



## Investigating the disparities in cervical cancer screening among Namibian women



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### HIGHLIGHTS

- Among Namibian women who have heard about cervical cancer, only 39% reported ever undertaking screening for the disease.
- Our results show that women with health insurance, autonomy in taking health care decision, and higher education screened for cervical cancer.
- We encourage the adoption of a universal health insurance scheme that ensures equity and empower women to demand health services.

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### ABSTRACT

**Objectives.** We examined the influence of knowledge and information, health care access and different socio-economic variables on women's decision to screen for cervical cancer using a nationally representative dataset.

**Methods.** We use hierarchical binary logit regression models to explore the determinants of screening for cervical cancer among women who reported hearing about cervical cancer. This enabled us to include the effect of unobserved heterogeneity at the cluster level that may affect screening behaviors.

**Results.** Among women who have heard about cervical cancer (N = 6542), only 39% of them did undergo screening with a mean age of 33 years. The univariate results reveal that women who are educated, insured, can afford money needed for treatment and reported distance not a barrier to accessing healthcare were more likely to screen. Our multivariate results indicate that insured women (OR = 1.89, p = 0.001) and women who had access to information through education and contact with a health worker (OR = 1.41, p = 0.001) were more likely to undertake screening compared to uninsured women and those with no contact with a health personnel, after controlling for relevant variables.

**Conclusions.** The adoption of a universal health insurance scheme that ensures equity in access to health care and extension of public health information targeting women in rural communities especially within the Caprivi region may be needed for a large scale increase in cervical cancer screening in Namibia.

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### 1. Introduction

Women in sub-Saharan Africa (SSA) face a high risk of developing cervical cancer, even though the disease can be easily diagnosed and prevented using simple testing [1]. Virtually all cases of cervical pre-cancer and cancer are associated with a high-risk of human papillomavirus (HPV) infection, with types 16 and 18 reported to account for the majority of cases [2]. Cervical cancer affects young women in the most reproductive and productive times of their lives creating suffering and disability among the most productive segment of Africa's population. It is estimated that about 846,961 new cancer cases and 591,169 deaths

occurred in Africa in 2012 alone, with cervical cancer accounting for 12% of all cancer-related morbidity and a 5-year prevalence of 1.78 million [3]. In most parts of SSA, the risk of cervical cancer is elevated by lack of diagnostic and treatment facilities, limited resources such as doctors and the pressing demand of related public health issues such as HIV/AIDS and malaria.

In Namibia, current estimates indicate that cervical cancer incidence and mortality are on the ascendancy [3,4]. Cervical cancer ranks as the second most prevalent cancer among all women and the third most prevalent cancer among women aged between 15–44 years in Namibia, making the disease a major public health concern in the country [4]. In response, the government of Namibia has introduced a number of strategies such as Visual Inspection with Acetic Acid (VIA) and cryotherapy to “Screen and Treat” women in order to stem the growing problem of cervical cancer. A national awareness, screening, and early treatment campaign are also underway in Namibia whose

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long-term goal is to eradicate cervical cancer by 2030. The scale up of screening is a gateway to universal access to preventive and treatment services. However, despite these laudable efforts, cervical cancer cases in Namibia have continued to rise [5]. In the absence of a comprehensive national cancer registry for tracking cases in the general population, the true magnitude of the problem may be underestimated.

In Namibia, like many developing countries, most women with HPV present themselves to health authorities late when the disease is already advanced and untreatable [1]. A number of institutional challenges contribute to this problem including poor access to treatment due to lack of infrastructure, drugs, and human resources. Poor disease surveillance systems at the national level and the absence of empirical studies have meant that much of what is presently known about the determinants of testing for HPV in the general population across SSA is mainly based on studies conducted in developed countries [6]. For instance, one of early studies conducted in England reported that while women were not opposed to testing for cervical cancer, the disease was generally seen as of low priority [7]. The same study also reported incorrect information, lack of regular visits to a family doctor, and fear of testing for HPV in England. In Ontario, Canada, significant socioeconomic disparities in cervical cancer screening have been found. Educated women were more likely to test for cervical cancer than less educated women [8]. Other studies from Canada have shown that Pap smear tests are less common among older women and recent immigrants [9].

The few studies from the SSA region suggest that there is a general lack of public awareness about cervical cancer and associated risk factors largely rooted in the failure of the health care system to promote testing for the disease [10,11]. General lack of public awareness about the cause of the virus associated with HPV and prevention, including the existence of screening have emerged as the major factors that accelerate the spread of cervical cancer in several counties in SSA such as Kenya, Ghana and Zambia [12–14]. This study fills in part of this gap by examining factors associated with screening for cervical cancer in Namibia.

## 2. Methods

### 2.1. Data and sample

This study used data from the most recent Namibia Demographic and Health Survey (NDHS) conducted in 2013. The NDHS is a nationally representative dataset collected by the National Statistical Bureau and Ministry of Health of Namibia with funding and technical assistance from the MEASURE DHS program in Calverton, Maryland, USA. A total of 6542 women who have heard about cervical cancer between the ages of 15–64 years were used for this analysis.

### 2.2. Measures

The NDHS data contain a variable that indicates whether respondents have ever tested for cervical cancer or not. Specifically, respondents were asked 'Have you ever been tested or examined for cervical cancer?' In response participants indicated whether they have ever tested or not. As previous studies have shown that access to information can shape people's decision to obtain a test [13,14], women's access to information and knowledge was captured by using variables that measure women's contact with health personnel in the last 12 months (no = 0; yes = 1), exposure to media through frequency of listening to radio and watching television, both coded (not at all = 0; less than once a week = 1; at least once a week = 2). Given the importance of education in enhancing health literacy, the study also controlled for level of education of the respondent, coded (no education = 0; primary education = 1; secondary education = 2; higher education = 3). Health care access was also controlled for in the study. These include distance to health facility (big problem = 0; not a big problem = 1),

money needed for treatment (big problem = 0; not a big problem = 1), health insurance coverage (no = 0; yes = 1), autonomy in taking health care decision (self = 0; respondent and partner/husband = 1; partner or husband alone and other = 2, not applicable = 3) and birth parity (none = 0; one = 1; two = 2; three = 3; and above 3 = 4).

Socio-economic variables controlled for include; employment status of respondents, coded (unemployed = 0; full time employment = 1; seasonal = 2; Occasional = 3) and wealth status, coded (poorest = 0; poorer = 1; middle = 2; richer = 3; richest = 4). Demographic variables included were age of woman, place of residence (urban = 0; rural = 1), region of residence (Caprivi = 0; Erongo = 1; Hardap = 2; Kara = 3; Kavango = 4; Khomas = 5; Kunene = 6; Ohangwena = 7; Omaheke = 8; Omusati = 9; Oshana = 10; Oshikoto = 11; Otjozondjupa = 12), and the religious denomination of respondents (Catholics = 0; Protestants = 1; Elcin<sup>1</sup> = 2; Others = 3).

### 2.3. Analysis

We used binary logit regression models because our dependent variable has two possible outcomes. Because the NDHS dataset has a hierarchical structure, where individual women were nested within clusters, we used random effects modeling procedure in order to avoid bias in the parameter estimates [15–17]. This analytical strategy allowed us to estimate both the magnitude and significance of clustering. The GLLMM software in STATA 13 was used to build all models. We first present a univariate distribution of selected independent variables and testing for cervical cancer as shown in Table 1. Table 2 presents bivariate associations between predictor variables and testing. This is followed by three multivariate hierarchical binary regressions models. The variables controlled in each model were 1) information and knowledge variables, 2) health care access variables, and 3) demographic factors and socio-economic factors.

### 2.4. Results

Descriptive results are provided in Table 1 for our dependent variable and some selected independent variables. Among Namibian women who have heard about cervical cancer, only 39% reported ever testing for the disease, about 34% of Namibian women have never heard of cervical cancer with only 21% insured. Majority of women in the sample were in the richest wealth quintile, with most of them residing in urban areas. It is evident that a substantial percentage of women are unemployed (48%), single (52%) and identify with the Elcin (44%) religion.

### 2.5. Bivariate results

Results from the bivariate models are reported in Table 2. Increasing levels of education was associated with women testing for cervical cancer. Women who had primary (OR = 1.41,  $p = 0.01$ ), secondary (OR = 1.36,  $p = 0.01$ ) or higher education (OR = 2.98,  $p = 0.01$ ) were more likely to report testing for cervical cancer compared to uneducated women. Compared to women with no contact with health personnel in the last 12 months, those who had contact with a health personnel (OR = 1.37,  $p = 0.01$ ) were more likely to take a test. Women who were covered by health insurance (OR = 3.27,  $p = 0.01$ ) were also more likely to report testing for cervical cancer compared to those with no insurance coverage. Similarly, compared to women who had difficulty in terms of distance or money to access health care, those to whom distance was not a problem (OR = 1.19,  $p = 0.01$ ) or money not a problem (OR = 1.34,  $p = 0.01$ ) were more likely to report testing. Women residents in all other regions of Namibia were more likely to report ever being examined for cervical cancer compared to

<sup>1</sup> A type of Christian religion practiced in Namibia.

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