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Original Research

Urban-rural differentials in the uptake of mammography and cervical cancer screening in Kenya

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ABSTRACT

Regular uptake of breast and cervical cancer screening are recommended for early detection of these two most common types of carcinoma among women in developing countries. Previous studies have demonstrated the occurrence of a strong urban/rural differential in several health indicators and the rate of utilization of health services in the areas of infectious and chronic diseases, mental and maternal healthcare utilization in Kenya. However, that of breast and cervical cancer screening has not been reported. In this study we aim to measure the prevalence of uptake of mammography and cervical cancer screening, and assess urban/rural differences in the uptake of the screening services for these two diseases.

Methods: Cross-sectional data were extracted from the latest KDHS conducted in the country. Subjects were 11,138 women ageing between 15 and 49 years. Outcome variables were self-reported screening status of breast and cervical cancer. Bivariate and multivariable logistic regression results were generated to explore the regional variation in utilization of cervical cancer and mammography screening.

Result: Women who took both of types of screenings were more likely to be residing in the urban areas (54.3% vs 45.7% for cervical cancer and 55.7% vs 44.3% for breast cancer). In the univariate analysis, urban women had respectively 62% and 90% higher odds of taking cervical and breast cancer screening compared to rural women. The association remained significant even after adjusting for the covariates in the multivariate analyses which showed respectively 12% and 14% higher odds of breast and cervical cancer screening among urban women compared to rural women.

Conclusion: Findings suggest that interventions to promote breast and cervical cancer screening utilization are necessary for rural women. Regional barriers that are preventing rural women from using the screening services as well as their urban counterparts needs to be identified.

1. Introduction

Despite a comparatively lower incidence rates of cancer than in developed countries, African nations share some of the highest cancer mortality rates in the world [1]. Kenya, one of the fastest growing economy in east Africa, has experienced a significant rise in mortality rates from breast cancer since 1980, and now rank among the countries with highest risk of breast and cervical cancer in Africa [2,3]. Cancer mortalities account for 7% of all deaths in the country which is estimated to be the second leading cause of all non-communicable diseases related mortalities (second only to cardiovascular diseases), and third largest of all-cause mortalities [4]. Similar to the global trend, breast cancer is the most common type of cancer among women in Kenya with an age standardized incidence rate (ASR) of 51.7 per 100,000 followed by cervical cancer with an ASR of 46.1 per 100,000 [5]. Together, these two diseases now account for about 44% of all cancers among women in Kenya [5]. This growing incidence is indicative of the late or advanced stage at diagnosis, low public awareness of the risk factors of the disease, inadequate poor medical infrastructure and expertise, which altogether resulting in poor treatment outcomes [6].

Evidence shows that cervical cancer is preventable with early screening and treatment, and yet it is a leading cause of cancer-related mortality among women in developing countries such as Kenya which is largely a result of lack of access to screening services [7]. Screening refers to the tests before the development any symptoms which aims to help early detection of cancer. In developing countries, inadequate utilization of screening facilities often con-

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tributes to high cancer morbidity and mortality rates [10]. Research evidence in the context of African countries is scarce, however in the developed countries diagnosis of breast cancer at an advanced stage has been attributed to less frequent utilization of screening for mammography [8], and the use of mammography as per recommendation is associated with lower death rates from the disease [9].

In Kenya, Due to a relatively higher burden of morbidity and mortality from infectious diseases, healthcare system is failing to improve cancer care facilities as there are many other health priorities and budgetary constraints. The outcomes of healthcare system level failure fall indiscriminately on disadvantaged population especially in rural areas, where health care access is characterized by numerous challenges e.g. lack of health insurance, unavailability of sufficient skilled physicians, inadequate provision of screening facilities, poor transportation, long distances and travel times, and other spatial barriers [11–14]. Higher burden of breast cancer among rural women indicates lower rate of uptake of screening services. Even in the developed countries rural women are less likely than their urban counterparts to receive regular and age-appropriate mammography screening [15,16].

Women who live in rural and urban settings have different outcomes for breast cancer, however the etiological relationship among these factors remains unclear [15]. Understanding the rural-urban differences in the utilization of breast and cervical cancer screening at national level is necessary for designing appropriate interventions strategies to address the regional inequality. However, the rural-urban differences among women in terms of the uptake of cancer screening services have not been reported for Kenya or any other countries in the region. Lack of adequate research capacity and quality data constitute a major barrier to knowing the situation of cancer care utilization at national level. To this regard, we undertook this study by extracting data from Kenya Demographic and Health Survey which is the first of this kind to provide information on breast and cervical cancer screening among adult women. DHS provides country-representative cross-sectional data on various sociodemographic, economic and health behaviour related indicators which serve as a reliable tool for researches in the countries covered by DHS [17].

2. Methods

2.1. Survey

This study is based on data from the Kenya Demographic and Health Survey (KDHS) conducted in 2014. KDHS 2014 is the sixth of this kind to be conducted in the country, however the first to include a section on non-communicable diseases such as cancer. The main objectives of the survey were to provide quality information on various health and demographic indicators to monitor and evaluate the population health situations in the country and to follow-up the trends from previous surveys. KDHS 2014 was implemented by the Kenya National Bureau of Statistics (KNBS) with financial support from USAID/Kenya and technical assistance from ICF International.

The survey aimed to produce nationally representative estimates for the indicators separately for urban and rural areas at the national level across all the 47 counties in the country. Fieldwork lasted from May 7 to October 20, 2014 following the training of surveyors which was conducted by ICF International from January 20 to 25 of the same year. The training was intended to clarify the objectives of the survey, of the training materials and equipment, concepts related to survey design and the content of the questionnaires.

For sample selection, the Fifth National Sample Survey and Evaluation Program (NASSEPV) sampling frame was adopted which is used to conduct household surveys in Kenya. To make sample population be country representative, an estimated 40,300 households from 1612 clusters were selected across the country (995 clusters in rural areas and 617 in urban areas) by using a two-stage sampling design. In the first stage 1612 enumeration areas (EAs) were selected with equal probability from the NASSEP V design, which served as the sampling frame for the second stage of selection that involved selection of 25 households from each cluster. In total 39,679 households were selected finally for interview, of which 36,430 were successfully interviewed yielding an overall household response rate of 99%. In the selected households, a total of 15,317 women and 14,217 men were interviewed generating a response rate of 96% 90% respectively. Further details regarding survey protocol and sampling techniques are available elsewhere [17,18].

2.2. Variables

The outcome variable were self-reported status of ever being screened for: 1) cervical and 2) breast cancer. Respondents were asked: 'Have you had any test or exam to see if you had cervical cancer' and, 'Ever examined breasts to detect or check for breast cancer'.

The answers were categorized as *Yes* if they underwent any test and *No* when answered otherwise.

The explanatory variable of primary interest was place of residency which was categorized as urban and rural.

2.3. Covariates

The analysis was adjusted for several individual and community-level characteristics, which were selected based on literature review and availability of these variables on the datasets. The following variables were included in the analysis as potential confounders: Age:15–19/20–24/25–29/30–34/35–39/40–44/45–49 years; Religion: Christian/Muslim/Other; Marital status: Married/No; Educational level: No education/Primary/Secondary/Higher;, Wealth index: Poorest/Poorer/Middle/Richer/Richest; Employment status: No/Yes; Drinks alcohol: No/Yes.

DHS surveys provide information on wealth status instead of any direct information on income. Household Wealth Index is a used as a proxy measure for household living status which takes into consideration household possessions e.g. TV, Radio, bicycle, and housing quality e.g. type of floor, wall, roof. Calculation of the wealth index consists of assigning a factor score for a set of possessions which is generated through principal component analysis (PCA). The scores are then summed and standardized for each household which places them in a continuous scale based on relative wealth scores. Finally, the scores are categorized into quintiles where each households fall into a category, with the lowest scores representing the poorest and highest representing the richest households [17,19].

2.4. Statistical analyses

Data were analyzed using SPSS version 21. At the first step, frequencies and percentages were calculated to describe the basic sociodemographic characteristics of the sample population. All variables were checked for outliers and missing variables, and was weighted by the Women's sample weight provided in the dataset. Variables were categorised as appropriate and were presented as counts and percentages. Group differences in screening (User vs non-user) were measured by cross-tabulation using chi-square tests of association. Variables which were significant at $p \leq 0.25$ were retained for regression analysis. Given the binary nature of the