

# Statistical analysis on the reported cases of breast cancer

## Abstract

One of the most common malignancies affecting about one in nine women is breast cancer. It's now the most common cancer and the second leading cause of death among women in Nigeria. Blacks have the highest incidence of cancer compared to whites and this is attributed to the cultural, social, behavioral, environmental, education and economic factors rather than racial or genetic deposition for cancer. This study assessed the reported cases of breast cancer for both rural and urban areas in Kano state. The main objectives are to examine the difference between the ages and the years of the reported breast cancer cases, to investigate if the rate of breast cancer is increasing or decreasing and to investigate the significant association between their life conditions: dead/alive, geographical area: rural/urban and years of the reported case. The data was analyzed using IBM PSW (SPSS Version 20). The statistical techniques used for the analysis are factorial ANOVA and Chi-square test. From the analysis, it was concluded that the ages of the patients are significantly different and the survival rate was increasing simultaneously.

Volume 4 Issue 1 - 2016

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**Received:** May 11, 2016 | **Published:** July 01, 2016

## Introduction

Cancer is one of the fatal diseases that involve abnormal growth of cells that increases compoundedly. It is a malignant tumor which snicks the surrounding tissues without any wall or boarder through the roots and spread to other parts of human body. If the cancer spread, small tads of cancer cell chuck off the original tumor and move to the other parts of the body.<sup>1</sup> The spread can either be direct, through blood or through lymphatic system. Cancers can touch various organs, and each type of cancer has its unique characteristics. Cancer of various types are known in relation to the location of cancers namely cervical cancer, lung cancer, gynecological cancer, skin cancer, brain cancer, breast cancer etc. the specific type of cancer that is more common to an area or community than the other cancer is breast cancer.

There was a stable rise in frequency of cancer across the period where a total of 1990 cancer cases were recorded consisting of 1001 (50.3%) males and 989 (49.7%) females. Cervical cancer (22.9%), Breast cancer (18.9%), Ovary cancer (8.2%), non-melanoma cancer of skin (6.3%), and Uterus cancer (6.2%) were the most common female cancers. In males, prostate cancer (16.5%), bladder cancer (10.2%), non-melanoma skin cancer (9.9%), colorectal cancer (9.3%) and cancer of connective tissue (6.3%) were most popular. Burkitt's lymphoma cancer (31.4%), other lymphoreticular cancers (23.8%) then retinoblastoma cancer (20%) predominated in children.<sup>2</sup>

## Breast cancer

One of the most popular malignancies affecting about one in nine women is breast cancer. It is undoubtedly the most dreaded cancer in women due to its psychological impacts. It is a disease in which the malignant cells are developing in the tissue of the breast. Breast cancer is of two types, Lobular cancer which begins in many small sacks in the breast that produce milk and Ductal cancer which develops in the tubes that carry milk from the lobules to the nipple within these broad categories and it is more common than lobular cancer.<sup>1</sup> It is also the type of cancer having the highest prevalence (45.7%) among the female in Nigeria and Border Countries.<sup>3</sup> Common signs and symptoms of breast cancer include change in a way the breast or nipple feeds, change in how the breast or nipple seems and discharge of the nipple.

Age is the common risk factor especially in western countries, The probability that 60 years old American woman will improve breast cancer in a single year is fourteen times that a 30 year old. Half of all women diagnosed are over age 65 (cancer facts 2012). Weight also serve as a risk factor such as overweight or being obese. It also includes the family and personal history, menstrual and reproductive history, medical and other factors.

## Breast cancer in nigeria

Breast cancer is now the most popular cancer and the second leading cause of death in Nigeria among women, it appeared as the condition that need more considerations, out of the list of all comparable conditions, and 56% cited as one of the top conditions they dreaded most. A study of cancer mindfulness in Nigeria showed that only 32% knew that breast lump has a warning sign of cancer, 58.3% were not aware of most warning sign, 9.8% knew method of detecting cancer and 50% did knew that cancer was curable when detected early. The low level knowledge of warning signs and identification may be responsible for late illustration, with as many as 64% of patients presenting six month after the onset of symptoms. The disease has been reported to have an early start among Nigerian women.<sup>4</sup> The spectrums of cancers in Nigeria and border countries are dominated by breast & Cervix uteri for females, and liver & prostate for males.<sup>3</sup>

A retrospective review in Sokoto state of Nigeria was carried out, comprising all patients with historically confirmed breast diseases between 2007 and 2011. Demographic characteristics, stage at presentation, management and follow up were included in the data studied, the prevalence rate of breast cancer in 2011 Sokoto state was 10.4 per 100 000 women. Late presentation was the average with 99.4% (811) presenting with advanced disease and 0.6% (5) staging with stage 2 disease. Therefore breast cancer continues to carry poor prognosis in this part of the country.<sup>5</sup> The aims of this study are to statistically investigate the reported cases of breast cancer by age and geographical area, and the number of cases categorized as dead and alive using the available statistical tools.

## Methodology

The study covered a period of 3 years from January 2010 to

September 2012; where 578 cases were used. Murtala Muhammad Specialist Hospital Kano Nigeria was selected as the case study area, owing among other factors to its large number of patient attending from different local government and even outside the state. Also, selection of the Kano state was based on the facts that it is the most populous state in the country. This situation proposes a wide range of selection as compared with areas outside the state.

The concept of data collection is concerned with obtaining statistical data which is precondition of any statistical research work. The data analysis was done using SPSS Version 20 statistical package. Frequency and simple percentages were used to describe qualitative variables. The quantitative variables were described using measures of central tendency and dispersion which are mean and standard deviation respectively since all the parametric assumptions are satisfied. Statistical significance difference among the cases, years and ages of the breast cancer patients was determined using factorial ANOVA (two-way analysis of variance). Significant association between their life condition dead/alive, geographical area rural/urban and years were tested using Chi-square test and P-value. The P-values less than 0.05 ( $\alpha$ ) were considered statistically significant.

## Results

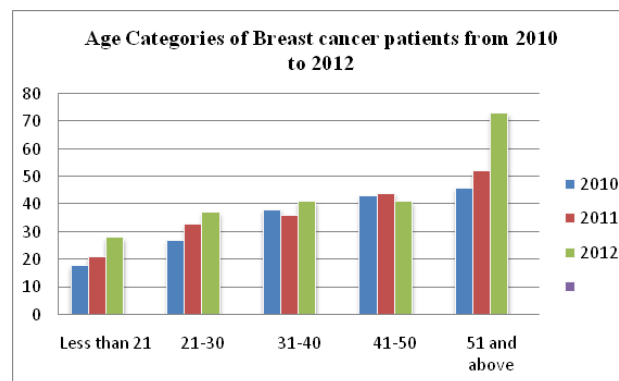
The descriptive statistics Table 1 below describes the age distribution of the breast cancer patients with 578 sample size as well as mean and standard deviation of 39.94 and 13.90 respectively. The mean and standard deviation are normally presented as  $39.94 \pm 13.90$ . Women above 51 years are having the highest frequency of 170 representing 29.4%. These shows that age serve as a risk factor and have a strong influence on the breast cancer since there was an increase in the disease incidence as a result of age categories differences. The incidence is higher in the older patients likened with the younger ones.

The data is represented in a bar chart below, where 2010 is estimated to be the year with minimum number of patients than 2011, while 2012 is estimated to be the year with highest number of patients affected by breast cancer, also the ages are increasing among years respectively Figure 1.

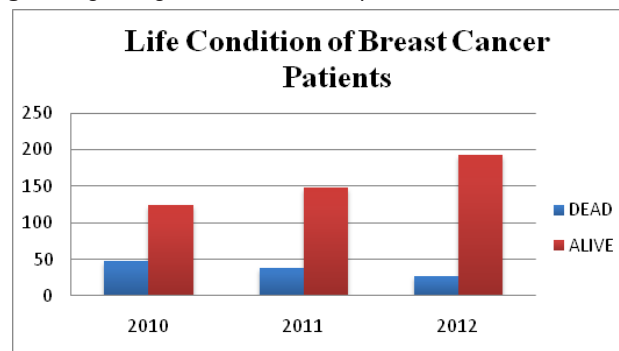
The number of patients in each age category at every year were assigned to be the cases in which the analysis of variance outcome with P-value of 0.81 indicates no statistical significant difference among the patients in the given years, likewise the p-value of 0.001 indicates that ages are significantly difference, all at  $\alpha = 0.05$  significance level. The chi-square test result with p-value = 0.632 shows no statistically significance difference between patients from urban areas and those from rural and this implies that the reported cases of breast cancer for those that are residing in urban and rural are equally probable.

**Table 1** Descriptive statistics of Age Distribution

Age Category	Frequency	Percentage (%)
Less than 21	68	11.8
21 - 30	98	17.0
31 - 40	115	19.9
41 - 50	127	22.0
Above 51	170	29.4
Total	578	100.0



**Figure 1** Age Categories of Breast cancer patients from 2010 to 2012.



**Figure 2** Life Condition of Breast Cancer Patients.

It is also indicates that the reported cases of breast cancer for those that are dead and those that are alive are not equally probable since the p-value is 0.001, and this shows that there is significance difference among their life condition. Referring to the bar chart below Figure 2.

The pattern shows that the number of breast cancer patients that are alive are much higher than those that are dead and the survival rate was simultaneously increasing.

## Conclusion

In this study, the result indicated that age has a strong influence on the occurrences of the disease and serves as a risk factor since the percentage is higher in older patients. However, the chart above indicated an increment in breast cancer reported cases in the subsequent years. This may be as a result of lack of awareness on the ways of controlling and preventing breast cancer in the particular society. The government and/or the ministry of health in collaboration with general public and most importantly the Non-Governmental Organizations (NGOs) must diligently work together in order to achieve the goal of minimizing the frequency of breast cancer occurrences in Kano state. This should be done by carefully looking at the risk factors. Age serve as the compounding variable for these studies. Based on the result obtained, women at age 51 and above are having the highest percentage (29%) of breast cancer reported cases and the cases are highly increasing yearly in the state.

## Acknowledgement

None.

## Conflict of Interest

None.

## References

1. Dollinger M, Rosenbaum EH, Cable G. Understanding Cancer in Everyone's guide to cancer therapy. Universal press syndicate company, USA; 1991. p. 1–9.
2. Mohammed AZ, Edino ST, Ochicha O, et al. Cancer in Nigeria A 10-Year Analysis of the Kano cancer registry. *Niger J Med*. 2014;17(3):280–284.
3. Isa AB, Evren H. Cancer Incidence in Nigeria and Border Countries. *Malays J Med Biol Res*. 2016;3:7–12.
4. Odusanya O, Olumuyiwa OT. Breast Cancer Knowledge Attitudes and Practice among nurses in Lagos, Nigeria. *Acta Oncol*. 2001;40(7):844–848.
5. Agbo PS, Khalid A, Oboirien M. Clinical Presentatio Prevalence and Management of Breast Cancer in Sokoto. *Nigeria J Women's Health Care*. 2014;3:149.