Increasing AMR at Uganda's National Referral Hospital—Requires Urgent Action[1]

communicate the results of research into antimicrobial resistance in surgical wards at in Surgical Wards at Mulago National Referral Hospital, Uganda, from 2014 to 2018 in simple language.

[1]Reference: Mboowa,G *et al*. Increasing Antimicrobial Resistance in Surgical Wards at Mulago National Referral Hospital, Uganda, from 2014 to 2018—Cause for Concern? *Trop. Med. Infect.Dis.*2021,6,82. https://doi.org/10.3390/tropicalmed6020082.

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Key Messages

- Antimicrobial resistance (AMR) to commonly used antibiotics has increased in patients attending surgical wards at Mulago National Referral Hospital, Uganda.
- The antibiotic resistance levels for seven currently used antimicrobials increased from 2014 to 2018: Penicillins (40–100%), Cephalosporins (30–100%), β-lactamase inhibitor combinations (70–100%), Carbapenems (10–100%), aminoglycosides (50–100%), sulphonamides (80–100%), and macrolides (40–100%).
- Gaps in AMR testing and reporting of results were observed and therefore efforts should be made by testing laboratories to provide bacterial culture and drug susceptibility test results within 48 hours.
- Antibiotic stewardship programmes should be instituted in hospitals.

What is the problem and why is it important?

Antimicrobial Resistance (AMR) is a major global public health challenges in our time. Appropriate empirical treatment of bacterial surgical infections necessitates an understanding of local AMR trends, which are only attainable through regular monitoring and surveillance which in many Low-and Middle-income Countries (LMIC) like Uganda, is not done. Furthermore, timely feedback of results from AMR surveillance is strongly recommended by the World Health Organisation (WHO) as part of the core components of effective national infection prevention and control (IPC) programs. In LMICs, hospital laboratories often are unable to provide culture and sensitivity testing results in a timely manner, which is a major bottleneck for the rational use of antibiotics by the clinicians.

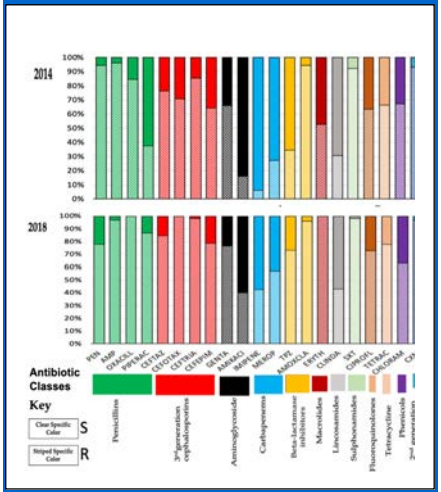
How did we measure it?

We analysed data on a total of 428 positive cultures and sensitivity results from five consecutive years (2014 to 2018) from the Laboratory Information Management System (LIMS) of Clinical Microbiology Laboratory at Makerere University College of Health Sciences, located in Mulago National Referral Hospital complex. 130 samples in 2014, 67 in 2015, 67 in 2016, 81 in 2017, and 85 in 2018. We utilized data from all bacteriologically positive samples obtained from obstetrics/gynaecology, general surgery, and orthopaedic wards of MNRH. The following variables were extracted and included in the study: sample type, name of the surgical ward, and bacterial culture, as well as sensitivity of test results.

What did we find?

- The most common samples were as follows: tracheal aspirates (36.5%), pus swabs (28.0%), and blood (20.6%).

Antimicrobial resistance (AMR) to commonly used antibiotics rose in patients attending surgical wards at Mulago National Referral Hospital, Uganda.



This study showed that AMR increased across all antibiotic classes over five years in Mulago National Reference Hospital. It strongly suggests that ongoing surveillance should be established to provide clinicians with up-to-date antibiograms to ensure that appropriate antimicrobial choices are based on the latest evidence. It also suggests that the laboratory introduces timely culture and sensitivity testing to properly target

- *Klebsiella* (21.7%), *Acinetobacter* (17.5%), and *Staphylococcus* species (12.4%) were the most common bacterial isolates.

- Resistance levels for different antimicrobials rose to dramatic levels between 2014-2018

Antibiotic class	Percentage of resistance (%)
Penicillins	40-100
Cephalosporins	30-100
β-lactamase inhibitor	70-100
Carbapenems	*10–100*
Polymyxin E	0–7
Aminoglycosides	50–100
Sulphonamides	80–100
Fluoroquinolones	40–70
Macrolides	40–100
Lincosamides	10–45
Phenicols	40–70
Nitrofurans	0–25
Glycopeptide	0–20

Implications

- This study points towards rising levels of antimicrobial resistance to the most commonly used antibiotics in Uganda over the five-year study period.

- It also suggests that there is an urgent need for enhancing the infection prevention and control practices (IPC), including antibiotic stewardship. Ultimately, laboratory capacity to enable timely bacteriological culture and sensitivity testing needs to be strengthened to ensure rational choice of antibiotics in all the hospitals.

- It also highlights the need for strengthening hospital-based monitoring and surveillance of AMR patterns to inform antibiotic prescription, and to contribute to national and global knowledge on AMR profiles.