CHARACTERIZATION OF ANTIMICROBIAL RESISTANCE PHENOTYPES IN SURGICAL SITE INFECTIONS AT A MILITARY HOSPITAL IN CAMEROON

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Background

Antimicrobial resistance (AMR) poses a significant health threat to U.S. military forces, allies and partners in Africa. To define this threat, NAMRU-EURAFCENT, in collaboration with Cameroon's Military Health Research Center (CRESAR), characterized AMR phenotypes in surgical site infections (SSIs).

Study Design & Methodology Overview

1. Setting & Timeline

- Study Location: Yaoundé Military Hospital
- Period: October 2023 - March 2026

2. Participants

- Population: Adult patients presenting with SSIs
- Total Enrolled: 1,128 patients

3. Sample & Data Collection:

- Wound swabs, epidemiological & clinical data

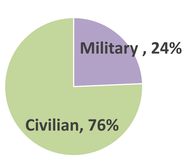
4. Laboratory Analysis:

- Pathogen identification & AMR phenotyping via VITEK 2 System

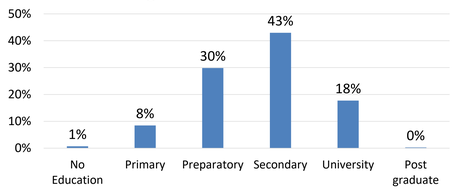
Demographics

Age (years), median (IQR): 37 (18–85)

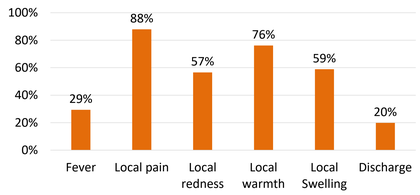
Military Status



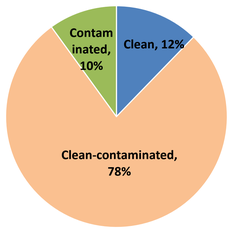
Highest Education Level



Reported Symptoms



Type of Surgery

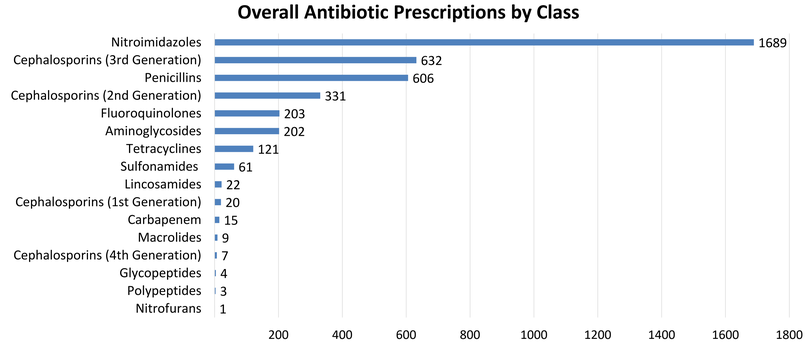


Behavior Before Surgery

	Shaving	No Shaving
Shower	15%	4%
No Shower	10%	71%

Results

Overall Antibiotic Prescriptions by Class

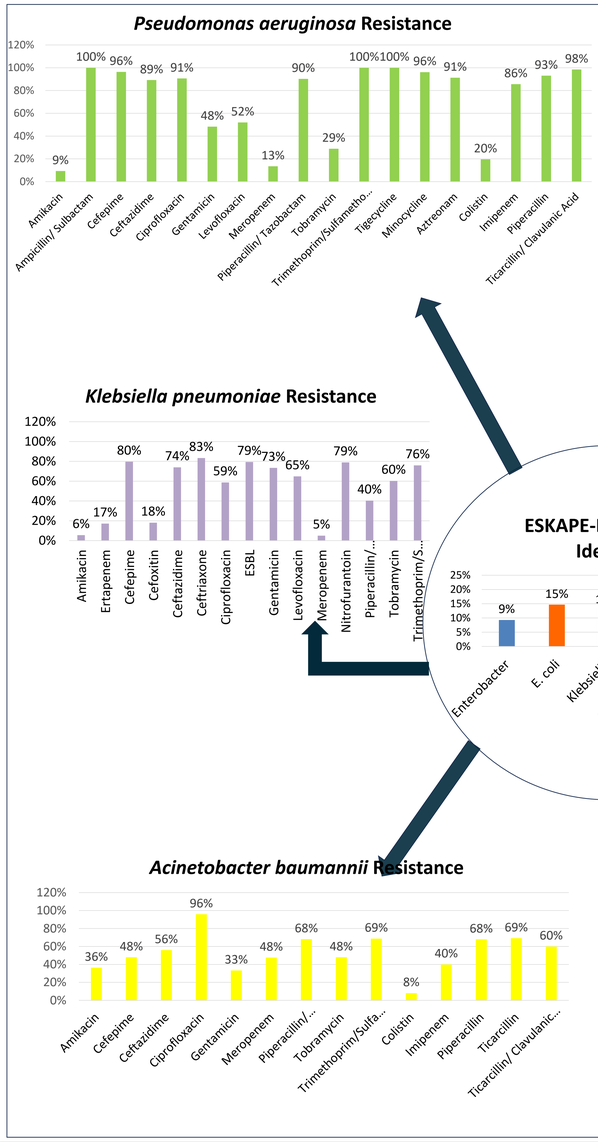


	Pre-operation	Intra-operation	Post-operation	After Discharge
Aminoglycosides	29	4	90	79
Carbapenem	7	2	4	2
Cephalosporins (1st Generation)	3		15	2
Cephalosporins (2nd Generation)	69	67	119	76
Cephalosporins (3rd Generation)	181	86	284	81
Cephalosporins (4th Generation)	3	1	1	2
Fluoroquinolones	66	3	84	50
Lincosamides	4		11	7
Macrolides	1	2	6	
Nitroimidazoles	400	159	717	413
Penicillins	185	19	220	182
Polypeptides	3			
Sulfonamides	21		18	22
Tetracyclines	94		16	11
Nitrofurans			1	
Glycopeptides			4	

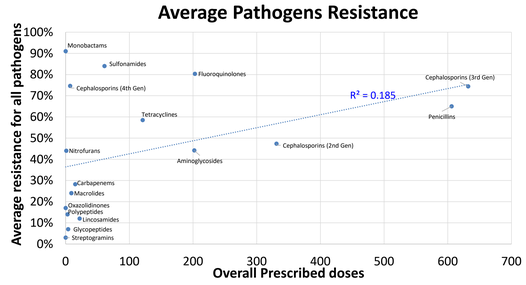
Antibiotic Prescribing Patterns Across Operation Stages

Antibiotic doses ranged between **0 to 10 doses/patient** with an average of **3.5 doses/patient**.
Total Doses administered to enrolled cases is **3,926**.

AMR Phenotypic Data



Correlation between Prescribed Doses and Average Pathogens Resistance



Conclusions

- This study shows an alarming prevalence of multidrug-resistant ESKAPE-E+ pathogens characterized by high rates of ESBL-producing Enterobacteriaceae and MRSA.
- Weak correlation between antimicrobial prescription decisions and resistance (R^2=0.185) indicates that AMR is driven by complex, broader factors such as historical antibiotic exposure, clinical practices and environmental factors rather than prescribing decisions alone.
- High reliance on 3rd-generation cephalosporins and multi-drug regimens likely accelerates this resistance profile.
- A striking 71% of patients did not engage in preoperative hygiene practices, highlighting an urgent need to implement mandatory preoperative hygiene protocols to mitigate this major modifiable risk factor.
- Updating surgical prophylaxis guidelines and implementing tailored antibiotic stewardship programs aligned with current resistance profiles is critical to enhance patient recovery, maintain military readiness, and safeguard last-resort treatments like carbapenems and amikacin.
- This study provides the first detailed, data-driven baseline of AMR SSIs in Yaounde, Cameroon, establishing an important scientific foundation for future surveillance and policy.

Partners/Collaborators

MINISTÈRE DE LA DÉFENSE
HONNEUR & FIDÉLITÉ

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