

## Pattern of Cancers at a Rural Referral Centre in North-Eastern Nigeria

Hadiza A. Usman<sup>1</sup>, Bala M. Audu<sup>1</sup>, Ibrahim M. Sanusi<sup>1</sup>, Mohammed Bukar<sup>1</sup>, Pindiga U. Hamidu<sup>2</sup>

### ABSTRACT

**Background:** Cancers have wide regional, urban/rural variations in reported prevalence.

**Objectives:** To determine the baseline pattern of cancers in the first 5 years from Hospital-based records of cancer cases at Federal medical centre Nguru, Northeast Nigeria.

**Methods:** A retrospective review of all histologically confirmed cancer cases managed at a rural referral tertiary health facility in Northeast Nigeria for the period 1<sup>st</sup> January, 2009 to 31<sup>st</sup> December, 2013 was undertaken.

**Results:** Of the 237 histological specimens during the period under review, 165 (69.6%) were cancers. Female cancers (n=101; 61%) were more than male cancers (n=64; 39%) and the mean age ( $\pm$ SD) for all cancers was 48.1( $\pm$ 18.7) years. The mean age for cancer was lower in females (Student t-test 5.103,  $P < 0.001$ ). The mean ages for the 3 commonest cancers in this centre were; 45.1  $\pm$  15.2 years for breast; 49 $\pm$ 10.9 years for cancer of the cervix and 67.4 $\pm$ 7.6 years for prostate cancer. The commonest cancer sites were in the female and male genital tracts. However, review of individual cancers showed that breast cancer was the commonest (n=31; 18.8%) followed by prostate cancer (n=29; 17.6%). The 3<sup>rd</sup> commonest cancer was that of the cervix which constituted 11.5% (n=19). Skin (excluding melanoma), gastrointestinal, head and neck and melanoma constituted 8.0%, 6.6%, 6.0% and 4.2% respectively. Only 1 case of childhood cancer (endodermal sinus tumour) was seen in an 18 months old child while cancers in teenage age group (13-19 years) constituted 3% (n=5); there were 2 squamous cell carcinoma of the skin, 1 each for Hodgkin's lymphoma, osteosarcoma and a retinoblastoma.

**Conclusion:** The pattern of cancers in this rural population is similar to findings in other parts of the country. Women have the highest burden but a lower mean age of cancers in this study. Breast, prostate and cervical cancers were the 3 commonest cancers constituting 48% of the cancer burden. There is the need for strategic preventive measures, including the establishment of an oncology unit, to reduce the burden of cancers in this community.

**Keywords:** Pattern of Cancers, Burden of Cancers, Malignancies, Prevalence, Northeast Nigeria.

<sup>1</sup>Department of Obstetrics and Gynaecology, University of Maiduguri Teaching Hospital, Maiduguri, Borno State, Nigeria.

<sup>2</sup>Department of Pathology, University of Maiduguri Teaching Hospital, Maiduguri, Borno State, Nigeria.

Dr. Hadiza Abdullahi Usman,  
Department of Obstetrics and Gynaecology,  
University of Maiduguri Teaching Hospital,  
Maiduguri, Borno State, Nigeria.  
eMail:-adiusman@yahoo.co.uk

#### Access this article online

Quick Response Code	
	website: <a href="http://www.bornomedicaljournal.com">www.bornomedicaljournal.com</a>
	DOI: 10.31173/bomj.bomj_103_15

### Introduction

Globally, cancer has become a public health issue. In 2012, 57% of all new cancer cases and 65% of cancer deaths occurred in less developed region of the world.<sup>2</sup> It was the second leading cause of death after cardiovascular diseases in 2013.<sup>3</sup> The burden of cancer was expected to have risen to 56% by 2008 and it has been projected that, by 2030, 70% of all new cancer cases will be from low- and middle income countries.<sup>4,5</sup> This increase in incidence has been attributed to the recent westernized life style changes, rapid population growth, aging populations, increasing life expectancy and high prevalence of HIV/AIDS in the sub-region.<sup>6,7</sup> In low- and middle income countries such as Nigeria, chronic infections by carcinogenic viruses such as Human Papilloma



Virus (HPV), Hepatitis B virus, Hepatitis C virus, and Epstein-Barr virus in addition to the HIV infection has been attributed to 15% of cancers diagnosed in 2012.<sup>7</sup> While these infections were attributable to 3.3% of cancers in developed world, they are responsible for 32.7% of the annual incidence of cancers in developing countries.<sup>8</sup> These has increased the burden of non-communicable diseases in the sub-region.<sup>9</sup> Tragically, the region has the worst prognosis for cancer cases due to lack of awareness, late presentation and ill-equipped health system needed for cancer care.<sup>3,6</sup>

The burden of cancer in Nigeria is enormous though under reported. In 2008, there were 681,000 new cancer cases in Africa and Nigeria alone contributed 15% to the burden of the disease.<sup>10</sup> With an annual incidence of 100,000 new cases, the case fatality ratio in Nigeria has been consistently high.<sup>11</sup> The pattern of cancers varies from region to region.<sup>12</sup> Worldwide, lung cancer was the most common cancer contributing 13% of the total cases in 2012, while breast cancer (women only) was the second with nearly 1.7 million (11.9%) new cases in 2012.<sup>2</sup> In Nigeria, various hospital-based cancer registries had reported preponderance of female cancers over male cancers. Similarly, same reports showed that the most common cancers in those parts of the country were prostate cancer in men and breast cancer in women.<sup>13-16</sup>

The World Health Assembly in 2017 passed the resolution 'Cancer Prevention and Control through an Integrated Approach' (WHA70.12) with the aim of accelerating action to achieve the targets specified in the Global Action Plan and 2030 UN Agenda for Sustainable Development to reduce premature mortality from cancer.<sup>17</sup> The few cancer registries in Nigeria are situated in the urban cities leaving data from undersearved rural communities uncaptured. If the UN 2030 agenda on reducing premature mortality from cancer is to be achieved, representative cancer data from various communities need to be captured for proper records and planning. We therefore, reviewed records of all histologically confirmed cases of cancers for the first five years of proper

records keeping of histological specimens at the Federal Medical Center Nguru, a rural referral center in Northeast Nigeria. This study will provide baseline data for cancers in this underserved rural referral center for the purpose of future research, policy planning on cancer prevention and comparism with other region of the country.

### Materials and Methods

This was a retrospective analysis of all cases of histologically confirmed cancers at the Federal Medical Centre (FMC) Nguru for the period 1st January 2009 to 31st December 2013. The FMC is the only Federal Referral Centre in Yobe state, Nigeria, and serves large population in the state, neighbouring Jigawa state, and some part of Niger republic. Results were retrieved from the cancer registry of the University of Maiduguri Teaching Hospital which serves as the primary referral pathology laboratory for all specimens from Federal Medical Centre Nguru. It is the Hospital policy to send all surgical specimens and products to the histopathology laboratory of UMTH. However, due to financial constraints or ignorance on the part of the patients, not all specimens get to the UMTH. The tumour histologic types were coded according to the International Classification of Diseases, ICD-10.<sup>1</sup> Demographic variables such as sex and age and tumour sites were retrieved. Statistical analysis was done using IBM SPSS version 20.0 (Armonk, NY: IBM Corp.). Ethical approval was obtained from the institutional Research committee of the FMC. Results are presented in frequency tables, charts, simple percentages and means.

### Result

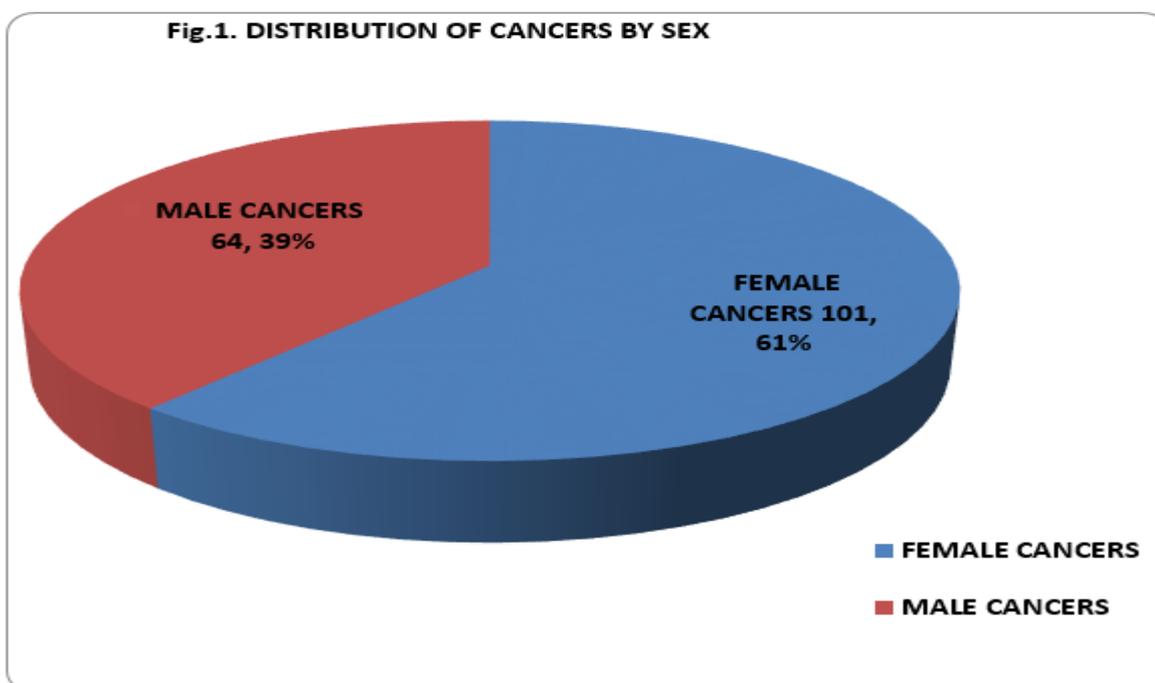
There were 237 histological specimens during the period under review of which 165 (69.6%) were histologically confirmed cancers. Cancers were more common amongst females (N=101; 61%) than males (N=64; 39%) in the ratio of 1.6: 1 as presented in figure 1. Table 1 depicts the age range for all cancers to be between 18 months to 100 years with a mean age (SD) of 48.1 ( $\pm$  18.7) years. Cancers were more likely to occur in younger age group in females than males (Student t-test 5.103,



P < 0.001) with a range of 12 years to 80 years, mean (SD) of 43 (± 15.4) years for female while males had age range between 18 months and 100 years with a mean (SD) of 56.2 (± 20.1) years. The 18 months old child had endodermal sinus tumour (testicular embryonal carcinoma) while the 100-year-old man had melanoma. The mean ages for the 3 most common cancers were; 45.1± 15.2 years for breast; 49 ± 10.9 years for cancer of the cervix and 67.4± 7.6 years for prostate cancer. Classification of the tumour according to histological sites showed that female genital tract cancers were the most common cancer sites constituting 26.6 % (n=44) of all cancers. The 2<sup>nd</sup> commonest cancer site was breast (n=31; 18.7%) while male genital tract was the 3<sup>rd</sup> (n=30; 18.1%) as shown in table 2. Table 3 showed the sex distributions of the most common cancers in the centre; breast cancer (n=31; 18.8%) was the commonest cancer followed by prostate cancer

(n=29; 17.6%) and cervical cancer (n=19; 11.5%). The three most common female genital cancers were cervical cancer (n=19; 43.2%), ovarian cancer (n=12; 27.3%) and choriocarcinoma (n=9; 20.5%). Of the 31 cases of breast cancers, 3 (9.7%) occurred in males giving a male-female ratio of 1:10. Prostate cancer was the most common male cancers and the commonest male genital tumour (n=29; 96.7%). Only 1(3.3 %) case of testicular cancer was observed during the period under review. Gastrointestinal (colorectal, gastric) cancers were more common in males (n=8; 72.7%) than females (n=3; 27.3%). Childhood cancers were rare; only 1 case of endodermal sinus tumour in an 18-month old child while cancers in teenage age group (13-19 years) constituted 3% (n=5); 2 squamous cell carcinoma of the skin, 1 each for Hodgkin's lymphoma, osteosarcoma and a retinoblastoma.

**Fig.1. DISTRIBUTION OF CANCERS BY SEX**



**Table 1:** Age distributions (n=165)

VARIABLES	NUMBER	PERCENTAGE
<10	1	0.6
10-29	30	18.2
30-49	44	26.7
50-69	61	37
≥70	26	15.7
Missing values	3	1.8
<b>Total</b>	<b>165</b>	<b>100</b>

*Age range: 18 months to 100 years; mean age (SD): 48.1 ( $\pm$ 18.7) years*

**Table 2.** Histological sites (n= 165)

Cancer sites	Number	Percentage
Female genital cancers	44	26.6
Breast cancer	31	18.7
Male genital cancer	30	18.1
Skin (excluding melanoma)	13	8.0
Gastrointestinal cancers	11	6.6
Head and neck cancers	10	6.0
Melanoma	7	4.2
Soft tissue sarcomas	6	3.6
Lymphoreticular	5	3.0
Urinary tract cancers	3	2.0
Hepatobiliary	3	2.0
Testicular Embryonal carcinoma	1	0.6
Neural sheet cancer	1	0.6
<b>Total</b>	<b>165</b>	<b>100</b>



**Table 3:** Sites and sex distribution of the commonest cancers

Type of cancer	Number	Percentage
<b>Female Genital Cancers</b>		
Cervical	19	43.2
Ovarian	12	27.3
Choriocarcinoma	9	20.5
Endometrial	3	6.8
Vulval	1	2.2
<b>Total Female Genital Cancers</b>	<b>44</b>	<b>100</b>
<b>Breast Cancers</b>		
Female Breast Cancer	28	90.3
Male Breast cancer	3	9.7
<b>Total Breast Cancers</b>	<b>31</b>	<b>100</b>
<b>Male Genital Cancers</b>		
Prostate cancer	29	96.7
Testicular cancer	1	3.3
<b>Total Male Genital Cancers</b>	<b>30</b>	<b>100</b>

**Discussion**

The 69.6% of confirmed cases of cancers among the specimens sent to the histopathology laboratory reflects the high prevalence of the condition among the population of surgical patients seen in the studied area. However, contrarily to the rule were every mass or product taken from the body is expected to be taken to the histopathology labrotory, we observed that, some were discaded by relatives due to ignorance or lack of funds to pay for the histology report. The high prevalence could have been influenced by the surgoen’s selection of the type of specimens to insist on histology based on his/her suspicion for malignancy or otherwise.

Our study showed that there were more malignancies in females (61%) than males (39%). This is consistent with findings from Ibadan and Abuja cancer registries which revealed 66% and

66.4% respectively of preponderanace of female cancers.<sup>13</sup> Similar findings were reported from Ekiti<sup>15</sup> and as high as 85.9% female cancers was reported in a study by Popoola from Lagos, <sup>16</sup> all in the Southwestern region of Nigeria. Reports from Calabar, Zaria, Kano and Jos showed similar findings.<sup>18-21</sup> The high preponderance in female cancers is attributed to the fact that breast and female genital tract malignancy alone contributed to 45% of cancer incidence in our study. This is in keeping with the current global trend and with most reports from Nigeria where 2 out of the 3 most common cancers occur in females with breast and cervical cancers consistently amongst the three.<sup>14,18-22</sup>

The distribution of cancer in this region cuts across all age groups from as young as 18 months to 100 years. The mean age for all cancers of 48.1 (± 18.7)



years is in consonance with a study from Lagos.<sup>14</sup> Though reports have shown trends in younger age at presentation, studies from Nigeria showed that the peak age for cancers were between the 4<sup>th</sup> and 6<sup>th</sup> decades of life.<sup>15, 19, 21, 22</sup> Our study showed that cancer occurs more in younger age groups in females than males ( $P < 0.001$ ). This is in agreement with reports from Lagos where the peak age incidence for female cancers was between 40 and 44 years. With a higher reported crude incidence rate and age standardized rate in females' cancers more than males.<sup>15, 18</sup> The cancer burden in females in Nigeria may likely hit the 70% projected increase even before the year 2030 if no proactive policies and programmes for reducing the burden of female cancers in particular, and all cancers in Nigeria are formulated. The mean ages for the 3 most common cancers in this centre were; 45.1± 15.2 years for breast; 49 ± 10.9 years for cancer of the cervix and 67.4± 7.6 years for prostate cancer. The mean age for breast cancer of 45.1 years is similar to 48.2 years reported from Sokoto<sup>23</sup> which is also from the Northern region. While 35.7% of the cases of breast cancer were 35 years and below, there were also younger women with cervical cancer; 2 of them were 25 years old. The mean age for prostate cancer of 67.4 years is in agreement with 68 years by Badmus et.al. from South-western Nigeria.<sup>24</sup>

There has been a rapid increase in incidence of female breast cancer in developing countries, though the incidence of breast cancer generally is lower in developing than developed countries. The same report showed that prostate cancer was the leading cause for cancer incidence for men and breast cancer for women.<sup>3</sup> Our findings is in line with this report. Breast cancer was the overall commonest cancer in this study constituting 18.7% of all cancers and also the commonest female cancer. Report from Ibadan and Abuja cancer registries showed a 100% increase in incidence of breast cancer in a decade.<sup>13</sup> Other findings consistently showed breast cancer to be the most common cancer in Nigeria and the commonest female cancer, the second commonest being cervical cancer while prostate cancer is the most common male cancer.<sup>14,15,18-22,25</sup> With female

genital cancers and breast cancer constituting 41.2% of the burden of cancer in this center, programmes directed at awareness creation and screening for these female cancers will drastically reduce the burden of cancers in this region. Male breast cancer constituted 9.7% of the breast cancer with male-to-female ratio of 1: 10. This is higher than a previous report by Dogo et.al<sup>27</sup> from the same geopolitical zone. This is a reflection of the global trend on the increase in breast cancer generally.

Childhood cancers are rare as shown in our study. Majority were between the age of 13-19 years and the commonest childhood malignancies seen was squamous cell carcinoma of the skin, Hodgkin's lymphoma, osteosarcoma and a retinoblastoma. This is similar to a report on childhood cancers from Zaria, Northern Nigeria.<sup>28</sup> The low incidence of childhood cancers in this study could be due to the small sample size.

In conclusion, the pattern of cancer distribution in this underserved rural community is similar to findings in other parts of the country. Women have the highest burden of cancer and a lower mean age. Breasts, prostate and cervical cancers were the 3 most common cancers. There is the need for strategic preventive measures, including the establishment of an oncology unit, to reduce the burden of cancer in this community.

## References

1. World Health Organization. International classification of diseases for oncology (1st ed). Geneva: WHO; 1976.
2. Ferlay J, Soerjomataram I, Ervik M, Dikshit R, Eser S, Mathers C, et al. GLOBOCAN 2012 v1.0, Cancer Incidence and Mortality Worldwide: IARC Cancer Base No. 11 [Internet]. Lyon, France: International Agency for Research on Cancer; 2013. Available from: <http://globocan.iarc.fr>, accessed on 3/1/2018.
3. Global Burden of Disease Cancer Collaboration. The Global Burden of Cancer 2013. JAMA oncology. 2015; 1(4): 505-527.doi:10.1001/jamaoncol.2015.0735.



4. World Health Organization. Cancer: fact sheets Geneva: WHO; 2013. [29 November 2013].
5. Boyle P, Levin B (eds). International Agency for Research on Cancer. World Cancer Report 2008; Lyon, France. Available at [www.iarc.fr](http://www.iarc.fr); accessed 2/3/2018
6. Parkin MD, Freddy Sitas, Mike Chirenje, Lars Stein, Raymond Abratt, Henry Wabinga. Part 1: Cancer in Indigenous Africans-burden, distribution, and trends. *The Lancet Oncology*, volume 9, issue 7, July 2008: 683-692.
7. Jemal A, Bray F, Forman D, O'Brien M, Ferlay J, Center M, et al. Cancer burden in Africa and opportunities for prevention. *Cancer*. 2012; 118(18):4372-84. Epub 2012/01/19. doi: 10.1002/cncr.27410.
8. Plummer M, de Martel C, Vignat J, Ferlay J, Bray F, Franceschi S. Global burden of cancers attributable to infections in 2012: a synthetic analysis. *Lancet Glob. Health*. 2016; 4(9): e609-e616. doi: [http://dx.doi.org/10.1016/S2214-109X\(16\)30143-7](http://dx.doi.org/10.1016/S2214-109X(16)30143-7).
9. World Health Organization Regional office for Africa -AFRO: Non-communicable diseases and conditions-AHO- African Health Observatory -World health organization. Available at: [www.who.int](http://www.who.int); accessed 2/1/2018
10. Sylla BS, Wild CP. A million Africans a year dying from Cancer by 2030: What can cancer research and control offer to the continent? *Int J Cancer*. 2012; 130 (2):245-50.
11. Ferlay J, Shin HR, Bray F, Forman D, Mathers C, Parkin DM. Estimates of worldwide burden of cancer in 2008: GLOBOCAN 2008. *Int J Cancer*. 2010; 127: 2893-2917.
12. Bray F, Ren JS, Masuyer E, Ferlay J. Estimates of global cancer prevalence for 27 sites in the adult population in 2008. *Int J Cancer*. 2013 Mar 1; 132(5):1133-45. doi: 10.1002/ijc.27711. Epub 2012 Jul 26.
13. Jedy-Agba E, Curado MP, Ogunbiyi O, Oga E, Fabowale T, Igbinoba F, et al. Cancer Incidence in Nigeria: A Report from Population-based Cancer Registries. *Cancer Epid* 2012; 36(5): e271-8. <http://doi.org/10.1016/j.canep.2012.04.007>
14. Sowunmi A, Alabi A, Fatiregun O, Olatunji T, Okoro US, Durosinmi Etti AF. Trend of cancer incidence in an oncology center in Nigeria. *West Afr J Radiol* 2018; 25:52-6
15. Awolola NA, Komolafe AO, Ojo OO, Taiwo OJ, Odesanmi WO, Ajumobi KO. The spectrum of Malignant Neoplasms in Ekiti state, South-west Nigeria. *Nig Q J Hosp Med*. 2011; 21(4): 276-83.
16. Popoola AO, Omodele FO, Oludara MA, Ibrahim NA, Igwilo AI, Makanjuola SBL. Prevalence and Pattern of Cancers among Adults Attending a Tertiary Health Institution in Lagos, Nigeria. *Journal of Dental and Medical Sciences*. 2013; 6 (3):68-73.
17. Cancer prevention and control in the context of an integrated approach. The seventieth World Health Assembly, Wha70.12-World Health Organization. Available at: [apps.who.int/wha70/A70\\_R12-en](http://apps.who.int/wha70/A70_R12-en); accessed 1/1/2018
18. Ekanem IO, Parkin DM. Five-year Cancer incidence in Calabar, Nigeria (2009-2013). *Cancer Epidemiol*. 2016 Jun; 42: 167-72.
19. Samaila M O, Ayeni E I, Ahmed S A. Cancer pattern in a hospital-based registry. *Arch Int Surg* 2015; 5: 57-62
20. Yusuf I, Atanda AT, Umar AB, Imam MI, Mohammed A Z, Ochicha O, Haruna MS. Cancer in Kano, Northwestern Nigeria: A 10-year update of the kano cancer registry. *Ann Trop Pathol* 2017; 8:87-93
21. Mandong BM, Manasseh AN, Echejoh GO. Cancer in Nigerian Women: A Critical Need for Prevention Strategy. *Nig Med. Pract* 2009; 56 (1-2): 3-5
22. Afolayan E, Ibrahim O, Ayilara G. Cancer Patterns in Ilorin: An Analysis of Ilorin Cancer Registry Statistics. *Tropical Journal of Health Sciences*. 2012;19: 42-47
23. Agbo PS, Khalid A, Oboirien M. Clinical Presentation, Prevalence and Management of Breast Cancer in Sokoto, Nigeria. *J Women's Health Care* 2014; 3(2): 149. doi:10.4172/2167-0420.1000149
24. Badmus TA, Adesunkanmi ARK, Yusuf BM, Oseni GO, Eziyi AK, Bakare TIB, et al. Burden



- of prostate cancer in southwestern Nigeria. *Urology*. 2010; 76 (2):412-6.
25. Awodele O, Adeyomoye AA, Awodele DF, Fayankinnu VB, Dolapo DC. Cancer distribution pattern in south-western Nigeria. *Tanzania journal of health research*. 2011; 13:106-8.
26. Mohammed AZ, Edino ST, Ochicha O, Gwarzo AK, Samaila AA. Cancer in Nigeria: a 10-year analysis of the Kano cancer registry. *Niger J Med*. 2008; 17 (3): 280-4
27. Dogo D, Gali B, Ali N, Nggada H. Male breast cancer in north eastern Nigeria. *Nigerian journal of clinical practice*. 2007; 9: 139-41.
28. Usman B, Mohammed A. Carcinoma in children at Ahmadu Bello University Teaching Hospital Zaria. *Ann Nigerian Med* 2015; 9: 61-5

---

**Cite this article as:** Hadiza A Usman, Bala M Audu, Ibrahim M. Sanusi, Mohammed Bukar, Pindiga U. Hamidu. **Pattern of Cancers at a Rural Referral Centre in North-Eastern Nigeria. *Bo Med J* 2018;15(1): 21-28. Source of Support:** Nil, **Conflict of Interest:** None declare

---

