A Comparative Study of Cancer Burden Among Males Aged 35 to 75 years in Ghana: Evidence from GLOBOCAN 2022

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Abstract

Background Cancer is a leading cause of death globally, ranking second behind cardiovascular diseases as the all-time leading cause of death in the world. In Ghana, there was an increased rise in cancer cases from 24,009 in 2020 to 27,385 in 2022. The total number of deaths due to cancer in 2020 in Ghana was 15,802, which rose to a total mortality of 17,944. Liver cancer is the most common form of cancer among Ghanaian males, which is followed by prostate cancer. However, among Ghanaian men aged 55+ years, prostate cancer is the leading cancer incidence.

Aim The study aimed to examine the cancer burden among Ghanaian males aged 35 to 75+ years using the GLOBOCAN 2022 cancer estimates.

Materials and Methods The incidence and mortality cases, as well as the age-standardised incidence and mortality ratios on the various forms of cancer among Ghanaian males aged 35 to 75+ years, were obtained from the GLOBOCAN 2022 cancer estimates.

Results A total of 11,398 cancer cases were recorded in 2022 among Ghanaian males. Liver cancer constituted 23.3% of the total cancer cases, and the incidence of prostate cancer in Ghana was 2,395 (21.0%). The leading age-specific incidence and mortality rate

of cancer among Ghanaian males aged 35 to 44 years was liver cancer disease, with age-standardised incidence of 35 per 100,000. Even though prostate cancer was the highest cancer incidence among men aged 55 to 64 years in Ghana, liver cancer was observed to have the most mortality cases with an age- standardised mortality ratio of 50 per 100,000.

Conclusion The leading cause of cancer incidence among Ghanaian males was liver cancer. However, prostate cancer was most common among men aged above 54 years. Lifestyle changes, infiltration of national tobacco and alcoholic companies, late detection and screening, lack of knowledge and awareness, and limited health system are challenges faced by the prevention and control of cancer cases among Ghanaian males.

Keywords: GLOBOCAN 2022, Ghana, liver cancers, male cancers, cancer

Introduction

Cancer is a global burden affecting the health of all populations in every country (Wen et al., 2021). It is one of the leading causes of morbidity and mortality among non-communicable diseases despite the global awareness of its prevention (Drummond et al., 2019). Cancer is the third leading cause of death among people aged 30 to 69 years in most countries across the globe and is responsible for one in four deaths from non-communicable diseases (Ferlay, Rebecca, & Mph, 2024). It is estimated that cancer cases will rise to 21.7 million by 2030 globally, with related deaths of about 13 million (Amoako et al., 2019). In 2022, there were an estimated 20 million new cancer cases worldwide, with a total mortality of 9.74 million deaths (Ferlay et al., 2021). Lung cancer was the leading form of cancer in terms of incidence (15.3%) and mortality (22.7%) among males globally in 2022, and prostate cancer was found to be the second leading cancer case among males (14.2%) (Ferlay et al., 2021).

In developed countries such as the United States of America, cancer is the second most common cause of death but ranks number five for all-cause mortality in developing countries (Sowunmi et al., 2018). Ghana, in the year 2020, recorded a total of 24,009 cancer cases, with a total mortality of 15,802 in 2020 (Tuck et al., 2023). There was an observed increase in cancer incidence in Ghana to 27,385 in 2022, as well as an increase in mortality cases to 17,944 (Ferlay et al., 2021). Most studies in Ghana have placed much focus on breast and cervical cancers due to their high incidence among the Ghanaian populace. However, there is a need to broaden the scope of cancer studies and education to include prostate and liver cancers, which were the most common forms of cancer among the male population in 2020 (Tuck et al., 2023). In 2022, liver cancer was the most common form of cancer among Ghanaian males (23.3%), followed by prostate cancer (21.0%) (Ferlay et al., 2021).

Cancers, in general, have been a major concern for developing countries due to the rise of infectious diseases such as Human papillomavirus (HPV), Human Herpes Virus-8 (HHV8), Hepatitis Virus B and C, and Cytomegalovirus (CMV) (Amoako et al., 2019). In addition, high levels of cigarette smoking found in public places, lack of awareness about risk factors, ageing, and changes in lifestyles could contribute to the increasing percentage of cancer cases in developing countries,

especially African countries, compared to developed countries (Amoako et al., 2019; Sowunmi et al., 2018). As a strategic approach to promote the healthy living of cancer patients and reduce cancer incidence, a National Strategy for Cancer Control was launched in 2011 in Ghana. However, there has been a slow progressive increase in the incidence of cancer due to several risk factors such as aflatoxin exposure, sedentary lifestyle, high rate of indoor solid fuel use, obesity, and cigarette smoking (Tuck et al., 2023). Promoting cancer control in Ghana may rely largely on screening and early detection. It is established that about 30% to 50% of all debilitating cancer cases can be prevented when there are appropriate and evidence-based interventions, early detection and screening programmes, and awareness creation on known risk factors (Mensah et al., 2022). Early detection is one of the bedrocks of the cancer control programme, and it offers a chance to improve the quality of life of cancer patients, in addition to timely therapeutic and palliative interventions (Mensah et al., 2022). Every government must invest in cancer control programmes to ensure healthy lives in the country.

Objective of the Study

The study aims to examine the cancer burden among Ghanaian males aged 35 to 75+ years using the Global Cancer Observatory (GLOBOCAN) 2022 cancer estimates.

Materials and Methods

General Study Details

The study utilised a comparative descriptive design to examine the cancer burden among men aged 35 to 75+ years old in Ghana. From the GLOBOCAN 2022 database, we extracted the incidence, mortality, and age-standardised ratios of cancer cases and deaths for the various cancer types among men in Ghana, Africa, and Northern America. As this study utilised secondary data from the GLOBOCAN database, which is publicly accessible and anonymised, there were no direct ethical concerns regarding patient confidentiality or informed consent.

However, the study adhered to ethical standards for research integrity and accuracy.

Study Participants

The corresponding population consisted of all Ghanaian males aged 35 to 75+. To compare the cancer burden within these age groups, the ages were stratified into four groups: 35–44, 45–54, 55–64, and 65–75+.

Objectives

The study aimed to examine the cancer burden among Ghanaian males aged 35 to 75+ years using the Global Cancer Observatory (GLOBOCAN) 2022 cancer estimates.

Study Methodology

The data for this study were extracted from the GLOBOCAN 2022 database, which provides comprehensive global cancer statistics, including estimates of incidence and mortality for 36 types of cancer across 185 countries. Specific data for Ghanaian males was extracted and analysed. Using the GLOBOCAN comprehensive data ensured the reliability and validity of the findings. The GLOBOCAN database was accessed to obtain cancer incidence and mortality data specific to Ghanaian males and compare them to those of Africa and Northern America. The number of new cancer cases diagnosed in 2022 and related deaths were extracted from the GLOBOCAN 2022 database. Two metrics of direct standardisation were used to enable meaningful comparison across populations, adjusted for differences in age structures:

- **Age-Standardised Incidence Ratio (ASIR)**: number of new cancer cases per 100,000 individuals, standardised to a world population.
- **Age-Standardised Mortality Ratio (ASMR)**: number of cancer-related deaths per 100,000 individuals, standardised to a world population.

Data Analysis

Descriptive statistics were employed to summarise the incidence and mortality rates. The total number of cancer cases and deaths was calculated for each age group. The age-standardised incidence and mortality ratios were described as presented in GLOBOCAN 2022 data. A comparative analysis evaluated differences in cancer burden between Ghana and Northern America. This analysis highlighted regional variations in cancer incidence and mortality.

Result

A total of 11,398 cancer cases were recorded in 2022 among Ghanaian males. Liver cancer constituted 23.3% of the total cancer cases, and the incidence of prostate cancer in Ghana was 2,395 (21.0%). Among Ghanaian men aged 35 to 44 years, liver cancer was observed to have the highest mortality of 520, constituting 52.5% out of the total mortality cases of 990. Of the 1,509 mortality cases among Ghanaian men between the ages of 45 and 54 years, it was observed that liver cancer recorded the highest mortality cases (33.6%). The total number of cancer mortality among Ghanaian men between the ages of 55 and 64 years was 1,717, and 25.1% and 17.0% were deaths related to liver cancer and prostate cancer, respectively.

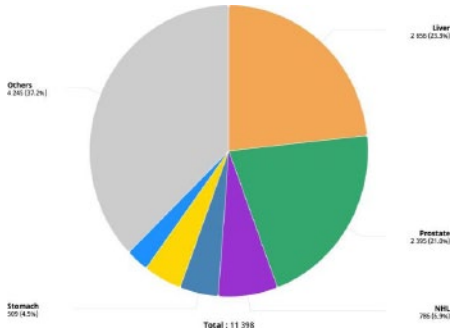

Fig. 1. Absolute numbers, Incidence, Males, in 2022, Ghana.

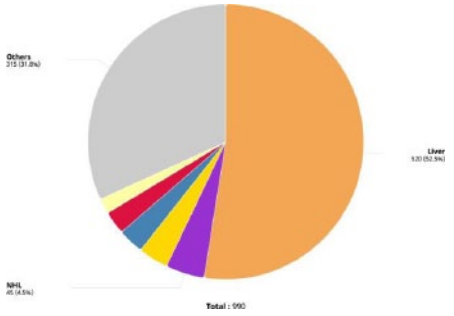

Fig. 2. Absolute numbers, Mortality, Males, age [35-44] in 2022, Ghana.

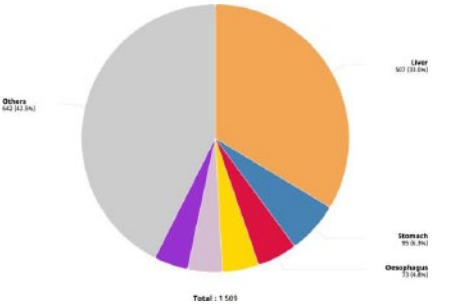

Fig. 3. Absolute numbers, Mortality, Males, age [45-54] in 2022, Ghana.

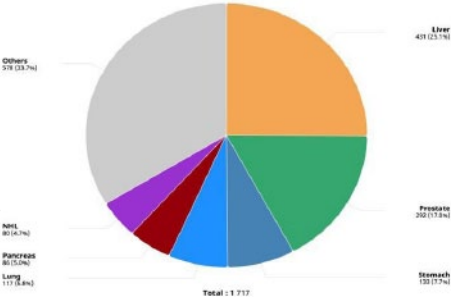

Fig. 4. Absolute numbers, Mortality, Males, age [55-64] in 2022, Ghana.

The leading age-specific incidence and mortality rate of cancer among Ghanaian males aged 35 to 44 years was liver cancer disease, with age-standardised incidence of 35 per 100,000 and age- standardized mortality slightly below 30 per 100,000.

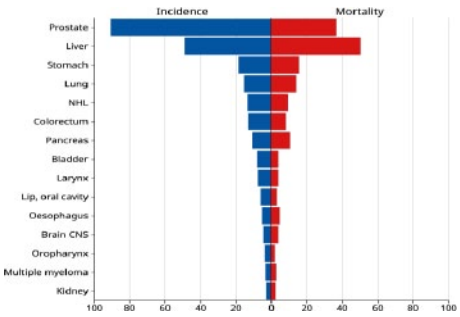

Fig. 5. Age-Standardised Rate (World) per 100 000, Incidence and Mortality, Males, age [55-74] in 2022, Ghana (Top 15 cancer sites).

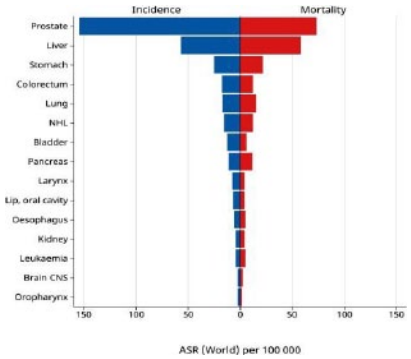

Fig. 6. Age-Standardised Rate (World) per 100 000, Incidence and Mortality, Males, age [55-64] in 2022, Ghana (Top 15 cancer sites).

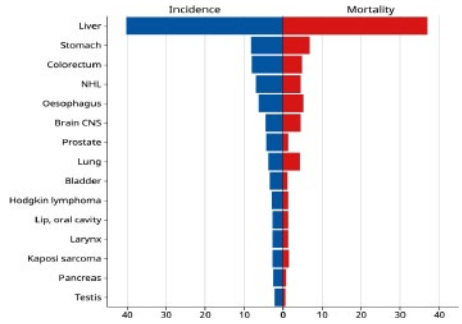

Fig. 7. Age-Standardised Rate (World) per 100 000, Incidence and Mortality, Males, age [45-54] in 2022, Ghana (Top 15 cancer sites).

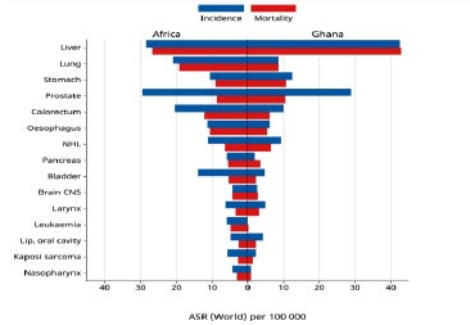

Fig. 8. Age-Standardised Rate (World) per 100 000, Incidence and Mortality, Males, age [50-59] in 2022, Ghana (Top 15 cancer sites).

However, in North America, colorectum cancer was the leading cancer incidence and mortality ratio among young men aged 35 to 44 years. About the same age group (35–44 years), the age- standardised incidence and mortality rate for stomach cancer was less than 10 per 100,000 in both Ghana and Northern America. Ghana is compared to North America to highlight differences in cancer patterns influenced by regional risk factors, healthcare infrastructure, and socio-economic conditions. This comparison aids in developing tailored intervention prioritising resources for effective cancer prevention and treatment. Among men aged 45 to 54 years in Ghana, liver cancer recorded 40 per 100,000 for the age-standardised incidence ratio and nearly 40 per 100,000 for the age-standardised mortality ratio. In contrast, the Northern American region recorded an

age-standardised incidence ratio of 70 per 100,000 for prostate cancer, which was the highest cancer incidence rate among the 15 top cancer cases for males aged 45 to 54 years. However, colorectum cancer was the leading age-standardised mortality ratio for men aged 45 to 54 years (18 per 100,000) in Northern America.

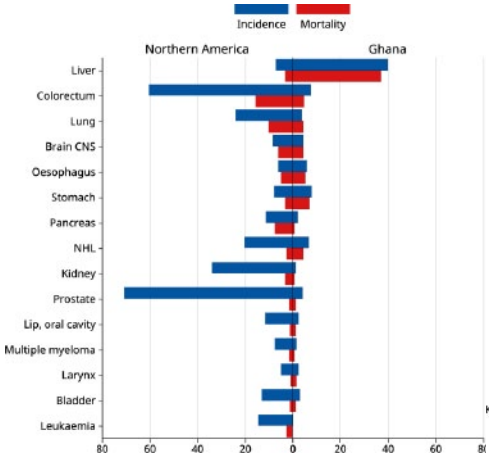

Fig. 9. Age-Standardised Rate (World) per 100 000, Incidence and Mortality, Males, age [45-54] in 2022, Northern America vs Ghana (Top 15 cancer sites).

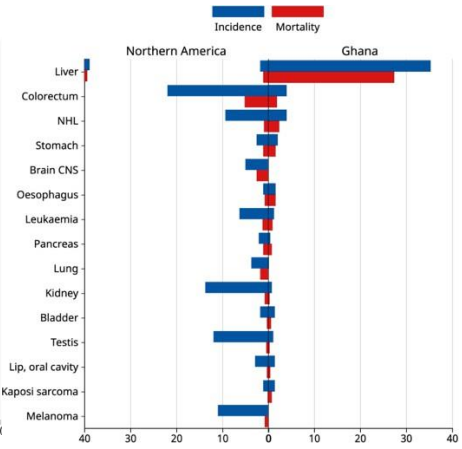

Fig. 10. Age-Standardised Rate (World) per 100 000, Incidence and Mortality, Males, age [35-44] in 2022, Northern America vs Ghana (Top 15 cancer sites).

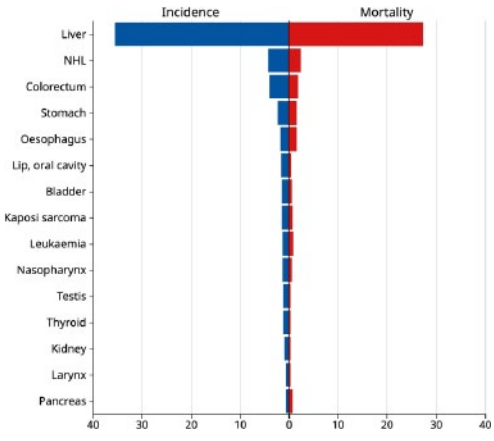

Fig. 11. Age-Standardised Rate (World) per 100 000, Incidence and Mortality, Males, age [35-44] in 2022, Ghana (Top 15 cancer sites).

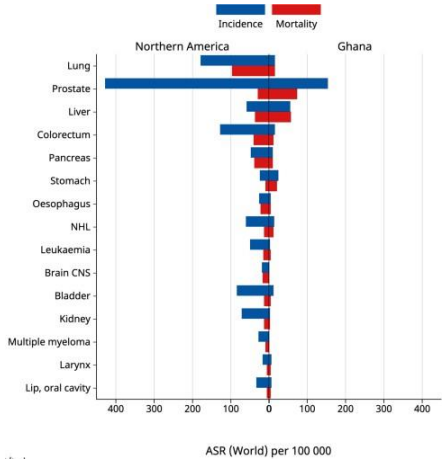

Fig. 12. Age-Standardised Rate (World) per 100 000 [55-74] in 2022, Northern America vs Ghana (Top 15 cancer sites).

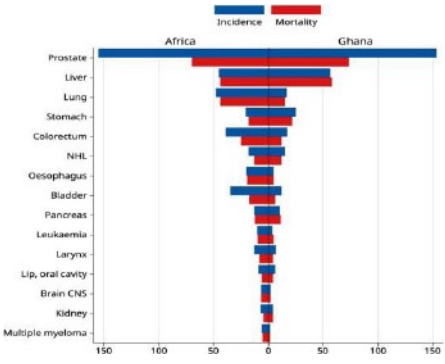

Fig. 13. Age-Standardised Rate (World) per 100 000, Incidence and Mortality, Males, age [55-74] in 2022, Africa vs Ghana (Top 15 cancer sites).

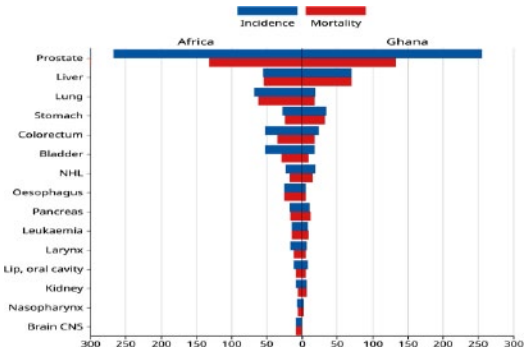

Fig. 14. Age-Standardised Rate (World) per 100 000, Incidence and Mortality, Males, age [65-74] in 2022, Africa vs Ghana (Top 15 cancer sites)..

In Ghana, prostate cancer recorded the highest age-standardised incidence ratio of 90 per 100,000, followed by liver (50 per 100,000) and stomach cancer (nearly 20 per 100,000) among men aged 55 to 64 years. The least age-standardised incidence observed among those age groups was kidney cancer (5 per 100,000). Even though prostate cancer was the highest cancer incidence among men aged 55 to 64 years in Ghana, liver cancer was observed to have the most mortality cases with an age-standardised mortality ratio of 50 per 100,000. In both Ghana and Africa as a continent, prostate cancer was observed to have the highest age-standardised incidence ratio (160 per 100,000) as well as the highest age-standardised mortality ratio (75 per 100,000) among men aged 55+ years. Although prostate cancer had the highest incidence ratio among all the top 15 cancer cases for men aged 55+ in Northern America, lung cancer was observed to have the highest mortality ratio of almost 200 per 100,000 for men aged 55+ in Northern America.

Discussion

Cancer Burden Among Males Aged 35–44 Years

Ageing is one of the most important non-modifiable risk factors for the various types of cancer among men (National Cancer Institute, 2021). It is rare for cancer to be diagnosed among males < 55 years old; however, there has been a global increase in cancer cases among all age groups, especially young males (Ntekim et al., 2023). The American Cancer Society data revealed that about 80,000 young adults between the ages of 20 and 39 years are diagnosed with cancer each year in the United States (Miranville, 2021). Based on the statistical data explored for men aged 35–44 years, it was found that liver cancer was the leading cancer inci-

dence in Ghana, with ASR ranges between 30 to 40 per 100,000. Contrary to this finding is the data of Northern America, which revealed colorectal cancer as the leading incidence of cancer among young males aged 35–44 years. In 2020, liver cancer was estimated as the sixth most commonly diagnosed cancer and ranked as the third most common cause of cancer death (Rumgay et al., 2022). About 15% to 26% of the total liver cancer worldwide occurs among people below the age of 50 years and could be attributed to non-deterministic risk factors such as smoking, alcohol, obesity, and diabetes (Guo et al., 2023).

The high incidence of liver cancer among young males (35–44 years) in Ghana could be due to the rapid pathological progression of infections such as hepatitis B and C, alcohol use, and smoking among Ghanaian males of this age bracket. According to Duah and Nartey (2023), the Hepatitis B virus (HBV) is the cause of 80% of hepatocellular carcinoma and the commonest liver disease causing deaths in Ghana. HBV-related liver cancer is more prominent among younger males in the African region, especially in Ghana, compared to North America and Western Europe, which may be due to late diagnosis and treatment, less knowledge of the Hepatitis B virus and its relation with hepatocellular carcinoma, smoking, and risky sexual behaviour (Opare-Asamoah et al., 2021; Id et al., 2020; Mohammed, 2022). Prolonged consumption of alcohol accelerates hepatocarcinogenesis, especially among HBV patients, and accounts for 30% of all confirmed hepatocellular carcinoma across the globe (Opare-Asamoah et al., 2021; Id et al., 2020).

Cancer Burden Among Males Aged 45–54 Years

It was revealed in the data displayed by GLOBOCAN 2022 that the most common form of cancer observed among Ghanaian males aged 45–54 years was liver cancer. This finding disagrees with the finding in Northern America, which ranked prostate cancer as the most common cancer diagnosed among Northern American males in this age bracket. The discrepancies could be due to excessive exposure to carcinogens such as tobacco and alcohol, related conditions of metabolic syndrome, as well as the rising prevalence of type-2 diabetes and obesity within the confines of limited healthcare resources in Ghana. It is estimated that about 18% of liver cancer may be related to tobacco smoking (Rumgay et al., 2022). Tobacco use is one of the major risk factors for non-communicable diseases such as cancer across the globe (Ganne-Carrié & Nahon, 2019). Over recent decades, tobacco use has declined in Western countries compared to developing countries, partly due to regulations and public health campaigns (Dalinjong et al., 2015). The shift of tobacco marketing from Western nations to developing countries is often attributed to multi-national tobacco companies seeking new markets without fully considering the detrimental health impact (Doku et al., 2013). The smoking of tobacco still exists in some Ghanaian communities, irrespective of national enforcement of bans on public smoking (Laryea et al., 2014). The 2014 Ghana Demographic and Health Survey revealed that the prevalence of cigarette smoking among males is 4.8% (Ghana Statistical Service, 2015). Tobacco contains a chemical toxin called nicotine, which stimulates

lifelong smoking addiction and activates stellate cells, leading to liver fibrosis (Altamirano & Bataller, 2008; Rutledge & Asgharpour, 2020). The activation and accumulation of hepatic stellate cells result in chronic liver inflammation, eventually developing into hepatocellular carcinomas (Shao et al., 2023).

Cancer Burden Among Males Aged 55–64 Years

The incidence rates for cancer increase steadily with age, rising from about 350 per 100,000 among people aged 40–49 years to more than 1,000 per 100,000 among individuals aged 60 years and above (National Cancer Institute, 2021). One of the most common cancers among men above age 55 is prostate cancer, with a global incidence of 1.4 million cases diagnosed in 2020 (Ntekim et al., 2023). According to the GLOBOCAN cancer data (2022), prostate cancer was the leading cancer incidence among Ghanaian males aged 55–64 years, with an ASR of more than 80 per 100,000. This finding is lower than the incidence rate of about 170 per 100,000 among males aged 45–64 in the United States in 2019 (United States Cancer Statistics Data Briefs, 2023). The fewer incidence cases of prostate cancer observed in Ghana, however, do not necessarily reflect a positive trend, as Ghana's total male population is substantial relative to the United States population (Macrotrends, 2024). The incidence of prostate cancer among Ghanaian men aged 55–64 years may be due to poor perception and attitudes toward the disease, late screening, and delayed detection.

Prostate screening—an effective tool for early detection—is low among Ghanaian men, often resulting in late detection and poorer treatment outcomes (Necku et al., 2019). In addition to late screening, there is no national cancer registry for effective record-keeping, making it difficult to track prostate cancer prevalence and outcomes (Necku et al., 2019). Knowledge deficits, limited health infrastructure, and poor healthcare accessibility also contribute to the increased incidence and mortality of prostate cancer among males (Kaninjing et al., 2018).

Cancer Burden Among Males Aged 65–75+ Years

It is established that close to 60% of prostate cancers are diagnosed among men aged 65 years or above, although the disease can occur from the age of 50 onward (Ntekim et al., 2023).

According to statistical data from the National Cancer Institute Surveillance, the median age for prostate cancer is 66 years, implying that half of the cases occur below 66 and half above (National Cancer Institute, 2021). GLOBOCAN 2022 cancer data among Ghanaian men aged 65–74 years revealed an incidence rate of slightly above 250 per 100,000, aligning with similar rates in Africa overall. Ageing is a risk factor for prostate cancer among males (Guo & Czerniak, 2023). In men, the hormone androgens are responsible for the physiological development and regulation of the prostate (Shi et al., 2013). Alteration or mutation in androgen receptor functions during older age increases the risk of prostate cancer development (Fujita & Nonomura, 2019).

However, the precise mechanisms by which increasing age influences prostate cancer pathogenesis remain an area of ongoing research (Clark et al., 2022).

Conclusion

The overall leading cancer by incidence and mortality among Ghanaian males was liver cancer, in contrast to prostate cancer, which is globally one of the leading causes of cancer mortality among males. It was observed that liver cancer had the highest age-standardised incidence ratio among young Ghanaian males aged 35–54 years. However, prostate cancer was found to be the leading age-standardised incidence ratio among males above 54 years. Lifestyle changes such as increased tobacco smoking, excessive alcohol consumption, obesity, and viral infections (HBV and HCV) could contribute to the rise of liver cancer cases among Ghanaian males. Inadequate enforcement of tobacco-use bans and infiltration by tobacco and alcohol companies have especially exposed young males, increasing their cancer risk. Moreover, poor screening exercises, limited health infrastructure, the lack of a comprehensive cancer registry, and late detection remain significant challenges for cancer control in Ghana.

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