Antibiotic access and use in the community setting in Africa and Asia: introducing the ABACUS projects
Annelie L. Monnier and Heiman F. L. Wertheim

Prosthetic valve endocarditis following transcatheter aortic valve replacement: insights on microbiology, prophylaxis and treatment strategies
Saliba Wehbe, Suha Kalash, Fatima Allaw, Johnny Zakhour and Souha S. Kanj

5th Global Ministerial Summit on Patient Safety
Pierre Tattevin

ISAC Project Grant: summary of research project
Puteri Zamri

Antimicrobial resistance in the news

ISAC society news

APUA news

About ISAC / APUA
ABACUS I (2017-2019) and ABACUS II projects (2020-2023)

Antibiotic resistance (AMR) has created an urge for global efforts to facilitate appropriate use of antibiotics. Global reports on AMR have shown that studies are needed in low – to middle-income countries (LMICs), where local data are scarce and resistance is widespread. The ABACUS I project (Antibiotic Access and Use) was initiated in 2017 to explore community-based antibiotic access and consumption practices across communities in LMICs to subsequently inform the design of, and identify targets for community-based interventions aiming to improve antibiotic use. The ABACUS I project was an international mixed-method study conducted in rural communities of three countries in Africa (South Africa, Ghana, Mozambique) and Asia (Thailand, Vietnam, Bangladesh). The study sites reflect different world economy classifications: Low Income (Mozambique), Low Middle Income (Ghana, Bangladesh and Vietnam) and Upper Middle Income (South Africa and Thailand). ABACUS I findings showed that a large proportion of antibiotics were acquired without a prescription across the six LMICs, 2,875 (35%) of the 8,214 interviewed community members purchased antibiotics without a prescription. Also, easy access to antibiotics was reported, particularly to broad-spectrum antibiotics in rural settings in Asia.

A common theme identified in Africa and Asia was self-treatment as it was being considered to be less time consuming, cheaper and overall more convenient than using public health services. Finally, the results illustrate that understanding of contextual complexities surrounding antibiotic access and use (including health care organisations, health policy frameworks and cultural norms) is paramount to develop interventions tailored to the specific contexts.

Furthermore, an important ABACUS I finding was the confusion among medicine suppliers (e.g., both formal and informal antibiotic suppliers, from pharmacists to street vendors) and community members regarding how to recognise an antibiotic; antibiotics can be mistaken for different medicines such as painkillers in both Africa and Asia. This finding later led to one of the main research focuses for the follow-up ABACUS II project (2020-2023).

Improving the identification of oral antibiotics

Following the findings from ABACUS I that illustrated confusion regarding how to identify them and distinguish them from other commonly sold oral medicine, we decided to explore how using the physical appearance of oral antibiotics could benefit their identification. Oral medicines come in many different names, shapes, colours, sizes and packaging. As a result, medicines with the same active pharmaceutical ingredient (API) can be found with different physical features and designs while, at the same time, two medicines with different APIs can look the same or very similar. Interestingly, medicines dispensed as capsules are often considered to be antibiotics by community members and medicine suppliers. This is the case despite that many antibiotics are not dispensed as capsules and, importantly, other classes of medicines (e.g., painkillers) are commonly sold as capsules. The fact that capsules are frequently perceived to be antibiotics is also reflected in the local names for how people refer to antibiotics in Vietnam, one of the words used to refer to antibiotics is “con nhộng”, which means “capsule”. In both Ghana and Mozambique, antibiotics are referred to as two-colour capsules such as “red and yellow”. Strikingly, “red and yellow” can either correspond to tetracycline or amoxicillin capsules, which are two different classes of antibiotics. In Vietnam, one of the words used to refer to antibiotics is “con nhộng”, which means “capsule”. In both Ghana and Mozambique, antibiotics are referred to as two-colour capsules such as “red and yellow”. Strikingly, “red and yellow” can either correspond to tetracycline or amoxicillin capsules, which are two different classes of antibiotics. In certain countries, medicines are sold in shop-made syndromic drug packages with a mix of various tablets and/or capsules in unlabeled plastic zip lock bags (e.g., “yaa chud” in Thailand). By mixing different medicines, it becomes even harder for users, suppliers and healthcare professionals (HCPs), to identify...
the medicines and therefore how to use them appropriately.

Our recent viewpoint article in the *Lancet Global Health* discusses how the visual distinction between antibiotics and other oral medicines is challenging for consumers, medicine suppliers and HCPs; how medicine appearance affects health care and global public health; and we report on conducted expert and stakeholder consultations on improving the identification of oral antibiotics. In summary, we argue that the lack of patient-friendly identification systems for medicine classes poses a major health concern that needs to be mitigated in both low- and high-income settings. Global initiatives to improve responsible antibiotic use will not work optimally if the medicine cannot be recognised easily and linked to the public health messages. We propose to use physical appearance tools to improve the identification of oral generic antibiotics and distinction from other commonly sold medicines such as painkillers. In other words, being able to distinguish between an antibiotic and painkiller comes down to improving personal health literacy (i.e., the degree to which individuals have the ability to find, understand and use information and services to inform health-related decisions and actions for themselves and others) and health equity. Improving antibiotic identification should contribute to the overarching aim of supporting and nudging awareness on responsible antibiotic use among HCPs, medicine suppliers and community members. In addition, a large qualitative study was recently conducted within the six ABACUS II countries to explore community perceptions of physical appearance of antibiotics. Data analysis is ongoing and the manuscript is expected later this year. In the meantime, we advocate for more awareness for the topic of antibiotic recognition and identification in future research including studies exploring medicine access and use practices but also studies evaluating responsible medicine / antibiotic use campaigns, medication errors and dispensing practices, and patient compliance studies.

**ABACUS output and next steps**

So far, the ABACUS research yielded an in depth body of knowledge on antibiotic use and access practices in six countries in Africa and Asia. An overview of the scientific output to date is shown on our project website. Last month, the consortium met at the ABACUS II conference in Bangkok, Thailand (Figure 2), to reflect on the projects' output and impact as well as to discuss preliminary results, and explore future collaborations.

**Acknowledgments**

*Members of the ABACUS II consortium*

Heiman F.L. Wertheim, Annelie A. Monnier (Radboud University Medical Center, Nijmegen, the Netherlands); Paul N. Newton, Céline Cailliet, Proochista Ariana, Taniya Sharmean (University of Oxford, Oxford, United-Kingdom); Kwaku-Poku Asante, Samuel Afari-Asiedu (Kintampo Health Research Center, Kintampo, Ghana); Khátia Munguambe, Esperanca Severe, Helena Boene, Olga Cambaco (Manhiça Health Research Centre, Manhiça, Mozambique); Wasif Ali Khan, Mohammed Abdul Matin (International Centre for Diarrhoeal Disease Research, Dhaka, Bangladesh); Toan K. Tran, Chuc T.K. Nguyen, Tuyet A. Phuong (Hanoi Medical University, Hanoi, Vietnam); Sureeporn Punpuwan, Malee Sunpuwan, Wipaporn Jarruruengpaisan (Mahiloh University, Thailand); F. Xavier Gómez-Olivé, Georgina Pujol-Busquets Guillén, Sizzy Ngobeni, Floidy Wafawanaka (University of the Witwatersrand, Johannesburg, South Africa); Nga T.T. Do, H. Rogier van Doorn (Oxford University Clinical Research Unit, Hanoi, Vietnam).

**Funding**

ABACUS I was funded by the Wellcome Major Overseas Programme (109595/Z/15/Z) and Volkswagen Foundation through the INDEPTH Network. ABACUS II is funded by the Wellcome Trust (grant number: 219403/2/19/Z).

**References**


Introduction
Transcatheter aortic valve replacement (TAVR) is a minimally invasive procedure that was initially developed for the management of symptomatic severe aortic valve stenosis. Since its inaugural procedure in 2002, TAVR has garnered significant attention and achieved substantial clinical and market recognition. Its less invasive nature compared to surgical aortic valve replacement (SAVR), coupled with growing evidence of positive outcomes, led the Food and Drug Administration (FDA) to progressively broaden its approved indications to encompass low- and intermediate-risk patients, starting in 2016. With an increase in the number of TAVR procedures, rare complications including infective endocarditis have been reported. Complications may manifest as aortic root dissection, paravalvular and aortic root abscesses, and intra / paravalvar regurgitation. The incidence of prosthetic valve endocarditis (PVE) following TAVR (TAVR-PVE) varies between 0.2% to 3.1% within one year of the procedure. Moreover, TAVR-PVE is associated with a substantial in-hospital mortality rate reaching 34.4% in one systemic review.

Microbiology
Gram-positive bacteria, including Staphylococcus aureus, coagulase-negative staphylococci, Enterococcus spp., and Streptococcus spp. (particularly the viridans group), are the primary causative pathogens of TAVR-PVE. Interestingly, Enterococcus spp. are more frequently observed in TAVR-PVE than in SAVR-PVE. This disparity is likely due to the use of the transfemoral access method during TAVR procedures.

Prophylaxis
During the initial year following the procedure, the risk of TAVR-PVE appears to be at its highest. This is potentially attributed to inadequate healing, ongoing paravalvular leaks and bacteraemia occurring during the peri-procedural period. Robust evidence-based recommendations for the choice of antimicrobial agents for pre-procedural prophylaxis in TAVR are currently lacking. A recent systematic review and meta-analysis revealed that the majority of patients (61.8%) receive cephalosporins as peri-procedural prophylaxis, while penicillin (22%) and vancomycin (16%) are used less frequently. Cefazolin (the most commonly used cephalosporin), or cefuroxime use in prophylaxis is extrapolated from practices in SAVR. However, these agents do not have activity against Enterococcus spp., limiting their effectiveness as prophylactic agents in TAVR.

Empirical antibiotics for TAVR-PVE
The clinical presentation of TAVR-PVE is variable among patients in terms of duration and spectrum of symptoms. When patients are haemodynamically stable and exhibit a subacute illness, deferring antibiotics in order to identify the causative organism is recommended. However, in situations of severe illness such as septic or cardiogenic shock, it is crucial to promptly initiate empirical antimicrobial therapy after obtaining three sets of blood cultures from different sites. According to the AHA guidelines, it is recommended to consult an infectious diseases specialist for guidance on selecting appropriate empirical antibiotic regimens. The choice of antimicrobial agents should be based on local epidemiological data and bacterial resistance rates, taking into account the risk of multidrug-resistant organisms (MDRO) and the potential for concurrent fungal infections.

Combination therapy involving bactericidal antibiotics, such as aminoglycosides, is recommended for the treatment of TAVR-PVE. This recommendation is based on the synergistic bactericidal activity achieved by combining aminoglycosides with cell wall inhibitors. The choice of empirical coverage for MRSA should be determined according to the local epidemiology, with vancomycin being an appropriate option as it also provides coverage for Enterococcus spp. The addition of rifampin, owing to its ability to penetrate staphylococcal biofilm, should be considered after achieving bacteraemia clearance (typically after 3-5 days of
effective antimicrobial therapy) due to its antagonistic effect with other antibiotics against planktonic bacteria\(^\text{13}\). While *Pseudomonas aeruginosa* infrequently contributes to cases of TAVR-PVE\(^\text{14}\), antipseudomonal therapy should be considered for critically ill patients with predisposing risk factors\(^\text{15}\). In this regard, a combination of an antipseudomonal beta-lactam along with vancomycin and an aminoglycoside would be suitable. If local surveillance data indicate high rates of difficult-to-treat (DTR) *P. aeruginosa* or if the patient is colonised with DTR *P. aeruginosa* or another Gram-negative MDRO, alternative agents such as one of the novel beta-lactam–beta-lactamase inhibitors combinations should be considered.

**Directed antimicrobial therapy**

The approach to targeted therapy for TAVR-PVE parallels that of SAVR-PVE and necessitates adherence to international guidelines, considering the susceptibility profile of the causative pathogen\(^\text{6,11}\). Notably, no RCTs have been conducted to directly compare the efficacy of different antimicrobial agents in treating TAVR-PVE.

Fungi, although rarely implicated, can contribute to cases of TAVR-PVE, presenting challenges related to difficult eradication and increased recurrence rates. *Candida* spp. induced TAVR-PVE necessitates a comprehensive approach combining medical and surgical interventions, with an uncertain impact on mortality from surgical interventions\(^\text{16,17}\). Options for antifungal therapy include either a lipid formulation of amphotericin B with or without flucytosine, or high-dose echinocandins\(^\text{18}\). The duration of treatment should extend for a minimum of 6 weeks, even in cases involving surgical intervention. In the absence of surgery, lifelong suppression with an oral azole (if the organism is susceptible) may be warranted\(^\text{18}\).

**Route of administration and duration of therapy**

Current guidelines recommend a minimum antibiotic course of 6 weeks for TAVR-PVE, considering the formation of biofilms on implanted valves and bacterial tolerance (13). In cases of surgical intervention, if the culture from the valve material is positive, a 6-week post-operative course is indicated, while in the case of negative cultures, a shorter course (2 weeks) is acceptable (13). Ideally, the duration of therapy should be individualised and determined based on clinical response, and follow-up inflammatory markers. As for the route of administration of antibiotics, initial parenteral treatment is recommended for all patients with endocarditis, due to the predictable serum concentrations and enhanced bacterial killing (19). While some studies have explored transitioning to oral therapy (20), the evidence for TAVR-PVE is limited, and a full course of parenteral antimicrobial treatment might be advised for optimal outcomes.

**Conclusion**

TAVR-PVE displays a distinct microbiological profile, primarily characterised by an increase in the prevalence of *Enterococcus* spp., setting it apart from SAVR-PVE. This disparity influences the selection of empirical therapy, as well as the choice of surgical prophylaxis. Given the limited evidence specific to TAVR-PVE, individualised decision-making, considering local epidemiology and resistance patterns, is essential in the choice of antimicrobial therapy. While there is growing interest in shorter treatment durations or oral therapy for the treatment of SAVR-PVE, current evidence does not support their adoption for TAVR-PVE. Further research is needed to optimise the management strategies of this serious infection.

**References**

The Alliance for the Prudent Use of Antibiotics (APUA) actively participated in the 5th Global Ministerial Summit on Patient Safety at Montreux, Switzerland, on 24 February 2023.

Loice Achieng Ombajo (Kenya), Abdul Ghafur (India) and Pierre Tattevin (France) moderated the session on “Medication safety & stewardship – the example of antibiotic use and misuse”.

Although the Summit encompassed a broad spectrum of topics related to patient safety, primarily in hospitals, the prudent use of antimicrobials was selected as one of the main priorities in the final document, entitled “Montreux Charter on Patient Safety: Less Harm, Better Care – from Resolution to Implementation”.

The discovery of antibiotics was a major medical advancement of the last century: these “miracle” drugs saved the lives of millions of people, from newborns to the elderly, by their dramatic effect on life-threatening infectious diseases such as pneumonia, meningitis and bloodstream infections. This class of drugs is unique in that its target is not a component of the human body: antibiotic targets are living organisms, the bacteria, that have the capacity of developing resistance to all antibiotics. The consequences of this unique property is that antibiotics lose their efficacy when used in excess, as was the case in many countries for too long. Ten years ago, Margaret Chan, then WHO Director, declared antimicrobial resistance (AMR) a global crisis, that may turn common infections into untreatable diseases, and jeopardise medical progress in many areas (complex surgeries, transplants, chemotherapy etc.).

More than 5 million deaths were associated with AMR in 2019 and the COVID-19 pandemic may have worsened the situation. There is no time for complacency, but the trends of AMR may be reversed, through sustained efforts to ensure that antibiotics are used appropriately worldwide. The primary objective is not to reduce the use of antibiotics, but to ensure that they remain effective and available for all patients in need. Patient safety is our primary concern: we have to improve our ability to identify and treat all bacterial diseases that benefit from antibiotics. We must invest in medical education and development of innovative diagnostic tools.

Although this session, and the summit, did not bring any scoop to those already involved in the field, the active participation of more than 60 ministers from five continents, and their commitment to tackling AMR in the final document, are important steps forward, to ensure that the fight against AMR is considered a priority for patient safety by most governments worldwide.

**Optimised doses of polymyxins to improve outcomes for non-critically ill and critically ill patients with MDR Gram-negative bacterial infection**

Puteri Zamri
University of Queensland / Malaysia Ministry of Health

*Dr Zamri is a recipient of an ISAC Project Grant and the following is a summary of the research that ISAC helped to fund.*

Polymyxin B has re-emerged in clinical practice as other treatment options for multidrug-resistant (MDR) infections continue to diminish. This study aims to characterise the pharmacokinetics (PK) of polymyxin B in hospitalised patients and to develop clinically-relevant dosing guidelines in the treatment of MDR *Acinetobacter baumannii* and *Pseudomonas aeruginosa* infections. This study was conducted at two tertiary medical centres in Malaysia; Hospital Selayang, Selangor and the University Malaya Medical Centre, Kuala Lumpur. Fifty Five patients were recruited, with a total 452 plasma samples couriered to the central bioanalysis laboratory at the University of Queensland Centre of Clinical Research (UQCCR), Brisbane, Australia to be assayed. Samples were being measured by a validated ultra-high performance liquid chromatography-tandem mass spectrometry method. Clinical outcomes for each patient were discussed with the treating physicians who are involved in the study. The determination of minimum inhibitory concentration (MIC) of the bacterial isolates were also conducted in UQCCR earlier this year. Plasma concentration-time data are currently being analysed by a pharmacokinetic software Pmetrics®, an R®-based software program, that utilises advanced mathematical pharmacokinetic/pharmacodynamic modelling to generate a pharmacokinetic model. Using this model, dosing simulations will be performed to identify optimal colistin and polymyxin B dosing regimens for Malaysian patients with MDR Gram-negative infections.
Antimicrobial Resistance in the News

Air pollution linked to rise in AMR

Authors of a global study on particulate matter (PM$_{2.5}$) AMR in The Lancet Planetary Health found a consistent association between PM$_{2.5}$ and AMR across regions and pathogens, indicating that PM$_{2.5}$ is one of the primary factors driving global AMR.

Data from 116 countries on air pollution, antibiotic use, sanitation services, economics, health expenditure, population, education, climate, year and region were collected from 2000 – 2018. Authors estimated that AMR derived from PM$_{2.5}$ caused approximately 480,000 premature deaths worldwide, equating to an annual welfare loss of US$395 billion. North Africa and West Asia had the highest contribution of PM$_{2.5}$ to AMR. It was also estimated that AMR increased by 1.1% for every 10% rise in air pollution. However, AMR could be reduced by almost 17%, if the PM$_{2.5}$ target concentration set by the World Health Organization is reached by 2050. This would avoid 23-4% of premature deaths attributable to AMR, a saving of $640 billion.

Ancient pathogens released from melting permafrost

Climate change could quicken the release of ancient pathogens from melting permafrost and ice according to a study in PLOS Computational Biology.

With temperatures rising, glaciers and permafrost are melting at an unprecedented rate meaning many dormant microorganisms could re-emerge. For the first time, authors used computer stimulations to predict the potential risk of these pathogens to ecological communities.

Authors simulated experiments where digital pathogens from the past invade communities of bacteria-like hosts. They then compared the effects of the invading pathogens on the diversity of host bacteria to controls where no invasions occurred.

The invading pathogens could often survive, evolve and in 3-1% of cases, became exceptionally dominant in the invaded community.

Although invaders mostly had negligible effects on the invaded community, 1.1% were highly unpredictable – some caused up to 30% of the host species to die out, while others increased diversity by up to 12% compared to the control simulations.

Nasal swabs reduce antibiotic use for sinusitis symptoms

Findings in a JAMA study support bacterial testing for children with sinusitis symptoms to reduce antibiotic use. As there is a large overlap of symptoms of acute sinusitis and viral upper respiratory tract infections (RTI), sometimes children with RTIs are treated with antibiotics unnecessarily.

510 children aged 2 - 11 were randomised to receive antibiotics or a placebo for ten days. Nasal swabs were tested for Streptococcus pneumoniae, Haemophilus influenzae or Moraxella catarrhalis. At enrolment, 71% had bacteria in their nasopharynx.

Symptoms resolved in 7 days for children on antibiotics and 9 days for those given a placebo. Children who did not test positive for bacteria benefitted less from antibiotics than those who did – thus the authors recommend testing for bacteria to prevent unnecessary antibiotic use. The colour of nasal discharge was not indicative of the type of infection and should not be used to decide whether or not to prescribe antibiotics.

14 AMR reports published for African region

The Africa Centres for Disease Control and Prevention (Africa CDC) and the African Society for Laboratory Medicine (ASLM) have published 14 individual African Union Member State reports providing a detailed representation of AMR across Africa. The reports were published as part of the “Mapping Antimicrobial Resistance and Antimicrobial Use Partnership” (MAAP) consortium’s efforts.

Over 819,500 AMR data records from 205 laboratories containing AMR surveillance data were analysed. The information will be fed into the national AMR action plan, national laboratory strategic plan and other relevant policies in Africa.

Key findings from the report are as follows:

- 5/15 antibiotic pathogens combinations prioritised by the WHO (GLASS) are being consistently tested and demonstrate a high rate of AMR.
- 1.3% of the 50,000 biology laboratories included conduct bacteriology testing.
- 12 African countries have Drug Resistance Index (DRI) scores that show that AMR is a significant hazard.
- Three pathogens are of immediate concern: Enterobacteriales, Staphylococcus aureus, Pseudomonas aeruginosa.

Vaccines could have averted 500,000 AMR-associated deaths

According to a new study, 500,000 deaths and 28 million disability-adjusted-life-years (DALYs) associated with AMR could have been averted by vaccines. The modelling study, published in BMJ Global Health, estimate vaccine avertable deaths and DALYs attributable to and associated with AMR by region, infectious syndrome and pathogen for 2019.

They used two scenarios—a baseline scenario (15 pathogens) for vaccination of specific age groups and a high-potential scenario (for a subset of 7 pathogens) including additional age groups. For the baseline scenario, as well as avoiding 500,000 AMR-associated deaths, 150,000 deaths attributable to AMR could have been averted by vaccines. In the high-potential scenario, vaccines could have averted an additional 1.2 million deaths and 37 million DALYs associated with AMR and 330,000 deaths attributed to AMR.

For pathogens with licensed vaccines, it was estimated that vaccination against S. pneumoniae at 2019 coverage levels averted 44,000 thousand deaths and 3.8 million DALYs associated with AMR in 2019. If the WHO recommended coverage level of 90% globally had been reached, 59,000 thousand deaths and 5.1 million DALYs associated with AMR could have been averted in 2019.

By region, authors found the avertable burden of AMR was highest for WHO Africa and South East Asia for lower respiratory infections, tuberculosis and bloodstream infections by syndromes, and for Mycobacterium tuberculosis and Streptococcus pneumoniae by pathogen.
Resistance to inexpensive antibiotics for childhood diarrhoea

A systematic review to determine AMR patterns of common pathogens that cause childhood diarrhoea in low- and middle-income countries (LMICs) showed widespread high-level resistance to older, inexpensive drugs like ampicillin, co-trimoxazole and chloramphenicol.

The study, published in the *Journal of Global Health*, looked at isolates with resistance to major classes of antibiotics stratified by major WHO global regions and time. Data, extracted from 42 articles from 1990 – 2020, showed *Escherichia coli* isolates had relatively high resistance rates to ampicillin and tetracycline in the African (AFR), American and Eastern Mediterranean Regions (EMR). Moderate to high resistance to ampicillin and third generation cephalosporins was found among *Salmonella* spp. in the AFR, EMR and the Western Pacific Region (WPR). Antibiotic resistant *Shigella* was highest in the Southeast Asia Region (SEAR).

Over the last decade, increases in resistance to broad-spectrum antibiotics, including third generation cephalosporins, especially ceftriaxone, and fluoroquinolones have increased alarmingly.

The increase in AMR, especially for relatively newer antibiotics (including ciprofloxacin which is recommended by the WHO for treatment of invasive diarrhoea in children), has implications for managing dysentery in children.

AMR levels high in Ukrainian patients

Researchers of a paper in *The Lancet Infectious Diseases* investigating the prevalence of antimicrobial-resistant (AMR) infections in Ukraine found many patients were affected by bacteria with extremely high levels of AMR. The authors conducted sentinel testing of hospitalised war victims with hospital-associated infections between February and September 2022. Due to resource limitations in Ukraine, the isolates were analysed at Lund University's clinical microbiology laboratory, followed by antibiotic susceptibility testing at the European Committee on Antimicrobial Susceptibility Testing (EUCAST) development laboratory. Samples were included from 141 patients (133 adults with war injuries and eight new-born babies with pneumonia) The study found that 58% of 154 isolates were resistant to meropenem including 76% of 45 *Klebsiella pneumoniae* isolates. Although most strains (including 90% of those resistant to meropenem) were sensitive to colistin, 9/156 isolates were resistant to all antibiotics tested, including newer *β*-lactam *β*-lactamase inhibitor combinations.

Due to limited resources Ukraine’s healthcare system is under immense pressure, which makes infection prevention and control measures difficult to maintain which could lead to the spread of resistant organisms. Resource support from neighbouring European countries, including access to antimicrobials and providing care for war victims, could help alleviate some of these challenges.

First global research agenda for human health

The World Health Organization (WHO) has published its first global research agenda for AMR in human health. The report outlines 40 research priorities across five themes (prevention, diagnosis, treatment and care, cross-cutting, and drug-resistant tuberculosis) to be addressed by 2030. It aims to guide policymakers, researchers, funders, implementing partners, industry and civil society in generating new evidence to inform AMR policies and interventions, especially in low-to-middle-income countries.

Antibiograms in veterinary medicine

Two complementary papers in the *Journal of American Veterinary Association* discuss the importance of antibiograms for veterinary medicine.

In the first article, Lorenz et al describe creating and distributing antibiograms to veterinarians in California. Authors also established a process for ongoing updated antibiogram publication and distribution.

In the second article, Burbick et al outline the benefits and challenges of developing and using veterinary antibiograms and propose strategies to enhance their applicability and accuracy.

Laboratory outreach to veterinarians is necessary to provide education on how antibiograms complement other diagnostic testing in empiric antimicrobial selection and how to identify an antibiogram that is appropriate to guide therapy.

5.2 million AMR deaths in the Western Pacific Region

It is estimated that AMR may cause 5.2 million deaths in the Western Pacific Region by 2030 at a cost of US$ 148 billion according to the first World Health Organization (WHO) assessment on health and economic impacts of AMR for seven priority bacteria in the Western Pacific Region.

The regional AMR-related mortality rate is similar to rates for kidney diseases, diabetes mellitus, liver cirrhosis and breast cancer, and is considerably higher than rates for tuberculosis and HIV/AIDS.

The projected regional AMR economic cost of US$ 148 billion is higher than the total health expenditure in 2019 in Australia (US$ 136.8 billion) and the Republic of Korea (US$ 134.4 billion). The total cost is comparable to the total diabetes-related health expenditure in 2019 in the Western Pacific Region (US$ 162.2 billion).

Governments must pay policy and financial attention to addressing AMR, proportionate to its impact compared with priority diseases as an investment in the economy for the future. The report highlights the need for more and better quality data, to understand the trajectory of AMR in the Region, reduce uncertainty around its impacts and monitor interventions.

One Health agenda promotes AMR research and investment

The Quadripartite composed of The United Nations (UN) Food and Agriculture Organization (FAO), the UN Environment Programme (UNEP), the World Health Organization (WHO) and the World Organisation for Animal Health (WOAH) published the “One Health Priority Research Agenda for Antimicrobial Resistance” to promote research and investment in AMR.

The agenda aims to direct future research in One Health AMR with a focus on low-resource settings and reflects the urgent need to invest in One Health AMR research, develop new interdisciplinary local and global research partnerships, bring together diverse research skills and generate new methodologies and evidence to support prevention and control of AMR across One Health sectors.
ISAC Project Grants

ISAC is now accepting Project Grant applications from ISAC Member Society applicants to fund antimicrobial research in low- to middle-income countries (LMICs).

Applications are invited for grants between £10,000 and £20,000.

Aim of Research Project

Applicants are required to demonstrate that ISAC funds will be utilised for a clearly defined piece of research, which will have an identifiable outcome on completion of the work.

At least one country involved must be an LMIC country.

Research projects should address one of the three following areas:
1. What are feasible & effective prevention strategies to prevent transmission of (resistant) pathogens in low resource settings?
2. What basic laboratory support does a healthcare system minimally need to tackle infectious diseases?
3. How do we improve antimicrobial use worldwide to ensure it is delivered only to those who need it?

Deadline: 1 September 2023

Download an application form

Antibiogram training project

Antimicrobial resistance has become a global crisis and highlights the need to enhance antimicrobial stewardship (AMS) activities around the world. Healthcare providers need accurate antimicrobial susceptibility test (AST) data to guide treatment of individual patients while AMS committees need cumulative AST data to develop recommendations for empiric therapy. Cumulative AST data are also critical for infection prevention programmes to control spread of multi-resistant organisms in hospitals. Regional and national surveillance activities also rely on the same AST data from microbiology laboratories to understand the changing epidemiology of resistant organisms and to formulate broad guidelines for antimicrobial use.

AST data are the heart of all of these activities. But it is not enough simply to generate AST data in the laboratory and hope the data find their way to the right place. Cumulative AST data (i.e., antibiograms) need to be disseminated to end users in a format that is easy to understand and use. The cumulative data must be assembled in such a way that recommendations for empiric therapy can be developed and potential outbreaks of drug-resistant organisms can be identified. For many laboratories though, putting together an antibiogram seems like a daunting task. Even some laboratories that have been assembling data for several years wonder if they are doing it correctly.

This training programme provides resources for developing and sharing hospital antibiograms regardless of whether you are using CLSI or EUCAST methods. It contains links to a wide variety of resources along three pathways:
1. Pathway A for laboratories with no experience with antibiograms;
2. Pathway B for laboratories with some experience that want to improve and expand the use of their antibiograms;
3. Pathway C for experienced laboratories that want to share their data with external surveillance systems.

It also contains links to helpful papers, lectures and videos to maximise the effectiveness of each hospital’s cumulative AST data.

Download the PDF here
ISAC Webinars

ISAC hosts free, educational webinars as part of the ISAC Academy on a variety of infectious disease-related topics in collaboration with its Working Groups and Member Societies.

Zero by 2030: One Health perspectives of rabies elimination
Organised by the ISAC Viral Infections Working Group
25 September 2023
10:00 EDT / 17:00 EEST

- Rehab Tash
- Alfonso Rodriguez-Morales
- J. Scott Weese
- Nissreen Badawy
- Fatma Amer

Objectives:
1. To describe rabies virology and vaccination.
2. Global epidemiology of rabies.
3. Specify the importance of different animal reservoirs in the spread of the virus.
4. To explain One Health perspectives in rabies elimination.

Zero by 2030: One Health perspectives of rabies
This free webinar, organised by ISAC’s Viral Infections Working Group, aims to raise awareness of various aspects related to rabies for both healthcare workers and the public.

Recent on-demand webinars

- Membrane lipid remodelling confers polymyxin resistance in Gram-negative bacteria
  Organised by the ISAC Early Career Working Group
  **Speakers:** Meiling Han and Wenyi Li

- Viral respiratory tract infections: superinfections
  Organised by the Alliance for the Prudent Use of Antibiotics
  **Speakers:** Nina van Sorge, Anuradha Chowdhary, Alex Soriano and Souha Kanj

- The benefits of routine-based sequencing of pathogens
  **Speakers:** Eric Bathoorn, Mariette Lokate, Matt Holden and John Rossen

- Journey into the anti-infective field: academic, clinical and industry perspectives
  Organised by the ISAC Anti-Infective Pharmacology and Early Career Working Groups
  **Speakers:** Sebastian Wicha, Thomas Tängdén and Cuong Vuong

E-modules

ISAC offers free E-modules as part of the ISAC Academy series of short courses on infection topics. Participants receive a certificate of completion on passing.

**Fever in returning travellers**
This module was developed by ISAC’s Immunisations & Vaccines Working Group, led by Dr David McIntosh, Prof. Robert Steffen and Prof. Blaise Genton. The course is aimed at healthcare professionals interested in learning more about managing fever in returning travellers. It contains case studies as well as methods of infection prevention including vaccination, vector control and chemoprophylaxis. Users will receive a certification upon completion. Access the module here.

**Respiratory tract infections and antimicrobial resistance**
This module explores the causes of Respiratory Tract Infections (RTIs), the epidemiological effect of the SARS CoV-2 pandemic on RTIs and antimicrobial prescribing. It also explores antimicrobial resistance (AMR) and diagnostics and the role of vaccines in reducing antimicrobial resistance. Access the module here.

**Coming soon...**
Treatment of hepatitis C—organised by the ISAC Viral Infections Working Group.
The Abstracts from the 32nd ICC have been published in ISAC’s journal, the Journal of Global Antimicrobial Resistance (JGAR). Read the abstracts here.

New President
APSCMI is delighted to announce Professor David Lye as the new President of APSCMI. Professor Lye is Director at the Infectious Disease Research and Training Office at the National Centre for Infectious Disease in Singapore. Prof. Lye will build upon the success of previous APSCMI President, Prof. Paul Tambyah, who was awarded ISAC Honorary Membership in 2022 for his exceptional leadership of APSCMI.

Asia Pacific Congress of Clinical Microbiology & Infection (APCCMI) 2023
The 19th Asia Pacific Congress of Clinical Microbiology and Infection (APCCMI 2023) was held face-to-face in Seoul, Korea in July 2023 in collaboration with the Korean Society of Clinical Microbiology. The congress was very successful, welcoming over 1,000 delegates from 36 countries. The next APCCMI will take place in Bangkok, Thailand in November 2025.

ISAC Member Society Spotlight: Iranian Society of Microbiology (ISM)
24th International Congress of Microbiology (ICM)
The 24th ICM, organised by the Iranian Society of Microbiology (ISM) and Iranian Research Organization for Science and Technology (IROST), will be held from 18—20 September 2023 in Tehran, Iran. Find out more here.

Iranian Journal of Microbiology
ISM is pleased to announce that the society’s official journal, Iranian Journal of Microbiology, has received its first impact factor of 1.4. The journal welcomes submissions on medical, veterinary, food and water, applied and environmental microbiology.
Future APUA Webinar

Beyond the pill: transformative approaches to combat AMR

We invite you to a joint webinar by the AMR Declaration Trust and the Alliance for the Prudent Use of Antibiotics (APUA):

26 August 2023
13.30 - 15.30 (CET) / 17:00 - 19:00 (IST)

The webinar aims to delve deep into the multifaceted issues surrounding AMR. Drawing from expertise across different regions and specialties, experts will explore strategies that range from grassroots implementation to high-level policy changes. The panelists will discuss a variety of relevant topics including:

- Overuse vs. lack of access to antibiotics
- Diagnostic stewardship
- COVID-19’s impact on AMR
- Antimicrobial stewardship in LMICs
- Hospital-based strategies
- Behavioural issues among clinicians
- Role of environment in AMR
- Global collaborations and partnerships
- Regulatory and policy challenges
- Economic impact of AMR

Panellists

- Pierre Tattevin (France)
- Heiman Wertheim (Netherlands)
- Gabriel Levy-Hara (Argentina)
- Vasant Nagvekar (India)
- V. Yamunadevi Yamunadevi (India)
- O. C. Abraham (India)
- Pricilla Rupali (India)
- Suneetha Nareddy (India)
- Raksha K. Bhat (India)
- Aravind Raghukumar (India)
- Abdul Ghafer (India, Moderator)

Register

26 August 2023
13.30 - 15.30 (CET) / 17:00 - 19:00 (IST)

Publications


Antibiotic cards

You can still download these free antibiotic summary cards for some of the main antibiotics currently in use with further cards to follow. These antibiotic cards have been primarily designed to assist prescribers in the selection of the most appropriate antibiotic, with optimal dosages, and to provide guidance to those who take care of patients who receive antibiotics. Click the images below to download individual cards or download them all from the website.
About ISAC
ISAC was founded as a non-profit organisation in 1961 and, in response to the dynamic nature of the subject matter, has focused most recently on antimicrobial stewardship and antimicrobial resistance.
ISAC is a federation of affiliated Member Societies which aims to increase the knowledge of antimicrobial chemotherapy and combat antibiotic resistance around the world.
ISAC currently has a worldwide membership of 97 national and regional societies, which in turn have over 60,000 individual members. Visit www.ISAC.world to see how your society can become an ISAC Member Society.
ISAC has 22 Working Groups on specialist subjects which are engaged in advancing scientific knowledge in antimicrobial chemotherapy, clinical microbiology and infectious diseases through various activities. To join an ISAC Working Group, please email Fee Johnstone, ISAC Executive Assistant (secretariat@ISAC.world) with a brief C.V.
ISAC has two society journals:
- *International Journal of Antimicrobial Agents (IJAA)* (impact factor: 10.8)
- *Journal of Global Antimicrobial Resistance (JGAR)* - gold open access (impact factor: 4.6)
ISAC’s scientific congress, International Congress of Antimicrobial Chemotherapy (ICC), is held every two years and it is now in its 32nd year.
For more information on ISAC, visit www.ISAC.world or scan the QR code.

About APUA
Founded in 1981 by Prof. Stuart B. Levy as a global non-profit organisation, APUA’s mission is to maximise the effectiveness of antimicrobial treatment by promoting appropriate antimicrobial use and containing drug resistance. It was the first organisation to address antibiotic preservation and continues to provide a strong voice in the field despite the subsequent emergence of many other organisations and groups addressing a topic which has become a specialty in its own right; that of “antibiotic stewardship”.
Prof. Levy’s retirement was announced towards the end of 2018. This was an opportunity for the APUA Board to review its leadership and governance and it took the opportunity to seek a partner organisation with which to synergise. This led to the merger of APUA with the International Society of Antimicrobial Chemotherapy (ISAC), effective from February 2019.
The new international APUA Board meets regularly and aims to build on the work achieved by Prof. Levy and his excellent team of associates.
Visit www.APUA.org for more information or scan the QR code.

Disclaimer
ISAC / APUA accept no legal responsibility for the content of any submitted articles, nor for the violation of any copyright laws by any person contributing to this newsletter. The mention of specific companies or of certain manufacturers’ products does not imply that they are endorsed or recommended by ISAC / APUA in preference to others of a similar nature that are not mentioned. Errors and omissions excepted, the names of proprietary products are distinguished by initial capital letters.
The opinions expressed within the content are solely those of the authors and do not reflect the opinions and beliefs of ISAC or APUA.
The APUA Newsletter (ISSN 1524-1424) © 2023 ISAC / APUA
Since 1983, the APUA Newsletter has been a continuous source of non-commercial information disseminated without charge to healthcare practitioners, researchers, and policy-makers worldwide. The Newsletter carries up-to-date scientific and clinical information on prudent antibiotic use, antibiotic access and effectiveness, and management of antibiotic resistance. The publication is distributed in more than in more than 100 countries. The material provided by ISAC / APUA is designed for educational purposes only and should not be used or taken as medical advice. We encourage distribution with appropriate attribution to ISAC / APUA. See previous editions of the Newsletter on the APUA website.
*ISAC welcomes contributions. Please send us your article ideas. All content may be edited for style and length. Please email secretariat@ISAC.world*

Newsletter Editorial Team: Fiona MacKenzie (Managing Editor) and Fee Johnstone (Editorial Assistant)