THE RELATIONSHIP BETWEEN INTIMATE PARTNER VIOLENCE AND CERVICAL CANCER SCREENING AMONG WOMEN AGED 15 AND OLDER IN SOUTH AFRICA

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A RESEARCH REPORT SUBMITTED TO THE SCHOOL OF SOCIAL SCIENCES, UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG, IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF ARTS IN DEMOGRAPHY AND POPULATION STUDIES

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Declaration

I, Marcus Hollington, hereby declare that this research report is my own original work. It is being submitted to the Faculty of Humanities and School of Social Sciences, University of the Witwatersrand in Johannesburg, South Africa. It is submitted in partial fulfillment of the requirements for the degree of Master of Arts in the field of Demography and Population Studies. I declare that this report has not been submitted before in part, or in full, for any other degree or examination at this or any other university.

Signature……

Dedication

A special thanks to my parents Lloyd and Stellah Hollington for constantly supporting my academic decisions and always standing by me through the complexities of life. My aunt Sandra for always supporting my academic journey and aunt Bertha for hosting me and my brother prior to the commencement of our studies. Lastly, to myself for never folding under pressure and for remaining focused when all seemed lost.

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ABBREVIATIONS AND ACRONYMS

AOR	Adjusted Odds Ratio
CCS	Cervical cancer Screening
CCSI	Cervical cancer Screening Intervals
CIS	Carcinoma in situ
CI	Confidence Interval
ICC	Inversive Cervical cancer
CCPCP	Cervical cancer Prevention and Control Policy
DU	Dwelling Units
EA	Enumeration Areas
GBV	Gender-Based Violence
HIV	Human immunodeficiency virus
HPV	Human papilloma virus
IPV	Intimate partner violence
MSF	Master Sample Frame
NDP	National Development Plan
NCIN	National Cancer Intelligence Network
OR	Odds Ratio
PSU	Primary Sampling Units
SSA	Sub-Saharan Africa
SES	Socio-Economic Status
SADHS	South Africa Demographic and Health Survey
SDG	Sustainable Development Goals
UN	United Nations
UOR	Unadjusted Odds Ratio
WHO	World Health Organization

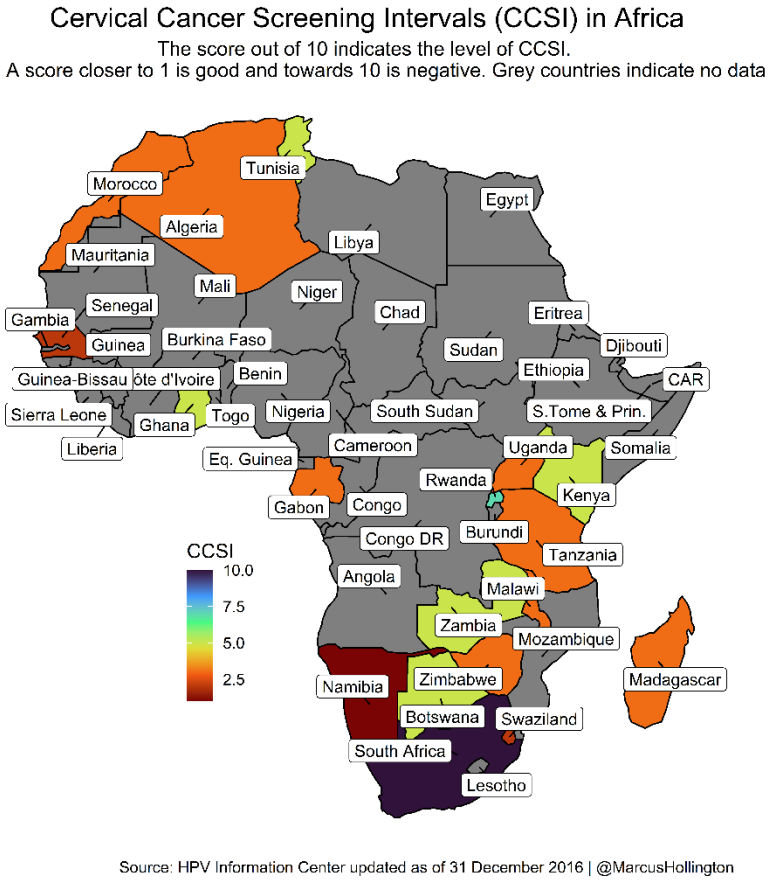
CHAPTER ONE: INTRODUCTION TO THE STUDY

1.1.Background

Cervical cancer is the fourth most prevalent cancer among women globally (Arbyn et al., 2020). It is estimated that in 2018, 570,000 women tested positive for cervical cancer worldwide and an estimated 311,000 women died as a result thereof resulting in a global case-fatality rate of 54.56% (WHO, 2021). Most of these deaths were in developing countries (Hull et al., 2020). Studies have found that the prevalence of cervical cancer in sub-Saharan Africa (SSA) is on the rise with over 74,000 new cases and an estimated 50,000 deaths annually – further exacerbated by the prevalence of HIV infections in the region (Mboumba Bouassa et al., 2017). Furthermore, the region constitutes over a third of all cervical cancer fatalities in the world despite representing only 14% of the globe's female population (American Cancer Society, 2019). Driving the disease's prevalence in the region is poor Cervical Cancer Screening (CSS), which has been reported to be as low as 12.87% (Yimer et al., 2021)

Figure 1.1 below shows the CCS intervals of African countries as per available data. The map was generated to highlight the risk of cervical cancer contraction among women who reside in countries that do not screen women frequently. With those that screen once every decade (e.g., South Africans) being highly susceptible to cervical cancer – as it gives abnormal cervical cells the opportunity to exacerbate prior detection, reducing the successful treat thereof (Health Service Executive, 2019). Rwanda has also been identified as a country whose women are at risk of contracting cervical cancer, as it has the second most lengthy screening interval after South Africa at 7 years per cervical cancer test (HPV Information Center, 2016). These lengthy screening intervals put women at risk of contracting cervical cancer more especially for women that cannot afford to undergo CCS outside of government funded screening.

Figure 1.1:



In South Africa, it is the second most prevalent cancer with some 5,406 fatalities recorded in 2015 (ANCON Medical, 2016; Fitzmaurice, 2018). The disease is of great concern in the country due to the widespread nature of the HIV, a predictor of cervical cancer (Denny, 2012). Conversely, studies have revealed that a leading cause of cervical cancer is the human papilloma virus (HPV), notably type 16 and 18, which increase cervical cancer susceptibility (Hull et al., 2020, Ntekim, 2012). The incidence rate of cervical cancer in the country ranges from 22.8/100,000 women to 27/100,000 women which is 42% higher than the global average of 15.8/100,000 women (Western Cape Government, 2021). Additionally, it is estimated that 19 million people aged 15 and older are at risk of developing cervical cancer (National Department of Health, 2017).

In response to the public health issue, the South African government has taken up several initiatives to curb the prevalence of the disease such as reducing HPV infections through the complementary testing and treating of pre-cervical cancer embedded in the Cervical cancer

Prevention and Control Policy (CCPCP) (National Department of Health, 2017). Despite these efforts, the prevalence of cervical cancer in the country remains high (Western Cape Government, 2021). As such, it is possible that the response to the policy by women in South Africa might be poor hence the prevalence of cervical cancer in the country (Western Cape Government, 2021). Thus, highlighting the need for novel investigations examining the mechanisms at play behind the country's high cervical cancer incidence rates.

In South Africa, 21% of ever partnered women or 1 in 5 women have been physically assaulted by their partners (Stats SA, 2020). Moreover, 14% of married women in South Africa have experienced physical violence while 4% have experienced violence of a sexual nature by their partners. However, the actual figure could possibly be high more especially within marriage or long-term partnership go under reported. While the figure is lower than the SSA prevalence rate of physical violence of 44% and 29.29% in Southern Africa, it is still a cause of concern in South Africa – as some women are reluctant to disclose such information in fear of victimization due to the sensitivity of the matter (Muluneh et al., 2020, Magubane, 2021).

These rates of violence against women by their partners whether it be sexual, physical, or emotional in nature could have an impact on the prevalence of cervical cancer in South Africa as it could impair screening thereof. For example, some studies have shown that female victims of intimate partner violence are significantly less likely to seek medical assistance in fear of further violence by their partners or abandonment illustrating negative implications on health-seeking behavior (Gordon, 2016). This hampers their psychological, sexual, and reproductive health. Thus, making them susceptible to sexual transmitted diseases such HPV, a precursor of cervical cancer (National Cancer Institute, 2017).

Exploring a potential association between intimate partner violence (IPV) and cervical cancer screening (CCS) could provide insights that could assist policymakers in addressing this public health issue as it could be an underlying or an indirect factor. Thus, it is crucial to understand the role that IPV plays in influencing CCS among women in South Africa. To this end, the study seeks to contribute to the field by investigating the potential association of IPV on CCS among other sociodemographic factors through which IPV impacts CCS in South Africa.

1.2.Problem Statement

Cervical cancer is the second most prevalent cancer in South Africa (ANCON Medical, 2016; Fitzmaurice, 2018). Due to limited access to prevention, early diagnosis, and treatment, cervical cancer is often fatal. According to the National Cancer Registry, in 2019, South Africa registered 6945 cervical cancer cases with an age-standardized incidence rate of 22.92 per 100,000 women and a cumulative lifetime incidence risk of 2.38 (0-74 years) per 100 people highlighting the widespread nature of the disease (National Cancer Registry, 2019). To this end, the South African government has identified the disease as a national priority (National Department of Health, 2017). This study contributes to the country's cervical cancer alleviation agenda by examining predictors of CCS and addressing them in a manner that reduces the prevalence of cervical cancer through increased screening. It takes a novel approach to examining CCS as an outcome by investigating the effect that IPV has on CCS in South Africa, a factor that has largely been excluded from CCS studies as a determinant thereof. The study's focus on IPV could shed new light on CCS in South Africa as well as the prevalence of cervical cancer in the country.

1.3.Research Question and sub-questions

What is the relationship between intimate partner violence (IPV) and cervical cancer screening (CSS) among women aged 15 and older in South Africa?

1.3.1. Sub-Questions

- What are the levels of CCS across South Africa's among women aged 15 and older?
- What is the association between IPV and CCS among women aged 15 and older while controlling for other sociodemographic variables?

1.4.Justification

In terms of research, this study seeks to contribute to the existing body of knowledge since studies in South Africa have not considered IPV as a factor associated with CCS. However, a descriptive pilot study conducted in the United States with the intent of exploring cervical

cancer screening (i.e., pap smear) and prevention (i.e., HPV vaccination) among survivors of IPV (N=30) found that only 23% of participants were up to date on their pap smear tests (Bagwell-Gray & Ramaswamy, 2022). While the study explored CCS among IPV survivors descriptively, it did not explore whether the afore was statistically associated with CCS. Additionally, it only explored CCS rates among IPV survivors with a small pilot sample which bars the study from generalizing its findings.

To this end, this study fills a gap in available limited literature by investigating whether a quantitative relationship between IPV and cervical cancer screening (CCS) exists among women aged 15 and older in South Africa. Importantly, it does so from a South African perspective as a search of literature revealed no such study conducted in the country. It also uses weighted data from the South African Demographic and Health Survey 2016 making it nationally representative of the South African population.

According to the Demographic and Health Survey (2016), there are four types of IPV namely sexual, emotional, less severe physical violence and severe physical violence. Sexual violence whether it be by husbands/partners or strangers puts women at risk of contracting cervical cancer as it can spread HPV, a significant precursor of the disease that is sexual transmitted (Holland, 2021). In terms of emotional IPV, women that are abused emotionally by their husbands/partners may suffer from low self-esteem impairing their likelihood of seeking health services. Thus, they may not undergo CCS. Violence against women often affects their self-esteem and as such, they too may not make use of health services as a study in Pakistan revealed (Tariq, 2013).

In SSA, IPV is widespread potentially impairing the ability of women to undergo CCS. Thus, it is important that scholars from the region explore the impact that IPV could potentially have on CCS outcomes in their respective countries to turn the tide of cervical cancer incidence (McCloskey et al., 2016). In South Africa, while the national government has taken several initiatives to curb the prevalence of cervical cancer through the implementation of the CCPCP, the incidence rates of the disease are still high among some of the highest in the world (Western Cape Government, 2021).

This highlights the need for innovative studies to examine under-reported variables such as IPV and how this affects the country's national cervical cancer prevention strategies such as those provided by the CCPCP in the form of CCS. Additionally, the study has implications for the United Nations Sustainable Development Goals (SDGs) (WHO, 2021). In terms of CCS, the study contributes to SDG 3 which advocates for good health and well-being. More specifically, it aligns itself with SDG 3.4 as it seeks to curb the prevalence of non-communicable diseases such as cervical cancer to improve the overall well-being of women. Moreover, given that cervical cancer is a sexual disease that is caused by the sexual infection of HPV types 16 and 18, the study also aligns itself with SDG 3.7 on sexual and reproductive health (Hull et al., 2020).

Findings from the study seek to highlight the need for the implementation of South Africa's Universal Health Coverage (UHC) in line with SDG 3.8 to improve female access to healthcare. It is hoped that this will encourage women to undergo CCS more frequently to curb the prevalence of the disease. Additionally, should the study find an association between IPV and CCS in South Africa it will strengthen the case for eliminating violence against women and girls (SDG 5.2.1). It will do this by examining the potential pathway of IPV on CCS and the indirect impact it has on the biological health of females should they contract the disease. It is in this light that the conduction of the study is justified.

1.5.Research Objective and sub-objectives

- To examine the relationship between IPV and CCS on women aged 15 and older in South Africa.

1.5.1. Sub-Objectives

- Ascertain the levels of CCS across South Africa's among women aged 15 and older.
- To examine the association between IPV and CCS among women aged 15 and older while controlling for sociodemographic variables.

CHAPTER TWO: LITERATURE REVIEW

2.1. Introduction

This chapter reviews topical literature on domestic violence with a bias for IPV and CCS. Herein the chapter outlines the health outcomes of women in relation to CCS by focusing on their wealth status, age, number of sexual partners, access to health insurance, contraceptive use, area of residence, level of education, cigarette smoking and health seeking behavior. Lastly, the chapter discusses the study's chosen theoretical and conceptual framework.

2.2. Review of literature

The health of women is important, and their mortality thereof should be safeguarded to promote their survival more so in South Africa where 41,8% of households are female headed (Kamer, 2021). To improve the survival of women, comprehensive research, analysis, and data on the leading causes of female mortality should be examined and disseminated to highlight the need to improve health policy designed to improve women health (Wheeler et al., 2013). Globally, cervical cancer is the 4th most common cancer infecting the female population, with an estimated 570,000 infections and 311,000 fatalities per annum. Of these, developing countries, including those in SSA suffer the greatest burden – with some 84% of cervical cancers being concentrated in the region (Ba et al., 2021). Yet despite this great cervical cancer burden, few women residing in SSA undergo CCS particularly amongst women of child-bearing age (15-49). This suggests that a large group of women do not screen for cervical cancer (Pennsylvania State University, 2021). Thus, putting them at risk of infection.

Driving this CCS deficit in the region is the economic status of women many of whom are poor and do not have access to adequate health care services such as pap smears and HPV tests (WHO, 2021). Moreover, the low-resource nature of SSA countries compromises women's health by causing deficits in frequent and effective population-based level CCS programs. For example, while South Africa is among the wealthiest countries in SSA it has the longest CCS interval (10 years) for women aged 30-years and above who are eligible for 3 free pap smears in their lifetimes making them highly susceptible to cervical cancer infections due to low CCS frequencies (Western Cape Government, 2021). This is lower than the 3-year screening

interval, starting at 25-years and older as prescribed by the Cancer Association of South Africa to detect abnormal cells in the cervix that could develop into cervical cancer earlier and improve women's odds of survival should they contract the disease (Ba et al., 2021).

2.3. Socio-demographic characteristics

2.3.1. CCS and area of residence

Studies have shown that living conditions influence the health outcomes of individuals (Pattyn et al., 2011; Theaker, 2020). For example, the affluency and prosperity of one's area of residence coupled with individual or family income and the general educational levels within an area and social relationships therein can have either a positive or negative effect on the health of individuals (Theaker, 2020). Those residing in the impoverished areas are more likely to have negative health outcomes than those residing in more affluent areas because of the residential factors. Residential areas with good logistical infrastructure – such as well-established road networks, descent housing, water, and sanitation – have better health outcomes than those without adequate access to these.

In support of the aforementioned, a study conducted by Barry and Breen (2005) – examining the role that place of residence plays in predicting the diagnosis of cervical cancer among women across 3 American cities using data from Surveillance, Epidemiology, and End Results – found that women that resided in economically and socially distressed areas were significantly susceptible to late-stage cervical cancer diagnosis. Conversely, a study conducted by Ndejjo and colleagues examining the uptake of CCS women residing in rural Uganda – found that the incidence rate of CCS was low, with only 4.3% of 900 women reporting ever undergoing CCS (Ndejjo et al., 2016). Similarly, a study conducted by McDonald and colleagues – investigating the relationship between access to health services and cervical cancer prevention risk in rural and urban areas found that women from rural areas were more susceptible to cervical cancer compared to women from urban areas (McDonald et al., 2016).

Furthermore, a report in England on the prevalence of all cancer cases in the country between 1995-2014 found that women from impoverished areas were more susceptible to cervical cancer compared to their richer counterparts (NCIN, 2008). Driving this deferential in health

outcomes is a deprivation gap that is fuelled by the lower uptake of CCS in deprived areas. The study found that in deprived areas 12 in every 100,000 women had cervical cancer compared to 6 in every 100,000 women residing in affluent areas. Thus, the literature shows a clear association between residential area and health outcomes of cervical cancer among women.

2.3.2. CCS and race/ethnic groups

Studies have shown that race/ethnicity has an influence on CCS (Levinson et al., 2016). A study conducted by Jo's Cervical cancer Trust on the understanding of CCS among white, black and minority racial groups found that more black women and minority female groups (12%) reported not undergoing CCS compared to 8% of white women in England (Public Health England, 2017). Additionally, a study conducted in the United States on tenacious racial disparities in CCS with Pap smear tests found that minority groups were less likely to uptake a Pap smear test compared to white women (McDaniel, Hallam, Cadwallader, Lee & Chou, 2021). Conversely, a study conducted by Musselwhite and colleagues (2016) found that racial/ethnic disparities in CCS exist and continue to persist among minority groups in both high-income and low-resource countries. In sum, the literature suggests that CCS is associated with ethnicity and will be examined to conclude whether the same findings apply in this study.

2.3.3. Cervical cancer and age of women

Females of child-bearing age (21-49 years) are susceptible to cervical cancer infections (Ba et al., 2021). Herein, middle-aged women ranging between 35-44 years old have the highest risk of contracting cervical cancer as their immune systems weaken and are no longer able to fight off HPV, the virus responsible for facilitating the contraction of cervical cancer (Hermansson, Olovsson, Hoxell & Lindström, 2018). A study conducted by Ba and colleagues on the prevalence and determinants of CCS in Benin, Ivory Coast, Kenya, Namibia, and Zimbabwe concluded that CCS in SSA is generally low and that the uptake of Pap smears is needed to detect and reduce morbidity and mortality in women particularly those that are middle-aged (Ba et al., 2021).

While cervical cancer is rare among women below the age of 30 it does occur, especially among those with risky sexual behaviours. However, these are likely to undergo screening due to

awareness deficits in this age group (Takano, 2021). A study conducted Barrow and colleagues (2020), on the prevalence and contributors of cervical cancer awareness among women of child-bearing age in Zimbabwe found that women become more conscious of cervical cancer and other diseases as they get older. For example, a study conducted by Adokuwebe and colleagues found that the prevalence of CCS was high among women aged 45 and older (Akokuwebe et al., 2021). While the studies focus in brief on the role that socio-demographic-economic variables play in informing CCS, they do not examine the effect that IPV could potentially have on CCS – to assess the impact that it has on the health outcome of women in the age groups where they are highly susceptible to cervical cancer.

2.3.4. CCS and level of education

A study conducted by Abu and colleagues examining the role that health education plays in influencing CCS uptake across several health centres in Addis Ababa found that women with degrees were more likely to undergo CCS compared to women that did not have degrees (Abu et al., 2020). Similarly, a study conducted by Murfin and colleagues examining the influence that education, income, and occupation have on the uptake cervical cancer prevention strategies such as the utilization of Pap smear tests among women in developed countries, found that women that had high school or college education were associated with CCS and HPV vaccination (Murfin et al., 2019). In Kenya, a study examining the demographic and economic predictors of CCS uptake among women in Isiolo county found that education was a significant determinant of CCS (Linus et al., 2021). In sum, topical literature suggests that CCS is associated with level of education and will be examined to conclude whether the same findings apply in South Africa.

2.3.5. CCS and wealth status

In 2018, cervical cancer was responsible for the death of an estimated 311,000 women and over 500,000 new cases (Ba et al., 2021; Cervical cancer Action, 2021). The highest proportion of cases and subsequent fatalities have been recorded in developing countries characterized with rampant socio-economic issues – resulting in poor health infrastructure and resources to better combat the disease through prevention and early detection (Teteh et al., 2019). On one hand, studies have shown that the rates of cervical cancer have decreased globally due to primary

prevention programmes that vaccinate, diagnose, and screen for cervical cancer early and treat women that test positive for the disease (McGuire, 2016; Finocchario-Kessler et al., 2016; World Health Organization, 2014). On the other hand, some authors have shown that the incidence rates in the developing countries have either increased or remained the same due to deficits in monitoring, screening, and treatment (Mahumud et al., 2020).

Driving these trends in incidence rates in developing countries, particularly in Africa, is the continent's socioeconomic issues such as poor levels of income and unemployment – which act as a catalyst in driving diseases (de Sanjose et al, 2019; Gakidou et al., 2008; Tapera et al., 2019). A study conducted by McKinnon and colleagues found that the variation of CCS uptake is disproportionately distributed among poor women globally and so is the burden of cervical cancer (McKinnon et al., 2010). Studies conducted by other authors found similar results showing that while 19% of women in resource-constrained countries, such as those found in SSA, underwent CCS while 60% of women in high-income countries underwent CCS (Gakidou et al., 2008). Furthermore, a study conducted in Botswana assessing factors associated with socioeconomic inequalities in breast and cervical cancer found that women in the poorest and poor wealth quantiles were less likely to undergo CCS compared to women in the richest wealth quantile (Keetile et al., 2021). Thus, highlighting the impact that wealth status has on the ability of women to undergo CCS.

Studies in Argentina and Nicaragua have revealed that access to a CCS service is dependent on the wealth status of women which facilitates their access to quality healthcare services (Claeys et al., 2002; Arrossi et al., 2008). Similarly, a study conducted by Soneji and Fukui (2013) in Latin America revealed that women in the poorest wealth quantile was lower compared to women in the middle wealth quantile. In South Africa, where 29,9 million people live below the upper-bound poverty line puts its population at risk of infectious diseases due to deficits in access health-care services at costs that many people cannot afford (Business Tech, 2019). In sum, topical literature suggests that the health outcomes of women improve as their wealth status improves. This results in greater access to health care thus, reducing female morbidity and mortality.

2.4. Health/risk factors

2.4.1. CCS and number of sexual partners

The risk of women contracting cervical cancer increases with multiple sexual partners as they are more susceptible to HPV (Anderson-Niles, 2010). HPV is the focal driver of cervical cancer in women and is transmitted through sexual intercourse, thus increasing with multiple sexual partners (Liu et al., 2015). Women that engage in sexual intercourse with men that have numerous sexual partners are more likely to transmit HPV to them as well as cervical cancer should they engage in sexual intercourse with women that have cervical cancer (Anderson-Niles, 2010; American Cancer Society, 2019). Thus, acting as a vector for the disease. Additionally, studies have shown that women that engage in sexual intercourse before the age of 18 are more susceptible to cervical cancer compared to women that start engaging in sexual intercourse from the age of 18 and older (Anderson-Niles, 2010; Hansen et al., 2018).

For example, a study conducted in Ethiopia assessing factors that influence CCS revealed that women that reported having 2 or more sexual partners had a higher likelihood of contracting cervical cancer compared to women that reported having less sexual partners (Fentie et al., 2020). In Australia, a study conducted by Smith and colleagues (2011) on the association between sexual behaviour and CCS found that women that had zero sexual partners were in the past year were less likely to undergo CCS. A study conducted in South Africa found similar results among women that had multiple sexual partners compared to women that had fewer sexual partners (Cooper et al., 2007; Zhang et al., 2020). A study conducted by Alfaro and colleagues (2015) found that women with many sexual partners were significantly associated with the non-attendance of CCS due to their likelihood of testing positive for cervical cancer (Anderson-Niles, 2010).

2.4.2. CCS and health insurance

The best available literature shows that health insurance is associated with better health outcomes and lower levels of morbidity and mortality (Franks et al., 1993; McWilliams et al., 2004). This is supported by a study assessing the impact that health insurance has on the health outcomes of individuals (Levy & Meltzer, 2008). This study concluded with mixed results. On one side, it found the causality between health insurance and good health to be unclear, as causality therein could be driven by other unobservable factors. On the other hand, the study

found evidence illustrating that health insurance improves the health outcomes of people in subpopulations. According to the National Academy of Sciences (2002), individualsthat are not in possession of health insurance are less likely to undergo CCS compared to women with health insurance and be vaccinated for plethora of diseases. Moreover, they are likely to receive these services in a timely manner than those without health insurance.

A study conducted by Reyes-Ortiz and colleagues (2008) in Latin American and the Caribbean found that women without health insurance were less likely to undergo CCS compared to women with health insurance. In South Africa, a study conducted using the World Health Survey to assess care-access dimensions and CCS found that women without health insurance were less likely to undergo CCS compared to women with health insurance (Akinyemiju et al., 2015). Similarly, a study conducted by Akokuwebe and colleagues (2021) to investigate the determinants of CCS among women of reproductive age found that the proportion of women that underwent CCS was significantly high among women with health insurance.

2.4.3. CCS and contraceptive use

Studies assessing factors associated with women's adherence to CCS have identified contraception as a determinant thereof (Barré, 2010; Oussaid et al., 2013). Causality between contraceptive use and cervical cancer has been identified by several studies – particularly the use of oral contraceptives such as pills that contain chemicals such as estrogen and progesterone, both known to increase women's susceptibility to cervical cancer (Smith et al., 2003; Iversen et al., 2021). Additionally, oral contraceptives increase the risk of contracting cervical cancer by altering the susceptibility of cervical cancer cells and increasing the incidence of HPV (National Cancer Institute, 2018). A study conducted by Barré (2010), focusing on the relationship between pap smear tests for CCS and contraception, hypothesized that the opportunity that women have to undergo CCS may be influenced by their contraception preferences. The rationale herein was that women's contraception visits to the doctor may be an opportunity for them to undergo CCS. The results revealed no significant difference between women whose preferred contraception method was intrauterine device (UID), pills and implants, and CCS (Barré, 2010).

On the other side of the debate some studies have found that causality between contraceptive use and cervical cancer has been identified by several studies particularly the use of oral contraceptives such as pills that contain chemicals such as estrogen and progesterone both known to increase the risk of cervical cancer (Smith et al., 2003; Iversen et al., 2021). Risk has also been identified in the long-term injection use as a contraception method among women. For example, a study conducted by the Lancet found that the use of oral contraceptives by women aged between 20 to 30 years increased the rates of incidence of invasive cervical cancer in their 50s by 1. That is from 7.3 per 1000 women to 8.3 per 1000 women in least developed countries (Smith et al., 2003). Both sides of the debate will be considered in the outcomes of the study.

2.4.4. CCS and cigarette smoking

According to a study conducted by Eng and colleagues – examining the association between cigarette smoking, cancer screening, and cancer stage using data from the Women's Health Initiative (WHI) Observational Study – found that current smokers had lower odds of undergoing CCS compared to non-smokers (Eng et al., 2021). It also found that former smokers were more likely to uptake CCS compared to non-smokers. Additionally, a study conducted by Utami and colleagues – assessing the association between tobacco intake and HPV infections in normal uterine cervix in Jakarta, Indonesia utilizing a total population of 1397 participants consisting of 69 tobacco smokers found that 4.3% of tobacco smokers tested positive for cervical cancer (Utami et al., 2021). Thus, showing the association between cigarette smoking and cervical cancer. Similarly, a study conducted by Chatzistamatiou and colleagues – examining the relationship between smoking and HPV among women that underwent CCS in Greece – revealed that among women that tested positive for HPV, 57% were tobacco smokers (Chatzistamatiou et al., 2013). The association was statistically significant among young women aged between 25-34 years.

2.5. Gaps in literature

While available literature has highlighted the association between predictors of cervical cancer screening such as area of residence, race, age, education, wealth status, health insurance and contraceptive use, studies have not explored the association of IPV to CCS in South Africa. To

this end that the study seeks to fill a gap in literature by examining this association and contributing to literature.

2.6. IPV in a global context

IPV is a global phenomenon that permeates all cultural groups, social class, religious groups, and wealth status. However, it is disproportionately distributed towards women who incur an overwhelming burden of it. As of 2021, 736 million women are subject to sexual violence by their intimate partners or non-partners (WHO, 2021). According to the WHO, "30% of ever partnered women globally have experienced physical or sexual violence by a partner in their lifetime" (WHO, 2021). Global rates of IPV vary per region ranging from 23% to 47% (WHO, 2021). However, the prevalence of this type of violence is projected to be so much higher than current figures might suggest due to the deficits in reporting and data collection in other countries. This suggests that this area of research is still developing.

While women can also be violent in relationships towards men, it is often in self-defence (WHO, 2021). Men are the most common perpetrators of IPV against women WHO, 2021). Although IPV is a global health issue, women residing in areas exhibiting high levels of gender inequality and social norms of violence against women as well male dominance over women, such as those in developing countries, are disproportionately affected in contrast to the rest of the world (Hleoheng, 2017). Literature suggests that women in abusive relationships often do not leave their relationships to maximize their safety. A study conducted by Heise et al. (1999) argues that women around the world often do not leave their abusive relationships in fear of increased violence, stigma of losing child custody, and love. Instead, they hope that their partners will change for the better over time.

However, despite these barriers, women subsequently leave their partners because of years of continuous violence. According to a study conducted by García-Moreno and Stöckl (2013), on women's health and IPV in multiple countries found that 19% to 51% of female respondents who have ever been in a physical or sexually abusive relationship had left home for at least 1 day while 8% to 21% had left between 2 and 5 times during their relationships. Literature, therefore, suggests that IPV is a global phenomenon albeit mostly concentrated in developing

countries where levels of gender inequality are high and social norms of violence against women are widespread.

2.6.1. IPV in Africa

IPV affects 36% of the SSA population exceeding the global average of 30% (McCloskey et al., 2016; WHO, 2021). According to McCloskey and colleagues, 45,6% of women in Africa suffer a lifetime of partner violence and sexual violence which affects 11,9% of women than elsewhere in the world. A growing body of epidemiological and demographic literature in Africa places a focus a on women as victims of violence by men although some studies examine both males and females as victims and perpetrators (Andersson et al., 2007; Gass et al., 2010; Jankey et al., 2011). An array of factors drives IPV in Africa, these vary from wealth status, unemployment, and alcohol abuse. Moreover, Africa's patriarchal traditions play a large role in IPV against women. For example, most of the continent's cultural and traditional beliefs promote and reinforce the male hierarchical role in relationships, especially in unions or marriages (Morrell et al., 2012).

In East Africa, some women do not have the choice of choosing a husband; with some having predetermined husbands from birth. According to the World Bank (2015), 63% of the continent's populace resides in rural areas separating them from the central law of the government prohibiting IPV and other forms of violence due to the remote nature of these areas (McCloskey et al., 2016). While an increasing number of African countries have adopted strict laws against gender-based violence (GBV), enforcement thereof is elusive as most of Africa's population resides in rural and often remote areas which are difficult to access because of poor road networks (United Nations, 2012; McCloskey et al., 2016). As such, the likelihood of IPV in rural areas is expected to be higher than in urban areas due to the remote nature of the locations, which limits access of the law.

Some frameworks have been developed to understand the multidimensional reasons for IPV. One of these is the eco-social model which examines culture and relationships within social settings and how the two factors influence one another (McCloskey et al., 2016). For example, men from cultural backgrounds with strong patriarchal characteristics are likely to be abusive and dominating in their relationships with women. Social beliefs regarding gender roles

facilitate the occurrence of IPV across the continent. While patriarchal beliefs are not the sole contributor of IPV in Africa, the attitudes embedded therein sustain community tolerance of such forms of violence perpetuated against women. This lessens the probability of systematic responses targeted at curbing the phenomenon. In SSA, a significant proportion of men and women are both advocates of a man's prerogative to discipline a woman should she disrespect her husband. Moreover, with more women than men supporting what is deemed as "justified" abuse doing away with GBV in the region may prove difficult (Koenig et al., 2003; McCloskey et al., 2016).

2.6.2. IPV in South Africa

South Africa has some of the highest rates of IPV in SSA. An estimated 50% of women murders are perpetrated by intimate partners. This estimation is among some of the highest rates in the world equating to a femicide rate of 8.8/100,000 (Groves et al., 2014; Joyner et al., 2015). A study conducted by Gass and colleagues in South Africa found that 1 in 3 women had experienced IPV in their ongoing relationships (Gass et al., 2010). Moreover, interpersonal violence, IPV included, affects the everyday lives of women in South Africa and accounts for 10.9% of all disability-adjusted life years (Groves et al., 2014). Additionally, according to United Nations (UN) Women (2021), IPV has no boundaries and permeates female children through child-marriages with a prevalence of 5.6%.

Driving the prevalence of IPV in South Africa is poverty which subsequently drives alcohol abuse, a pivotal driver of violence, jealousy, and culturally acceptable gender-based violence as discussed in the previous sub-section (Jewkes, 2002). Most importantly, gender inequality is chief among the drivers of IPV. Recent reports of IPV and femicide saw President Cyril Ramaphosa declare a state of national disaster in response to GBV following rates of around 3000 women being murdered between April-2018 and March-2019 which equates to an average of 7 female murders per day perpetrated by men (Cohen & Mbatha, 2019; Khumalo, 2019).

Such levels of violence have devastating effects on the mental well-being of children that witness such traumatic events. Thus, perpetuating a cycle of trauma and potential future perpetrators of IPV. According to Frade and De Wet-Billings (2019), children that witness

cases of IPV are likely to perform poorly at school and male children who witness cases of IPV are likely to perpetrate such acts of violence as adults. The literature, therefore, suggests that rates of IPV against women in South Africa are high and act as a risk factor for sexually transmitted diseases such as HIV and HPV (National Cancer Institute, 2017).

2.7. Theoretical Framework

This section serves to discuss the theoretical framework that was employed to guide the conduction of this study.

2.7.1. Health-seeking behaviour model

This study is guided by the Heath-Seeking Behaviour model (HSBM) (Poortaghi et al., 2015). The model was chosen as a theoretical framework for this study as the outcome CCS is health-seeking behaviour. The model postulates that HSBM is influenced by a person's perception of a threat posed by a health problem and the value associated with actions aimed at reducing the threat. Health seeking behaviour is defined as an individual's actions to maximize their well-being, recovery, and rehabilitation for better health outcomes (Chinn et al., 1999). The HSBM approaches action-based health outcomes with the understanding that health revolves around physical, mental, and spiritual well-being (Clark, 2007). Globally, there is a consensus that the provision of knowledge and education at the individual level is not enough to alter people's behaviour towards better health outcomes (MacKian, 2003). Thus, by seeking to understand the local health perceptions of societies and factors that inform health decision-making processes are vital components of understanding people.

Figure 2.1: Health-seeking behavior model Adopted from (Poortaghi et al., 2015) and modified for this study

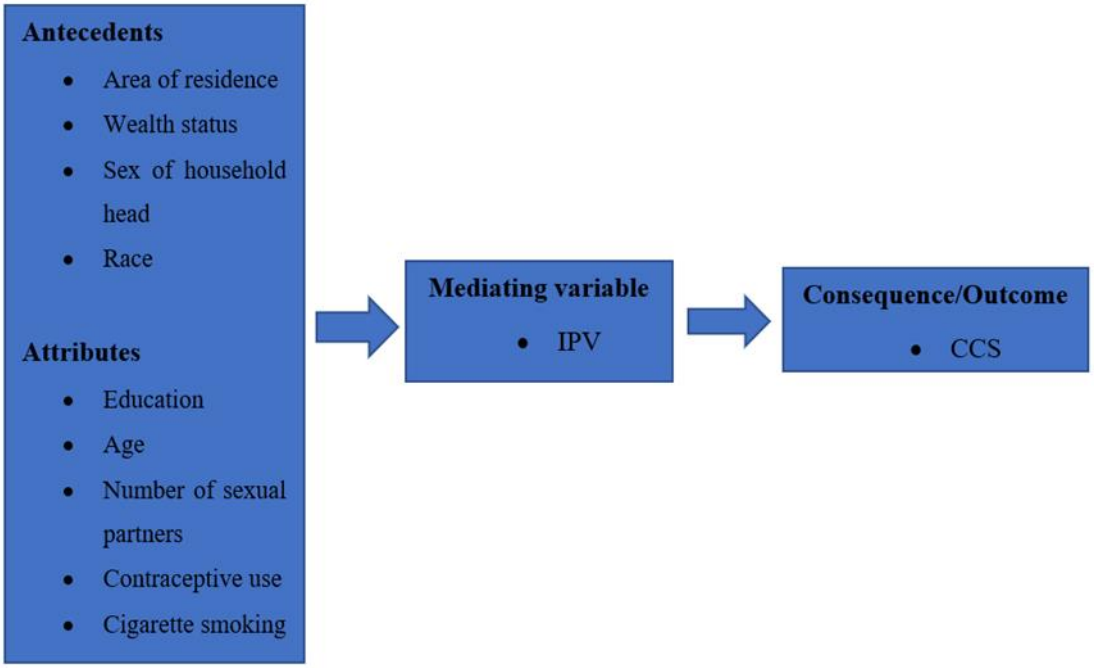


Figure 2 above illustrates the HSBM which shows the processes and factors through which health-seeking behaviour is often informed namely, antecedents, attributes, and consequences of such action. Antecedents can be defined as events that occur prior to the incidence of an event (Poortaghi et al., 2015). The antecedents of the health-seeking behaviour model are fourfold namely, social, cultural, economic factors and issues related to health service. This study will focus on these. Social factors are identified as precursors of such events – such as but not limited to province, and area of residence. Cultural factors are but not limited to ethnicity. Conversely, economic factors that influence the health-seeking behaviour of individuals are wealth. Issues related to health services are but not limited to health insurance.

Attributes are defined as the features that help clarify a concept in depth (Poortaghi et al., 2015). (Poortaghi et al., 2015). The features are better uncovered by asking questions that revolve around the characteristics of a concept, herein being CCS and the women that undergo the preventative cervical cancer measure. According to the model, the attributes of health-seeking behaviour are ‘interactive and process’, ‘intellectual’, ‘decision-making’ and the ‘ability to measure’. The ‘interactive and process’ aspect of the model posits that health-seeking behaviour involves an individual’s social network interaction with both their social network and social interaction with other individuals potentially influencing their health-seeking

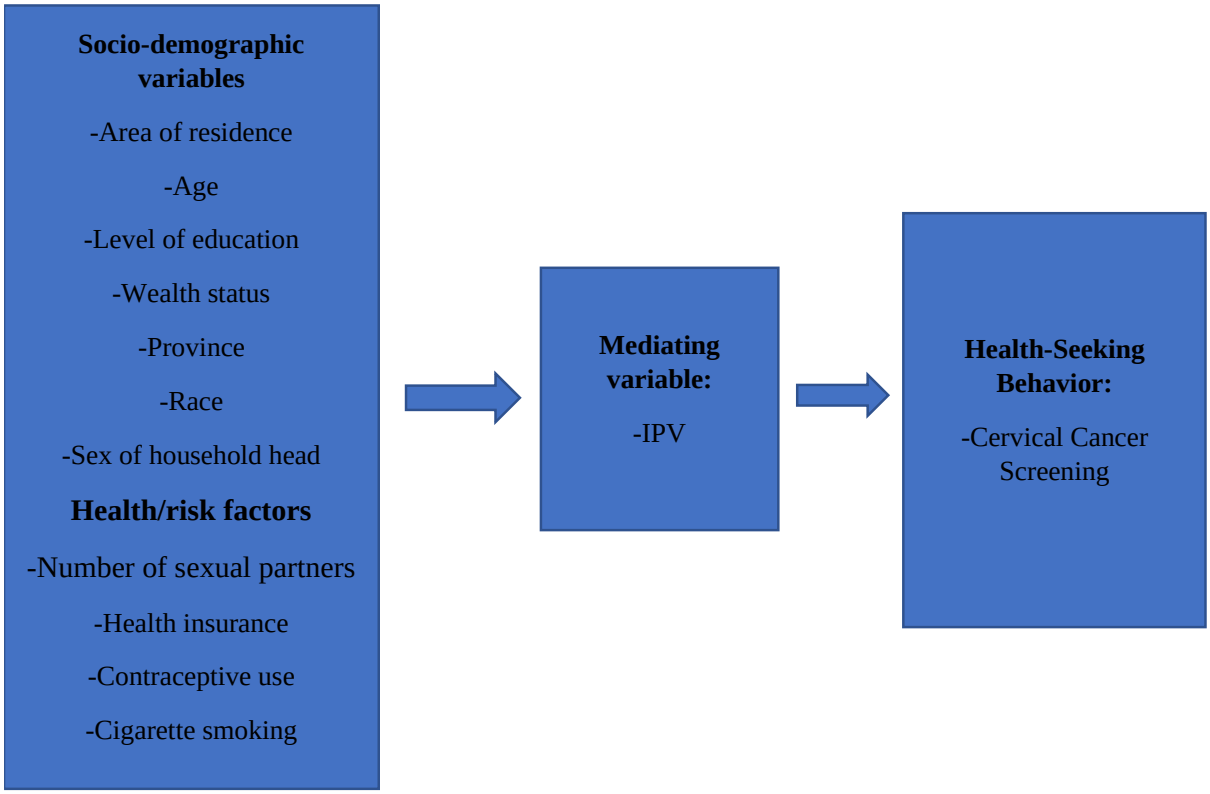
behaviour. Herein, their interaction with the health system helps identify factors that encourage individuals to alter their health behaviour for better health outcomes (Mackian, 2004; Poortaghi et al., 2015).

The active and decision-making-based dimension pertains to the ability that one has in making health choices. The study's participant attributes are education, age, number of sexual partners, contraceptive use and cigarette smoking. In the context of consequence, this study seeks to prevent cervical cancer through screening thus its consequence is health promotion.

2.8. Conceptual Framework

To reflect on the health-seeking behaviour model this study will examine variables that are based on the earlier mentioned components and dimensions. Figure 2.2 below presents the study's conceptual framework which illustrate the relationship between IPV, and CCS in South Africa as informed by the health-seeking behaviour model.

Figure 2.2: Conceptual framework illustrating the relationship between IPV and CCS



The study adapted the health-seeking behaviour model, the pathway of interest is IPV and how it affects CCS. It assumes that the socio-demographic variable and health/risk factors as informed by the health-seeking behaviour model act as predictors of CCS. In terms of sociodemographic variables studies have revealed that area of residence is associated with CCS (Ndejjo et al., 2016). Age is included in the model as it influences CCS among women because of their increased susceptibility to the disease as they age (Ba et al., 2021; Takano, 2021). Education increases the level of CCS and HPV vaccinations among women (Murfin et al., 2019). Wealth status has also been identified by some authors as a factor that influences the health-seeking behaviour of women in terms of CCS (McKinnon et al., 2010; Keetile et al., 2021).

In terms of health/risk factors, the number of sexual partners that women have has an influence on CCS (Fentie et al., 2020; Smith et al., 2011). Likewise, health insurance and contraceptive use (Akokuwebe et al., 2021; Barré, 2010; Iversen et al., 2021). Cigarette smoking has also been identified in previous studies as having an impact on CCS among women (Eng et al., 2021; Utami et al., 2021). IPV the main independent variable of the model is presented as the mediating factor in the model.

2.9. Hypotheses

Utilizing the framework above the study seeks to test the following hypotheses:

H_0 (Null): There is no relationship between IPV and CCS in South Africa among women aged 15 and older.
H_1(Alternative): There is a relationship between IPV and CCS in South Africa among women aged 15 and older.
Significance level: $\alpha = 0.05$

CHAPTER THREE: METHODOLOGY

This chapter discusses the methodology employed in response to the study's research questions to meet its objectives. It commenced by describing the study design, data source, study population and sample size, and questionnaire design. Additionally, it outlined both the dependent and independent variables, ethical issues, hypotheses, data analysis plan and limitations of the study.

3.1. Study Design

The study used cross-sectional and used data from the 2016 South Africa Demographic and Health Survey (2016SADHS). The sampling frame utilized for this survey was derived from the Master Sample Frame (MSF) developed from the 2011 Census enumeration areas (EA's) as created by Statistics South Africa (National Department of Health et al, 2019). The MSF consisted of manageably sized EAs that were treated as primary sampling units (PSUs). Information in the frame contained geographical data pertaining to urban and rural areas, as well as the approximate number of dwelling units (DUs) therein. Given that these were approximates, one or more households were located per DU. Similar surveys conducted identified an average of 1.03 households per DU.

The sample incorporated all 9 of South Africa's provinces and provided approximates of key national indicators in both urban and rural areas across all provinces. Data across all 9 provinces were stratified into urban, farms or traditional areas resulting in 26-sampling strata (National Department of Health et al, 2019). The survey employed a 2-stage sample design in which "a probability proportional to size sampling of PSUs" was conducted in the first stage and DU sampling was conducted in the second stage (National Department of Health et al, 2019). The PSU measure size was derived from the DU of the 2011 Census. The survey made use of a total of 750 PSUs of which 468 PSUs were urban areas while the remainder traditional and farm areas.

Interview eligibility was afforded to 50% of households in all DUs in which women aged 15-49 who either permanently resided in the households or were overnight guests participated in the survey by answering standard individual questionnaires (National Department of Health et

al, 2019). The remaining 50% of DUs and households located therein were eligible to participate in interviews by responding to household questionnaires.

3.2. Data source

The SADHS is a population-based survey that collects demographic and health data to better inform policy and manage strategic programs for the advancement of the South African population (National Department of Health et al, 2019). It is conducted through the dissemination of questionnaires that remain constant over time for monitoring and evaluation (M&E) purposes with a focus of demographic and health indicators such as adult and reproductive health as well as nutrition. The survey also provides participants with the opportunity to understand their health status (Stats SA, 2021). This has direct implications for South Africa's National Development Plan (NDP) and health-related Sustainable Development Goals (SDGs). It does this with the intent to monitor progress or regress to better meet the health goals and objectives of countries.

3.3. Study population and sample

The 2016 SADHS had a response rate of 83% resulting in 11,083 households. Therein a total of 8,514 women were interviewed and 3,618 men were interviewed resulting in a total of 12,132 participants (National Department of Health et al, 2019). In the adult health module of the survey, a total of 10,336 participants aged 15 and older were successfully interviewed. This study's research population comprised of 1,936 women aged 15 and older who responded to questions pertaining to CCS (National Department of Health et al, 2019). The final sample size was 1,934 women aged 15 and older after excluding participants that responded, "I don't know". The study weighted the data to ensure national representativeness as well as addressing any imbalances in sample profiles after data collection

3.4. Questionnaire Design

The questionnaire design of the survey utilized in the conduction of this study was derived from the individual women's questionnaire of the 2016 SADHS, from which eligible women aged 15 and older participated. In households, eligible women were interviewed on an array of

topics ranging from background characteristics (demographic variables included), family planning, fertility preferences, and birth history to mention a few (National Department of Health et al, 2019). These were disseminated by field workers who employed face-to-face strategies to conduct interviews with participants. The data gathered therein revolved around sociodemographic and health/risk characteristics such as age, frequency of smoking cigarettes, number of sexual partners, wealth status, health insurance, area of residence, educational attainment, domestic violence with a bias for IPV. These were extracted from the individual questionnaire while health seeking behaviour under the guise of CCS was extracted from the adult health questionnaire. Merging of the two datasets was achieved using a one-to-one on key variables in which "caseid" was used to match variables between the two datasets.

3.5. Study variables

3.5.1. Dependent Variable

The outcome variable of the study is CCS. This variable was derived from women aged 15 and older who were asked if they had ever undergone CCS through the uptake of a Pap smear exam. The survey collected the data using the question:

"Have you ever had a Pap smear exam?"

Table 3. 1: Definition and categorization of dependent (outcome) variable

Variables	**Original variable Categories**	**Definition**	**Categorization**
Dependent (Outcome) Variable			
CCS s1407	0. No 1.Yes 8. I don't know	Screened for cervical cancer	0. No
			1. Yes

The responses were categorized with "yes" and "no" binary responses from participants.

3.5.2. Independent variables

Table 2 below illustrates the variables that were utilized in the conduction of this study as informed by the topical literature and conceptual framework. IPV referred to women who experienced the following types of IPV namely, emotional violence, less severe violence, severe physical violence, and sexual violence perpetrated by either husband or partner. Experiencing any of the 4 forms of IPV qualified the respondent to be categorised as having experienced IPV. It is categorized with the binary responses "no" and "yes" which are coded as 0 and 1 respectively.

Area of residence was defined as the area in which the women that participated in the study reside. It was categorized 2 categories namely, rural, and urban and coded as 1 and 2 respectively.

Table 3. 2: Definition and categorization of independent variables for this study as informed by the health-seeking behaviour model

Variables	Original variable categories and codes	Definition	This study's categories and codes
		Mediating variable	
IPV d104 d106 d107 d108	No (0) Yes (1)	Experienced emotional violence, less severe violence, severe physical violence, and sexual violence by husband/partner	0. No 1. Yes
		Socio-demographic variables	
Area of residence v025	Rural (1) Urban (2)	Area in which participants reside	1. Rural 2. Urban
Age v013	15-19 (1) 20-24 (2) 25-29 (3) 30-34 (4) 35-39 (5) 40-44 (6) 45-49 (7) 50+ (8)	Age of women that have undergone CCS	1. 15-24 2. 25-34 3. 35-44 4. 45+
Level of education v149	No education (0) Incomplete primary (1) Complete primary (2) Incomplete secondary (3) Complete secondary (4) Higher (5)	Level of educational attainment	0. None and incomplete education 2. Primary 4. Secondary 5. Tertiary
Wealth Index v190	Poorest (1) Poorer (2) Middle (3) Richer (4)	The wealth status of women	1. Poorer & Poorest 3. Middle 4. Richer & Richest

	Richest (5)		
Province v024	Western Cape (1) Eastern Cape (2) Northern Cape (3) Free State (4) Kwazulu-Natal (5) North West (6) Gauteng (7) Mpumalanga (8) Limpopo (9)	Administrative division of country	1. Western Cape 2. Eastern Cape 3. Northern Cape 4. Free State 5. KwaZulu-Natal 6. North West 7. Gauteng 8. Mpumalanga 9. Limpopo
Race v131	Black/African (1) White (2) Coloured (3) Indian/Asian (4) Other (996)	Population group	1. Black/African 3. Coloured 996. Other (White, Indian/Asian & Other groups)
Sex of household head v151	Male (1) Female (2)	Gender that heads the household	1. Male 2. Female
Health/risk factors			
Sexual partners in the last 12 months v766b	0 1 2 3 4 5 6 95+	Number of sexual partners that women had in the last 12 months including their spouse	0. 0 1. 1 2. 2+
Frequency of cigarette smoking v463aa	Does not smoke (0) Every day (1) Some days (2)	Frequency of smoking cigarettes	0. Non-smoker 1. Everyday 2. Sometimes
Current contraceptive use v312	Not using (0) Pill (1) Iud (2) Injections (3) Male condom (5) Female sterilization (6) Male sterilization (7) Periodic abstinence (8) Withdrawal (9) Implants/Norplant (11) Female condom (14) Emergency contraception (16) Other modern method (17) Injections 2 month (19)	Current method of contraception	0. Not using 1. Other modern methods 3. injections
Health insurance s1402	No (0) Yes (1)	Whether women have health insurance or not	0. Has no health insurance 1. Has health insurance

Age was defined as the age of women that have undergone CCS. In this study, the age ranged from 15 years and older. It was categorized into three 10-year intervals namely, 15-24 coded as 1, 25-34 coded as 2, 35-44 coded as 3 and 45+ as the open-ended age which was coded as 4. Levels of education is defined as the level of educational attainment and categorized as no and incomplete education coded as 0, primary coded as 2, secondary coded as 4, and tertiary coded as 5.

Wealth index was defined as the wealth status of women and was split into 3 categories namely: poorer and poorest coded as 1, middle coded as 3, richer, and richest coded as 4. Province was defined as the administrative division of South Africa. These were categorized into 9 categories namely, Western Cape coded as 1, Eastern Cape coded as 2, Northern Cape coded as 3, Free State coded as 4, KwaZulu-Natal coded as 5, North-West coded as 6, Gauteng coded as 7, Mpumalanga coded as 8, and Limpopo coded as 9.

Race was defined as population group, and it was categorized into 3 categories namely, Black African coded as 1, Coloured coded as 3, and other (White, Indian/Asian, and other groups) coded as 996. The latter racial groups in "other" were combined due to their low frequencies which would ultimately affect the study's inferential statistics. Sex of household head was defined as gender that heads the household. It was categorized as male coded as 1 and female coded as 2.

Sexual partners in the last 12 months were defined as the number of sexual partners that women had in the last 12 months including their spouse. It was categorized and coded as "0" for women that did not have any sexual partners, "1" for women that had one sexual partner and "2" for women that had 2 and more sexual partners over the 12-month period. Frequently smokes cigarettes was defined as the frequency with which respondents smoke cigarettes. It was categorized as non-smoker, every day, and some days coded as 0, 1 and 2 respectively.

Current contraceptive use was defined as the current method of contraception. It was divided into 3 categories namely, not using coded as 0, other modern methods coded as 1 and injections coded as 3. Health insurance was defined as possession of health insurance to supplement medical bills and was categorized as, has health insurance coded as 1, and does not have health insurance coded as 0.

3.6. Ethical considerations

The study was conducted using secondary data derived from the 2016 SADHS. It was conducted anonymously and as such neither ethical clearance nor participant consent was required. The data collection for this study did not involve any communication with participants. No privacy issues were contravened as the information of participants such as names, identity numbers etc., was not revealed in the survey and corresponding datasets. In addition, an ethics application was made through the Department of Demography and Population Studies at the University of the Witwatersrand. Thereafter, an ethics waiver was granted to undertake this study. Ultimately, the study was granted the ethics number: WDEMG2021/08/06

3.7. Data Analysis

The data analysis of this study was conducted to answer the research objectives. For the first objective, the study employed a bivariate examination between the dependent (outcome) variable and each of the independent variables. The second objective of the study was answered by employing a multivariate analysis ascertaining the association between the study's independent variables on CCS. This phase of the data analysis comprised of a binary logistic regression. The subsequent sections of the study provided descriptions of each of the components of the statistical analysis plan.

3.7.1. The levels of CCS across South Africa among women aged 15 and older

To illustrate the levels of CCS in South Africa the study obtained distribution of the study sample in relation to the background characteristics of women. Frequencies and percentage distributions were generated using weighted factors of the 2016 SADHS. The results were presented in a pie chart.

Thereafter, the study employed a bivariate analysis of CCS and each of the study's independent variables. It made use of weighed cross tabulations of the outcome variable, main independent variable, and control variables. Bivariate associations were tested using chi-square tests which

enabled the study to ascertain the strength of crude relationships between CCS and the study's independent variables. Associations recorded at $p<0.05$ in both the chi-square test and binary logistic regressions were considered statistically significant and interpreted as such. The independent variables that were analysed in the study were IPV, area of residence, age, level of education, wealth index, province, race, sex of household head, sexual partners in the last 12 months, frequency of cigarette smoking, current contraceptive use, and health insurance. The results were presented in a table.

3.7.2. Investigating the association between IPV and CCS in South Africa among women aged 15 and older.

To examine the association of IPV and CCS among women aged 15 and older while controlling for area of residence, age, level of education, wealth index, province, race, sex of household head, sexual partners in the last 12 months, frequency of cigarette smoking, current contraceptive use, and health insurance. The study conducted a multivariate analysis through the employment of a binary logistic regression as the outcome of the study is categorized with yes and no binary responses. The binary logistic regression results were presented in tabular format consisting of both an unadjusted and adjusted model. The unadjusted binary model regression examined association of each independent variable against CCS while the adjusted binary logistic regression ran all the independent variables in the model simultaneously against the outcome

Odds ratios above 1.00 were interpreted as "more likely" in favour of the outcome while those that are below 1.00 were interpreted as less likely against the outcome of the study which is CCS. A p-value score expressed as $p < 0.05$ represented significant results at 95% level of confidence and were interpreted as statistically significant.

The logistic model which was computed using Stata statistical software using the format below:

$$\text{Logit (Y)} = \ln\left(\frac{\pi}{1-n}\right) = \alpha + \beta_1 X_1 + \beta_2 X_2 \ldots\ldots$$

Therefore,

$$\pi = Probability\ (Y = outconme\ of\ interest \mid X_1 = x_1, X_2 = x_2)$$

$$= \frac{e^{\alpha+\beta_1 X_1+\beta_2 X_2}}{1+e^{\alpha+\beta_1 X_1+\beta_2 X_2}}$$

Where π is the success probability that an observation is in a specified category of the binary **Y** variable (CCS)

α = intercept

β = regression coefficients

Xs = the study's predictors / independent variables

3.8. Data Management

Data for this study was managed and analysed using Stata software version 14. All "I don't knows" were dropped from the analysis. To avoid problems in inferential statistics, the study recoded some of the variables to avoid multicollinearity driven by low frequencies as informed by a base univariate and bivariate analysis. Age was recoded into 4 categories, namely "15-24", "25-34", "35-44", and "45+" as the opened-ended age group. Sexual partners in the last 12 months were recoded into 3 categories, namely "0", "1" and "2+". Contraceptive use was recoded into 3 categories namely, not using, other modern methods (iud, male sterilization, periodic abstinence, withdrawal, female condom, emergency contraception) and injections. In terms of race, white, Indian/Asian & Other groups were combined.

Wealth index was recorded into 3 categories namely, poorer, and poorest, middle, and richer and richest. Level of education was recoded, and no education, incomplete primary, and incomplete secondary were combined and categorized into 4 categories as "no and incomplete education", primary, secondary, and tertiary education. The IPV variable was developed by

combining emotional, severe, less severe, and sexual violence. Women that experienced any one for the forms of IPV fell into the IPV variable.

3.9. Binary logistic regression assumptions

According to Harris (2021) a binary logistic regression relies on 3 assumptions for reliability namely: Independent observations, absence of perfect multicollinearity among independent variables and continuous predictors must be linearly related to a transformed version of the outcome (linearity). This is assessed by the model diagnostics and test for multicollinearity in subsequent sections.

3.10. Model Diagnostics

3.10.1. Test for specification error

The test for specification error is used to examine whether the logit of the outcome variable is a linear combination of the independent variables and that only and all the relevant variables have been included in the model. This is often done using the Stata command -*linktest*- usually after the logit or logistic command. The *linktest* uses the linear predicted value *(_hat)* and linear predicted value squared *(_hatsq)* as the predictors to rebuild the model such that the variable _hat should be a statistically significant predictor since it is the predicted value from the model (UCLA, 2021). On the other hand, the _hatsq *(linktest)* is not expected to have much predictive power (insignificant) except by chance if the model is correctly specified and relevant variable(s) has not been omitted (Olamijuwon, 2022). A contrary result, on the other hand, is an indication of a specification error such that the link function is not the correct choice or the relationship between the logit of the outcome variable and the independent variables are not linear.

Appendix B, the _hat is statistically significant (p-value=0.00). The *linktest* was also found to be significant (p-value=0.02). This confirmed that the model was correctly specified, and relevant variables were not omitted.

3.10.2. Test for Multicollinearity

The test for multicollinearity examines the level of collinearity among the study variables. This could be done using a correlation matrix. A very high correlation coefficient above (0.80) between study may be an indication of multicollinearity (Olamijuwon, 2022). The result of the correlation matrix presented in **Appendix C** showed that there was no evidence of multicollinearity among the study variables.

3.11. Limitations

Due to the cross-sectional nature of the data used in the conduction of the study, the research is limited in that the main predictor of the study and the outcome are measured simultaneously which makes it impossible to ascertain whether other factors acted as precursors of the outcome. This is because logistic regression cannot measure causality between IPV and CCS, but rather allows for descriptive analysis of variables associated with CCS. Additionally, the study is based on a data set that was developed in 2016 thus, its limitation is that it has been 5 years since the SADHS has been updated and some of the data might be outdated as the dynamics of the South African population continue to change over time.

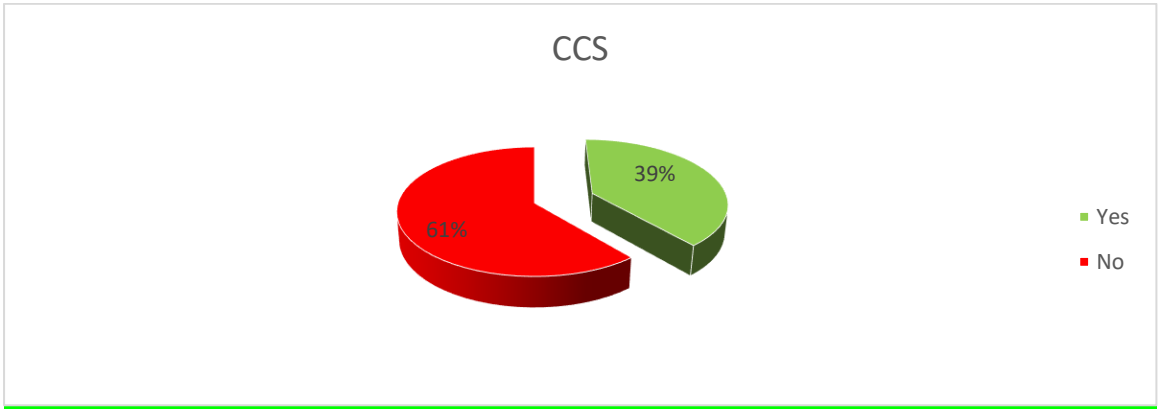
CHAPTER FOUR: RESULTS

The objective of the study was to examine the impact that IPV on CCS among women in South Africa. This chapter presents the results of the analysis. The first section of the study conducted a bivariate analysis and provides summary statistics and the strength of association for CCS with all covariate measures that were generated through chi-square tests and cross-tabulations. It also shows the level of CCS per province. The second section of the study employed a multivariate logistic regression analysis to model the probability of CCS among women aged 15 and older.

4.1. Levels of CCS among women aged 15 and older in South Africa

The first objective of the study was to ascertain the levels of CCS among women aged 15 and older in South Africa. These levels were ascertained through a univariate analysis in the frequency distribution above and presented in Figure 4.1 below. The figure shows that 39% of women aged 15 and older screened for cervical cancer while 61% of women in the same age range did not screen for cervical cancer.

Figure 4.1: Percentage distribution of CCS among women aged 15 and older



The second objective of the study was to examine the levels of CCS across South Africa's province among women aged 15 and older. To this end, the study employed a bivariate analysis to illustrate the levels of CCS by province as well as determine the association between the two and other independent variables in the study.

Table 4. 1: Bivariate associations between predictor variables and CCS in South Africa

Variables	CCS (%) Yes	CCS (%) No	P-Value & X2
Mediating variable			
IPV			
Yes	188 (44.34)	236 (55.56)	0.01** & 6.54
No	566 (37.48)	944 (62.52)	
Socio-demographic variables			
Area of residence			
Urban	478 (43.73)	615 (56.27)	0.00** & 23.80
Rural	276 (32.82)	565 (67.18)	
Age			
15-24	42 (11.26)	331 (88.74)	
25-34	254 (33.96)	494 (66.04)	0.00** & 231.70
35-44	314 (55.67)	250 (44.33)	
45+	144 (57.83)	105 (42.17)	
Level of Education			
None and incomplete education	318 (34.73)	716 (65.27)	
Complete primary	27 (37.50)	45 (62.50)	0.00** & 33.30
Complete secondary	226 (41.32)	321 (58.68)	
Tertiary	120 (55.05)	98 (44.95)	
Wealth Index			
Poorer & Poorest	250 (31.13)	553 (68.87)	0.00** & 52.96
Middle	149 (36.52)	259 (63.48)	
Richer & Richest	355 (49.10)	368 (50.90)	
Province			
Western Cape	95 (67.38)	46 (32.62)	
Eastern Cape	93 (40.26)	138 (59.74)	
Northern Cape	73 (40.56)	107 (59.44)	
Free State	76 (39.18)	118 (60.82)	
KwaZulu-Natal	81 (31.64)	175 (68.36)	0.00** & 61.83
North-West	81 (42.19)	111 (57.81)	
Gauteng	71 (33.65)	140 (66.35)	
Mpumalanga	91 (36.55)	158 (63.45)	
Limpopo	93 (33.21)	187 (66.79)	
Racial Group			
Black/African	608 (36.10)	1076 (63.90)	
Coloured	96 (52.75)	86 (47.25)	0.00** & 54.48
Other (White, Indian/Asian & Other groups)	50 (73.53)	18 (26.47)	
Sex of household head			
Male	386 (42.05)	532 (57.95)	
Female	368 (36.22)	648 (63.78)	0.01** & 6.88
Health/risk factors			
Sexual partners in the last 12 months (including spouse)			
0	75 (41.21)	107 (58.79)	
1'	650 (39.30)	1004 (60.70)	0.13 & 4.08

2+	29 (29.59)	69 (70.41)	
Frequency of cigarette smoking			
Non-smoker	684 (38.45)	1095 (61.55)	
Everyday	60 (48.78)	63 (51.22)	0.05 & 5.98
Some days	10 (31.25)	22 (68.75)	
Current contraceptive use			
Non-user	340 (38.16)	551 (61.84)	
Other modern methods	243 (44.75)	300 (55.25)	0.00** & 12.66
injections	171 (34.20)	329 (65.80)	
Health Insurance			
Has health insurance	177 (66.04)	91 (33.96)	0.00** & 95.76
Does not have health insurance	577 (34.63)	1089 (65.37)	

********Significance level p<0.05*

The highest percentage of women that underwent CCS were women that reported experiencing IPV (44.34%) while those that reported not experiencing IPV constituted the least percentage of women that did not undergo CCS (37,48%). The association between IPV and CCS was statistically significant ($x^2 = 6.54$; p<0.05). By area of residence, women from urban areas constituted the greatest percentage of women that underwent CCS (43,73%) while women from rural areas constituted the least percentage of women that underwent CCS (32,82%). The association between area of residence and CCS was found to be statistically significant (x^2=23.80; p<0.05).

In terms of age, the highest percentage of women that underwent CCS was among women aged between 45+ years (57.83%) followed by women aged 35-44 years and older (55,67%), 25-34 years (33,96%) while women aged between 15-24 years old constituted the percentage of women that underwent CCS (11.26%). The association between age and CCS was found to be statistically significant ($x^2 = 231.70$; p<0.05). By level of education, the greatest percentage of women that underwent CCS had tertiary education (55,05%) followed by women with secondary education (41,32%), primary education (37,50%) while women without an education and those that did not complete their education constituted the least (34,73%). The association between level of education and CCS was found to be statistically significant ($x^2 = 33.30$; p<0.05).

By wealth index, women that fell in the richer and richest category constituted the greatest percentage of women that underwent CCS (49,10%) followed by women that fell in the middle category (36,52%) while women in the poorer and poorest category constituted the least percentage of women that underwent CCS (31,13%). The association between wealth index and CCS was found to be statistically significant (x^2=52.96; p<0.05). In terms of province, women from the Western Cape constituted the greatest percentage of women that underwent CCS (67,38%) followed by women from the North West (42,19%), Northern Cape (40,56%), Eastern Cape (40,26%), Free State (39,18%), Mpumalanga (36,55%), Gauteng (33,65%), Limpopo (33,21%) and KwaZulu-Natal (31,64%). The association between province and CCS was found to be statistically significant ($x^2 = 61.83$; p<0.05).

By race, women in other (White, Indian/Asian & Other groups) constituted the greatest percentage of women that underwent CCS (73,53%) followed by coloured women (52,75%) while black/African women constituted the least percentage of women that underwent CCS (36,10%). The association between race and CCS was found to be statistically significant ($x^2 = 54.48$; p<0.05). By sex of household head, women that reside in male-headed households constituted the greatest percentage of women that underwent CCS (42,05%) while women that reported residing in female-headed households constituted the least percentage of women that underwent CCS (36,22%). The association between sex of household head and CCS was found to be statistically significant ($x^2 = 6.88$; p<0.05).

By contraceptive use, women that reported using other modern methods of contraception constituted the greatest percentage of women that underwent CCS (44,75%) followed by non-users (38,16%) while women that reported injections constituted the least percentage of women that underwent CCS (34.20%). The association between contraceptive use and CCS was found to be statistically significant ($x^2 = 12.66$; p<0.05). In terms of health insurance, women that reported having health insurance constituted the greatest percentage of women that underwent CCS (66,04%) while women that did not have health insurance constituted the least percentage of women that underwent CCS (34,63%). The association between health insurance and CCS was found to be statistically significant ($x^2 = 95.76$; p<0.05).

Figure 4.2:

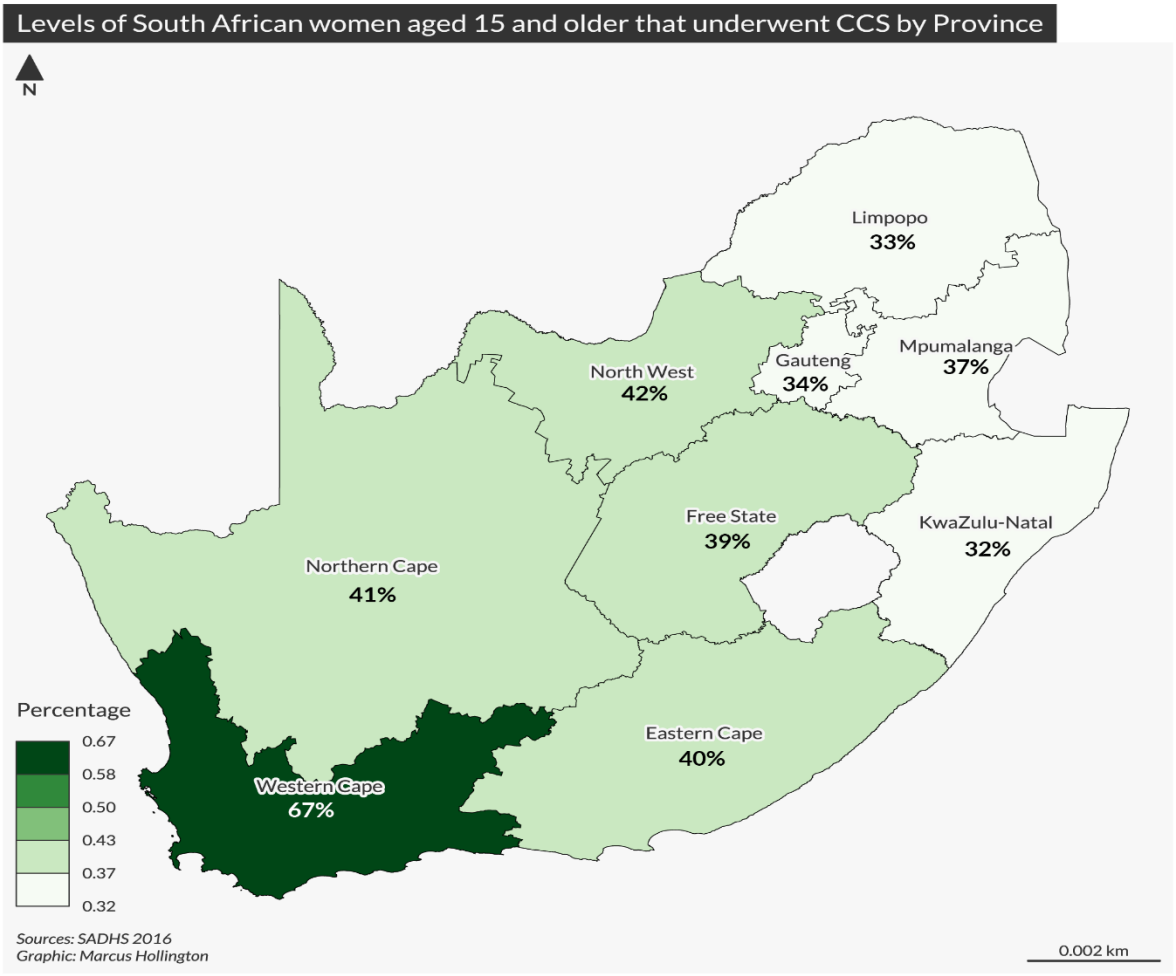


Figure 4.2 above shows that out of all 9 of South Africa's provinces only Western Cape had over 50% of its female population in the study sample undergo CCS with 67% of women in the province screen for cervical cancer. The rest of the country's provinces had CCS levels of less than 43% with the North West recording 42% and the Northern Cape recording 41% while KwaZulu-Natal recorded the lowest level of CCS among women aged 15 and older with 32%.

4.2. The association between IPV and CCS among women aged 15 and older while controlling for sociodemographic variables

The third objective of the study was to examine the association between IPV and CCS among women aged 15 and older while controlling for sociodemographic variables. This will be done through the employment of unadjusted and adjusted binary regression models. This section seeks to present the study's unadjusted odds ratios (UOR) to illustrate the association between

the study's background characteristics and CCS among women aged 15 and older in South Africa.

Table 4.2 shows that women that experienced IPV were significantly more likely to undergo CCS compared to women that did not experience IPV (UOR: 1.33; p<0.05; CI: 1.07-1.65). By area of residence, women that resided in rural area were significantly less likely to undergo CCS compared to women from urban areas (UOR: 0.63; p<0.05; CI: 0.52-0.76). In terms of age, women aged between 25-34 years were significantly more likely to undergo CCS compared to women aged 15-24 years old (UOR: 4.05; p<0.05; CI: 2.84-5.78). Conversely, women aged between 35-44 years old were significantly more likely to undergo CCS compared to women aged 15-24 years old (UOR: 9.90; p<0.05; CI: 6.90-14.21). Women aged 45 and older were significantly more likely to undergo CCS compared to women aged 15-24 years old (UOR: 10.81; p<0.05; CI: 7.19-16.25).

Table 4. 2: Logistic regression results (Unadjusted Odds Ratios)

Variable	UOR	P-Value	95% Confidence Interval
Mediating variable			
IPV			
No (R.C)			
Yes	1.33	0.01**	1.07-1.65
Socio-demographic variable			
Area of Residence			
Urban (R.C)			
Rural	0.63	0.00**	0.52-0.76
Age			
15-24 (R.C)			
25-34	4.05	0.00**	2.84-5.78
35-44	9.90	0.00**	6.90-14.21
45+	10.81	0.00**	7.19-16.25
Level of Education			
None and incomplete education (R.C)			
Primary	1.13	0.63	0.69-1.85
Secondary	1.32	0.01**	1.07-1.63
Tertiary	2.30	0.00**	1.71-3.09
Wealth Index			
Poorer & Poorest (R.C)			
Middle	1.27	0.06	0.99-1.64
Richer & Richest	2.13	0.00**	1.73-2.63
Province			
Western Cape (R.C)			

Eastern Cape	0.33	0.00**	0.21-0.51
Northern Cape	0.33	0.00**	0.21-0.52
Free State	0.31	0.00**	0.20-0.49
KwaZulu-Natal	0.22	0.00**	0.14-0.35
North West	0.35	0.00**	0.22-0.56
Gauteng	0.25	0.00**	0.16-0.39
Mpumalanga	0.28	0.00**	0.18-0.43
Limpopo	0.24	0.00**	0.16-0.37
Racial group			
Black/African (R.C)			
Coloured	1.98	0.00**	1.45-2.69
Other (White, Indian/Asian and other groups)	4.92	0.00**	2.84-8.50
Sex of household head			
Male (R.C)			
Female	0.78	0.01**	0.65-0.94
Health/risk factors			
Sexual partners in the last 12 months (including spouse)			
0 (R.C)			
1	0.92	0.62	0.68-1.26
2+	0.60	0.06	0.35-1.01
Frequency of cigarette smoking			
Non-smoker (R.C)			
Everyday	1.52	0.02**	1.06-2.20
Some days	0.73	0.41	0.34-1.55
Current contraceptive use			
Not using (R.C)			
Other modern methods	1.31	0.01**	1.06-1.63
Injections	0.84	0.14	0.67-1.06
Health Insurance			
Does not have health insurance (R.C)			
Has health insurance	3.67	0.00**	2.80-4.82

*RC = Reference Category, **p < 0.05 represents significant results at 95% level of confidence, Unadjusted Odds Ratio = UOR*

By level of education, women with secondary education were significantly more likely to undergo CCS compared to women with no and incomplete education (UOR: 1.32; p<0.05; CI: 1.07-1.63). Women with tertiary education were significantly more likely to undergo CCS compared to women with no and incomplete education (UOR: 2.30; p<0.05; CI: 1.71-3.09).
In terms of wealth index, women that fell in the richer and richest wealth quantile were significantly more likely to undergo CCS compared to women that fell in the poorer and poorest wealth quantile (UOR: 2.13; p<0.05; CI: 1.73-2.63).

In terms of province, women from the Eastern Cape were significantly less likely to undergo CCS compared to women from the Western Cape (UOR: 0.33; p<0.05; CI: 0.21-0.51). Women from the Northern Cape were significantly less likely to undergo CCS compared to women from the Western Cape (UOR: 0.33; p<0.05; CI: 0.21-0.52). Women from the Free State were significantly less likely to undergo CCS compared to women from the Western Cape (UOR: 0.31; p<0.05; CI: 0.20-0.49). Women from KwaZulu-Natal were significantly less likely to undergo CCS compared to women from the Western Cape (UOR: 0.22; p<0.05; CI: 0.14-0.35). Women from the North West were significantly less likely to undergo CCS compared to women from the Western Cape (UOR: 0.35; p<0.05; CI: 0.22-0.56).

Women from Gauteng were significantly less likely to undergo CCS compared to women from the Western Cape (UOR: 0.25; p<0.05; CI: 0.16-0.39). Women from Mpumalanga were significantly less likely to undergo CCS compared to women from the Western Cape (UOR: 0.28; p<0.05; CI: 0.18-0.43). Women from Limpopo were significantly less likely to undergo CCS compared to women from the Western Cape (UOR: 0.24; p<0.05; CI: 0.16-0.37).

In terms of race, coloured women were significantly more likely to undergo CCS compared to black/African women (UOR: 1.98; p<0.05; CI: 1.45-2.69). Conversely, other (White, Indian/Asian, and other groups) women were significantly more likely to undergo CCS compared to black/African women (UOR: 4.92; p<0.05; CI: 2,84-8.50). By sex of household head, women from female-headed households were significantly less likely to undergo CCS compared to women from male-headed households (UOR: 0.78; p<0.05; CI: 0.65-0.94).

In terms of frequency of smoking cigarettes, everyday smokers were significantly more likely to undergo CCS compared to non-smokers (UOR: 1.52; p<0.05; CI: 1.06-2.20). By contraceptive use, women that reported using other modern methods of contraception were significantly more likely to undergo CCS compared to women that reported not using (UOR: 1.31; p<0.05; CI: 1.06-1.63). In terms of health insurance, women with health insurance were significantly more likely to undergo CCS compared to women without health insurance (UOR: 3.67; p<0.05; CI: 2.80-4.82).

Table 4.3 below shows the adjusted logistic regression results illustrating the relationship between IPV and CCS while controlling for other independent variables.

Table 4. 3: Logistic regression results (Adjusted Odds Ratio)

Variable	AOR	P-Value	95% Confidence Interval
Mediating variable			
IPV			
No (R.C)			
Yes	1.46	0.00**	1.14-1.86
Socio-demographic variable			
Area of Residence			
Urban (R.C)			
Rural	0.63	0.00**	0.48-0.82
Age			
15-24 (R.C)			
25-34	3.79	0.00**	2.62-5.49
35-44	9.89	0.00**	6.75-14.48
45+	10.20	0.00**	6.57-15.86
Level of Education			
None and incomplete education (R.C)			
Primary	1.16	0.59	0.68-1.99
Secondary	1.29	0.04**	1.01-1.66
Tertiary	1.55	0.02**	1.06-2.26
Wealth Index			
Poorer & Poorest (R.C)			
Middle	1.34	0.04**	1.01-1.78
Richer & Richest	1.65	0.00**	1.26-2.17
Province			
Western Cape (R.C)			
Eastern Cape	0.45	0.00**	0.27-0.78
Northern Cape	0.37	0.00**	0.22-0.62
Free State	0.38	0.00**	0.22-0.67
KwaZulu-Natal	0.34	0.00**	0.20-0.59
North West	0.54	0.03**	0.31-0.94
Gauteng	0.25	0.00**	0.14-0.44
Mpumalanga	0.42	0.00**	0.25-0.72
Limpopo	0.37	0.00**	0.21-0.64
Racial group			
Black/African (R.C)			
Coloured	1.03	0.91	0.64-1.66
Other (White, Indian/Asian and other groups)	1.63	0.13	0.87-3.07
Sex of household head			
Male (R.C)			

Female	0.91	0.41	0.73-1.13
Health/risk factors			
Sexual partners in the last 12 months (including spouse)			
0 (R.C)			
1	1.01	0.95	0.70-1.45
2+	0.72	0.28	0.39-1.32
Frequency of cigarette smoking			
Non-smoker (R.C)			
Everyday	1	1	0.63-1.60
Some days	0.72	0.45	0.31-1.68
Current contraceptive use			
Not using (R.C)			
Other modern methods	1.31	0.03**	1.02-1.69
Injections	1.20	0.18	0.92-1.56
Health Insurance			
Does not have health insurance (R.C)			
Has health insurance	1.89	0.00**	1.35-2.64

*RC = Reference Category, **p < 0.05 represents significant results at 95% level of confidence, Adjusted Odds Ratio = AOR*

In terms of IPV, the results show that women that experienced IPV were significantly more likely to undergo to undergo CCS compared to women that did not experience IPV (AOR: 1.46; p<0.05; CI: 1.14-1.86). By area of residence, women from rural areas were significantly less likely to undergo CCS compared to women from urban areas (AOR: 0.63; p<0.05; CI: 0.48-0.82). By age, women aged between 25-34 years were significantly more likely to undergo CCS compared to women aged 15-24 years (AOR: 3.79; p<0.05; CI: 2.62-5.49). Women aged between 35-44 years old were significantly more likely to undergo CCS compared to women aged 15-24 years (AOR: 9.89; p<0.05; CI: 6.75-14.48). Women aged 45 and older were significantly more likely to undergo CCS compared to women aged 15-24 years (AOR: 10.20; p<0.05; CI: 6.57-15.86).

By level of education, women with secondary education were significantly more likely to undergo CCS compared to women with no and incomplete education (AOR: 1.29; p<0.05; CI: 1.01-1.66). Conversely, women with tertiary education were significantly more likely to undergo CCS compared to women with no and incomplete education (AOR: 1.55; p<0.05; CI: 1.06-2.26). In terms of wealth index, women that fell in the middle wealth quantile were more likely to undergo CCS compared to women that fell in the poorer and poorest wealth quantile

(AOR: 1.34; p<0.05; CI: 1.01-1.78). Conversely, women that fell in the richer and richest wealth quantile were significantly more likely to undergo CCS compared to women that fell in the poorer and poorest wealth quantile (AOR: 1.65; p<0.05; CI: 1.26-2.17).

In terms of province, women from the Eastern Cape were significantly less likely to undergo CCS compared to women from the Western Cape (AOR: 0.45; p<0.05; CI: 0.27-0.78). Women from the Northern Cape were significantly less likely to undergo CCS compared to women from the Western Cape (AOR: 0.37; p<0.05; CI: 0.22-0.62). Women from Free State were significantly less likely to undergo CCS compared to women from the Western Cape (AOR: 0.38; p<0.05; CI: 0.22-0.67). Women from KwaZulu-Natl were significantly less likely to undergo CCS compared to women from the Western Cape (AOR: 0.34; p<0.05; CI: 0.20-0.59). Women from the North West were significantly less likely to undergo CCS compared to women from the Western Cape (AOR: 0.54; p<0.05; CI: 0.31-0.94). Conversely, women from Gauteng were significantly less likely to undergo CCS compared to women from the Western Cape (AOR: 0.25; p<0.05; CI: 0.14-0.44). Women from Mpumalanga were significantly less likely to undergo CCS compared to women from the Western Cape (AOR: 0.42; p<0.05; CI: 0.25-0.72). Women from Limpopo were significantly less likely to undergo CCS compared to women from the Western Cape (AOR: 0.37; p<0.05; CI: 0.21-0.64).

By contraceptive use, women that reported using other methods of contraceptive were significantly more likely to undergo CCS compared to women that reported not using contraceptives (AOR: 1.31; p<0.05; CI: 1.02-1.69). In terms of health insurance, women with health insurance were significantly more likely to undergo CCS compared to women without health insurance (AOR: 1.89; p<0.05; CI: 1.35-2.64).

4.3. Testing the hypothesis

The hypotheses for this study were tested using the unadjusted and adjusted binary logistic regression models:

H_0 (Null): There is no relationship between IPV and CCS in South Africa among women aged 15 and older.

H_1(Alternative): There is a relationship between IPV and CCS in South Africa among women aged 15 and older.

Assumption: Significance level: α= 0.05

Upon completing analysis, the study rejected the null hypothesis (H_0) in favour of the alternative (H_1) that there is a relationship between IPV and CCS in South Africa among women aged 15 and older.

CHAPTER FIVE: DISCUSSION, IMPLICATIONS, RECOMMENDATIONS AND CONCLUSION

5.1. Introduction

The World Health Organization (WHO) (2021) posits that cervical cancer is the fourth most prevalent cancer among women in the world. In SSA, the burden of the disease is on the rise – with over 74,000 new cases and an estimated 50,000 deaths annually further exacerbated by the prevalence of HIV infections in the region (Mboumba, Bouassa et al., 2017). In South Africa, it is the second most prevalent cancer among women and the leading cause of cancer-related fatality with 5,406 deaths recorded in 2015 (ANCON Medical, 2016; Fitzmaurice, 2018). In response to the prevalence of cervical cancer and the related fatalities, the study explored the potential relationship between IPV and CCS among women aged 15 and older in South Africa as a contributing factor to the issue. The following section discusses the study's objectives in relation to the literature, theoretical framework and concludes with a brief discussion on the implications of the findings.

5.2. Levels of CCS among women aged 15 and older in South Africa

The first objective of the study was to illustrate the national level of CCS among women aged 15 and older in South Africa. As mentioned earlier in the study, while the WHO recommends that women aged 30 and above undergo CCS every 10-years, the Cancer Association of South Africa recommends that women aged 25 and older undergo CCS in South Africa in 3-year intervals (WHO, 2021; Ba et al., 2021). The rationale herein is to detect abnormal cells in the cervix – that could develop into cervical cancer – earlier, treat them and improve women's odds of survival should they contract the disease. According to a study conducted by Mabaso and colleagues (2021), adolescents in South Africa are at increased risk contracting HIV compared other age groups. Hence, women as young as 15 were included in the study. As illustrated in Figure 4, the findings revealed that only 36% of women in the study underwent CCS.

The findings corresponded with the findings of other authors that identified low rates of CCS in SSA countries (Ba et al., 2021). Conversely, South Africa's low levels of CCS among women aged 15 and older corresponded with the country's high cervical cancer incidence rates,

which range from 22.8/100,000 women to 27/100,000 (Western Cape Government, 2021). This is 42% higher than the global average cervical cancer incidence rate 15.8/100,000 women (Western Cape Government, 2021). These low levels of CCS among women aged 15 and older in South Africa could explain the country's 5,406 cervical cancer-related deaths recorded in 2015 (ANCON Medical, 2016; Fitzmaurice, 2018). They also explain the country's annual cervical cancer fatality rate of 55% (National Department of Health, 2017).

By province, the study showed that women from the Western Cape have the highest levels of CCS in South Africa (66.38%) (See Table 4.1). Attributing to the province's high levels of CCS is the province's CCS and HPV vaccination campaigns that spread cervical cancer awareness among women (Western Cape Government, 2021). The North West province scored second highest in CCS, with 42.19% of women in the province undergoing CCS. Attributing to this relatively low level of CCS is the province's predominantly rural nature, which as some studies have revealed makes it difficult for women to access health services such as CCS (Ndejjo et al., 2016; Theaker, 2020). The same applies to the Eastern Cape, Free State, Mpumalanga, and Limpopo – all of which registered low levels of CCS due to their rural nature (See Table 4.1). Similarly, despite having the majority of their populations residing in urban areas, the low levels of CCS in Gauteng, KwaZulu-Natal, and the Northern Cape suggest the lack of cervical cancer awareness (Stats SA, 2012; Erumeda et al., 2019).

5.3. The association between IPV and CCS in South Africa among women aged 15 and older

The second objective of the study was to examine the association between IPV and CCS among women aged 15 and older while controlling for other variables. To this end, the study's bivariate, unadjusted-, and adjusted- binary regression results revealed a significant association between both forms of IPV and CCS; with the population group of interest resulting in H_1 ($p>0.05$). Conversely, the unadjusted and adjusted binary regression results showed that women that experienced IPV were more likely to undergo CCS than women that did not experience IPV (UOR: 1.33 and AOR: 1.46). Driving this result is the risk that women who experience IPV have at contracting cervical cancer, particularly among women that experience sexual violence from their husbands/partners (Levinson et al., 2016). This is because that experience IPV are susceptible to cervical cancer, precipitated by their heightened risk for HPV (Bagwell-Gray & Ramaswamy, 2022).

Thus, their need to undergo CCS. However, a study conducted by Gordon (2016), had a contradictory finding. The study found that female victims of IPV were significantly less likely to seek medical assistance in fear of further violence by their partners or abandonment illustrating negative implications on health-seeking behavior. This would act as a barrier to their health seeking behavior as they would be left to fend themselves in the absence of a bread winner. Moreover, barring women from seeking medical assistance following their abuse is shame. Abuse is viewed as shameful and humiliating in its very nature (Engel, 2018). The victims often feel dehumanized, helpless and at the mercy of their perpetrator and as such do not have the will to seek medical assistance such as undergoing CCS to ensure that they are not at risk of contracting STIs and cervical cancer.

With regards to area of residence, Table 5 and 6 found a significant association with CCS. Herein, the study found that women from rural areas were significantly less likely to undergo CCS compared to women from urban areas (UOR: 0.63 and AOR: 0.63). This is because women that reside in rural areas are more likely to experience logistical issues with accessing health services compared to women that reside in urban areas. This corresponded with findings from the study conducted by Ndejjo and colleagues (2016) which found that women from rural Uganda had a CCS incidence rate of only 4.3% of 900 women that reported ever undergoing CCS. Similarly, the findings corresponded with the findings of several authors that identified similar associations (McDonald et al., 2016; NCIN, 2008). Driving this deferential in health outcomes for women that reside in rural areas is a deprivation gap that is fuelled by the lower uptake of CCS in deprived areas.

In terms of age, Table 5 and 6 found a significant association with CCS. Herein, the study found that the likelihood of women undergoing CCS increase with age with women aged 45 and older being most likely to undergo CCS than younger women (UOR: 10.81 and AOR: 10.20). This is due to a compromised immune system because of old age. This corresponded with studies which found that the prevalence of CCS in was high among women aged 45 and older (Akokuwebe et al., 2021).

In terms of education, the study found that the likelihood of women undergoing CCS increased with higher levels of education. For example, the study found that women with secondary

education and higher were more likely to undergo CCS compared to women no and incomplete education. This corresponded with a study conducted by Abu and colleagues (2020) in Addis Ababa which found that women with degrees had higher odds of undergoing CCS compared to women that did not have degrees. Similarly, in this current study, women with tertiary education had greater odds of undergoing CCS compared to women with no education and incomplete education (See Table 4.2 & 4.3).

Conversely, this current study found that women with tertiary education had great odds of undergoing CCS compared to women with no education and those that did not complete their education (UOR: 2.30 and AOR: 1.55). This corresponded with a study conducted by Murfin and colleagues (2019) – which found that women that had high school or college education were associated with CCS and HPV vaccination to prevent cervical cancer. Thus, cementing the findings. In South Africa, one of the most unequal countries in the world, disparities in educational attainment are widespread – with many youths failing to complete their education and pursue tertiary education because of financial exclusion (Maluleke, 2017). This could potentially contribute to women not being able to complete their primary-tertiary education. Thus, making them less likely to undergo CCS and increasing their risk of contracting cervical cancer.

In terms of wealth index, the binary regression found that it was significantly associated with CCS. The study found that women in the middle, and richer and richest wealth quantile were more likely to undergo CCS compared to women in the poorer and poorest wealth quantile. This is because women that fall under the middle, richer and richest wealth quantile have the financial capacity to undergo CCS compared to women in the poorer and poorest wealth quantile which is largely dependent on the provision of health services from the government. This corresponded with a study conducted by McKinnon and colleagues (2020) which found that the variation of CCS uptake is disproportionately distributed among poor women globally and so is the burden of cervical cancer. In support, a study conducted in Botswana assessing factors associated with and socioeconomic inequalities in breast and cervical cancer found that women in the poorest and poor wealth quantiles were less likely to undergo CCS compared to women in the richest wealth quantile (Keetile et al., 2021). Thus, highlighting the impact that wealth status has on the ability of women to undergo CCS.

In terms of race/ethnicity, the study found black women were significantly less likely to undergo CCS compared to coloured and women from other ethnic groups as illustrated in table 5. This corresponded with findings from a study conducted by Musselwhite and colleagues (2016) which found that racial/ethnic disparities in CCS exist and continue to persist among minority groups in both high-income and low-resource countries. South Africa's inequality explains these racial disparities more especially among black women many of whom have poor access to health services (Matsolo, 2019). Thus, are disproportionately underrepresented in CCS.

With regards to the number of sexual partners in the last 12-months, the study's unadjusted (See Table 4.2) found that women with one sexual partner were less likely to undergo CCS compared to women that reported having no sexual partners in the last 12-months (UOR: 0.92). This contradicted the findings of Fentie and colleagues (2020), who found that women that had 2 or more sexual partners were more likely to undergo CCS compared to women that had 0 or 1 sexual partner. Moreover, they were likely to test positive for cervical cancer. Similar findings were revealed in other studies (Smith et al., 2011; Alfaro et al., 2015 & Zhang et al., 2020).

In terms of health insurance, women with health insurance had greater odds of undergoing CCS compared to women without health insurance (UOR: 3.67 & AOR: 1.89). This corresponded with a study conducted by Akinyemiju and colleagues (2015) in South Africa which found that women without health insurance were less likely to undergo CCS compared to women with health insurance. This is because women with health insurance have better access to healthcare which entails CCS when needed should the health insurance cover such medical tests.

Similarly, a study conducted by Akokuwebe and colleagues (2021) on the determinants of CCS among women of reproductive age found that the proportion of women that underwent CCS was significantly high among women with health insurance. This corresponded with a study conducted by Akinyemiju and colleagues (2021) in South Africa which found that using the world health survey found that women without health insurance were less likely to undergo CCS compared to women with health insurance.

With regards to the frequency of smoking cigarettes, the study identified that women that smoked cigarettes everyday were more likely to undergo CCS compared to female non-smokers (See Table 4.2). This corresponded with studies that found that smokers were more likely to uptake CCS compared to non-smokers, as they are susceptible to developing cervical cancer (Eng et al., 2021; Utami et al., 2021). This is because cigarettes contain over 1000 chemicals; 70 of these are associated with several types of cancer, including cervical cancer (Tikhonovich, 2020). These chemicals damage the genetic makeup of cervix cells and can be attributed to the progression of cervical cancer.

Hence, an association between women that smoke cigarettes and CCS was found. Conversely, women that reported smoking cigarettes on some days are less likely to undergo CCS compared to non-smokers. This could be due to women that smoke on some days not feeling pain or discomfort that would encourage them to seek health services at health facilities. In terms of contraceptive use, the study found a significant association with CCS particularly among women that used other methods of contraception who were more likely to undergo CCS compared to women that did not use contraceptives (UOR: 1.31 & AOR: 1.31). This is possibly due to the risk that women that use contraceptives have in contracting cervical cancer by altering the susceptibility of cervical cancer cells and increasing the incidence of HPV (National Cancer Institute, 2018; Iversen et al., 2021).

5.4. Applicability of theoretical framework

The study was guided by the health-seeking behaviour model. The model postulates that HSBM is influenced by a person's perception of a threat posed by a health problem and the value associated with actions aimed at reducing the threat. The antecedents employed in the model were social (age, sex, education, province, and area of residence), cultural (ethnicity), economic factors (wealth index) and issues related to health service (health insurance). In terms of ethnicity, the framework was useful in predicting how the ethnicity of South African women is associated with their health seeking behaviour. This study found that black women were less likely to undergo CCS compared to coloured and other racial groups i.e., White, Indian/Asian, and other groups in both the unadjusted and adjusted regression models (See Tables 4.2 and 4.3). This helped the study gauge how women from different racial groups perceive CCS. With regards to economic factors, wealth index was used as an economic factor of health seeking

behaviour and revealed that the likelihood of CCS among women increases higher levels of wealth. This correlated with the findings of other studies (Keetile et al., 2021; Soneji & Fukui, 2013).

5.5. Implications of findings

5.5.1. Policy

These findings show that while South Africa has put measures in place to curb the prevalence of cervical cancer under the national CCPCP in line with the WHO's cervical cancer recommendations, which suggest that countries screen women aged 30 years and older for the disease every 5-10 years (WHO, 2022). South Africa currently implements the upper end of the recommendation which is insufficiently capable detecting the disease's progression among women who may contract the disease during the interval.

Thus, there is a need to redesign South Africa's cervical cancer response policy in a manner that is reflective of its unique characteristics and circumstances embedded in the array of the socio-demographic variables that were examined in this study for better policy development. Current policy under the CCPCP leaves women below the age of 30 years susceptible to the disease as they are not catered for, despite emerging as a vulnerable group due to risky sexual behaviour (The Citizen, 2021). Hence, organizations – such as the Cancer Association of South Africa –recommend that South African women screen for cervical cancer in 3-year intervals, starting at age 25 due to the prevalence of the disease driven by risky sexual behaviour and high HIV infection rates (WHO, 2021; Ba et al., 2021).

Conversely, the lengthy CCS interval could explain the low levels of CCS (36%) in South Africa and the disease's prevalence in the country as indicated by the study. Thus, illustrating the need to alter South Africa's current measures to curb the disease and improve the country's cervical cancer response. This can be achieved through further research on predictors that inform CCS among women in South Africa and facilitate the development of evidence-based policies with effective implementation plans. In terms of provinces, the results in the study's bivariate analysis imply that the Western Cape's implementation of the CCPCP is the best in the country; with only 67% of women in the province undergoing CCS compared to 42% in

the North West which performed second best in the country. The gap is staggering and shows severe differentials in CCS levels across the country which are below average except for the Western Cape.

Ultimately, the country's disparities in levels of CCS highlight overall poor CCS implementation plans which need to be evaluated and reimplemented efficiently to improve the uptake of CCS. In terms of health insurance, women with health insurance are more likely to undergo CCS compared to women without (See Table 4.2 & 4.3) – illustrating the role that healthcare plays in the prevention of the disease through screening and subsequent treatment for the sick. This has implications for South Africa's pending National Health Insurance, which seeks to provide everyone in the country with quality and efficient healthcare services which would subsequently see more women undergo CCS (South African Government, 2020).

Last but importantly, the study shows that IPV is associated with CCS. This is because of the susceptibility that women that experience IPV have in contracting cervical cancer compared to women that do not experience it. For example, some studies have shown that female victims of intimate partner violence are significantly less likely to seek medical assistance in fear of further violence by their partners or abandonment illustrating negative implications on health-seeking behavior (Gordon, 2016). This hampers their psychological, sexual, and reproductive health. Thus, making them susceptible to sexual transmitted diseases such HPV, a precursor of cervical cancer (National Cancer Institute, 2017). This finding provides a broadened lens of which to combat cervical cancer, inform better and improved policy to enhance CCS. This will safeguard the health of women by putting measures in place to curb the double-burden of IPV and increased cervical cancer susceptibility as a result thereof (Gordon, 2016; National Cancer Institute, 2017).

5.5.2. Programme recommendations

Having found that there is a statistically significant association between IPV and CCS among women aged 15 and older in South Africa, this report provides several recommendations to improve the country levels of CCS and programming as informed by the study's findings. It is evident that CCS campaigns and policies such as the CCPCP should be targeted at black women as they are less likely to undergo CCS (See Table 4.2 & 4.3). However, interventions

should not neglect other ethnic groups such as coloureds, white, Indian/Asian among others as this will impair the overall levels of CCS in South Africa. In terms of wealth, women within the middle, richer and richest wealth quantiles are more likely to undergo CCS compared to women in the poorer and poorest wealth quantile (See Table 4.2 & 4.3).

Thus, the focus should be placed on women that fall within the poorer and poorest wealth quantiles to allow them to undergo CCS and reduce their susceptibility to the disease. However, to ensure an inclusive approach, focus on CCS policy and campaigns should permeate all social classes. In terms of age, although the uptake of CCS is higher among women aged 25 and older, more effort needs to be placed among younger women in schools to educate them on the dangers of risky sexual behaviour, HPV infection, and subsequent cervical cancer contraction. This is important as South Africa is currently experiencing a surge of teenage pregnancies and thousands of HIV infections every week among the youth which could see an increasing number of young women become more susceptible to HPV infections and see them develop cervical cancer (Mabaso et al., 2021).

Considering the above-mentioned, South Africa should not conform to the WHO recommendation of screening women for cervical cancer from the age of 30 years and older every 5-10 years in its CCPCP. Rather, it should tailor its CCS approach according to its unique characteristics as adolescents in South Africa are at increased risk of HIV infections compared to other groups and as such are susceptible to contracting cervical cancer (Mabaso et al., 2021; Chambuso et al., 2017).

In terms of area of residence, the South African government should develop better health infrastructure and/or put better measures in place to facilitate CCS in rural areas as they are likely to undergo screening compared to women residing in urban areas (UOR: 0.63 & AOR: 0.63). This could include frequent visitations by trained teams to rural populations about cervical cancer, how it is transmitted including risk factors, and why it is important to screen for the disease. Ideally, these teams should be able to administer pap smear tests to interested women. It is also important to educate men on the role they play in spreading HPV to their partners or wives when they cheat with other women (Anderson-Niles, 2010; American Cancer Society, 2019). While the disease does not affect men they act as a vector for the disease. Thus, putting their partners/wives at risk of developing cervical cancer through sexual transmission.

Health insurance was significantly associated with CCS compared to women without health insurance highlighting the importance of health cover in accessing health services such as a pap smear test (See Table 4.2 & 4.3). To this end, the South African government should fast-track the implementation of the UHC to enable women with financial difficulties to undergo CCS in line with SDG 3.8 to improve female access to healthcare. These recommendations contribute to SDG 3 which advocates for good health and well-being. More specifically, the recommendations contribute to SDG 3.4 which seeks to curb the prevalence of non-communicable diseases such as cervical cancer to improve the overall well-being of women. Moreover, given that cervical cancer is a sexual disease that is caused by the sexual infection of HPV types 16 and 18, the recommendations align with SDG 3.7 on sexual and reproductive health.

5.5.3. Suggestions for further research

Further research should include a qualitative component to ascertain the attitudes and perceptions of South African women aged 15 and older probing into the low uptake of CCS. This is because qualitative research allows respondents to gather the narrative behind the uptake of CCS by documenting their views on what could have influenced them to undergo or not undergo CCS. The study would involve selecting women aged 15 years and older in South Africa and conducting in-depth interviews with them on the uptake of CCS. The narrative of the study would provide a clear picture on the events leadings up to CCS and provide meaningful insights on the drivers of CCS in South Africa qualitatively for added value. It is also suggested that researchers probe into potential associations with other variables and CCS. For example, while this study found no association between number of sexual partners and CCS in different circumstances other studies might find an association thus there is a need to probe further.

5.6. Conclusion

The report investigated the quantitative relationship between IPV and CCS among women aged 15 and older in South Africa. The findings indicated that of the women that experienced IPV only 39% underwent CCS. The relatively low uptake of CCS among women aged 15 and older

in South Africa implies that there is a need for greater access to CCS for affected women on a regular basis external to the currently available 10-year screening interval for women aged 30 and older as provisioned by the government under the CCPCP. Especially among women that have experienced IPV. Nonetheless, the findings of this current report were synonymous with the findings of a study conducted in the United States which found that of the women that survived IPV only 23% underwent CCS (Bagwell-Gray & Ramaswamy, 2022).

However, as indicated earlier in the report the afore study was solely limited to descriptive analysis and used a small pilot sample. To contribute further to the literature, this current study went beyond descriptive analysis and used a bigger sample (n=1934) to conduct analysis at both bivariate and multivariate levels. The findings indicated that IPV is statistically associated with CCS. Herein, it revealed that women who experience IPV in South Africa are more likely to undergo CCS compared to women that do not experience IPV (UOR: 1.33 and AOR: 1.46). This is because women who experience IPV are at greater risk of contracting cervical cancer. Thus, their need to undergo CCS.

Based on the findings, to reduce the burden of cervical cancer, measures to address IPV should be implemented as it is a driver of cervical cancer in the country. These findings imply that reducing the incidence of cervical cancer does not only entail increasing CCS rates but also addressing the prevalence of IPV as it increases the risk that women have of contracting cervical cancer. Hence the study found that women who experience IPV in South Africa are more likely to undergo CCS compared to women that do not.

The other variables which were controlled for in the study such as education showed that the likelihood of South African women undergoing CCS increases with higher levels of education as illustrated in tables 4.2 and 4.3. This suggests that women with higher education levels are more conscious of their health. Thus, they are inclined to uptake CCS as a preventative measure of cervical cancer. This is synonymous with the findings of other studies, particularly regarding health-seeking behaviour (Murfin et al., 2019; Linus et al., 2021). In terms of race, black women were found to be less likely to undergo CCS compared to other racial groups and as such, CCS campaigns and policies such as the CCPCP should be targeted at black women to increase their likelihood of undergoing CCS without neglecting other racial groups. Similarly,

the findings are in support of other studies which revealed black people are less likely to undergo CCS compared to their white counterparts (Public Health England, 2017).

Analysis of health/risk factors revealed that health insurance and current contraceptive use were significantly associated with CCS. Conversely, the frequency of smoking cigarettes was significantly associated with CCS in the unadjusted regression model (See Table 4.2). This is due to the debilitating effects of cigarette smoking which compromises the immune system making women susceptible to cervical cancer, hence their need to undergo CCS. Additionally, women with health insurance were found to be more likely to undergo CCS compared to women without health insurance.

This is because women with health insurance are more likely to be covered for pap smear tests to detect cervical cancer compared to women without health insurance. These findings provide insights on modifiable factors that influence CCS among women aged 15 and older in South Africa and can be used to curb the prevalence of cervical cancer particularly the role of IPV. It is hoped that by addressing IPV among a plethora of factors identified in this study, the prevalence of cervical cancer will decline in the country while simultaneously increasing the uptake of CCS among women in South Africa.

Bibliography

Abu, S., Woldehanna, B., Nida, E., Tilahun, A., Gebremariam, M., & Sisay, M. (2020). The role of health education on cervical cancer screening uptake at selected health centers in Addis Ababa. *PLOS ONE, 15*(10), e0239580. https://doi.org/10.1371/journal.pone.0239580

Akokuwebe, M., Idemudia, E., Lekulo, A., & Motlogeloa, O. (2021). Determinants and levels of cervical Cancer screening uptake among women of reproductive age in South Africa: evidence from South Africa Demographic and health survey data, 2016. *BMC Public Health*, *21*(1). doi: 10.1186/s12889-021-12020-z

Arbyn, M., Weiderpass, E., Bruni, L., de Sanjosé, S., Saraiya, M., Ferlay, J., & Bray, F. (2020). Estimates of incidence and mortality of cervical cancer in 2018: a worldwide analysis. *The Lancet Global Health*, *8*(2), e191-e203. https://doi.org/10.1016/s2214-109x(19)30482-6

Akinyemiju, T., McDonald, J., & Lantz, P. (2015). Health care access dimensions and cervical cancer screening in South Africa: analysis of the world health survey. *BMC Public Health*, *15*(1). https://doi.org/10.1186/s12889-015-1686-5

Alfaro, K., Gage, J., Rosenbaum, A., Ditzian, L., Maza, M., & Scarinci, I. et al. (2015). Factors affecting attendance to cervical cancer screening among women in the Paracentral Region of El Salvador: a nested study within the CAPE HPV screening program. *BMC Public Health*, *15*(1). https://doi.org/10.1186/s12889-015-2360-7

American Cancer Society. (2019). *The burden*. American Cancer Society. Retrieved from https://canceratlas.cancer.org/wp-content/uploads/2019/09/CA3_SubSaharanAfrica.pdf

Andersson, N., Ho-Foster, A., Mitchell, S., Scheepers, E., & Goldstein, S. (2007). Risk factors for domestic physical violence: national cross-sectional household surveys in eight southern African countries. *BMC Women's Health*, *7*(1). https://doi.org/10.1186/1472-6874-7-11

Anderson-Niles, A. (2010). *Cervical Cancer Linked To Multiple Sex Partners*. Retrieved 27 November 2021, from https://urbanbellemag.com/2010/03/cervical-cancer-linked-to-multiple-sex-partners/.

ANCON Medical. (2016). *Cancer burden in South Africa - ANCON Medical Inc.*. ANCON Medical Inc. Retrieved 27 May 2021, from https://anconmedical.com/cancer-burden-in-south-africa/#:~:text=In%20South%20Africa%2C%20breast%20cancer,5%2C406%20female%20deaths%20last%20year.

American Cancer Society. (2019). *Cervical Cancer Causes, Risk Factors, and Prevention*. Retrieved 12 July 2021, from https://www.cancer.org/content/dam/CRC/PDF/Public/8600.00.pdf.

Arrossi, S., Ramos, S., Paolino, M., & Sankaranarayanan, R. (2008). Social inequality in Pap smear coverage: identifying under-users of cervical cancer screening in Argentina. *Reproductive Health Matters*, *16*(32), 50-58. https://doi.org/10.1016/s0968-8080(08)32410-0

Bagwell-Gray, M., & Ramaswamy, M. (2022). Cervical Cancer Screening and Prevention among Survivors of Intimate Partner Violence. *Health &Amp; Social Work*, *47*(2), 102-112. https://doi.org/10.1093/hsw/hlac009

Barré S, editor. *Etat des lieux et recommandations pour le dépistage du cancer du col de l'utérus en france*. Haute Autorité de Santé; Retrieved from http://www.has-sante.fr/portail/upload/docs/application/pdf/2010-11/synthese_recommandations_depistage_cancer_du_col_de_luterus.pdf.

Bongaerts, T., Ridder, M., Vermeer-Mens, J., Plukkel, J., Numans, M., & Büchner, F. (2021). Cervical Cancer Screening Among Marginalized Women: A Cross-Sectional Intervention Study. *International Journal Of Women's Health*, *Volume 13*, 549-556. doi: 10.2147/ijwh.s302002

Ba, D., Ssentongo, P., Musa, J., Agbese, E., Diakite, B., & Traore, C. et al. (2021). Prevalence and determinants of cervical cancer screening in five sub-Saharan African countries: A

population-based study. *Cancer Epidemiology*, *72*, 101930. https://doi.org/10.1016/j.canep.2021.101930

Barry, J., & Breen, N. (2005). The importance of place of residence in predicting late-stage diagnosis of breast or cervical cancer. *Health & Place*, *11*(1), 15-29. https://doi.org/10.1016/j.healthplace.2003.12.002

Business Tech. (2019). *More than half of South Africans are living on less than R41 a day*. Businesstech.co.za. Retrieved 31 May 2021, from https://businesstech.co.za/news/lifestyle/345026/more-than-half-of-south-africans-are-living-on-less-than-r41-a-day/#:~:text=While%20these%20statistics%20are%20across%20the%20entire%20South,it%20costs%20to%20live%20in%20South%20Africa%2C%20

Barrow, A., Onikan, A., Nzoputam, C., & Ekholuenetale, M. (2020). Prevalence and determinants of cervical cancer awareness among women of reproductive age: evidence from Benin and Zimbabwe population-based data. *Applied Cancer Research*, *40*(1). https://doi.org/10.1186/s41241-020-00092-z

CANSA. (2021). *Women & Cancer | CANSA - The Cancer Association of South Africa*. CANSA - The Cancer Association of South Africa. Retrieved 31 May 2021, from https://cansa.org.za/womens-health/.

Chatzistamatiou, K., Katsamagas, T., Zafrakas, M., Zachou, K., Orologa, A., & Fitsiou, F. et al. (2013). Smoking and genital human papilloma virus infection in women attending cervical cancer screening in Greece. *World Journal Of Obstetrics And Gynaecology 10.5317/wjog.v2.i3.53*

Chatzistamatiou K, Katsamagas T, Zafrakas M, Zachou K, Orologa A, Fitsiou F, Theodoridis T, Konstantinidis T, Konstantinidis TC, Agorastos T. Smoking and genital human papilloma virus infection in women attending cervical cancer screening in Greece. World J Obstet Gynecol 2013; 2(3): 53-61 [DOI: 10.5317/wjog.v2.i3.53]

Chambuso, R., Shadrack, S., Lidenge, S., Mwakibete, N., & Medeiros, R. (2017). Influence of HIV/AIDS on Cervical Cancer: A Retrospective Study From Tanzania. *Journal Of Global Oncology*, *3*(1), 72-78. https://doi.org/10.1200/jgo.2015.002964

Claeys, P., Gonzalez, C., Gonzalez, M., Page, H., Bello, R., & Temmerman, M. (2002). Determinants of cervical cancer screening in a poor area: results of a population-based survey in Rivas, Nicaragua. *Tropical Medicine And International Health*, *7*(11), 935-941. https://doi.org/10.1046/j.1365-3156.2002.00953.x

Cohen, M., & Mbatha, A. (2019). *Bloomberg - Are you a robot?*. Bloomberg.com. Retrieved 2 June 2021, from https://www.bloomberg.com/news/articles/2019-09-05/south-africa-s-ramaphosa-pledges-to-tackle-gender-based-violence.

Cooper, D., Hoffman, M., Carrara, H., Rosenberg, L., Kelly, J., & Stander, I. et al. (2007). Determinants of sexual activity and its relation to cervical cancer risk among South African Women. *BMC Public Health*, *7*(1). https://doi.org/10.1186/1471-2458-7-341

Clark, M. (2007). *Population and community health nursing*. Pearson.

Chinn, P., Kramer, M., Sitzman, K., & Chinn, P. (1999). *Knowledge development in nursing* (5th ed.). Mosby Elsevier.

Denny, L. (2012). *Cervical cancer and HPV Associated disease in HIV positive women*. Presentation, University of Cape Town. Retrived 27 May, from https://sahivsoc.org/Files/Lynette%20Denny%20-%20Epidemiology%20and%20detection%20of%20cervial%20canceer%20in%20HIV%20(27%20Nov,%2015h30).pdf

de Sanjose, S., & Tsu, V. (2019). Prevention of cervical and breast cancer mortality in low- and middle-income countries: a window of opportunity. *Int J Womens Health* .. https://doi.org/10.2147/IJWH.S197115

Eng, V., David, S., Li, S., Ally, M., Stefanick, M., & Tang, J. (2021). The association between cigarette smoking, cancer screening, and cancer stage: a prospective study of the women's health initiative observational cohort. *BMJ Open.* http://dx.doi.org/10.1136/bmjopen-2020-037945

Engel, B. (2018). *Why so many women don't report sexual harassment and Assault*. Psych Central. Retrieved March 13, 2022, from https://psychcentral.com/blog/why-so-many-women-dont-report-sexual-harassment-and-assault

Erumeda, N., Couper, I., & Thomas, L. (2019). A self-assessment study of procedural skills of doctors in peri-urban district hospitals of Gauteng, South Africa. *African Journal Of Primary Health Care & Family Medicine*, *11*(1). https://doi.org/10.4102/phcfm.v11i1.1975

Fitzmaurice, C. (2018). Global, regional, and national cancer incidence, mortality, years of life lost, years lived with disability, and disability-adjusted life-years for 29 cancer groups, 2006 to 2016: A systematic analysis for the Global Burden of Disease study. *Journal Of Clinical Oncology*, *36*(15_suppl), 1568-1568. https://doi.org/10.1200/jco.2018.36.15_suppl.1568

Finocchario-Kessler, S., Wexler, C., Maloba, M., Mabachi, N., Ndikum-Moffor, F., & Bukusi, E. (2016). Cervical cancer prevention and treatment research in Africa: a systematic review from a public health perspective. *BMC Women's Health*, *16*(1). https://doi.org/10.1186/s12905-016-0306-6

Frade, S., & De Wet-Billings, N. (2019). The relationship between women's experience of intimate partner violence and other socio-demographic factors, and under-5 children's health in South Africa. *PLOS ONE*, *14*(11), e0225412. https://doi.org/10.1371/journal.pone.0225412

Franks, P., Clancy, C., Gold, M., & Nutting, P. (1993). Health insurance and subjective health status: data from the 1987 National Medical Expenditure survey. *American Journal Of Public Health*, *83*(9), 1295-1299. https://doi.org/10.2105/ajph.83.9.1295

Fentie, A., Tadesse, T., & Gebretekle, G. (2020). Factors affecting cervical cancer screening uptake, visual inspection with acetic acid positivity and its predictors among women attending

cervical cancer screening service in Addis Ababa, Ethiopia. *BMC Women's Health*, *20*(1). https://doi.org/10.1186/s12905-020-01008-3

García-Moreno, C., & Stöckl, H. (2013). Violence against Women, Its Prevalence and Health Consequences. *Key Issues In Mental Health*, 1-11. https://doi.org/10.1159/000343777

Gordon, C. (2016). Intimate partner violence is everyone's problem, but how should we approach it in a clinical setting?. *South African Medical Journal*, *106*(10), 962. doi: 10.7196/samj.2016.v106i10.11408

Gakidou, E., Nordhagen, S., & Obermeyer, Z. (2008). Coverage of Cervical Cancer Screening in 57 Countries: Low Average Levels and Large Inequalities. *Plos Medicine*, *5*(6), e132. https://doi.org/10.1371/journal.pmed.0050132

García-Moreno, C., Jansen, H., Ellsberg, M., Heise, L., & Watts, C. (2005). *WHO Multi-countr yStudy on Women's Health and Domestic Violence against Women* (p. World Health Organization). Geneva: W. Retrieved from https://www.who.int/reproductivehealth/publications/violence/24159358X/en/

Gass, J., Stein, D., Williams, D., & Seedat, S. (2010). Gender Differences in Risk for Intimate Partner Violence Among South African Adults. *Journal Of Interpersonal Violence*, *26*(14), 2764-2789. https://doi.org/10.1177/0886260510390960

Groves, A., Moodley, D., McNaughton-Reyes, L., Martin, S., Foshee, V., & Maman, S. (2014). Prevalence, Rates and Correlates of Intimate Partner Violence Among South African Women During Pregnancy and the Postpartum Period. *Maternal And Child Health Journal*, *19*(3), 487-495. https://doi.org/10.1007/s10995-014-1528-6

Harris, J. (2021). Primer on binary logistic regression. *Family Medicine And Community Health*, *9*(Suppl 1), e001290. https://doi.org/10.1136/fmch-2021-001290

Health Service Executive. (2019). Cervical cancer - Causes. Retrieved 11 March 2022, from https://www2.hse.ie/conditions/cervical-

cancer/causes/#:~:text=Causes%201%20HPV.%20HPV%20is%20the%20name%20for,risk%20factors.%20HPV%20infection%20is%20very%20common.%20

Hull, R., Mbele, M., Makhafola, T., Hicks, C., Wang, S., & Reis, R. et al. (2020). Cervical cancer in low and middle-income countries (Review). *Oncology Letters*, *20*(3), 2058-2074. https://doi.org/10.3892/ol.2020.11754

He, W., & Li, C. (2021). Recent global burden of cervical cancer incidence and mortality, predictors, and temporal trends. *Gynecologic Oncology*, *163*(3), 583-592. https://doi.org/10.1016/j.ygyno.2021.10.075

Huang, J., Deng, Y., Boakye, D., Tin, M., Lok, V., & Zhang, L. et al. (2021). Global distribution, risk factors, and recent trends for cervical cancer: A worldwide country-level analysis. *Gynecologic Oncology*, *164*(1), 85-92. doi: 10.1016/j.ygyno.2021.11.005

Hansen, B., Campbell, S., & Nygård, M. (2018). Long-term incidence trends of HPV-related cancers, and cases preventable by HPV vaccination: a registry-based study in Norway. *BMJ Open*, *8*(2), e019005. https://doi.org/10.1136/bmjopen-2017-019005

HPV Information Center. (2016). *M4. Preventative strategies - Cervical screening - Screening programme*. Hpvcentre.net. Retrieved 28 May 2021, from https://hpvcentre.net/parser.php?xml=M4_Cervical%20screening_Programme&iso=XFX&title=M4.%20Preventative%20strategies%20-%20Cervical%20screening%20-%20Screening%20programme.

Hadley, J., & Waidmann, T. (2006). Health Insurance and Health at Age 65: Implications for Medical Care Spending on New Medicare Beneficiaries. *Health Services Research*, *41*(2), 429-451. https://doi.org/10.1111/j.1475-6773.2005.00491.x

Heise, L., Ellsberg, M., & Gottemoeller, M. (1999). *Ending Violence Against Women*. Baltimore: John Hopkins University School of Public Health. Retrieved from https://vawnet.org/material/population-reports-ending-violence-against-women

Hleoheng, M. (2017). *Factors influencing intimate partner violence among women in Clermont: An exploratory study* (MA). University of KwaZulu-Natal.

Hindin, P., Btoush, R., Brown, D., & Munet-Vilaro, F. (2015). Intimate Partner Violence and Risk for Cervical Cancer. *Journal Of Family Violence*, *30*(8), 1031-1043. https://doi.org/10.1007/s10896-015-9733-7

Iversen, L., Fielding, S., Lidegaard, Ø., & Hannaford, P. (2021). Contemporary hormonal contraception and cervical cancer in women of reproductive age. *International Journal Of Cancer*, *149*(4), 769-777. https://doi.org/10.1002/ijc.33585

Iversen, L., Sivasubramaniam, S., Lee, A., Fielding, S., & Hannaford, P. (2017). Lifetime cancer risk and combined oral contraceptives: the Royal College of General Practitioners' Oral Contraception Study. *American Journal Of Obstetrics And Gynecology*, *216*(6), 580.e1-580.e9. https://doi.org/10.1016/j.ajog.2017.02.002

Jankey, O., Próspero, M., & Fawson, P. (2011). Mutually violent attitudes: effects on intimate partner violence and mental health symptoms among couples in Botswana, Africa. *Journal Of Aggression, Conflict And Peace Research*, *3*(1), 4-11. https://doi.org/10.5042/jacpr.2011.0017

Joyner, K., Rees, K., & Honikman, S. (2015). *Intimate Partner Violence (IPV) in South Africa: How to break the vicious cycle*. Retrieved from http://www.sun.ac.za/english/faculty/healthsciences/Documents/News/2016/IPV_policybrief%2012%2001%2015%20final.pdf

Jewkes, R. (2002). Intimate partner violence: causes and prevention. *The Lancet*, *359*(9315), 1423-1429. https://doi.org/10.1016/s0140-6736(02)08357-5

Kamer, L. (2021). *Distribution of households headed by females in South Africa*. Statista. Retrieved 30 May 2021, from https://www.statista.com/statistics/1114301/distribution-of-female-headed-households-in-south-africa-by-province/#:~:text=Published%20by%20Lars%20Kamer%2C%20Feb%2024%2C%202021%20As,amounted%20to%20a%20total%20of%20approximately%207.2%20million.

Koenig, M. A., Lutalo, T., Zhao, F., Nalugoda, F., Wabwire-Mangen, F., Kiwanuka, N., Wagman, J., Serwadda, D., Wawer, M., & Gray, R. (2003). Domestic violence in rural Uganda: evidence from a community-based study. *Bulletin of the World Health Organization*, *81*(1), 53–60.

Khumalo, T. (2019). *South Africa Declares 'Femicide' a National Crisis*. Voice of America. Retrieved 2 June 2021, from https://www.voanews.com/africa/south-africa-declares-femicide-national-crisis.

Keetile, M., Ndlovu, K., Letamo, G., Disang, M., Yaya, S., & Navaneetham, K. (2021). Factors associated with and socioeconomic inequalities in breast and cervical cancer screening among women aged 15–64 years in Botswana. *PLOS ONE*, *16*(8), e0255581. https://doi.org/10.1371/journal.pone.0255581

Levinson, K., Jernigan, A., Flocke, S., Tergas, A., Gunderson, C., & Huh, W. et al. (2016). Intimate Partner Violence and Barriers to Cervical Cancer Screening. *Journal Of Lower Genital Tract Disease*, *20*(1), 47-51. doi: 10.1097/lgt.0000000000000153

Liu, Z., Liu, W., Liu, Y., Ye, X., & Chen, S. (2015). Multiple Sexual Partners as a Potential Independent Risk Factor for Cervical Cancer: a Meta-analysis of Epidemiological Studies. *Asian Pacific Journal Of Cancer Prevention*, *16*(9), 3893-3900. https://doi.org/10.7314/apjcp.2015.16.9.3893

Levy, H., & Meltzer, D. (2008). The Impact of Health Insurance on Health. *Annual Review Of Public Health*, *29*(1), 399-409. https://doi.org/10.1146/annurev.publhealth.28.021406.144042

Linus, A., Wanyoro, A., & Gitahi, M. (2021). Demographic and Economic Predictors of Uptake of Cervical Cancer Screening among Women in Isiolo County, Kenya. *Global Journal Of Health Science*, *13*(12), 72. https://doi.org/10.5539/gjhs.v13n12p72

McDonald, Y., Goldberg, D., Scarinci, I., Castle, P., Cuzick, J., Robertson, M., & Wheeler, C. (2016). Health Service Accessibility and Risk in Cervical Cancer Prevention: Comparing Rural

Versus Nonrural Residence in New Mexico. *The Journal Of Rural Health*, *33*(4), 382-392. https://doi.org/10.1111/jrh.12202

Mabaso, M., Maseko, G., Sewpaul, R., Naidoo, I., Jooste, S., & Takatshana, S. et al. (2021). Trends and correlates of HIV prevalence among adolescents in South Africa: evidence from the 2008, 2012 and 2017 South African National HIV Prevalence, Incidence and Behaviour surveys. *AIDS Research And Therapy*, *18*(1). https://doi.org/10.1186/s12981-021-00422-3

Magubane, P. (2021). *Many women fear victimisation when they consider reporting GBV cases to police: Activists - SABC News - Breaking news, special reports, world, business, sport coverage of all South African current events. Africa's news leader.*. SABC News - Breaking news, special reports, world, business, sport coverage of all South African current events. Africa's news leader. Retrieved 24 November 2021, from https://www.sabcnews.com/sabcnews/many-women-fear-victimisation-when-considering-reporting-gbv-cases-to-police/#:~:text=%E2%80%9CWomen%20are%20usually%20reluctant%20to%20report%20cases%20of,feel%20humiliated%2C%20ridiculed%20and%20quite%20embarrassed%2C%E2%80%9D%20adds%20Omar.

Muluneh, M., Stulz, V., Francis, L., & Agho, K. (2020). Gender Based Violence against Women in Sub-Saharan Africa: A Systematic Review and Meta-Analysis of Cross-Sectional Studies. *International Journal Of Environmental Research And Public Health*, *17*(3), 903. https://doi.org/10.3390/ijerph17030903

Murfin, J., Irvine, F., Meechan-Rogers, R., & Swift, A. (2019). Education, income and occupation and their influence on the uptake of cervical cancer prevention strategies: A systematic review. *Journal Of Clinical Nursing*, *29*(3-4), 393-415. https://doi.org/10.1111/jocn.15094

McCloskey, L., Boonzaier, F., Steinbrenner, S., & Hunter, T. (2016). Determinants of Intimate Partner Violence in Sub-Saharan Africa: A Review of Prevention and Intervention Programs. *Partner Abuse*, *7*(3), 277-315. https://doi.org/10.1891/1946-6560.7.3.277

Maluleke, R. (2019). *Determinants of health among the youth aged 15–34 years in South Africa*. Pretoria: Statistics South Africa. Retrieved from http://www.statssa.gov.za/publications/03-00-15/03-00-152020.pdf

Maluleke, R. (2017). *Higher Education and Skills in South Africa*. Pretoria: Statistics South Africa. Retrieved from http://www.statssa.gov.za/publications/Report-92-01-05/Report-92-01-052017.pdf

Mboumba Bouassa, R., Prazuck, T., Lethu, T., Jenabian, M., Meye, J., & Bélec, L. (2017). Cervical cancer in sub-Saharan Africa: a preventable noncommunicable disease. *Expert Review Of Anti-Infective Therapy*, *15*(6), 613-627. https://doi.org/10.1080/14787210.2017.1322902

Mahumud, R., Keramat, S., Ormsby, G., Sultana, M., Rawal, L., & Alam, K. et al. (2020). Wealth-related inequalities of women's knowledge of cervical cancer screening and service utilisation in 18 resource-constrained countries: evidence from a pooled decomposition analysis. *International Journal For Equity In Health*, *19*(1). https://doi.org/10.1186/s12939-020-01159-7

McWilliams, J., Zaslavsky, A., Meara, E., & Ayanian, J. (2004). Health Insurance Coverage And Mortality Among The Near-Elderly. *Health Affairs*, *23*(4), 223-233. https://doi.org/10.1377/hlthaff.23.4.223

McCloskey, L., Boonzaier, F., Steinbrenner, S., & Hunter, T. (2016). Determinants of Intimate Partner Violence in Sub-Saharan Africa: A Review of Prevention and Intervention Programs. *Partner Abuse*, *7*(3), 277-315. https://doi.org/10.1891/1946-6560.7.3.277

McGuire, S. (2016). World Cancer Report 2014. Geneva, Switzerland: World Health Organization, International Agency for Research on Cancer, WHO Press, 2015. *Advances In Nutrition*, *7*(2), 418-419. https://doi.org/10.3945/an.116.012211

Morrell, R., Jewkes, R., & Lindegger, G. (2012). Hegemonic Masculinity/Masculinities in South Africa. *Men And Masculinities*, *15*(1), 11-30. https://doi.org/10.1177/1097184x12438001

McDaniel, C., Hallam, H., Cadwallader, T., Lee, H., & Chou, C. (2021). Persistent racial disparities in cervical cancer screening with Pap test. *Preventive Medicine Reports*, *24*, 101652. doi: 10.1016/j.pmedr.2021.101652

Musselwhite, L., Oliveira, C., Kwaramba, T., de Paula Pantano, N., Smith, J., & Fregnani, J. et al. (2016). Racial/Ethnic Disparities in Cervical Cancer Screening and Outcomes. *Acta Cytologica*, *60*(6), 518-526. doi: 10.1159/000452240

Matsolo, M. (2019). Low-income black women hardest hit by noncommunicable diseases. Retrieved 5 February 2022, from https://mg.co.za/article/2019-10-27-00-low-income-black-women-hardest-hit-by-noncommunicable-diseases/

McKinnon, B., Harper, S., & Moore, S. (2010). Decomposing income-related inequality in cervical screening in 67 countries. *International Journal Of Public Health*, *56*(2), 139-152. https://doi.org/10.1007/s00038-010-0224-6\

MacKian, S. (2003). *A review of health seeking behaviour: problems and prospects*. Manchester: University of Manchester.

Mackian, S. (2004). Up the garden path and over the edge: where might health-seeking behaviour take us?. *Health Policy And Planning*, *19*(3), 137-146. https://doi.org/10.1093/heapol/czh017

Ntekim, A. (2012). Cervical Cancer in Sub Sahara Africa. *Topics On Cervical Cancer With An Advocacy For Prevention*. https://doi.org/10.5772/27200

National Academy of Sciences. (2002). *Care without coverage: Too little, Too Late* (pp. 48-56). National Academy Press.

Ndejjo, R., Mukama, T., Musabyimana, A., & Musoke, D. (2016). Uptake of Cervical Cancer Screening and Associated Factors among Women in Rural Uganda: A Cross Sectional Study. *PLOS ONE*, *11*(2), e0149696. https://doi.org/10.1371/journal.pone.0149696

National Cancer Institute. (2017). *HIV Infection and Cancer Risk*. National Cancer Institute. Retrieved 31 May 2021, from https://www.cancer.gov/about-cancer/causes-prevention/risk/infectious-agents/hiv-fact-sheet#:~:text=Because%20HIV-infected%20women%20have%20a%20higher%20risk%20of,with%20HIV%20infection%20up%20to%20age%2026%20years.

National Department of Health (NDoH), Statistics South Africa (Stats SA), South African Medical Research Council (SAMRC), and ICF. 2019. *South Africa Demographic and Health Survey 2016.* Pretoria, South Africa, and Rockville, Maryland, USA: NDoH, Stats SA, SAMRC, and ICF.

National Department of Health. (2017). *Cervical Cancer Prevention and Control Policy*. Pretoria: National Department of Health. Retrieved from https://www.westerncape.gov.za/text/2020/February/cervical_cancer_prevention_and_control_policy.pdf

National Cancer Institute. (2018). *Oral Contraceptives (Birth Control Pills) and Cancer Risk*. National Cancer Institute. Retrieved 12 July 2021, from https://www.cancer.gov/about-cancer/causes-prevention/risk/hormones/oral-contraceptives-fact-sheet.

National Cancer Registry. (2019). *Cancer in South 2019 Full Report*. National Cancer Registry. Retrieved from https://www.nicd.ac.za/wp-content/uploads/2021/12/NCR_Path_2019_Full_Report_8dec2021.pdf

Olamijuwon, E. (2022). *The relationship between social cohesion and the health status of adults in South Africa*. Johannesburg. Retrieved from https://wiredspace.wits.ac.za/bitstream/handle/10539/24551/ResearchRpt_Olamijuwon.pdf?sequence=2

Oussaid, N., Lutringer-Magnin, D., Barone, G., Haesebaert, J., & Lasset, C. (2013). Factors associated with Pap smear screening among French women visiting a general practitioner in the Rhône-Alpes region. *Revue D'épidémiologie Et De Santé Publique*, *61*(5), 437-445. https://doi.org/10.1016/j.respe.2013.04.009

Pattyn, E., Van Praag, L., Verhaeghe, M., Levecque, K., & Bracke, P. (2011). The association between residential area characteristics and mental health outcomes among men and women in Belgium. *Archives Of Public Health*, *69*(1). https://doi.org/10.1186/0778-7367-69-3

Public Health England. (2017). Health matters: making cervical screening more accessible. Retrieved 5 February 2022, from https://www.gov.uk/government/publications/health-matters-making-cervical-screening-more-accessible/health-matters-making-cervical-screening-more-accessible--2

Poortaghi, S., Raiesifar, A., Bozorgzad, P., Golzari, S., Parvizy, S., & Rafii, F. (2015). Evolutionary concept analysis of health seeking behavior in nursing: a systematic review. *BMC Health Services Research*, *15*(1). https://doi.org/10.1186/s12913-015-1181-9

Prosman, G., Lo Fo Wong, S. H., & Lagro-Janssen, A. L. (2013). Why abused women do not seek professional help: A qualitative study. *Scandinavian Journal of Caring Sciences*, *28*(1), 3-11. doi:10.1111/scs.12025

Reyes-Ortiz, C., Velez, L., Camacho, M., Ottenbacher, K., & Markides, K. (2008). Health insurance and cervical cancer screening among older women in Latin American and Caribbean cities. *International Journal Of Epidemiology*, *37*(4), 870-878. https://doi.org/10.1093/ije/dyn096

Soneji, S., & Fukui, N. (2013). Socioeconomic determinants of cervical cancer screening in Latin America. *Revista Panamericana De Salud Pública*, *33*(3), 174-182. https://doi.org/10.1590/s1020-49892013000300003

Smith, A., Heywood, W., Ryall, R., Shelley, J., Pitts, M., & Richters, J. et al. (2011). Association Between Sexual Behavior and Cervical Cancer Screening. *Journal Of Women's Health*, *20*(7), 1091-1096. https://doi.org/10.1089/jwh.2010.2585

Schocken, C. (2020). Integrating Cervical Cancer Prevention into Comprehensive Women's Health Care. Retrieved 11 February 2022, from https://www.newsecuritybeat.org/2020/04/integrating-cervical-cancer-prevention-comprehensive-womens-health-care/#:~:text=Cervical%20cancer%20affects%20570%2C000%20women%20a%20year%20and,%28NCD%29%20because%20of%20the%20slower%20way%20it%20presents.

South African Government. (2020). *Universal Health Coverage Day 2020 | South African Government*. Gov.za. Retrieved 25 September 2021, from https://www.gov.za/UniversalHealthCoverageDay2020.

Singh, G. (2012). Global Inequalities in Cervical Cancer Incidence and Mortality are Linked to Deprivation, Low Socioeconomic Status, and Human Development. *International Journal Of MCH And AIDS (IJMA)*, *1*(1). https://doi.org/10.21106/ijma.12

Statistics South Africa. (2020). *Crimes against women in South Africa, an analysis of the phenomenon of GBV and femicide*. Pretoria: Statistics South Africa. Retrieved from https://www.parliament.gov.za/storage/app/media/1_Stock/Events_Institutional/2020/womens_charter_2020/docs/30-07-2020/A_Statistical_Overview_R_Maluleke.pdf

Stats SA. (2012). *Province at a glance*. Pretoria: Statistics South Africa. Retrieved from http://www.statssa.gov.za/census/census_2011/census_products/Provinces%20at%20a%20glance%2016%20Nov%202012%20corrected.pdf

Smith, J., Green, J., de Gonzalez, A., Appleby, P., Peto, J., & Plummer, M. et al. (2003). Cervical cancer and use of hormonal contraceptives: a systematic review. *The Lancet*, *361*(9364), 1159-1167. https://doi.org/10.1016/s0140-6736(03)12949-2

Tapera, O., Kadzatsa, W., Nyakabau, A., Mavhu, W., Dreyer, G., Stray-Pedersen, B., & SJH, H. (2019). Sociodemographic inequities in cervical cancer screening, treatment and care amongst women aged at least 25 years: evidence from surveys in Harare, Zimbabwe. *BMC Public Health*, *19*(1). https://doi.org/10.1186/s12889-019-6749-6

Theaker, L. (2020). *Determinants of Health: Area of Residence*. NursingAnswers.net. Retrieved 1 June 2021, from https://nursinganswers.net/essays/determinants-health-residence-3605.php.

Teteh, D., Dawkins-Moultin, L., Robinson, C., LaGroon, V., Hooker, S., Alexander, K., & Kittles, R. (2019). Use of community forums to increase knowledge of HPV and cervical cancer in African American communities. *Journal Of Community Health*, *44*(3), 492-499. https://doi.org/10.1007/s10900-019-00665-2

Vu, M., Yu, J., Awolude, O., & Chuang, L. (2018). Cervical cancer worldwide. *Current Problems In Cancer*, *42*(5), 457-465. doi: 10.1016/j.currproblcancer.2018.06.003

World Health Organization. (2021). *World Health Statistics*. Who.int. Retrieved 22 November 2021, from https://www.who.int/data/gho/data/themes/world-health-statistics#:~:text=Health%20has%20a%20central%20place%20in%20SDG%203%3A,to%20health%20or%20will%20contribute%20to%20health%20indirectly.

Western Cape Government. (2021). *HPV vaccinations*. Western Cape Government. Retrieved 18 September 2021, from https://www.westerncape.gov.za/general-publication/hpv-vaccinations.

Takano, J. (2021). *Cervical Cancer in Girls and Young Women*. Pyroenergen.com. Retrieved 31 May 2021, from https://www.pyroenergen.com/articles10/cervical-cancer.htm.

Tariq, Q. (2013). Impact of Intimate Partner Violence on Self Esteem of Women in Pakistan. *American Journal Of Humanities And Social Sciences*, *1*(1). doi: 10.11634/232907811301271

United Nations. (2020). *Goal 3: Ensure healthy lives and promote well-being for all at all ages*. United Nations Sustainable Development. Retrieved 9 July 2021, from https://www.un.org/sustainabledevelopment/health/.

Utami, T., Kusuma, F., Winarto, H., Anggraeni, T., Peters, A., & Spaans, V. et al. (2021). Tobacco use and its association with HPV infection in normal uterine cervix: A study from a Sustainable Development Goals perspective. *Tobacco Induced Diseases*, *19*(August), 1-7. https://doi.org/10.18332/tid/140093

University of California, Los Angeles (UCLA). (2021). *Lesson 3 Logistic Regression Diagnostics*. Stats.oarc.ucla.edu. Retrieved 18 July 2022, from https://stats.oarc.ucla.edu/stata/webbooks/logistic/chapter3/lesson-3-logistic-regression-diagnostics/.

World Health Organization (WHO). (2021). *Cervical cancer*. World Health Organization. Retrieved 27 May 2021, from https://www.who.int/health-topics/cervical-cancer#tab=tab_1.

World Health Organization (WHO). (2021). *New recommendations for screening and treatment to prevent cervical cancer*. Who.int. Retrieved 11 September 2021, from https://www.who.int/news/item/06-07-2021-new-recommendations-for-screening-and-treatment-to-prevent-cervical-cancer.

Western Cape Government. (2021). *Protect Your Health (Pap Smear)*. Western Cape Government. Retrieved 28 May 2021, from https://www.westerncape.gov.za/general-publication/protect-your-health-pap-smear#:~:text=You%20are%20entitled%3A,years%2C%20starting%20in%20your%20thirties.

Wheeler, J., Foreman, M., & Rueschhof, A. (2013). *Improving Women's Health Health Challenges, Access and Prevention*. National Conference of State Legislatures. Retrieved from https://www.ncsl.org/documents/health/ImprovingWH613.pdf

World Bank. (2015). *The 8 Millennium Development Goals*. Www5.worldbank.org. Retrieved 28 May 2021, from https://www5.worldbank.org/mdgs/.

World Health Organization (WHO). (2021). *Women's Health*. WHO | Regional Office for Africa. Retrieved 31 May 2021, from https://www.afro.who.int/health-topics/womens-health.

World Health Organization (WHO). (2021). *Prevention and control of cervical cancer*. World Health Organization. Retrieved 31 May 2021, from https://www.who.int/reproductivehealth/topics/cancers/en/.

World Health Organization (WHO). (2022). Cervical cancer. Retrieved 6 February 2022, from https://www.who.int/news-room/fact-sheets/detail/cervical-cancer

World Health Organization (WHO). (2021). *WHO | Intimate partner violence*. Who.int. Retrieved 2 June 2021, from https://www.who.int/gho/women_and_health/violence/intimate_partner_text/en/#:~:text=30%25%20of%20ever%20partnered%20women%20globally%20have%20experienced,that%20this%20field%20of%20research%20is%20still%20developing.

World Health Organization (WHO). (2021). *Devastatingly pervasive: 1 in 3 women globally experience violence*. Who.int. Retrieved 2 June 2021, from https://www.who.int/news/item/09-03-2021-devastatingly-pervasive-1-in-3-women-globally-experience-violence.

Yimer, N., Mohammed, M., Solomon, K., Tadese, M., Grutzmacher, S., & Meikena, H. et al. (2021). Cervical cancer screening uptake in Sub-Saharan Africa: a systematic review and meta-analysis. *Public Health*, *195*, 105-111. https://doi.org/10.1016/j.puhe.2021.04.014

Zhang, S., Xu, H., Zhang, L., & Qiao, Y. (2020). Cervical cancer: Epidemiology, risk factors and screening. *Chinese Journal Of Cancer Research*, *32*(6), 720-728. https://doi.org/10.21147/j.issn.1000-9604.2020.06.05

Zhao, M., Wu, Q., Hao, Y., Hu, J., Gao, Y., Zhou, S., & Han, L. (2021). Global, regional, and national burden of cervical cancer for 195 countries and territories, 2007–2017: findings from the Global Burden of Disease Study 2017. *BMC Women's Health*, *21*(1). doi: 10.1186/s12905-021-01571-3

APPENDIXES

Appendix A: Literature Matrix

Title	Author(s) and Year	Study description	Journal	Data Source and Methods of Analysis
Racial/Ethnic Disparities in Cervical Cancer Screening and Outcomes	Musselwhite et al., 2016	Study setting United States Study population Women aged 20 years and older. Study sample 59,452	Preventing Chronic Disease	The study used 2010-2014 data from Centers for Disease Control and Prevention's National Program of Cancer Registries and the National Cancer Institute's Surveillance, Epidemiology, and End Results Program It compared the frequency of cervical cancer and adjusted age incidence rates by rurality and ethnicity.
Persistent racial disparities in cervical cancer screening with Pap test	McDaniel, Hallam, Cadwallader, Lee & Chou, 2021	Study setting United States Study population 18-69 years Study sample 538,218	Preventive Medicine Reports	Used data from the Behavioural Risk Factor Surveillance System to compare Pap smear testing among women from different ethnicities. It used descriptive and a multivariate logistic regression model.
Prevalence and determinants of cervical cancer screening in five sub-Saharan African countries: A population-based study	Ba et al., 2021	Study setting Benin, Ivory Coast, Kenya, Namibia, and Zimbabwe Study population 21-49 years Study sample 28,976	Cancer Epidemiology	The study used cervical cancer screening data from the Demographic and Health Surveys. It used a Poisson regression model to ascertain the independent factors associated with cervical cancer screening.
Prevalence and determinants of cervical cancer awareness among women of reproductive age: evidence from Benin and Zimbabwe population-based data	Barrow et al., 2020	Study setting Benin and Zimbabwe Study population 15–49 years Study sample 9,955	Applied Cancer Research	The study used data from the Benin Demographic and Health Survey (BDHS) and Zimbabwe Demographic and Health Survey. It used a binary regression model logistic regression model to analyse predictors of cervical cancer awareness.

Determinants and levels of cervical Cancer screening uptake among women of reproductive age in South Africa: evidence from South Africa Demographic and health survey data, 2016	Akokuwebe et al., 2021	Study setting South Africa Study population 15–49 years Study sample 5,903	BMC Public Health	The study used data from the South Africa Demographic and Health Survey. It used a binary regression model logistic regression model to analyse predictors of cervical cancer awareness.
Education, income and occupation and their influence on the uptake of cervical cancer prevention strategies: A systematic review	Murfin et al., 2019	Study setting Europe	PubMed	Systematic review and narrative synthesis.
Demographic and Economic Predictors of Uptake of Cervical Cancer Screening among Women in Isiolo County, Kenya	Linus et al., 2021	Study setting Kenya Study population 15-65 years Study sample 444	Global Journal of Health Science	The study used primary data collected from eligible women in Kenya and it used a logistic regression to understand the demographic and economic predictors of cervical cancer screening.
Use of community forums to increase knowledge of HPV and cervical cancer in African American communities	Teteh et al., 2019	Study setting United States Study population Women aged 20 years and older Study sample 412	Journal of Community Health	The study used cross-sectional data from the study population.
Cervical cancer prevention and treatment research in Africa: a systematic review from a public health perspective	Finocchario-Kessler et al., 2016	380 research articles/reports	BMC Women's Health	Systematic review and narrative synthesis.
Wealth-related inequalities of women's knowledge of cervical cancer screening and service utilisation in 18 resource-constrained countries: evidence from a pooled decomposition analysis	Mahumud et al., 2020	Study setting 18 resource constrained countries Study population Women aged 26 years and older Study sample 1,802,413	International Journal for Equity in Health	The study used data from the Demographic and Health Surveys and used a logistic regression model.

Sociodemographic inequities in cervical cancer screening, treatment and care amongst women aged at least 25 years: evidence from surveys in Harare, Zimbabwe	Tapera et al., 2019	Study setting Zimbabwe Study population Women aged 25 years and older Study sample 277	BMC Public Health	The study used primary data collected from eligible women in Zimbabwe and used a logistic regression model to show the association between sociodemographic inequities and cervical cancer screening.
Factors associated with and socioeconomic inequalities in breast and cervical cancer screening among women aged 15–64 years in Botswana	Keetile et al., 2021	Study setting Botswana Study population 15-64 years Study sample 813	PLOS ONE	The study used data from the Chronic Non-Communicable Diseases in Botswana conducted (NCD survey) in 2016. It used logistic regression models to show the association between socioeconomic variables, cervical cancer and breast cancer screening.
Factors affecting cervical cancer screening uptake, visual inspection with acetic acid positivity and its predictors among women attending cervical cancer screening service in Addis Ababa	Fentie et al., 2020	Study setting Ethiopia Study population 15-44 years Study sample 844	BMC Women's Health	The study used a mixed-method approach. It also used descriptive statistics and a logistic regression to examine factors associated with VIA positivity of the cervical among women that underwent cervical cancer screening.
Contemporary hormonal contraception and cervical cancer in women of reproductive age	Iversen et al., 2021	Study setting Denmark Study population 15-50 years Study sample 1,853,542	International Journal of Cancer	The study used data from the Danish Sex Hormone Register Study. It used a Poisson regression to calculate the risk of cervical cancer among women in different contraceptive user groups.
The association between cigarette smoking, cancer screening, and cancer stage: a prospective study of the women's health initiative observational cohort	Eng et al., 2021	Study setting United States Study sample 89,058	BMJ Open	The study used data from the Women's Health Initiative (WHI) Observational Study. It used logistic regression analyses to explore associations between smoking status and cervical cancer screening among women.
Tobacco use and its association with HPV infection in normal uterine cervix: A study from a Sustainable Development Goals perspective	Utami et al., 2021	Study setting Jakarta Study population 19–84 years Study sample 1,397	Tobacco Induced Diseases	The study used data from 7-year cross-sectional study of a clinically normal uterine cervix population from Jakarta. It used a logistic regression to examine the association between tobacco use and cervical cancer.

Cervical cancer: Epidemiology, risk factors and screening	Zhang et al., 2020	N/A	Chinese Journal Of Cancer Research	Systematic review and narrative synthesis.

APPENDIX B: Test for Specification Error

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Logistic regression                             Number of obs     =      1,934
                                                Wald chi2(2)      =     313.87
                                                Prob > chi2       =     0.0000
Log pseudolikelihood = -1080.271                Pseudo R2         =     0.1647
```

CervicalCancerScreening	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf.	Interval]
_hat	1.090453	.0715	15.25	0.000	.9503152	1.23059
_hatsq	.0928248	.0390252	2.38	0.017	.0163369	.1693127
_cons	-.0558338	.0613336	-0.91	0.363	-.1760456	.0643779

APPENDIX C: Test for Multicollinearity

```
.  pwcorr CervicalCancerScreening IPV_New AreaOfResidence Age_n LevelOfEducation WealthIndex Province
>  PopulationGroupRace SexOfHouseholdHead SexPartnersInclSpouse12m_n FrequencySmokesCigarettes Curren
> tContraceptiveUse HealthInsurance, obs star (0.05) sig
```

	Cervic~g	IPV_New	AreaOf~e	Age_n	LevelO~n	Wealth~x	Province
CervicalCa~g	1.0000						
	1934						
IPV_New	0.0582*	1.0000					
	0.0105						
	1934	1934					
AreaOfResi~e	-0.1109*	0.0243	1.0000				
	0.0000	0.2862					
	1934	1934	1934				
Age_n	0.3307*	0.0294	-0.0063	1.0000			
	0.0000	0.1968	0.7830				
	1934	1934	1934	1934			
LevelOfEdu~n	0.1137*	-0.0432	-0.1194*	-0.0663*	1.0000		
	0.0000	0.0574	0.0000	0.0035			
	1934	1934	1934	1934	1934		
WealthIndex	0.1563*	-0.0725*	0.1875*	0.0813*	0.3011*	1.0000	
	0.0000	0.0014	0.0000	0.0003	0.0000		
	1934	1934	1934	1934	1934	1934	
Province	-0.1131*	-0.0700*	0.3067*	-0.0475*	-0.0105	0.0892*	1.0000
	0.0000	0.0021	0.0000	0.0366	0.6460	0.0001	
	1934	1934	1934	1934	1934	1934	1934
Population~e	0.1355*	-0.0130	-0.1342*	0.1288*	0.1609*	0.1851*	-0.0499*
	0.0000	0.5689	0.0000	0.0000	0.0000	0.0000	0.0281
	1934	1934	1934	1934	1934	1934	1934
SexOfHouse~d	-0.0597*	0.0132	0.0860*	0.0034	-0.0311	-0.0798*	0.0335
	0.0087	0.5631	0.0002	0.8821	0.1718	0.0004	0.1414
	1934	1934	1934	1934	1934	1934	1934
SexPartner~n	-0.0372	0.0212	-0.0372	-0.1348*	0.0142	-0.0044	-0.0010
	0.1023	0.3512	0.1022	0.0000	0.5335	0.8465	0.9646
	1934	1934	1934	1934	1934	1934	1934
FrequencyS~s	0.0217	0.0540*	-0.1572*	0.0054	-0.0591*	-0.0282	-0.2103*
	0.3407	0.0175	0.0000	0.8127	0.0093	0.2143	0.0000
	1934	1934	1934	1934	1934	1934	1934
CurrentCon~e	-0.0352	0.0073	0.0022	-0.1771*	0.0047	-0.0609*	-0.0194
	0.1223	0.7494	0.9222	0.0000	0.8367	0.0074	0.3939
	1934	1934	1934	1934	1934	1934	1934
HealthInsu~e	0.2225*	-0.0570*	-0.1435*	0.1370*	0.3352*	0.3083*	-0.0500*
	0.0000	0.0122	0.0000	0.0000	0.0000	0.0000	0.0279
	1934	1934	1934	1934	1934	1934	1934

	Popula~e	SexOfH~d	SexPar~n	Freque~s	Curren~e	Health~e
Population~e	1.0000					

	Popula~e	SexOfH~d	SexPar~n	Freque~s	Curren~e	Health~e
Population~e	1.0000					
	1934					
SexOfHouse~d	-0.1112*	1.0000				
	0.0000					
	1934	1934				
SexPartner~n	-0.0079	-0.0928*	1.0000			
	0.7296	0.0000				
	1934	1934	1934			
FrequencyS~s	0.0451*	-0.0604*	0.0360	1.0000		
	0.0474	0.0079	0.1139			
	1934	1934	1934	1934		
CurrentCon~e	-0.0800*	0.0057	0.1307*	-0.0263	1.0000	
	0.0004	0.8018	0.0000	0.2481		
	1934	1934	1934	1934	1934	
HealthInsu~e	0.2649*	-0.1192*	0.0184	-0.0212	-0.0712*	1.0000
	0.0000	0.0000	0.4194	0.3517	0.0017	
	1934	1934	1934	1934	1934	1934

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end of do-file
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APPENDIX D: ETHICS CLEARANCE CERTIFICATE

Demography and Population Studies

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http://web.wits.ac.za/Academic/humanities/socialsciences/demographyandpopulationstudies

Ethics Waiver Approval Letter - 2021

Dear Marcus Hollington, (705513),

This letter serves as confirmation that your application for an Ethics Waiver for your research project titled *'Relationship between domestic violence and cervical cancer screening among adult women in South Africa'* has been approved for 2021.

Your ethics number is: **WDEMG2021/08/06**

Please cite this number of all Faculty of Humanities submission forms, your proposal and final manuscript and any submissions of your research made to journals or book editors.

Sasha Frade		23 November 2021
Supervisor Name	Supervisor Signature	Date
Nicole De Wet-Billings	N DeWet-Billings	23 November 2021
Ethics Committee member	Signature	Date
Mucha Musemwa		23 November 2021
Head of School, Social Sciences	Signature	Date