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Cancer Distribution Patterns over 5-Year Period (2016-2020) in Ekiti State Cancer Registry, Ido-Ekiti, Southwestern, Nigeria

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Abstract

Background: Cancer is one of the major disease burdens worldwide and the second leading cause of death after cardiovascular disease. In Nigeria, survival rate is low due to high cost of treatment and late presentation at the hospitals. According to the 2020 World Cancer Report, prevention is the "only consideration that will credibly decrease [cancer] burden". The WHO-endorsed Asturias Declaration, further asserted that "Primary prevention - prevention of the exposures that cause cancer - is the single most effective means of prevention." This approach requires the study of the geographical spread of different cancer types to ascertain the possible contributions of environmental exposures (including local geology) together with occupational exposures. *Materials and Methods:* The demographic data of 707 cancer patients spanning over a five-year period (2016-2020) were collected from the Ekiti State cancer registry situated in Federal Teaching Hospital, Ido-Ekiti (FETHI). Cancer occurrence as a function of socio-demographic variables such as cancer type, age, gender, geographical location and occupation of the subjects were studied using Excel spread sheet. *Results:* The result showed that cancer types were distributed as follows in Ekiti state: reproductive (37.2%), breast (33.5%), gastrointestinal track G.I.T. (7.1%), blood and bone marrow (3.1%), colon (3.1%), connective tissue (2.8%), skin (2.7%), metastatic (2.5%), liver and gall bladder (2.3%), brain (1.8%), endocrine (1.8%), kidney (1.6%), lungs (1.0%), lymphoma (0.8%), eye (0.7%) and jaw (0.4%). The number of male and female subjects were 264 (37.3%) and 443 (62.7%), respectively, with 53% of the female subjects presenting with breast cancer. The age at diagnosis ranged from less than-one-year to 100 years with an average of 57.8 years. All the cancer of the jaw cases were in male subjects, while all the breast cancer cases were in female subjects. Similarly, more cases of cancer of reproductive sites were recorded in female (64.8 %) than in male subjects (37.2 %). The implicated age ranges from 30 to 80 years with trading being the most implicated occupation (38.6 %). The prevalence of cancer (number of cases divided by the population) ranged from 0.64 per 100,000 at Ise/Orun LGA to 15.59 per 100,000 at Ido-Osi LGA. This disparity can be due to the geology of these areas.

Conclusion: In Ekiti State, cancer occurrence is higher in females than males, the most frequent being cancer of reproductive sites. The average age of cancer patients was 57.8 years while Ido-Osi Local Government is worst hit in terms of cancer prevalence. This may be due to the underlying geology of the area.

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Abstrait

Contexte: Le cancer est l'un des principaux fardeaux de morbidité dans le monde et la deuxième cause de décès après les maladies cardiovasculaires. Au Nigéria, le taux de survie est faible en raison du coût élevé du traitement et de la présentation tardive dans les hôpitaux. Selon le Rapport mondial sur le cancer 2020, la prévention est « la seule considération qui réduira de manière crédible le fardeau [du cancer] ». La Déclaration des Asturies, approuvée par l'OMS, affirmait en outre que "la prévention primaire - la prévention des expositions qui causent le cancer - est le moyen de prévention le plus efficace". Cette approche nécessite l'étude de la répartition géographique des différents types de cancer pour déterminer les contributions possibles des expositions environnementales (y compris la géologie locale) ainsi que des expositions professionnelles.

Matériels et méthodes: Les données démographiques de 707 patients atteints de cancer sur une période de cinq ans (2016-2020) ont été recueillies auprès du registre du cancer de l'État d'Ekiti situé à l'hôpital universitaire fédéral d'Ido-Ekiti (FETHI). L'occurrence du cancer en fonction de variables sociodémographiques telles que le type de cancer, l'âge, le sexe, la localisation géographique et la profession des sujets a été étudiée à l'aide d'un tableur Excel.

Résultats: Le résultat a montré que les types de cancer étaient répartis comme suit dans l'état d'Ekiti: reproducteur (37.2%), sein (33.5%), voie gastro-intestinale G.I.T. (7.1%), sang et moelle osseuse (3.1%), côlon (3.1%), tissu conjonctif (2.8%), peau (2.7%), métastatique (2.5%), foie et vésicule biliaire

(2.3%), cerveau (1.8%), endocrinien (1.8%), rein (1.6%), poumons (1.0%), lymphome (0.8%), œil (0.7%) et mâchoire (0.4%). Le nombre de sujets masculins et féminins était de 264 (37.3%) et 443 (62.7%), respectivement, avec 53% des sujets féminins présentant un cancer du sein. L'âge au diagnostic variait de moins d'un an à 100 ans avec une moyenne de 57.8 ans. Tous les cas de cancer de la mâchoire concernaient des sujets masculins, tandis que tous les cas de cancer du sein concernaient des sujets féminins. De même, plus de cas de cancer des sites reproducteurs ont été enregistrés chez les sujets féminins (64.8%) que chez les sujets masculins (37.2%). L'âge impliqué varie de 30 à 80 ans, le commerce étant la profession la plus impliquée (38.6%). La prévalence du cancer (nombre de cas divisé par la population) variait de 0,64 pour 100 000 à Ise/Orun LGA à 15.59 pour 100 000 à Ido-Osi LGA. Cette disparité peut être due à la géologie de ces zones.

Conclusion: Dans l'État d'Ekiti, l'incidence du cancer est plus élevée chez les femmes que chez les hommes, le plus fréquent étant le cancer des sites reproducteurs. L'âge moyen des patients atteints de cancer était de 57.8 ans, tandis que le gouvernement local d'Ido-Osi est le plus touché en termes de prévalence du cancer. Cela peut être dû à la géologie sous-jacente de la région.

Introduction

Globally, cancer is known as the second leading cause of death after cardiovascular disease with estimates of 6.7 million deaths in 2008, and is projected to rise to 13.1 million deaths by 2030. Morbidity and mortality from cancer are projected to continue to rise to an estimation of 11.4 million deaths in 2030 [1,2]. In 2012, the Global Cancer statistics (GLOBOCAN) estimated 14.1 million new cases of cancer, 8.2 million cancer deaths and 32.2 million people living with cancer (based on five years prevalence) worldwide. Of these, 57% (8 million) of new cases, 65% (5.3 million) of cancer deaths and 48% (15.6 million) of the 5-year cancer prevalence cases were reported to occur in less developed regions. Global Cancer Statistics (GLOBOCAN) [3] reported 19.3 million new cancer cases and almost 10 million deaths worldwide in year 2020. Recently, the trend of the disease is increasingly growing, thereby increasing its global burden. In view of this, the global incidence of cancer cases is projected to rise to 24 million people by 2050, from which 70% of the predicted will be diagnosed annually from the lower-income countries. Cancer incidence among various countries worldwide has shown significant variation attributed to the difference in socioeconomic development, and lifestyle [4,5]. Other factors such as environmental, physical as well as geographical locations of cancer patients may be influential [6]. Data on cancer incidence and mortality in Nigeria is under-represented because the availability and quality of cancer data presented for Nigeria are poor [7]; hence, the GLOBOCAN data estimation system presents low figures for cancer incidence and mortality in Nigeria.

In a recent study, Wei et al. [8] reported an updated estimate of GLOBOCAN 2020 cancer burden carried out to investigate the changing profiles of cancer burden in China. A descriptive secondary analysis was carried out using data extracted from the GLOBOCAN 2020 database in the study. The study compared GLOBOCAN 2018 report with that of 2020; incidence and mortality rates of cancer were reported based on data obtained from cancer registry in China. As a result of the findings, future projections of 49% and 62% increment in the new cases of cancer and mortality respectively were estimated to occur in six continents; whereas countries in Africa are projected to experience a striking increment. The study concluded that China is undergoing a transition with an increasing lung, gastrointestinal, and breast cancers burden and that cancer mortality rate is higher in China than in other developing countries. In Africa, an epidemiological report of cancer revealed that 667,000 incident cases and 518,000 deaths were recorded in 2008 [9].

In Nigeria, cancer burden is increasing gradually. Based on World Health Organization report, National Cancer Control Plan [7] estimated 102,000 new cases of cancer and about 72,000 associated annual deaths in the country. However, cancer incidence was projected to rise to 90.7 and 100.9 per 100,000 by 2020 for male and female respectively [10]. This is because cancer is a disease burden that is poorly addressed in Nigeria [11]. Moreover, low cancer awareness, late diagnosis, and lack of affordable curative services have been identified as the cause of cancer fatality in this region of the world [12].

Previous work on cancer incidence in Nigeria have been limited to cancer types and frequencies based on gender [10,11,13], an improvement on these was done by Ojo et. al, [6] where geographical locations of cancer cases were included in the study. However, there is need to study the geographical spread of different cancer types to ascertain the possible influence of geology on cancer prevalence

as well as the link between occupation and cancer types. This study therefore seeks to bridge this knowledge gap by associating cancer prevalence in Ekiti State with geographical location as well as occupation types. It is hoped that the data would contribute to effective (possibly, even primary) cancer prevention as well as cancer management in the region.

Materials and Methods

Data Collection

Cancer cases recorded for five years from 2016-2020 were extracted from the Ekiti State Cancer Registry located at the Federal Teaching Hospital, Ido-Ekiti (FETHI), Ekiti-State. Out of the five socio-demographic variables needed such as cancer type, age, gender, residential location and occupation of the subjects, only three i.e., cancer type, age and gender were obtainable at the registry. This is also reported by Akinwande et al. [14] that information on the environmental and socio-cultural factors of the patients is not available at the cancer registries. However, availability of residential locations of patients in cancer registries data is important in order to enhance geographic connection with cancer disparities [15].

Medical Records Department of the same Hospital was then contacted for the remaining two variables however, records were only found for 272 of the total 707 subjects and only 222 out of the 272 cases were from Ekiti state, while the rest were from adjoining states. Thus, unavailability of residential locations and occupations for most of the patients poses a form of limitation to this study. The retrieval of records was preceded by both oral and written agreements for research collaboration with the registry and the hospital record unit, and apart from usual precautions to protect the subjects' privacy; their identities (names and street addresses) were not extracted. The data extraction at both the Cancer Registry and the Medical Record Department was carried out with the supervision of the respective staff members in charge of the records.

Data Treatment

The records of 707 subjects retrieved from the registry were exhaustively analysed to disrobe the distribution of the various types of cancer among various demographic groupings. Cancer prevalence across the 16 Local Government Areas in Ekiti state was computed for the 222 subjects with residence information indicated. Likewise, the distribution of cancers based on the occupation of the same 222 subjects was investigated. The ARC-GIS software was later used for the geo-spatial distribution of the patients' geographical locations on the map of Ekiti State.

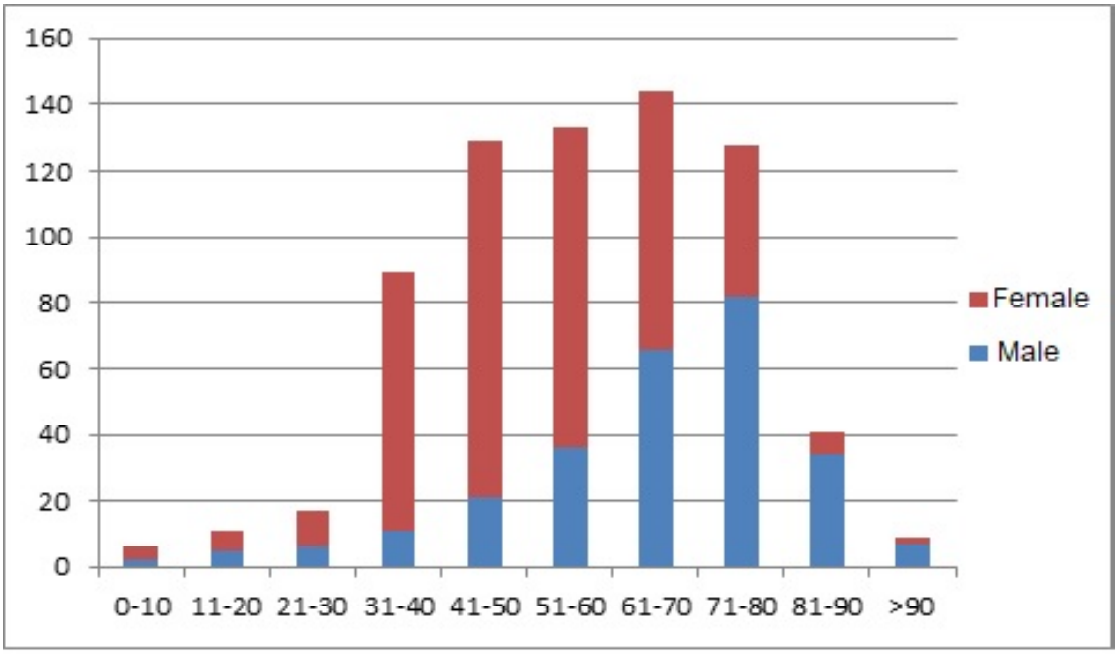


Figure 1: Age and gender distribution of cancer patients (707 subjects)

Results and Discussions

Distribution of cancer cases reported at the cancer registry (707 cases) by age and gender

The result shows that the patients with age range 61-70 years have the highest number 144 (20.4 %) of cancer cases while the neonate (0-10 years) has the least 2 cases (0.3%). The mean age of the 707 cancer patients is 57.6 years which is close to the average life expectancy of 55.8 years in Nigeria in 2020. The age distribution for all the 707 subjects is as shown in Figure 1 below. The number of male and female subjects were 270 (38.2 %) and 437 (61.8 %) respectively, Cancer incidence increased substantially with age from 30 to 80 years. This age group (30-80 years) account for 88 % of all the cancer cases reported at the registries. Between ages 0-10 years, 11-20 years and 21-30 years, cases of cancer among male subjects has the least records of 32%, 44% and 35% respectively while the highest cases were recorded for male between age ranges 71-80 years, 81-90 years and > 90 years with 64%, 83% and 78% respectively. On the other hand, cases of cancer among female subjects were predominant between ages 31-40 years, 41-50 years and 61-70 years with records of 88%, 84% and 72% respectively. This shows that females are more susceptible to cancer between ages 31-80 while males are more susceptible to cancer above age 71 and beyond.

Distribution of cancer cases reported at the cancer registry (707 cases) by gender and cancer types

Figure 2 shows the frequency distribution of the different types of cancers for male and female subjects. The cancer cases were grouped into 16 different types based on sites of occurrence. The result shows that cancer of the reproductive sites

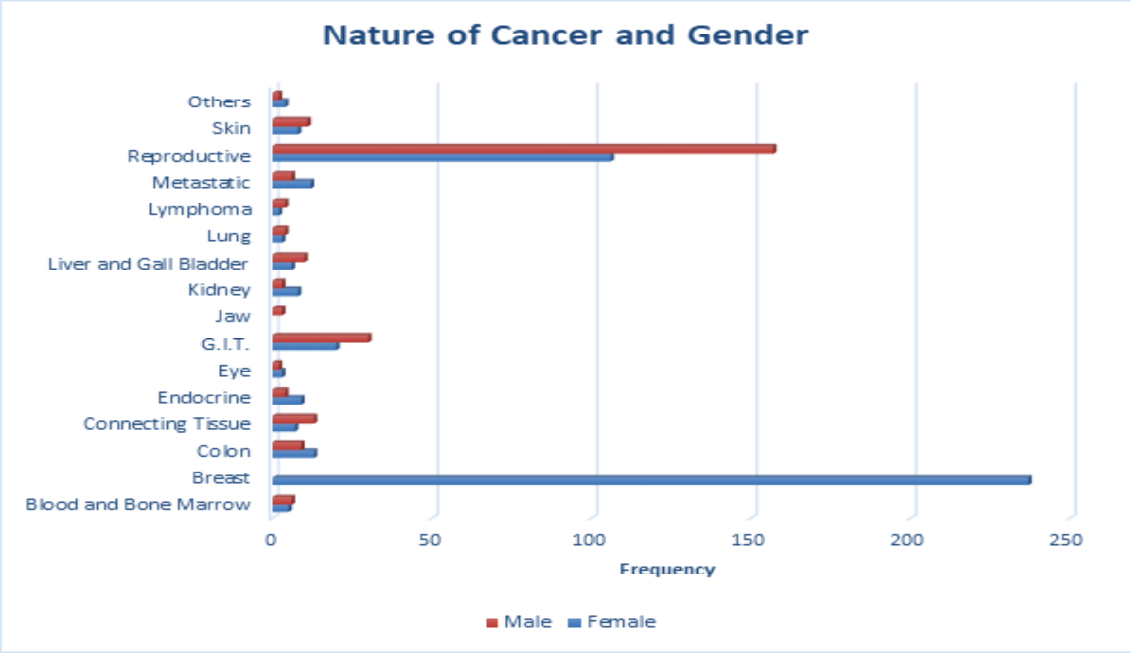
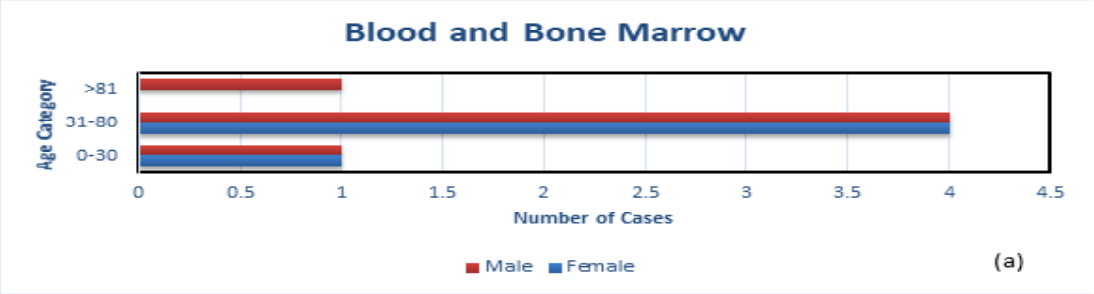
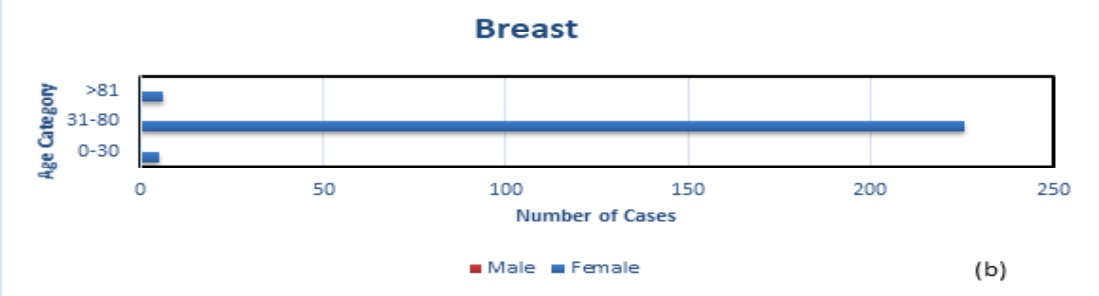
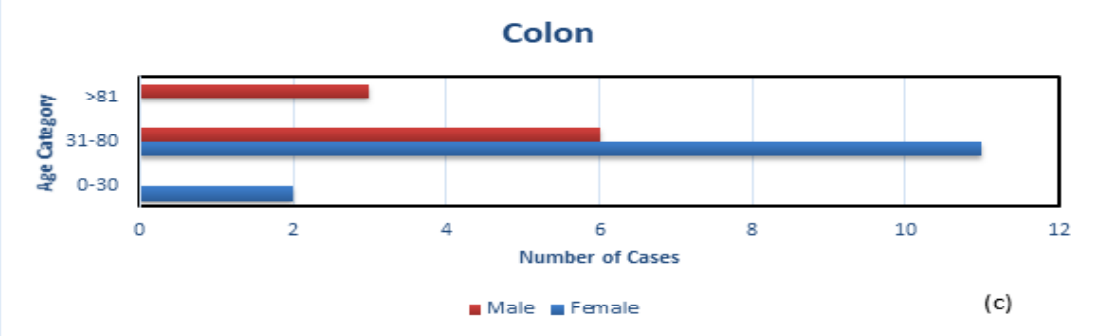


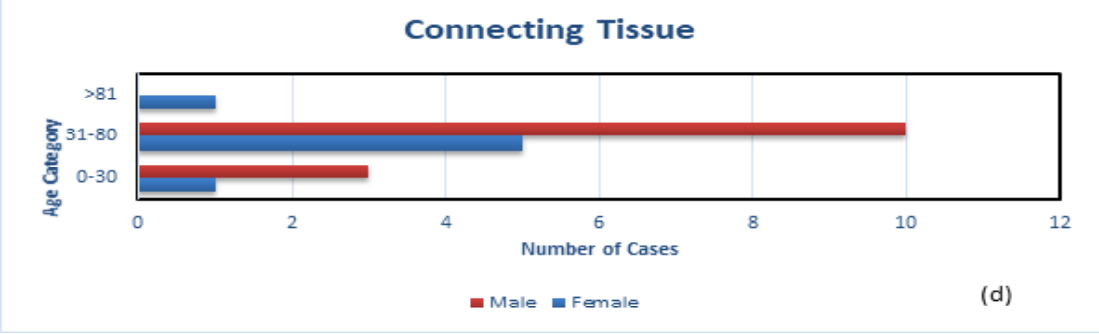
Figure 2: Distribution of various cancers types and gender as obtained Ekiti State Cancer Registry, Ido-Ekiti

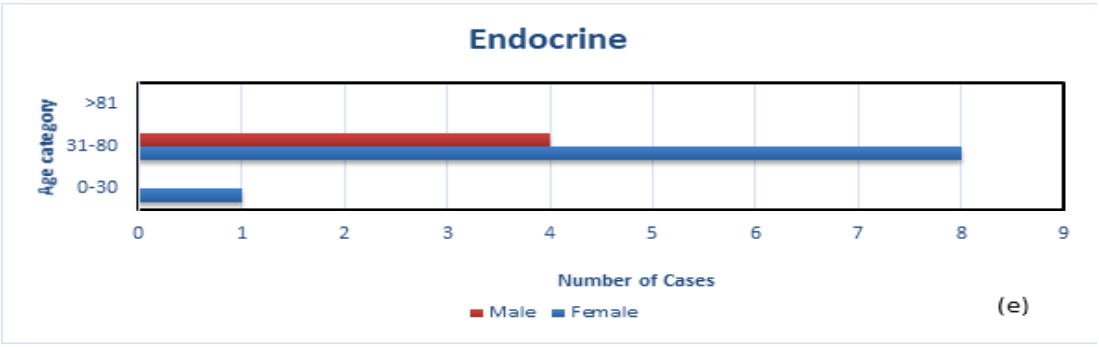
has the highest value (37.2%), followed by breast (33.5%), gastrointestinal track G.I.T. (7.1%), blood and bone marrow (3.1%), colon (3.1%), connective tissue (2.8%), skin (2.7%), metastatic (2.5%), liver and gall bladder (2.3%), brain (1.8%), endocrine (1.8%), kidney (1.6%), lungs (1.0%), lymphoma (0.8%), eye (0.7%) and jaw (0.4%). Out of the 437 female subjects, 54% were presented with breast

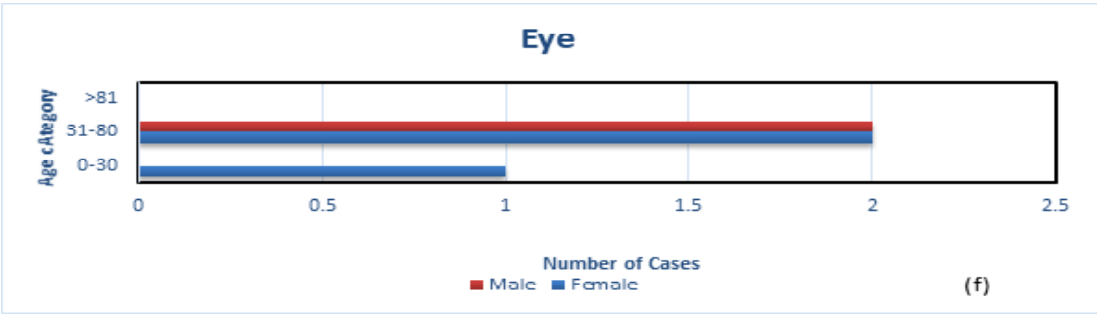


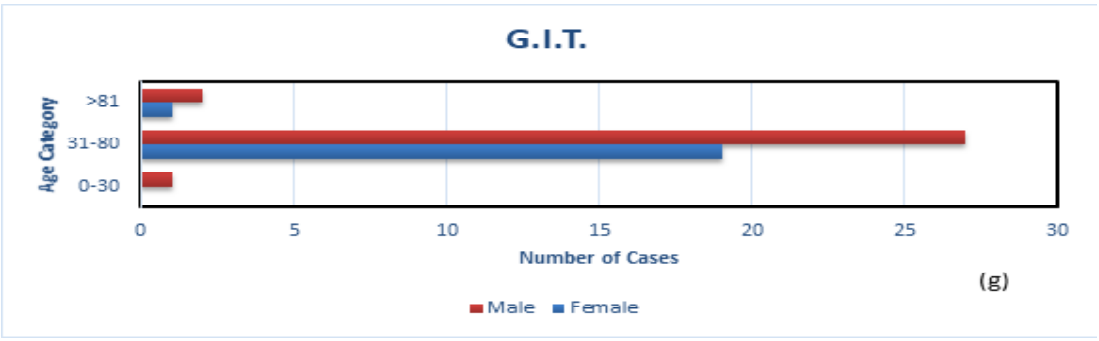


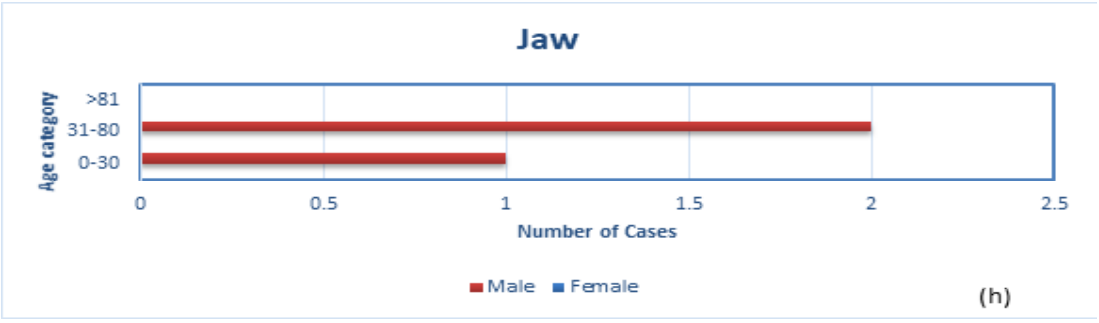


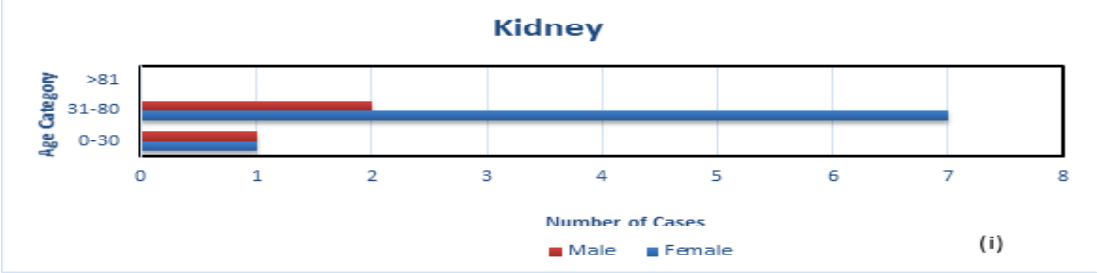


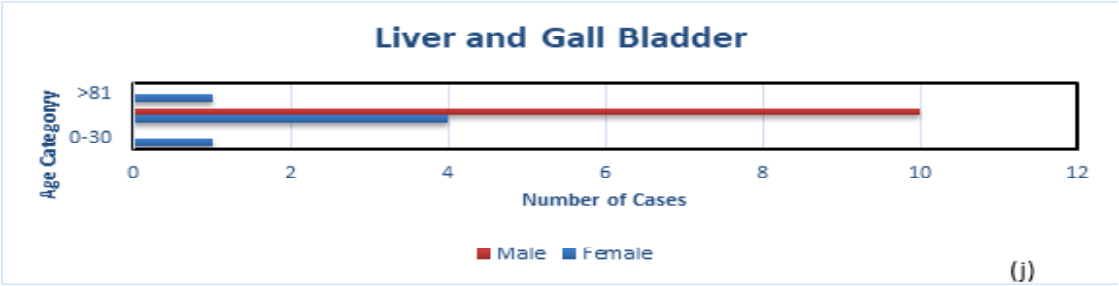

Endocrine
Age category
>81
31-80
0-30
0
1
2
3
4
5
6
7
8
9
Number of Cases
Male
Female
(e)


Eye
Age category
>81
31-80
0-30
0
0.5
1
1.5
2
2.5
Number of Cases
Male
Female
(f)

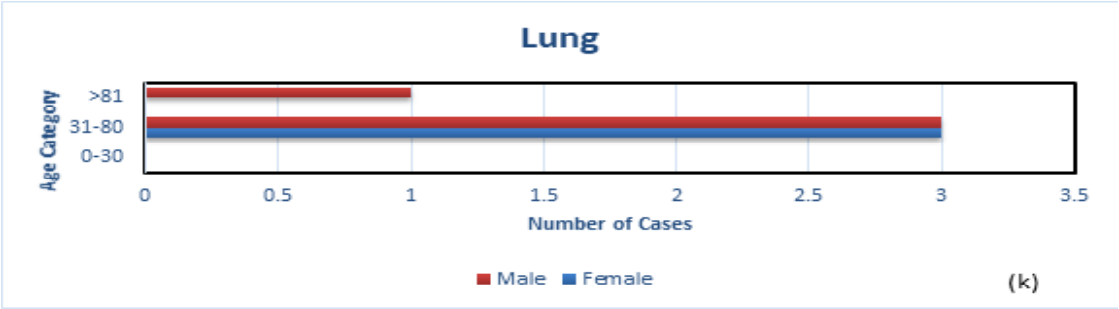

G.I.T.
Age Category
>81
31-80
0-30
0
5
10
15
20
25
30
Number of Cases
Male
Female
(g)


Jaw
Age category
>81
31-80
0-30
0
0.5
1
1.5
2
2.5
Number of Cases
Male
Female
(h)

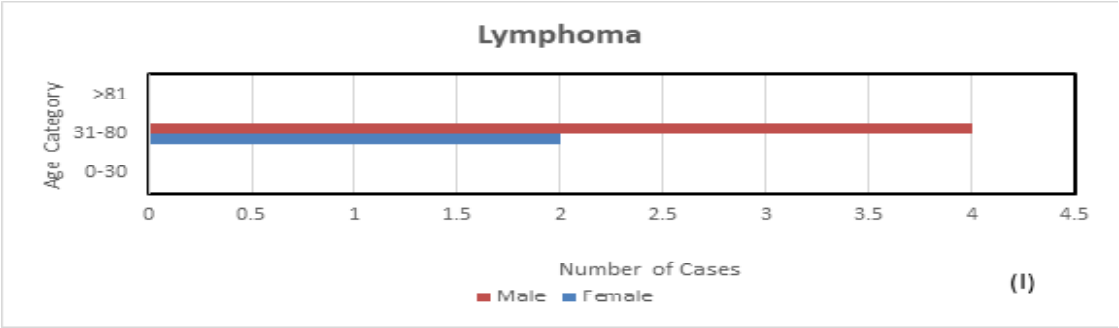

Kidney
Age Category
>81
31-80
0-30
0
1
2
3
4
5
6
7
8
Number of Cases
Male
Female
(i)


Liver and Gall Bladder
Age Category
>81
0-30
0
2
4
6
8
10
12
Number of Cases
Male
Female

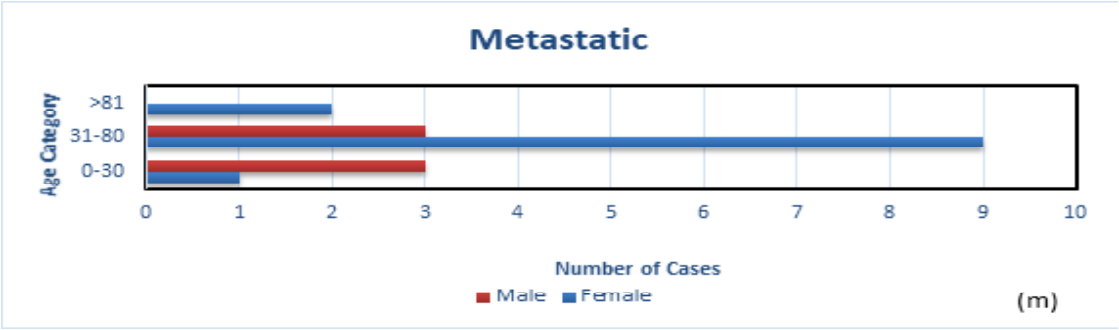
(j)


Lung
Age Category
>81
31-80
0-30
0
0.5
1
1.5
2
2.5
3
3.5
Number of Cases
Male
Female

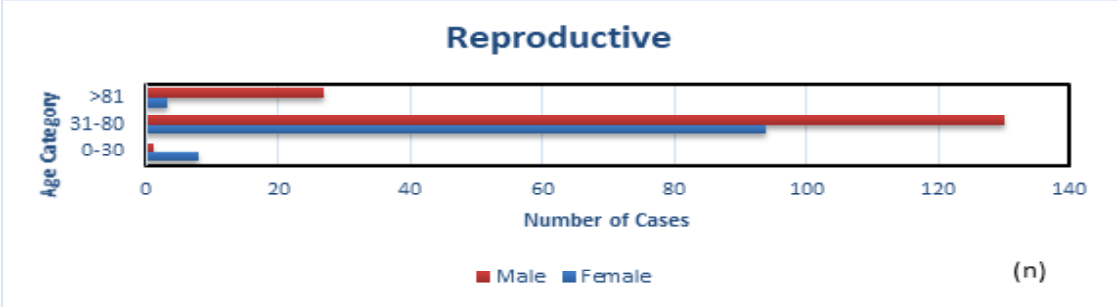
(k)


Lymphoma
Age Category
>81
31-80
0-30
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
Number of Cases
Male
Female

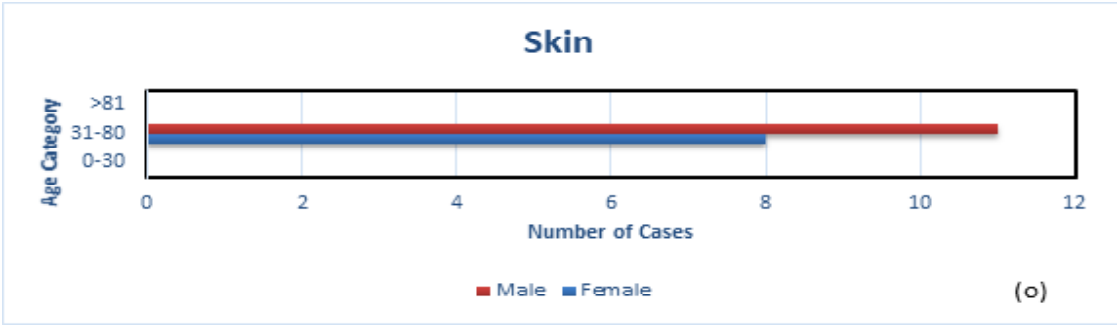
(l)


Metastatic
Age Category
>81
31-80
0-30
0
1
2
3
4
5
6
7
8
9
10
Number of Cases
Male
Female

(m)


Reproductive
Age Category
>81
31-80
0-30
0
20
40
60
80
100
120
140
Number of Cases
Male
Female

(n)



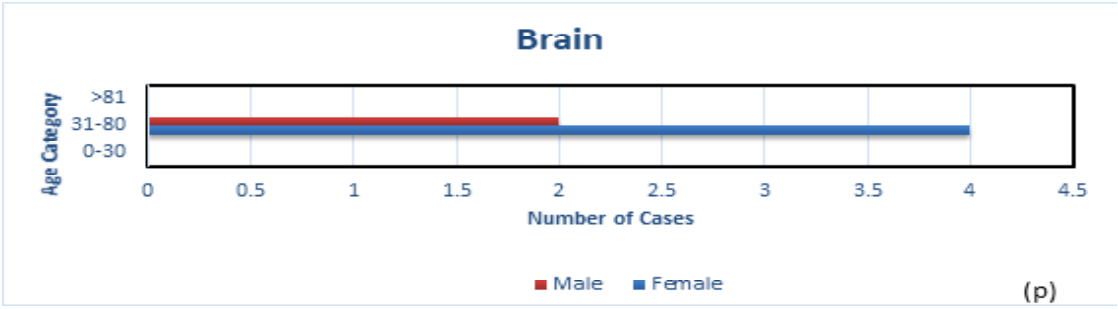


Figure 3a-p: Distribution of cancer types in male and female subjects among age categories: 0-30 years, 31 – 80 years, and >81 years.

cancer. The age at diagnosis ranged from less than-one-year (2 female neonates presenting with colon cancer) to 100 years (a male with prostate cancer). All the 3 cases of cancer of the jaw were in male subjects, while all the 237 cases of cancer of the breast were in female subjects. Also, more cases of cancer of reproductive sites were recorded in female (64.8%) than in male subjects (37.2%).

Cancer type distribution pattern by age and gender for 707 cases

A summary of the demographic profile for each type of cancer is presented in Figures 3a to 3p. The distributions show each type of cancer among three age classifications (viz 0-30 years, 31-80 years, and above 81 years) for both males and females.

Blood and Bone Marrow Cancers: Eleven blood and bone marrow cases comprised of 1 case each of blood and bone marrow and 9 cases of leukaemia. Of the cases recorded, 45.45% were for female and 54.55% were for male subjects. The ages of the female subjects ranged from 24 to 76 years, while those in male subjects ranged from 13 to 81 years. The median ages of diagnoses were 66 years and 38.5 years for female and male subjects respectively.

Breast Cancers: 237 cases of various types of breast cancers were recorded among the female subjects. The subjects' ages ranged from 21 to 90 years, with the mean age of 52.2 years.

Colon: Twenty-two cases of cancers of the colon were recorded at the cancer registry. 59.1% of the cases were recorded in female subjects. The age distribution for this cancer ranged from 0 to 74 years, while those in male subjects ranged from 35 to 83 years. The median ages of diagnosis in the female and male subjects were 51 years and 75 years respectively. The diagnosis for the youngest subjects were recorded in female (less than a year), while the oldest was recorded in a male subject.

Connective Tissue: There were twenty cases listed in this group. These comprised 7 cases for limb, 3 cases for bone, thigh-4, neck-2, and one case each of knee joint, elbow, spinal cord and Iliac. The cases in male subjects were more than twice the cases in female subjects. The ages of the female subjects ranged from 4 to 89 years with the median age of 52 years, while those in male subjects ranged from 15 to 60 years with the median age of 64 years. The diagnosis for the youngest subjects in both male and female was a limb, while those for the oldest subjects were knee joint (female) and thigh (male).

Endocrine: The 13 cases listed as Endocrine comprise of 5 cases of Pancreas, 4 cases of Thyroid,

3 cases of Abdomen and one case of Spleen. The cases in female subjects were more than twice that of the male subjects. While the age of the female subjects ranged from 30 to 75 years, the age of the male subject ranged from 47 to 60 years. The median ages for the female and male subjects were 51 years and 57 years respectively. The diagnoses for the youngest cases were Thyroid (female) and Spleen (male), while those for the oldest cases were Abdomen (female) and endocrine (male). There was no case recorded in subjects below 30 years.

Eye: There were 5 cases of this type at the cancer registry. These are classified as follow: 2 cases of conjunctiva, one case each of corneal, retinoblastoma and orbital mass. 60% of the cases were recorded in female subjects. The ages of the female subjects ranged from 12-61 years with the median age of 49 years, while those in male subjects ranged from 66-68 years with the median age of 67 years. There was no case of this cancer in male subjects below 66 years. The diagnosis for the youngest subjects was retinoblastoma (female) and conjunctiva (male), while those for the oldest subjects were corneal (male) and orbital mass (female).

Gastrointestinal Track Cancers: Cancers of the gastrointestinal track (GIT) ranked third at the Ekiti State Cancer Registry. A total of 50 cases were recorded as follows: Gastric-15, Rectal-20, Omentum-3, Caecum-3, Oesophageal-2, Anal-3, and 1 each of Anorectum, Antrum, intestine and salivary gland. 40% of the cases were recorded in females, while 60% were in male subjects. The ages of the female subjects ranged from 32 to 82 years, while those in male subjects ranged from 22 to 98 years. The average age for the diagnosis of GIT was 49 years, and there was no case of this cancer recorded for subjects below 20 years. The diagnoses for the youngest subjects were rectal (female) and oesophageal (male), while those for the oldest subjects were caecum (female) and gastric (male).

Jaw: The 3 cases listed as cancers of the jaw comprised of one case each of palatal, parotoid and lip. There was no case recorded in female subjects. The ages of the male subjects ranged from 10-72 years, with an average age of 65 years. The diagnosis for the youngest in male subjects was palatal, while those in oldest cases were upper lip.

Kidney: There were 11 cases listed as the cancer of kidney at the cancer registry. These comprised 6 cases of bladder and 5 cases of kidney; 72.7% of the cases were recorded in female subjects. The ages of the female subjects ranged from 10-69 years with the median age of 54 years, while those in male subjects ranged from 22-73 years with the median age of 25 years. The diagnosis for the youngest subjects in both female and male was kidney, while for the oldest female and male subjects were bladder.

Liver and Gallbladder: The 16 cases in this group comprised 13 cases reported for liver cancer, 2 cases for hepatocellular carcinoma and one case in the gall bladder. 37.5% of the cases were recorded in female subjects. The age ranged from 28 to 89 years in female subjects with the median age of 66 years while those in male subjects ranged from 36 to 79 years with the mean age of 55.5 years. There was no case of this cancer recorded in subjects below 28 years. Two cases of hepatocellular carcinoma were recorded in female and male subjects. The diagnosis for the youngest and oldest subjects in both sexes was liver cancer.

Lung: Seven cases were listed as cancers of the lungs at the cancer registry. Of the cases, 42.9% occurrence was recorded in females. The age ranges in both female and male subjects were 60-78 years and 34-71 years, respectively. The median ages for the female and male subjects were 78 years and 74.5 years respectively.

Lymphoma: Six cases recorded as lymphoma comprised of lymph node with 3 cases, and one case each of axillary, tonsil and gluteal. The case in males is twice that in female subjects (33.3% and 66.7%, respectively). The ages ranged from 37 to 44 years in female subjects while those in male ranged from 25 to 83 years. The median ages for the diagnosis were 40.5 years and 66.5 years for male respectively.

Metastatic: The 18 cases listed as metastatic comprised of the following: umbilicus with 6 cases, and two cases each of pleural, intraperitoneal, gluteal and submandular; and one case each of supraclavicular, gluteal, peritoneal and retroperitoneal. The cases in female subjects doubled those in male subjects. The age ranges in female and male subjects were 12 - 91 years and 7 -78 years, respectively. The median ages of both female and male subjects were 53 years and 33.5 years respectively. The diagnosis for the youngest subjects was neck (female) and pleural (male), while those for the oldest subjects were umbilicus (female and chest (male).

Cancers of the Reproductive sites: Reproductive cancers have a total number of 263 cases. These comprised 158 cases of prostate cancers, 54 cases of cervical, 32 cases of ovarian, 12 cases of endometrial, 2 cases each of uterus and genital track, and 1 case each for priapism, testicular and vagina cancer. One hundred and three of the reproductive (105) cancers were found in female subjects, ranging from 15 to 91 years. On the other hand, there were 160 cases in male subjects, ranging from 28-100 years. The median ages for female subjects diagnosed with cervical, ovarian and endometrial cancers were 62 years, 51 years and 68 years respectively. The youngest female subject was diagnosed with fibro adenoma.

Skin Cancers: 19 cases were listed as skin cancer. The age of the male and female subjects with skin cancer ranged from 35-80 years with an average age of 55.9 years. While there are 11 cases in the male subjects with age range 35-80 years, female subjects had 8 cases with age range 42-80 years. The median ages for both female and male subjects were 59 years and 50 years respectively.

Brain: There were 6 cases listed in this category. 66.7% of the cases were recorded in female subjects. The age of the female subjects ranged from 61-66 years with the median age of 61 years, while those in male subjects ranged from 38-61 years with the median age of 66 years. The average age of the subjects was 58.6 years.

The commonest cancers were breast and cervical cancers among women and prostate cancer among men. The rate of breast cancer is increasing across the globe and presently, it is the most common female malignancy in Nigeria [16]. In this study, 33.5% of the subjects had breast cancer with age range of 21-90 with a mean of 52.2 years which is comparable with earlier findings [17] which showed that 11.3% of the female identified with breast cancer in India were younger than 35 years. The result is also similar to the finding of Ojo and co-researchers [6] at Ife-Ijesa cancer registry for all the categories of cancers for both subjects except eye cancer where the researchers recorded more cases in male subjects who were between 0-10 years. Incidence of breast cancer increases with age and high mortality rate is associated with breast cancer [18]. However, the poor outcome in breast cancer treatment is connected with late presentation, inadequate diagnostic facilities and various treatment barriers [16]. This study also revealed that the proportion of female patients with cancer is higher than male subjects (37.3%). This is in consistence with the findings of several authors [19, 20, 14]. They showed that cancer of the cervix is ranked second to the breast cancer. Of the 273 cases grouped under cancer of the reproductive site, prostate cancer in male subjects is higher (59.7%) and occurred from age 28 to 100 years in contrast to what is observed in the USA, where males above 65 years were identified to have prostate cancer [21].

Figure 3 shows the distribution of cancer types among male and female subjects across different age categories. Out of the 237 females presented with cancer, 95.36% are reported with breast cancers between ages 31 and 80 years. Also, more cases of cancer of the reproductive sites are recorded among male than female subjects as 158 out of 263 were reported. The study is in agreement with findings of some researchers in other part of Nigeria [6] which showed that breast cancer is commonest among the age group > 20 years and also recorded more cases of cancer of the reproductive sites for male than female subjects. The data obtained further revealed that across the cancer sites, skin, lung, liver and gall bladder, GIT, in both sexes, the number of males is higher than that of females. This is in accordance with the findings of a study conducted in England which observed that men were at higher risk of advanced stage of diagnosis for skin, lung and rectal cancers [22]. Higher proportion of female patients with cancer of the bladder observed in this study is not consistent with the findings of [6] that showed higher male patients with cancer of the bladder than female subjects. Higher attendance recorded for female in the hospital may not be unconnected with the curious nature of women about the state of their health than men. There are no cases of cancer of the jaw among female subjects and a few recorded for male. This is nearly in agreement with the findings of the study conducted in Malaysia which showed that jaw cancer is higher among male (62.8%) than in female subjects [23].

Cancer Prevalence in Ekiti State

Of the 707 subjects, only 272 have records of occupation and geographical location. The majority of the subjects, not surprisingly, were from Ekiti State with about 81.6% subjects represented. Half of the subjects were residents of the northern part of the state. The data for Ekiti State is 222 (84.2%) out of the 272 with records of occupation and residential

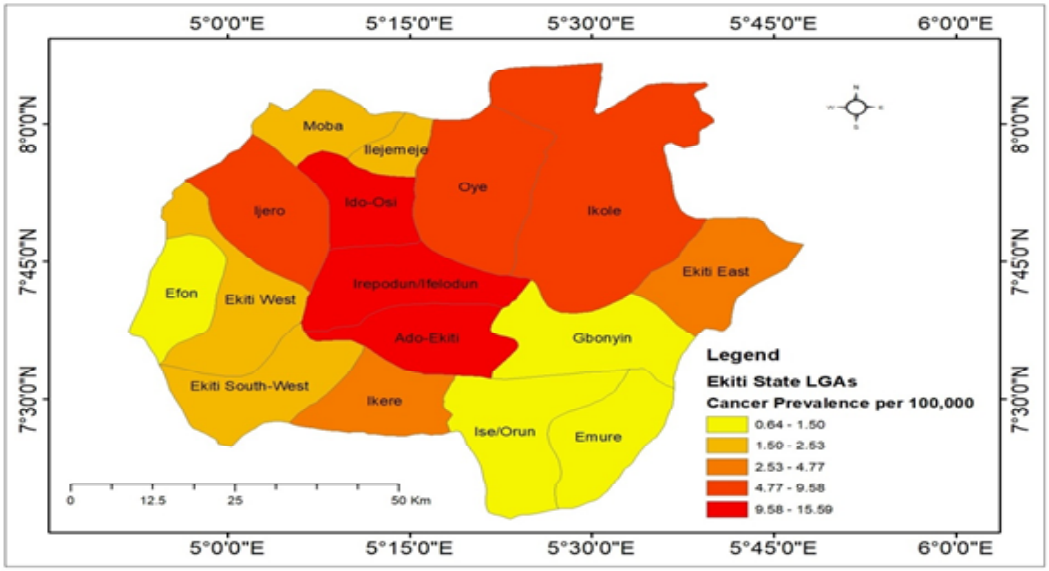


Figure 4: Cancer Prevalence across the LGAs in Ekiti State

information obtained from the Medical Health Records department of FEHTI, Ido –Ekiti. The prevalence of cancer (number of cases reported at the medical records divided by 2016 population census data as projected by the National Population Commission) ranged from 0.64 per 100,000 at Ise/ Orun LGA to 15.59 per 100,000 at Ido-Osi LGA as shown in Figure 4. The results also shows that Ido-Osi LGA indicated with red colour has the highest value of 15.59 per 100, 000 population.

Distribution of Cancer cases by Types, Gender and Occupation

The distribution of cancer cases based on the occupation, age and gender of the patients is as in shown in Figure 5. The occupations of the subjects were categorized into artisan, civil servant, farming, student and graduate, neonates, retiree and dependant, clergy and traditional ruler, professional and trading**.** Most of the subjects (38.60 %) were traders while the neonates formed the smallest group (0.74 %). The artisan group consist of bricklaying, carpentry, driving, tailoring and those recorded as artisan; the professional includes engineer and accountant; civil servant includes teaching and others denoted as civil servants. The result shows that 37% of the patients were traders while the least is recorded for neonates and traditional ruler and clergy. The study revealed that 86.48% of the subjects under civil servants were female. Of the 105 cases recorded

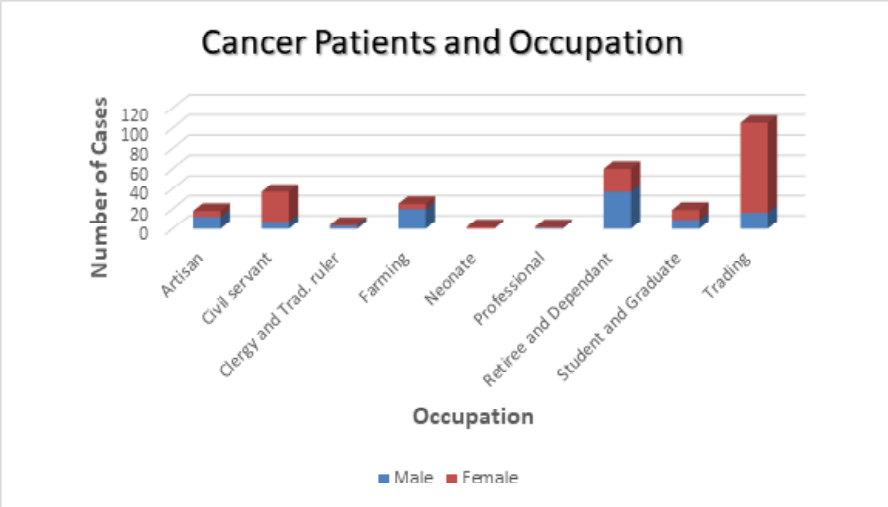


Figure 5: Cancer Distribution in Ekiti State as a function of occupation and gender

among traders, 86.67% were female identified with breast (45.71%). Moreover, 86.49% of the cancer subjects were also female. This result is in agreement with the findings of [24] who showed that women working in office and those whose jobs require mainly to sit are at higher risk of developing breast cancer among Japanese women. Among the retirees and dependants, 50% has prostate cancer, 16.67% has cancer of the breast, 5% of both genders have cancer of the gastro intestinal track, and however, the least are recorded for lung and blood.

Conclusion

Various types of cancer cases from Ekiti State cancer registry from 2016-2020 were exhaustively analysed and presented in terms of age, gender, occupation and geographical location. The study found that cancer occurrence is more frequent among traders than other occupations. For gender-based analysis, cancer occurrence is more frequent in females (62.7 %) than in males (37.3 %). Sharp disparity in cancer prevalence with geographical locations was also observed: 15.59 per 100,000 in Ido-Osi compared with 0.64 per 100,000 in Ise/Orun. This disparity can be due to the geology of these areas. The various relationships with age, location and occupation examined could help bring to limelight, in particular, the lifestyle and environmental-health issue of induction periods of cancers, childhood cancers not exempted. The data can also help in having better understanding of the various factors that are responsible for the development of cancers in a region. It is hoped that these preliminary analyses will stimulate more interests in investigation of the possible influences of physical environment and geographical locations on the aetiology of cancer in Nigeria like the situation observed in developed countries.

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