

# **Integrating Antimicrobial Resistance Surveillance and Stewardship into Cancer Care in Katsina State, Nigeria: A Pilot Study to Inform National Cancer Control Planning**

## **Executive Summary**

Antimicrobial resistance (AMR) is a growing global health threat, and cancer patients are particularly at risk due to immunosuppression, frequent hospitalizations, and repeated antibiotic use. In Katsina State, there is limited data on AMR patterns in oncology care, leading to delayed diagnosis, treatment failures, and increased morbidity and mortality.

This project aims to establish a comprehensive AMR surveillance system in cancer care facilities across Katsina State. It will strengthen laboratory diagnostic capacity, standardize specimen collection and antimicrobial susceptibility testing, and train healthcare workers on AMR detection and rational antibiotic use. Systematic data collection, reporting, and analysis will enable timely use of surveillance findings to inform clinical decisions and policy planning.

The project will employ a results-based Monitoring and Evaluation framework to track progress, assess outcomes, and ensure accountability. Key outcomes include improved laboratory and clinical capacity, reliable AMR data for cancer patients, enhanced antimicrobial stewardship practices, and strengthened institutional coordination.

In the long term, the project will reduce the prevalence of resistant infections among cancer patients, improve treatment outcomes, and build sustainable capacity for AMR detection and management in the state. By generating actionable evidence, the initiative will support state-level policy development, contribute to national AMR control efforts, and strengthen health system resilience against emerging resistant pathogens.

This initiative addresses a critical gap in AMR surveillance in oncology care, ensuring that vulnerable patients in Katsina State receive safer, evidence-based treatment while supporting sustainable strategies to combat antimicrobial resistance.

## **Background and Context**

Antimicrobial resistance (AMR) is a growing public health crisis globally, with disproportionately severe consequences in low- and middle-income countries such as Nigeria. Cancer patients are particularly vulnerable to antimicrobial-resistant infections due to immunosuppression from chemotherapy, radiotherapy, surgery, and prolonged hospital stays. These infections are increasingly reported as major contributors to cancer-related morbidity, mortality, treatment interruption, and escalating healthcare costs.

Despite Nigeria's commitment to both cancer control and antimicrobial resistance containment through separate national strategies, AMR considerations remain poorly integrated into cancer care delivery and National Cancer Control Plans (NCCPs). This disconnect is more pronounced at sub-national levels, including states like Katsina, where oncology services are emerging and infection prevention infrastructure remains limited. Currently, there is a lack of local data on the burden, patterns, and clinical impact of antimicrobial-resistant infections among cancer patients in Northern Nigeria, particularly in Katsina State. Without such evidence, cancer control programs cannot adequately plan for infection prevention, antimicrobial stewardship, or supportive care strategies that are critical for improving cancer outcomes.

This proposal seeks to address this critical knowledge and implementation gap by generating local evidence and piloting feasible AMR-integrated cancer care interventions in Katsina State, with relevance for scale-up across Nigeria.

## **Problem Statement**

While antimicrobial resistance is recognized as a major threat to effective healthcare delivery in Nigeria, its impact on cancer patients is largely undocumented and unaddressed in cancer control planning, especially at state and facility levels. There is insufficient data on:

- The prevalence and types of antimicrobial-resistant infections among cancer patients.
- Existing antimicrobial prescribing practices in oncology-related care.
- Infection prevention and control (IPC) capacity in facilities managing cancer patients.
- How AMR considerations can be practically integrated into cancer care pathways and NCCPs.

This gap undermines effective cancer treatment, contributes to preventable deaths, and weakens Nigeria's cancer control response.

## **Project Goals and Objectives**

### **Overall Goal**

To generate evidence and pilot context-appropriate strategies for integrating antimicrobial resistance surveillance and stewardship into cancer care in Katsina State, Nigeria.

### **Specific Objectives**

- To determine the prevalence and patterns of antimicrobial-resistant infections among cancer patients attending selected healthcare facilities in Katsina State.
- To assess antimicrobial use and prescribing practices in the management of infections among cancer patients.

- To evaluate infection prevention and control (IPC) capacity in oncology-related wards and units.
- To pilot a basic antimicrobial stewardship and IPC intervention tailored to cancer care settings.
- To develop policy-relevant recommendations for integrating AMR into cancer control planning at state and national levels.

## **Project Methodology**

### Study Design

This project will adopt a mixed method, phased implementation design combining quantitative surveillance, qualitative assessment, and a pilot intervention. The approach is deliberately pragmatic to generate policy-relevant evidence while strengthening local capacity.

The methodology will be implemented in three sequential phases:

Baseline Assessment (AMR burden and practices)

Health Facility Capacity and Systems Assessment

Pilot Integration of AMR Strategies into Cancer Care

### **Phase I: Baseline Assessment of AMR among Cancer Patients (Months 1-10)**

#### Study Design

A hospital-based cross-sectional study will be conducted to determine the prevalence and patterns of antimicrobial-resistant infections among cancer patients.

#### Study Sites

Purposively selected healthcare facilities in Katsina State that:

Provide cancer diagnosis, treatment, or referral services.

Have basic laboratory capacity or access to referral laboratories.

These may include:

State-owned tertiary or secondary hospitals.

Selected private or faith-based facilities involved in oncology care.

#### Study Population

Adult and pediatric cancer patients receiving inpatient or outpatient care during the study period.

Patients with suspected or confirmed bacterial or fungal infections.

#### Inclusion Criteria

Confirmed diagnosis of cancer.

Clinical evidence of infection requiring antimicrobial therapy.

Availability of laboratory culture and sensitivity results (where applicable).

#### Data Collection Procedures

Retrospective and prospective review of medical records to identify infection episodes.

Extraction of microbiology laboratory data, including:

Type of pathogen isolated.

Antimicrobial susceptibility patterns.

Collection of patient clinical data (age, sex, cancer type, treatment modality, hospitalization history).

#### Outcome Measures

Prevalence of culture-confirmed infections among cancer patients.

Proportion of infections caused by antimicrobial-resistant organisms.

Common resistance patterns relevant to cancer care.

### **Phase II: Assessment of Antimicrobial Use and Facility Capacity (Months 11-25)**

#### Antimicrobial Use Assessment

A structured review of antimicrobial prescribing practices will be conducted using:

Prescription audits.

Treatment records for infection episodes.

Key indicators assessed will include:

- Appropriateness of antimicrobial choice.
- Duration of therapy.
- Use of empirical versus culture-guided treatment.
- Availability and use of treatment guidelines.
- Infection Prevention and Control (IPC) Assessment

Facility-level IPC capacity will be evaluated using standardized checklists adapted from WHO

IPC tools, focusing on:

- Hand hygiene infrastructure.

- Isolation practices.
- Environmental cleaning.
- Availability of personal protective equipment.
- Waste management systems.

### Healthcare Worker Survey

Structured questionnaires and key informant interviews will be administered to:

Clinicians

Nurses

Pharmacists

Laboratory personnel

Areas explored:

Knowledge of AMR in cancer care.

Challenges in antimicrobial prescribing.

Barriers to infection prevention.

Training needs.

### **Phase III: Pilot Integration of AMR Strategies into Cancer Care**

#### **Intervention Design (Months 26-36)**

Based on findings from Phases I and II, a context-appropriate pilot intervention will be implemented in selected facilities.

Core components will include:

1. Antimicrobial Stewardship (AMS) Intervention

Development or adaptation of simplified antimicrobial treatment guidelines for cancer patients.

Training workshops for healthcare workers on:

Rational antimicrobial use.

Interpretation of laboratory results.

Establishment of a basic AMS focal team within facilities.

2. Infection Prevention and Control Strengthening

Targeted IPC training sessions.

Reinforcement of hand hygiene and isolation practices.

Provision of low-cost IPC tools where necessary (e.g., posters, checklists).

3. Laboratory–Clinician Linkage

Improving communication between laboratories and clinicians.

Encouraging culture-guided treatment where feasible.

Standardizing reporting of susceptibility results.

**Stakeholder Engagement**

Throughout the project, engagement will be maintained with:

Katsina State Ministry of Health.

Hospital management.

Oncology and infection control units.

This ensures ownership, policy relevance, and sustainability.

## **Stakeholder Engagement Strategy**

Engagement Across the Project Lifecycle

Stakeholders will be engaged at all stages:

Project Stage

Engagement Activities

Planning

Consultative meetings, stakeholder mapping

Implementation

Joint training sessions, regular coordination meetings

Monitoring

Feedback sessions, shared review of findings

Dissemination

Policy dialogues, stakeholder workshops

## **Coordination and Governance**

Establishment of a Project Steering Committee comprising representatives from:

Katsina State Ministry of Health

Participating health facilities

Laboratory services

Academic partners

The committee will provide strategic guidance and ensure alignment with national and state priorities.

### **Expected Outcomes**

Strengthened AMR Surveillance Capacity

Improved capacity of selected health facilities and laboratories in Katsina State to routinely conduct culture and antimicrobial susceptibility testing in line with national and WHO guidelines.

Improved Quality and Availability of AMR Data

Generation of reliable, timely, and standardized antimicrobial resistance data to support clinical decision-making and state-level AMR reporting.

Enhanced Human Resource Capacity

Increased knowledge and technical competence of healthcare workers and laboratory personnel in AMR surveillance, antimicrobial stewardship, and data management.

Improved Antimicrobial Stewardship Practices

Better prescribing practices informed by local resistance patterns, leading to more rational use of antibiotics in participating health facilities.

## Increased Institutional Engagement and Coordination

Strengthened collaboration between health facilities, laboratories, the State Ministry of Health, and other relevant stakeholders on AMR prevention and control.

## Evidence-Informed Policy and Planning

Availability of locally generated AMR evidence to inform state antimicrobial resistance action plans, treatment guidelines, and public health interventions.

## Improved Gender and Social Inclusion in AMR Activities

Equitable participation of men and women in training, surveillance, and stakeholder engagements, with attention to inclusive capacity-building.

## Foundation for Sustainable AMR Control

Establishment of systems, trained personnel, and partnerships that support continuity of AMR surveillance and stewardship activities beyond the project period.

## **Impacts (Long-Term)**

### Impact 1: Improved Cancer Treatment Outcomes

Reduced infection-related morbidity and mortality among cancer patients.

Fewer treatment interruptions and delays caused by resistant infections.

Improved overall quality and continuity of cancer care.

### Impact 2: Reduced Burden of Antimicrobial Resistance

Slower emergence and spread of resistant pathogens within cancer care settings.

More efficient and sustainable use of antimicrobials in health facilities.

### Impact 3: Strengthened Health System Resilience

Health facilities better equipped to manage infections in vulnerable populations.

Improved integration of AMR strategies within routine clinical services.

Enhanced preparedness for future infectious threats affecting cancer patients.

### Impact 4: Contribution to National and Global Goals

Supports Nigeria's National Action Plan on AMR.

Informs National Cancer Control Plan (NCCP) implementation and revision.

Contributes to WHO Global Action Plan on AMR and Sustainable Development Goal 3.

## **Monitoring and Evaluation (M&E)**

- Results-Based M&E Framework

The project will adopt a results-based monitoring and evaluation framework to track inputs, outputs, outcomes, and impact against predefined objectives and indicators.

- Key Performance Indicators

Monitoring will focus on indicators such as number of facilities participating in AMR surveillance, volume of specimens processed for culture and susceptibility testing, number of healthcare workers trained, and completeness and timeliness of AMR data reporting.

- Data Collection and Quality Assurance

Data will be collected using standardized laboratory and surveillance tools, with routine verification through supervisory visits, record cross-checking, and periodic data validation meetings.

- Evaluation Activities

A midline review will assess implementation progress and inform corrective actions, while an end-line evaluation will measure improvements in AMR surveillance capacity and antimicrobial stewardship practices.

- Reporting and Use of Findings

Findings will be documented in periodic technical reports and shared with stakeholders to support adaptive project management, policy engagement, and sustainable AMR control in Katsina State.

## **Conclusion**

The proposed antimicrobial resistance (AMR) project in Katsina State is designed to strengthen surveillance, build human and institutional capacity, and generate reliable, locally relevant data to inform clinical and public health decision-making. By enhancing laboratory and healthcare worker capabilities, improving antimicrobial stewardship practices, and fostering collaboration among stakeholders, the project will contribute to the reduction of AMR prevalence, support evidence-based policy, and promote sustainable interventions. Ultimately, this initiative will reinforce the state's health system resilience, improve patient outcomes, and align with national and global efforts to combat antimicrobial resistance, ensuring long-term public health benefits for the population of Katsina State.

