JOURNAL OF AMERICAN MEDICAL SCIENCE & RESEARCH

Review Article
ISSN: 3041-5578
Journal homepage: https://medical.researchfloor.org/

Gastric Cancer in West Africa: A Regional Review of Epidemiology, Clinic pathology, and Management

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ABSTRACT

Background: *Gastric cancer (GC) represents a major global health challenge, with marked geographic variation in incidence, risk factors, and outcomes. While West Africa reports comparatively low incidence rates, mortality remains disproportionately high due to late diagnosis, limited diagnostic infrastructure, and constrained treatment resources. A regional synthesis is essential to guide evidence-based policies and targeted interventions.*

Objectives: *To review the epidemiology, clinic pathological characteristics, molecular profiles, management patterns, and health system constraints associated with gastric cancer in West Africa, and to identify research gaps and policy priorities.*

Methods: *A narrative review was conducted using literature from PubMed, Scopus, African Journals Online (AJOL), and grey literature sources published from 2000 to 2025. Studies were included if they reported data from West African populations on gastric cancer incidence, clinical presentation, histopathology, treatment modalities, or outcomes. Data were synthesised descriptively and compared with regional (sub-Saharan Africa) and global statistics.*

Results: *West Africa shows a low reported incidence of GC (2–6 per 100,000) but a high mortality-to-incidence ratio (>0.85). Most patients present with advanced-stage disease (Stage III/IV in over 70%) following prolonged symptom duration (4–12 months). Non-cardia adenocarcinomas predominate, strongly associated with Helicobacter pylori infection and environmental risk factors. Molecular profiling studies are scarce, with limited application of the Cancer Genome Atlas (TCGA) subtyping. Surgical management is hampered by late presentation, and D2 lymphadenectomy is rarely performed. Radiotherapy and chemotherapy availability are inadequate, with most countries having fewer than one radiotherapy machine per 10 million people. Financial barriers and fragmented cancer control systems contribute to high treatment abandonment rates. Research output is limited, with an absence of population-based cancer registries and minimal clinical trial activity.*

Conclusion: *Gastric cancer in West Africa is characterised by late presentation, limited diagnostic and therapeutic infrastructure, and poor survival outcomes. Strengthening endoscopy and pathology services, expanding radiotherapy and chemotherapy capacity, integrating GC into national cancer control plans, and establishing robust cancer registries are critical. Collaborative research on molecular subtyping, risk factor profiling, and region-specific treatment outcomes is urgently needed.*

Keywords: *Cancer control; Cancer registries; Clinic pathology; D2 lymphadenectomy; Epidemiology; Gastric cancer; Health systems; Helicobacter pylori; Radiotherapy access; West Africa.*

Citation: Ugwu IV, Umobong EO, Gbaa ZL, Ojo BA, Uko AF, Onyewuchi AJ and Gbaa AF (2025). Gastric Cancer in West Africa: A Regional Review of Epidemiology, Clinic pathology, and Management. *Journal of American Medical Science and Research.* *DOI: https://doi.org/10.51470/AMSR.2025.04.02.08*

Received 22 June 2025
Revised 18 July 2025
Accepted 07 August 2025

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Introduction

Gastric cancer ranks as the fifth most prevalent malignancy worldwide and is the third primary cause of cancer-related mortality, with approximately 1 million new cases and over 760,000 deaths each year {1}. Incidence rates have decreased in high-income countries owing to advancements in food preservation and Helicobacter pylori management; however, Sub-Saharan Africa, particularly West Africa, still experiences a substantial disease burden and elevated mortality rates. The actual incidence in West Africa is probably underestimated due to inadequate cancer registry coverage and underdiagnosis. Dietary patterns, chronic H. pylori infection, inadequate healthcare access, and delayed diagnosis collectively contribute to unfavourable outcomes {1,2}.

This review seeks to analyse the existing data on gastric cancer in West Africa, emphasising its epidemiology, histopathologic trends, clinical presentation, diagnostic and therapeutic strategies, and the challenges faced by regional health systems. The study highlights recent advancements, identifies research gaps, and offers practical recommendations to enhance cancer care in the region.

Methods

The methods used are those of narrative review, which utilises data sourced from peer-reviewed journals, national health reports, and international databases. The databases utilised were PubMed, African Journals Online (AJOL), Google Scholar, and WHO/AFRO. The inclusion criteria were research conducted in West African nations from 2013 to 2024, focusing on English-language publications and studies that report epidemiological, histopathological, or clinical data. The exclusion criteria included non-peer-reviewed sources, studies

lacking a regional focus, and case reports unless they were part of a series or offered regional insights. The data were synthesised thematically across the domains of epidemiology, pathology, clinical features, diagnostics, and treatment patterns.

Epidemiology

Epidemiologically, Gastric Cancer (GC) represents a significant global health issue, characterised by notable regional disparities in incidence and outcomes. Global Cancer Incidence, Mortality and Prevalence estimates indicate that gastric cancer resulted in over 1 million new cases and 769,000 deaths worldwide, positioning it fifth in incidence and fourth in cancer-related mortality {2,3}. Incidence rates are highest in East Asia, Eastern Europe, and certain regions of Latin America. In contrast, Sub-Saharan Africa (SSA), particularly West Africa, reports lower incidence rates but experiences disproportionately higher mortality due to late diagnosis and inadequate cancer control systems {3,4}.

There is a lack of accurate epidemiologic data on gastric cancer in West Africa, attributed to inadequate population-based cancer registries. Available institutional and regional studies indicate that gastric cancer ranks among the top 5–10 cancers in numerous West African countries. A recent analysis {4} indicated that stomach cancer represented 2–5% of all cancer cases documented in regional registries, exhibiting variations among different countries. In Nigeria, the most populous country in the region, institutional studies from major tertiary hospitals indicate a rising trend in gastric cancer cases, particularly among males aged 50 to 70 years {5-7}. Similar trends have been observed in Ghana {8}, Senegal {9}, and The Gambia {10}. The estimated incidence is likely underestimated due to diagnostic limitations and inadequate utilisation of endoscopy services. Gastric cancer in West Africa primarily impacts older adults, with the highest incidence observed between the fifth and seventh decades of life(Table 1) {5-7}. The male-to-female ratios vary between 1.5:1 and 2:1, aligning with global trends. (Table 1)

Table 1: Descriptive and Comparative Analysis

Metric	Nigeria	Sub-Saharan Africa	Global
Incidence ASR (per 100,000)	3.2	4.8	11.1
Mortality ASR (per 100,000)	3.1	4.7	8.5
5-Year Survival (%)	12%	15%	35%
Early-stage Diagnosis (Stage I/II)	8%	12%	45%
Advanced-stage Diagnosis (Stage III/IV)	72%	68%	40%
HER2 Testing Availability (Scale 1–5)	1	1	5
Endoscopy Units per Million People	0.7	1.0	8.0

Incidence vs. Mortality: *Although incidence rates are low in Nigeria and SSA, this likely reflects underdiagnosis and incomplete registry coverage, not a lower disease burden. Mortality rates nearly match incidence rates in Nigeria (3.1 vs 3.2), revealing very poor survival outcomes and a high case fatality rate.*

Survival Disparities: *5-year survival in Nigeria (12%) is less than half the global average (35%), highlighting: Delayed diagnosis, limited curative surgery, inadequate access to chemotherapy, radiotherapy, or HER2-targeted therapy.*

Stage at Presentation: *More than 70% of Nigerian patients present at Stage III/IV, compared to only 40% globally, confirming a systemic diagnostic delay. Less than 10% of Nigerian patients are diagnosed early, compared to 45% globally, reducing the chance of curative treatment.*

Infrastructure Gaps: *HER2 testing is virtually unavailable (1 on a 5-point scale), limiting eligibility for trastuzumab or related biologics. Endoscopy services are extremely limited (0.7 units per million), severely impeding early detection and biopsy services* {13,14}.

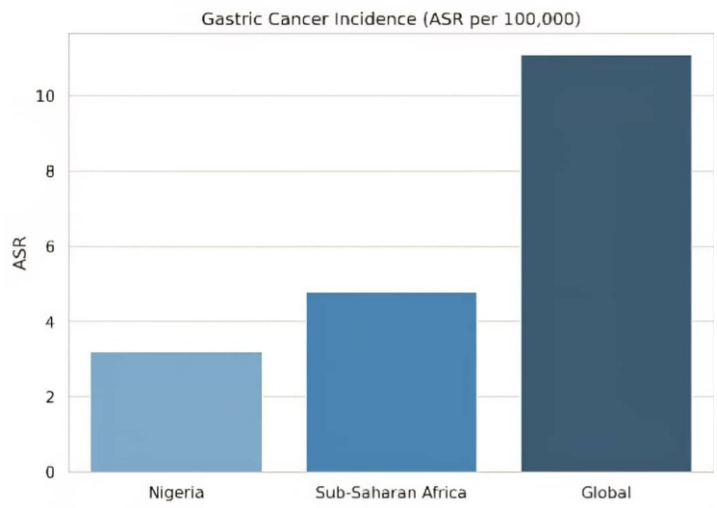

Figure 1: Incidence of Gastric Cancer

Table 2: Risk Factor Prevalence

Risk Factor	Nigeria (%)	SSA (%)	Global (%)
H. pylori Infection{10-12}	70–90	60–90	50–60
High-salt diet	Common	Common	Variable
Smoking (men)	8–12	10–20	25–40
Alcohol consumption	Moderate	Moderate	High in some regions
Low fruit/vegetable intake	High	High	Varies

Mortality related to GC in West Africa is elevated due to delayed diagnosis, insufficient treatment infrastructure, and the absence of follow-up care. Five-year survival rates are typically below 20% in many countries, whereas they exceed 60% in early-stage gastric cancer within high-income nations {14,15}. The lack of national screening programs and inadequate access to curative surgical or oncologic care significantly contribute to poor prognoses. (Figure 2)

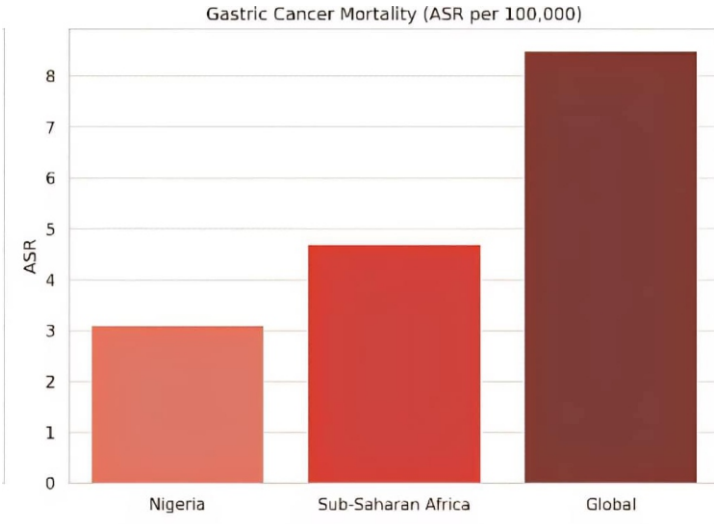

Figure 2: Gastric Cancer Mortality Rate

Histopathological and Molecular Profile

Gastric cancer presents a varied histopathological spectrum, characterised by specific morphological subtypes that carry prognostic and therapeutic significance. Histopathological evaluation is fundamental to diagnosis in West Africa, even with restricted access to molecular diagnostics in numerous contexts.

DOI: https://doi.org/10.51470/AMSR.2025.04.02.08

Gastric cancer primarily manifests as adenocarcinoma, representing more than 90% of global cases {16,17}. Lauren's classification identifies two principal histological types of gastric adenocarcinoma as the intestinal and the diffuse types. The intestinal type, which is linked to chronic Helicobacter pylori infection, precursor lesions such as intestinal metaplasia and atrophic gastritis, as well as various environmental factors. It manifests as well-differentiated, gland-forming tumours, typically in older adults. Diffuse-type adenocarcinoma Poorly cohesive cells, characterised by signet ring morphology, correlate with a poorer prognosis and are frequently observed in younger patients. Research conducted in West Africa consistently identifies the intestinal type as the predominant subtype, with prevalence rates between 50% and 70%. {18,19}. Diffuse and mixed types account for 20–40% of cases, frequently associated with younger age groups and advanced disease at the time of diagnosis {21,22}. The World Health Organisation (WHO) classification delineates further subtypes, including Papillary, Tubular Mucinous, and Signet-ring cell carcinoma.

Despite the documentation of these variants in institutional studies throughout Nigeria, Ghana, and Senegal, the majority of pathology laboratories in the region continue to depend on basic histology, owing to constraints in immunohistochemistry (IHC) and supplementary tools {23,24}. Moderately differentiated tumours are reported with greater frequency than poorly differentiated carcinomas. Numerous studies indicate that most patients are diagnosed with advanced-stage tumours, generally beyond Stage II or III, often accompanied by lymph node metastases or peritoneal spread {20,25}. This trend indicates a significant delay in diagnosis, inadequate access to endoscopic services, and insufficient screening programs.

The Cancer Genome Atlas (TCGA) project categorised gastric adenocarcinoma into four primary molecular subtypes through extensive genomic, epigenomic, transcriptomic, and proteomic analyses. These classifications establish a framework for comprehending tumour biology and directing precision oncology approaches {22}.

These are: Epstein-Barr Virus (EBV)-Positive Tumours account for approximately 9% of gastric cancers. Key features include the presence of EBV DNA within tumour cells, elevated DNA hypermethylation, particularly in promoter CpG islands, which is observed alongside frequent PIK3CA mutations (approximately 80%), indicating activation of the PI3K–AKT pathway. Additionally, there is overexpression of immune checkpoint proteins, including PD-L1 and PD-L2, which suggests potential responsiveness to immune checkpoint inhibitors. These groups exhibit a robust immunogenic profile and demonstrate favourable responses to immunotherapy.

The second class comprises Microsatellite Instability-High (MSI-H) Tumours, with a prevalence of approximately 21% of cases. Their primary characteristics include a defective DNA mismatch repair (MMR) system resulting in microsatellite instability (MSI), a high tumour mutational burden (TMB) characterised by numerous frameshift mutations, and an enrichment of mutations in genes such as ACVR2A, TGFBR2, and KRAS. Early-stage cases demonstrate a favourable prognosis; immunotherapy, such as anti-PD-1, may prove effective owing to a high neoantigen load.

The third class is Genomically Stable (GS) tumours, which represent the third category, with a prevalence of approximately 20% among gastric cancers.

Their notable characteristics include an absence of significant chromosomal instability or microsatellite instability (MSI). Diffuse-type histology, as classified by Lauren, frequently exhibits alterations in cell adhesion genes, including CDH1 (E-cadherin) and RHOA. This subtype is often linked to poor prognosis due to its aggressive infiltrative growth and resistance to standard therapies.

The commonest class are the Chromosomal Instability (CIN) Tumours represent the most prevalent type, accounting for up to 50% of cases. The primary characteristics include extensive somatic copy number alterations (SCNAs), amplification of receptor tyrosine kinases (RTKs) such as HER2, EGFR, MET, and FGFR2, along with frequent TP53 mutations, primarily associated with intestinal-type histology. This Subtype is most responsive to targeted therapies, such as trastuzumab for HER2-positive tumours {22}.

Clinical relevance of this molecular classification has revolutionised the understanding of gastric cancer heterogeneity and supports a move towards personalised treatment approaches. While clinical implementation is still evolving, it forms the basis for patient stratification in clinical trials, Selection for immunotherapy (especially EBV+ and MSI-H) and the use of targeted therapy in CIN tumours (e.g., HER2 inhibitors). Molecular testing is infrequently accessible in West Africa, and there are limited studies investigating MSI status, HER2 overexpression, or EBV association. Several isolated studies from Nigeria and Ghana indicate HER2 positivity in 8–15% of gastric tumours, which holds therapeutic significance for targeted therapy {24,25,27}.

Chronic H. pylori infection is recognised as a precursor to intestinal-type gastric cancer via the Correa cascade: chronic gastritis → atrophy → intestinal metaplasia → dysplasia → carcinoma {26}. Histological investigations conducted in West African institutions often document the presence of active chronic gastritis, intestinal metaplasia, and dysplasia in gastric biopsies, particularly among patients with non-cardia tumours {27}.

Routine biopsy of premalignant lesions is infrequently performed in general practice, and surveillance protocols are not well established.

Clinical features

In West Africa, gastric cancer typically presents with nonspecific symptoms that mimic benign gastrointestinal conditions, contributing to delayed diagnosis and advanced-stage disease, and ultimately, poor prognosis. Most patients report symptoms persisting beyond six months before diagnosis {28-30}. Common clinical features include epigastric pain (70–90%), early satiety, anorexia with weight loss, nausea/vomiting, gastrointestinal bleeding (e.g., haematemesis, melena), and dysphagia for proximal tumours. Advanced cases may show abdominal masses, ascites, and signs of metastasis such as hepatomegaly, jaundice, and lymphadenopathy.

Due to limited diagnostic capacity in rural areas, these symptoms are often misattributed to gastritis or peptic ulcer disease, causing further delays {31}. The average symptom duration ranges from 4 to 12 months, with over 70% of patients in the institutional series from Nigeria, Ghana, and Senegal presenting at Stage III/IV, often with unresectable or metastatic disease {32,33}. Non-cardiac cancers are more prevalent in West Africa than in the Cardiacancer {34}. In terms of locations, antrum/pylorus: 45–65%, body: 20–30%, cardia/fundus: 10–20%. Common metastatic sites include the liver,

DOI: https://doi.org/10.51470/AMSR.2025.04.02.08

peritoneum, lymph nodes (especially Virchow's node), and, less frequently, the lungs and bones {35}. Paraneoplastic manifestations like acanthosis nigricans, dermatomyositis, and hypercoagulability are rarely documented due to diagnostic limitations.

Diagnosis

The diagnosis of gastric cancer in West Africa is often postponed owing to nonspecific symptoms, a low index of suspicion, and restricted access to diagnostic tools. Numerous patients receive diagnoses solely after the emergence of complications or during exploratory laparotomies, highlighting the diagnostic and systemic constraints in the region.

A thorough history and physical examination are essential yet inadequate for diagnosis. Common clinical indicators of malignancy encompass persistent upper abdominal pain and progressive weight loss. Gastrointestinal bleeding, early satiety or vomiting, and a palpable epigastric mass. These conditions are frequently misattributed to dyspepsia or peptic ulcer disease when alarm symptoms are absent, particularly in rural regions {36}. Upper gastrointestinal endoscopy (esophagogastr -oduodenoscopy, EGD) with multiple biopsies is the definitive method for diagnosis. It facilitates direct visualisation of suspicious lesions, including ulcerated, fungating, or infiltrative types, and permits histological confirmation through biopsy. Endoscopy services are often limited or unavailable in numerous tertiary and regional centres in West Africa, resulting in extended wait times and significant out-of-pocket expenses {37,38}. This results in diagnoses occurring at advanced stages or dependence on alternative methods.

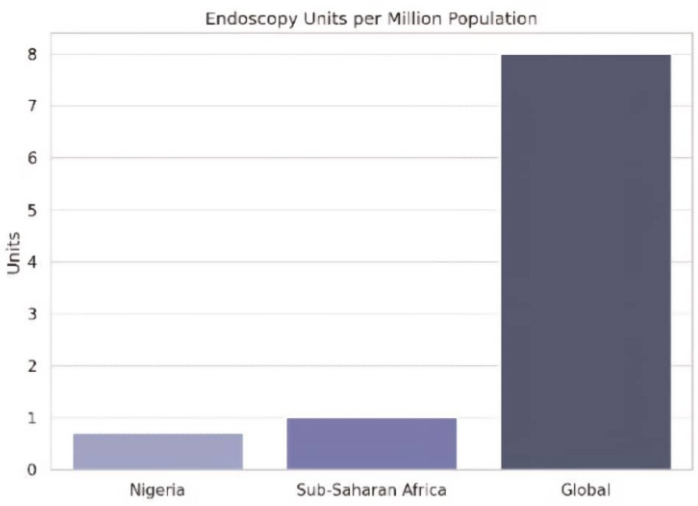

Figure 3: Endoscopic Use

Histological confirmation is essential for diagnosis. Most centres conduct standard haematoxylin and eosin (H&E) staining, while access to immunohistochemistry (IHC) remains limited. Tumour typing and grading are conducted utilising Lauren's or WHO classifications, as previously discussed. Pathology services in West Africa are characterised by delayed reporting, inadequate sampling or specimen processing, and a shortage of trained pathologists {39}.

Imaging is essential for staging and treatment planning, although its availability is inconsistent. Abdominal ultrasound is frequently the initial choice because of its accessibility; however, it has limited sensitivity. Contrast-enhanced CT scan is recommended for local staging, detection of metastases, assessment of lymph node involvement, and surgical planning. Barium meal studies are diagnostic imaging procedures used to evaluate the upper gastrointestinal tract. They involve the ingestion of a barium sulphate contrast agent, which enhances the visibility of the oesophagus, stomach, and duodenum during X-ray examinations. Continues to be utilised in resource-limited environments; however, it provides restricted diagnostic accuracy. Access to advanced imaging modalities, such as MRI and PET-CT, is rarely accessible and infrequent {40}. Serological tumour markers include CEA, CA 19-9, and CA 72-4. These are infrequently utilised because of their low sensitivity and specificity, as well as their limited availability in most regional hospitals {41}. When utilised, they primarily function for monitoring rather than for initial diagnosis.

Liquid biopsy is emerging as a promising investigative modality in gastric cancer. Circulating tumour cells (CTCs) and circulating tumour DNA (ctDNA) provide minimally invasive tools for prognosis, disease monitoring, and therapeutic guidance. Meta-analyses confirm that CTC detection is significantly associated with worse survival outcomes and advanced disease features {42,43}. Systematic reviews also demonstrate that circulating biomarkersincluding CTCs, ctDNA, and microRNAs, correlate with recurrence and progression. Moreover, ctDNA can capture tumour heterogeneity, detect minimal residual disease, and assess treatment response, making it an important adjunct to tissue biopsy {44}. While not yet a replacement, liquid biopsy complements standard diagnostic approaches in gastric cancer.

The Tumour-Node-Metastasis (TNM)system established by the American Joint Committee on Cancer (AJCC) is the predominant staging method utilised worldwide. However, its consistent application in West Africa is constrained by incomplete imaging workup, limited access to diagnostic laparoscopy, and delays or inadequacies in histological reporting.

Significant diagnostic challenges in West Africa comprise insufficient endoscopy units and trained staff, elevated costs of imaging studies, prolonged histopathology turnaround times, and underutilisation of standardised protocols {45}. These challenges require immediate enhancement of diagnostic infrastructure and workforce training to facilitate earlier and more accurate detection.

Treatment

The management of gastric cancer in West Africa is significantly affected by late-stage presentation, inadequate healthcare infrastructure, and limited resources. Treatment frequently remains inadequate, with curative options available to only a small subset of patients. Many institutions primarily offer palliative care because of the advanced stage of disease at the time of diagnosis. Effective management of gastric cancer necessitates a multidisciplinary team (MDT) that includes Surgical Oncologists, Gastroenterologists, Medical Oncologists, Radiologists, and Pathologists. The MDT approach in West Africa is underutilised owing to a lack of specialised human resources, fragmented referral systems, and inadequate integration between diagnostic and treatment services {46}.

Surgery is the primary method of curative treatment for localised gastric cancer. The selection of procedure is contingent upon the tumour's location and stage. Subtotal distal gastrectomy is preferred for antral or distal tumours. Total gastrectomy is indicated for proximal or extensive tumours. The standard surgical approach for resectable gastric cancer involves gastrectomy—either subtotal or total—based on tumour location, combined with lymphadenectomy for accurate staging and disease control.

DOI: https://doi.org/10.51470/AMSR.2025.04.02.08

Lymphadenectomy is categorised as D1 or D2, depending on the extent of nodal dissection. D1 lymphadenectomy entails the removal of perigastric lymph nodes only (stations 1–6), while D2 lymphadenectomy extends to include nodes along the left gastric artery, common hepatic artery, celiac axis, and splenic artery/hilum (stations 7–11), offering more comprehensive disease clearance {48-50}. D2 dissection is considered the standard of care in high-volume centres in East Asia due to improved survival outcomes and better staging accuracy, especially in locally advanced gastric cancer {51-53}. However, its implementation in West Africa is limited by a lack of surgical expertise, higher operative risk, and constrained resources for intensive postoperative care {54,55}. Nevertheless, some tertiary institutions in the region are increasingly adopting D2 lymphadenectomy as oncology training, infrastructure, and perioperative support improve {54}. A standard surgical approach involves D1 or D2 lymphadenectomy; however, D2 dissection is rarely conducted in West Africa due to insufficient surgical expertise and perioperative support {52}. Curative surgery is feasible in fewer than 30% of patients owing to late-stage presentation. Numerous surgical procedures are palliative, including gastrojejunostomy, feeding jejunostomy, and tumour debulking. However, with ongoing improvements in surgical training, oncology infrastructure, and perioperative care in some West African tertiary hospitals, D2 lymphadenectomy is increasingly being adopted as part of standard oncologic surgery for gastric cancer when feasible {55}.

Chemotherapy functions as a neoadjuvant treatment, administered before surgery to reduce tumour size. Adjuvant therapy is administered post-surgery to prevent recurrence, while palliative care is utilised in cases of metastatic or unresectable disease. Access to chemotherapy in West Africa is constrained by elevated costs, inconsistent drug supply, and a deficiency of trained oncologists. Fluoropyrimidine-based regimens, such as 5-FU and capecitabine, are frequently administered with or without cisplatin or oxaliplatin. Patients infrequently receive standard-of-care protocols like FLOT (5-FU, leucovorin, oxaliplatin, docetaxel), which are prevalent in high-income countries {56}.

Radiotherapy serves as an adjuvant treatment following surgery, particularly in cases of R1 resections, and is also employed as palliative therapy for symptom management, such as bleeding and pain. Access to radiotherapy is significantly restricted in numerous West African nations. Nigeria has fewer than 10 operational radiotherapy machines serving a population exceeding 200 million {57}. This impedes the effective delivery of comprehensive cancer care.

Targeted therapy and immunotherapy are utilised; however, in developed nations, HER2-positive tumours receive benefits from the combination of trastuzumab and chemotherapy. Immunotherapy, such as PD-1 inhibitors, has demonstrated potential in advanced gastric cancer. In West Africa, HER2 testing is infrequently accessible, Trastuzumab and checkpoint inhibitors are predominantly unaffordable or unavailable, and molecular profiling is limited, thereby constraining personalised therapy. Palliative care is the predominant management approach due to the elevated incidence of advanced disease. The emphasis is on pain relief, nutritional support, symptom management (including vomiting and bleeding), and psychological and spiritual support.

Hospice and palliative care services are significantly underdeveloped in many areas of the region {58}.

Outcomes and Prognosis

Challenges to effective management encompass delayed diagnosis and presentation. Restricted availability of surgical oncology and chemotherapy. The elevated expenses of healthcare are shouldered by patients. Insufficient cancer centres and pharmaceutical supply chains. Limited availability of radiotherapy facilities and qualified staff {59}.

The prognosis for gastric cancer in West Africa is notably unfavourable, primarily attributable to late presentation, inadequate diagnostic and treatment infrastructure, and limited access to adjuvant and targeted therapies. Although global 5-year survival rates have markedly improved due to early detection and multimodal therapy, such results are infrequently observed in this region. Institutional studies conducted in Nigeria, Ghana, Senegal, and Sierra Leone indicate that the overall 1-year survival rate varies from 20% to 40%, while the 5-year survival rate is estimated to be below 10% in most centres {62-64}. In contrast, nations such as Japan and South Korea, which prioritise early screening and comprehensive care, demonstrate a 5-year survival rate surpassing 60%, particularly for early gastric cancer {65}.

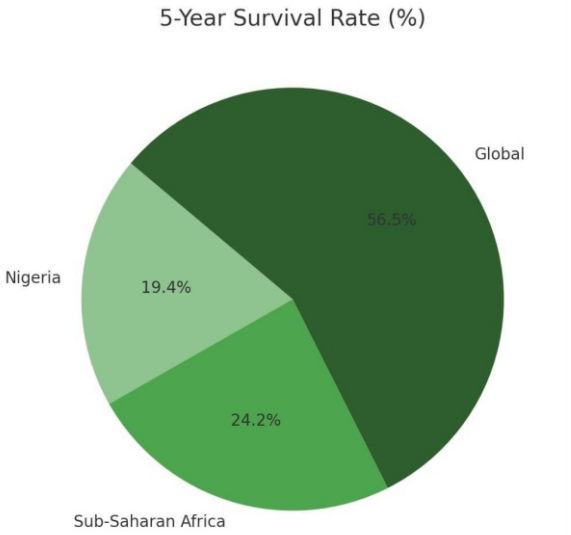

Figure 4: 5 Year Survival distribution

Survival proportions derived from hospital-based studies across Nigeria, Ghana, and Senegal (2010–2023).

Multiple factors are associated with adverse outcomes in patients from West Africa: In more than 70–80% of cases, the presentation occurs at late stages (Stage III/IV). Poor nutritional status and anaemia, absence of neoadjuvant or adjuvant therapy, and incomplete resections (R1 or R2 margins). Lymphadenectomy is absent. Insufficient postoperative monitoring; restricted availability of palliative care. Histologic subtype and tumour differentiation, such as signet ring cell carcinoma, correlate with aggressive behaviour and poorer outcomes {66}.

Surgical morbidity is significantly elevated due to factors such as delayed referrals, advanced disease requiring emergency or palliative surgery, inadequate perioperative optimisation, and a high incidence of wound infections, leakage, or anastomotic failure. Studies indicate that postoperative complication rates range from 25% to 45%, while perioperative mortality rates vary between 10% and 20%, contingent upon the institution and the support available {67,68}.

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Given that most patients receive palliative care instead of curative treatment, effective symptom management is crucial. Many facilities, however, lack structured palliative services, and the availability of pain control through opioids is inconsistent.

Indicators of poor quality of life include persistent vomiting and obstruction, cachexia and inanition, social isolation, financial hardship, and psychological distress resulting from limited counselling support. The unfavourable outcomes indicate broader systemic challenges, including insufficient health insurance coverage, inadequate cancer registries and surveillance systems, limited cancer awareness among the general population, and a scarcity of specialised cancer centres in the region. Improving outcomes necessitates a focus on early detection, enhancement of oncology infrastructure, training of specialised personnel, and government-supported cancer initiatives.

Management challenges of GC management in West Africa:

The region faces significant systemic, infrastructural, and sociocultural challenges that negatively impact patient outcomes. Despite global advancements in early detection and multimodal therapy, patients in the region encounter significant obstacles throughout the continuum of care. Patients frequently exhibit advanced disease, typically following extended symptomatic durations. Common misdiagnoses encompass peptic ulcer disease, dyspepsia, and gastritis, often resulting from a low index of suspicion among primary healthcare providers {69}. The absence of organised screening initiatives, particularly among high-risk populations, significantly contributes to the postponement of diagnosis. Limitations in diagnostics, including Insufficient endoscopy services: Limited centres possess operational upper gastrointestinal endoscopy with biopsy capabilities. Histopathology delays are significant, with turnaround times often exceeding 4–6 weeks due to staff shortages, reagent unavailability, and logistical challenges {70}. Furthermore, advanced diagnostic techniques such as immunohistochemistry, HER2 testing, molecular markers, and diagnostic laparoscopy are largely unavailable in most facilities. Barriers to Accessing Treatment: There are surgical limitations due to a scarcity of trained surgical oncologists and insufficient intensive care support for major gastrectomies. Access to chemotherapy: Inconsistent drug supply, high out-of-pocket expenses, and variable protocols hinder adoption {71}. Radiotherapy scarcity is evident in West Africa, where most countries possess fewer than 1 radiotherapy machine per 10 million individuals. This situation results in prolonged waiting periods and increased rates of treatment abandonment {72}. Financial constraints further exacerbate this issue. Significant out-of-pocket expenses arise from inadequate or absent national health insurance provisions for cancer treatment. The expenses associated with endoscopy, surgery, chemotherapy, radiotherapy, and supportive care are prohibitive for numerous patients, resulting in treatment discontinuation or non-compliance {73}.

Human resource gaps are seen when shortage of trained oncologists, gastroenterologists, surgical oncologists, pathologists, and oncology nurses. Rural-urban disparities in workforce distribution worsen inequitable access {74}. Infrastructure deficiencies are a hindrance as few comprehensive cancer centres with capacity for multidisciplinary care. Unreliable electricity, inadequate water supply, and poor surgical facilities are found in many hospitals. Palliative care gaps exist, as the services are largely unavailable or poorly integrated into mainstream cancer care. Pain control is suboptimal due to poor availability of opioids, provider bias, or regulatory restrictions {75}. Data deficiency is a common problem in West African countries, as the absence of comprehensive cancer registries in most countries hampers policy formulation, resource allocation, and research. Underreporting of gastric cancer cases is common, leading to a lack of accurate incidence and outcome data {76}. Sociocultural and educational factors contribute to widespread reliance on traditional medicine delays hospital presentation. Low cancer awareness and stigma affect health-seeking behaviour. Myths, fear of surgery, and fatalism often lead to treatment refusal or abandonment.

Recent Advances in Gastric Cancer Management in West Africa

Despite ongoing systemic challenges in West Africa, there have been notable incremental advancements in the care of gastric cancer (GC) within the region. These developments, while constrained in scale and accessibility, offer a foundation for optimism and the enhancement of health systems strategically. Recent investments from both public and private sectors have resulted in the establishment of new gastrointestinal endoscopy units, particularly in teaching hospitals and tertiary centres in countries including Nigeria, Ghana, and Senegal {76}. The training of endoscopists and technicians via regional collaborations, such as WACS and ESGE, has enhanced diagnostic capacity. Advancements in histopathology and immunohistochemistry have led some centres to provide immunohistochemical staining for tumour subtyping and limited molecular profiling, including HER2 testing, Ki-67, and E-cadherin analysis {77}. The local production of histology reagents and enhanced funding for pathology laboratories have slightly decreased the turnaround time for results. The use of targeted treatment with Trastuzumab is now implemented in several urban tertiary centres, particularly for HER2-positive gastric cancer, facilitated by international pharmaceutical collaborations or donor funding {78}. Pilot programs for PD-L1 testing and immune checkpoint inhibitors, such as nivolumab, are currently being investigated in specific research environments in Nigeria and Ghana. Collaborations at both international and regional levels. Collaborative cancer research consortia, including the African Cancer Registry Network (AFCRN), the IARC, and NIH-funded programs, have enhanced cancer data collection, training, and protocol development {79}. Telemedicine and digital pathology are being implemented as pilot programs to mitigate workforce shortages.

Policy-level interventions have been implemented in certain countries, such as Nigeria and Ghana, which have incorporated cancer treatment into their National Health Insurance Schemes, thereby covering a portion of the expenses associated with diagnosis and chemotherapy {80}. National cancer control programs now identify gastric cancer as a priority for early detection and management strategies.

Research Gaps and Future Directions

Despite these advancements, major research and implementation gaps persist, which significantly constrain the regional response to gastric cancer.

Epidemiological Surveillance Gaps: The absence of robust population-based data is a key limitation. Most existing information derives from hospital-based studies, which do not

DOI: https://doi.org/10.51470/AMSR.2025.04.02.08

accurately reflect community-level disease burden. In addition, national and regional cancer registries are either non-existent or underdeveloped, impeding long-term tracking of gastric cancer incidence, mortality, and survival trends {79,80}. The future need is to strengthen cancer surveillance systems and implement mandatory national reporting of all confirmed cancer cases.

Genomic and Molecular Research Deficits: There is a paucity of molecular and genetic studies targeting gastric cancer in African populations. Research on gastric cancer genomics, epigenetics, molecular subtypes (e.g., TCGA classifications), and biomarkers (e.g., HER2, PD-L1) is extremely limited. The Future need will be to encourage biobank-supported molecular epidemiology, including studies on H. pylori strains, Epstein–Barr virus, and diet-genetic interactions, tailored to West African populations.

Under-Studied Risk Factors: Although Helicobacter pylori is endemic in West Africa, little is known about the virulence patterns of local strains and their interactions with dietary carcinogens, such as aflatoxins, salted/preserved foods, and micronutrient deficiencies {81}. Future needs will be to launch longitudinal case-control and cohort studies that explore environmental, infectious, and lifestyle risk factors.

Scarcity of Clinical Trials: The contribution of West Africa to global gastric cancer clinical trials is currently negligible. Limitations include weak trial infrastructure, delays in ethical approval, and limited research funding. Future need is to create regional trial networks, improve regulatory frameworks, and incentivise investigator-led and multinational gastric cancer studies.

Research on the implementation of health systems. Limited research examines obstacles to prompt diagnosis, patient navigation, and treatment adherence. There is a lack of research regarding the integration of palliative care and cancer survivorship. Future Requirement is to utilise operational research to inform tailored interventions and policy decisions.

Conclusion

Gastric cancer remains a significant but underecognised public health burden in West Africa, characterised by late-stage presentation, high mortality, and limited diagnostic and therapeutic resources. Despite its relatively low global share, the regional impact is amplified by systemic healthcare weaknesses, poor awareness, and inadequate infrastructure. Adenocarcinoma is the predominant histological type, with *Helicobacter pylori* infection, poor nutrition, and socioeconomic hardship as key risk factors. While recent improvements in endoscopy, immunohistochemistry, and policy awareness offer promise, urgent needs include robust cancer registries, capacity building, and targeted research. Addressing the disease's burden requires coordinated multisectoral action, government commitment, and sustained international support.

Recommendations

Measures for the management of gastric cancer in West Africa will include:

- Enhancing Health System Capacity: Enhance endoscopy and pathology services in rural and underserved regions, improve infrastructure for radiotherapy and chemotherapy to provide comprehensive cancer care, and cultivate the oncology workforce through organised training programs and regional collaboration.
- Integrate gastric cancer into national cancer control plans, establishing clear objectives for screening, diagnosis, and treatment. Additionally, incorporate gastric cancer services into national health insurance schemes to mitigate out-of-pocket expenses for patients.
- Implement public health education campaigns focused on Helicobacter pylori, dietary risks, and early symptoms, while establishing screening protocols for high-risk populations, such as those with chronic dyspepsia, a family history of gastric issues, or previous gastric lesions.
- Enhance population-based cancer registries throughout West Africa and promote region-specific research focused on the epidemiology, molecular profiling, and treatment outcomes of gastric cancer.
- International collaboration involves partnering with global cancer institutions, NGOs, and donors to enhance training, capacity building, and drug access. Additionally, it facilitates multicentre clinical trials aimed at introducing novel therapies and promoting evidence-based oncology practices in the region.

Acknowledgements: We are grateful to the management of our various institutions for the use of their library resources.

Conflicts of interest: none

Sources of funding: We received no grants or funding for this review article.

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