

REVIEW ARTICLE

Disparities in prostate cancer epidemiology: a comparative analysis of West Africa and Europe

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Abstract

Prostate cancer remains a leading cause of morbidity and mortality worldwide, disproportionately affecting black men. This review examines the differences in prostate cancer incidence and mortality rates between West Africa and Europe. While prostate cancer is more prevalent in Europe, primarily attributed to widespread screening programmes, West Africa faces significant challenges, including underdeveloped cancer registration systems, low public awareness, and limited access to screening. These factors lead to underreporting of incidence rates, yet higher mortality rates. In addition, this narrative review explores the role of environmental and lifestyle factors, including high levels of chronic stress and exposure to pollutants, as additional risk factors for prostate cancer in West Africa compared to European countries. As the global incidence of prostate cancer is projected to increase, implementing region-specific interventions and targeting modifiable lifestyle factors will be vital in alleviating the burden in West Africa. Addressing these disparities is essential for improving early detection, enhancing survival outcomes, and promoting more equitable prostate cancer care.

Keywords: *prostate cancer; West Africa; European countries; prostate cancer incidence; screening methods*

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Prostate cancer is a malignant growth of the prostate gland that can be diagnosed through multiple methods such as digital rectal examination, prostate-specific antigen (PSA) testing, imaging and tissue biopsy [1]. This disease is the second most diagnosed cancer and a leading cause of cancer-related mortality among men worldwide [2]. Consequently, it remains a significant public health burden due to increasing incidence, disability-adjusted life years and mortality [3].

A notable aspect of prostate cancer is the regional variation in both incidence and mortality. While the incidence is particularly high in Northern Europe, mortality rates do not correlate [2]. Studies indicate that as the mortality-to-incidence ratio increases, there is a corresponding decline in the human development index and income level [4]. This discrepancy suggests that factors such as public awareness initiatives, screening methods, underlying risk profiles, and access to treatment play a critical role in determining prostate cancer outcomes.

In addition, higher incidence rates are seen among black men in other continents, thus suggesting a potential link between West African ancestry and prostate cancer [5]. A study conducted in North-east London revealed

that African-Caribbean men have a risk three times greater than that of European men. This finding is also reflected in data from the United States of America and the Caribbean, indicating that Black men of West African descent face a higher risk of prostate cancer [6].

This review aims to compare the incidence, mortality, risk factors, and challenges associated with prostate cancer in West Africa and Europe. Given the projected increase in prostate cancer incidence globally [7], this review will help guide public health policies by highlighting the reasons behind these differences and emphasising the need for region-specific strategies to ensure equitable prostate cancer care.

Methodology

To conduct this narrative review, a comprehensive search was performed using medical subject headings in databases such as PubMed, Google Scholar, African Journals Online, and national registries. The inclusion criteria focused on articles published in the last 20 years that examined prostate cancer in black men and its epidemiology in Africa and Europe. Older studies were not selected as they may not reflect current trends.

Incidence and mortality rates

Cancer registries provide comprehensive data on incidence, prevalence, and outcomes. They provide insights into cancer burden and guide effective prevention and treatment strategies [8]. However, in West Africa, registries are underdeveloped, thus limiting the ability to fully grasp the burden of prostate cancer and develop effective strategies [9]. While some countries, like Nigeria, have made efforts, the data remains scarce due to a lack of consistent reporting. This can be attributed to challenges such as insufficient funding, underreporting, and inadequate training [10]. To address this issue, international organisations provide limited insight through initiatives such as the Global Cancer Observatory (GLOBACAN). Prostate cancer is the most prevalent cancer among Western African men, with an estimated 31,231 newly diagnosed cases in 2022, an incidence rate of 36.9 per 100,000 men [11]. These figures emphasise the significant burden of prostate cancer and the critical need for further development of population-based cancer registries to assess its implications accurately.

In contrast, most European countries have established population-based cancer registries that maintain up-to-date data on prostate cancer incidence [12]. These registries collaborate within regional networks, such as the European Network of Cancer Registries, to provide insights into European cancer patterns. According to the GLOBOCAN report, Europe recorded the highest incidence rates globally, with 417,659 new cases in 2022, 59.9 per 100,000 men, far exceeding those of West Africa [10]. This trend is especially pronounced in Lithuania, Norway, and Sweden, demonstrating notably high incidence rates. One reason for this is the growing accessibility of screening methods such as PSA testing [13, 14].

While the incidence of prostate cancer is higher in European countries than in West Africa, the elevated rates observed among black men in Europe, whose ancestral roots trace back to West Africa, suggest that comparable high rates may exist in West Africa, although they remain largely undocumented [15].

In contrast, the mortality rate paints a different picture, with 11.2 per 100,000 affected European men in 2022 [10]. Conversely, West Africa recorded 18,787 prostate cancer-related deaths in 2022, corresponding to a mortality rate of 23.5 per 100,000 individuals, the fourth highest mortality rate worldwide [10]. This disparity underscores the challenges faced in West Africa, where high mortality rates may be attributed to late-stage diagnoses, limited screening programmes, and restricted healthcare access. Europe's lower mortality rate reflects its more advanced treatment options and robust healthcare infrastructure.

This narrative review will delve deeper into the key differences in awareness of cancer symptoms and accessing care, clinical evaluation and staging, and access to

treatment, each of which plays a crucial role in improving early diagnosis and outcomes for prostate cancer patients [16]. In addition, it will also explore socioeconomic, environmental and genetic factors that contribute to the high prostate cancer-related deaths among black men.

Awareness and accessing care

Firstly, patients must be aware of the cancer symptoms and understand the urgency to seek medical care [14]. In West Africa, public awareness of prostate cancer is a significant barrier to early detection, with many men delaying care due to a lack of knowledge, fear of stigma, and deeply ingrained societal beliefs about prostate cancer [17]. Some view prostate cancer as a form of spiritual retribution or because of improper sexual relations [18]. Many men over 40 failed to recognise their risk, and studies showed that a substantial proportion of the population (65.2% in one study) has limited knowledge of the disease [19]. Although there are mixed reviews on the impact of limited knowledge on screening uptake, issues such as masculinity, fears of erectile dysfunction and digital rectal examinations often discourage men from seeking medical attention [20]. These factors contribute to delays in the early diagnosis of prostate cancer in West Africa. On the other hand, in Europe, there are several targeted campaigns to encourage men to undergo prostate cancer screening and promote understanding of early detection, such as 'Talk (not too late), about your Prostate' and 'It's Easier Than You Think'.

Screening methods & guidelines

Prostate cancer screening methods remain a subject of ongoing debate, with each approach presenting distinct advantages and challenges. The PSA test, while non-invasive, carries the risk of false positives and overdiagnosis, potentially leading to unnecessary treatments [21]. Digital rectal examinations are low-cost but can cause patient stress and have limited sensitivity [22]. More expensive modalities, such as magnetic resonance imaging, offer non-invasive imaging, which reduces the overdiagnosis of insignificant prostate cancer [23]. Current studies indicate significant regional variations in screening availability in Africa, with only 24.7% of individuals screened based on healthcare professional advice. Furthermore, there is the inequitable distribution of screening centres in urban and rural populations, as many rural residents face difficulties accessing prostate cancer screening due to the absence of centres [24]. In some areas, screening is lacking, and clinicians only perform diagnostic procedures on symptomatic patients [25].

In contrast, prostate cancer screening is more accessible in European countries. Although there is a risk of overdiagnosis from opportunistic PSA screening, a 16-year follow-up has demonstrated that its use can significantly

reduce both prostate cancer mortality and metastasis [26]. Furthermore, the risk of overdiagnosis is mitigated by using recommended risk stratification tools [13, 27]. For example, the European Association of Urology (EAU) guidelines advise early PSA testing for well-informed men with elevated risk, such as those of African descent [28]. In addition, initiatives such as the PRAISE-U project aim to reduce European morbidity and mortality rates through customised screening programmes.

Given the fact that the incidence of prostate cancer in Africa is projected to double by 2040, compared to a moderate 1.3% rise in Europe, there is an urgent need to implement a low-cost national screening programme in West Africa [29]. Such an initiative would not only address the mortality disparity but also help curtail late-stage diagnosis and reduce the financial burden of treating advanced prostate cancer.

Clinical evaluation, diagnosis, and staging

Once prostate cancer is suspected, prompt clinical evaluation and accurate staging are essential for deciding the most appropriate treatment [14]. Guidelines from EAU emphasise early treatment based on a risk stratification model that incorporates PSA levels, Gleason scores, and clinical stage [30]. This comprehensive approach ensures that prostate cancer is identified early and treated appropriately, significantly improving survival rates. However, in West Africa, many patients are diagnosed at advanced stages and staging is often insufficient or absent due to limited healthcare resources [31]. This results in suboptimal treatment and poorer outcomes.

Treatment access and variation

Access to affordable treatment is another critical factor influencing mortality [14]. Europe's universal healthcare systems, such as national health insurance programmes, ensure that prostate cancer patients receive prompt treatment without a significant financial burden. On the other hand, many patients in West Africa face substantial out-of-pocket expenses for diagnostics and treatments [15]. Without the necessary financial support or insurance coverage, many men cannot access the diagnostic workup and treatment they need, leading to late-stage diagnosis and higher mortality rates.

In addition to financial barriers, variations in clinical practice further contribute to disparities in outcomes. Although international guidelines, like those provided by EAU and the National Comprehensive Cancer Network, provide recommendations for the management of prostate cancer, different specialists often use varying guidelines [22]. This usually leads to disparities in treatment approaches and inconsistencies in patient care.

For instance, in the management of metastatic prostate cancer, androgen deprivation therapy (ADT) is essential [32].

While both surgical and medical castration effectively suppress testosterone levels, they differ significantly in costs and psychological impact. Bilateral orchidectomy is more commonly used in West Africa due to its affordability [33]. One study found that the price of a single dose of a gonadotrophic-releasing hormone agonist was equivalent to the cost of the bilateral orchidectomy, demonstrating the inaccessibility of medical ADT in low-income countries [34]. Despite its cost-effectiveness, orchidectomy often leads to significant psychological distress, including anxiety, depression and body image issues [35].

In contrast, medical ADT is the standard in Europe, supported by national insurance with access to cancer nurse specialists who assist in managing treatment side effects, including emotional well-being [36, 37]. As a result, prostate cancer care in Europe often prioritises both clinical effectiveness and quality of life, whereas economic constraints usually dictate treatment decisions in West Africa, with many patients with castration-resistant disease left only with palliative options.

Tackling these disparities in prostate cancer care demands a coordinated, regional approach to standardised prostate cancer management across West Africa. By implementing uniform guidelines and focusing on early detection and treatment, the progression to advanced disease can be prevented, thus avoiding the higher costs of late-stage diagnosis. This approach will help ensure that all patients receive timely prostate cancer care regardless of geographical location or income.

Genetic factors

Prostate cancer has one of the highest heritability rates. Genetic mutations in DNA repair genes are associated with increased risk of developing prostate cancer and more aggressive forms [38]. Studies have reported a higher rate of BRCA2 mutations in Black men compared to White men [39]. As such, biological factors are critical determinants of prostate cancer incidence and mortality rate.

While family history may be viewed as a substitution for genetic factors, in many cases, biological differences arise from physiological responses to environmental stressors such as neighbourhood deprivation and resource scarcity. This raises the concerning possibility that socioeconomic inequalities not only impact cancer patients' access to healthcare but may also impart heritable imprints, further compounding the impact of prostate cancer in West Africa [34].

Environmental factors

In West Africa, many individuals live in deprived neighbourhoods with exposure to harmful pollutants, which heighten cancer risks [40]. Moreover, social factors such as racial discrimination, violence, and lack of social

support are linked to chronic stress in black individuals. Excessive stress is known to promote cancer development [33]. In contrast, Europe generally offers better living conditions and lower environmental hazards, contributing to lower prostate cancer mortality rates in the region. Consequently, the confluence of environmental challenges and socio-economic stressors in West Africa is a key driver in the region's higher prostate cancer mortality rates.

Lifestyle factors

Similarly, lifestyle factors, particularly obesity, have a more significant impact on prostate cancer risk within African populations compared to other racial groups [41]. In one study, involving Ghanaian men, obesity, particularly abdominal obesity, was positively associated with an increased risk of prostate cancer [42]. These findings underscore the importance of addressing modifiable risk factors such as obesity in regions such as West Africa, where the prevalence of obesity is rising. By addressing these environmental and lifestyle factors, we can work towards mitigating disparities in prostate cancer outcomes across regions.

Conclusion

The disparities in prostate cancer epidemiology between West Africa and Europe underscore the urgent need for targeted interventions in West Africa. While reported cases are lower in West Africa, the region experiences significantly higher mortality rates due to underreporting, limited screening, and insufficient healthcare access. To address this public health burden, a comprehensive strategy is needed. Key actions include improving cancer registries for accurate data and implementing personalised risk assessment strategies. Culturally tailored awareness campaigns are also crucial to reduce stigma, encourage early health-seeking behaviours and address modifiable lifestyle risk factors through education. Efforts should also focus on promoting consistent diagnostic and treatment guidelines, including increasing access to PSA testing and medical ADT. Together, these interventions can help reduce the gap in prostate cancer mortality and foster more equitable prostate cancer care worldwide.

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