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RESEARCH ARTICLE

Rising prostate cancer incidence in Africa: socioeconomic impact implications and 25-year projection

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Abstract

***Background*:** Prostate cancer is the most common male malignancy globally, with a disproportionately high burden in Africa and negative quality of life and economic consequences, as well as premature mortality.
***Methods*:** This study uses Global Cancer Observatory 2022 data on prostate cancer (International classification of diseases [ICD]-10 C61) from 48 African countries to estimate incidence and mortality and to project future trends to 2050. Incidence and mortality predictions were based on constant 2022 national rates applied to population growth projections. Economic productivity losses were calculated using International Labour Organisation statistics and remaining years of productive life before age 65.
***Results*:** In 2022, there were an estimated 103,050 new prostate cancer cases and 58,890 deaths in Africa, accounting for 8.7% of all cancers. Age-standardised incidence and mortality rates were 30.3 and 17.3 per 100,000, respectively, with the highest rates observed in Southern, Middle, and West Africa. By 2050, prostate cancer cases are projected to increase by 173.7%, reaching 282,005 new cases annually, with the steepest rise in countries such as Equatorial Guinea, Zambia, and Cape Verde. Prostate cancer was among the top cancers contributing to economic productivity loss in four of five African regions, with West Africa recording an average of 32.2 years of productive life lost compared to a world average of 9.4 years.
***Conclusions*:** Prostate cancer burden in Africa is expected to nearly triple by 2050, driven by demographic expansion and ageing. Strengthening early detection, access to care, and targeted health policies are required to address this growing challenge and mitigate productivity losses.

Keywords: *prostate cancer*; *Africa*; *cancer projection*; *GLOBOCAN*; *economic productivity loss*; *cancer epidemiology*; *mortality*

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Prostate cancer is one of the most common malignancies affecting men globally and remains a leading cause of cancer-related mortality. In 2022, it was the second most frequently diagnosed cancer among men worldwide, following lung cancer [1], and accounted for approximately 14.1% of all newly diagnosed cancers in men [2]. In 2020, an estimated 1.41 million new prostate cancer cases and 375,304 deaths were recorded globally [3], underscoring its substantial contribution to the global cancer burden. These high incidence and mortality figures highlight prostate cancer as one of the major threats to men's health worldwide.

In Africa, the burden of prostate cancer represents a significant and growing public health challenge. The continent faces disproportionately high mortality rates, driven largely by limited diagnostic capacity, late-stage presentation, and restricted access to timely and effective treatment services [4]. Lower reported rates compared with those in higher-income regions may reflect underdiagnosis, data limitations, and structural barriers across health systems, potentially leading to disproportionate outcomes.

The epidemiology of prostate cancer in Africa is influenced by a wide range of risk factors. Beyond age, several modifiable and non-modifiable determinants have been implicated, including behavioural and metabolic factors, prostate specific antigen (PSA) testing practices, and environmental exposures. Additionally, demographic transitions, characterised by population ageing, rapid urbanisation, and increasingly westernised lifestyles, are expected to intensify the prostate cancer burden on the continent relative to that worldwide. From 2020 to 2040, Africa's contribution of new prostate cancer cases will double from 6.2 to 12.0%, whilst the proportion of prostate cancer mortality will increase from 11.6 to 17.7% [5]. In low- and middle-income countries (LMICs), the proportion of non-selected global cancer cases has risen from 15 in 1970 to 50% in 2008 and is projected to reach 70% by 2030 [6], reflecting both population dynamics and evolving risk

profiles. Sub-Saharan Africa has experienced particularly notable increases. Disability-adjusted life years (DALYs) attributable to prostate cancer doubled from 100,200 in 1990 to 219,700 in 2010, and prostate cancer deaths increased from 5,600 to 12,300 during the same period [6].

Earlier Global Cancer Observatory (GLOBOCAN) estimates reported prostate cancer incidence and mortality rates of 23.2 and 17.0 per 100,000 population, respectively, across Africa in 2012 [6]. However, these figures likely underestimate the true burden due to limited cancer registry coverage, under-reporting, and disparities in health system infrastructure. When combined with evidence of late-stage diagnosis and limited access to curative treatment, prostate cancer continues to impose a disproportionate clinical and economic toll. Its economic impact is further accentuated by significant losses in productive life years, posing challenges for national development in many African countries.

Accurate estimation of prostate cancer incidence, mortality, and associated economic losses is essential to guide evidence-based health planning, resource allocation, and policy formulation.

This study, therefore, aims to quantify the current burden of prostate cancer in Africa using GLOBOCAN 2022 data and to project its future incidence, mortality, and economic productivity loss through to 2050.

Methods

The data used in this paper for prostate cancer (International classification of diseases [ICD]-10 C61) were extracted from the dataset of the GLOBOCAN 2022 project by the International Agency for Research on Cancer [2, 7]. From GLOBOCAN estimates of the burden of cancer from 185 countries or territories of the world, data were extracted for 48 African countries. The methods used to estimate the age-specific incidence rate included national (or sub-national, with coverage greater than 50%) rates projected to 2022, the most recent rates from a single registry applied to the 2022 population, and, for those with no data, rates are those of neighbouring countries/registries in the same area [7]. The incidence methodology across Africa is shown in Fig. 1.

For the age-specific mortality rate, all African countries, except South Africa and Western Sahara, were estimated from national incidence estimates using modelling. South African figures were from national rates projected to 2022. There was no data for Western Sahara.

The predictions of incidence and mortality of cancers in 185 countries and regions, from 2022 to 2050, are based on the current estimates of incidence, mortality and prevalence of 2022 [7]. The key assumptions are that national rates remain constant in the prediction and that the national population projections are accurate for these

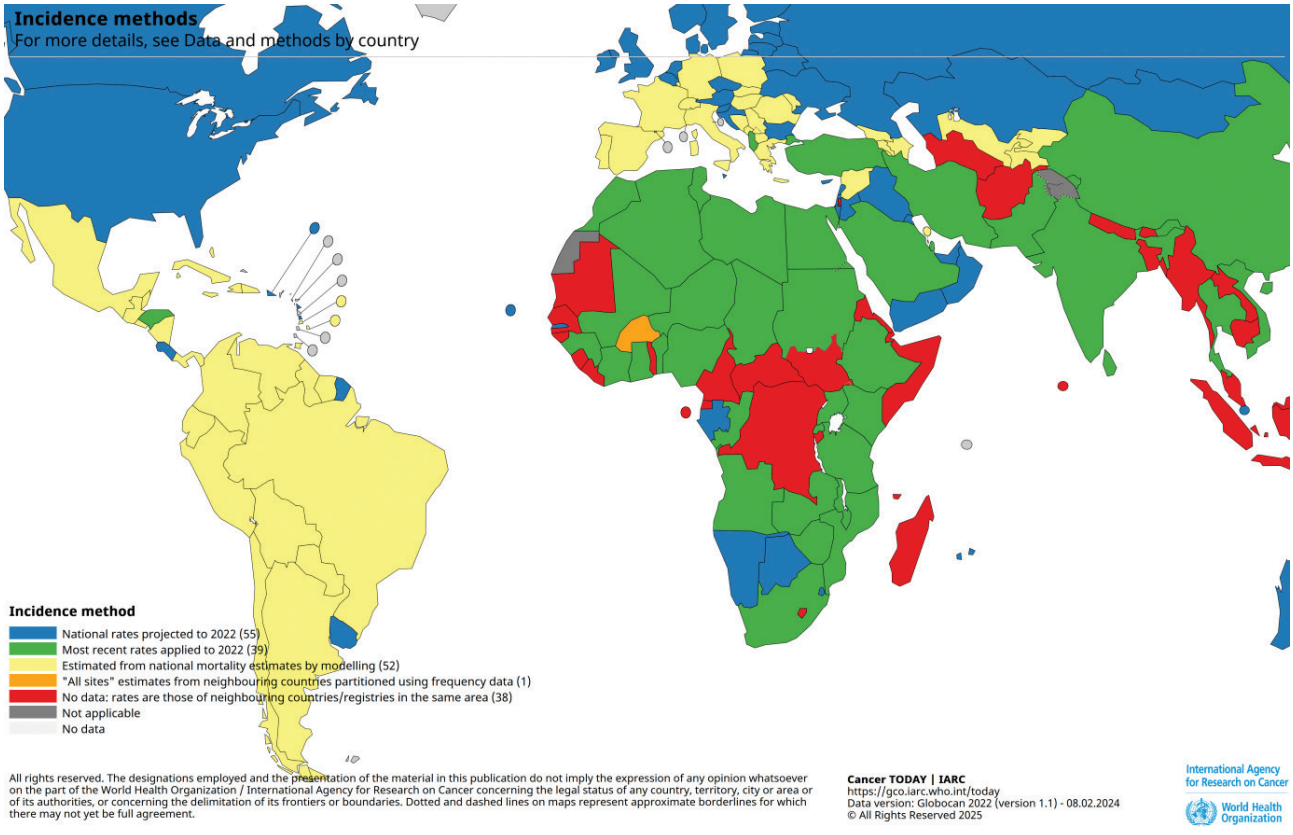

Fig. 1. Methods used to estimate the age-specific incidence rate.

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years [8]. Given the variety of the quality of data from different countries (Fig. 1), estimates should be interpreted with due caution [9].

The economic statistics were obtained from the International Labour Organisation (ILO), and the complete list is presented in Kong et al. [10]. To estimate productive life years, a retirement age of 65 years was assumed, consistent with the retirement age among Organisation for Economic Co-operation and Development countries in 2022. Years of productive life were calculated by multiplying the number of deaths by the remaining life expectancy at age 65 for each age group.

Results

There were 103,050 new prostate cancers in Africa in 2022, across all age groups to 85 years, 8.7% of all total cancers in Africa after breast cancer (16.8%) and cervical cancer at 10.6%. The age-standardised rates (ASR) for incidence and mortality of prostate cancer were 30.3 and 17.3 per 100,000, respectively. It was the most common male cancer, constituting 20.4% of all male cancers (Fig. 2) and 16.1% of all male cancer mortality in Africa in 2022 (Fig. 3).

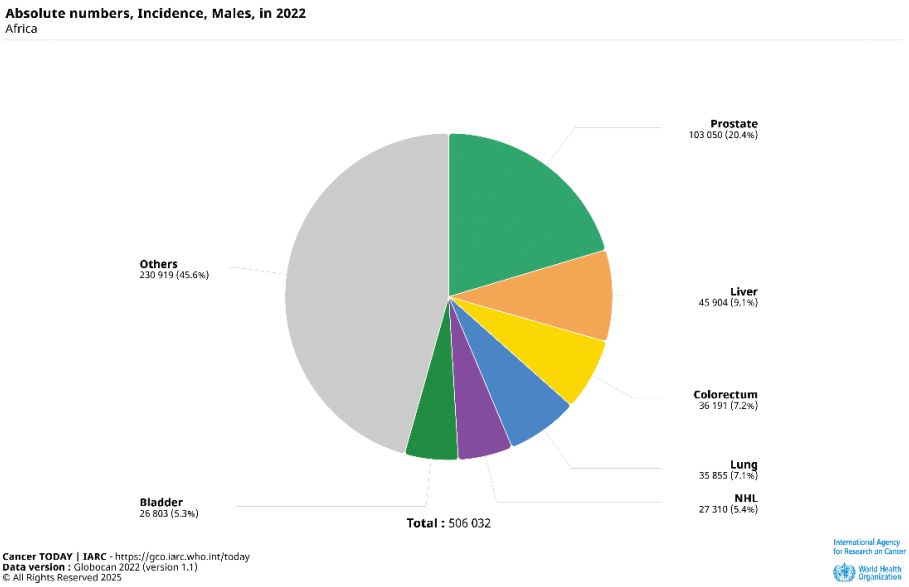

Fig. 2. Absolute numbers of new male cancers in Africa in 2022.

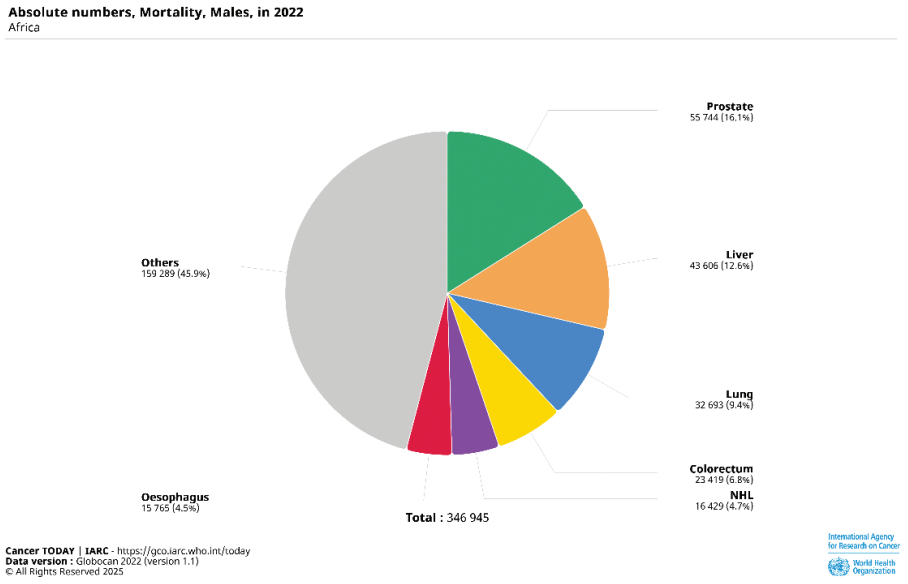

Fig. 3. Absolute numbers of deaths from male cancers in Africa in 2022.

While Africa's ASR for incidence was the fourth-highest globally, its ASR for mortality was the highest (Fig. 4). The three top African subregions with ASR incidence per 100,000 were Southern Africa, Middle Africa, and West Africa, with rates of 59.9, 44.2, and 36.9, respectively. The same countries also had the highest ASR mortality rates at 29.7, 27.2, and 23.5, respectively. Chad, Zimbabwe and Zambia had the three highest ASR incidence rates at 82.2, 68.3 and 65.4, respectively (Fig. 5). The three countries also had the highest ASR mortality rates at 49.4, 37.2 and 37.6, respectively.

Prostate cancer economic productivity loss in 2022

While prostate cancer was the second most common cancer in men after lung cancer worldwide in 2022, it was only in West Africa that it was in the top three cancers leading to a total loss of economic productivity. Four of the five African regions were in the top 10 regions with the most significant economic productivity loss due to prostate cancer in 2022 (Table 1). In West Africa, 32.2 years of productive life are lost to prostate cancer compared to a world average of 9.4 years.

Fifteen African countries were in the top 20 countries with the highest productivity loss as a percentage of their

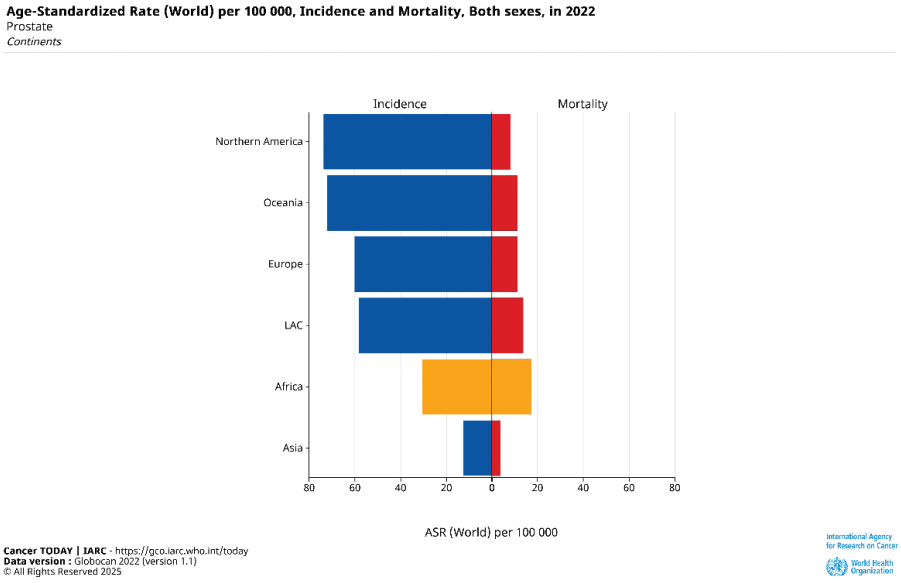

Fig. 4. ASR incidence and mortality of prostate cancer by continents. LAC: Latin Americas and Caribbean; ASR: age-standardised rates.

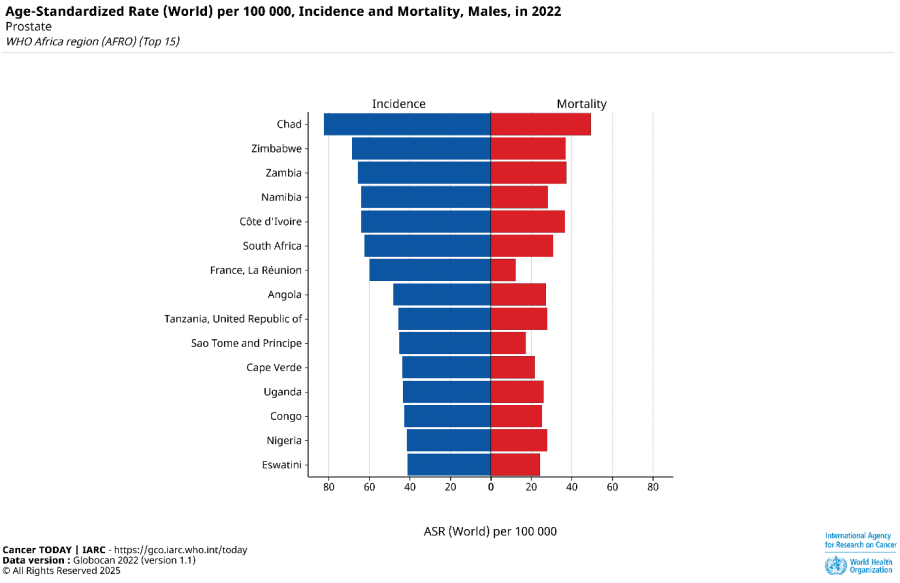

Fig. 5. ASR incidence and mortality for the top 15 African countries. ASR: age-standardised rates.

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Gross domestic product (GDP), with the top five countries being Chad (0.13%), Sierra Leone (0.12%), Mozambique (0.10%), Malawi (0.09%), and the Democratic Republic of the Congo (0.08%). The first European country was Ukraine at 0.02%. Of the top 20 countries with the years of productive life lost, there were eight African countries: Chad (119.6), Mozambique (46.1), Nigeria (45.7), Benin (37.5), Uganda (37.5), Malawi (35.2), Burkina Faso (31.9), and Rwanda (28.0). Eight countries were from Latin America and the Caribbean, and three from Europe, Lithuania (29.5), Armenia (29.2) and Belarus (28.1).

Predicted incidence and mortality of prostate cancer in Africa by 2050

New prostate cancer cases are predicted to rise worldwide by 2050, and this rise is steepest in Africa at +173.7% (Table 2). In Africa, there is a rise across all age groups, with the largest increase in the over-75 age group, with an increase of 205.3% between 2022 and 2050. Figure 7 shows the percentage rise in each African country. Equatorial Guinea (395.6%), Zambia (306.2%) and Cape Verde (296.1%) are projected to see the most significant increases, and only four countries, South Sudan, Lesotho, Mauritius and France, La Reunion will not double the number of new cases in that period (Fig. 7).

Discussion

In this study, we assessed continent-wide pooled estimates of prostate cancer incidence and mortality in Africa and used these data to project the burden of disease through 2050. Our analysis demonstrates a rapidly escalating prostate cancer burden across the continent. The age-standardised incidence rate has risen from 15.7 per 100,000 in the 1990s [11] to 22.0 per 100,000 in 2015 [11], reaching 30.3 per 100,000 in the present analysis. Comparably, the age-standardised mortality rate of 17.3 per 100,000 is more than three times the current global mortality rate of 5.26 per 100,000 and represents a 47.9% increase from the 1990–2019 estimate of 11.7 per 100,000 [3, 12]. Significant regional differences were noted, with a disproportionate contribution to both incidence and mortality from Southern, Middle, and West Africa.

Several factors may explain the rising incidence across Africa. Demographic changes, particularly population growth and rising life expectancy, are major drivers of the increase in case numbers. Enhanced awareness of prostate cancer and increased access to PSA testing in urban areas may also contribute to higher detection rates. Improved health system documentation and case reporting, along

Table 1. Prostate cancer economic productivity loss in 2022

Label	Value of total productivity loss (in millions USD)	Value of paid productivity loss (in millions USD)	Value of unpaid productivity loss (in millions USD)	Years of productive life lost rate
Caribbean	75.7	62.1	13.6	38.052
Western Africa	147.9	112.7	35.2	32.167
Middle Africa	99.3	81.8	17.5	30.537
Southern Africa	19.8	13.5	6.3	24.526
Eastern Europe	327.9	186.5	141.4	19.858
Eastern Africa	103.3	74.1	29.3	19.314
Melanesia	4.1	2.9	1.1	16.095
Northern America	1725.7	995.5	730.2	15.47
South America	185.8	130.6	55.2	15.016
Polynesia	0.36	0.26	0.10	14.962
World	4710.5	2933.2	1777.4	9.392

Table 2. Estimated number of new prostate cancer cases from 2022 to 2050, Incidence, 0–85+

Population	Annual population		Number		Change in number
	2022	2050	2022	2050	
Africa	703,122,445	1,238,719,813	103,050	282,005	+173.7%
Asia	2,374,486,911	2,667,148,836	386,424	870,939	+125.4%
Latin America and the Caribbean	327,201,180	367,532,118	225,985	471,395	+108.6%
Oceania	21,902,160	28,903,389	23,602	39,616	+67.9%
Northern America	184,781,027	209,228,651	255,782	345,571	+35.1%
Europe	361,242,024	342,044,607	473,011	628,400	+32.9%

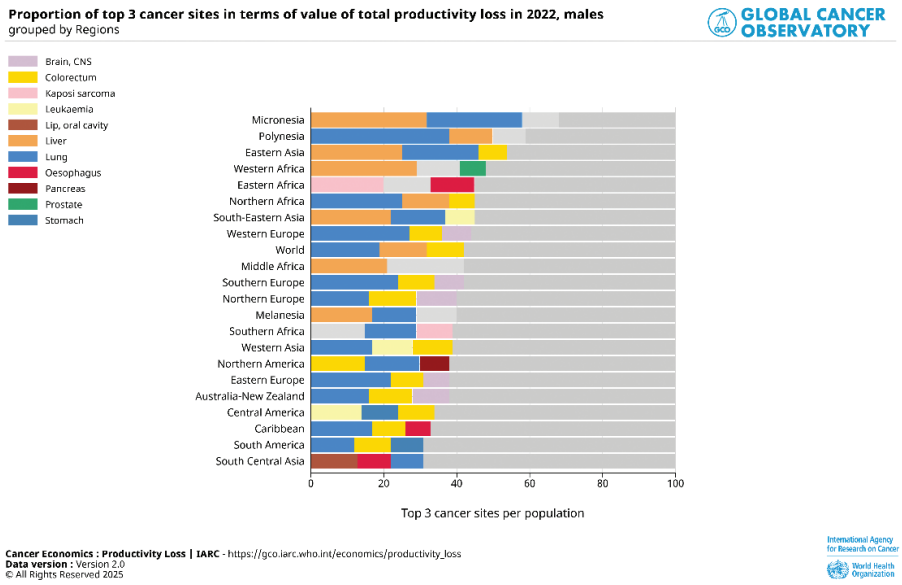

Fig. 6. The top three cancers leading to loss of productivity across regions.

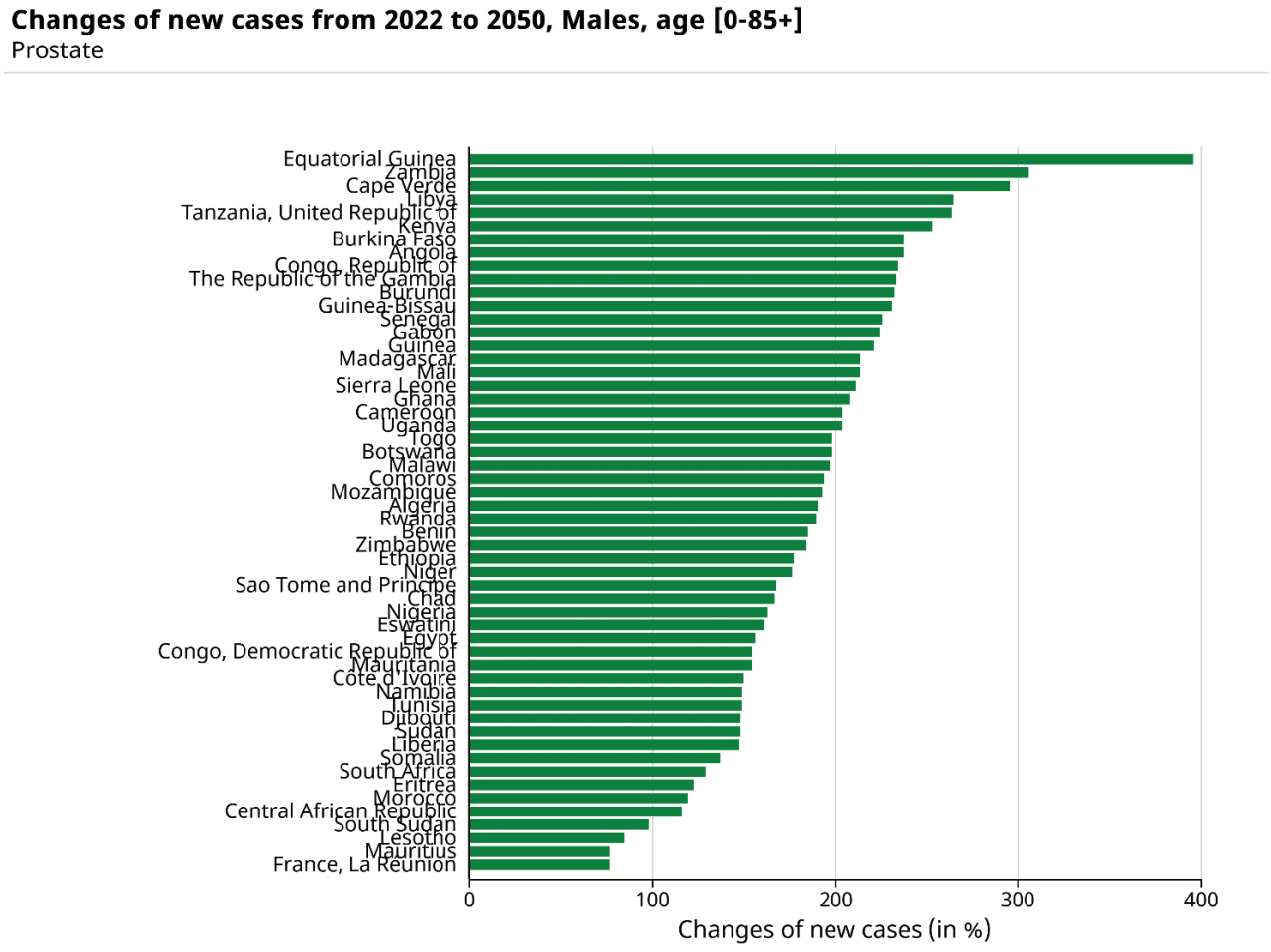

Fig. 7. Percentage increase in the number of prostate cancer cases in Africa between 2022 and 2050.

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with continued rural-to-urban migration, may likewise elevate observed incidence. In settings where screening remains limited, the growing burden may also reflect shifts towards more 'westernised' lifestyle patterns, including obesity, tobacco use, reduced physical activity, and dietary changes that have been implicated in prostate cancer risk.

Interpretation of incidence and mortality in Africa requires caution, as GLOBOCAN country estimates rely on modelled and corrected datasets to compensate for underreporting and incomplete cancer registry coverage. A positive correlation ($r = 0.65$) [13] between prostate cancer incidence and the degree of urban registry coverage suggests that rural cases remain substantially underreported. This likely contributes to conservative estimates of the true burden.

Future burden of disease

Projections from this study indicate that prostate cancer incidence in Africa will nearly triple by 2050, increasing from 103,050 to 282,005 cases, a 173.7% rise, representing the steepest increase among all world regions. While demographic transitions account for much of this escalation, further amplification may result from changing lifestyle exposures, environmental factors, and improved detection.

Mortality and survival disparities

The disproportionately high mortality observed in Africa likely reflects limited access to early detection, late-stage diagnosis, and restricted availability of high-quality treatment, including radiotherapy and advanced systemic therapies. Despite ranking fourth globally in incidence, Africa has the highest prostate cancer mortality. Five-year survival is as low as 28% in South Africa, compared to >90% in high-income countries such as Australia (94.5%), France (93%), and the United States (97%) [14]. These disparities highlight structural inequities in screening practices, diagnostic capacity, and treatment availability. For example, the number of radiotherapy machines per million population is markedly lower in Africa compared to regions with much lower prostate cancer mortality [14].

A key observation from the projected percentage increase in prostate cancer cases in Africa between 2022 and 2050 is the comparatively smaller rise in incidence in territories such as La Réunion and Mauritius relative to several higher-incidence countries. This pattern may reflect differences in healthcare infrastructure, screening practices, cancer registration systems, socioeconomic conditions, and population health policies. It is plausible that closer integration with European/French healthcare models has contributed to these trends; however, this association requires careful empirical evaluation. Further investigation into the underlying determinants may help identify transferable strategies that could be adapted to support prostate cancer control efforts in higher-burden regions across Africa.

Screening and early detection evidence

Prostate cancer survival for localised disease at an early stage exceeds 99% at 10 years in developed countries [14] underscoring the importance of early detection. PSA-based screening, combined with digital rectal examination (DRE) and, more recently, multiparametric Magnetic resonance imaging (MRI), has contributed to earlier-stage detection in many high-income countries. Randomised evidence, however, presents a complex picture. Landmark negative screening trials did have limitations. The CAP Trial (UK) involved one-off PSA screening rather than serial testing, whilst the PLCO Trial (US) control arm was heavily contaminated by screening outside of the study protocol. Both suggest an increased detection of low-risk cancers but no survival benefit. Conversely, updated 23-year results from the multi-national ERSPC Trial (Europe) suggest that 456 men must be screened to prevent one prostate cancer death, and one death is prevented for every 12 cancers diagnosed, figures now comparable to or better than those reported for breast cancer screening [15]. How these studies in high-income countries will directly translate to African healthcare systems remains unclear. An EU-wide (27 countries) screening programme has commenced (PRostate cancer Awareness and Initiative for Screening in the European Union [PRAISE-U]), which may provide valuable insights for the continent of Africa in terms of logistics and different jurisdictions. Notwithstanding the human cost, reducing the economic burden of the expensive management of metastatic disease would be of significant benefit.

Revisiting racial disparities

Recent evidence has challenged long-standing assumptions regarding biological predisposition to aggressive prostate cancer among men of African descent. Analyses from the SEER database show that the Black race is not independently associated with worse stage-for-stage prostate cancer–specific mortality [3, 16, 17]. After adjustment for socioeconomic and healthcare access variables, disparities largely reflect systemic barriers that delay diagnosis and limit receipt of high-quality, evidence-based treatment. Importantly, Black men exhibit higher rates of non–cancer-related mortality, particularly cardiovascular and cerebrovascular deaths [3], emphasising the need for holistic care models.

Current guidelines from organisations such as the American Urological Association, the Canadian Task Force on Preventive Health Care, the Japanese Urological Association, and the European Association of Urology increasingly emphasise individualised decision-making for PSA testing based on age, life expectancy, and

personal risk. The use of validated risk calculators may further refine screening strategies and help align benefits with resource constraints, and this may be a highly prudent strategy if adopted in sub-Saharan Africa.

Economic implications

Beyond clinical outcomes, prostate cancer imposes a substantial economic burden. Four of Africa's five regions rank among the top 10 globally for productivity loss attributable to prostate cancer from this study, with West Africa experiencing the greatest impact. The years of productive life lost in West Africa are four times the global average of 9.4 years. Rising prostate cancer burden in low- and lower-middle SDI (Socio-demographic Index) countries, predominant across Africa [10], disproportionately affects men in their economically productive years, compounding the challenges posed by limited health infrastructure. Chad and Sierra Leone exemplify the macroeconomic consequences, exhibiting some of the world's highest productivity losses relative to GDP (Fig. 6).

Policy and health system implications

Effective mitigation of the growing prostate cancer burden in Africa requires coordinated investment across multiple domains:

- Strengthening cancer registries and surveillance systems to improve data accuracy and guide resource planning.
- Expanding context-appropriate early detection and screening strategies.
- Enhancing access to diagnostic and treatment services, including radiotherapy, surgery, and hormonal therapy.
- Integrating prostate cancer control within national non-communicable disease frameworks.
- Implementing policies to reduce productivity loss, including workplace-based health programs and social protection interventions.

While the projections assume constant incidence and mortality rates, the actual burden may deviate depending on future trends in lifestyle risk factors, screening uptake, and treatment availability. Timely investments in the public health system could temper projected increases, whereas worsening risk environments may exacerbate them.

Conclusion

Prostate cancer represents a major and rapidly growing health and economic challenge in Africa. By 2050, Africa is projected to experience the steepest increase in global prostate cancer incidence, with profound implications for healthcare systems and national economies. Strengthening early detection, expanding treatment access, and implementing targeted policies are essential to mitigate the projected burden and improve outcomes for men across the continent.

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