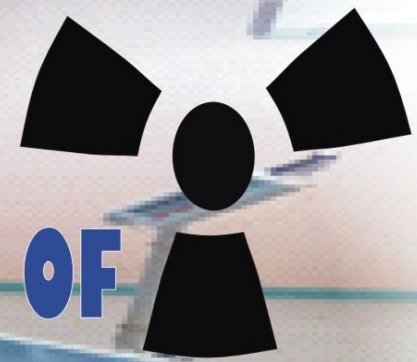


# JOURNAL OF THE ASSOCIATION OF RADIOGRAPHERS OF NIGERIA

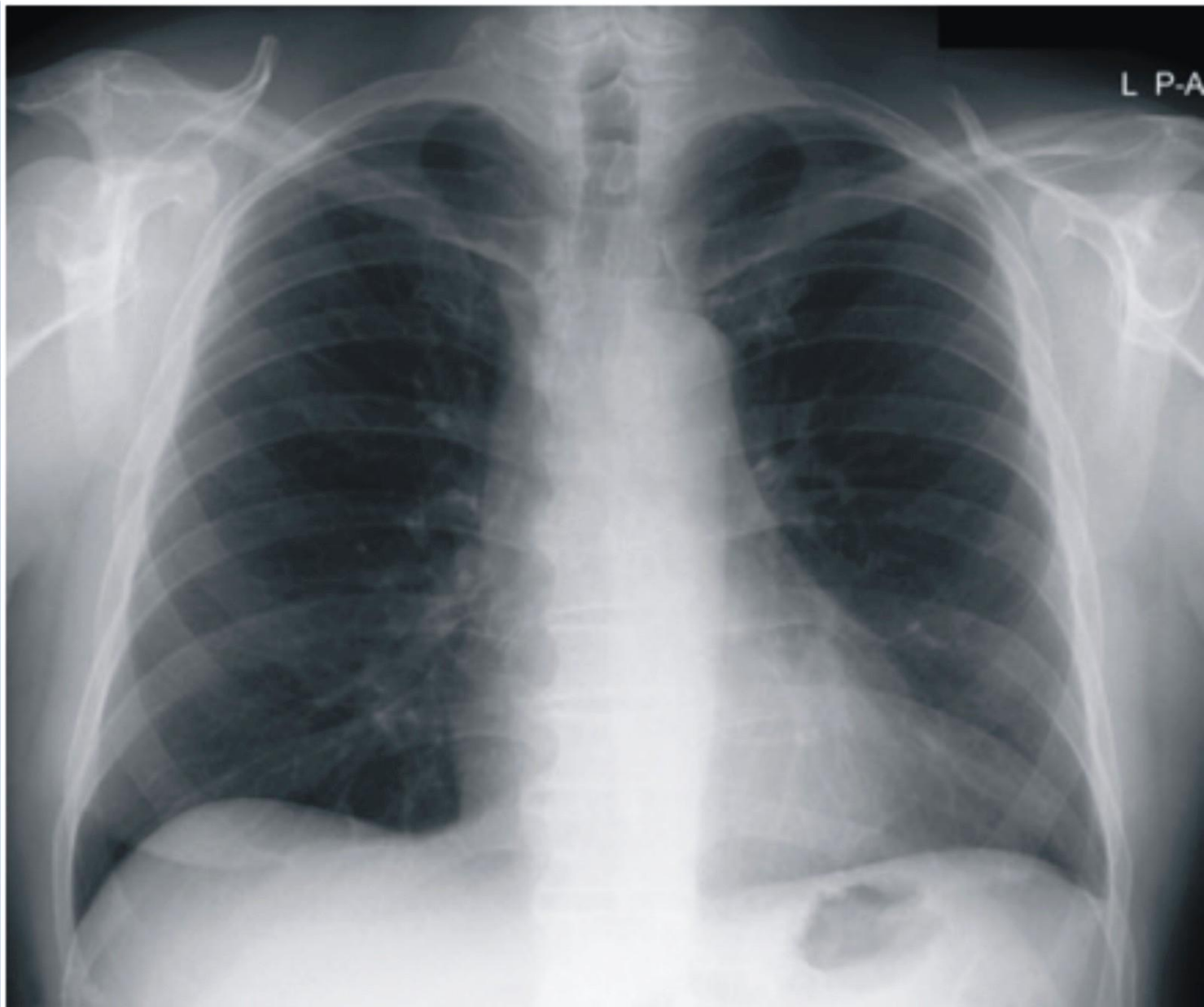


ISSN: 1115- 7976

Vol 29, Issue 1, December, 2015

The Official Journal of The Association of Radiographers of Nigeria

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Journal homepage: [www.jarnigeria.com](http://www.jarnigeria.com)

# Audit of Referral Pattern of Cancer Cases to the Radiotherapy and Oncology Unit of a Tertiary Hospital in Nigeria

Luntsi Geofery\*, Abdussalam Lawal, Adamu Abdullahi<sup>1</sup>, Nwobi I. Chigozie, Ida A. Patrick<sup>1</sup>, Nkubli B. Flavious, Auwal Abubakar, Muhammad Njiti

Department of Medical Radiography, College of Medical Sciences, University of Maiduguri, Nigeria

<sup>1</sup>Radiotherapy & Oncology Department, Ahmadu Bello University, Teaching Hospital, Zaria, Kaduna State.

\*Corresponding author: geostuffy@unimaid.edu.ng

Received: March 15, 2015. Received in revised form: September 25, 2015. Accepted December 10, 2015

## ABSTRACT

**Objectives:** This study assessed the types of cancer cases referred to Radiotherapy and oncology unit of Ahmadu Bello University Teaching Hospital (ABUTH) Zaria, and determine the age, sex, and geopolitical zones distributions of cancer cases in ABUTH, Zaria.

**Methods:** A retrospective study was conducted reviewing all cancer cases referred to the centre, for a period of 10 years (2004 – 2013). Ethical approval was obtained from the ethical committee of the hospital. Data capture sheet was used to collect information from the patient's folder and this was analysed using statistical package for social sciences version 20.0

**Results:** Three thousand nine hundred and thirty four (3934) patient's records were reviewed. Patient's age ranged from 0 -110 years, with a mean age of 42.4 years. Patients within the age range of 31 to 60 years had the highest cancer incidence. A total of 37 types of cancer were diagnosed with cervical cancer having the highest incidence of 1083 (27.5%). This was followed by head and neck 821 (20.9%). Intestinal cancer had the least incidence of 1 (0.02%). Female cancer cases predominated with a female to male ratio of 1.8:1. North-western Nigeria had the highest cancer incidence of 1656 (42.1%).

**Conclusion:** This study found high incidence of cancer cases among adults age ranged 31 to 60 years with female to male ratio of 1.8:1. Cervical cancer had the highest incidence among the 37 cancer spectrum treated at the centre. The North-western Nigeria had the highest incidence of cancer cases.

**Key word:** Cancer, Oncology, Patients, Radiotherapy, Referrals.

## Introduction

Cancer (Ca) remains a leading cause of morbidity and mortality in both the developed and developing countries of the world, with approximately 14 million new cases in 2012 and over 8.2 million ca-related deaths [1]. More than half of all cancers (56.8%) and ca deaths (64.9%) in 2012 occurred in developing regions due to a shift in life style and low awareness [1,2,3].

The burden of cancer in Nigeria is unknown, mainly because of lack of statistics or under-reporting [4]. This is however, not peculiar to

Nigeria alone, but most parts of Africa and other developing nations of the world. In a study of cancer registry literature update from all over the world, only 1% of the literature emanated from Africa compared to 34% and 42% from Europe and Asia respectively. This is partly due to inaccurate population statistics which makes age specific incidence rates impossible or if available, inaccurate. The better half of the population still never seeks orthodox medical care and so are not recorded [4].

More than 60% of world's total new annual cases occur in Africa, Asia, Central and South America. These regions account for 70% of the world's cancer death and will rise from 14 million in 2012 to 22 million in 2030 [5]. The 2002 estimated incidence of cancer by the World Health Organization (WHO) from different sites in Nigeria revealed 90.7 and 100.9 per 10,000 for males and females, respectively [6]. Majority of the new cancer cases occur in the age group of 65 years and above. However, cancer distribution differ among the developed and developing countries of the world. While cancer in the elderly dominates in the former, the latter has more cases in children, adolescence, and young adults[6].

A study by Fatimah [4], showed that the common female cancer in 1960-69 was cancer of the cervix, in 1998, breast became the commonest cancer among female followed by cervix and ovary. Current data show that female cancers account for about half of the total cases. The common female cancers reported from the Northern part of Nigeria are cancer of the cervix, breast and ovary, while from Enugu and Lagos (South-east and South-west), breast cancer is commonest followed by cancer of the cervix with both accounting for over 40% [4].

Cervical cancer is the second most common cancer in Nigerian women and the most common female genital cancer constituting a major cause of mortality among Nigerian females in their most productive years, between the ages of 17-80 years which peaks in the 5th decade of life [4]. This has been attributed to poor screening facilities, and lack of organized national screening programme. The Patients are multiparous with average parity of 5.6-6.5. Multiple marriages, and late presentation are common and majority of the patients have not had Pap smear done before. Squamous cell carcinoma is the most common (90-91%) histological type while adenocarcinoma represents 2.4% to 5.1% [4].

Socio-demographic factors, such as low socio-economic level, early age at first sexual

intercourse and multiple sexual partners, place women at high risk of developing cervical cancer in northern Nigeria, where late presentation with advanced disease predominates [6]. Anderson (2014) [7], reported that more than 50% of all cancer patients will receive radiotherapy either exclusively, or in combination with other forms of treatments such as surgery, stereotactic radiosurgery, neoadjuvant radiation, intraoperative radiation therapy, chemo-radiation or radio-chemotherapy.

Thus this study was aimed at determining the pattern of cancer cases diagnosed and referred to ABUTH Radiotherapy and oncology centre and their age, sex and geopolitical zones distribution.

### **Material and methods**

A retrospective survey study was conducted reviewing all cancer cases referred to Radiotherapy and Oncology unit of Ahmadu Bello University Teaching Hospital Zaria, from 2004 to 2013. Ethical approval was obtained from the ethical committee of the hospital. Data was collected using a data capture sheet with columns for date of examination, age, gender, marital status, anatomy affected, type of cancer, type of radiotherapy administered. The radiotherapy machine used in the centre was Radionuclide Co-60 machine manufacture in 1999 in France and with source type and activity of GK60T03 and 215TBq, respectively. Data was analysed using descriptive statistics from the statistical package for social sciences (SPSS) version 20.0.

### **Results**

A total of 3,934 records of patients diagnosed with cancer and referred to the oncology and radiotherapy unit of ABUTH Zaria were reviewed for a period of ten (10) years, January 2004 to December 2013. Table 1 shows the pattern of cancer diagnosed and referred to the oncology and radiotherapy unit of ABUTH Zaria, with cervical cancer having the highest cancer incidence of 1083 (27.5%), and intestinal cancer was the least with 1 (0.02%).

Figure 1 shows the type of treatment the patient received in the oncology and radiotherapy unit of ABUTH, with 2264 (57.55%) of the patients receiving radiation therapy and 1670 (42.45%) receiving other forms of treatment either chemotherapy or surgery.

Table 2 depicts sex distribution of cancer; Female cancer incidence was found to be higher than that of the male with a frequency of 2,616 (66.18%) and 1,318 (33.6%) in males respectively.

Figure 2 that the age group with the highest cancer incidence is 40-50 years (25.74%) and 91-110 years had the least incidence of 0.05%.

Figure 3 shows geopolitical zone distribution of cancer with the northwestern part depicting the highest cancer incidence of 42.1% and the least being south-south with an incidence of 5.99%.

### Discussion

A total 3934 records of patients diagnosed with cancer and referred to the oncology and radiotherapy unit of ABUTH Zaria were reviewed, among whom 1318 (33.6%) were males and 2616 (66.18%) were females, with age range of 0 -110 years with a mean age of 42 years.

A spectrum of 37 carcinoma were referred to Oncology and Radiotherapy unit of ABUTH within a period of 10 years. Cervical cancer had the highest frequency of 1083 (27.5%), followed by head and neck 821 (20.9%) and breast cancer 809 (20.7%). Intestinal cancer had the least frequency of 1 (0.02%). Out of the 3934 patients referred to the oncology and radiotherapy unit of the hospital, 2262 (57.5%) of the patients received radiation therapy and or in combination with other treatments. This could be due to the fact that majority of the cancer patients presented at a late stage when palliation was the best option.

Radiotherapy is a major cancer treatment modality involved in over 50% of cancer treatments and about 40% of cancer cure. Modern radiotherapy techniques such as intensity modulated radiation therapy (IMRT) and high precision image guided radiotherapy (IGRT), as well as dose escalation strategies to limited volumes, have demonstrated

not only improved effectiveness but also reduced toxicity [8]. This result is similar to the result of previous studies [7,9,10].

The belief that cancer is caused by evil spirits and cannot be treated with orthodox medicine has been reported as confounding factor in our environment [10]. Most patients usually present in the hospital after failure of herbal, traditional, and spiritual treatments. At this point, the disease has often progressed significantly with distant metastasis.

Cancer incidence in females predominated over males 2,616 (66.16%) and 1,318 (33.6%) respectively. These findings tallies with the World Health Organization (WHO) [1,2,3] estimate of Nigerian cancer incidence of 90.7% and 100.9% per 10,000 for males and females respectively. Socio-cultural background, diet, and other factors like sex may not be unassociated to prevalence among women.

Cervical cancer with an incidence of 1083 (27.5%) was diagnosed among female patients, and patients from the northern part of the country had the highest incidence of 24.4%. This was found to be similar to the report by Fatimah [4]. The vulnerability of the female genitourinary system to infections especially the Human Papilloma Virus (HPV) which has been implicated to cause cancer could be a factor and also socio-demographic predispositions which include poor socio-economic status, early age at first sexual intercourse and multiple sexual partners, place women at high risk of developing cervical cancer in this region of the country, where ignorance and late presentation with advanced disease stages predominates.

Breast cancer with a frequency of 809 (20.7%) occurred in both sexes with higher incidence in females 784 (20.1%) than in males 25(0.6%). This is in line with the report of Fatimah [4], who stated that male breast cancer constitutes 3.7% to 8.6% of all breast cancers in Nigeria. The higher incidence in females could be attributable to such predisposing factors as gender, aging, genetic risk factors including BRCA1 (Breast Cancer gene 1) and BRCA2 (Breast Cancer gene 2) genes, family

history of breast cancer, personal history of breast cancer, not having children or having the first child at age 30, not breast feeding, early menarche, late menopause, post menopausal obesity, alcohol consumption, obesity have all been implicated as predisposing factors. This agrees with the report by American Cancer Society (ACS) [11], who stated that about 66% of breast cancer cases are diagnosed among women 55 years and above. Breast cancer was also found to be more prevalent in northern part of the country with an incidence rate of 12.5% out of the 20.7% total incidence. This could be related to diet, cultural dispositions, low socio-economic level, high rate of illiteracy, ignorance, late presentation at which time the disease may have metastasized.

Head and neck cancer with an incidence of 821 (20.9%) had higher incidence in males (12.6%) than in females (8.3%). This result agrees with that of Larizadeh et al [12], who also found higher incidence of head and neck cancer cases in males than females. The higher incidence in males than in female in this study could be as a result of high consumption of carcinogenic substances such as tobacco and alcohol among others [13].

The highest cancer incidence occurred between ages 31 to 60 years particularly among patients within the ages of 40 to 50 years, followed by those within the age range 50 to 70 years.

This is in agreement with the findings of ACS [11] who suggested that the risk of developing cancer increases with aging. However this finding contradicts the report by Globalcan [5], where more cases were recorded among children, adolescence, and young adults. This variation may be due to race, dietary or socio-economic nature of the populations studied as majority of data from which the result of Globacan was based on were more from developed countries and only very few were reported from developing countries like Nigeria [5].

In terms of geopolitical zone distribution of cancer, North-west had the highest prevalence with 42.0%, followed by North-central with a prevalence of 21.0%, and then North-east with 17.0%, and the least were from South-west with 8.0%, South-east with 6.0% and South-south with 6.0%. Ignorance, cultural dispositions, poor socioeconomic status, among others may be the reason for the high prevalence of cancer case in northern Nigeria as reported by Adewuyi [6]. However proximity and accessibility of the healthcare facility might be a confounding factor as the teaching hospital is located in North-west geopolitical zone of the country.

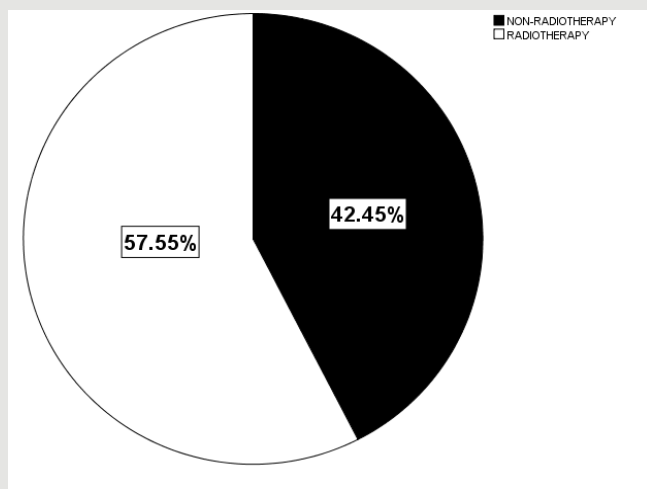


Fig. 1: Types of treatment

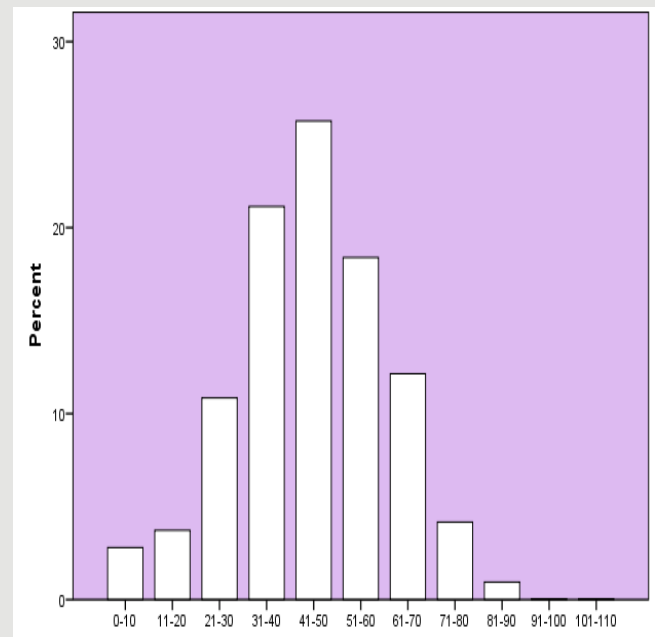


Fig. 2: Age Distribution

**Table 1: Types of Cancer Referred to ABUTH Oncology Unit.**

Type of cancer	Frequency	%
Head & Neck	821	20.9
Retinoblastoma	66	1.6
Nasopharyngeal Ca.	198	5.0
Breast Ca.	809	20.7
Cervical Ca.	1083	27.5
Bladder Ca.	88	2.1
Prostate Ca.	128	3.1
Rectal Ca.	67	1.6
Karposi Sarcoma	81	2.0
Anal Ca.	30	0.8
Hodgkin Lymphoma	43	1.1
Non-Hodgkin lymphoma	16	0.34
Ovarian Ca.	40	1.0
Endometrial Ca.	25	0.6
Uterine Ca.	15	0.4
PLCC Carcinoma	8	0.22
Colonic Ca.	43	1.1
Penile Ca.	10	0.2
Vaginal Ca.	14	0.3
Vulva Ca.	14	0.3
Scrotal Ca.	7	0.14
Lung Ca.	15	0.3
Colorectal Ca.	9	0.18
Vertebral Ca.	3	0.06
Upper limb Ca.	63	1.6
Lower limb Ca.	158	4.0
Renal Ca.	29	0.7
Ca Caecum	5	0.1
Peritoneal Ca.	6	0.12
Pancreatic Ca.	6	0.12
Intestinal Ca.	1	0.02
Sternal Ca.	4	0.08
Testicular Ca.	7	0.14
Ca of the Back	5	0.1
Skin Ca.	4	0.08
Urethral Ca.	2	0.04
Ca of unknown origin	11	0.22
<b>Total</b>	<b>3934</b>	<b>100</b>

**Table 2: Sex Distribution of Cancer**

Type of cancer	Male (Freq/%)	Female (Freq/%)	Total (Freq/%)
Head & Neck	493 (12.6%)	328 (8.3%)	821 (20.9%)
Retinoblastoma	46(1.1%)	20 (0.5%)	66 (1.6%)
Nasopharyngeal Ca.	139 (3.5%)	59 (1.5%)	198 (5.0%)
Breast Ca.	25 (0.6%)	784(20.1%)	809 (20.7%)
Cervical Ca.	0 (0.0%)	1083 (27.5%)	1083 (27.5%)
Bladder Ca.	70 (1.7%)	18 (0.4%)	88 (2.1%)
Prostate Ca.	128 (3.1%)	0 (0.0%)	128 (3.1%)
Rectal Ca.	37 (0.9%)	30 (0.7%)	67 (1.6%)
Karposi Sarcoma	50 (1.2%)	31 (0.8%)	81 (2.0%)
Anal Ca.	23 (0.6%)	7 (0.2%)	30 (0.8%)
Hodgkin lymphoma	35 (0.9%)	8 (0.2%)	43 (1.1%)
Non-Hodgkin lymphoma	14 (0.3%)	2 (0.04%)	16 (0.34%)
Ovarian Ca.	0 (0.0%)	40 (1.0%)	40 (1.0%)
Endometrial Ca.	0 (0.0%)	25 (0.6%)	25 (0.6%)
Uterine Ca.	0 (0.0%)	15 (0.4%)	15 (0.4%)
PLCC	7 (0.2%)	1 (0.02%)	8 (0.22%)
Colonic Ca.	27 (0.7%)	16 (0.4%)	43 (1.1%)
Penile Ca.	10 (0.2%)	0 (0.0%)	10 (0.2%)
Vaginal Ca.	0 (0.0%)	14 (0.3%)	14 (0.3%)
Vulva Ca.	0 (0.0%)	14 (0.3%)	14 (0.3%)
Crotal Ca.	7 (0.14%)	0 (0.0%)	7 (0.14%)
Lung Ca.	8 (0.16%)	7 (0.14%)	15 (0.3%)
Colorectal Ca.	5 (0.1%)	4 (0.08%)	9 (0.18%)
Vertebral Ca.	2 (0.04%)	1 (0.02%)	3 (0.06%)
Upper limb Ca.	38 (1.0%)	25 (0.6%)	63 (1.6%)
Lower limb Ca.	95(2.4%)	63 (1.6%)	158 (4.0%)
Renal Ca.	16 (0.4%)	13 (0.3%)	29 (0.7%)
Ca caecum	3 (0.06%)	2 (0.04%)	5 (0.1%)
Peritoneal Ca.	4 (0.08%)	2 (0.04%)	6 (0.12%)
Pancreatic Ca.	5 (0.1%)	1 (0.02%)	6 (0.12%)
Intestinal Ca.	1 (0.02%)	0 (0.0%)	1 (0.02%)
Sternal Ca.	4 (0.08%)	0 (0.0%)	4 (0.08%)
Testicular Ca.	7 (0.14%)	0 (0.0%)	7 (0.14%)
Ca of the back	5 (0.1%)	0 (0.0%)	5 (0.1%)
Skin Ca.	2 (0.04%)	2 (0.04%)	4 (0.08%)
Urethral Ca.	2 (0.04%)	0 (0.0%)	2 (0.04%)
Ca of unknown Origin	10 (0.2%)	1 (0.02%)	11 (0.22%)
<b>Total</b>	<b>1318 (33.6%)</b>	<b>2616 (66.18%)</b>	<b>3934 (100%)</b>

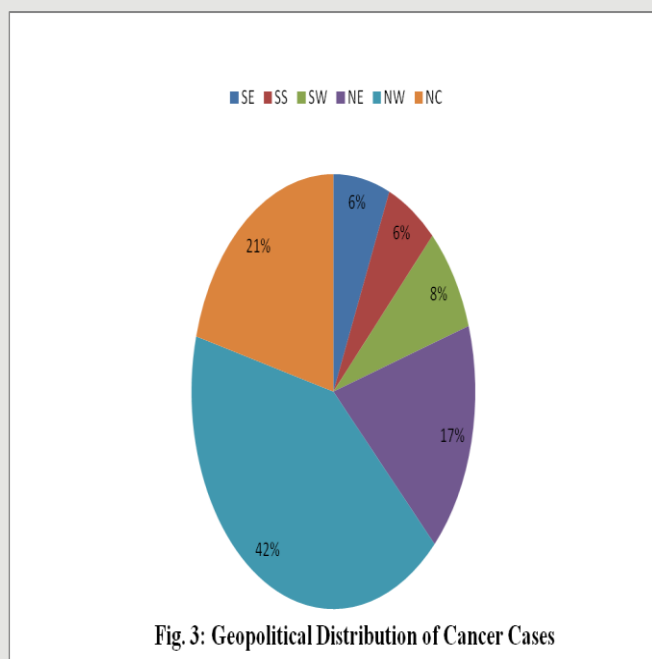


Fig. 3: Geopolitical Distribution of Cancer Cases

**KEY:** SE- South East, SS - SouthSouth, SW-South West, NE-North East, NW-North West, NC-North Central

### Conclusion

Findings from this study has shown the pattern of cancer cases referred to the oncology and radiotherapy unit of ABUTH Zaria, with high incidence among adults within the age range of 31 to 60 years, and with female to male ratio of 1.8:1. Cervical cancer had the highest incidence among the 37 types of cancer diagnosed and referred to the facility. Out of the 6 geopolitical zones in Nigeria, Northwest had the highest incidence of cancer cases.

### Recommendations

We strongly recommend intensive public campaign against cancer through the print and the electronic media, seminars, workshops and symposiums on the facts and myths of cancer to enlighten the general public on the scourge of cancer in our society, and also make cancer screening free and accessible to the common man in the society.

**Conflict of Interest:** None declared.

### References

1. World Health Organization, (2014); *cancer fact sheet* No. 297. available at [www.who.international/mediacentr/factsheets/fs297/en](http://www.who.international/mediacentr/factsheets/fs297/en) Accessed on 08/30/2014
2. International Agency for Research on Cancer, (2013); *World cancer statistics*. Available at <http://www.iglobocan.iarc.fr>, {accessed on 16/04/2014}.
3. World Health Organization, and International Agency for Research on Cancer, (2013); latest world cancer statistics, press release no 223. Accessed On 17<sup>th</sup> April, 2014.
4. Fatimah A., (2009); *epidemiology and incidence of common cancers in Nigeria Cancer Registry*. An epidemiology workshop. Department of anatomy and pathology, College of Medicine, University of Lagos. available at [ihvnigeria.org/ihvweb/web\\_new\\_download/cancer%20org/Nigeria](http://ihvnigeria.org/ihvweb/web_new_download/cancer%20org/Nigeria).
5. GlobalCan, 2012; *Nigeria cancer statistics from IARC*. Available at [www.nigeria/cancers/statistics](http://www.nigeria/cancers/statistics). Accessed on 02/09/2014.
6. Adewuyi S.A., Shittu S.O., Rafindadi A.H., (2008); *sociodemographic and clinic-pathologic characterization of cervical cancer in northern Nigeria*. European Journal of Gynecological Oncology,29(1): 61-64.
7. Anderson M.,D., 2014; *radiation therapy*, available at [www.mdanderson.org/cancer-information/cancertreatment/radiation](http://www.mdanderson.org/cancer-information/cancertreatment/radiation). Accessed on 28/08/2014.

8. Rivera Sofia, Conchita Vens, Philippe Maingon, Anne Sophie Govaerts, Emad Shash, Denis Lacombe, Warren Grant, Vincent Grégoire. (2013) Combining novel targeted therapies and radiotherapy: A challenge to overcome. Proceedings of the AACR-NCI-EORTC International Conf: Mol Cancer Ther 2013;12(11 Suppl)
9. Ong, S.; Watters, J. M.; Grunfeld, E.; O'Rourke, K., (2005). Predictors of referral for adjuvant therapy for colorectal cancer. Can J Surg, 48 (3):225 - 229.
10. Adewuyi SA, Usman AM, Samaila MO, Ajeikigbe AT, Ketiku KK. (2013) Clinicopathologic characterization of nasopharyngeal carcinoma seen in the radiotherapy and Oncology Department, Ahmadu Bello University Teaching hospital, Zaria, Nigeria: 2006-2010. West Afr J Radiol;20:89-95
11. American Cancer Society (ACS) (2014) Breast Cancer. Detailed Guide. <http://www.cancer.org/cancer/breastcancer/detail/edguide>. Accessed on 02/02/2015
12. Mohammad LH, Damghani MA, and Shabani M. (2014) Epidemiological Characteristics of head and neck cancers in Southeast of Iran. Iran J. Cancer Prev. 7(2):80-86.
13. Baletine JR. (2011). Risk factors of Breast Cancer, Breast Cancer <http://medicinenet.com/breastcancer/riskfactor>

**How to cite: Luntsi G, Abdussalam L, Adamu A, Nwobi IC, Ida AP, Nkubli BF, Auwal A, Njiti M. Audit of Referral Pattern of Cancer Cases to the Radiotherapy and Oncology Unit of a Major Tertiary Hospital in Northern Nigeria. J Assoc Rad Niger, 2015; 29 (1): 40 – 46**