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### Title

Assessment of College Students' Knowledge, Attitudes, and Practices Regarding Antibiotics Stewardship

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## PS01.25 (907)

**Antimicrobial Resistance in South East Asia: A Participatory Systems Modelling Approach**

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**Purpose:** Our study purpose was to identify (1) the underlying causal system of factors influencing antimicrobial resistance (AMR) development and spread in South East Asia (SEA) and (2) places to intervene by integrating diverse perspectives to find context-specific solutions.

**Methods & Materials:** Using a complex adaptive systems lens and participatory, qualitative, systems modelling approach, we conducted 2 participatory workshops and 2 interviews involving AMR experts and other disciplinary experts to brainstorm factors influencing AMR and identify leverage points for intervention. Transcripts were thematically analyzed for factors, connections, and leverage points for interventions, which were then transcribed into a causal loop diagram (CLD) using Vensim 8.0.4 and validated via participant feedback.

**Results:** Seventeen participants representing diverse perspectives across the One Health spectrum (e.g., animal welfare, pharmaceutical industry, food industry, water and sanitation, pest control) constructed a CLD that identified 98 factors, interlinked by 393 arrows, that influenced AMR in SEA. Seven themes explained the AMR dynamics illustrated in the CLD: consumer demand; agricultural food production systems; antimicrobial and pesticide/chemical misuse and AMR spread in the environment; inequitable access to quality antibiotics and health care; poor food safety practices; poor knowledge; and a need for research and innovation. Eight 'overarching factors', not included in the CLD because they impact the entire AMR system, emerged as underpinning the AMR dynamics described in each theme: leadership priorities and investments (e.g., privatized health care); poor regulations and enforcement; social and cultural norms; infectious disease prevalence; the drive to survive (e.g., due to food insecurity, poverty); increasing wealth and urbanization; climate change; and the underlying goal of economic prosperity that drives system behaviour. Fifteen leverage points representing different 'overarching' and CLD factors were identified as places to intervene with potential to change AMU and AMR directly (e.g., via setting AMU standards) or indirectly (e.g., via improving food security) in SEA.

**Conclusion:** Our study illustrates AMR as the product of actions across the One Health spectrum and identifies the need for multi-pronged and multi-level interventions, including actions relevant to achieving the sustainable development goals, to transform our reliance on AMU and mitigate AMR sustainably.

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## PS01.26 (187)

**Antimicrobial Resistance Pattern in Two Intensive Care Units in A Resource Limited Setting**

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**Purpose:** Antimicrobial resistance (AMR) is a major determinant of outcome for patients in the intensive care unit (ICU). Susceptibility data derived from surveillance can be a barometer for emerging resistance. This study determined the rates of ICU acquired infections, clinical outcome, and antimicrobial resistance pattern of pathogens causing these infections in a low resource setting.

**Methods & Materials:** This was a 6-month prospective cohort study in 2 ICUs in Nigeria. Patients were recruited and followed-up until they were either discharged from the ICU or died. Sociodemographic and clinical data was obtained from each patient. Relevant clinical specimens were collected aseptically and processed accordingly. All pathogens isolated were identified using vitek 2. Primary outcome was ICU discharge or mortality.

**Results:** One hundred and five patients were recruited; 73(69.5%) had clinical features suggestive of infection and 140 samples were collected and processed. ICU infection rate was 52.1% (38/73). 71(97.3%) had antibiotherapy; commonly used were Ceftriaxone and metronidazole (30), followed by Meropenem (26). 16(44.4%) had more than one infection, and a total of 90 different infections were documented. Blood stream Infection was 37%, Urinary tract infection was 31.5%, Respiratory tract infection was 6.9% and Soft Skin and tissue infection was 4.1%. Candida species 21.2%, *Klebsiella pneumonia* 18.9%, *Acinetobacter baumannii* 15.6% were the most predominate pathogens. Multidrug resistant (MDR) gram-negative organisms accounted for 72.9% (43) of the pathogens. 17 isolates of *Klebsiella pneumonia* and 10 isolates of *Acinetobacter baumannii* were MDR. Five of the *Klebsiella pneumonia* were ES-BLs producers. High level of resistance was found against Cefazolin with only 2 isolate showing susceptibility and cabapenem resistance was 64%(34) among gram negative organisms with 64% been observed among *Klebsiella spp* and *Acinetobacter spp*. No Methicillin resistant *Staphylococcus* (MRSA) was isolated. Crude mortality rate was 50.7% (37/73); 10 of whom had gram-negative bacteraemia, 8 of which were MDR.

**Conclusion:** We documented high AMR rates in a resource limited setting, where patients pay from pocket for ICU care. A robust antimicrobial stewardship program with educational intervention is critical to combat this problem.

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## PS01.27 (219)

**Assessment of College Students' Knowledge, Attitudes, and Practices Regarding Antibiotics Stewardship**

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**Purpose:** Antimicrobial resistance (AMR) is a global emergency jeopardizing population health, food security, and environmental quality, projected to take more than 10 million lives by 2050. In America, costs range from \$6000–\$30,000 per patient, totaling over \$20 billion annually. Proposed remediation strategies hinge on improving antibiotic stewardship (AS), but the multi-sectoral location of educational intervention among healthcare, agriculture, pharmaceutical, and environmental sectors is complicated, necessitating assessment of the knowledge, attitudes, and practices of subpopulations to tailor effective interventions.

**Methods & Materials:** We surveyed 211 adolescent individuals transitioning from pediatric healthcare to relatively independent adult healthcare using the World Health Organization's "Antibiotic Resistance: Multi-Country Public Awareness Survey" between September and October 2020, adapted to regional demographic patterns. Results were analyzed with a combination of statistical methods, including Chi-square and unadjusted regression analyses.

**Results:** We found no difference due to the gender of respondents and level of knowledge about AMR. However, their level of educational attainment was significantly correlated with knowledge of AMR. Junior students (mean age=20.1 years) demonstrated 1.93 times better knowledge of antibiotics than freshmen (mean age=17.7 years) ( $P < .05$ ). No significant difference was observed in the level of antibiotic knowledge beyond the Junior level. Attitudes toward AS varied significantly by gender, as males have 0.17 times lower attitude scores than females ( $P < .05$ ). We found no significant difference in practice regarding AS across gender or educational attainment.

**Conclusion:** To improve AS for preventing AMR, educational interventions to improve knowledge and attitudes about antibiotics should begin early in college and address gender gaps.

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#### PS01.28 (228)

##### Monitoring of antibiotic resistance of non-fermenting bacteria circulating in hospitals in Rostov-On-Don (2012–2019)

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**Purpose:** A significant place among the causative agents of nosocomial infections is occupied by gram-negative non-fermenting bacteria (GNNFB). Monitoring of prevalence, assessment of antibiotic resistance of GNNFB in hospitals allows assessing the risk of occurrence and contributes to the prevention of HCl.

The aim of the work was to study antibiotic resistance of non-fermenting bacteria strains identified in multidisciplinary hospitals in Rostov-on-Don.

**Methods & Materials:** In the period 2012–2019, a study of antibiotic susceptibility was carried out on 2709 NCOB cultures isolated in hospitals from different biotopes.

The isolated microorganisms were identified using MALDI-TOF based on a Microflex mass spectrometer. Determination of antibiotic susceptibility of bacteria studied with Vitek-2 (bacteriological analyzer and a standard disk diffusion method).

**Results:** Monitoring of non-fermenting bacteria in hospitals revealed that GNNFB was detected in 5–28% of all identified potential pathogens of HCl.

*Pseudomonas* spp. remained dominant in 2012–2013 – 83–85% and somewhat less in 2018–2019 – 48–60%. We determined an increase in the share of *Acinetobacter* spp. from 7–8% in 2012–2013 to 37–41% in 2018–2019. Other GNNFB and *Stenotrophomonas* spp. did not exceed 13% of all detected non-fermenting bacteria.

In 2012–2013 among the strains of GNNFB isolated in hospitals, there were still variants of cultures that are sensitive to groups of antibiotics used for a long time in medical practice: to aminoglycosides of the 1st generation (Am I), cephalosporins of the 1st generation (Cef II), semisynthetic penicillins of the 1st generation (Pen I). Until 2015, GNNFB had become almost 100% resistant to these drugs. We registered an increase of the resistance of GNNFB to antibiotics of later generations: to fluoroquinolones (Ftorh), aminoglycosides of the 2nd generation (Am II), cephalosporins of the 3rd generation (Cef III), semisynthetic penicillins of the 2nd generation (Pen II), macrolides (Mac).

**Conclusion:** At the beginning of our observation period, we identified 25–30% of resistant strains, at the end – 60–80%. The antibiotic resistance of GNNFB continued to increase during the observation period. The drugs of choice for the treatment of infectious diseases remain carbapenems (45% of resistant crops in 2019) and drugs of the nitrofur series (50% – 2019).

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#### PS01.29 (835)

##### Faecal carriage of extended-spectrum beta-lactamase-producing Enterobacteriaceae in healthy volunteers and hospitalized patients in Ouagadougou, Burkina Faso: prevalence, resistance profile, and associated risk factors

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**Purpose:** Extended spectrum beta-lactamase-producing Enterobacteriaceae (ESBL-PE) are a serious challenge to patients' treatment. The aim of this study is to determine the prevalence of ESBL-PE, investigate the associated resistance, and analyze the associated risk factors for acquisition of ESBL-PE.

**Methods & Materials:** A cross-sectional study was conducted on healthy volunteers and inpatients. After obtaining informed consent, rectal swabs were collected from each participant for isolation of Enterobacteriaceae on Hektoen enteric agar containing 4 µg/L cefotaxime. The Enterobacteriaceae isolates were identified using biochemical tests and ESBL production was confirmed by the double-disc synergy test of amoxicillin and clavulanic acid. Antibiotic susceptibility test of each isolate was done by the disc diffusion method and interpreted using the recommendations of the European Committee on Antimicrobial Susceptibility Testing (EUCAST) clinical breakpoints version 5.0.

**Results:** During the study period, prevalence of faecal ESBL-PE among the study participants was 54.5% (103/189); 53.5% among healthy volunteers and 55.7% among inpatients ( $p=0.87$ ). The major ESBL-PE isolates was *Escherichia coli* (71%) followed by *Klebsiella pneumoniae* (16%). The isolates in hospitalized patients were resistant to norfloxacin (84.2%), cotrimoxazole (89.5%), and gentamicin (7.0%). The isolates from healthy volunteers were resistant to