diseases, famine, certain archaic cultural practices, wars, and rape because of false belief that men can rid themselves of HIV/AIDS by engaging in intercourse with a virgin; thus, many young girls have been raped and subsequently, infected with HIV (Inungu & Karl, 2006).

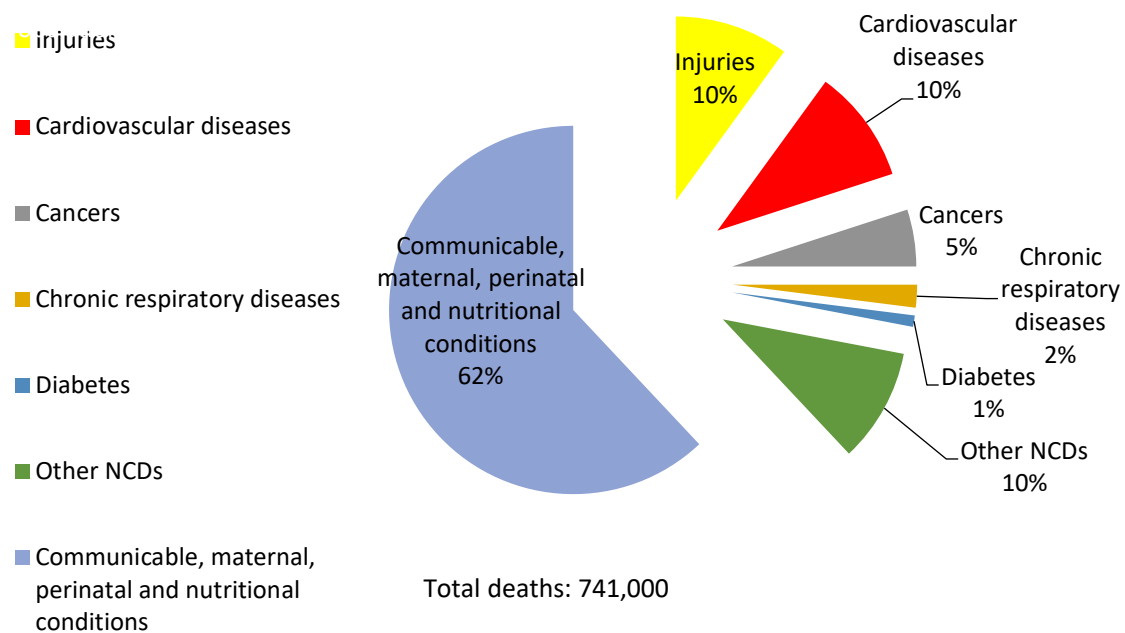
In 2005–2006, the median HIV prevalence rate among antenatal clinic (ANC) attendees in the Democratic Republic of Congo was 4.4% (Asimwe-Okiror, Kufa, Ntabangana, Alisalad, & Calleja, 2008). According to the CDC, in 2009, the Democratic Republic of Congo had 1.2 to 1.6 % estimated prevalence of HIV among Congolese (age 15–49); 26,000 to 40,000 estimated deaths; 350,000 to 510,000 estimated orphans; only 34,967 reported number of people receiving ART; and 170,000 to 240,000 estimated

number of people needing ART (UNAIDS, 2010). According to the WHO, HIV became the tenth cause of death in the Democratic Republic of Congo in 2012 due most likely to health education and the decrease of the practice of polygamy (WHO, 2015).

In July 2012, the President's Emergency Plan for AIDS Relief (PEPFAR) produced a blueprint outlining how the United States could contribute to creating an HIV free generation; this objective became reality on June 30th, 2015, when the WHO declared Cuba as the only country to have eliminated the mother to child transmission of HIV (World Health Organization, 2015); thus, meeting the objectives set by the President's Emergency Plan for AIDS Relief (PEPFAR) to produce an AIDS-free generation in Cuba, where virtually no children are born with HIV. The Democratic Republic of Congo has received sizeable financial and logistic support from the PEPFAR and CDC in the effort to eliminate MTCT of HIV with the goal of creating a Congolese HIV free generation (CDC, 2015).

Congolese PCPs could meet this challenge with the initiation of four key activities or steps, namely: (1) HIV universal testing of all pregnant women and newborn babies of HIV positive mother with follow up to 18 months after birth; (2) initiation of triple antibiotic with highly active antiretroviral therapy (HAART) as recommended by the Kesho Bora Study (2011) in accordance with the WHO and the CDC HIV guideline therapy; (3) education of nursing mothers not to breastfeed their children and assist them to find alternative to breast milk; and (4) health education with the involvement of key stakeholders to stop archaic sexual practices of widow inheritance, polygamy, and rape of

young virgin girls to get rid of HIV (Inungu & Karl, 2006), sexual education of abstinence, use of condoms and avoidance of prostitution (CDC, 2018).



*Figure 4.* Proportional mortality of the Democratic Republic of Congo

*Note.* World Health Organization. (2014b). Noncommunicable diseases country profiles, 2014

### **Advanced Preventive Health Services**

The USPSTF and the ACIP are two broadly used sets of national recommendations to guide the delivery of preventive care in the United States (Hurley et al., 2016). The USPSTF encompasses an independent board of PCPs who are connoisseurs in evidence-based medicine, and these experts conduct scientific evidence reviews of clinical preventive services and grades their recommendations, based on the evidence, as A (strongly recommends), B (recommends), C (no recommendation), D (not

recommended), and I (insufficient evidence to make a recommendation) (Hurley et al., 2016; Preventive Services Task Force, 2014). USPSTF defers vaccine recommendations to ACIP. The 15 experts of the ACIP group review the evidence and make recommendations to the CDC on the use of vaccines. ACIP publishes adult and pediatric immunization schedules annually and, in 2010, adopted a framework for developing evidence-based recommendations based on the GRADE (Grading of Recommendations, Assessment, Development, and Evaluation) approach (Hurley et al., 2016). The use of clinical guidelines by healthcare professionals is crucial to standardize medical care practice, to enhance the quality of care, and to mitigate several kinds of risk, including medical errors (Javadi, Kadkhodae, Yaghoubi, Maroufi & Shams, 2013). Therefore, several hospital institutions have been urging their physicians and nurses to meticulously follow the prescribed guidelines when providing care to patients in order to provide excellent and consistent care (Javadi et al., 2013).

Moreover, the ACA of 2010 comprised numerous provisions aimed to promote the provision of preventive services. The ACA enhances access to APHS by (1) expanding health insurance coverage, (2) requiring that USPSTF Grade A and Grade B services and ACIP-recommended vaccines be provided without cost to patients with no private insurance plans, and (3) requiring that USPSTF Grade A and Grade B services covered by Medicare be provided at no cost to beneficiaries (Hurley et al., 2016). Furthermore, the ACA crafted for Medicare beneficiaries a new venue for preventive service delivery called the annual wellness visit similar to the “Welcome to Medicare” visit which was introduced in 2005; PCPs are required to establish a preventive care plan

for each Medicare beneficiary (Hurley et al., 2016). The following preventive services constituted the focus of the study: cervical cancer screening, colorectal cancer screening, blood pressure screening, HIV screening, diabetes screening, lifestyle modification: tobacco screening, healthy diet, and physical activity counseling to prevent CVD, and obesity screening and counseling (US Preventive Services Task Force, 2018). ACIP recommended vaccinations included recommendations and schedules for the HPV vaccine (Hurley et al., 2016).

According to Hobbs et al. (2016), screening can be defined as the detection of unrecognized disease or, in the case of CVD, of unknown increased risk of CVD in individuals without symptoms. Disease or cancer risk assessment or screening can be accomplished opportunistically or systematically; opportunistic screening stands for screening without a prescheduled strategy, on the contrary, is performed when the opportunity crops up as in the case when the individual is being seen by the PCP for another reason (Hobbs et al., 2016). Systematic screening is usually carried out in the general population as part of a screening program or in targeted subpopulations, such as individuals with a family history of premature CVD or familial adenomatous polyposis (Hobbs et al., 2016).



Screening Type	Grade	USPSTF Recommendation
Cervical cancer screening and prevention	A	Every 3 years, with cervical cytology alone in women aged 21 to 29 years. Women aged 30 to 65 are recommended to undergo screening every 3 years with cervical cytology alone (Pap smear), every 5 years with high-risk human papillomavirus (hr HPV) testing alone or every 5 years with hr HPV testing in combination with cytology (co-testing).
Colorectal cancer screening	A	Starting at age 50 years and continually until age 75 years. The following stool-based screening tests and intervals are recommended every year: Guaiac-based fecal occult blood test (FOBT) and the fecal immunochemical test (FIT). The USPSTF also recommends the following direct visualization screening tests and intervals: colonoscopy (every 10 years), computed tomography (CT) colonography (every 5 years), flexible sigmoidoscopy (every 5 years) and flexible sigmoidoscopy with FIT; sigmoidoscopy (every 10 years, with FIT every year).
Blood pressure screening	A	To begin in adults aged 18 years or older. Before starting treatment, USPSTF recommends that measurements be obtained outside of the clinical setting for diagnostic confirmation.
HIV screening	A	For nonpregnant adolescents and adults: USPSTF recommends screening for HIV infection in adolescents and adults ages 15 to 65 years. Younger adolescents and adults who are at increased risk should also be screened. For pregnant women: USPSTF recommends HIV screening for all pregnant women, including those who present in labor who are untested and whose HIV status is unknown.
Diabetes screening	B	For overweight or obese adults aged 40 to 70 years, screening for abnormal blood glucose as part of cardiovascular risk assessment. Blood glucose abnormalities should be measured by either HbA <sub>1c</sub> or fasting plasma glucose or with an oral glucose tolerance test. USPSTF further recommends clinicians offer or refer patients with abnormal blood glucose to intensive behavioral counseling interventions to promote a healthful diet and physical activity.
Obesity screening	B	For adults: USPSTF recommends screening all adults for obesity. Patients with body mass index of 30 kg/m <sup>2</sup> or higher to intensive should be referred to or offered multi-component behavioral interventions. For children and adolescents: Clinicians should screen for obesity in children and adolescents 6 years and older and offer or refer them to comprehensive, intensive behavioral interventions to promote improvements in weight status.

*Figure 5. USPSTF Recommendations for Screenings*

*Note.* U.S. Preventive Services Task Force, 2018

### **Healthy Lifestyle Modification**

Li et al. (2018) reported that adherence to a low-risk or healthy lifestyle could extend life expectancy at age 50 years by 14.0 and 12.2 years in female and male U.S. adults in comparison to individuals who do not adhere to any of the low-risk lifestyle factors. In their quantitative prospective study, the authors focused on five modifiable lifestyle factors including diet (high diet quality score [upper 40%]), smoking (never), physical activity ( $\geq 30$  min/d of moderate to vigorous physical activity), alcohol consumption (moderate), and body mass index (BMI) of 18.5 to 24.9 kg/m<sup>2</sup> (Li et al., 2018). Li et al. (2018) found that a healthy diet pattern, moderate alcohol consumption, nonsmoking status, a normal weight, and regular physical activity were each associated with a low risk of premature mortality. Smoking is a clear-cut independent risk factor of cancer, DM, CVDs, and mortality more likely by producing oxidative stress and chronic inflammation; in contrast, smoking cessation has been associated with a decrease of these extra risks (Gandini et al., 2008; Mons et al., 2015; Pan, Wang, Talaei, Hu, & Wu, 2015). Schwingshackl, Bogensberger, and Hoffmann (2018) asserted that a healthy nutritional outline and its main food constituents had a relationship with lesser risk of morbidities and mortality of DM, CVD, cancer, and neurodegenerative disease, and its likely health benefits have been duplicated in medical experiments (Estruch et al., 2018). Moreover, physical activity and weight loss drastically have trimmed down the risk of DM, cardiovascular risk factors, and breast cancer (Andersen et al., 2016; Ashktorab et al., 2014, Dragovich & Espat, 2017; Hamer & Warner, 2017; Hardefeldt, Penninkilampi,

Edirimanne, & Eslick, 2017; Li et al., 2018; Smith, Crippa, Woodcock, & Brage, 2016; Valencia, Stoutenberg, & Florez, 2014).

Two prior studies have shown that healthy behaviors could cut obesity-related cancers which were roughly a third of all of cancers and that public health and policy initiatives to reduce alcohol consumption and promote a vegetable-based diet by enhancing availability, affordability, and access to healthy plant foods through healthy grocery stores and supermarkets, green carts, and farmers markets have the potential to decrease the cancer burden (Kabat, Matthews, Kamensky, Hollenbeck, & Rohan, 2015; Makarem, Lin, Bandera, Jacques, & Parekh, 2015). Lower alcohol consumption and a plant-based diet consistent with the cancer prevention guidelines were associated with reduced risk of obesity-related cancers in this population (Makarem et al., 2015). The ACS guidelines recommend that individuals avoid smoking, achieve and maintain a healthy weight, be physically active, and eat a healthy diet that emphasizes plant foods (Kabat et al., 2015; Makarem et al., 2015). Kabat et al. (2015) reported that in both men and women, adherence to the ACS guidelines was associated with reductions in all-cancer incidence and the incidence of cancer at specific sites, as well as with reductions in cancer mortality and total mortality. Furthermore, the authors argued that their findings suggested that, after accounting for cigarette smoking, adherence to a set of healthy behaviors might have considerable health benefits (Kabat et al., 2015). Although no long-term trial of alcohol consumption on chronic disease risk have been conducted, Ronksley, Brien, Turner, Mukamal, and Ghali (2011) have suggested that cardiovascular benefits of moderate alcohol intake have been steadily discerned in large cohort studies. In

conclusion, the cardio-protective benefits of exercise encompass lowering fat tissue, which decreases obesity, lessening blood pressure, lipids, and vascular inflammation, restoring endothelial dysfunction, amending insulin sensitivity, and ameliorating endogenous fibrinolysis (Boudi & Ali, 2019). In addition, exercising on a regular basis lowers myocardial oxygen demand and enhances exercise capability, resulting in reduced coronary risk (Boudi & Ali, 2019).

Sacks et al. (2001) and Appel et al. (1997) reported that the dietary approaches to stop hypertension (DASH) trial established that a diet that stressed fruits, vegetables, and low-fat dairy products, that embraced whole grains, poultry, fish, and nuts; that enclosed merely slight amounts of red meat, sweets, and sugar-containing beverages; and that included reduced amounts of total and saturated fat, and cholesterol slashed blood pressure considerably equally in individuals with high blood pressure and those with normal blood pressure, in comparison with a typical diet in the United States. In addition, the DASH dietary pattern endorses a considerable intake of protective nutrients such as potassium (K), calcium (Ca), magnesium (Mg), fiber and vegetable proteins and de facto, a reduced intake of refined carbohydrates and saturated fat (Siervo et al., 2015).

Subsequently, Sacks et al. (2001) found that combining the DASH diet with the reduction of sodium intake to levels below the current recommendation of 100 mmol per day together reduced blood pressure significantly, with better results in combination than individually. Although DASH has been recommended by the American Heart Association for the non-pharmacological management of hypertension, Siervo et al. (2015) noted that the mean change in cardiometabolic markers among individuals who

observed DASH diet yielded a reduction of approximately 13 % in the 10-year Framingham risk score (age, high-density lipoprotein [HDL], total cholesterol, treated and non-treated systolic blood pressure, smoker, and DM) for cardiovascular events (coronary heart disease, cerebrovascular disease, peripheral vascular disease, and heart failure [D'agostino et al., 2008]); hence, underscoring the fact that DASH diet interventions could be appropriate and effective in the prevention of CVD beyond the well-known BP-lowering effects. After conducting a systematic review and meta-analysis of randomized controlled clinical trials, Soltani, Shirani, Chitsazi, and Salehi-Abargouei (2016) reported that DASH diet was an adequate option for weight reduction in overweight and obese individuals since DASH diet was rich in foods that were inversely related to obesity; moreover, the authors noted that low caloric DASH fared better in more weight reduction in comparison to other low-energy diets.

Widmer, Flammer, L. O. Lerman, and Lerman (2015) suggested that Mediterranean diet was arguably the best-studied and most evidence-based diet to prevent not only CVD, but also other chronic diseases; hence, it has become the standard for healthy eating and a dietary template of particular value, and a crucial player in CVD prevention. Mediterranean diet consists of fish, monounsaturated fats from olive oil, fruits, vegetables, whole grains, legumes/nuts, and moderate alcohol consumption (Widmer et al., 2015). Furthermore, the authors noted that the Mediterranean diet had been found to be effective in lessening the burden or avert the development of CVD, breast cancer, colorectal cancer, DM, obesity, asthma, erectile dysfunction, depression, and cognitive decline (Widmer et al., 2015). Mediterranean diet has been effective in

improving and preventing metabolic syndrome as well as surrogates of CVD, such as waist-to-hip ratio, lipids, and markers of inflammation, over and above primary CVD outcomes such as death and events in both observational and randomized controlled trial data (Widmer et al., 2015). Most significantly, Widmer et al. (2015) argued that the Mediterranean diet was akin to other preventive measures such as aspirin, statin drugs, physical activity, and even anti-hypertensive drugs such as angiotensin-converting enzyme (ACE) inhibitors or beta-blockers in decreasing the risk of CVD morbidity, mortality, and events. Moreover, Martínez-González et al. (2015) argued that the Mediterranean diet was an attractive, affordable, and easily achievable prevention against CVD and because of its high content of unsaturated fat from a natural vegetable source, the Mediterranean diet was better for cardiovascular health than a low-fat diet.

### **Human Papillomavirus Vaccine**

The HPV vaccine has been hailed as one of the most significant innovations in women's health, and a game-changer for the prevention of cervical cancer since its approval by the U.S. Food and Drug Administration (FDA) in 2006 (Gilkey, Calo, Marciniak, & Brewer, 2017). HPV is sexually transmitted and is widespread in young people (Arbyn, Xu, Simoens, & Martin-Hirsch, 2018). Typically, HPV is cleared by the immune system; however, when high-risk (hr) types persist, they can cause the development of abnormal cervical cells, which are referred to as cervical pre-cancer if at least two-thirds of the surface layer of the cervix is affected (Arbyn et al., 2018). Pre-cancer can develop into cervical cancer after several years (Arbyn et al., 2018). There are a number of different hrHPV types that can cause cervical pre-cancer and cancer HPV16,

and 18 are the most important high-risk types, they cause about 70% of cervical cancers worldwide (Arbyn et al., 2018).

Preventive vaccination, by injection of HPV virus-like particles in the muscle, triggers the production of antibodies that protect against future HPV infections (Arbyn et al., 2018). Vaccination against the HPV aspires to prime the immune system to generate specific antibodies that can prevent subsequent HPV infection; and HPV vaccination is highly protective against precancerous cervical lesions in adolescents and young women compared with placebo, especially those who are negative for HPV at the time of vaccination (Arbyn et al., 2018). However, HPV vaccines are greatly ineffective in older women who are more likely to have been exposed to HPV before receiving the vaccine; therefore, immunizing adolescent and young women between ages of 10 and 26 before exposure to HPV has the potential to protect against cervical pre-cancer, and it is more likely that it will reduce cervical cancer rates in the future (Arbyn et al., 2018). Since cervical cancer may take several years to develop following HPV infection and development of pre-cancer lesions; therefore, it is vital to have regular screening, even after been vaccinated against HPV (Arbyn et al., 2018).

Currently, there are three types of HPV vaccines licensed in the United States including the bivalent HPV vaccine that targets HPV types 16 and 18 (*Cervarix*, GlaxoSmithKline), the quadrivalent vaccine that targets HPV types 6 and 11 as well as 16 and 18 (*Gardasil*, Merck & Co), and the newer vaccine that targets nine different HPV types (*Gardasil 9*, Merck & Co) (Arbyn et al., 2018). The majority of all HPV-associated cancers are caused by HPV 16 or 18, types targeted by all three vaccines. In addition,

4vHPV targets HPV 6 and 11 types that cause genital warts. 9vHPV protects against these and five additional types: HPV 31, 33, 45, 52, and 58. All three vaccines have been approved for administration in a 3-dose series at intervals of 0, 1 or 2, and 6 months (Meites, Kempe & Markowitz, 2017). Stratifying efficacy by baseline HPV status, researchers found that HPV vaccination dramatically reduced cervical intraepithelial neoplasia grade 2 and above (CIN2+) and grade 3 and above (CIN3+), as well as adenocarcinoma in situ (AIS) in recipients age 15 to 26 years who were free of high-risk HPV infection at the time of vaccination (Arbyn et al., 2018). The same vaccines reduced the incidence of CIN3+ associated with HPV 16/18 from 70 in 10,000 for placebo patients to 0 of 10,000 among vaccine recipients (Arbyn et al., 2018). The risk for AIS from HPV 16/18 again dropped to 0 of 10,000 in females who had been vaccinated against 9 of 10,000 among those who received a placebo. In the end, the authors concluded that the vaccines were extremely efficient against CIN2+ and CIN3+ in adolescent girls and women who tested negative for HPV 16 and 18 at baseline (Arbyn et al., 2018).

ACIP recommends routine HPV vaccination at age 11 or 12 years; vaccination can be given starting at age nine years (Meites et al., 2017). ACIP also recommends vaccination for females through age 26 years and for males through age 21 years who were not adequately vaccinated previously; males aged 22 through 26 years may be vaccinated (Meites et al., 2017). For persons initiating vaccination before their 15th birthday, the recommended immunization schedule is two doses of HPV vaccine; the second dose should be administered 6–12 months after the first dose (0, 6–12-month



schedule) (Meites et al., 2017). For individuals initiating vaccination on or after their 15th birthday, the recommended immunization schedule is three doses of HPV vaccine; the second dose should be administered 1–2 months after the first dose, and the third dose should be administered six months after the first dose (0, 1–2, 6-month schedule) (Meites et al., 2017). Gilkey et al. (2017) suggested that improving provider recommendation for HPV vaccination through training was crucial for motivating the uptake while decreasing parent hesitancy to vaccination. Furthermore, other studies have reported that physically active PCPs could serve as genuine role models by providing better, more credible, and motivating preventive counseling to their patients (Lobelo & de Quevedo, 2016). Of note, the HPV has been associated with anal, penile, and oropharyngeal cancers in men (Arbyn et al., 2018). Studies have shown that adequate use of a condom in addition to being vaccinated with the HPV vaccine bestowed the utmost protection against HPV infections (FitzGerald, Cornally, & Hegarty, 2018).

### **Use of TPB Constructs in APHS Provision**

Theory-based interventions can be valuable in promoting behavior change; one aspiring model is the TPB (Riebl et al., 2015). According to Ajzen (1991), there are four proximal constructs of TPB, including attitude, subjective norms, perceived behavioral control, and behavioral intention (Sharma, 2017). I reviewed the potential impact of each construct of TPB on the provision of APHS by Congolese PCPs.

### **Potential Impact of Attitude toward APHS Provision**

Attitude toward the behavior is the overall feeling of like and dislike toward a behavior (Sharma, 2017). A more favorable or a positive attitude toward a behavior, the

more likely the individual will intend to perform the behavior (Ajzen, 1991; Sharma, 2017). Attitude toward the behavior can be modified by influencing behavioral beliefs and outcome evaluations (Sharma, 2017). Behavioral beliefs, which are one of two determinants of attitude toward a behavior, are beliefs that executing a stated behavior will lead to certain outcomes. Outcome evaluations are the other determinants of attitude; and are the value an individual consigns on each outcome derived from carrying out the given behavior (Sharma, 2017). In their systematic review and meta-analysis of the TPB's application to understand and predict nutrition-related behaviors in youth, Riebl et al. (2015) reported that attitude had the strongest relationship with dietary, behavioral intention (mean  $r=0.52$ ), while intention was the most common predictor of behavior performance (mean  $r=0.38$ ; both  $p<0.001$ ). Similarly, Linder et al. (2017) noted that the intention and attitude constructs of TPB had the most significant bearing on whether the university students engaged in exercise. In another systematic review and meta-analysis, Cooke, Dahdah, Norman, and French (2016) reported that attitudes had the strongest relationship with intention ( $r+ = .62$ ), followed by subjective norms ( $r+ = .47$ ) and perceived behavioral control (PBC;  $r+ = .31$ ). Therefore, I was swayed that elucidating the attitude of Congolese PCPs toward the provision of APHS using their behavior belief and outcome evaluation scores was crucial in predicting the behavior intention and the provision of APHS by Congolese PCPs.

### **Subjective Norm and its Impact on APHS Provision**

Subjective norm can be described as an individual's belief that most of the significant others in his or her life think that the individual ought to or ought not to carry

on the behavior (Ajzen, 1991; Sharma, 2017). Subjective norm is the second construct of TPB, and it is shaped by two distal constructs, namely normative beliefs and motivation to comply (Ajzen, 1991; Sharma, 2017). Normative beliefs describe how a person thinks that people who are important in his or her life or profession would like the individual to behave (Ajzen, 1991; Sharma, 2017). People view the normative norm as the normal expectation of the individual behavior within the society, community, environment, or profession (Sharma, 2017). For instance, a Congolese PCP may think that performing a cervical cancer screening will be viewed by colleagues as an excellent practice of preventive care. This is quite significant to the medical field since the practice of medicine, and preventive care follows guidelines, protocols, and procedures for the standard of care (Francis et al., 2004). Motivation to comply is the second distal construct that shapes the subjective norm and is described as the degree to which an individual is willing to act in congruence with the perceived wishes of those significant to his or her life or profession (Sharma, 2017). Subjective norms can be modified by influencing normative behavior and motivation to comply through discussion and role-play (Sharma, 2017). The Congolese government and international non-governmental organizations could provide financial incentives to Congolese PCPs to provide APHS. Studies have shown the more positive subjective norm, the stronger the behavioral intention to perform a given behavior (Ajzen, 1991). Although the behavioral belief of student nurses was the most significant factor affecting behavioral intention to report medication errors, Cornally (2014) noted that the behavioral intention was high and that the TPB constructs explained 38% of the variance in students' intention to report medication errors.

Moreover, the authors reported that the constructs of behavioral beliefs, subjective norms, and perceived behavioral control were all affecting this intention (Cornally, 2014). The findings also revealed that students' fear of the reaction to the disclosure of the error from superiors and colleagues might impede them from reporting the error (Cornally, 2014).

### **Perceived Behavioral Control and its Impact on APHS Provision**

Perceived behavioral control can be defined as how much an individual feels being in command of carrying out a stated behavior; it relies on two distal constructs, namely control belief and perceived power (Sharma, 2017). Furthermore, perceived behavioral control is a surrogate measure of genuine behavioral control and is an adequate assessment of real control over the behavior, specifically in the case where volitional control is low (Sharma, 2017). Moreover, perceived behavioral control echoes the individual's belief concerning the presence or lack of resources for carrying out a behavior, so that the existence of resources is considered as a facilitator and the absence of them as an inhibitor of behavior (Hosseini, Aghamolaei, GharlipourGharghani, & Ghanbarnejad, 2015).

The control beliefs are beliefs pertaining to internal and external factors that may inhibit or facilitate the performance of the behavior (Ajzen, 1991; Sharma, 2017). The concept of facilitator and inhibitor factors is crucial in the provision of APHS in the Democratic Republic of Congo, where PCPs encounter several challenges in the practice of their profession. The lack of adequate equipment, vaccine supply, the high ratio of patients-physicians, and adequate infrastructure are some of the barriers that may discourage Congolese PCPs to provide APHS. On the other hand, an immunization

program sponsored by international organizations such as WHO and CDC may facilitate the provision of APHS by Congolese PCPs.

Perceived power is the second distal construct of perceived behavioral control; it refers to an individual perception about how easy or difficult it is to carry on a given behavior in each situation pinpointed in the control beliefs (Sharma, 2017). Perceived behavioral control can be modified by influencing both the control beliefs and perceived power through a discussion about factors that facilitate the behavior, providing incentives, reduction of inhibiting factors, removing barriers, and breaking down the behavior into small steps (Sharma, 2017). In their study about the effect of educational interventions based on TPB to promote breakfast consumption behavior in students; Hosseini et al. (2015) reported that perceived behavioral control was a stronger predictor of intention to having breakfast; thus, contradicting previous studies in which attitude had the highest predictive value for intention. Hosseini et al. (2015) conducted an interventional quasi-experimental study in Bandar Abbas in 2011 on 88 middle-school students based on the TPB. At the conclusion of the training program, perceived behavioral control, and intention of having breakfast were boosted in the intervention group, and the change was statistically significant based on the Wilcoxon test ( $P=0.000$ ).

### **Behavioral Intention and its Impact on APHS Provision**

Behavioral intention can be defined as the thought to carry on a given behavior; it is considered as a direct determinant of the behavior (Sharma, 2017). Behavioral intention is viewed as the hallmark of the TPB model, which hypothesizes that intention is a proximal measure of behavior (Sharma, 2017). However, intention or thought to

perform a behavior does not necessarily translate into carrying on the actual behavior; this is one of the shortcomings of the TPB (Sharma, 2017). Behavioral intention can be modified by influencing attitude toward the behavior, subjective norms, and perceived behavioral control (Sharma, 2017). The more favorable the attitude and subjective norms, and the stronger the perceived behavioral control, the more likely the intention to perform the behavior (Ajzen, 1991; Sharma, 2017). As highlighted by Cooke et al. (2016) in their study on “how well does the TPB predict alcohol consumption”, intention had the strongest relationship with alcohol consumption ( $r = .54$ ), followed by self-efficacy (SE) ( $r = .41$ ). In contrast, perceived behavioral control (PBC) and perceived control (PC) had negative relationships with alcohol consumption ( $r = -.05$  and  $-.13$ , respectively).

### **The Role of Demographics in the Provision of APHS**

Although demographic variables, such as age and gender are not encompassed in TPB (Ajzen, 1991); nevertheless, previous studies have shown that gender may play a key role in predicting the delivery of some preventive care by male and female healthcare professionals (Hine & Smith, 2014; Saeedi et al., 2014). Because of religious and cultural beliefs, only female physicians were allowed to carry out breast cancer screening in Muslim countries such as Saudi Arabia (Saeedi et al., 2014). On the other hand, some female physicians may feel uncomfortable to perform rectal exam for colorectal and prostate cancer screening; Hine and Smith (2014) reported that some male physicians in the United Kingdom (UK) experienced discomfort in performing intimate examinations and screening; and forcing them to simply avoid conducting these intimate, vital preventive services because of feelings of embarrassment, fear and anxiety, and

vulnerability. Several researchers had included the age of participants as crucial demographic variables in the provision of APHS in the United States and Eastern Mediterranean countries (Hurley et al., 2016; Qidwai et al., 2015). In both studies, younger physicians were eager to participate in the cross-sectional survey studies in comparison to older physicians; unfortunately, both studies did not flush out clearly the relationship between age of physicians and behavioral intention to provide APHS. This study provided an opportunity or venue to explore the role of gender and age in the delivery of APHS by Congolese PCPs, and how these demographics related to behavioral intention of Congolese PCPs in the provision of APHS using the TPB. Furthermore, the study findings had the potential to refute or to confirm the assertion made by Sniehotta et al. (2014) that TPB was rather apposite to predict behavior amongst the young, fit, and affluent individuals.

### **Summary**

Chronic NCDs and cancers have become a major burden to society worldwide, and despite the preponderance of infectious diseases in the Democratic Republic of Congo, nevertheless, cancers and chronic diseases are becoming a significant cause of morbidity and mortality. Fortunately, the provision of vaccines, screening of preventable diseases, and promotion of a healthy lifestyle have the potential to prevent and decrease morbidity and mortality due to preventable chronic NCDs and cancers. Promotion of healthy lifestyle through health education, smoking cessation, moderate alcohol consumption, DASH and Mediterranean diet, use of condoms, regular physical exercise and weight loss is an effective tool to prevent morbidity and premature mortality from

chronic NCDs; Congolese PCPs can use this efficient tool to promote healthy and long life among Congolese people.

I conducted an extensive, thorough, and systematic literature review that substantiated knowledge and practice gaps in the provision of APHS by Congolese PCPs in the Democratic Republic of Congo. I took advantage of a good literature synthesis to ascertain whether findings were consistent across several studies, especially in terms of statistics from the WHO, CDC, and the Congolese Ministry of Health. Ali-Risasi et al. (2015) highlighted the lack of screening of cervical cancer and the administration of the anti-HPV vaccine in the Democratic Republic of Congo. PATH provided an overview of the healthcare system in the Democratic Republic of Congo and state of childhood immunization. Hurley et al. (2016) described the APHS as recommended by the USPSTF and ACIP guidelines; these APHS defined as recommendation A and B of USPSTF and ACIP constituted the bastion of this study. Additionally, I described some epidemiological statistics of selected preventable diseases and cancers in the Democratic Republic of Congo, such as cervical cancer, colon cancer, CVD, DM, obesity, and HIV.

Furthermore, I was able to use this literature review to argue for the use and suitability of the TPB as the appropriate theory for this study. First, I provided a brief historical perspective of the theory; then, I described the constructs of the theory (attitude, subjective norms, perceived behavioral control, and behavioral intention) with its limitations and critics; and finally, I explored the potential impact of each construct of TPB on the provision of APHS. In conclusion, the findings from the literature review have highlighted the need to test the constructs of TPB in the provision of APHS by



Congolese PCPs in order to fill the gap in knowledge and practice of Congolese PCPs in the prevention of preventable chronic diseases and cancers. In the next chapter, I described the research method to conduct this study, including study design, study population, sampling method, recruitment procedure of participants, instrumentation, data analysis and management, ethical considerations, and potential threats to validity.

## Chapter 3: Research Method

### **Introduction**

In this chapter, I outlined the concise methodology or steps that I undertook to address the research questions. Although I conducted an elicitation study, I opted for a quantitative cross-sectional survey design to conduct this study and to respond to the research questions. The primary purpose of the study was to test the TPB constructs (attitude, subjective norms, perceived behavioral control) in predicting the behavioral intention of Congolese PCPs in the provision of preventive services as recommended by the USPSTF guidelines, and ACIP recommended vaccines. My independent or predictor variables were attitude, subjective norms, and perceived behavioral control; and my dependent or outcome variable was behavioral intention of Congolese PCPs.

This chapter encompassed three sections; in the first section, I described the type of study design and its appropriateness. In the second section, I depicted the study population, sampling method, procedures for recruitment of participants, data collection instruments, data analysis procedures, and management. Finally, in the third section, I reviewed the anticipated ethical issues as well as the potential threats to my study validity.

### **Selection of Research Method**

The TPB has been useful in designing strategies to assist individuals in adopting healthy behaviors and in abetting physicians to enhance their adoption and implementation of evidence-based guidelines such as the USPSTF and ACIP recommendations (Francis et al., 2004). Creswell (2014) had argued that a mixed

methods approach to research that comprised both qualitative and quantitative methods bestowed a robust understanding and analysis of the topic, and most importantly, Ajzen (1991) had suggested utilizing the sequential mixed methods approach when conducting research-based of the TPB. Therefore, as suggested by Ajzen (1991), Francis et al. (2004), and Sharma (2017), I initially conducted an elicitation study, a form of qualitative approach using open-ended questions, to identify commonly held beliefs by Congolese PCPs toward APHS, to identify advantages and disadvantages of providing APHS, and to identify facilitator and barrier factors to the provision of APHS by Congolese PCPs. Furthermore, the elicitation study contributed to the development of the initial questionnaire, which I subsequently pilot tested with the ultimate goal of constructing the final survey questionnaire of the study. Although this study included elicitation questionnaires to explore and identify salient behavioral, normative, and control beliefs of the target populations, the method I used to answer the research questions was mostly a quantitative approach, as suggested by Professor Ajzen (2006).

The purpose of quantitative studies is threefold, including prediction, control, or explanation/ theory testing, or all three (Rudestam & Newton, 2015). Quantitative research methods involve the collection of data that can be analyzed using statistical methods; these include descriptive and inferential statistics to determine the relationship between variables or the significance of group differences or the effect of an intervention (Rudestam & Newton, 2015). Babbie (2016) described quantitative analysis or approach as the numerical representation and manipulation of observations to describe and explain the phenomena that those observations reflected. Such data are usually collected through

surveys or compilations of administrative records; furthermore, these data yield numbers used to describe the extent of societal problems, to infer causation or correlation among variables of interest, to monitor program operations, to determine program efficiency and effectiveness and to analyze by how much they can be improved, to evaluate the impact of program, and to bring about new information that fills gaps in our knowledge (Babbie, 2016). Moreover, quantification of data allows aggregation, comparison, summary, and analysis of data; thus, making it possible to draw statistical inferences among variables of interest (Berman & Wang, 2012; Salazar et al., 2015). The selection of mixed methods was appropriate for this study; I utilized the elicitation study to identify the target population beliefs and to construct initial questionnaire while the quantitative approach was rigorous and suitable for me to respond to the research questions and to test the TPB in predicting the behavioral intention of Congolese PCPs in the delivery of APHS.

Survey design conveys a quantitative or numeric description of trends, attitudes, or opinions of a population by studying a sample of that population; it is economical and has a rapid turnaround in data collection (Creswell, 2014). I conducted a quantitative cross-sectional survey design with data collected during a five-month period; this snapshot collection of data was achieved mostly through hard-copy surveys distributed directly to participants at their worksites (hospital or clinics) because of limited access to internet, sporadic use of telephone and an inefficient postal service in the Democratic Republic of Congo. I was guided by the tailored design method (TDM), as described by Dilman (2014). Dilman (2014) claimed that to increase the response rate to surveys, the researcher must design surveys as a social exchange that simultaneously focused on

reducing costs, increasing benefits, and engendering trust that the expected benefits of responding would outweigh the costs of responding. Furthermore, Dilman (2014) advocated that providing a small financial incentive (\$2 to \$5) could boost the response rate to surveys, and it was not unethical. After obtaining access to the hospital premises, I gave a 10-minute presentation of my research topic in a conference format in a designated room in hospitals or clinics. I discussed the study purpose, potential benefits and risks, the written informed consent signing, the recruitment procedure, and the participation in the survey study. Foremost, I disclosed that I did not receive any financial or logistic support from any organization and that I would not gain any financial benefit from this study. To boost the participation of PCPs, I provided food such as pizza, sandwiches, salad and fruit, soft drinks, or coffee during the presentation. I decided not to give them money, two or five dollars would have been insignificant and counterproductive to Congolese PCPs and might have been perceived as an affront to them.

The following were three important research studies that had been carried out using quantitative cross-sectional survey design. In 2012, Hurley et al. (2016) investigated the attitudes of U.S. physicians toward adult vaccines and other preventive practices in the United States. Hurley et al. (2014) studied U.S. physicians' perspective of adult vaccine delivery, and Qidwai et al. (2015) used cross-sectional survey designs to elicit perceptions and practice among family physicians in the Eastern Mediterranean region in providing health promotion, disease prevention, and periodic health checks. Though cross-sectional designs have the advantages and strengths to be quick and inexpensive, with low or no attrition and high participation rate; nevertheless, cross-

sectional designs have shortcomings or limitations, such as the introduction of selection bias, the lack of temporal relationships among variables and most importantly, cross-sectional design cannot determine cause and effect among independent and dependent variables (Salazar et al., 2015). Despite all these limitations and due to the constraints of time allotted to complete this dissertation and limited resources, I opted for the cross-sectional survey design to conduct this doctoral study. I excluded to use a prospective longitudinal design because of time constraints and costs to complete this dissertation.

### **Study Variables**

Variables are vital to research; they can be described as empirically observable or measured phenomena, characteristics, or attributes of an individual or organization, and that they vary among people or organizations under study (Berman & Wang, 2012; Creswell, 2014). Age, gender, weight, attitude, diseases, immunization, and health promotion are all examples of variables (Berman & Wang, 2012; Creswell, 2014). In quantitative studies, variables can be classified as independent or predictor variables, dependent or outcome variables, mediating or intervening variables, moderating variables, control variables, and confounding variables (Berman & Wang, 2012; Creswell, 2014). Independent variables cause, affect, influence, or predict the outcome or result; while dependent variables depend or rely on the impact of the independent variables, they constitute the outcome or the results of the influence of independent variables (Berman & Wang, 2012; Creswell, 2014). Mediating or intervening variables mediate the effects of the independent variable on the dependent variable while moderating variables are independent variables that impact the direction and or the

strength of the relationship between predictor and outcome variables (Berman & Wang, 2012; Creswell, 2014). Control variables such as demographic variables (age and gender) are a particular type of independent variables that play a determinant role in quantitative studies; they are used to detect whether relationships between independent and dependent variables hold up under the presence of alternative, rival explanations for the observed pattern of outcomes (Berman & Wang, 2012). Since control variables have the potential to affect the dependent variables; therefore, researchers must measure them and control them using statistical analysis so that the actual impact of a predictor variable on the outcome variable can be assessed (Creswell, 2014). Confounding or spurious variables are truly not observed or measured; however, the researchers may suspect their influence at the end of the study to explain the relationship between the independent variable and the dependent variable even when they were not or could not be readily assessed (Berman & Wang, 2012; Creswell, 2014).

The independent variables for this study were the three proximal constructs of TPB, namely, attitude toward the provision of APHS, subjective norms, and perceived behavioral control of Congolese PCPs; the dependent variable was the behavioral intention of Congolese PCPs toward the provision of APHS, and the control variables were age and gender of Congolese PCPs.

## **Methodology**

### **Target Population**

All PCPs, men and women, aged 24 – 69 years old, and practicing in the capital city of Kinshasa, and the two western provinces of Kongo Central and Kwilu were the

potential participants. I selected Kinshasa and the western provinces as sites of the study because of the relative peace and security that are observed in that part of RDC in comparison to the eastern provinces where continuous armed conflicts, violent rapes, and killings are taking place (Cohen, 2016; Kelly, 2010; Trenholm, Olsson, Blomqvist, & Ahlberg, 2016). I sought out permission from each medical director of major state-run and faith-based medical institutions to recruit participants both in rural and urban settings (see Appendix J). Although some nurses and public health workers were capable of providing basic public health services such as prenatal care and childhood immunization, I excluded them in this study because of the complexity and advanced technicity for performing some procedures of APHS, such as cervical and colon cancer screening.

### **Sample and Sampling Procedure**

Although random sampling is the most accurate way to obtain a representative sample of the target population and from which generalization of the study findings can be made (Berman & Wang, 2012); unfortunately, because of the limited number of PCPs in the Democratic Republic of Congo (0.09 physicians per 1000 population; The World Factbook, 2015), I did not conduct a random sampling of participants. Once again, all willing and consenting PCPs men and women and aged 24 – 69 years old were welcome to participate in the survey. I conducted a power analysis to determine the appropriate sample size to detect a statistically significant relationship or effect as suggested by Rudestam and Newton (2015) and Salazar et al. (2015).

Power analysis encompasses four key parameters, namely the effect size, the sample size, the alpha significance criterion, and the power of the statistical test (Ellis,



2010). Statistical power is the probability that a statistical test will accurately detect an actual effect or the probability that it will reject a false null hypothesis (Ellis, 2010). Therefore, statistical power is inversely related to beta or the probability of making a Type II error; power = 1 - beta, and .80 (80%) is the conventionally agreed value for adequate power (Ellis, 2010). Sufficient statistical power is essential in conducting researches where large grant funds are invested or in scholarly studies that are deemed to contribute to knowledge, science, and literature.

The three parameters or elements influence statistical power in a given study: alpha level, effect size, and sample size (Ellis, 2010). The alpha significance criterion or alpha level is the risk or probability of committing a Type I error; alpha level (Type I error) is the chance of finding a significant effect when one doesn't exist; and traditionally, alpha level is set at two values .05 and .01 (Ellis, 2010). For this study, I set the alpha level at .05; meaning that there was only a 5% chance of making a Type 1 error; that is, incorrectly rejecting the null hypothesis (Ellis, 2010). The effect size is the magnitude of the observed effect or the degree to which the phenomenon is present in the target population (Ellis, 2010). Effect size is calculated by dividing mean difference before and after treatment by standard deviation (Cohen, 1998); for multiple regression,  $R^2$  represents effect size, and Cohen (1998) has suggested the following criteria for effect size: Small:  $R^2 < .13$ ; medium:  $R^2 = .13 - .26$ ; and large:  $R^2 > .26$ . However, the effects of interest in multiple regression are the individual predictor effects that are indexed by part-r-squared. Hence, a medium-size predictor effect is .0545, which in G\*Power is entered in the "variance explained by special effect." A medium-size multiple-R-squared is .13,

and 1 minus .13 is .87, which is entered into the "Residual variance." When this is calculated and transferred to the main window, the f-squared is .0626. At  $\alpha=.05$  and  $\text{power}=.80$ , the sample size is 128. Sample size or the number of participants ( $N$ ) determination was a crucial component of this study since larger sample sizes provide the best opportunities for boosting the ability to spot effects; however, sample sizes must be reasonable in size and cost-effective (Ellis, 2010). I calculated the adequate sample size for this study using the G\* Power 3.1; and set the alpha level at 0.05, the statistical power at .80 or 80%, medium effect size ( $f^2$ ) at .0626, and factored in the three predictors of the TPB and the multiple regression analysis. After I ran the numbers using G\*Power 3.1, I computed the sample size of 128 participants. Although Francis et al. (2004) had suggested doubling the number of participants since the response rates are often around 50%; however, instead of distributing only 256 questionnaires to achieve the estimated sample size of 128 participants, I decided to recruit at least 300 participants for this study. According to Bujang et al. (2017), the ideal sample size for multiple linear regression should be at least 300 participants; and this was pertinent for this study since I conducted the data collection in a non-random manner, and this should have eliminated the influence from the confounders' variables. Therefore, the recommended minimum required sample size for this study was 300 to be able to estimate a close approximation of the statistics toward the parameters in the targeted population (Bujang et al., 2017).

### **Procedure for Recruitment, Participation, and Data Collection**

Due to the lack of an effective viable postal service and limited access to the internet across the Democratic Republic of Congo, I personally distributed hard copies of

the survey questionnaire to potential participants at their work sites. Foremost, after securing approval from the Walden University IRB, I sought permission from hospital and clinic medical directors (gatekeepers) to first conduct the elicitation study and then the pilot study on their premises. After making some corrections to the pilot survey questionnaire, I then distributed hard copies of the final survey questionnaire to consenting PCPs, in person. I intended to explain the purpose of the research and keywords to the participants in a conference format and then distributed the survey after they signed the informed consent form. I reassured them about the confidentiality and safety of their personal health information. Within a week, I returned to the site to collect the completed survey questionnaire and then moved to the next sites. I handed out the hard-copy version of the final survey questionnaire to consenting PCPs along with two envelopes (see Appendix K). I made arrangements to collect the signed informed consent forms and the filled-out survey questionnaires that had been sealed separately in the envelopes.

### **Instrument and Operationalization of Constructs**

The main concept behind the TPB is to predict whether an individual intends to perform an action or behavior; hence a researcher needs to know three things:

- Whether the individual is in favor of performing the action ('attitude')
- How much the individual feels social pressure to perform it ('subjective norm')
- Whether the individual feels in control of the action in question ('perceived behavioral control') (Francis et al., 2004).

By enhancing these three predictors (attitude, subjective norm, and perceived behavioral control), Francis et al. (2004) suggested that physicians would more likely increase their intention to perform the desired action and thus increase the chance of actually performing it. In preventive medicine, physician screening decisions and actions are examples of intentional behaviors (Francis et al., 2004). According to Ajzen (2006) and Francis et al. (2004), the construction of a TPB questionnaire encompasses the use of both the qualitative method through elicitation study and the quantitative method. Besides the behavior construct, which can be observed, most variables in the TPB model are psychological or internal constructs; therefore, they must be operationalized to be measured directly or indirectly (Ajzen, 2006; Francis et al., 2004). For instance, the predictor attitude can be measured directly by asking participants about their attitude, or indirectly by asking participants about specific behavioral beliefs and outcome evaluations (Ajzen, 2006; Francis et al., 2004). Beliefs play a central role in the TPB; they are presumed to provide the cognitive and affective foundations for attitudes, subjective norms, and perceptions of behavioral control (Ajzen, 2006). Elicitation study is required to identify accessible behavioral, normative, and control beliefs (Ajzen, 2006; Francis et al., 2004). By assessing beliefs, researchers can gain insight into the core cognitive underpinning, such as exploring why individuals hold certain attitudes, subjective norms, and perceptions of behavioral control (Ajzen, 2006).

### **Operationalization of Variables**

Operationalization is the process of identifying or developing specific variables that are used for measuring each dimension of a concept (Berman & Wang, 2012).

Concepts are abstract ideas that are observed indirectly through variables, and processes of concept measurement involve two steps: first, the concept must be clearly defined, and its dimensions identified; this process is called conceptualization (Berman & Wang, 2012). Secondly, the variables used to measure the concept, and its dimensions must also be identified and defined; this process is called operationalization (Berman & Wang, 2012). Although there are three approaches to operationalization, I opted for the development of separate measures for each construct of TPB. For example, the predictor attitude was measured directly on a 7-point semantic differential scale ranging from favorable to unfavorable, or from good to bad; while the subjective norm predictor was measured on a 7-point unipolar scale with a range of strongly agree to strongly disagree, and perceived behavioral control was assessed on a 7-point unipolar scale with a range of strongly agree (7) to strongly disagree (1; Sharma, 2017).

### **Research Questions and Hypotheses**

RQ1: To what degree can Congolese PCPs' attitudes predict their behavioral intention for the provision of the best practices in disease prevention and health promotion as set forth by the USPSTF and ACIP?

*H<sub>01</sub>*: There is no statistically significant relationship between the attitude of Congolese PCPs and their behavioral intention for the provision of best practices in disease prevention and health promotion as set forth by the USPSTF and ACIP guidelines.

*H<sub>11</sub>*: There is a statistically significant relationship between the attitude of Congolese PCPs and their behavioral intention for the provision of best practices

in disease prevention and health promotion as set forth by the USPSTF and ACIP guidelines.

RQ2: To what degree can Congolese PCPs' subjective norms predict their behavioral intention for the provision of the best practices in disease prevention and health promotion as set forth by the USPSTF and ACIP guidelines?

*H<sub>0</sub>2*: There is no statistically significant relationship between the subjective norms of Congolese PCPs and their behavioral intention for the provision of best practices in disease prevention and health promotion as set forth by the USPSTF and ACIP guidelines.

*H<sub>1</sub>2*: There is a statistically significant relationship between subjective norms of Congolese PCPs and their behavioral intention for the provision of best practices in disease prevention and health promotion as set forth by the USPSTF and ACIP guidelines.

RQ3: To what degree can Congolese PCPs' perceived behavioral control predict their behavioral intention for the provision of the best practices in disease prevention and health promotion as set forth by the USPSTF and ACIP guidelines?

*H<sub>0</sub>3*: There is no statistically significant relationship between the perceived behavioral control of Congolese PCPs and their behavioral intention for the provision of best practices in disease prevention and health promotion as set forth by the USPSTF and ACIP guidelines.

*H<sub>1</sub>3*: There is a statistically significant relationship between the perceived behavioral control of Congolese PCPs and their behavioral intention for the

provision of best practices in disease prevention and health promotion as set forth by the USPSTF and ACIP guidelines.

RQ4: To what degree can Congolese PCPs' attitudes, subjective norms, and perceived behavioral control together while controlling for gender and age, predict their behavioral intention for the provision of the best practices in disease prevention and health promotion as set forth by the USPSTF and ACIP guidelines?

*H<sub>04</sub>*: There is no statistically significant relationship between the attitude, subjective norms, and perceived behavioral control while controlling for gender and age of Congolese PCPs, and their behavioral intention for the provision of best practices in disease prevention and health promotion as set forth by the USPSTF and ACIP guidelines.

*H<sub>14</sub>*: There is a statistically significant relationship between the attitude, subjective norms, and perceived behavioral control while controlling for gender and age of Congolese PCPs, and their behavioral intention for the provision of best practices in disease prevention and health promotion as set forth by the USPSTF and ACIP guidelines.

### **Instrumentation**

An instrument can be defined as a tool to measure concepts and constructs by transforming them into variables (Sharma & Petosa, 2014). In scholarly research, the development of new instruments must follow key steps to ensure its readability, face and content validity, reliability, and construct validity (Sharma & Petosa, 2014). These crucial steps include: defining the purpose of instrument development; reviewing existing

instruments related to the purpose; identifying concept-construct of interest; defining each concept-construct of interest; prioritizing the number of concept-construct of interest to be measured; operationally defining selected objects of interest (indicator-variable); choosing the scale of measurement; developing items; preparing a draft with directions, scoring, and layout (Sharma & Petosa, 2014). Further key instrument development steps include: testing for readability and adjusting according to the target population, sending to a panel of expert for the face and content validation, conducting at least two rounds with the panel of experts, and revising the instrument based on their feedback; conducting a pilot test with a small sample of the target population for readability, comprehension, time of completion and other important issues such as cost; establishing reliability (internal consistency and stability), establishing construct validity (confirmatory factor analysis) and establishing criterion validity, if applicable comparison with other scales of the same measure (Sharma & Petosa, 2014).

However, for the construction of the instrument to measure the variables of this study I was guided by the blueprint developed by Francis et al. (2004) to assist psychologists and non-psychologists of the European Union interested in health services research to compose an efficient questionnaire to measure the TPB constructs (see permission in Appendix F). Francis et al. (2004) developed this guide based on the work of Ajzen (1988), Conner and Sparks (1995), and Godin and Kok (1996). Francis et al. (2004) asserted that this instant guide had been scrutinized through several reviewing and testing procedures.



Moreover, the development of this research study's survey questionnaire (see Appendix B) required elicitation studies and a pilot study (see Appendix C) that contributed to the construction of the final version of the survey questionnaire to be administered to study participants (Francis et al., 2014). Elicitation study denotes a qualitative investigation of a subset of a population under inquiry to uncover the prominent behavioral, normative, and control beliefs about the behavior (Francis et al., 2004). The value of conducting elicitation studies lies in their ability to ascertain both direct and indirect measures of the TPB constructs (attitude, subjective norm, and perceived behavioral control). I selected a sample of 30 Congolese PCPs to whom I distributed hard copies of the survey questionnaires. I proceeded with open-ended questions to elicit salient beliefs among the participants, sources of social pressure, and control belief strength (Francis et al., 2004).

Per the recommendations set forth by Ajzen (2006), the pilot study participants consisted of individuals representative of the intended and targeted group. Pilot studies are deemed beneficial as they serve as a trial run for the research to identify unforeseen problems with the survey questionnaire and allow for open feedback from the participants. Furthermore, pilot studies are helpful in providing an estimation of response rates from participants and the estimation of the monetary costs of the implementation of the final survey (Dilman et al., 2009). I was more inclined to use the same 30 participants who took part in the elicitation study.

## **Measuring Behavior Intentions**

Behavioral intention can be defined as the thought to carry on a given behavior; although there is not a perfect relationship between behavioral intention and actual behavior, nevertheless, behavioral intention is considered as a direct determinant of the behavior (Ajzen, 2006; Francis et al., 2004; Sharma, 2017). Behavioral intention is also considered as the hallmark of the TPB model, which hypothesizes that intention is a proximal measure of behavior (Sharma, 2017). Measuring behavior intention can be assessed through three methods namely by observing the actual performance (intention performance), by measuring the generalized intention of individuals health-related behavior; however, since I was investigating the behavior of healthcare professionals (Congolese PCPs), I proceeded mainly with the intention simulation method. Though the intention simulation method is time-consuming, or it may be misleading; yet, it is a more genuine surrogate measure for real behavior since it more faithfully approaches concrete clinical presentations that require physician decisions (Francis et al., 2004). However, since I also measured the generalized intention of Congolese PCPs, I had the possibility of running a statistical analysis of the general intention as a dependent variable to compare the results with simulated intention analysis results.

I wrote different clinical scenarios with varying demographic features of patients such as age, gender or weight, and the provision of different USPSTF and ACIP recommended preventive services, such as colon cancer screening, cervical cancer screening, HIV screening, DM screening, hypertension screening, CVD screening, tobacco screening, exercise, and weight education. According to Ajzen (2006) and

Sharma (2017), behavior intention is measured on a 7-point bipolar scale that includes the categories of extremely probable (+3), quite probable (+2), slightly probable (+1), neither probable or improbable (0), slightly improbable (-1), quite improbable (-2), and extremely improbable (-3).

1. A healthy 50-year old Congolese woman presents in your office for an annual physical exam; she has no physical complaints but worries about dying of colon cancer because one of her friends was recently diagnosed with terminal colon cancer.  <u>I intend to provide USPSTF and ACIP-recommended preventive services.</u>	Extremely Improbable	-3	-2	-1	0	+1	+2	+3	Extremely Probable
2. A 35-year old obese Congolese man presents in your office for a follow-up of his diabetes mellitus.  <u>I expect to measure his blood pressure and provide diet and lifestyle counseling as recommended by the USPSTF and ACIP guidelines.</u>	Extremely Improbable	-3	-2	-1	0	+1	+2	+3	Extremely Probable
3. A pregnant 27-year old pregnant Congolese woman presents in your office for an ultrasound exam.  <u>I intend to provide her with an HIV screen test and counseling, as recommended by the USPSTF and ACIP guidelines.</u>	Extremely Probable	-3	-2	-1	0	+1	+2	+3	Extremely Improbable
4. A 55-year old Congolese man presents in your office complaining of vague abdominal pain and weight loss. He blames his pain on intestinal parasites.  <u>I want to screen him for colorectal cancer.</u>	Extremely Probable	+3	+2	+1	0	-1	-2	-3	Extremely Improbable
5. A 50-year old obese Congolese man presents in your office for an annual check-up.  <u>I am inclined to provide diet and lifestyle modification advice and to offer colon cancer screening and diabetes screening.</u>	Extremely Probable	+3	+2	+1	0	-1	-2	-3	Extremely Improbable
6. A 30-year old female nurse presents in your office for her annual physical exam.  <u>I am inclined to provide her with a Hep B vaccine, cervical cancer screening, HIV screening and counseling per the USPSTF and ACIP-recommended guidelines.</u>	Extremely Improbable	-3	-2	-1	0	+1	+2	+3	Extremely Probable

*Figure 6. Sample simulated intention statements*

### **Measuring Attitudes of Congolese PCPs toward the Provision of APHS**

Attitude toward the behavior is the overall feeling of like or dislike toward a behavior (Sharma, 2017). A more favorable or a positive attitude toward a behavior, the more likely the individual will intend to perform the behavior (Ajzen, 1991; Sharma, 2017). Attitude is measured directly on a 7-point semantic differential scale ranging from favorable to unfavorable or from good to bad; semantic differential rating scales use bipolar adjectives (Sharma, 2017). Though, Ajzen (2006) and Francis et al. (2004) recommended measuring attitude both directly and indirectly; however, for this study, I only conducted direct measurement of the attitude of Congolese PCPs to respond to my research questions, as well as the measurements of the subjective norms and perceived behavioral control of Congolese PCPs (Francis et al., 2004).

**Direct measure of Congolese PCPs attitudes.** I created a list of four items in which bipolar adjectives were paired with positive and negative endpoints. These scales consisted of a combination of instrumental items (whether the behavior achieves something: useful-worthless) and experiential items (how it feels to perform the behavior: pleasant-unpleasant). For example, extremely good (7), quite good (6), slightly good (5), neither good nor bad (4), slightly bad (3), quite bad (2), and extremely bad (1). I made sure that the items were arranged in a mix of positive and negative endpoints to minimize the risk of response set or a tendency to answer questionnaire items in the same way regardless of the content. However, for scoring purposes, I recoded the items so that the

higher numbers would refer to more positive attitudes (on the right side), and the lower numbers would refer to negative attitudes (on the left side) (see Appendix E).

Example of wide-ranging semantics for attitude:

For me, providing USPSTF and ACIP recommended preventive services is:

Worthless: 1\_\_ : \_\_2\_\_ : \_\_3\_\_ : \_\_4\_\_ : \_\_5\_\_ : \_\_6\_\_ : \_\_7\_\_ : valuable

Good: 1\_\_ : \_\_2\_\_ : \_\_3\_\_ : \_\_4\_\_ : \_\_5\_\_ : \_\_6\_\_ : \_\_7\_\_ : Bad

Harmful: 1\_\_ : \_\_2\_\_ : \_\_3\_\_ : \_\_4\_\_ : \_\_5\_\_ : \_\_6\_\_ : \_\_7\_\_ : Beneficial

Easy: 1\_\_ : \_\_2\_\_ : \_\_3\_\_ : \_\_4\_\_ : \_\_5\_\_ : \_\_6\_\_ : \_\_7\_\_ : Difficult

Inappropriate: 1\_\_ : \_\_2\_\_ : \_\_3\_\_ : \_\_4\_\_ : \_\_5\_\_ : \_\_6\_\_ : \_\_7\_\_ : Appropriate

Useful: 1\_\_ : \_\_2\_\_ : \_\_3\_\_ : \_\_4\_\_ : \_\_5\_\_ : \_\_6\_\_ : \_\_7\_\_ : useless

Unimportant: 1\_\_ : \_\_2\_\_ : \_\_3\_\_ : \_\_4\_\_ : \_\_5\_\_ : \_\_6\_\_ : \_\_7\_\_ : Important

Desirable: 1\_\_ : \_\_2\_\_ : \_\_3\_\_ : \_\_4\_\_ : \_\_5\_\_ : \_\_6\_\_ : \_\_7\_\_ : Undesirable

Unpleasant: 1\_\_ : \_\_2\_\_ : \_\_3\_\_ : \_\_4\_\_ : \_\_5\_\_ : \_\_6\_\_ : \_\_7\_\_ : pleasant

### **Measuring Subjective Norms**

Subjective norm can be described as an individual's belief that most of the significant others in his or her life think that the individual ought to or ought to not carry on the behavior or simply, perceived social pressure to execute a behavior (Francis et al., 2004; Sharma, 2017). Normative beliefs and motivation to comply are two determinants that shape subjective norms. Normative beliefs insinuate how a person thinks others who are significant in his or her life would like him or her to behave or perceptions of significant others' preferences about whether one should carry on a behavior (Francis et al., 2004; Sharma, 2017). The motivation to comply represents the degree to which a

person wants to act per the perceived wishes of significant members in his or her life or the extent to which an individual feels inclined to match his or her behavior to different sources of social pressure (Francis et al., 2004; Sharma, 2017).

**Direct measurement of Subjective Norms.** Subjective norm is assessed on a 7-point unipolar scale with a range of strongly agree (7) to strongly disagree (1); for example, strongly agree (7), moderately agree (6), slightly agree (5), neither agree nor disagree (4), slightly disagree (3), moderately disagree (2), and strongly disagree (1) (Sharma, 2017). I directly measured the subjective norms of physicians by creating three-question scales referring to the opinions of important people, such as the medical director, colleagues, patients, and government officials. This allowed me to measure the societal pressure experienced by Congolese PCPs to perform the behavior.

< Most people who are important to me think that

I should not:   1  :   2  :   3  :   4  :   5  :   6  :   7  : I should provide USPSTF and ACIP recommended preventive services during every encounter with patients from now on.

< It is expected of me that I provide USPSTF and ACIP recommended preventive services during every encounter with patients from now on.

extremely likely:   1  :   2  :   3  :   4  :   5  :   6  :   7  :  
extremely unlikely

< The people in my life whose opinions I value

would disapprove:   1   :   2   :   3   :   4   :   5   :   6   :   7   : approve of my provision of USPSTF and ACIP recommended preventive services during every encounter with patients from now on.

*Example: A patient presents with no physical complaints. The target behavior is providing USPSTF and ACIP-recommended advanced preventive health services.*

1. Most people who are important to me think that.

I should 

1	2	3	4	5	6	7
---	---	---	---	---	---	---

 I should not

provide USPSTF and ACIP-recommended advanced preventive health services.

2. It is expected of me that I refer patients, who have no physical complaints, for USPSTF and ACIP-recommended advanced preventive health services.

Strongly disagree 

1	2	3	4	5	6	7
---	---	---	---	---	---	---

 Strongly agree

3. I feel under pressure to provide patients with USPSTF and ACIP-recommended advanced preventive health services.

Strongly agree 

1	2	3	4	5	6	7
---	---	---	---	---	---	---

 Strongly disagree

4. People who are important to me want me to provide USPSTF and ACIP-recommended advanced preventive health services.

Strongly disagree 

1	2	3	4	5	6	7
---	---	---	---	---	---	---

 Strongly agree.

*Figure 7. Sample subjective norm direct questionnaire items*

## Measuring Perceived Behavioral Control

Perceived behavioral control denotes perceptions about how easy or difficult it is to perform the behavior or how much a person feels he or she is in command of enacting



the given behavior (Francis et al., 2004; Sharma, 2017). Perceived behavioral control is a proxy measure of actual behavioral control; it is a good assessment of actual control over the behavior, specifically when volitional control is not high (Sharma, 2017).

**Direct measure of perceived behavioral control.** Perceived behavioral control is assessed on a 7-point unipolar scale with a range of strongly agree (7) to strongly disagree (1); for example, strongly agree (7), moderately agree (6), slightly agree (5), neither agree nor disagree (4), slightly disagree (3), moderately disagree (2), and strongly disagree (1; Sharma, 2017). Perceived power stands for a person's perception of how easy or difficult it is to perform the behavior in each condition identified in that person's control beliefs (Sharma, 2017).

<u>Self-efficacy</u>								
1. I am confident that I could provide my patients with USPSTF and ACIP-recommended advanced preventive health services.								
Strongly disagree	1	2	3	4	5	6	7	Strongly agree
2. For me to provide my patients with USPSTF and ACIP-recommended advanced preventive health services is								
difficult	-3	-2	-1	0	+1	+2	+3	easy
<u>Controllability</u>								
3. The decision to provide patients with USPSTF and ACIP-recommended advanced preventive health services is beyond my control.								
Strongly disagree	1	2	3	4	5	6	7	Strongly agree
4. Whether I provide patients with USPSTF and ACIP-recommended advanced preventive health services or not is entirely up to me.								
Strongly agree	1	2	3	4	5	6	7	Strongly disagree

*Figure 8.* Sample perceived behavioral control direct questionnaire items

### **Data Analysis Plan and Data Management**

I set up a data file where I entered all of the data into one SPSS file. I listed all variables or questionnaire items in the same order in which they appeared in the questionnaire, making data entry quick and easy. I made concise and meaningful entries in the “variable label” column; thus, ensured that all output files encompassed the meanings and content of the items analyzed (Francis et al., 2004). I performed data screening by inspecting the distributions of each variable, checking for data entry errors by noticing if all responses were in the range represented by the response format. In the case of highly skewed distributions, this could require the use of nonparametric tests instead of multiple regression analysis (Francis et al., 2004). Using SPSS, I performed statistical analysis in two stages: descriptive and inferential. In the first step, demographic data such as age and gender were analyzed using descriptive statistics. Measures of central tendency, the normality of distribution, and frequency distribution for discrete variables were studied. In the second step, I conducted multiple regression analysis to examine the relationship between predictor variables (attitude, subjective norms, and perceived behavioral control) and the dependent variable (behavioral intention to provide preventive services) (Ajzen, 2006; Francis et al., 2004; Qidwai et al., 2015). Multiple regression can be described as a quantitative analytic procedure that either concurrently or cumulatively measures or calculates relationships between several independent variables and one dependent variable (Berman & Wang, 2012; Francis et al., 2004). Moreover, regression permits to predict outcomes based on the gen of dependent

variables; besides, it is the basis for studying relationships among three or more variables, including control variables (Berman & Wang, 2012).

### **Main Analysis**

#### **Analysis using the direct measures of the predictor variables**

Though I could have run a statistical analysis in my study using both direct and indirect measures of the chosen variables, I decided to conduct analysis using only direct measures of the predictor variables to respond to the research questions. Using the SPSS, I first used the 'recode' command to recode any negatively worded responses; then, I conducted an item analysis on each item relating to the direct measures to establish internal consistency. Granted, all of the internal consistency coefficients were acceptable ( $>0.6$ ); I then included all the items in the composite variables as suggested by Francis et al. (2004). Subsequently, I used the 'compute' commands to create the composite variables for the direct measures; special attention was given to concisely define the new variables so that the labels would be included in the output files (Francis et al., 2004). I ran a multiple regression analysis by entering intention as the dependent variable and the direct measures of attitude, subjective norm, and perceived behavioral control of Congolese PCPs as the predictor variables. Finally, I entered the control variables age and gender to respond to Research Question 4.

### **Ethical Considerations**

Ethical conduct should be paramount and a priority in any research involving human participants in order to avoid past egregious and unethical conduct such as in the case of the Tuskegee syphilis study, also referred as "shadow of Tuskegee," and the

horrific and infamous atrocities inflicted on the people of Guatemala during medical research supported by the United States between 1946 and 1948 (Salazar et al., 2015). I strictly and religiously observed and abided by the ethical principles of the Belmont Report that emphasize respect for persons, beneficence, and justice during the entire dissertation process. From the principle of respect for persons, or autonomy, stems the concept of written informed consent, which is the cornerstone of ethical consideration for the conduct of research involving human participants (Babbie, 2016; Salazar et al., 2015). Moreover, I abided by and respected the three main foci of research ethics, namely the integrity of purpose, the integrity of the process of analysis and communication, and the integrity of dealing with human participants (Berman & Wang, 2012).

Furthermore, as a researcher, I needed to meet the three key obligations before venturing into human research. First, I ought to be certified or become familiar with human participant research by completing a course approved by my university's Institutional Review Board as stipulated by Salazar et al. (2015). Second, I could not store signed informed consent forms in the same filing cabinet as any other study records that contain personal information of participants, and I should keep these signed consent forms for at least five years beyond the end date of the study as suggested by Salazar et al. (2015). And third, I was obligated to understand and observe the HIPAA by protecting participant health information, such as their age or any other sensitive health information, when researching in partnership with healthcare organizations. However, the participant could sign a waiver of his or her HIPAA rights that could be included in the consent form (Salazar et al., 2015).

## **Institutional Review Board Approval**

In the United States, research involving human beings is regulated by the Department of Health and Human Services through the Office of Human Research Protection (OHRP) (Salazar et al. 2015). OHRP, in turn, confers authority through a Federal Wide Assurance number (FWA), granted to each institution such as a university that needs to review and approve research protocols involving human participation (Salazar et al. 2015). The main purpose of the IRB is to assure that institution conducts only research in which potential benefits outweigh the potential risks to participants (Babbie, 2016; Walden University, n.d.). In order to provide broad consideration of the ethical impact of a proposed study, an IRB will examine benefits and risks from the perspective of participants providing data, the researcher, the copyright holders of all data collection instruments, the stakeholders who belong to the community impacted by the data collection and results, and the university (Walden University, n.d.). IRB is responsible for ensuring that all Walden University research complies with the university's ethical standards, as well as U.S. federal regulations; this would be accomplished by providing a personalized check on each study's research procedures to confirm that the study's benefits outweigh the risks in a way that is in full compliance with all requirements (Walden University, n.d.). IRB approval is required before collecting any data, including pilot data (Walden University, n.d.).

Ethical principles are universal rules of conduct, derived from ethical theories that provide a practical basis for identifying what kinds of actions, intentions, and motives are valued (Salazar, Crosby, & DiClemente, 2015). Babbie (2016) and Salazar et al. (2015)

underscored the pertinence of the researchers to abide by the ethical principles as elaborated in The Belmont Report, namely the respect for persons, beneficence, and justice. The principle of respect for persons states that individuals should be treated as autonomous agents and that people with diminished autonomy are entitled to protection in the course of research (Salazar et al. 2015). Furthermore, the principle of respect for a person demands that people be provided with full disclosure of all possible risks and benefits that are associated with study participation; from this principle of respect for persons or autonomy derives the cornerstone of ethical research principle of written informed consent (Salazar et al., 2015). Moreover, the American College of Epidemiology (ACE) Ethics Guidelines, and other institutions and authorities, assert that informed consent for research studies should be secured from all research participants and should include disclosure of the aims of the study, the scientific methods and procedures, any anticipated risks and benefits, and the right to refuse participation or to withdraw from the research at any time without repercussions and coercion (Salerno et al., 2016).

The principle of beneficence states that research should always have the welfare of the participants as a goal, and harm should be avoided and risk minimized; this principle echoes the cornerstone of the Hippocratic oath that is "first, do no harm" (Salazar et al., 2015). Besides physical risk or harm, epidemiologists must avoid psychosocial risk, which is any negative social consequences that may ensue when personal, sensitive information (diagnosis of HIV, use of an illicit drug, commercial sex work, and mental illness) becomes public (Salazar et al., 2015). The principle of justice

states that research should ensure that reasonable, non-exploitative, and well-considered procedures are administrated fairly and equally; that is to say that the study population should be likely beneficiaries of the study findings with fairness to all (Salazar et al., 2015). In the finale, I was guided by the two main ethical issues to conduct this research namely the need to obtain participants' fully informed consent and to ensure that participants emerge from the venture unharmed (Rudestam & Newton, 2015). The following are some of the Walden University ethical standards:

- Safety and privacy risks are minimized by using procedures that are consistent with sound research design and do not unnecessarily expose participants to risks
- Risks are reasonable concerning anticipated benefits
- Participants are selected equitably so that burdens and benefits of research are fairly distributed
- Informed consent will be obtained and documented
- Perceived coercion to participate is minimized especially among potentially vulnerable participants
- Research is monitored (Walden University, n.d.).

Salazar et al. (2015) underscored the need for protecting human participants in research from minimizing risk and maximizing benefit in both research and practice. The IRB emphasizes three obligations that the researcher must observe while conducting his or her study, including certification in human participant research, storing consent forms, and understanding HIPAA Salazar et al. (2015). Furthermore, Rudestam and Newton (2015) suggested that researchers must observe five norms, namely: validity of research,

competency of the researcher, beneficence of research, special population consideration, and informed consent. Securing approvals from the IRB is essential for any research involving human beings, and a higher level of scrutiny is applied by IRB members to provide special protection for populations considered vulnerable, such as pregnant women, children, and prisoners Salazar et al. (2015). Since participants of this research might include vulnerable populations, such as pregnant physicians, I eagerly pursued approvals from the Walden University IRB.

### **No Harm to Participants**

Babbie (2016) contended researchers should never cause any harm to the people being studied. This included physical harm and psychological harm caused by revealing information that could embarrass the research participants or endanger their quality of life (Babbie, 2016). The nature of the questionnaire items and the design of this study had little likelihood of affecting a participant's psychological status. The questionnaire focused on Congolese PCP practices and delivery of APHS as recommended by the USPSTF and ACIP. The survey was also anonymous.

Since this research involved the personal demographic information of participants, I had to observe and adhere to the privacy and confidentiality principles as outlined by the HIPAA, especially with the current revolution of health informatics. Not storing informed consent forms with personal information of participants and deidentification of participants were some measures I undertook to preserve the confidentiality and privacy of the research participants as noted by Salazar et al. (2015). Although Rothstein (2010) had suggested that the Privacy Rule listed 17 specific



provisions and one general provision regarding the types of identifiers that must be removed from health information before the information was deemed deidentified, I adapted and limited those provisions in accordance to the realities in the Democratic Republic of Congo. Therefore, I removed the following identifiers: (1) names; (2) geographical subdivisions smaller than a state (3) all elements of dates (except year) that relate to birth date; (4) telephone numbers; (5) e-mail addresses; (6) certificate or license numbers; (7) biometric identifiers; (8) photographic and comparable images; and (9) any other unique identifying number, characteristic, or code.

Before I collected data from PCPs (participants), I secured fully informed consent without coercion with all its elements including my name as conductor of the research, why the participant was selected, the time commitment, benefits expected, potential risks and how to manage them, explanation of study and response to questions, emphasis that participation was always voluntary, provision of a copy of the informed consent form, advisement to participants about nonpayment, explanation about limits of confidentiality, and notification to participants about debriefing as suggested by Rudestam and Newton (2015). Although most of the potential participants were full-capacity adults aged 24–69 years old, it was quite possible that pregnant physicians would be surveyed; therefore, I provided special protection in order to include these participants while applying for IRB approval; for example, permission from the father of fetus or husband might be required in addition for the pregnant physician. I assigned participants with identification numbers and I did not keep demographic information in the same storage box with identification numbers to avoid any linkage of participant identification to the assigned number.

I installed password on the computer to safeguard the data files, and only I had access to these data files; I changed this password intermittently. Although this study was carried out in the Democratic Republic of Congo and fell in the category of international research; per Walden University IRB, I was not required to secure another approval from a local IRB. Nevertheless, I had to submit to Walden IRB both English and French translated documents such as informed consent forms and survey questionnaires since French is the official spoken language in the Democratic Republic of Congo.

### **Potential Threats to Study Validity**

According to Burkholder, Cox, and Crawford (2016), high-quality research must meet certain indicators or standards of quality that certify that research outcomes precisely epitomize the participants, phenomenon, or process being scrutinized. Furthermore, the authors argue that not meeting the standards of quality would undoubtedly result in misleading or inaccurate research (Burkholder et al., 2016). Babbie (2016) and Burkholder et al. (2016) suggested that validity and reliability were the best indicators of high-quality and robust research; Babbie (2016) noted that precision and accuracy were the other indicators of high-quality quantitative research (p. 157).

Babbie (2016) described validity as a measure that perfectly mirrors the notion it is supposed to gauge, whereas reliability is achieving unswerving or steady findings from the same measure. Although the ultimate validity of a measure can never be proved, relative validity can be achieved by face validity, criterion-related validity, content validity, construct validity, internal validity, and external validity (Babbie, 2016). In order to promote the validity of the research findings, Burkholder et al. (2016) argued

that pertinent considerations must be fulfilled during the crucial process of study design in addressing and resolving the research question namely: the method of data collection (quantitative or qualitative), the types of data collected (interviews, attitude surveys, standardized test results), the sample of data collected, interview and survey questions appropriated to the research question, and inclusion of enough participants to allow generalization of results beyond the study. Moreover, Burkholder et al. (2016) emphasized that validity should not be viewed as a one-dimensional goal; instead, it is both a process and an outcome and requires an iterative process with the ultimate endpoint to grasp the research topic better. Thus, the authors suggested that validity is a continuum and that evidence for validity ranged from being poor to really great, as opposed to something being either valid or not; and the authors encouraged the use of modifiers 'approximately' when referring to validity since one can never know what is true (Burkholder et al., 2016).

### **Threats to Internal and External Validity**

In practical terms, Burkholder et al. (2016) suggested that internal validity is the degree of truthfulness to which the proposition that a change in one variable, rather than changes in other variables, causes a change in outcome. There are several threats to internal validity, including ambiguous temporal precedence, selection, history, maturation, regression artifacts, attrition or mortality, testing, instrumentation, and additive and interactive effects of threats to validity (Burkholder et al., 2016). Threats to internal validity are described as threats that result from the study design and that jeopardize the study conclusions; usually, these threats question the logic of study

conclusion (Berman & Wang, 2012). During this study, I followed all the steps suggested by Francis et al. (2004) and the methodology championed by Ajzen (2006) in applying the TPB namely a quantitative cross-sectional design survey, an elicitation study, a pilot study, construction of final survey, and the implementation of the final survey. Although for this study I used an instrument developed by Francis et al. (2004) for health researchers, and an instrument that has been subjected to several reviewing and trialing procedures; however, it was imperative that I established the reliability of each measure. For direct measures, I established the internal reliability or internal consistency by using an index of internal consistency or Cronbach alpha as stipulated by Francis et al. (2004) and Berman and Wang (2012). Internal consistency helps to determine whether the items in the scale measure the same construct (Berman & Wang, 2012).

Threats to external validity are threats that jeopardize the generalizability of the study findings; unfortunately, since the study sample I selected was not random, this study conclusion would not be generalized to all PCPs practicing in the Democratic Republic of Congo. Nevertheless, valuable knowledge and insight would be learned from this study. To avoid saturation, I conducted the elicitation study in Kinshasa recruiting a total of 30 participants only.

### **Conclusion**

Although a quantitative cross-sectional design survey was the main method used to conduct this study; however, as suggested by Ajzen (2006) and Francis et al. (2004), I previously carried on a qualitative study through an elicitation questionnaire to identify the salient beliefs of Congolese PCPs toward APHS, to identify advantages and

disadvantages of providing APHS, to identify potential facilitator and inhibitor factors of providing APHS in the Democratic Republic of Congo and to assist in constructing initial survey questionnaire. I also conducted a pilot study with the purpose of obtaining feedback from a group of participants to fine-tune the final questionnaire survey. Unfortunately, random sampling of Congolese PCPs was not possible for logistic reasons. Instead, all Congolese PCPs practicing in Kinshasa and two western provinces of the Democratic Republic of Congo were potential participants. Using the G\*Power analysis tool, I calculate the minimum sample size of 128 participants for this study. Although Francis et al. (2004) suggested doubling the number of participants since the response rates are often around 50%; however, instead of distributing only 256 questionnaires to achieve the estimated sample size of 128 participants, I decided to recruit at least 300 participants for this study.

I conducted this study according to the ethical principles as depicted in the Belmont Report with the emphasis on obtaining written informed consent and ensuring safety and confidentiality of personal health data as stipulated by HIPAA laws. Before collecting data, I secured approval from Walden University IRB. Collected data were de-identified and stored in a safe place different from the informed consent. For this study, I used an instrument developed by Francis et al. (2004), based on the work of Ajzen. I measured directly all three predictor and dependent variables of the TPB model, and I identified the beliefs of the Congolese PCPs through elicitation questionnaires. I conducted a pilot study to help construct the final survey questionnaires. I re-worded and coded properly the data collected before conducting the SPSS analysis. Data analysis

included descriptive analysis and inferential analysis using multiple regression. Unfortunately, I would not be able to generalize the conclusion of this study to all Congolese PCPs because of a lack of random sampling of participants. Before administering the survey questionnaire, I translated the informed consent and the questionnaire survey to French, which is the official language spoken in the Democratic Republic of Congo.

## Chapter 4: Results

### **Introduction**

My aim of conducting this study was to use the Ajzen's TPB as the theoretical framework to predict the provision of APHS by Congolese PCPs as recommended by the USPSTF and ACIP guidelines. In this result chapter, I included a data collection report and statistical analysis conducted through IBM SPSS version 25. I examined the relationships between the four proximal constructs of TPB, namely, attitude toward the provision of APHS, subjective norms of Congolese PCPs, perceived behavioral control of Congolese PCPs, and intention to provide APHS. I only surveyed and analyzed the direct measurements of predictor variables (attitude, subjective norms, and perceived behavioral control) in conjunction with the dependent variable, behavioral intention. Although the demographic variables, age, and gender of participants, are not constructs of TPB per se, nevertheless, I assessed their controlling impact on the relationship between the predictor and dependent variables. I addressed the first three hypotheses of this study through simple regression; then I conducted a multiple regression to assess how well the three predictor variables together predict the intention to provide APHS; and finally, I ran a hierarchical multiple regression to assess the impact of control variables (age and gender) on the relationship between predictor variables and outcome variable. I used the interpretation of the regression coefficients to assess the relationship among the predictor variables (attitude, subjective norms, and perceived behavioral control) and the dependent variable (intention to provide APHS). Moreover, using SPSS, I was able to utilize the chi-square test supplemented by the adjusted R-squared ( $R^2$ ) to assess the model's overall

goodness-of-fit. Before running multiple regression analysis, I assessed the internal consistency reliability of all TBP variables by conducting Cronbach's alpha analysis.

This chapter is meticulously organized, such as I steadily presented the data collection process, the statistical analysis, and the study findings. In the first section, I outlined the data collection process and the operationalization of variables. In the second section, I described the statistical analysis which encompassed both descriptive and inferential statistics (multiple regression) results. Finally, in the third section, I presented the chapter summary.

### **Data Collection**

Foremost, I followed scrupulously the steps for data collection, as diligently described in the methodology section of Chapter 3. After securing conditional IRB approval from Walden University to conduct the study, I traveled to the Democratic Republic of Congo in May 2019, or more precisely to the capital city of Kinshasa and to the two western provinces of Kongo Central and Kwilu to seek permission from hospital and clinic medical directors to conduct this study in their medical institutions. I progressively approached a total of 12 medical directors from different hospitals and clinics; unfortunately for political reasons, only 11 medical directors from hospitals and clinics that had an established research ethics team granted me permission to conduct the study in their institutions; therefore, only three medical institutions in Kinshasa and four hospitals in Kongo Central and Kwilu provinces each extended their partnership to conduct the study inside their premises. With the medical director authorizations for research partnership in hand, I petitioned Walden University IRB to grant definitive IRB



approval for each medical institution. The process was time-consuming, requiring at least 10 days for each hospital or clinic partnership for IRB approval. The IRB authorization number is 05-10-19-0552786 and expires on May 09, 2020 (see Appendix H). Despite his enthusiasm and eagerness to allow the study to be conducted in his state-run clinic, the lone medical director who could not grant access to conduct the study in his clinic premises was bound to seek permission from the Democratic Republic of Congo minister of public health. Unfortunately, following the dismissal of the public health minister for mismanagement of the Ebola virus outbreak in Eastern Congo, the petition was not addressed by the departing minister of public health for 3 months. In the state-run hospitals in Kinshasa, the presumption for partnership implied that a substantial amount of money for the research was to be distributed among the hospital administrators and public health ministry staff despite my proclamation that I did not receive any funding for the research. Overall, I visited each medical institution three times; first, to gain authorization to conduct the study from the medical director, and after approval from Walden University IRB, I went back to the hospital to recruit participants and distribute the survey questionnaire and informed consent forms. Following a brief overview of the study, most PCPs present in the conference room were eager to participate in the study.

As noted by Groves et al. (1992), Congolese PCPs were more likely to participate and respond to survey questionnaires since they knew that I was their colleague physician. After one week or so, I went back to the hospital to retrieve filled survey questionnaires from each consenting participant; I then moved to the next hospital or clinic and continued this pattern for institutions that followed. Most of the medical

directors were adamant that their hospital or clinic be acknowledged and publicized in the final study report; however, after clearly explaining the concerns surrounding data confidentiality and security and the respect for the privacy of participants, they developed a clear understanding and acceptance of my inability to grant their request. Nevertheless, I promised to send them each a copy of the study or an internet link to ProQuest. Moreover, some hospitals and clinics requested a payment of research fees, which ranged from \$50 to \$250; however, after explaining to the hospital ethic teams that I did not receive any funding for this doctoral research, the fee was reduced to between \$50 to \$80.

During a 10 to 15-minute oral presentation of the study overview, I informed all potential participants that their participation was voluntary and noncoercive and that they were unrestricted to abandon the survey at any time and to refrain from responding any awkward or embarrassing questions. Moreover, I reassured all potential participants that I would abide by *The Belmont Report* ethic principles and would ensure the confidentiality and safety of data and the privacy of all participants. Furthermore, I underscored that the study was for the completion of my doctorate degree, I did not receive any funding for the study, and I did not represent any particular financial conflict of interest. As promised in the informed consent, I provided soft drinks and sandwiches to all potential participants who attended the study oral presentation overview. In conclusion, I reassured participants on my eagerness to abide by the respect of research ethics, namely the integrity of the purpose of the study, the integrity of the process of analysis and communication, and the integrity of dealing with human study participants as stipulated

by Berman and Wang (2012). I flew three times to the Democratic Republic of Congo to conduct the collection of data between May 5, 2019, and November 7, 2019.

### **Elicitation Study**

As suggested by Ajzen (2006) and underscored in the methodology section of Chapter 3 of this study, I conducted first an elicitation study and a pilot study before the development of the final survey questionnaire. This is a standard approach in developing the actual survey questionnaire when applying the TPB (Francis et al., 2004). The elicitation or qualitative study instrument (Appendix B) was mirrored from Ajzen's (2006) and Francis et al. (2004) elicitation survey questionnaires. As implied by Ajzen (1991), Francis et al. (2004), and Sharma (2017), my main purpose of conducting an elicitation study, a form of qualitative approach using open-ended questions, was to identify commonly held beliefs by Congolese PCPs toward APHS, to identify advantages and disadvantages of providing APHS, and to identify facilitator and barrier factors to the provision of APHS by Congolese PCPs. Moreover, the elicitation study contributed to the development of the initial questionnaire which was subsequently pilot tested with the ultimate goal of constructing the final survey questionnaire of the study as suggested by Ajzen (1991), Francis et al. (2004), and Sharma (2017).

I recruited the elicitation study participants among a convenient sample of Congolese PCPs working in the first hospital-clinic that granted the authorization to conduct the study in the capital city of Kinshasa. A total of 30 PCPs consented to participate in this study. Most PCPs surveyed valued the provision of APHS and were eager to provide them. However, they expressed frustration when trying to administer

these vital preventive and promotional health services mainly because most patients were too poor to afford screening services such as Pap smear for cervical cancer and colonoscopy for colon cancer, in a country where there is no health insurance coverage for these pertinent services. Furthermore, although the majority of Congolese people are Christian and God-fearing people, some still blame witchcraft and sorcery for the occurrence of diseases, accidents, and unexplained death. This belief in witchcraft and sorcery has been exacerbated by the teaching of unscrupulous pastors who are preaching falsely and deceitfully that the diseases and deaths are caused by evil spirits and witchcraft, and that only their prayers can protect them against these diseases and deaths. Hence, Congolese PCPs are facing stiff reluctance from Congolese people to participate in disease prevention and health promotion activities. For instance, one PCP shared how embarrassing and discouraging his inability to sway and recruit Congolese women in Kinshasa to undergo free Pap smear screening by a team of Belgian researchers. In their denial to participate in the free Pap smear screening, most women contacted responded that “in the name of Jesus-Christ, they would not contract that disease; therefore, they did not need that screening test.” To overcome these barriers, most PCPs surveyed advocated a national health policy recommending these APHS, free coverage for these services to increase access for every Congolese to these services, a better training and financial incentive to motivate PCPs to provide these APHS, the government to provide appropriate equipment and supplies to hospitals and clinics, and for the Public Health Ministry to launch national campaign to educate and sensitize all Congolese people the benefits of receiving APHS.

## **Pilot Study**

As recommended by Ajzen (2006) et Francis et al. (2004), I conducted a pilot study a week later in the same medical institution as the elicitation study (see Appendix C). Per the recommendations set forth by Ajzen (2006), the pilot study participants consisted of a small sample of Congolese PCPs practicing in Kinshasa; a total of 30 PCPs participated in the pilot study, with some participants taking part in an elicitation study, others only participating in the pilot study. Pilot studies are deemed beneficial as they serve as a trial run for the researcher to identify unforeseen problems with the survey questionnaire and allow for open feedback from the participants. Furthermore, pilot studies are helpful in providing an estimation of response rates from participants and the estimation of the monetary costs of the implementation of the final survey (Dilman et al., 2009).

The pilot study findings were useful in shaping the final survey questionnaire. The age limit of 65 years was a major issue for older participants who were still practicing; they claimed to be unfairly discriminated against and were keen to take part in this pertinent study. Some PCPs expressed not being familiar with USPSTF and ACIP recommendations. Other PCPs did not understand the Likert scale grading and needed some assistance to complete the survey. Subsequently, I introduced a request for a change of procedure to Walden University IRB to extend the age limit to 69 years, which was afterward approved. I printed a page of the USPSTF and ACIP recommendations and handed it out to potential participants; I provided more explanation on these recommendations during the brief introduction of the study. Furthermore, I spent more

time explaining the grading of the questionnaire on a Likert scale. Overall, participants were enthusiastic about participating in the study and they noted that the questions were not ambiguous, long, or repetitive. However, I removed two questions to improve the Cronbach's alpha index for the subjective norm and perceived behavioral control, a negatively formulated question that caused confusion to some participants, and another question with a confusing translation in French.

### **Implementation of Final Study**

After making appropriate changes to the initial survey questionnaire according to the feedback received from the elicitation and the pilot studies, and subsequent approval of change of procedure by Walden University IRB, I proceeded by collecting data in Kinshasa and the two provinces of Kongo Central and Kwilu.

### **Results of the Study**

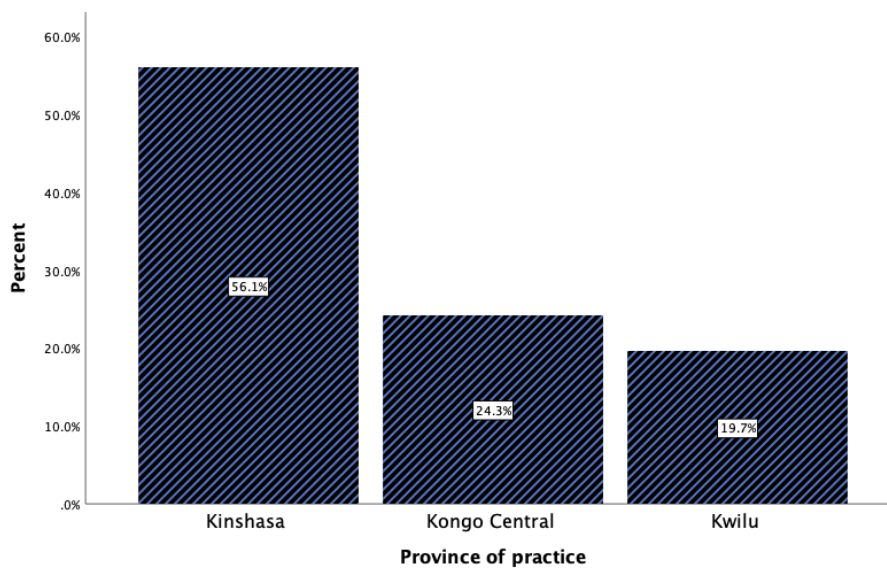
Ensuing completion of the survey, I entered the data collected in Excel to form a dataset that I exported to SPSS 25. As described in the methodology section, I screened collected data for missing values, outliers, normality, skewness, and kurtosis.

Subsequently, I performed statistical analysis of data in two stages: descriptive and inferential. In the first step, I analyzed demographic data such as age and gender using descriptive statistics in SPSS. In the second step, I ran multiple regression analysis to examine the relationship between predictor variables (attitude, subjective norms, and perceived behavioral control) and the dependent variable (behavioral intention to provide APHS) as suggested by Ajzen (1991) and Francis et al. (2004).

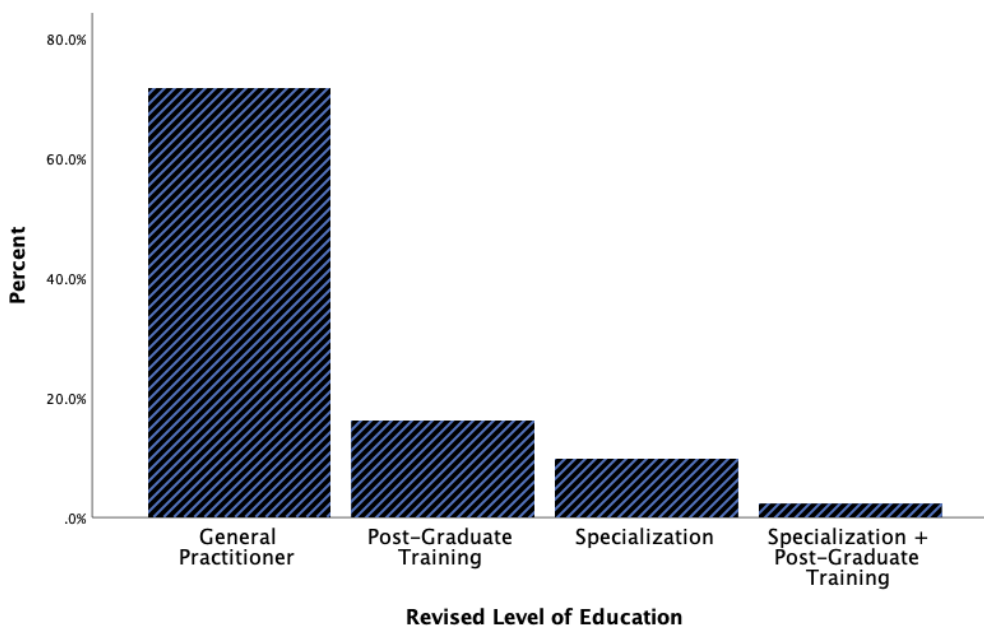
## **Descriptive Analysis Results**

Out of the 200 questionnaires that I distributed following the overview of the study and the description of USTPTF and ACIP guidelines, I recruited 178 participants which were deemed eligible for the study, and signed the consent form; 178/200, an 89% response rate. Participants of the 22 surveys that were excluded from the study failed to meet the eligibility criteria as some participants were not PCPs (dentists and nurse practitioners) or were aged beyond the approved age limit (above 70 years of age). After data screening and cleaning, five surveys out of the 178 eligible surveys were discarded for containing an excessive number of missing values. However, in instances where missing values were sporadic, means were used to mitigate numerically based questionnaire items. The sample size of 173 participants was more than enough to meet the minimum required sample size of 128 participants, as determined by G\*Power calculation. As shown in Figures 6 and 7, as well as Table 1, of the 173 participants who returned completed questionnaires, 71.7% (124/173) reported being general practitioners, 16.2% (28/173) had post-graduate training, and 9.8% (17/173) were specialists, and 2.3% (4/173) have both some post-graduate training and specialization. 134 (77.5%) men and 39 (22.5%) women took part in this study. As for age, 51.4% (89/173) of participants were between the ages of 24 to 34 years; 34.7% (60/173) were between the ages of 35 to 45 years; 10.4% (18) were between the ages of 46 to 56 years, and 3.5% (6/173) were 57 years old and over. Regarding years of practice, 66.5% (115/173) have one to 5 years of practice; 15.6% (27/173) have six to ten years of practice; 9.2% (16/173) have 11 to 15 years of practice, and 8.7% (15/173) have 16 and over years of practice. Concerning the

number of patients seen per week, 9.2% (16/173) of participants see 61 and more patients; 8.1% (14/173) see 41 to 60 patients; 38.7% (67/173) see 21 to 40 patients, and 43.9% (76/173) see 20 and fewer patients.



*Figure 9.* Congolese PCP Province of Practice



*Figure 10.* Congolese PCP Level of Education



Table 1

*Descriptive Statistics (n=173)*

Descriptive Statistic	Frequency	Percent
Categorical Age Distribution (in years)		
24 to 34	89	51.4
35 to 45	60	34.7
46 to 56	18	10.4
57 and Over	6	3.5
Gender		
Male	134	77.5
Female	39	22.5
Categorical Years of Practice		
Up to 5 years	116	67.1
6 to 10 years	27	15.6
11 to 15 years	15	8.7
16 years and Above	15	8.7

## Current Practice by Congolese PCPs

Current Practice: Are you currently providing the following advanced preventive health services?	Frequency (%)	
	Yes	No
Cervical Cancer Screening	52 (30.1%)	121 (69.9%)
Colon Cancer Screening	21 (12.1%)	152 (87.9%)
High Blood Pressure Screening	148 (85.5%)	25 (14.5%)
HIV Screening	159 (91.9%)	14 (8.1%)

Diabetes Screening	146 (84.4%)	26 (15.0%)
Diet and Lifestyle Modification (Exercise, Smoking Cessation and Obesity Screening) Counseling	153 (88.4%)	20 (11.6%)

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In terms of their province of practice, 56.1% (97/173) of participants work within the Capital City of Kinshasa, 24.3% (42/173) in Kongo Central province, and 19.7% (34/173) in Kwilu province. 69.4% (120/173) of participants work in an urban/city setting and 30.6% (53/173) in a rural setting. Concerning hospital or clinic affiliation, 58.4% (101/173) of participants practice in public or state-run hospitals; 27.7% (48/173) in Catholic hospitals/clinics; and 13.9% (24) in Protestant hospitals/clinics.

Concerning current practice, 30.1% (52/173) of Congolese PCPs indicated that they screen for cervical cancer; 12.1% (21/173) screen for colon cancer; 85.5% (148/173) screen for high blood pressure; 91.9% (159/173) screen for HIV; 84.4% (146/173) screen for diabetes mellitus; and 88.4% (153/173) provide diet and lifestyle modification counseling, as seen in Table 1. Out of the next ten patients, Congolese PCPs expressed the intention to provide APHS in average to seven patients (mean of 6.8).

### **Internal Consistency Reliability, Goodness-of-Fit Test, and Assumptions**

Cronbach's alpha analysis was run to assess the internal consistency reliability of the TPB variables after the pilot study. Cronbach alpha values vary from 0 to 1 and values greater than .70 are deemed acceptable for any index (Berman & Wang, 2012). As seen in Table 2, the Cronbach's alpha analysis results denoted that all of the variables met the suggested levels of reliability (>.70) except for the subjective norms even after removing certain questions.

Table 2

*Cronbach alpha scores*

Factors	Number of Indicators	Coefficient Alpha
Attitude	4	.858
Subjective Norm	2	.511
Perceived Behavioral Control	2	.848
General Intention	3	.845
Simulated Intention	9	.724

It was crucial to determine whether the model used in this research was a good model. The goodness of fit test is a test used to determine whether two distributions are similar, or whether a distribution is consistent with a stated value (Berman & Wang, 2012). Adjusted R-square is often used to assess model explanation or fit; adjusted R-square < 0.20 indicates weak model fit;  $0.20 < \text{adjusted R-square} < 0.40$  denotes a moderate fit; adjusted R-square > 0.40 indicates strong fit; and adjusted R-square > 0.65 indicates very strong model fit (Berman & Wang, 2012). IBM-SPSS bestows an index named goodness of fit chi-square; a p-value of more than 0.05 is deemed as adequate (Sharma & Petosa, 2014). Chi-square/df is an old reasonable measure of goodness of fit for models with about 75 to 200 cases; Chi-square/df needs to be less than 5:1 to be considered as an acceptable fit (Carmines & McIver, 1981; Hu & Bentler, 1999; Kenny, 2015). Other measures of goodness of fit include: Goodness of fit index which ranges from 0 (poor fit) to 1 (perfect fit); adjusted goodness of fit index which is a measure that adjusts for degree

of freedom (df), a value greater than 0.90 is viewed as suitable; root mean square residual (RMR) which ought to be less than 0.05, good fitting models have a small RMR; and root mean square error of approximation (RMSEA) with values of less than 0.05 indicating good fit, 0.05-0.08 denoting a fair fit, 0.08-0.10 indicating poor fit, and  $>.10$  suggesting a very poor fit (Sharma & Petosa, 2014). The adjusted R square was used to determine the goodness of fit; unfortunately, the adjusted R square for this study was 7.6%, well below 20%, indicating a weak fit. The goodness of fit chi-square yielded a p-value of less than 0.05, indicating poor model fit. However, the Chi-square/df for the simulated intention was 1.60, which is less than 5, indicating a good fit (Carmines & McIver, 1981; Hu & Bentler, 1999; Kenny, 2015).

Although multiple regression is a powerful tool for hypotheses testing, a number of assumptions must be met in order for the regression results to be assumed as robust (Berman & Wang, 2012). Therefore, using SPSS, assumption testing was performed to exclude any violation; hence, the survey data were screened for outliers, normality, linearity, multicollinearity, heteroscedasticity, and autocorrelation. The relationship between the outcome variable and the independent variables should be linear, and scatterplots can be helpful in showing whether there is a linear or curvilinear relationship (Berman & Wang, 2012). Multiple regression assumes that the residuals are normally distributed; and that the independent variables are not highly correlated with each other (no multicollinearity), which can be tested using Variance Inflation Factor (VIF) values. The lack of heteroscedasticity or the presence of homoscedasticity suggests that the variances of error terms are similar across the values of the independent variables; this

assumption can be tested using a plot of standardized residuals versus predicted values which reveal whether points are equally distributed across all values of the independent variables (Berman & Wang, 2012).

All multiple regression assumptions were met; the scatterplot of the standardized residuals was used to detect outliers. None of the observed values fell beyond -3 and or +3; hence no outlier was identified (Berman & Wang, 2012). The probability plot (P-P) of the regression standardized residual was normally bell-shaped and revealed a straight regression line denoting the linearity of the relationship (Berman & Wang, 2012). The variance inflation (VIF) for each regression coefficient was computed, and the values of 1.057 for attitude, 1.025 for the subjective norm, and 1.038 for perceived behavioral control were below 5, indicating no multicollinearity among independent variables (Berman & Wang, 2012). An equal variance of the error terms was shown in the error term plot, revealing a rectangular distribution of residuals; thus, no obvious trumpet-shaped pattern of the scatterplot was detected graphically. Hence there was no assumption of heteroscedasticity. Since this was a cross-sectional study, the assumption of autocorrelation was not of major concern since the autocorrelation is usually a concern for time series data (Berman & Wang).

### **Inferential Analysis Results**

The expectation of applying the TPB in the provision of APHS by Congolese PCPs stems from the premise that the more favorable the attitude and subjective norm, and the greater the perceived control, the stronger should be the person's intention to perform the behavior in question (Ajzen, 1991; Ajzen, 2006; Francis et al., 2004; Sharma,

2017). Both the generalized and simulated intention to provide APHS were regressed on predictor variables attitude, subjective norms, and perceived behavioral control, and the regression results were reported and compared.

### **Research Question 1**

It was foreseeable that Congolese PCPs who enjoyed a positive attitude toward the provision of APHS would more likely express the intention of providing these vital APHS.

RQ1: To what degree can Congolese PCPs' attitudes predict their behavioral intention for the provision of the best practices in disease prevention and health promotion as set forth by the USPSTF and ACIP?

*H<sub>0</sub>1*: There is no statistically significant relationship between the attitude of Congolese PCPs and their behavioral intention for the provision of best practices in disease prevention and health promotion as set forth by the USPSTF and ACIP guidelines.

*H<sub>1</sub>1*: There is a statistically significant relationship between the attitude of Congolese PCPs and their behavioral intention for the provision of best practices in disease prevention and health promotion as set forth by the USPSTF and ACIP guidelines.

Alternative Hypothesis 1 was supported by the data for both the generalized and simulated intention of Congolese PCPs to provide APHS as set forth by the USPSTF and ACIP guidelines to a certain point, as seen in Table 3. Attitude explained 12.4% of variation ( $R^2$ ) in generalized intention at p-value of  $< 0.01$  and 3.4% of variation in

simulated intention at p-value of  $<0.05$ . These results denoted a statistically significant relationship between attitude and the intention to provide APHS according to USPSTF and ACIP recommendations.

Table 3

*Model Summary: Simple Linear Regression – Attitude vs. Simulated Intention (General Intention)*

R	R-square	Adjusted R <sup>2</sup>	Std. Error of the Estimate
.183 (.352)	.034 (.124)	.028 (.119)	1.06610 (.76909)

*ANOVA Results: Attitude*

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	6.745 (14.278)	1 (1)	6.745 (14.278)	5.934 (24.139)	.016 (.000)
Residual	194.353 (101.148)	171 (171)	1.137 (.592)		
Total	201.098 (115.426)	172 (172)			

*Attitude Simple Linear Regression Results with Dependent variable: SIscale (GIscale)*

Model	Unstandardized coefficients		Standardized coefficients	t	Sig.
	beta	Standard Error	Beta		
(Constant)	.246 (3.023)	.429 (.310)		.574 (9.765)	.566 (.000)
AT scale	.175 (.254)	.072 (.052)	.183 (.352)	2.436 (4.913)	.016 (.000)

*Note.* Dependent Variable: SIscale (GIscale)  
Predictors: (Constant), AT scale

## Research Question 2

In applying the TPB, the expectation was that the study would establish that Congolese PCPs who were under social pressure to provide APHS from individuals who were important to them and whose opinion was valued, were more likely to bestow them.

RQ2: To what degree can Congolese PCPs' subjective norms predict their behavioral intention for the provision of the best practices in disease prevention and health promotion as set forth by the USPSTF and ACIP guidelines?

*H<sub>0</sub>2*: There is no statistically significant relationship between the subjective norms of Congolese PCPs and their behavioral intention for the provision of best practices in disease prevention and health promotion as set forth by the USPSTF and ACIP guidelines.

*H<sub>1</sub>2*: There is a statistically significant relationship between subjective norms of Congolese PCPs and their behavioral intention for the provision of best practices in disease prevention and health promotion as set forth by the USPSTF and ACIP guidelines.

Alternative Hypothesis 2 was also supported by data for both the generalized and simulated intention of Congolese PCPs to provide APHS as set forth by the USPSTF and ACIP guidelines, as seen in Table 4. Subjective norm explained 11.4% of variation ( $R^2$ ) in generalized intention at p-value of  $< 0.01$  and 4.4% of variation in simulated intention at p-value of  $< 0.05$ . These results denoted a statistically significant relationship between subjective and the intention to provide APHS according to USPSTF and ACIP recommendations. Furthermore, the relationship between subjective norm and



generalized intention remained statistically significant with a standardized coefficient Beta of 0.287 at  $p < 0.01$  when controlled for all the other independent variables.

Similarly, the relationship between subjective norm and simulated intention remained statistically significant, with a standardized coefficient of 0.179 at a p-value of  $< 0.05$  when controlled for all the other variables.

Table 4

*Model Summary: Simple Linear Regression – Subjective Norms vs. Simulated Intention (General Intention)*

R	R-square	Adjusted R <sub>2</sub>	Std. Error of the Estimate
.209 (.338)	.044 (.114)	.038 (.109)	1.06044 (.77327)

*ANOVA Results – Subjective Norms*

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	8.803 (13.178)	1 (1)	8.803 (13.178)	7.828 (22.039)	.006 (.000)
Residual	192.295 (102.248)	171 (171)	1.125 (.598)		
Total	201.098 (115.426)	172 (172)			

*Subjective Norms Simple Linear Regression Results with Dependent variable: SIscale (GIscale) (n=173)*

Model	Unstandardized coefficients		Standardized coefficients	t	Sig.
	beta	Standard Error	Beta		
(Constant)	.563 (3.648)	.266 (.194)		2.115 (18.791)	.036 (.000)
SNscale	.149 (.182)	.053 (.039)	.209 (.338)	2.798 (4.695)	.006 (.000)

*Note.* Dependent Variable: SIscale (GIscale)

Predictors: (Constant), SNscale

### **Research Question 3**

This study has provided the opportunity to examine how the perceived behavioral control of Congolese PCPs, including facilitator and inhibitor factors, would affect the intention to provide APHS.

RQ3: To what degree can Congolese PCPs' perceived behavioral control predict their behavioral intention for the provision of the best practices in disease prevention and health promotion as set forth by the USPSTF and ACIP guidelines?

*H<sub>03</sub>*: There is no statistically significant relationship between the perceived behavioral control of Congolese PCPs and their behavioral intention for the provision of best practices in disease prevention and health promotion as set forth by the USPSTF and ACIP guidelines.

*H<sub>13</sub>*: There is a statistically significant relationship between the perceived behavioral control of Congolese PCPs and their behavioral intention for the provision of best practices in disease prevention and health promotion as set forth by the USPSTF and ACIP guidelines.

Alternative Hypothesis 3 was supported by the data for both the generalized and simulated intention of Congolese PCPs to provide APHS as set forth by the USPSTF and ACIP guidelines to a certain point, as seen in Table 5. Perceived behavioral control explained 3% of variation ( $R^2$ ) in generalized intention at p-value of  $< 0.05$  and 3.9% of variation in simulated intention at p-value of  $< 0.01$ . These results denoted a statistically

significant relationship between perceived behavioral control and the intention to provide APHS according to USPSTF and ACIP recommendations.

Table 5

*Model Summary: Simple Linear Regression – Perceived Behavioral Control vs. Simulated Intention (General Intention)*

R	R-square	Adjusted R <sub>2</sub>	Std. Error of the Estimate
.198 (.173)	.039 (.030)	.034 (.024)	1.06299 (.80920)

*ANOVA Results: Perceived Behavioral Control*

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	7.876 (3.455)	1 (1)	7.876 (3.455)	6.970 (5.276)	.009 (.023)
Residual	193.222 (111.971)	171 (171)	1.130 (.655)		
Total	201.098 (115.426)	172 (172)			

*Perceived Behavioral Control Simple Linear Regression Results with Dependent variable: SIscale (GIscale) (n=173)*

Model	Unstandardized coefficients		Standardized coefficients	t	Sig.
	beta	Standard Error	Beta		
(Constant)	.507 (4.009)	.301 (.229)		1.683 (17.487)	.094(.000)
SNscale	.149 (.098)	.056 (.043)	.198 (.173)	2.640 (2.297)	.009 (.023)

*Note.* Dependent Variable: SIscale (GIscale)  
Predictors: (Constant), PBCscale

Table 6

*Relationship between TPB Constructs and Simulated Intention (General Intention) Model Summary*

R	R-square	Adjusted R <sup>2</sup>	Std. Error of the Estimate
.304 (.465)	.092 (.216)	.076 (.202)	1.03919 (.73173)

*ANOVA Results: All TPB Constructs*

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	18.593 (24.939)	3 (3)	6.198 (8.313)	5.739 (15.526)	.001 (.000)
Residual	182.505 (90.487)	169 (169)	1.080 (.535)		
Total	201.098 (115.426)	172 (172)			

*Note.* Dependent Variable: SIscale (GIScale)

*All TPB Construct Coefficients: SI scale (GI scale) (n=173)*

Model	Unstandardized coefficients		Standardized coefficients	t	Sig.
	beta	Standard Error	Beta		
(Constant)	-.666 (2.258)	.502 (353)		-1.327 (6.392)	.186(.000)
ATscale	.120 (.209)	.072 (.051)	.126 (.290)	1.674 (4.143)	.096 (.000)
SNscale	.127 (.155)	.053 (.037)	.179 (.287)	2.407 (4.163)	.017 (.000)
PBC scale	.121 (.056)	.056 (.040)	.162 (.098)	2.165 (.1419)	.032 (.158)

Predictors: (Constant), AT scale, SN scale, PBC scale

As shown in Table 6, the global  $F$ -test (3,169) = 5.739 for simulated intention and 15.526 for generalized intention represents the overall effect of all independent variables jointly on the dependent variable. The overall effect of all predictor variables jointly on the outcome variable is statistically significant. Looking at the standardized coefficients

in Table 6, subjective norm had the greatest impact on explaining the variation on the dependent variable (simulated intention of Congolese PCPs) with a standardized coefficient Beta of 0.179 at a p-value of  $<0.05$ . However, for the generalized intention of Congolese PCPs, the attitude of Congolese PCPs toward the provision of APHS had the greatest impact on explaining the variation on the dependent variable (generalized intention of Congolese PCPs) with a standardized coefficient Beta of 0.290. The standardized coefficient Beta is described as the variation induced in the dependent variable by a unit of change in the independent variable when all variables are assessed in rapport of standard deviations units (Berman & Wang, 2012). Beta is without unit and allows for comparing the impact of various predictor variables on explaining the dependent variable (Berman & Wang, 2012).

Only subjective norm construct had a standardized coefficient Beta statistically significant for both simulated (Beta = 0.179 at  $p < 0.05$ ) and generalized intention (Beta = 0.287 at  $p < 0.01$ ). Furthermore, the relationship between attitude and generalized intention remained statistically significant, with a standardized coefficient Beta of 0.290 at  $p < 0.01$  when controlled for all the other independent variables. Attitude had the strongest standardized coefficient beta among all the predictors in this model. However, the relationship between attitude and simulated intention became not statistically significant, with a standardized coefficient of 0.126 at a p-value of 0.096 when controlled for all the other variables. Furthermore, the relationship between perceived behavioral control and simulated intention remained statistically significant, with a standardized coefficient Beta of 0.162 at  $p < 0.05$  when controlled for all the other independent

variables. However, the relationship between perceived behavioral control and generalized intention became not statistically significant, with a standardized coefficient of 0.098 with a p-value of 0.158 when controlled for all the other variables.

#### **Research Question 4**

Although demographic factors such as age and gender are not constructs of the TPB per se; however, prior studies have suggested that age and gender of PCPs do affect differently the provision of APHS especially when dealing with sensitive sexual issues. Hence, this research question was set to assess the impact of controlling variables age and gender on the relationship between the predictor variables altogether with the outcome variable (see Figure 8).

RQ4: To what degree can Congolese PCPs' attitudes, subjective norms, and perceived behavioral control together while controlling for gender and age, predict their behavioral intention for the provision of the best practices in disease prevention and health promotion as set forth by the USPSTF and ACIP guidelines?

*H04*: There is no statistically significant relationship between the attitude, subjective norms, and perceived behavioral control while controlling for gender and age of Congolese PCPs, and their behavioral intention for the provision of best practices in disease prevention and health promotion as set forth by the USPSTF and ACIP guidelines.

*H14*: There is a statistically significant relationship between the attitude, subjective norms, and perceived behavioral control while controlling for gender and age of Congolese PCPs, and their behavioral intention for the provision of

best practices in disease prevention and health promotion as set forth by the USPSTF and ACIP guidelines.

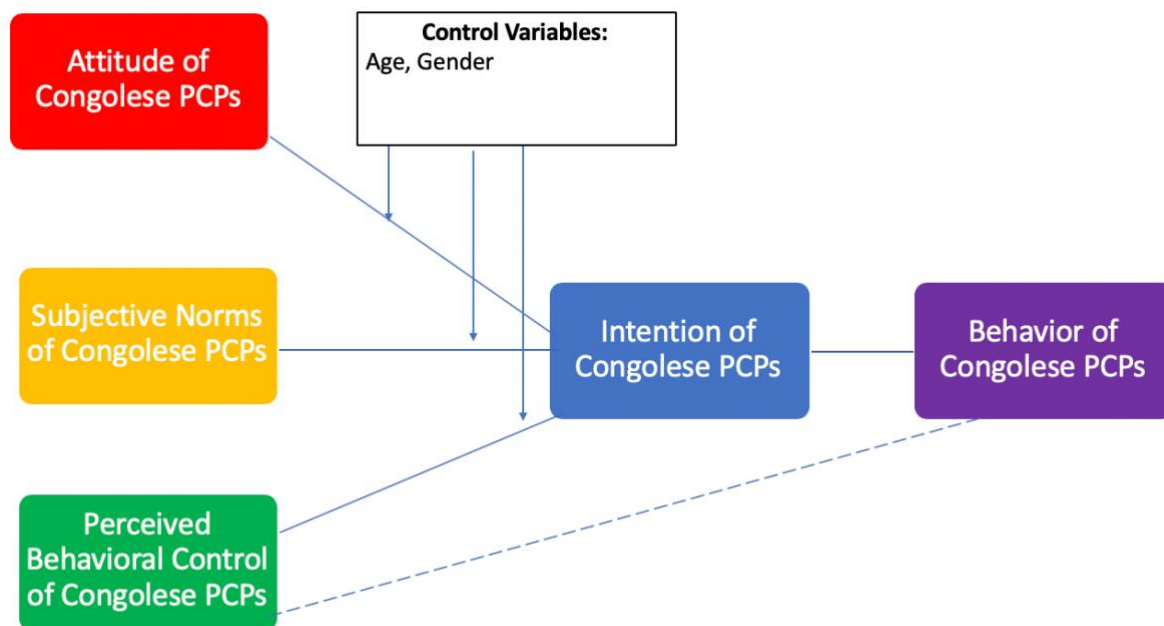


Figure 11. Theory of planned behavior conceptual model

I conducted hierarchical or stepwise multiple regression to assess the ability of three predictor variables (attitude, subjective norm, and perceived behavioral control) to predict the provision of APHS by Congolese PCPs after controlling for the impact of two demographic variables (age and gender). As detailed in Table 7, I entered age and gender at step 1, explaining 2.3% in the variance of the simulated intention of Congolese PCPs to provide APHS per USPSTF and ACIP guidelines but with  $p = 0.138$ ; not significant. Only age had a statistically significant relationship with the simulated intention of Congolese PCPs to provide APHS with a beta of 0.151 at  $p = 0.050$ .

After entry of the predictor variables (attitude, subjective norm, and perceived behavioral control) at step 2, the total variance explained by the model as a whole was 10.9%,  $F(5,167) = 4.075$ ,  $p < 0.01$ . The three predictor variables explained an additional 8.6% of the variance in simulated intention, after controlling for age and gender,  $R$  squared change = .086,  $F$  change (3, 167) = 5.352,  $p < 0.01$ .

In the final model, only two predictor variables (subjective norm and perceived behavioral control) were statistically significant, with the perceived behavioral control recording a higher beta value (beta = 0.171,  $p < 0.05$ ) than subjective norm (beta = 0.167,  $p < 0.05$ ). Unfortunately, the predictor attitude relationship with simulated intention was not statistically significant (beta = 0.113,  $p = 0.139$ ).

Table 7

*Model Summary: Hierarchical Multiple Linear Regression with SIScale*

Model	R	R-square	Adjusted R <sub>2</sub>	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F. Change
Step 1	.152	.023	.012	1.07501	.023	2.006	2	170	.138
Step 2	.330	.109	.082	1.03597	.086	5.352	3	167	.002

*ANOVA Results: Hierarchical Multiple Linear Regression with SIScale*

Model		Sum of Squares	df	Mean Square	F	Sig.
Step 1	Regression	4.637	2	2.318	2.006	.138 <sub>a</sub>
	Residual	196.461	170	1.156		
	Total	201.098	172			
Step 2	Regression	21.869	5	4.374	4.075	.002 <sub>b</sub>



Residual	179.229	167	1.073
Total	201.098	172	

*Hierarchical Multiple Linear Regression Results with Dependent variable: SIScale<sub>c</sub> (n=173)*

Model	Unstandardized coefficients		Standardized coefficients	t	Sig.	Collinearity Statistics VIF	
	beta	Standard Error	Beta				
Step 1 <sub>a</sub>	(Constant)	.939	.200		4.700	.000	
	Categorical Age	.203	.103	.151	1.975	.050	1.018
	Gender	-.014	.197	-.005	-.069	.945	1.018
Step 2 <sub>b</sub>	(Constant)	-.847	.513		-1.653	.100	
	Categorical Age	.165	.101	.123	1.636	.104	1.055
	Gender	-.069	.191	-.027	-.363	.717	1.031
	PBC scale	.129	.056	.171	2.293	.023	1.044
	SN scale	.118	.053	.167	2.239	.026	1.037
	AT scale	.108	.072	.113	1.487	.139	1.084

*Note.*

- a. Predictors: (Constant), Gender, Categorical Age
- b. Predictors: (Constant), Gender, Categorical Age, PBC scale, SN scale, AT scale
- c. Dependent Variable: SIScale

Subsequently, I conducted another hierarchical or stepwise multiple regression to assess the ability of three predictor variables (attitude, subjective norm, and perceived behavioral control) to predict the generalized intention for the provision of APHS by Congolese PCPs after controlling for the impact of two demographic variables (age and gender). As described in Table 8, age and gender were entered at step 1, explaining 2.3%

in the variance of the generalized intention of Congolese PCPs to provide APHS per USPSTF and ACIP guidelines. Only age had a statistically significant relationship with the generalized intention of Congolese PCPs to provide APHS with a beta of 0.152 at  $p = 0.049$ . After entry of the predictor variables (attitude, subjective norm, and perceived behavioral control) at step 2, the total variance explained by the model as a whole was 22.6%,  $F(5,167) = 9.729, p < 0.01$ . The three predictor variables explained an additional 20.3% of the variance in generalized intention, after controlling for age and gender,  $R$  squared change = 0.203,  $F$  change (3, 167) = 14.566,  $p < 0.01$ . In the final model, only two predictor variables (subjective norm and attitude) were statistically significant, with the attitude recording a higher beta value (beta = 0.283,  $p < 0.01$ ) than subjective norm (beta = 0.279,  $p < 0.01$ ). Unfortunately, the predictor perceived behavioral control relationship with generalized intention was not statistically significant (beta = 0.105,  $p = 0.133$ ).

Table 8

*Model Summary: Hierarchical Multiple Linear Regression with GIscale*

Model	R	R-square	Adjusted R <sub>2</sub>	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F. Change
Step 1 <sub>a</sub>	.151	.023	.011	.81449	.023	1.995	2	170	.139
Step 2 <sub>b</sub>	.475	.226	.202	.73161	.203	14.566	3	167	.000

*ANOVA Results: Hierarchical Multiple Linear Regression with GIscale*

Model		Sum of Squares	df	Mean Square	F	Sig.
Step 1	Regression	2.647	2	1.324	1.995	.139 <sub>a</sub>

	Residual	112.778	170	.663		
	Total	115.426	172			
Step 2	Regression	26.038	5	5.208	9.729	.000 <sup>b</sup>
	Residual	89.388	167	.535		
	Total	115.426	172			

*Hierarchical Multiple Linear Regression Results with Dependent variable: GIscale (n=173)*

	Model	Unstandardized coefficients		Standardized coefficients	t	Sig.	Collinearity Statistics VIF
		beta	Standard Error	Beta			
Step 1 <sup>a</sup>	(Constant)	4.259	.151		28.150	.000	
	Categorical Age	.155	.078	.152	1.981	.049	1.018
	Gender	.002	.150	.001	.011	.991	1.018
Step 2 <sup>b</sup>	(Constant)	2.166	.362		5.983	.000	
	Categorical Age	.085	.071	.833	1.188	.237	1.055
	Gender	-.083	.135	-.043	-.617	.538	1.031
	PBC scale	.060	.040	.105	1.509	.133	1.044
	SN scale	.150	.037	.279	4.027	.000	1.037
	AT scale	.205	.051	.283	3.997	.000	1.084

*Note.*

- a. Predictors: (Constant), Gender, Categorical Age
- b. Predictors: (Constant), Gender, Categorical Age, PBC scale, SN scale, AT scale
- c. Dependent Variable: GIscale

### Summary

This chapter provided a succinct and detailed description of data collection from the IRB conditional approval to the collection of data per se through three trips to the Democratic Republic of Congo, the demand and approval of partnership from the medical directors of 11 Congolese hospitals/clinic, the final IRB approval, the implementation of elicitation and pilot studies to graft the final survey questionnaire, and the collection of data. A total of 200 questionnaires were distributed, and only 178 Congolese PCPs consented to participate. Following cleaning, coding, and imputing data, only data from 173 PCPs were included in the final analysis. The collection of data took place from May 2019 to the beginning of November 2019. I abided by the ethical principles of the Belmont Report and the HIPAA regulations on confidentiality and safety of personal data.

I conducted the data analysis in two steps using the SPSS software 25; the descriptive analysis yielded the following results: of 173 participants, 134 (77.5%) were males, and 39 were (22.5%) females; 51.4% (89/173) of participants were between the ages of 24 to 34 years; 34.7% (60/173) were between the ages of 35 to 45 years; 10.4% (18) were between the ages of 46 to 56 years; and 3.5% (6/173) was 57 years old and over; 56.1% (97/173) of participants work within the Capital City of Kinshasa, 24.3% (42/173) in Kongo Central province, and 19.7% (34/173) in Kwilu province. The Chi-square/df for the simulated intention was 1.60, which is less than 5 indicating good fit; all multiple regression assumptions were met, and the Cronbach's alpha index was acceptable for most variables except for subjective norms.

I used simple linear regression to respond to the first three research questions; all predictors variables (attitude, subjective norm, and perceived behavioral control) had a statistically significant relationship with the outcome variable, both generalized and simulated intention. I also performed standard multiple linear regression to examine the relationship between each predictor variable and the outcome variable when controlled for all the other independent variables. The relationship between attitude and generalized intention remained statistically significant, with a standardized coefficient Beta of 0.290 at  $p < 0.01$  when controlled for all the other independent variables. Attitude had the strongest standardized coefficient beta among all the predictors in this model. However, the relationship between attitude and simulated intention became not statistically significant, with a standardized coefficient of 0.126 at a p-value of 0.096 when controlled for all the other variables. The relationship between subjective norm and generalized intention remained statistically significant, with a standardized coefficient Beta of 0.287 at  $p < 0.01$  when controlled for all the other independent variables. Similarly, the relationship between subjective norm and simulated intention remained statistically significant, with a standardized coefficient of 0.179 at a p-value of  $< 0.05$  when controlled for all the other variables. The relationship between perceived behavioral control and simulated intention remained statistically significant, with a standardized coefficient Beta of 0.162 at  $p < 0.05$  when controlled for all the other independent variables. However, the relationship between perceived behavioral control and generalized intention became not statistically significant, with a standardized coefficient of 0.098 with a p-value of 0.158 when controlled for all the other variables.

I performed a hierarchical or stepwise multiple regression to assess the ability of three predictor variables (attitude, subjective norm, and perceived behavioral control) to predict the provision of APHS by Congolese PCPs after controlling for the impact of two demographic variables (age and gender). Age and gender were entered at step 1, explaining 2.3% in the variance of **the** simulated intention of Congolese PCPs to provide APHS per USPSTF and ACIP guidelines. After entry of the predictor variables (attitude, subjective norm, and perceived behavioral control) at step 2, the total variance explained by the model as a whole was 10.9%,  $F(5, 167) = 4.075, p < 0.01$ . The three predictor variables explained an additional 8.6% of the variance in simulated intention, after controlling for age and gender,  $R^2 \text{ change} = .086, F \text{ change}(3, 167) = 5.352, p < 0.01$ . In the final model, only two predictor variables (subjective norm and perceived behavioral control) were statistically significant, with the perceived behavioral control recording a higher beta value ( $\beta = 0.171, p < 0.05$ ) than subjective norm ( $\beta = 0.167, p < 0.05$ ). In the next chapter, I conducted an in-depth discussion of the results in the context of the Democratic Republic of Congo; I entertained a final conclusion and recommendation for future studies.

## Chapter 5: Discussion, Conclusions, and Recommendations

### **Introduction**

The final chapter of this study includes a summary and interpretation of significant findings; limitations of the study; recommendation for future studies; positive social change, practical, policy, and theoretical implications; and the conclusion of the study. My goal to conduct this study was to use the Ajzen's TPB as the theoretical framework to predict the provision of APHS by Congolese PCPs as recommended by the USPSTF and ACIP guidelines. My secondary goal was to assess the current practice of Congolese PCPs in the delivery of preventive services. After obtaining Walden University IRB approval and subsequently collecting data from 173 consenting Congolese PCPs in the Capital City of Kinshasa and in two western provinces of the Democratic Republic of Congo, I performed a sequential multiple linear regression through the IBM SPSS version 25 to study the relationship between the predictor constructs (attitude, subjective norms, and perceived behavioral control) and the outcome construct (behavioral intention) of TPB. I proceeded by surveying only the direct measurements of TPB constructs, and I assessed both generalized and simulated intention.

All predictors variables (attitude, subjective norm, and perceived behavioral control) had a statistically significant relationship with the outcome variable, both generalized and simulated intention at various degrees. The controlling demographic variables (age and gender) explained 2.3% of the variance in simulated intention. The three predictor variables explained an additional 8.6% of the variance in simulated

intention, after controlling for age and gender. All multiple regression assumptions were met; the model goodness of fit was poor in relation with the adjusted *R-square* (<0.20) but adequate with the Chi-square/df for simulated intention of 1.60 which is less than 5, indicating good fit (Carmines & McIver, 1981; Hu & Bentler, 1999; Kenny, 2015).

### **Summary and Interpretation of Findings**

After an extensive literature review that yielded no records on the delivery of APHS in the Democratic Republic of Congo, I was probably the first to apply the TPB to predict the provision of APHS by Congolese PCPs per USPSTF and ACIP guidelines. In this study, I focused on establishing a relationship between the three predictor constructs (attitude, subjective norm, and perceived behavioral control) and the outcome construct (behavioral intention) of TPB to predict the intention of Congolese PCPs to deliver APHS. As previously underscored in Chapter 2, the underpinnings of the TPB stressed that planned behavior is the endpoint of behavioral intention, which is a zenith of attitude, subjective norms, and perceived control (Ajzen, 1991; Sharma, 2017). Attitude is defined as the person's general feeling of favorability or unfavorability for the stated behavior or concept; subjective norm refers to the perception of social pressure to perform or not perform the behavior in question; and perceived behavioral control denotes perceptions about how easy or difficult it is to perform the behavior or how much a person feels he or she is in command of enacting the given behavior (Ajzen, 1991; Sharma, 2017). Moreover, Ajzen (1991) postulated that the more favorable the attitude and subjective norm, and the greater the perceived control, the person's intention to perform the behavior in question would be the strongest. Though the minimum required sample size of



participants was exceeded (>128); still, the findings of this study cannot be generalized to the entire population of Congolese PCPs because of a lack of randomization in the recruitment of participants and the limitation of the sample frame only to the west of the country. The following are the foremost findings of this study.

### **Key Finding 1**

All three predictor constructs (attitude, subjective norm, and perceived behavioral control) of the TPB were noted to be positive predictors of the behavioral intention of Congolese PCPs for providing APHS per USPSTF and ACIP guidelines; and had a statistically significant relationship with the outcome construct (behavioral intention) at sundry extent. In this study, attitude, subjective norm, and perceived behavioral control jointly explained 9.2% of the variance for simulated intention and 21.6% of the variance for generalized intention. This finding is coherent with the results of research conducted by Pawlak, Malinauskas, and Rivera (2009), who reported that predictor variables attitude, subjective norms, and perceived behavior control jointly explained 72% of the variance in the behavioral intention of eating a healthful diet.

Similarly, Finnish researchers Kortteisto, Kaila, Komulainen, Mäntyranta, and Rissanen (2010) reported in their study on healthcare professionals' intentions to use clinical guidelines that their results indicated that all three independent variables of TPB, the attitude toward the behavior, the subjective norm, and the perceived behavior control, were statistically significant factors associated with the professionals' intention to use clinical practice guidelines for their area of practice in the decisions they would make on the care of patients in the next three months. Most recently, Abamecha, Tena, and Kiros

(2019) suggested in their study on psychographic predictors of intention to use cervical cancer screening services among women attending maternal and child health services in Southern Ethiopia that all predictor constructs of TPB were positively associated to intention to use the services with perceived behavioral control ( $\beta = 0.297$ , 95% CI = [0.172, 0.343]), perceived social pressure ( $\beta = 0.248$ , 95% CI = [0.131, 0.301]) and attitude toward screening ( $\beta = 0.110$ , CI = [0.018, 0.158]).

Subsequent to the results of this study, the three first alternative hypotheses ( $H_{11}$ ,  $H_{12}$ ,  $H_{13}$ ) were accepted, and their null hypothesis rejected. Therefore, the TPB was found suitable for predicting the provision of the APHS by Congolese PCPs as directed by the USPSTF and ACIP guidelines. The low variance may be explained by the presence of the inhibitor factors not stipulated and surveyed in this study such as the lack of health policy and guidelines on the schedule of APHS to guide PCPs, and the reluctance of PCPs to order these APHS due to skepticism of Congolese people created by the belief in witchcraft as the etiology of diseases, the misleading teaching of unscrupulous pastors who claim that they can prevent and cure diseases by their prayers, the unaffordable cost or the lack of health insurance for the majority of Congolese people to pay for screening tests such as colonoscopy and Pap smear.

### **Key Finding 2**

The construct Subjective Norms had the greatest impact on explaining the dependent construct (Simulated Behavioral Intention to provide APHS) among all the independent constructs (Attitude, Subjective Norms, and Perceived Behavioral Control) with a standardized coefficient  $\beta$  of 0.179 ( $p < 0.05$ ,  $n = 173$ ). Nevertheless, the construct

Attitude of Congolese PCPs toward the provision of APHS had the strongest relationship with the dependent construct (Generalized Behavioral Intention to provide APHS per USPSTF and ACIP guidelines) among all the independent constructs (Attitude, Subjective Norms, and Perceived Behavioral Control) with a standardized coefficient  $\beta$  of 0.290 ( $p < 0.01$ ,  $n = 173$ ). These findings are interesting but not uncommon; they mirror the results of a study conducted by FitzGerald, Cornally, and Hegarty (2018) on men's perspective on cancer prevention behaviors associated with HPV. The authors reported that the Subjective Norm construct ( $\beta = 0.519$ ,  $P < .001$ ) was the most influential predictor in relation to men's intention to receive the HPV vaccine; while the Attitudes construct ( $\beta = 0.394$ ,  $P < .001$ ) was the most significant predictor of intention to use a condom.

Furthermore, Korteisto et al. (2010) in Finland reported in their study on the use of clinical guidelines that both the nurse and the physician factors had positive ( $p < 0.01$ ) effects on the intention to use clinical guidelines in comparison to other professionals. However, the Subjective Norms construct had the strongest relationship with the intention of nurses and other professionals to use guidelines while the Perceived Behavioral Control construct had the strongest relationship with the intention of physicians to use guidelines (Korteisto et al., 2010). For this study, it is understandable for the predictor construct, Subjective Norms, to have the strongest relationship with the simulated intention to provide APHS since USPSTF and ACIP guidelines set standards or norms for the practice of preventive care and health promotion by PCPs. Healthcare professionals feel some pressure from their heads of departments, colleagues, or patients

to know and follow the guidelines meticulously. On the other hand, Congolese PCPs expressed their generalized intention to provide APHS without worrying about the schedule or details about the age or general condition of the patients for the delivery of APHS.

### **Key Finding 3**

Although the demographic control variables (age and gender of PCPs) explained 2.3% of the variance in the dependent variable intention (both simulated and generalized), the relationship was not significant with  $p > 0.50$ . Only the age of PCPs had a statistically significant relationship with the dependent variable intention to provide APHS (both simulated and generalized intention) with  $p < 0.50$ ; its impact was positive on the dependent variable behavioral intention to provide APHS. Gender was a negative predictor ( $\beta = -0.027$  for simulated intention and  $-0.043$  pour generalized intention), and its relationship to the dependent variable was not statistically significant for both simulated and generalized intention ( $p > 0.05$ ). After controlling for age and gender, the predictor variables attitude, subjective norms, and perceived behavioral control explained 10.9% variance on the dependent variable simulated intention to provide APHS by Congolese PCPs and the relation between the predictor variables and the dependent variable remains statistically significant at  $p < 0.01$ . However, only two predictor variables (subjective norm and perceived behavioral control) were statistically significant, with the perceived behavioral control recording a higher  $\beta$  value ( $\beta = 0.171$ ,  $p < 0.05$ ) than subjective norm ( $\beta = 0.167$ ,  $p < 0.05$ ).

After controlling for age and gender, the predictor variables attitude, subjective norms, and perceived behavioral control explained 22.6% variance on the dependent variable generalized intention to provide APHS by Congolese PCPs and the relation between the predictor variables and the dependent variable remains statistically significant at  $p < 0.01$ . However, only two predictor variables (subjective norm and attitude) were statistically significant, with the attitude recording a higher beta value ( $\beta = 0.283$ ,  $p < 0.01$ ) than subjective norm ( $\beta = 0.279$ ,  $p < 0.01$ ). These results supported the fourth alternative hypothesis ( $H_{14}$ ) of this study, and the null hypothesis was rejected. The control demographic variable age had a statistically significant relationship with the dependent variable behavioral intention, both simulated and generalized, with a  $p < 0.050$ . This finding was similar to the result of the studies conducted by Hurley et al. (2016) in the United States among PCPs and that of Qidwai et al. (2015) in that the majority of surveyed Congolese PCPs (86.1%) had less than 45 years of age. In these three studies, younger physicians were eager to participate in the cross-sectional survey studies in comparison to older physicians. Unfortunately, I was not able to refute or to confirm the assertion made by Sniehotta et al. (2014) that TPB was rather apposite to predict behavior amongst the young, fit, and affluent individuals.

Nonetheless, unlike the study conducted by Saeedi et al. (2014) in Saudi Arabia where only female physicians were allowed to provide sensitive female services, and *Hine* and Smith (2014) in the United Kingdom, where male physicians were uncomfortable performing intimate examinations and screening in young female patients, gender did not seem to affect the behavioral intention of Congolese PCPs to provide

APHS. However, the findings from the study conducted by Sebo et al. (2017) in Switzerland and part of France indicated that two preventive services were notably more often delivered by female PCPs in contrast to their male counterparts: screening for at-risk drinking and screening for smoking, while only one preventive service (refraining from systematic screening for prostate cancer) was more regularly observed by PCPs less than 55 years old in comparison to older PCPs.

#### **Key Finding 4**

Congolese PCPs' current practice on providing APHS: The most commonly reported APHS by Congolese PCPs were HIV screening (91.9%), diet and lifestyle counseling (88.4%), high blood pressure screening (85.5%) and diabetes mellitus (84.4%). The least frequently reported practices were colon cancer screening (12.1%) and cervical cancer screening (30.12%). The high HIV screening can be explained in part by the international funding (CDC and World Bank) of the mandatory screening of pregnant women and the voluntary screening of nonpregnant Congolese (CDC, 2019; PATH, 2016; The World Bank in the Democratic Republic of Congo, 2020). With regard to the general intention statement, out of the next ten patients, Congolese PCPs aimed to provide APHS to seven patients on average (mean of 6.8). Though this commitment of Congolese PCPs to provide APHS to seven patients out of ten is commendable, the Canadian Task Force on Preventive Health Care has suggested that the most adequate approach to deliver preventive services was to provide them during periodic health visits instead of during annual checkups and that visit intervals should depend on the age, gender, and health condition of the individual (Birtwhistle, Bell, Thombs, Grad, &

Dickinson, 2017). That is why it is crucial for Congolese PCPs to follow the USPSTF and ACIP guidelines on APHS and to master their schedule of delivery. Furthermore, I would design strategies to boost the provision of cervical and colon cancer screening in view of the low rate of screening of these two types of cancers. I would seek international support to finance this endeavor the same way MTCT of HIV has been sponsored in Congo.

### **Key Finding 5**

The majority of surveyed Congolese PCPs (96.5%) were less than 57 years of age, which corresponds to the life expectancy of Congolese people. Only 3.5% of the participants were older than 57 years of age. 51.4% of PCPs were between the age of 24 and 34 years old, and 34.7% of the surveyed PCPs were between age 35 to 45 years old, and 10% were between the age of 46 to 56 years old. Although the retirement age for PCPs in the Democratic Republic of Congo is 65 years old, most PCPs elect to continue working until the age of 70 years.

### **Key Finding 6**

From the elicitation study and the exchange following the oral presentation of the study, I was able to highlight some inhibitor factors to the provision of APHS by Congolese PCPs namely the lack of national health policy with concise guidelines on preventive health services, the lack of central government support and funding of preventive services, reactive approach to epidemic outbreaks, the reliance on international financial and technical support, competing health issues, the belief in witchcraft by Congolese people concerning the etiology and treatment of diseases, the

deceitful teaching of religious leaders about the prevention and cure of diseases, the cost of providing the APHS in the absence of universal health insurance coverage, the lack of appropriate equipment and supplies, the complexity and confusion of APHS schedule, the lack of training and financial incentives of Congolese PCPs, and the poor health literacy of Congolese people.

### **Limitations of the Study**

This study evinced some limitations. Although the minimum required sample size of 128 participants was met; however because of a lack of randomization in the recruitment of Congolese PCPs, the inability to recruit the ideal sample size for multiple linear regression of at least 300 Congolese PCPs (Bujang et al., 2017), and the geographic delimitation of the sampling frame to the west of the Democratic Republic of Congo; unfortunately, the results of this study cannot be generalizable to the entire population of Congolese PCPs.

Moreover, although Congolese PCPs were enthusiastic about participating in this study, the survey relied on self-reported responses rather than on observation; thus, the possibility of introducing information bias, such as respondent bias, which could represent a threat to the validity of the study as indicated by Szklo and Nieto( 2014). Furthermore, as noted by Berman and Wang (2012), Salazar et al. (2015), and Szklo and Nieto (2014), with the use of the cross-sectional design, which is subject to both selection bias and information bias a causal relationship could not be established between the independent and dependent variables because of lack of a right temporal sequence, such as in a prospective design. Other important limitations were related to the exclusion of indirect



measurements of the predictor constructs (attitude, subjective norms, and perceived behavioral control of Congolese PCPs) and the lack of familiarity of Congolese PCPs with the recommendations of USPSTF and ACIP on APHS.

### **Recommendations for Future Research**

A future randomized study involving all willing and consenting Congolese PCPs across the country and assessing both the direct and indirect measurements of the predictor constructs of the TPB is warranted. This ambitious endeavor would actually require substantial human and financial resources for a vast country like the Democratic Republic of Congo with limited infrastructures and internet access. Another study could explore how to promote the positive Attitude of Congolese PCPs toward APHS by brainstorming behavioral beliefs and discussing positive outcomes (outcome evaluations) of APHS. Since the majority of surveyed PCPs who expressed their generalized intention to screen for preventable diseases and cancer and to promote healthy habits confided that their effort and willingness to provide these APHS were hampered by the Congolese public beliefs in witchcraft and the false teaching of unscrupulous religious leaders; therefore, subsequent studies in the context of cultural and religious beliefs and socioeconomic status are needed to explore the attitude, subjective norms and perceived behavioral control of Congolese people as participants to adopt APHS.

Another consideration would be to use the Integrative Model of Behavioral Prediction (IM) as the theoretical framework to study the health behavior of Congolese people in adopting APHS as inferred by Sharma (2017). The IM encompasses constructs from the health belief model (HBM), social cognitive theory, the theory of reasoned

action, and the theory of planned behavior (Sharma, 2017). Fishbein refined his earlier TRA to include the role of environment, skills and abilities in moderating the intention-behavior relationship (Sharma, 2017). Moreover, Fishbein's IM posits background influence of past behavior, demographics and cultural knowledge, attitudes toward targets, personality, moods, emotions, other individual differences, intervention exposure, and media exposure (Sharma, 2017). These background influences shape the attitudes, norms, and self-efficacy, which subsequently affect intention and behavior (Sharma, 2017).

Another suggestion is to use the multi-theory model (MTM) for health behavior change. The MTM is based on empirical evidence and is used to predict either one-time or long-term health behavior changes with sufficient predictive power and malleable constructs that can be applied to different cultures (Sharma, 2017). The initiation of health behavior change is predicted through the incorporation of different socio-behavioral theories that use participatory dialogue, changes in the physical environment, and behavioral confidence (Sharma, 2017). In order to predict the maintenance of changes in health behavior, the MTM utilizes practice for change, emotional transformation, and changes in the social environment (Sharma, 2017). Another cross-sectional study on the provision of APHS by Congolese PCPs can be conducted a year from the last survey with the same PCPs surveyed in the same hospitals to review the patients' charts to collect data on the provision of APHS instead of relying on self-reported survey responses.

## **Implications**

### **Positive Social Change, Practice Implication, and Policy Implication**

This study has the makings of providing positive social change by enhancing the quality of primary care in the Democratic Republic of Congo, by promoting a healthy lifestyle, by preventing and decreasing morbidity and premature death, and ultimately by promoting healthy and productive long life of Congolese people. Sebo et al. (2017) have noted that PCPs are more and more scrutinized to enhance the quality of care by following the prescribed recommendations and guidelines; however, PCPs face several challenges during their implementation in practice, and little is known on how to overcome these barriers. This study offered an opportunity to study these challenges for Congolese PCPs and find ways to overcome them. For the first time, Congolese PCPs had the opportunity to learn and discuss the APHS as recommended by the USPSTF and ACIP. During the oral presentation of the study, Congolese PCPs showed a keen interest in APHS and wanted to learn more about these vital preventive and promotional health services. The use of clinical guidelines such as those formulated by USPSTF and ACIP by Congolese PCPs in delivering APHS would help to standardize medical care practice, to enhance the quality of care, and to mitigate several kinds of risk including medical errors and confusion about the schedule of APHS (Javadi et al., 2013). The APHS schedule as recommended by USPSTF and ACIP was complex even for United States PCPs (Hurley et al., 2016); and this study highlighted the lack of familiarity of Congolese PCPs with the APHS and the confusion about the schedule of different services and

vaccinations; thus, to promote the delivery of APHS by Congolese PCPs, the APHS schedule should be clear and easily implemented in practice.

In addition, a recommendation for the adoption of national health policy on APHS to guide and train Congolese PCPs on the provision of these vital preventive and promotional health services is craved. The delivery of healthcare in the Democratic Republic of Congo would become proactive instead of reactive. Furthermore, I would advocate the creation and appointment of a national surgeon general as the nation's doctor to advance the health of Congolese people and to coordinate all preventive and promotional health services in the Democratic Republic of Congo, as in the US. Health education of the general public about the benefits of APHS and the collaboration of key stakeholders such as religious leaders, revered athletes and musicians, and politicians are essential in promoting acceptance and adoption by the general public of these key preventive and promotional health services with the goal of curbing preventive diseases and improving the quality of life of Congolese people.

Another crucial recommendation is to find ways and the means to increase the access of the entire Congolese population to these APHS, either by soliciting the Congolese government to provide these health services at no charge to the population or by seeking international funding or collaboration similar to that of the Expanded Program on Immunization (EPI). This funding should also include financial incentives for Congolese PCPs who are actively engaged in the delivery of these APHS. Furthermore, I am strongly advocating that it would be cost-effective for the Congolese government to

provide universal coverage for these crucial APHS than to continue reacting to preventive disease outbreaks or sending regime dignitaries overseas for costly treatments.

### **Theoretical Implication**

Although the TPB has been applied in several studies to predict the intention to perform certain behaviors in the fields of health education, public health, and nursing mostly in the United States and other developed countries (Sharma, 2017), this study was unique and conducted in the context of a poor, developing country with different kinds of variables not included in the initial TPB, such as cultural and religious beliefs, several recurrent rebellions and insecurity, poor infrastructures, lack of access to internet, inadequate hospital equipment, and supplies, inadequate training of PCPs on APHS, recurrent infectious disease outbreaks (Ebola, measles, cholera), several health competing issues, and a lack of universal health insurance coverage. Despite the aforementioned issues, all three main predictor constructs of the TPB had a statistically significant relationship with the outcome construct, implying that the TBP was suitable to predict the behavior intention of Congolese PCPs to predict the provision of APHS according to the USPSTF and ACIP recommendations.

However, the poor model fit, low variance, and weak coefficient index may suggest that the model was not fully specified in the context of a poor country with a myriad of problems, such as the Democratic Republic of Congo. Although all predictor variables of the TPB were included in the model, some other variables such as the lack of universal health insurance coverage and access to care, the belief in witchcraft, false religious teaching about the occurrence of diseases, security issues, fear to seek medical

care, cost of APHS, other competing priorities for people, poor health literacy of the Congolese public and the lack of national health policy and guidelines on APHS may impact Congolese PCPs intention to provide APHS. All these non-specified variables can account for the inhibitor factors of the perceived behavioral control of Congolese PCPs.

### **Conclusion**

The provision of preventive services, health promotion, and health maintenance has become the cornerstone of primary care practice in the United States (US) and other industrialized nations with the goals to prevent morbidity and premature mortality, and to increase the quality and years of healthy life (Hurley et al., 2016; Salazar, Crosby, & DiClemente, 2015). Moreover, studies have shown that PCPs play a key role in providing these vital APHS, and in educating and swaying patients and the general public in getting these needed APHS. Furthermore, studies have shown that countries that have adopted and implemented these APHS, have seen their populations enjoy a healthy quality of life and a long productive life with increased life expectancy.

The Democratic Republic of Congo, a poor African country with vast natural resources but with a corrupt central government, continuous armed conflicts and recurrent infectious disease outbreaks, has poor health indicators with increased morbidity and mortality due to noncommunicative diseases and cancers, low life expectancy, and a lack of clear health policy in the delivery of preventive and promotional health services. Nevertheless, the Democratic Republic of Congo can benefit from the provision of these vital APHS by its PCPs to prevent diseases and promote a healthy lifestyle. Using the TPB as a theoretical framework, this study was the first in its

kind undertaken to predict the provision of APHS by Congolese PCPs per USPSTF and ACIP guidelines.

Using IBM SPSS software version 25 for statistical analysis, the findings from this cross-sectional study have shown that there was a statistically significant relationship between all three predictor constructs (attitude, subjective norm, and perceived behavioral of Congolese PCPs) and the outcome construct (behavioral intention of Congolese PCPs) of TPB at various strength. However, the relationship did not seem strong enough, indicating that other factors not specified in the model may play a pivotal role in predicting the provision of these APHS. Some Congolese PCPs have suggested that their efforts to provide APHS are impeded by the belief in witchcraft by Congolese people concerning the etiology and treatment of diseases, the deceitful teaching of religious leaders about the prevention and cure of diseases, the cost of providing the APHS in the absence of universal health insurance coverage, the lack of appropriate equipment and supplies, the complexity and confusion of APHS schedule, the lack of training and financial incentives of Congolese PCPs, and the poor health literacy of Congolese people. Still, the TPB was found to be an adequate theoretical framework to predict the provision of APHS by Congolese PCPs.

Likewise, this study provided an opportunity for Congolese PCPs to learn, digest, grasp, and discuss the benefits of the provision of APHS as set forth by the USPSTF and ACIP guidelines. The study also underscored Congolese PCPs' responsibility in providing these vital preventive and promotional services and in educating and swaying Congolese people to get them. Hopefully, when APHS are adopted and fully

implemented, this study has the makings of inducing positive social change by enhancing the quality of care delivered by Congolese PCPs in the Democratic Republic of Congo, by promoting a healthy lifestyle, by preventing and decreasing morbidity and premature death from preventable diseases and cancers, by decreasing the cost of healthcare, by promoting healthy and productive long life, and eventually by enhancing the life expectancy of Congolese people. Enhancing the health literacy of Congolese people through health education by Congolese PCPs on the benefits of APHS remains the most efficient antidote to the false teaching of unscrupulous pastors and to the deep-seated belief in witchcraft as the source of diseases in the Democratic Republic of Congo. Boosting the screening of cervical and colon cancers should become a focus in curbing and preventing these preventable cancers. Unfortunately, with a corrupt central government, key international stakeholders such as CDC experts, World Bank funding, WHO, UNICEF, EPI, Doctors Without Borders, and philanthropic organizations must continue to play a pivotal role in the successful adoption and implementation of APHS by Congolese PCPs in their practice.

I am committed to translating this study into French and to publish it in a reputable French scientific journal for key stakeholders to assess it. I am indebted toward the Congolese PCPs who took part in this study and to the medical directors who allowed and facilitated this study to be conducted. As promised, I will provide to stakeholders a translated hardcopy of the study and its internet link both in English and French. Of note, upon the completion of the doctoral degree, I am pledging to use my newly acquired scholarly voice to become an effective agent of positive social change with the mission to



enhance awareness and health literacy of Congolese people on the health benefits of APHS, to teach medical students and to lecture health care professionals on the health benefits of providing APHS, and to advocate for a national health policy on APHS to guide Congolese PCPs on the delivery of APHS.

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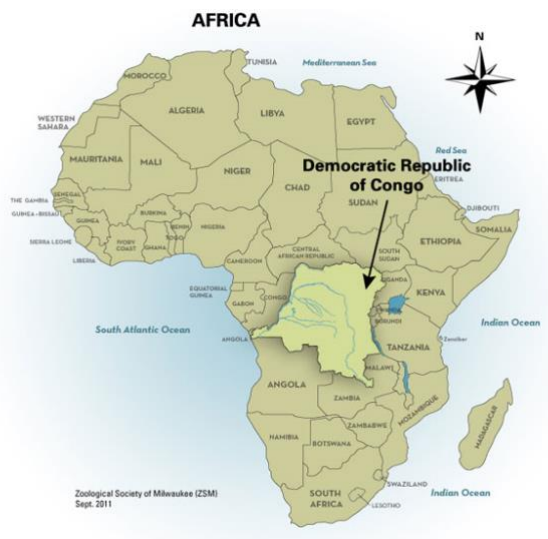
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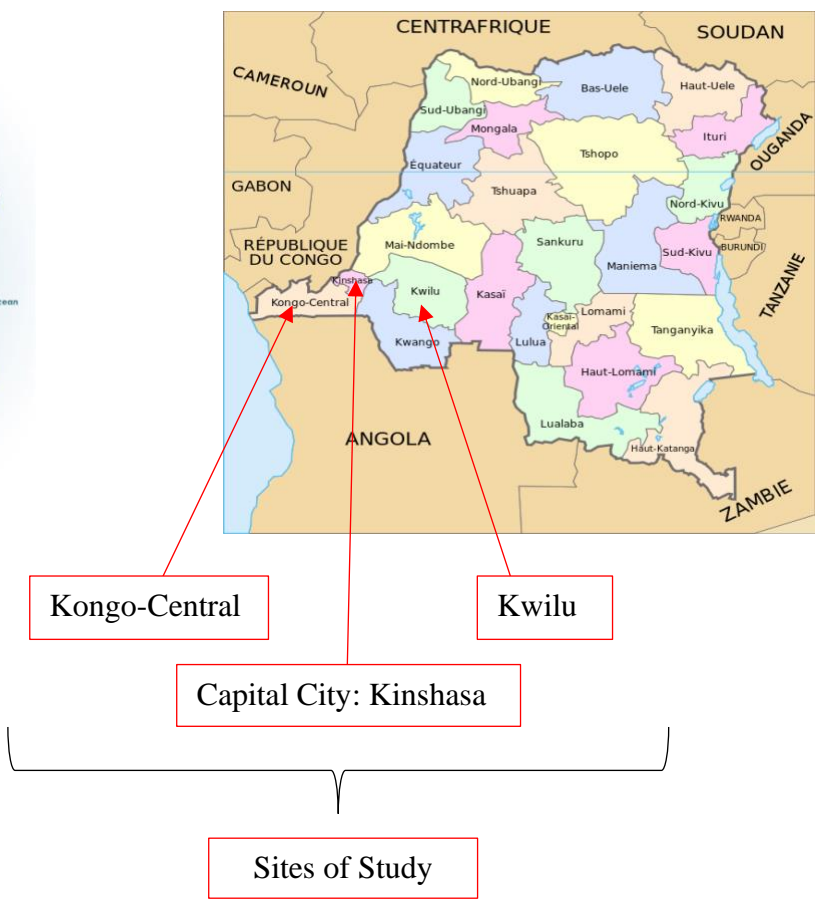
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Appendix A: Maps of Africa and the Democratic Republic of Congo (DRC)

Map of Africa



Map of the DRC



## Appendix B: Elicitation Study Materials

## Elicitation Study Materials:

We are conducting a study of Congolese primary care physicians in the Democratic Republic of Congo. We are interested in the reasons why Congolese PCPs do or do not want to adopt and implement APHS in their practices. We would appreciate your responses to some questions about this. There are no right or wrong answers. Please tell us what you really think.

Please take a few minutes to list your thoughts about the following questions.

When Congolese patients consult their primary care physicians,

- What do you believe are the *advantages* of providing preventive services in accordance with the USPSTF and ACIP guidelines?
- What do you believe are the *disadvantages* of providing preventive services, in accordance with USPSTF and ACIP guidelines?
- Is there anything else you associate with your own views about the USPSTF and ACIP recommended preventive services?
- Are there any individual or groups who would *approve* of the provision of USPSTF and ACIP recommended preventive services?
- Are there any individual or groups who would *disapprove* of the provision of USPSTF and ACIP recommended preventive services?
- Is there anything else you associate with other people's views about the provision of USPSTF and ACIP recommended preventive services?
- What factors or circumstances would enable you to provide USPSTF and ACIP recommended preventive services?

- What factors or circumstances would make it difficult or impossible for you to provide USPSTF and ACIP recommended preventive services?
- Are there any other issues that come to mind when you think about the provision of USPSTF and ACIP recommended advanced preventive health services?



## Appendix C: Pilot Questionnaire

**Piloting the Questionnaire Draft**

Questions	Responses
1. Are any items ambiguous or difficult to answer?	
2. Does the questionnaire feel too repetitive?	
3. Does it feel too long?	
4. Does it feel too superficial?	
5. Are there any annoying features of the wording or formatting?	
6. Are there inconsistent responses that might indicate that changes in response endpoints are problematic for respondents who complete the questionnaire quickly?	

## Appendix D: Survey Questionnaire

## Survey Questionnaire

## SECTION 1

**About your BACKGROUND**

**A. Age (in years):**

\_\_\_\_\_

**B. Gender:** Male \_\_\_\_\_ Female \_\_\_\_\_

**C. How many years of practice?**

\_\_\_\_\_

**D. What is the average number of patients you treat per week?**

\_\_\_\_\_

**E. In which province are you practicing?**

Kinshasa  Kongo Central  Kwilu

**F. What type of environment is your hospital located in?**

Urban/City  Rural

**G. Hospital or Practice Affiliation:**

- State-run hospital or clinic
- Faith-based hospital or clinic
  - Catholic
  - Protestant
  - Kimbanguist
  - Muslim

**H. What is your level of education?**

- General Practitioner
- Post-Graduate Training: Yes
- Specialization
  - Internal Medicine
  - Family Medicine
  - OB/GYN

## SECTION 2

**Each question in this section refers to providing USPSTF and ACIP preventive services in your hospital or clinic.**

1. Overall, I think that the provision of USPSTF and ACIP recommended preventive services is:	Harmful	1	2	3	4	5	6	7	Beneficial		
2.	Pleasant	1	2	3	4	5	6	7	Unpleasant		
3.	The wrong thing to do	1	2	3	4	5	6	7	The right thing to do		
4.	Good practice	1	2	3	4	5	6	7	Bad practice		
5. People who are important to me think that I should NOT provide USPSTF and ACIP recommended preventive services.	Strongly agree	1	2	3	4	5	6	7	Strongly disagree		
6. I expect to provide USPSTF and ACIP preventive services in each consultation	Strongly agree	1	2	3	4	5	6	7	Strongly disagree		
7. I feel under social pressure to provide USPSTF and ACIP recommended preventive services	Strongly agree	1	2	3	4	5	6	7	Strongly disagree		
8. I am confident that I can provide USPSTF and ACIP recommended preventive services if I want to.	Strongly agree	1	2	3	4	5	6	7	Strongly disagree		
9. Whether I provide USPSTF and ACIP recommended preventive services is entirely up to me.	Strongly agree	1	2	3	4	5	6	7	Strongly disagree		
10. For me, providing USPSTF and ACIP recommended preventive services in the consultation is	Easy	1	2	3	4	5	6	7	Difficult		
11. I want to provide USPSTF and ACIP recommended preventive services in each consultation	Strongly agree	1	2	3	4	5	6	7	Strongly disagree		
12. It is expected of me that I provide USPSTF and ACIP recommended preventive services.	Strongly agree	1	2	3	4	5	6	7	Strongly disagree		
13. I intend to provide USPSTF and ACIP recommended preventive services in each consultation	Strongly agree	1	2	3	4	5	6	7	Strongly disagree		
14. Out of the next 10 patients you see, how many would you expect to provide USPSTF and ACIP	0	1	2	3	4	5	6	7	8	9	10

recommended preventive service?	
15. Are you currently providing the following advanced preventive health services? Please circle Yes or No:	<ul style="list-style-type: none"> <li>▪ Cervical Cancer Screening: Yes or No</li> <li>▪ Colon Cancer Screening: Yes or No</li> <li>▪ High Blood Pressure Screening: Yes or No</li> <li>▪ HIV Screening: Yes or No</li> <li>▪ Diabetes Screening: Yes or No</li> <li>▪ Diet and Lifestyle Modification (Exercise, Smoking Cessation and Obesity Screening) Counseling: Yes or No</li> </ul>
16. A healthy 50-year old Congolese woman presents in your office for annual physical exam; she has no physical complaints but worries about dying of colon cancer because one of her friends was recently diagnosed with terminal colon cancer.	<p>I intend to provide USPSTF and ACIP-recommended preventive services</p> <p style="text-align: center;">Extremely -3 -2 -1 0 +1 +2 +3 Extremely Improbable Probable</p>
17. A 60-year old Congolese man presents in your office with no physical complaints.	<p>I expect to screen for colon cancer as recommended by the USPSTF and ACIP guidelines</p> <p style="text-align: center;">Extremely +3 +2 +1 0 -1 -2 -3 Extremely Probable Improbable</p>
18. A 35-year old obese Congolese man presents in your office for follow up of his diabetes mellitus.	<p>I expect to measure his blood pressure and provide diet and lifestyle counseling as recommended by the USPSTF and ACIP guidelines</p> <p style="text-align: center;">Extremely -3 -2 -1 0 +1 +2 +3 Extremely Improbable Probable</p>
19. A pregnant 27-year old pregnant Congolese woman presents in your office for an ultrasound exam.	<p>I intend to provide her with an HIV screen test, as recommended by the USPSTF and ACIP guidelines</p> <p style="text-align: center;">Extremely +3 +2 +1 0 -1 -2 -3 Extremely Probable Improbable</p>
20. A 37-year old Congolese man presents in your office with an incessant cough.	<p>I am inclined to screen him for tobacco smoking and provide him counseling for smoke cessation</p> <p style="text-align: center;">Extremely -3 -2 -1 0 +1 +2 +3 Extremely Improbable Probable</p>
21. A 55-year old Congolese man presents in your office complaining of vague abdominal	<p>I want to screen him for colorectal cancer</p> <p style="text-align: center;">Extremely +3 +2 +1 0 -1 -2 -3 Extremely Probable Improbable</p>

<p>pain and weight loss. He blames his pain on intestinal parasites.</p>	
<p>22. A 68-year old Congolese woman with Type 2 diabetes presents in your office for a routine checkup</p>	<p>I am inclined to take her blood pressure and provide appropriate immunization as stipulated by USPSTF and ACIP guidelines</p> <p>Extremely -3 -2 -1 0 +1 +2 +3 Extremely Improbable Probable</p>
<p>23. A 50-year old obese Congolese man presents in your office for annual check-up.</p>	<p>I am inclined to provide diet and lifestyle modification advice, and to offer colon cancer screening and appropriate immunizations.</p> <p>Extremely +3 +2 +1 0 -1 -2 -3 Extremely Probable Improbable</p>
<p>24. A 20-year old Congolese woman presents in your office for her annual physical exam.</p>	<p>I am inclined to provide her with a Hep B vaccine, cervical cancer screening, HIV screening and counseling per the USPSTF and ACIP-recommended guidelines</p> <p>Extremely -3 -2 -1 0 +1 +2 +3 Extremely Improbable Probable</p>

*Thank you for your participation!*

## Appendix E: Scoring Key for Survey Questionnaire

**Scoring Key for Survey Questionnaire**

<b>Question Numbers</b>	<b>Response format</b>	<b>Items requiring reverse scoring</b>	<b>Items requiring internal consistency analysis</b>	<b>Items requiring multiplication</b>	<b>Construct measured</b>
1 to 4	1 to 7	✓	✓		Attitudes, direct measure
5, 7, 12	1 to 7	✓	✓		Subjective Norms, direct measure
8 to 10	1 to 7	✓	✓		Perceived Behavioral Control, direct measure
6, 11, 13	1 to 7	✓	✓		Generalized intention
14	0 to 10				Intention Statement
15	Yes or No				Current Practice
16 to 24	-3 to +3	✓	✓		Simulated Intention

## Appendix F: Experts Letter of Permission

12/14/2018

Mail - jean-clement.mumbusi@waldenu.edu

### FW: Request for Permission of Use of Survey Questionnaire

Publications <publications@city.ac.uk>

Mon 12/10/2018 5:30 AM

To: Jean-Clement Mumbusi <jean-clement.mumbusi@waldenu.edu>;

1 attachments (48 KB)

CopyrightRequest.pdf;

Dear Dr Mumbusi,

Please see Professor Francis's email below regarding your query. I hope this answers your question.

Kind regards,  
Rhav.

Dear Jean-Clement Mumbusi,

Thank you for your request for permission to use the material presented in the Francis et al. (2004) manual for using the Theory of Planned Behaviour.

I am happy for you to use the material, as long as any reports and publications arising from your research cite the manual and any relevant publications by Ajzen, the originator of the theory.

All the best with your research,  
Professor Jill Francis

12/19/2018

Mail - jean-clement.mumbusi@waldenu.edu

### Re: Request for Permission to Reproduce TPB Figure in Dissertation

Icek Aizen <aizen@psych.umass.edu>

Fri 9/28/2018 1:15 PM

To: Jean-Clement Mumbusi <jean-clement.mumbusi@waldenu.edu>;

1 attachments (17 KB)

AbstractJCM18.docx;

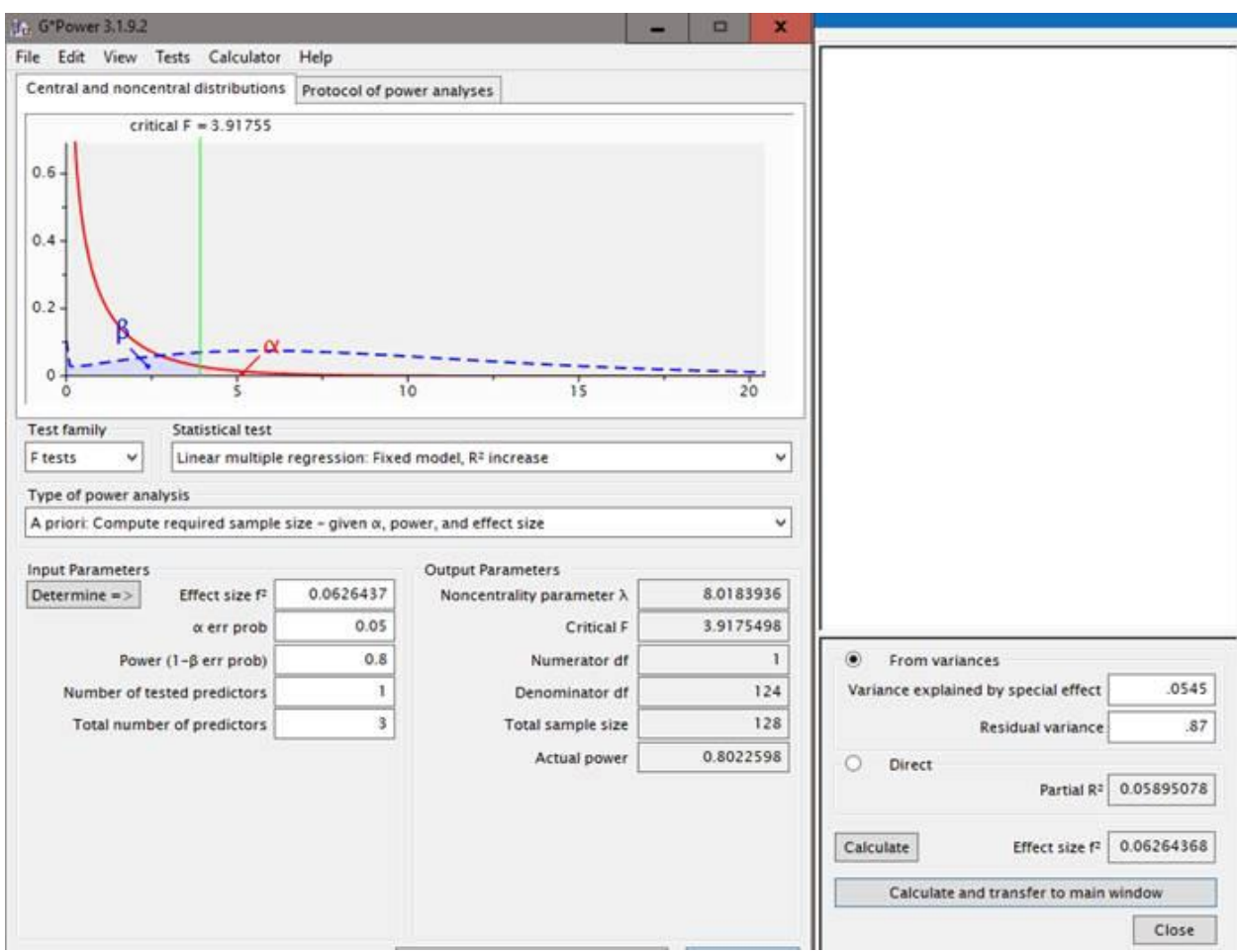
Dear Mr. Mumbusi,

The theory of planned behavior is in the public domain. No permission is needed to use the theory in research, to construct a TPB questionnaire, or to include an ORIGINAL drawing of the model in a thesis, dissertation, presentation, poster, article, or book. If you would like to reproduce a published drawing of the model, you need to get permission from the publisher who holds the copyright. You may use the drawings on my website ("<https://people.umass.edu/aizen/tpb.diag.html>" or "<https://people.umass.edu/aizen/tpb.background.html>") for non-commercial purposes, including publication in a journal article, so long as you retain the copyright notice.

Best regards,

Icek Ajzen  
Professor Emeritus  
University of Massachusetts - Amherst  
<https://people.umass.edu/aizen>

### Appendix G: G\*Power Calculation Output





## Appendix H: Institutional Review Board Approval Letter

1/4/2020

Mail - Jean-Clement Mumbusi - Outlook

**IRB Approval Granted, Conditional upon Partner Approval - Jean-Clement Mumbusi**

IRB &lt;irb@mail.waldenu.edu&gt;

Fri 5/10/2019 5:34 PM

To: Jean-Clement Mumbusi <jean-clement.mumbusi@waldenu.edu>  
Cc: Manoj Sharma <manoj.sharma@mail.waldenu.edu>1 attachments (254 KB)  
Mumbusi Consent Forms.pdf;

Dear Mr. Mumbusi,

This email is to notify you that the Institutional Review Board (IRB) has approved your application for the study entitled, "Using the Theory of Planned Behavior to Predict the Provision of Advanced Preventive Health Services by Congolese Physicians," conditional upon the approval of the research partners, as documented in signed notifications of approval, which will need to be submitted to the Walden IRB once obtained. The researcher may not commence the study until the Walden IRB confirms receipt of those signed notifications of approval.

Your approval # is 05-10-19-0552786. You will need to reference this number in your dissertation and in any future funding or publication submissions. Also attached to this e-mail are the IRB approved consent forms. Please note, if these are already in an on-line format, you will need to update those consent documents to include the IRB approval number and expiration date. Please also ensure that you update the translated copy of your consent form with this information.

Your IRB approval expires on May 9, 2020. One month before this expiration date, you will be sent a Continuing Review Form, which must be submitted if you wish to collect data beyond the approval expiration date.

Please note that this letter indicates that the IRB has approved your research. You may **NOT** begin the research phase of your doctoral study, however, until you have received official notification from the IRB to do so. Once you have received this notification by email, you may begin your data collection. Your IRB approval is contingent upon your adherence to the exact procedures described in the final version of the IRB application materials that have been submitted as of this date. This includes maintaining your current status with the university. Your IRB approval is only valid while you are an actively enrolled student at Walden University. If you need to take a leave of absence or are otherwise unable to remain actively enrolled, your IRB approval is suspended. Absolutely NO participant recruitment or data collection may occur while a student is not actively enrolled.

If you need to make any changes to your research staff or procedures, you must obtain IRB approval by submitting the IRB Request for Change in Procedures Form. You will receive confirmation with a status update of the request within 1 week of submitting the change request form and are not permitted to implement changes prior to receiving approval. Please note that Walden University does not accept responsibility or liability for research activities conducted without the IRB's approval, and the University will not accept or grant credit for student work that fails to comply with the policies and procedures related to ethical standards in research.

When you submitted your IRB application, you made a commitment to communicate both discrete adverse events and general problems to the IRB within 1 week of their occurrence/realization. Failure to do so may result in invalidation of data, loss of academic credit, and/or loss of legal protections otherwise available to the researcher.

Both the Adverse Event Reporting form and Request for Change in Procedures form can be obtained at the Documents section of the Walden website: <http://academicguides.waldenu.edu/researchcenter/orec>

Researchers are expected to keep detailed records of their research activities (i.e., participant log sheets, completed consent forms, etc.) for the same period of time they retain the original data. If, in the

<https://outlook.office.com/mail/deeplink?version=2019123003.04&popoutv2=1>

1/2

1/4/2020

Mail - Jean-Clement Mumbusi - Outlook

future, you require copies of the originally submitted IRB materials, you may request them from Institutional Review Board.

Both students and faculty are invited to provide feedback on this IRB experience at the link below:

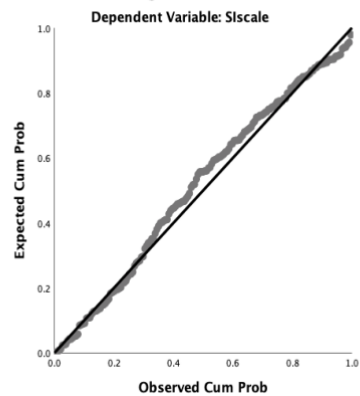
[http://www.surveymonkey.com/s.aspx?sm=qHBJzkJMUx43pZegKImdiQ\\_3d\\_3d](http://www.surveymonkey.com/s.aspx?sm=qHBJzkJMUx43pZegKImdiQ_3d_3d)

Sincerely,  
Libby Munson  
Research Ethics Support Specialist  
Office of Research Ethics and Compliance  
Walden University  
100 Washington Avenue South, Suite 900  
Minneapolis, MN 55401  
Email: [irb@mail.waldenu.edu](mailto:irb@mail.waldenu.edu)  
Phone: (612) 312-1283  
Fax: (626) 605-0472

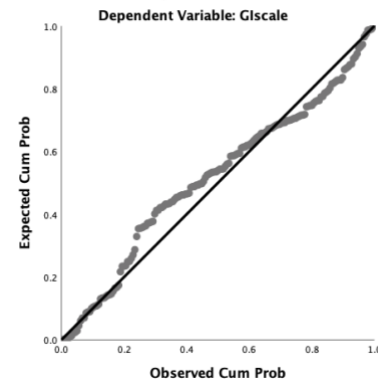
Information about the Walden University Institutional Review Board, including instructions for application, may be found at this link: <http://academicguides.waldenu.edu/researchcenter/orec>

Appendix I: Assumptions Tests

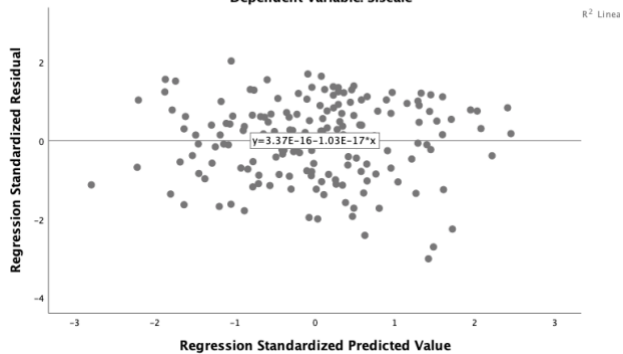
Normal P-P Plot of Regression Standardized Residual



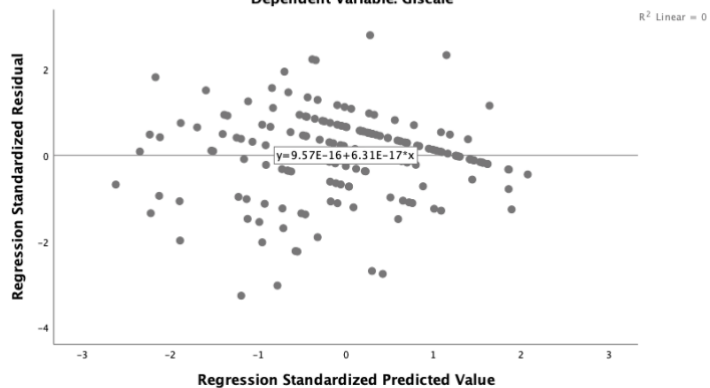
Normal P-P Plot of Regression Standardized Residual



Scatterplot  
Dependent Variable: SIscale



Scatterplot  
Dependent Variable: GIscale



## Appendix J: Research Partner Letter of Cooperation

## Letter of Cooperation from a Research Partner

Name of the community research partner  
Contact information

Date

Dear Dr. Jean-Clément M. Mumbusi,

Based on my review of your research proposal, I hereby authorize you to conduct the study entitled "Use of the theory of planned behavior to predict the provision of advanced preventive health services by Congolese physicians" within Insert name of community partner. As part of this study, I authorize you to conduct research on hospital/clinic premises, including meeting and recruiting potential participants and collecting data. Participation in this study will be voluntary and at the sole discretion of potential participants.

We understand that our organization's responsibilities are: to provide space for you to conduct your own research; to inform potential participants about the availability of this research; and to provide written information about the research and how to contact you for additional information and to register. We reserve the right to withdraw from this study at any time if circumstances change.

I understand that the student will not name our organization in the doctoral thesis report to be published in ProQuest.

I hereby confirm that I am authorized to approve this research project in this context, and that this project is in compliance with the organization's policies.

I understand that the data collected will remain strictly confidential and may not be shared with anyone except the staff/teaching staff responsible for supervising the student without the authorization of Walden University.

Sincerely,  
Person responsible for issuing the authorization  
Contact information