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The ESUTH AMS Team. Photo credit: Kabir Abdullahi, MTaPS

Implementing Antimicrobial Stewardship at a Teaching Hospital in Nigeria

Technical Highlight | May 2023 | Nigeria

Leveraging Interprofessional Collaboration for Antimicrobial Stewardship at Enugu State University Teaching Hospital (ESUTH)

Background

For more than 100 years, antibiotics have been used to treat infections in both humans and animals. However, as the use of antibacterial and other antimicrobial medicines has expanded, an increasing number of pathogens have stopped responding to these medicines. This is known as antimicrobial resistance (AMR). The World Health Organization (WHO) estimates that AMR is associated with nearly 5 million deaths per year.¹

The US Agency for International Development (USAID) is working to address the threat of AMR through the Global Health Security Agenda (GHS), an international effort which brings together more than 70 countries and nongovernmental partners to collectively achieve the vision of a world safe and secure from global health threats posed by infectious diseases. The USAID Medicines, Technologies, and Pharmaceutical Services (MTaPS)

¹ Antimicrobial Resistance Collaborators. (2022). Global burden of bacterial antimicrobial resistance in 2019: a systematic analysis. *The Lancet*; 399(10325): P629-655. DOI: [https://doi.org/10.1016/S0140-6736\(21\)02724-0](https://doi.org/10.1016/S0140-6736(21)02724-0)

program (2018–2025) is a key implementer in USAID’s support for the GHSA vision.

Aligned with this vision, since 2021, MTaPS has supported Nigeria in its efforts to contain AMR. This includes development and implementation of an antimicrobial stewardship (AMS) program at the national, subnational, and facility levels. AMS aims to ensure appropriate use of antibiotics, avert inappropriate prescribing and dispensing practices, and deter self-medication.

MTaPS supported establishment of national- and state-level AMR coordinating committees/technical working groups (TWG) at the national level to drive programs/actions around ensuring prevention of AMR in Nigeria. In its first move to bring AMS beyond the national level, MTaPS partnered in July 2021 with the public, state-owned Enugu State University Teaching Hospital (ESUTH) to introduce a facility-level AMS program at the hospital.

Problem Statement

Before MTaPS began its collaboration with ESUTH, the hospital had no AMS program in place. A baseline assessment using the Nigeria Centre for Disease Control and Prevention’s (NCDC) adaptation of the WHO AMS assessment tool revealed that ESUTH’s staff—from doctors and nurses to lab personnel and pharmacists—did not know much at all about AMS, and the facility lacked any AMS infrastructure, such as a committee or team to plan or lead activities to contain AMR. As is common in Nigeria, ESUTH’s doctors routinely determined when and which antibiotics to prescribe based solely on their own expertise and clinical judgement, without input from other members of the health care team or any lab tests, such as antimicrobial culture and sensitivity testing. ESUTH did not have a formulary in place to guide prescription practices, it lacked any formalized prescription policies, and it had not yet instituted an antibiogram—a facility-

level report on susceptibility of strains of pathogens to a variety of antibiotics—to track drug resistance trends.

Technical Approach

MTaPS’ work to strengthen AMS practices at the facility level in Nigeria is guided by the WHO Joint External Evaluation (JEE) 2.0 tool (2018) and the WHO Benchmarks for International Health Regulations (IHR) Capacities (2019).² These tools are designed to help countries identify gaps and implement recommended actions to make progress in GHSA technical areas, including multisectoral collaboration, infection prevention and control (IPC), and AMS. The JEE AMS benchmarks (level 3) include implementation of AMS programs at designated facilities, such as monitoring antimicrobial use, education/communication with health professionals, and other interventions to improve antibiotic use by the facility. At the facility level, MTaPS uses the WHO’s AMS evidence-based guidance, including the WHO AMS toolkit, to support technical implementation.

To strengthen AMS at ESUTH, MTaPS emphasized interprofessional engagement in both training and implementation. In its Competency Framework for Health Workers’ Education and Training on Antimicrobial Resistance, the WHO notes the importance of “an interprofessional approach based on the principle that addressing AMR requires a shared understanding, and effective collaboration and communication among health workers,” recognizing that “a number of different health workers are involved in the sequence of events and scenarios leading to the prescription and use of antimicrobials.”³

Stakeholder Engagement

In introducing AMS activities in ESUTH, MTaPS collaborated closely with the NCDC, the national AMR TWG secretariat, and hospital administration and staff.

² International Health Regulations (IHR) (2005), an instrument of international law that is legally binding in 196 countries, establishes rights and obligations for countries related to reporting, surveillance, and response to public health events, with the aim of protecting public health globally. IHR covers 19 technical areas, including AMR.

³ WHO Competency Framework for Health Workers’ Education and Training on Antimicrobial Resistance. Geneva: World Health Organization; 2018 (WHO/HIS/HWF/AMR/2018.1). License: CC BY-NC-SA 3.0 IGO. <https://www.who.int/publications/i/item/who-competency-framework-for-health-workers%E2%80%99-education-and-training-on-antimicrobial-resistance>.

Intervention

MTaPS helped establish and then worked in collaboration with the AMR TWG secretariat to launch activities in Enugu State. In collaboration with the AMR TWG and ESUTH, MTAps supported establishment of structures and program elements for an interprofessional facility-level AMS program to address the gaps in prescription behavior, overall antimicrobial use, build capacity for program implementation, and support program implementation, as described below.

Laying the groundwork

MTaPS, in collaboration with the national AMR TWG secretariat, provided guidance to Enugu State to establish a state-level One Health AMR TWG, which would mirror the national-level body. Following a directive from the State Commissioner for Health and in collaboration with ESUTH's management and the Enugu State IPC focal person, MTAps held an introductory meeting to present AMS to hospital management.

Assessing AMS at ESUTH

Using the WHO AMS assessment tool, MTAps supported the AMR TWG secretariat team and selected ESUTH staff to conduct a baseline assessment to determine what core AMS elements were in place in the hospital, examine available data on antimicrobial consumption, and look at existing AMS competencies at the facility. The findings revealed gaps in governance, coordination, education and training, and the availability of antimicrobial use and resistance data. Specifically, ESUTH lacked an AMS program, did not have an AMS committee or team, and no platform existed for discussion of patient outcomes across perspectives/specialties, including AMS and IPC, pharmacy, microbiology, and clinicians.

Establishing a governance structure at ESUTH

MTaPS worked in concert with ESUTH leadership to establish an interprofessional team for AMS program implementation. Together, MTAps and ESUTH management identified doctors, nurses, pharmacists, laboratory scientists, information technology (IT) professionals, IPC experts, and administrative staff from across the community's medicine, pharmacy, laboratory medicine, nursing services, administrative, and IT departments. The team included both IPC and AMS champions who served as a rallying force for other

team members and whose enthusiasm drove the shared vision of improving prescription practices and IPC in the facility; these champions would prove crucial for AMS implementation. AMS team members originally served in their roles on a voluntary basis, but when other work priorities pulled them away from AMS, MTAps encouraged ESUTH management to formalize their role on the team and give them more responsibility.

The hospital also established a combined IPC/AMS committee at the management level to provide oversight and hospital wide adoption of the activities and interventions prioritized by the AMS team. The committee oversees the work of the AMS team. The team reports to the committee and implements the committee's prioritized facility improvement plan activities.

Developing a facility-level AMS plan

MTaPS supported the ESUTH AMS team to undertake an assessment of the facility's AMS core elements with a view to identifying the elements that required strengthening. The interprofessional AMS team prioritized its interventions to address the gaps identified in the assessment of the AMS core elements. This prioritization took into account the resources required to implement desired interventions. Next, the AMS team consolidated the prioritized interventions in a facility AMS action plan, which included the required human and financial resources. The plan focused on the establishment of a facility AMS program; the appointment of a facility AMS focal person and the inauguration of the facility AMS team; the training of facility AMS team members and cascading of the training to other hospital staff; reinforcement of training with deployment of job aids and information, education, and communication materials; reviewing of existing prescription guidelines; and development of a hospital formulary.

Strengthening workforce capacity

As per the plan, MTAps supported engagement and training sessions, a mentorship program, and supportive supervision visits to build the capacity of doctors, nurses, pharmacists, microbiologists, IT personnel, and records management staff that constitute the ESUTH AMS team. The sessions focused on improving the team's understanding of the importance of championing rational use of antibiotics, identifying appropriate AMS interventions in response to identified AMS gaps, and establishing a monitoring and evaluation plan with the

overall goal of contributing to improved treatment outcomes for patients by reducing irrational prescription of antibiotics. Team members from across functional areas took part in the training together, which helped them build relationships, understand the value of each other's work in preventing AMR, and set the stage for interprofessional collaboration in the workplace.

Implementing AMS interventions

MTaPS supported the AMS team in implementation of facility AMS plan, which included the inauguration of the facility teams/committees, educating prescribers and health care personnel involved in antibiotics use, and reviewing and updating existing guidelines and formulary for prescribers. MTAps supported a baseline point prevalence survey (PPS) (August 2022) which revealed an overdependence on the Reserve and Watch group antibiotics, based on the WHO Access, Watch, and Reserve (AWaRe) categorization of prescribing based on three groups: those antibiotics which should be in the Access category and prescribed for most common conditions requiring antibiotics, those which should be used under Watch in particular cases, and those which should be held on Reserve for use in very limited circumstances. This overdependence indicated the need for improved health care worker education and behavior change interventions, as well as reducing empirical prescription of antibiotics (i.e., without lab tests, in cases where such tests are indicated).

In response, MTAps supported the facility-level AMS committee in introducing the WHO AWaRe categorization of antibiotics through training of doctors, pharmacists, nurses, and microbiologists/laboratory scientists on using AWaRe to optimize antibiotic prescribing practices. MTAps also collaborated with facility stakeholders to conduct surveillance and reporting and a PPS to examine antibiotic prescribing practices as compared with the AWaRe categorization. MTAps is supporting the national AWaRe TWG of the Essential Medicines List Committee to develop an AWaRe categorization for Nigeria, which will later be introduced at ESUTH.

Results and Achievements

MTaPS' support at ESUTH has allowed the facility to establish a fully functional interprofessional IPC/AMS committee to oversee both IPC and AMS activities at the facility. The multidisciplinary nature of the committee is notable, with communication and collaboration between ESUTH staff, representing various professions, fostering strong understanding and unity, and driving AMS implementation forward. While the facility AMS team is still led by a doctor, other health care staff have demonstrated capacity for AMS leadership and play an active role in AMS implementation. The team has developed a contextualized hospital formulary to meet the AMS needs of the facility. MTAps' interventions and the influence of ESUTH's interprofessional IPC/AMS committee have decreased prescribers' resistance to inputs from pharmacists on antibiotic prescription practices. These interventions have also increased physicians' acceptance of laboratory results of sensitivity/resistance profiles to guide their choices of antibiotics. ESUTH has data on antibiotic prescribing practices at the facility and how they compare with AWaRe categorization recommendations and uses these data for improved decision making on antibiotic use. A facility AMS plan is in place, and all members of the IPC and AMS teams are trained on AMS and understand its key principles.

Changes in behavior of health care providers as a result of AMS interventions takes time to blossom. Persistence of the AMS team coupled with the support of the hospital management and patience by the technical team are required to achieve the desired AMS goal of a hospital wide adoption of rational use, and prescription of antibiotics for improved patient treatment outcomes.

—Dr. Ifeyinwa Nwafia
AMS mentor supporting the ESUTH AMS Team

Lessons Learned

- **A multidisciplinary/interprofessional AMS team fosters productivity.** ESUTH's AMS team included lab workers, pharmacists, IT specialists, and doctors. This multidisciplinary approach is unusual for Nigerian health care facilities. Collaboration between the various disciplines brought various perspectives to understanding AMS issues in the facility and helped to drive AMS forward, despite the limited resources the facility can provide for AMS activities.
- **It is important to dispel the perception that only doctors can lead the interprofessional AMS teams.** Although doctors are normally seen as leaders in a hospital, MTaPS explained that AMS teams can be led by whoever is most committed. At ESUTH, one of the AMS team members, a lab scientist, has demonstrated strong passion for AMS and has stepped up to contribute significantly to AMS, but still cannot run the team because that role is currently reserved for an MD.
- **Engaging management early and often and identifying AMS champions is key for managing expectations and fostering long-term commitment.** After initial engagement and implementation, ESUTH's strong enthusiasm and commitment to AMS began to wane. It became clear then that the hospital's expectations for MTaPS' support were not aligned with MTaPS' plans. MTaPS was able to mitigate the challenge by engaging facility management, encouraging ESUTH management to issue letters of appointment to AMS team members to make their role more official, encouraging teams to leverage their most committed members and give them more responsibility, and identifying and engaging an AMS champion who was able to motivate the broader team.

Pathway to Sustainability

ESUTH's AMS program is on the pathway to sustainability. It has a governance structure in place, including the joint IPC/AMS committee and a standalone AMS team, and staff have improved knowledge and awareness of AMS.

A facility-level AMS implementation plan is in place. Based on their improved understanding of the importance of data for decision making, ESUTH has included IT specialists in its AMS team and is taking steps to introduce an electronic medical records system. Additional AMS interventions now under discussion at the facility include developing an antibiogram and a hospital formulary. To achieve long-term sustainability, facility management needs to dedicate budget funding for AMS and institute ongoing measurement of AMR data, analyze and share these data with health care workers and use the data to inform future AMR interventions.

Conclusions

Thanks to the collaboration between MTaPS and ESUTH, the hospital now has a functional interprofessional AMS program contributing to implementation of measures to prevent and contain AMR in Enugu state. While ESUTH had little knowledge about AMS before the collaboration began, today the hospital team—from doctors to pharmacists to lab workers and even to IT specialists—is well aware of the risks of AMR and the AMS approaches to address these risks. Over the remainder of its lifetime, MTaPS plans to support a follow-up assessment on AMS, conduct a second PPS, and ensure that the antibiogram is integrated into ESUTH practice. MTaPS will also introduce continuous quality improvement methodology to the facility, as a tool that the IPC/AMS committee and AMS team can use themselves to identify and address AMR issues moving forward.

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