Health workers pledge to address antimicrobial resistance in the Elgon region

HEPS-Uganda Trains Arua and Lira District One Health Teams on AMR
Antimicrobial resistance (AMR) has many drivers, with antibiotics use in the human and animal sectors being the most significant and modifiable factor. We all must work towards preservation of the available antimicrobials through judicious and thoughtful antimicrobial use in all sectors. All of us have a vital role to play by making meaningful decisions and changes that can improve the use antimicrobials, patient safety, and the health of the population. AMR will continue to exist; there is no turning back. The challenges in the health system in Uganda necessitate the use of empiric, often broad-spectrum antibiotics. Even so, there are numerous opportunities for improvement, with significant evidence showing misuse of antibiotics in health facilities. For example, we commonly see the unnecessary use of antibiotics for viral upper respiratory tract infections (URTIs), the wrong antibiotic prescribed for urinary tract infections (UTIs), and prolonged use of antibiotics for surgical prophylaxis. There is a need for the country to consolidate efforts for implementing a set of actions that promote the responsible use of antimicrobials at the individual, health facility and national levels, and across human health, animal health, and the environment. This is known as antimicrobial stewardship (AMS).

Antimicrobial stewardship is a coherent set of actions that promote the responsible use of antimicrobials. This definition can be applied to actions at the individual, national, and global levels and across human health, animal health, and the environment.

The ASO TWC is a One Health multisectoral and multidisciplinary TWC of the national AMR sub-committee (NAMRSC). Its goal is to preserve the effectiveness and efficacy of antimicrobial agents for human and animal health through controlled access, effective AMS, and appropriate use. The NAMRSC, established in 2018 by the national action plan for AMR (AMR-NAP), is the national coordinating body for the implementation of AMR activities. The ASO TWC coordinates, catalyzes, and monitors the implementation of strategic objective 3 (promote optimal access and use of antimicrobials) of the AMR-NAP. The committee utilizes the One Health approach by bringing together experts from the human, animal, and environmental sectors.

In Uganda, the national One Health Platform, a collaboration among the MoH; Ministry of Agriculture, Animal Industry, and Fisheries; Uganda Wildlife Authority; and Ministry of Water and Environment, was established and launched in 2016. The platform coordinates AMR-NAP implementation through the NAMRSC.

The foundation of antimicrobial stewardship is teamwork.

Given the rise in resistant infections and antimicrobial consumption and use (AMC&U) problems in Uganda, I call on all individuals and institutions in the animal, human, and environmental health sectors and the general public to consolidate efforts for improving and optimizing the use of antimicrobials by being extra conscious whenever antimicrobials are prescribed, dispensed, or used.

The foundation of AMS is teamwork. I would like to thank the US Agency for International Development (USAID) Medicines, Technologies, and Pharmaceutical Services (MTaPS) Program for supporting the crucial steps of setting up multisectoral coordinating bodies, including the NAMRSC and the ASO TWC. The ASO TWC is looking forward to continuing working with all sector experts. This newsletter is a significant step toward regular communication to stakeholders and the public about the efforts to improve antibiotic use in Uganda.

2 https://www.cdc.gov/onehealth/basics/index.html
A Note from the Editorial Team and Secretariat

Welcome to the first newsletter produced by the ASO TWC. This newsletter is a concrete action by Uganda to improve awareness and understanding of AMR through effective communication, education, and training. It is in line with the first key objective of the global action plan to tackle the growing problem of resistance to antibiotics and other antimicrobial medicines that was endorsed at the Sixtieth World Health Assembly in May 2015. The Uganda AMR-NAP restates this as strategic objective 1, to promote public awareness, training, and education.

The theme for this edition of the newsletter is A Call to Action for Antimicrobial Stewardship. It provides a summarized evolution of the framework that lays the foundation upon which AMS is implemented in Uganda. This includes the Uganda National AMR-NAP, which was launched on November 23, 2018, the Uganda MoH Medicines and Therapeutic Committees (MTCs); and the Uganda Clinical Guidelines. It also highlights some of the ongoing activities by different actors in the AMS space. First, using the case study of antimicrobial use in the animal and human health sectors in rural and peri-urban settings in Uganda, the Antimicrobials in Society (AMIS) Uganda team provides a simple and compelling argument for us to construct and build health systems as the actual stewards of antibiotics. Second, Dr. Nanyonga summarizes the achievements of the Strengthening Healthcare Practitioners’ Capability for Effective Antimicrobial Stewardship in Eastern Uganda project. Third, Drs. Kitutu and Sheba provide a timely account of the contribution of the Commonwealth Partnership for Antimicrobial Stewardship (CwPAMS), which is a health partnership-based program managed and funded by the UKAID Fleming Fund to tackle AMR globally. Fourth, Mr. Kasuja and Dr. Murungi write about the ongoing efforts supported by MTaPS to establish and sustain Centers of Excellence for AMS and Infection Prevention and Control (IPC) at selected health facilities across the country. Lastly, Dr. Kibira and Mr. Abena write about their efforts to bolster the governance structures for One Health at the local government level by implementing capacity building activities for district One Health task forces. This newsletter also features the story of Dr. Christine Florence Najjuka, a well-known academic, researcher, and medical microbiologist whose efforts have shaped national efforts to implement IPC and illuminated the increasing AMR problem affecting commonly prescribed antimicrobials in Uganda. Dr. Kajumbula shares recent findings from one of his studies of the growing problem of difficult-to-treat gram-negative rods (DTR) that cause life-threatening infections and are resistant to carbapenems, the most potent of beta-lactams, and fluoroquinolones.

To the extent possible, the editorial team has applied the five evidence-based principles recommended in the Wellcome report Reframing Resistance: How to Communicate about Antimicrobial Resistance Effectively, to create a newsletter that informs, motivates, and persuades actors to take action.

1) Drug-resistant infections have been framed as undermining the current foundations upon which modern medicine is based.

2) A clear explanation of what resistance is has been provided. It is a microbial not a human phenomenon. The contribution of human activity as a driver of resistance has been stated.

3) AMR has been presented as a universal issue affecting everyone, including the authors and audience of this newsletter.

4) The focus of the message is the here and now, and

5) A strong recommendation for immediate action has been made.

6) On behalf of the editorial team, we trust that you will find these stories informative and enjoyable. We are grateful to USAID MTaPS Program, implemented by Management Sciences for Health, for its support and to the Government of Uganda for providing an enabling environment. We hope that you will take up your mantle to contribute to the ongoing effort to curtail AMR.

Finally, the editorial team invites and welcomes submission for consideration to publish in future issues of the newsletter.

Dr. Freddy Eric Kitutu, editorial team lead

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Increased use of antimicrobial medicines to treat humans and animals is a driver of AMR. As concerns about AMR grow, increasing attention is placed on the need to reduce unnecessary use of antimicrobials in both humans and animals. The AMIS Uganda project was set up to examine why antimicrobial use is so pervasive across rural and urban Uganda. The intention is to provide detailed information that can guide locally relevant AMS interventions.

Systems as Stewards of Antibiotics

Susan Nayiga
On behalf of Christine Nabirye, Miriam Kayendeke, Laurie Denyer Willis, Sarah Staedke and Clare Chandler, AMIS Uganda project

Increased use of antimicrobial medicines to treat humans and animals is a driver of AMR. As concerns about AMR grow, increasing attention is placed on the need to reduce unnecessary use of antimicrobials in both humans and animals. The AMIS Uganda project was set up to examine why antimicrobial use is so pervasive across rural and urban Uganda. The intention is to provide detailed information that can guide locally relevant AMS interventions.

This four-year social science study started in 2017 as part of a collaborative research program led by the London School of Hygiene and Tropical Medicine, with the Infectious Diseases Research Collaboration (Uganda) and Mahidol University and Ministry of Public Health (Thailand) as partners, to better understand the role of antimicrobials in society and everyday life in urban Kampala, peri-urban Wakiso, and rural Tororo in Uganda.

Frequently Used Antibiotics in Households and Farms

We started by conducting cross-sectional surveys in Kampala, Wakiso, and Tororo, focusing on households and on piggery and poultry farms. The aim of these surveys was to understand the patterns of antibiotic use and the sources of these medicines. We found that the frequency of antibiotic use varied from place to place, as did the types of antibiotics used in different areas, particularly between rural and urban areas. Most of the antibiotics frequently used for human treatment belonged to the Access category of the World Health Organization’s (WHO) Access Watch Reserve (AWaRe) classification. We did find some reports of frequent use of ciprofloxacin and erythromycin.
Antibiotics as a Quick Fix for Modern Life

We spent an extended period of time in selected households, farms, and health facilities to understand what everyday life was like in these settings and the roles that antibiotics played.

In our study site in Kampala, which is an informal settlement, people experienced frequent flooding, had limited access to toilets and faced challenges with water contamination. Diarrhea was common, and there was frequent use of metronidazole in anticipation of diarrhea almost every week. Many times, buying medicine competed with buying food and meeting other needs in the home. In this setting, antibiotics offered a practical way to cope with frequent diarrhea and other risks of everyday life, allowing people to continue being productive.

Antibiotics as Substitute for Hygiene in Kampala’s Informal Settlements

In the rural study site in Tororo, people experienced chronic ill health amidst limited access to clean water, inadequate toilet facilities, and limited access to good quality health care. Residents had resorted to taking antibiotics in small doses that they could afford to be able to tolerate the lingering forms of ill health and remain productive in their

Antibiotics used frequently for human treatment, as reported by participants

- metronidazole
- trimethoprim/sulfamethoxazole
- ciprofloxacin
- azithromycin
- cefixime
- azithromycin/secnidazole/fluconazole
- ofloxacin
- amoxicillin/clavulanic acid
- ampicillin/cloxacillin
- doxycycline
- phenoxymethylpenicillin
- ampicillin
- amoxicillin/clavulanic acid
- erythromycin
- chloramphenical
- tetracycline
- cefalexin (cephalexin)
- benzylpenicillin
gardens. In this setting, antibiotics filled the gaps in sanitation and health care infrastructures.

Antibiotics as Investment Protection in Wakiso

Among piggery and poultry farmers in our peri-urban site in Wakiso, antibiotics were used to support raising exotic breeds for maximum protein production. Amidst heavy financial investment and numerous risks that were shouldered by farmers with no safety nets, antibiotics not only provided immediate treatment and prevention of infection but also protected financial investments and livelihoods.

Antibiotics as Care in Lower-Level Health Facilities

In lower-level health care facilities in our rural site in Tororo, where health workers operated in a context of scarcity of equipment, supplies, and human resources, we observed that the existing structures of health care continue to rotate around the giving of medicines. Stewardship activities had not yet been rolled out, and the latest clinical guidelines had not yet been disseminated. Removing antibiotics from health care encounters is likely be a challenge as has been observed in the case of antimalarials. Care beyond medicines will require investment in infrastructure as well as training of health care practitioners.

Reducing Reliance on Antibiotics: Investing in Systems

Our findings highlight the need to invest in system factors that drive antibiotic use across societies. Future AMS interventions could consider systems as well as individuals to be stewards of antibiotics. This means generating more systemic solutions that can achieve an equitable and sustained impact (table 1).

<table>
<thead>
<tr>
<th>Sector</th>
<th>Recommendations</th>
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<tbody>
<tr>
<td>Water and sanitation</td>
<td>Invest in safe water and sanitation systems in both rural and urban areas to avoid people relying on the piecemeal use of antibiotics to cope with the high risk of infection.</td>
</tr>
<tr>
<td>Farming</td>
<td>Provide safety nets such as affordable insurance schemes to reduce the need for farmers to use additional antibiotics to protect financial investments and livelihoods.</td>
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<tr>
<td>Economic</td>
<td>Address economic insecurity to achieve health security and avoid people turning to antibiotics to counter the insecurities that affect them every day in different ways.</td>
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<tr>
<td>Private sector</td>
<td>Improve implementation of regulations, particularly of the sale of Watch and Reserve list antibiotics.</td>
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<tr>
<td>Health care systems</td>
<td>Beyond disseminating guidelines, AMS programs will also require investment in the health infrastructure to improve clinicians’ ability to deliver quality care beyond the provision of medicines.</td>
</tr>
</tbody>
</table>

For more information, please visit www.antimicrobialsinsociety.org
Reports and papers
1) Tompson, Alice C; Chandler, Clare IR; (2021) Addressing antibiotic use: insights from social science around the world. Project Report. London School of Hygiene & Tropical Medicine. DOI: https://doi.org/10.17037/PUBS.04659562

Evolution of the Antimicrobial Stewardship Program in Uganda

Dr. Freddy Eric Kitutu,
Lecturer, Pharmacy Department, School of Health Sciences
Leader, Sustainable Pharmaceutical Systems, Makerere University

AMS has come a long way in terms of policy discussions in Uganda. Today, it features in the draft National Pharmaceutical Services Strategic Plan 2020/21–2024/25.4 AMS interventions and activities have been prioritized at the national, district, and health facility levels. This means that over the next five years, the Department of Pharmaceuticals and Natural Medicines will lead, mobilize resources, and provide guidance on what interventions need to be implemented to conserve effective antimicrobials for ourselves and future generations.

Before 2015, implementers and practitioners in Uganda had a narrow focus on rational use of medicines, and the main thrust of monitoring and accountability for performance of pharmaceutical systems was on availability of essential medicines. The process of developing the Uganda AMR-NAP brought to the fore the need to focus on the use of antimicrobials as well, particularly antibacterial medicines.

From 2016 to 2018, with leadership from the then Pharmacy Division of the MoH, a sub-committee comprising representatives from academia, implementing partners in the health commodity supply space, and WHO country office developed the objectives and priority actions under objective 3: “to promote optimal access and use of antimicrobials”. Not surprising, the proposed interventions cover a wide scope, from ensuring access to effective antimicrobials; promoting their judicious prescribing, dispensing,

Strategic Objectives of the AMR-NAP
1) To promote public awareness and understanding on antimicrobial use, resistance prevention, and containment through effective communication and training.
2) To improve infection prevention and containment of resistant microorganisms in human health care, community and animal health through individual and environmental sanitation, hygiene and infection prevention and biosecurity measures.
3) To optimize the use of antimicrobial drugs in human and animal health-care settings through effective stewardship practices.
4) To strengthen the knowledge and evidence base of antimicrobial use and antimicrobial resistance through One Health surveillance to inform policy.
5) To invest in research and innovations to inform policy and implementation science.

4 Ministry of Health Uganda (2021); The National Pharmaceutical Services Strategic Plan (NPSSP) 2020/21 to 2024/25
and use; and managing their quality and promoting research and development as an enabler for local manufacture. Implementing enablers and drivers of AMS is emphasized too. These include financing and pricing mechanisms, up-to-date evidence-based treatment guidelines, use of diagnostics to guide clinical decisions, and incentives and rewards systems for most compliant prescribers and dispensers. In the One Health spirit through which the AMR NAP was developed, this section prescribes interventions for human and animal health. It also prioritizes monitoring drug residues in animal products. The launch of the Uganda AMR-NAP provided the necessary impetus to move interest in AMS into action.

To Prescribe or Not to Prescribe Antibiotics: That Is the Question

Dr. Juliet Sanyu Namugambe, Senior Lecturer, Pharmacy Department, Faculty of Medicine, Mbarara University of Science and Technology, Uganda

AMR awareness campaigns have gained momentum in the last decade, and many clinicians are now aware of their role in fighting AMR as the primary custodians of antibiotics to preserve their effectiveness. Antimicrobial use has been proven to have a direct correlation with the emergence and spread of resistant microbes. Many of us, as clinicians, want to do the right thing and are cognizant of the need to limit the use of antibiotics to situations where they are absolutely necessary. A situation often arises where we are faced with a patient and we are unsure of whether to prescribe antibiotic. Consider this scenario: A mother comes to your clinic with a three-year-old boy, who has had a fever for two days, looks weak, is visibly irritable, and has a decreased appetite and a runny nose. The mother gave the boy some Paracetamol syrup she had at home. The physical examination reveals no remarkable findings. You do a malaria test, which is negative, and a full blood count that shows mildly increased lymphocytes, but all other parameters are normal. A lot of questions go through your head, “Now what do I do for this mother? Is this infection bacterial? Is it possible that the malaria parasites just didn’t show in the blood slide? What if I don’t prescribe antibiotics and the child keeps getting worse?”.

In other circumstances, as in many settings in public hospitals and rural areas, clinicians do not even have the luxury of conducting a simple complete blood count test. Even in developed countries, the differences among a viral infection, a bacterial infection, a parasitic infection, and an inflammation are not always clear;

Being SMART also means you avoid broad-spectrum antibiotics for infection, and you must adhere to standard treatment guidelines.

5 Republic of Uganda (2018); Uganda National AMR National Action Plan

The Honorable Minister of Health, Dr. Jane Ruth Aceng Ocero launching the National AMR Action Plan on November 21st 2018 at the Annual AMR conference at Hotel Africana, Kampala, Uganda
as symptoms overlap. In many cases, we are inclined to give the patients antibiotics under the “better safe than sorry” thinking and approach.

This article provides examples on when to prescribe antibiotics and when not to. First, we will cover URTIs, including coughs, colds, sore throats, and some earaches. These are most commonly caused by viruses (e.g., rhino virus, corona viruses) and do not need antibiotics. However, you need to give your patient something, so you give something to relieve uncomfortable symptoms, such as an antihistamine, a cough expectorant or suppressant, or a mild anti-inflammatory such as paracetamol or ibuprofen for the pain and fever. In addition, you have to explain to the patient or their caretaker that their body will fight the infection over the next few days, and they should help it by resting, eating healthy, and increasing the amount of fluids, fruits, and vegetables they consume. It is important to allay the patient’s fears, for example by giving them information on when they should worry (a leaflet used in England can serve as an example).

Another strategy is to use the delayed prescription technique. Delayed prescribing is a method whereby a prescription is issued by a health professional for use by the patient at a later date if their symptoms do not improve. It has been proven to reduce antibiotic prescription collections by up to 65%, as usually the patient feels better within three to five days.

Another situation where antibiotics are prescribed but not needed is diarrhea, especially in children. Diarrhea in children is most often caused by rotaviruses, which are not responsive to antibiotics. In 2013, the government introduced a rotavirus vaccine into the routine childhood immunization calendar as a way of preventing diarrheal diseases in children. The body tries to clear the infection by flushing it out through increased/loose stools, and the danger here is posed by dehydration and loss of essential electrolytes and nutrients. Therefore, the clinician should prescribe oral rehydration salts and zinc and encourage parents to provide proper nutrition, continue breastfeeding, increase fluid intake, and ensure proper hygiene to prevent future episodes. On the other hand, bloody diarrhea, or dysentery, is caused by bacteria (Shigella) and amoebiasis. In this case, the clinician needs to prescribe antibiotics following the local guidelines. Other circumstances where antibiotics are not warranted include clean wounds and continuing antibiotics after clean surgery (when there is no evidence of surgical site infection), malaria, and fungal infections such as candidiasis and ringworms.

There are some general tips on good antibiotic prescribing, also known antibiotic smart use, that employ the “Start Smart, Then Focus” approach. This method has been promoted in many health care settings as part of AMS activities that are aimed at improving the safety and quality of patient care and greatly reduce the emergence and spread of AMR. It is an organizational rather than an individual effort. Starting smart includes putting the following into action. First, do not prescribe antibiotics unless you have clear evidence that there is an infection. Make sure that the patient is not allergic to the antibiotics you intend to prescribe. When you suspect an infection, give the antibiotic within one hour of diagnosis, and in case of sepsis or life-threatening infections, give as soon as possible. Being SMART also mean avoiding broad-spectrum antibiotics for those infections that can be managed with narrow-spectrum ones, and you must adhere to the standard treatment guidelines (in Uganda, the Uganda Clinical Guidelines). Also remember to clearly document in the patient’s record the diagnosis, drug name, dose, duration, route, and frequency. You must include a date when you will review or stop the antibiotic. Whenever possible, obtain a sample for culture and sensitivity testing, but do not wait for results to start treatment. Avoid using antibiotics as prophylaxis or as a replacement for proper hygiene and infection control practices. After you have taken those SMART actions, you can focus the choice of antimicrobials based on the additional information about the patient and from the lab investigations. This means that at 48 to 72 hours after prescribing, you should examine the patient again and make a decision, clearly documented, on what to do next. Has the patient improved? Gave the signs and symptoms (e.g., pain, fever, discomfort) resolved? Are the symptoms worse: Was the initial diagnosis, correct? Depending on the answers to these questions, you might stop the antibiotic if there is no clear evidence of infection, switch antibiotics from intravenous to oral, change antibiotics to a narrower spectrum for targeted infection or to a broad-spectrum alternative, continue and document next review date or stop date, and assess whether the patient is eligible for outpatient parenteral antibiotic therapy.

We have discussed some actions to guide us to prescribe antibiotics appropriately. In the future, we hope that rapid and
advanced diagnostics may clearly indicate the differences between bacterial and viral infections. In the meantime, because resistant microbes are not waiting, we shall use all available techniques, and the knowledge and skills we have at hand, to prescribe antimicrobials as proficiently as we can so that our patients get better, while at the same preventing AMR.

References

The Entrance of Medicine and Therapeutics Committees into the Repertoire of Tools for AMS

Dr. Freddy Eric Kitutu,
Lecturer, Pharmacy Department, School of Health Sciences
Leader, Sustainable Pharmaceutical Systems, Makerere University

Dr. Monica Imi,
Enabel Uganda

An MTC is a proven and well-known mechanism though which health facilities can promote rational use of medicines. Rational use of medicines is the process of appropriate prescribing, dispensing, and patient use of drugs for diagnosis, prevention, and treatment of diseases.8,9 It consists of the following components:

1) Appropriate prescribing, which includes good diagnostic and prescribing practice. Good prescribing practice refers to the process of safe, effective, and economical ordering of drugs for the benefit of the patient.

2) Appropriate dispensing is the process of providing the right drug to the right patient in the right formulation or dosage, proper counseling, clear patient instructions, and good stock-management practice.

3) Appropriate patient use, which includes patient adherence or compliance.

MTCs also evaluate the clinical use of pharmaceuticals; advise medical, administrative, and pharmacy departments on pharmaceutical issues; develop pharmaceutical policies and procedures; evaluate and select medicines for the formulary and provide for periodic revisions; identify medicine use problems; promote interventions to improve medicine use; manage adverse drug reactions and medication errors; manage and control pharmaceutical expenditures; and implement interventions aimed at fighting AMR.10

Following the modest efforts of the Medicines Transparence Alliance to operationalize MTCs in three hospitals, the idea gained traction among policy makers in early 2018. With support from the Uganda Health Supply Chain, an MSH program supported by USAID, the then Pharmacy Division embarked on developing a comprehensive and updated manual to guide the implementation of MTCs in regional referral and general hospitals.11

As usual, this process was highly consultative and multidisciplinary, and it involved key participants from districts; regional referral hospitals (RRHs); and the private, not-for-profit sector.

The manual is thus useful for hospital managers and hospital pharmacists. It is written in simple language with clear practical instructions for novices in establishing structures to manage the broad range of issues relevant to health commodities in health facilities.

First, it provides guidance on the practical steps for setting up and functionalizing the health facility MTC; conducting medicines use surveys; and
the operational, administrative, and reporting aspects of the committees. The MTC manual also explains the practical ways to introduce and implement AMS activities. The process for developing this manual coincided with the period when interest in and understanding of AMS interventions was increasing. The manual was intended to provide a platform for hospitals to engage with other health professionals and for pharmacists to provide clarification on pharmacy-initiated actions to a team that would disseminate them to other colleagues. One drawback to the chapter on AMS is that it does not place enough emphasis on behavior change. Otherwise, this chapter covers very important concepts and phenomena that every health care worker needs to know.

At the patient level, AMS indicates “the optimal selection, dosage and duration of antimicrobial treatment that results in the best clinical outcome for the treatment or prevention of infection, with minimal toxicity to the patient and minimal impact on subsequent resistance”.

At the system level, AMS refers to “an organizational or healthcare system-wide approach to promoting and monitoring judicious use of antimicrobials to preserve their future effectiveness”.

Antimicrobial stewardship intends to rationalise and optimise the use of antimicrobials, a known modifiable driver of AMR. We need to use appropriate effective antimicrobial medicines in patients who need them, and we have to avoid any use among those who do not need them. We need to emphasize the importance of prescribers having enablers to meet this requirement such as functional microbiology laboratories that guide clinical decision making in a timely manner on a routine basis. The AMS chapter also breaks down the tools required to support AMS in hospitals, such as a multidisciplinary AMS subcommittee, AMC&U surveillance among inpatient and outpatient departments, root cause analysis to unpack problems of antimicrobial misuse and their context, and the Anatomical Therapeutic Chemical/Defined Daily Doses methodology and AWaRe classification.

Conversation with Veteran Medical Microbiologist Dr. Christine Florence Najjuka

Compiled by Dr Marion A. Murungi, Senior Technical Adviser, USAID MTaPS Uganda

Dr. Christine Najjuka is a medical doctor, a medical microbiologist, and a champion of AMR research in Uganda. She completed her bachelor of medicine and bachelor of surgery in 1983, and later a master of medicine (pathology) at Makerere University. Dr. Najjuka also holds a master of science in medical microbiology from University College London (1994) and has garnered many awards and taken various short courses on immunology, vaccinology, and biotechnology throughout her career. She holds a PhD in microbiology from Makerere University, where she has been a senior lecturer since 1996.

Dr Najjuka’s interest in AMR was first peaked when her mentor, Dr. John Baingana, brought to light the imperativeness of having an active IPC committee within Mulago Hospital where she worked. Dr. Baingana advocated for infection prevention nurses whose main role was to monitor adherence to IPC and compliance within the hospital. The idea of IPC nurses was met with a lot of resistance. However, following the death of the then hospital director due to a resistant pathogen, she became more determined to draw the attention of health workers and hospital administration to the urgency of IPC by taking samples from the operating theater, which she cultured and used to prove the presence of the same resistant strains within the theater.

In 1998, she attended a conference on AMR in Italy that bolstered her passion for AMR research, and she has published more than 50 articles on AMR and taught students at the undergraduate and graduate levels.

“You will not be able to sustain interest in the fight against AMR if results are not there”

As an AMR champion and female leader in her field, her journey was not easy, and she often met resistance at various levels of engagement, such as soliciting funding for her research or making a case for nurses as an integral part of hospital IPC, which were often not welcome ideas.

Regarding the MTaPS approach to supporting the MoH
to implement the AMR-NAP, she emphasized the need for evidence-based interventions at the national and health facility levels: “You will not be able to sustain interest in the fight against AMR if results are not there. Prescribers should base their treatments on microbiology results, pharmacists should appreciate the role of laboratory results to inform the selection of drugs for procurement, and policy makers should translate findings into programmatic and policy changes”, she said.

She also notes that the attitude problem among health workers toward IPC and AMS needs to be addressed, adding that very often, sample taking in itself is inappropriate and can contaminate the sample and give inaccurate results. Dr. Najjuka concluded by calling on policymakers to ensure that the preservice curriculum focuses on IPC and AMS beginning in primary school with instilling the basics of hand hygiene. She advocates for IPC structures to be at every level of the health system and for all health facilities to routinely audit the quality of care they are offering by auditing their IPC infrastructure.

Currently Dr. Najjuka is offering her knowledge and expertise to guide the setup of Equator University of Science and Technology in Masaka. She is also a member of the MoH’s NAMRSC and appreciates the role of MTaPS in assisting the sub-committee to have clear terms of reference and the support to conduct routine meetings, which aid in the coordination of IPC plans and interventions, as well as sharing best practices at both the national and health facility levels.

Dr. Stella Maris Nanyonga, 
Clinical Pharmacist, Clinical Epidemiologist and Biostatistician 
Associate member, Sustainable Pharmaceutical Systems unit, Makerere University

Health workers from 10 health center IVs and one hospital in the Elgon region pledged to resist AMR in a bid to promote AMS. The health workers attended a two-day training on AMR and AMS in May 2021. The training was organized by the Strengthening Healthcare Practitioners’ Capability for Effective Antimicrobial Stewardship project in Eastern Uganda, which is implemented by Makerere University with support from the MoH and the participating local governments. Collaborators on this project include Mbarara University of Science and Technology in Uganda, the University of Manchester in the United Kingdom, and Uppsala University International Maternal and Child Health in Sweden. The project has been made possible with support from the Pfizer Global Medical Grants. The interdisciplinary training program for health workers is aimed at creating a pool of health workers to act as ambassadors and champions of AMS at their facilities and in their communities. The training was attended by medical doctors, clinical officers, nurses, midwives, pharmacists, and all allied professionals in primary health care in the Elgon region. The health workers were tasked to develop facility-level solutions to address the problem of AMR, including:

Map showing Elgon region, Uganda. Map credit - Dr. Freddy Kitutu.
Health workers form the Elgon region taking a pledge to become guardians of antibiotics in Sironko district.

1) Functionalization of the MTC
2) Provision of quality and sufficient diagnostic equipment and materials
3) Use of updated clinical guidelines at all prescribing points
4) Creating isolation units for patients with resistant strains
5) Provision of clean water for hand washing and drinking at all points for patients and staff
6) Proper use of personal protective equipment
7) Proper disposal of medical waste
8) Health education for patients on the dangers of inappropriate medicine use and AMR
9) Use of audit tools to measure AMC&U to identify best practices and areas that need improvement

The health workers wrote facility and individual pledges to become stewards of antibiotics. This was done by stating one thing that they are going to change in their practice that will prevent the emergence or spread of AMR. Facility pledges included functionalizing MTCs, creating AMS sub-committees, and conducting continuing medical education on AMR and quarterly prescription audits. Individual pledges were specific to each health worker’s department and included improving prescribing habits, reviewing prescriptions after three days, switching from IV to oral medication whenever indicated, labelling a patient’s medication, improving handwriting when prescribing, providing adherence counselling for patients, and observing the five moments of hand washing. This face-to-face training will be followed by on-the-job support for health workers to enhance the AMS message.

Collaborators on this project include Mbarara University of Science and Technology in Uganda, the University of Manchester in the United Kingdom, and Uppsala University International Maternal and Child Health in Sweden. The project has been made possible with support from the Pfizer Global Medical Grants.
Influence of CwPAMS on Growth of AMS Programs in Ugandan Hospitals

Dr Freddy Eric Kitutu, Lecturer, Pharmacy Department, School of Health Sciences
Leader, Sustainable Pharmaceutical Systems, Makerere University and
Dr. Sheeba Gitta, Country Director, Tropical Health and Education Trust, Uganda

Following the launch of the Uganda AMR-NAP on November 21, 2018, and dissemination of the MoH MTC manual, the foundation for AMS interventions in human health in Uganda was laid. When the CwPAMS scheme was promulgated, the Uganda One Health ASO TWC construed it as a timely opportunity to adapt and implement AMS in selected hospitals.

The CwPAMS is a health partnership program managed by the Commonwealth Pharmacists Association (CPA) and the Tropical Health Education Trust (THET) and funded by the UKAID Fleming Fund to tackle AMR globally. The CPA, with its AMS and pharmacy expertise, teamed up with the THET, a global health partnership organization with rich experience in implementing interventions overseas. From the THET’s perspective, a health partnership is an innovative, collaborative model based on a long-term mutually beneficial arrangement between a health institution in the UK and a similar, counterpart institution in a low- or middle-income country.

1) Jinja Regional Referral Hospital (JRRH) and Makerere University Pharmacy Department and Infectious Diseases Institute teamed up with University College London Hospitals, London School of Hygiene and Tropical Medicine, and the Manchester Change Exchange
2) Entebbe Regional Referral Hospital (ERRH) and Makerere University School of Public Health teamed up with Buckinghamshire National Health Service (NHS) Trust and Nottingham Trent University
3) Fort Portal Regional Referral Hospital and the Pharmaceutical Society of Uganda teamed up with the University of Salford
4) Gulu Regional Referral Hospital and Lacor Hospital teamed up with University of Manchester. MTaPS Uganda leveraged the experiences in these hospitals to set them up as centers of excellence for AMS.
5) Mulago National Referral and Teaching Hospital and Makerere University College of Health Sciences teamed up with the Cambridge University Hospitals NHS Foundation Trust.

Through the above health partnerships, the Ugandan hospitals were supported to establish MTCs as the mechanism through which AMS interventions were implemented. Riding on the new and updated MTC manual, the ASO committee guided the health partnership to align the implementation of activities as detailed in the MTC manual. The CwPAMS also supported the ASO TWC at the national level to host national stakeholder meetings every three months. At these meetings, the health partnerships presented AMS interventions, best practices, and challenges. These meeting were also used as an avenue to characterize issues that the MoH needed to clarify or resolve. Generally, these meetings enabled teams to share and learn from each other. It was at one of these meetings that the ERRH was inspired to reconstitute alcohol rub, and to do that it was proposed for the ERRH to work with the JRRH, which had experience in this area.

The achievements are within the overarching predefined aims of the CwPAMS as follows:
1) Leverage existing international expertise in AMS and the health partnership arrangement to support the application of existing guidance documents and frameworks in UK and low- and middle-income country health care institutions
2) Provide a unique platform for participating health professionals to improve knowledge and practice related to IPC, AMS, prescribing practice, leadership skills, and understanding of the global context of AMR
3) Support partnerships to share learning and knowledge on AMS
4) Foster long-term collaborations with the aim of strengthening the implementation of AMS interventions
5) Share learning, resources, and knowledge around AMS or systems in and between host countries and with the UK
6) Provide easy access to simplified and easy-to-use CwPAMS tools and resource kits
7) Allow partners and national pharmacy associations to share expertise and opportunities for volunteers
8) Open discussions as to how CwPAMS initiatives can have a lasting impact, such as contributing to continuing professional development provided by professional bodies
9) Support participating health partnerships to gather data, collect feedback on the scheme, and improve the support we can offer partnerships in any future schemes.
Among the highlights from the CwPAMS implementation in Uganda was the audit of antimicrobial use among inpatients and the launch of the Microguide, a CPA smartphone app that provides guidance on the use of antimicrobials at the point of care.

The CwPAMS also supported the beneficiary hospitals to undertake their first-ever antimicrobial use audits using the Global Point Prevalence Survey (GPPS) protocol, sponsored by BioMérieux and coordinated by University of Antwerp. Hospitals can use the GPPS to:

1) Identify the burden by evaluating antimicrobial prescribing practices and survey performance indicators in hospitals

2) Change practice by enabling the design of hospital interventions and identifying targets for quality improvement of antimicrobial prescribing and the prevention of health care-associated infections

3) Measure impact by assessing the effectiveness of the intervention through repeated point prevalence surveys

The CPA’s smartphone app provides guidance on the use of antimicrobials at the point of care. The app also highlights key AMS guidance, resources, and training documents and functions independent of an internet connection.

According to Sarah Cavanagh, International Partnerships Lead of the CPA, “Adhering to treatment guidelines is absolutely key if we are to reduce the inappropriate use of antimicrobials. This app makes guidelines and protocols easy to find and easy to use at the point of prescribing. They are relatable to the prescriber and easy to adapt locally.”

This summarizes the app, which also includes the WHO AWaRE classification and national treatment guidelines for participating countries such as Uganda.

The CPA is a health partnership program managed by the Commonwealth Pharmacists Association (CPA) and the Tropical Health Education Trust (THET) and funded by the UKAID Fleming Fund to tackle AMR globally.

IPC and AMS Centers of Excellence at Health Facilities in Uganda

Mr. Hassan Kasujja, Technical Officer, USAID MTaPS Uganda
Dr. Marion Murungi, Senior Technical Adviser, USAID MTaPS Uganda

USAID MTaPS is providing direct technical assistance to 14 health facilities, including six public RRHs and eight private, not-for-profit hospitals. The thrust of this support is to sustainably build capacity to implement AMS and IPC interventions. It is done as part of the wider effort to support the implementation of the Uganda AMR-NAP and to improve the country’s

MTaPS Technical Advisor Dr. John Paul Waswa leads a discussion on AMR (L), and a team from St. Mary’s Hospital Lacor participates in a break-out practical session (R). Photo Credit: Hassan Kasujja.
capacity to respond to Global Health Security threats as indicated in the improved Joint External Evaluation scores. These beneficiary hospitals are being supported to become Centers of Excellence for both AMS and IPC. A baseline assessment at these hospitals conducted by MTaPS found that between 76% and 95% of hospitalized patients in private, not-for-profit hospitals receive antibiotics, compared to 65% to 75% in RHs. This finding was in contrast to the recommended 40%. Similarly, IPC capacity was low, with most facilities scoring basic capacity on the WHO recommended IPC and Hand Hygiene Assessment tools.

MTaPS and Makerere University conducted a four-day residential training on IPC and AMS for eight supported health facilities March 15–18, 2021. A total of 41 participants were trained. The target health professionals for the training were members of the IPC and AMS committees in the health facilities.

The training focused on building trainees’ capacity to lead the implementation of IPC and AMS interventions in their hospitals. The mid-term goal of this activity was to improve the use of antibiotics in surgery, URTIs, and UTIs and a hand hygiene improvement program as part of the effort to control AMR. To facilitate the application of knowledge, training included practical sessions on:

1) Identifying implementation gaps
2) Stakeholder mapping
3) Feasibility assessment of AMS and hand hygiene interventions
4) Prioritization approach to interventions
5) Identifying resources
6) Strengths, weaknesses, opportunities, and threats analysis
7) Developing mitigation plans and action plans for AMS and IPC interventions for each hospital.

As part of the ongoing implementation, MTaPS pledged support to the health facilities to operationalize the proposed workplans by providing direct technical assistance, reference materials and guides, as well as facilitation (meals and refreshments) for committee meetings and facility CMEs. These sessions were conducted in groups of five individuals as representatives of the health facilities. The key output was a six-month hospital specific action plan/CQI project aimed at optimizing the use of antibiotics in surgery, URTIs and UTIs, and a hand hygiene improvement program.

To augment the knowledge and skills acquired from the workshop training, the MTaPS team conduct monthly visits to the individual facilities in efforts to consolidate and support implementation of the developed action plans. Each visit usually provides an opportunity for on-job prescriber training to improve prescription practices and antibiotic use in UTIs, URTIs and surgical prophylaxis and track progress in implementation using an inhouse supervision checklist.


The Urgent Burden of Difficult-to-Treat Gram-negative Rods in Uganda

Dr. Henry Kajumbula,
Senior Lecturer, Department of Medical microbiology
Chair, National Antimicrobial Resistance Sub-Committee

Gram-negative bacteria, notably the Enterobacterales, Pseudomonas and Acinetobacter, are among the most important causes of life-threatening infections such as pneumonia, bacteremia, and complicated abdominal infections. Traditionally, beta-lactam and fluoroquinolones are the choice agents for treatment of infections due to these pathogens because of their efficacy and safety. As such, the term DTR has been coined for gram-negative rods that are resistant to carbapenems, the widest spectrum and most potent beta-lactams, and fluoroquinolones. Such bacterial pathogens are almost invariably resistant to most of the other safe and effective antibiotics but could still be susceptible to alternative last-resort agents like polymyxins (e.g., colistin) and tigecycline. However, these agents have not always yielded optimal outcomes in clinical trials, due in part to their toxicity and their unfavorable pharmacokinetics.

A case in point is the poor distribution of colistin/polymyxins in the respiratory tract, accounting for the poor response of pneumonia to systemically administered colistin. As such, severe infections due to DTRs carry significant mortality.

In Uganda, ongoing collection of surveillance data shows an increasing burden of DTR pathogens. Between November 2019 and October 2020, the Department of Medical Microbiology Laboratory received 1,169 clinical specimens from various wards of Mulago, Kiruddu, and Kawempe Hospital as well as the Uganda Cancer Institute. The most common specimens were blood cultures (688), tracheal aspirates (172), pus (143), and urines (127). A total of 402

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bacterial pathogens, of which 303 were Gram-negative rods, were recovered. The isolated pathogens are summarized in table 2.

Table 2. Frequencies and proportions of isolated pathogens at Department of Medical Microbiology Lab between November 2019 and October 2020

<table>
<thead>
<tr>
<th>Isolate</th>
<th>No</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acinetobacter</td>
<td>81</td>
<td>20</td>
</tr>
<tr>
<td>E. coli</td>
<td>80</td>
<td>20</td>
</tr>
<tr>
<td>Klebsiella pneumoniae</td>
<td>71</td>
<td>18</td>
</tr>
<tr>
<td>Pseudomonas aeruginosa</td>
<td>28</td>
<td>7</td>
</tr>
<tr>
<td>Citrobacter</td>
<td>19</td>
<td>5</td>
</tr>
<tr>
<td>Enterobacter Spp</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>Other non-fermentative rods</td>
<td>9</td>
<td>2</td>
</tr>
<tr>
<td>Other Enterobacterales</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Salmonella (NTS)</td>
<td>2</td>
<td>0.5</td>
</tr>
<tr>
<td>Various Gram-positive pathogens</td>
<td>99</td>
<td>25</td>
</tr>
<tr>
<td>Total</td>
<td>402</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 3. Resistance of Gram-negative rods to selected antibiotics

<table>
<thead>
<tr>
<th>Antibiotic</th>
<th>% resistance (95%CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amoxicillin &amp; Clavulanic Acid</td>
<td>80 (73-86)</td>
</tr>
<tr>
<td>Piperacillin &amp; Tazobactam</td>
<td>44 (38-51)</td>
</tr>
<tr>
<td>Third-generation Cephalosporin</td>
<td>81 (74-86)</td>
</tr>
<tr>
<td>Ciprofloxacin</td>
<td>79 (73-86)</td>
</tr>
<tr>
<td>Meropenem</td>
<td>30 (24-35)</td>
</tr>
<tr>
<td>Gentamicin</td>
<td>47 (40-54)</td>
</tr>
<tr>
<td>Amikacin</td>
<td>26 (18-34)</td>
</tr>
<tr>
<td>Colistin</td>
<td>2 (0.7-4)</td>
</tr>
</tbody>
</table>

Resistance to meropenem, a carbapenem with one of the broadest spectra among beta-lactams, was 30%, while resistance to ciprofloxacin, the most widely available fluoroquinolones, was nearly 80%.

The findings indicate that up to 30% of gram-negative rods are DTR. These microbes show susceptibility to only colistin which is an antimicrobial with significant renal toxicity and unpredictable penetration into the respiratory tract. While there is no consensus on the threshold for the prevalence of resistance at which a drug may not be used empirically, at 20% prevalence of resistance, response is very unpredictable and can have grave consequences in cases of severe infection.

While empirical antibiotic therapy is urgent for patients with severe suspected bacterial infections, it is of utmost importance that specimens for microbiological testing are drawn prior to its initiation. There is also a need for updated guidelines for antimicrobial management of such patients.

References:

HEPS-Uganda Trains Arua and Lira District One Health Teams on AMR

In Uganda, ongoing collection of surveillance data shows an increasing burden of DTR pathogens...

Dr Denis Kibira, Executive Director, HEPS-Uganda
Mr. Cliff Abenaitwe, Communications and Network Officer, Coalition for Health Promotion and Social Development (HEPS-Uganda)

HEPS-Uganda is one of the consortium partners implementing the second country grant funded by the Fleming Fund of the UK Department of Health and Social Care, implemented by Mott MacDonald through the Infectious Diseases Institute. HEPS-Uganda is a nongovernmental organization that promotes the rights of poor and vulnerable people with a special focus on health and socioeconomic rights. Its vision is “a just and fair society in which all Ugandans realize their socio/economic rights and exercise their responsibilities”, and its mission is “to promote equitable access to health services and economic empowerment programs for all people in Uganda”.

The second Fleming Fund country project aims to strengthen the governance of AMR surveillance with a One Health approach, sustaining the existing support to AMR and AMC&U surveillance in human health and expanding to additional sites. The project also works to sustain existing support to AMR and AMC&U surveillance in terrestrial animals and to expand AMR surveillance to include the environmental sector.
HEPS-Uganda is responsible for supporting the strengthening of local government One Health structures. These efforts are intended to avert the health and economic burden of AMR in Uganda. The districts of focus in this phase include Arua, Lira, Mbarara, Masaka, Jinja, Soroti, Mbale, Gulu, and Kabale. These district One Health teams comprise experts in human and veterinary health, wildlife, and food and production and experts from the water and environmental sectors. HEPS-Uganda is undertaking capacity building activities in these districts, including training and community sensitization as prioritized in the Uganda AMR-NAP.

During April and May 2021, HEPS-Uganda implemented activities in Aru and Lira districts.

“It’s good that we are talking about the challenge of AMR,” Lira District Health Officer Edmond Aceka said while opening the training for the One Health team, adding that this is a time bomb that should have been handled yesterday. “AMR is here with us and it’s time to act together to scale up surveillance but most importantly sensitize the public. This issue has been exacerbated by human practices like self-medication, poor use of antibiotics, and buying human and veterinary drugs from unlicensed outlets, all of which can be minimized if the public is more enlightened,” he observed.
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Why the One Health Approach?

AMR is a complex problem that requires a united, multisectoral approach. The One Health Approach brings together multiple sectors and stakeholders engaged in human, animal, and plant health; food and feed production; water; and the environment to communicate and work together in the design and implementation of programs, policies, legislation, and research to attain better public health outcomes on AMR. Going by the feedback from the field, the Lira and Arua district One Health teams are committed to strengthening intersectoral collaboration and scaling up community sensitization on AMR. These commitments, among others, are contained in the action plans that the One Health teams from the two districts developed during training on AMR and the AMR-NAP. This message was further emphasized by Dr. Denis Kibira, the HEPS-Uganda Executive Director, as follows, “AMR is a big global health threat that requires collective effort and action now”.

“AMR is here with us and it’s time to act together to scale up surveillance but most importantly sensitize the public. This issue has been exacerbated by human practices like self-medication, poor use of antibiotics, and buying human and veterinary drugs from unlicensed outlets, all of which can be minimized if the public is more enlightened” - Lira District Health Officer Edmond Aceka
ACRONYMS AND ABBREVIATIONS

<table>
<thead>
<tr>
<th>AMC&amp;U</th>
<th>Antimicrobial Consumption and Use</th>
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</thead>
<tbody>
<tr>
<td>AMIS</td>
<td>Antimicrobials in Society</td>
</tr>
<tr>
<td>AMR</td>
<td>antimicrobial resistance</td>
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<tr>
<td>AMS</td>
<td>antimicrobial stewardship</td>
</tr>
<tr>
<td>ASO</td>
<td>Antimicrobial Stewardship, Optimal Access, and Use</td>
</tr>
<tr>
<td>AWARe</td>
<td>Access Watch Reserve</td>
</tr>
<tr>
<td>CPA</td>
<td>Commonwealth Pharmacists Association</td>
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<tr>
<td>CwPAMS</td>
<td>Commonwealth Partnership for Antimicrobial Stewardship</td>
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<tr>
<td>DP&amp;NM</td>
<td>Department of Pharmaceuticals and Natural Medicines</td>
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<tr>
<td>DTR</td>
<td>difficult-to-treat gram-negative rods</td>
</tr>
<tr>
<td>ERRH</td>
<td>Entebbe Regional Referral Hospital</td>
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<tr>
<td>GPPS</td>
<td>Global Point Prevalence Survey</td>
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<tr>
<td>HEPS-Uganda</td>
<td>Coalition for Health Promotion and Social Development</td>
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<tr>
<td>IPC</td>
<td>infection prevention and control</td>
</tr>
<tr>
<td>JRRH</td>
<td>Jinja Regional Referral Hospital</td>
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<tr>
<td>MoH</td>
<td>Ministry of Health</td>
</tr>
<tr>
<td>MSH</td>
<td>Management Sciences for Health</td>
</tr>
<tr>
<td>MTaPS</td>
<td>Medicines, Technologies, and Pharmaceutical Services</td>
</tr>
<tr>
<td>MTC</td>
<td>Medicines and Therapeutics Committee</td>
</tr>
<tr>
<td>NAMRSC</td>
<td>National AMR Sub-Committee</td>
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<tr>
<td>NAP</td>
<td>National Action Plan</td>
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<tr>
<td>NHS</td>
<td>National Health Service</td>
</tr>
<tr>
<td>RRH</td>
<td>Regional Referral Hospital</td>
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<tr>
<td>THET</td>
<td>Tropical Health Education Trust</td>
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<tr>
<td>TWc</td>
<td>Technical Working Committee</td>
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<tr>
<td>UTI</td>
<td>Urinary Tract Infection</td>
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<tr>
<td>URTI</td>
<td>upper respiratory tract infection</td>
</tr>
<tr>
<td>USAID</td>
<td>US Agency for International Development</td>
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<td>WHO</td>
<td>World Health Organization</td>
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