



# ewsletter

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# Antibiotic access and use in the community setting in Africa and Asia: introducing the ABACUS projects

Annelie L. Monnier and Heiman F. L. Wertheim on behalf of the ABACUS II consortium\* Radboud University Medical Center, Nijmegen, the Netherlands



ABACUS I (2017-2019) and ABACUS II projects (2020-2023) vendors) and community members regarding how to Antibiotic resistance (AMR) has created an urge for global recognise an antibiotic; antibiotics can be mistaken for efforts to facilitate appropriate use of antibiotics. Global different medicines such as painkillers in both Africa and reports on AMR have shown that studies are needed in low Asia<sup>1</sup>. This finding later led to one of the main research - to middle- income countries (LMICs), where local data are focuses for the follow-up ABACUS II project (2020-2023). scarce and resistance is widespread<sup>1</sup>. The ABACUS I project (AntiBiotic ACcess and USe) was initiated in 2017 to explore Improving the identification of oral antibiotics community-based antibiotic access and consumption Following the findings from ABACUS I that illustrated practices across communities in LMICs to subsequently confusion regarding how to identify them and distinguish

inform the design of, and identify for community-based targets interventions aiming to improve antibiotic use<sup>2</sup>. The ABACUS I project was an international mixed -method study conducted in rural communities of three countries in (South Africa, Ghana, Africa Mozambique) and Asia (Thailand, Vietnam, Bangladesh). The study reflect different sites world economy classifications incl. Low (Mozambique), Income Low Middle Income Upper Middle Income (South A. Three common capsules sold in Kintampo, Ghana. From Africa and Thailand)<sup>3</sup>.

ABACUS I findings showed that a without were acquired prescription across the six LMICs. 2,875 (35%) of the antibiotics was reported, particularly to broad-spectrum project in February 2017<sup>5</sup>) antibiotics in rural settings in Asia.

A common theme identified in Africa and Asia was self- antibiotics. In Vietnam, one of the words used to refer to treatment as it was being considered to be less time antibiotics is "con nhông", which means "capsule". In both consuming, cheaper and overall more convenient than Ghana and Mozambigue, antibiotics are referred to as twousing public health services. Finally, the results illustrate colour capsules such as "red and yellow"<sup>4,5</sup>. Strikingly, "red that understanding of contextual complexities surrounding and yellow" can either correspond to tetracycline or antibiotic access and use organisations, health policy frameworks and cultural antibiotics (Figure 1A). In certain countries, medicines are norms) is paramount to develop interventions tailored to sold in shop-made syndromic drug packages with a mix of the specific contexts.

confusion among medicine suppliers (e.g., both formal or different medicines, it becomes even harder for users, informal antibiotic suppliers, from pharmacists to street suppliers and healthcare professionals (HCPs), to identify



(Ghana, Figure 1: Pictures taken as part of the ABACUS project Bangladesh and Vietnam) and highlighting that the identification of medicines is challenging.

left to right: amoxicillin, tetracycline and tramadol. Capsules that were "Red and yellow" were found in several countries as either tetracycline or amoxicillin, two different antibiotic large proportion of antibiotics classes. Tramadol (a painkiller) can be mistaken for an a antibiotic as it is dispensed as a capsule in settings where patients consider capsules to be antibiotics. (Pictures taken as part of the ABACUS project in November 2022.) 8,214 B. Bags of "yaa chud" (mixture of unknown medicines) sold interviewed community members in Kanchanaburi Health and Demographic Surveillance System area, Thailand. "Yaa chud" are often sold for people purchased antibiotics without a with respiratory symptoms and contain various unidentifiable prescription. Also, easy access to medicines. The common practice of syndromic packages "yaa chud" highlights the key issue of medicine identification (which pill is what?). (Picture taken as part of the ABACUS I

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<sup>1</sup>. 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 (Figure 1A). The fact that capsules are frequently perceived to be antibiotics is also reflected in the local names for how people refer to

(including health care amoxicillin capsules, which are two different classes of various tablets and /or capsules in unlabeled plastic zip lock Furthermore, an important ABACUS I finding was the bags (e.g. "yaa chud" in Thailand, Figure 1B)<sup>4</sup>. By mixing the medicines and therefore how to use appropriately.

Our recent viewpoint article in the Lancet Global Health output and impact as well as to discuss preliminary results, discusses how the visual distinction between antibiotics and explore future collaborations. 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<sup>5</sup>. 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 down comes to improving personal health literacy (i.e., the degree which to individuals have the ability to find, understand and use information and inform services to



them month, the consortium met at the ABACUS II conference in Bangkok, Thailand (Figure 2), to reflect on the projects'

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#### \*Members of the ABACUS II consortium

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health-related decisions and actions for themselves and health equity. Improving antibiotic others) and 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 5. Monnier A.A et al. Is this pill an antibiotic or a painkiller? Improving the knowledge on antibiotic use and access practices in six countries in Africa and Asia. An overview of the scientific 6. AntiBiotic ACcess and USe (ABACUS) project. Available from: www.abacusoutput to date is shown on our project website<sup>6</sup>. Last

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### Prosthetic valve endocarditis following transcatheter aortic valve replacement: insights on microbiology, prophylaxis and treatment strategies Saliba Wehbe<sup>1</sup>, Suha Kalash<sup>1</sup>, Fatima Allaw<sup>1</sup>, Johnny Zakhour<sup>1</sup> and Souha S. Kanj<sup>1,2\*</sup>

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#### Introduction

minimally invasive procedure that was initially developed the TAVR procedure is more appropriate than for the management of symptomatic severe aortic valve cephalosporins for pre-procedural prophylaxis, with a stenosis<sup>1</sup>. Since its inaugural procedure in 2002, TAVR has second dose to be administered if the procedure lasts for garnered significant attention and achieved substantial more than 2 hours<sup>11</sup>. In cases of beta-lactam allergy or high clinical and market recognition<sup>2</sup>. Its less invasive nature rates of methicillin-resistant Staphylococcus aureus (MRSA), compared to surgical aortic valve replacement (SAVR), a single dose of IV vancomycin or teicoplanin may be coupled with growing evidence of positive outcomes, led administered. There is no evidence to support a longer the Food and Drug Administration (FDA) to progressively duration of antibiotics<sup>12</sup>. As for antibiotic prophylaxis in broaden its approved indications to encompass low- and patients after TAVR, there are no randomised controlled intermediate-risk patients, starting in 2016<sup>3</sup>. With an trials (RCT) evaluating the benefits of prophylaxis following increase in the number of TAVR procedures, rare various procedures. However, the American Heart complications including infective endocarditis have been Association (AHA) and the European Society of Cardiology reported. Complications may manifest as aortic root (ESC) recommend prophylaxis with oral amoxicillin for highdissection, paravalvular and aortic root abscesses, and risk patients with prosthetic valves including those post intra / paravalvular regurgitation<sup>4</sup>. The incidence of TAVR prior to certain dental procedures<sup>13</sup>. For non-dental prosthetic valve endocarditis (PVE) following TAVR (TAVR- procedures, systematic antibiotic prophylaxis is not advised. PVE) varies between 0.2% to 3.1% within one year of the Antibiotic therapy should only be considered when invasive procedure<sup>3,5</sup>. Moreover, TAVR-PVE is associated with a procedures are performed in the setting of infection<sup>13</sup>. substantial in-hospital mortality rate reaching 34.4% in one systemic review<sup>6</sup>.

#### Microbiology

Gram-positive bacteria, including Staphylococcus aureus, When patients are haemodynamically stable and exhibit a coagulase-negative staphylococci, Enterococcus spp., and subacute illness, deferring antibiotics in order to identify Streptococcus spp. (particularly the viridans group), are the the causative organism is recommended<sup>4</sup>. However, in primary causative pathogens of TAVR-PVE<sup>7</sup>. Interestingly, situations of severe illness such as septic or cardiogenic Enterococcus spp. are more frequently observed in TAVR- shock, it is crucial to promptly initiate empirical PVE than in SAVR-PVE. This disparity is likely due to the use antimicrobial therapy after obtaining three sets of blood of the trans-femoral access method during TAVR cultures from different sites<sup>13</sup>. According to the AHA procedures<sup>8</sup>.

#### **Prophylaxis**

During the initial year following the procedure, the risk of agents should be based on local epidemiological data and TAVR-PVE appears to be at its highest. This is potentially bacterial resistance rates, taking into account the risk of attributed to inadequate healing, ongoing paravalvular multidrug-resistant organisms (MDRO) and the potential for leaks and bacteraemia occurring during the peri-procedural concurrent fungal infections. period<sup>9</sup>. Robust evidence-based recommendations for the choice of antimicrobial agents for pre-procedural Combination therapy involving bactericidal antibiotics, such majority of patients (61.8%) receive cephalosporins as peri- bactericidal activity achieved by combining aminoglycosides procedural prophylaxis, while penicillin (22%) and with cell wall inhibitors<sup>13</sup>. The choice of empirical coverage vancomycin (16%) are used less frequently<sup>6</sup>. Cefazolin (the for MRSA should be determined according to the local most commonly used cephalosporin), or cefuroxime use in epidemiology, with vancomycin being an appropriate prophylaxis is extrapolated from practices in SAVR. option as it also provides coverage for Enterococcus spp. However, these agents do not have activity against The addition of rifampin, owing to its ability to penetrate Enterococcus spp., limiting their effectiveness as staphylococcal biofilm, should be considered after prophylactic agents in TAVR<sup>10</sup>.

A single dose of IV amoxicillin-clavulanate or ampicillin-Transcatheter aortic valve replacement (TAVR) is a sulbactam 0-60 minutes prior to the arterial puncture for

#### **Empirical antibiotics for TAVR-PVE**

The clinical presentation of TAVR-PVE is variable among patients in terms of duration and spectrum of symptoms. guidelines, it is recommended to consult an infectious diseases specialist for guidance on selecting appropriate empirical antibiotic regimens<sup>4</sup>. The choice of antimicrobial

prophylaxis in TAVR are currently lacking. A recent as aminoglycosides, is recommended for the treatment of systematic review and meta-analysis revealed that the TAVR-PVE. This recommendation is based on the synergistic achieving bacteraemia clearance (typically after 3-5 days of

effective antimicrobial therapy) due to its antagonistic Conclusion effect with other antibiotics against planktonic bacteria<sup>13</sup>.

cases of TAVR-PVE<sup>14</sup>, antipseudomonal therapy should be disparity influences the selection of empirical therapy, as considered for critically ill patients with predisposing risk well as the choice of surgical prophylaxis. Given the limited factors<sup>15</sup>. In this regard, a combination of an evidence specific to TAVR-PVE, individualised decisionantipseudomonal beta-lactam along with vancomycin and making, considering local epidemiology and resistance an aminoglycoside would be suitable. If local surveillance patterns, is essential in the choice of antimicrobial therapy. data indicate high rates of difficult-to-treat (DTR) While there is growing interest in shorter treatment P. aeruginosa or if the patient is colonised with DTR durations or oral therapy for the treatment of SAVR-PVE, P. aeruginosa or another Gram-negative MDRO, alternative current evidence does not support their adoption for TAVRagents such as one of the novel beta-lactam-beta- PVE. Further research is needed to optimise the lactamase inhibitors combinations should be considered.

#### **Directed antimicrobial therapy**

that of SAVR-PVE and necessitates adherence to international guidelines, considering the susceptibility 2. profile of the causative pathogen<sup>4,13</sup>. 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 5 eradication and increased recurrence rates. Candida spp. induced TAVR-PVE necessitates a comprehensive approach <sup>6.</sup> combining medical and surgical interventions, with an uncertain impact on mortality from surgical 7. interventions<sup>16,17</sup>. Options for antifungal therapy include either a lipid formulation of amphotericin B with or without 8. flucytosine, or high-dose echinocandins<sup>18</sup>. 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<sup>18</sup>.

#### 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 <sup>15. Zakhour J et al.</sup> Antimicrobial Treatment of Pseudomonas aeruginosa determined based on clinical response, and follow-up inflammatory markers. As for the route of administration of antibiotics, initial parenteral treatment is recommended for 17. Arnold CJ et al. Candida infective endocarditis: An observational cohort 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.

TAVR-PVE displays a distinct microbiological profile, primarily characterised by an increase in the prevalence of While Pseudomonas aeruginosa infrequently contributes to Enterococcus spp., setting it apart from SAVR-PVE. This management strategies of this serious infection.

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# **5th Global Ministerial Summit on Patient Safety**

**Pierre Tattevin** 

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Safety at Montreux, Switzerland, on 24 February 2023.

Loice Achieng Ombajo (Kenya), Abdul Ghafur (India) and Pierre transplants, chemotherapy etc.). Tattevin (France) moderated the session on "Medication safety & stewardship - the example of antibiotic use and More than 5 million deaths were associated with AMR in 2019 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 entitled "Montreux document, 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. Although this session, and the summit, did not bring any scoop This class of drugs is unique in that its target is not a to those already involved in the field, the active participation component of the human body: antibiotic targets are living of more than 60 ministers from five continents, and their organisms, the bacteria, that have the capacity of developing commitment to tackling AMR in the final document, are resistance to all antibiotics. The consequences of this unique important steps forward, to ensure that the fight against AMR property is that antibiotics lose their efficacy when used in is considered a priority for patient safety by most excess, as was the case in many countries for too long. Ten governments worldwide.



Attendees at the 5th Global Ministerial Summit on Patient Safety Top row L-R: Marlieke de Kraker, Switzerland; Christopher Butler, UK; Katie J. Suda. USA: Ariun Srinivasan. USA. Bottom row L-R: Pierre Tattevin (France); Loice Achieng Ombajo (Kenya).

The Alliance for the Prudent Use of Antibiotics (APUA) actively years ago, Margaret Chan, then WHO Director, declared participated in the 5th Global Ministerial Summit on Patient antimicrobial resistance (AMR) a global crisis, that may turn common infections into untreatable diseases, and jeopardise medical progress in many areas (complex surgeries,

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 The appropriately worldwide. 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.

#### 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 <u>The</u> <u>Lancet Planetary Health</u> 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<sub>2'5</sub> 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<sub>2'5</sub> to AMR. It was also estimated that AMR could be reduced by almost 17%, if the PM<sub>2'5</sub> 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 <u>PLOS</u> <u>Computational Biology</u>.

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 <u>JAMA</u> 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 <u>14 individual African Union Member State reports</u> 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: *Enterobacterales*, *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 middleincome countries (LMICs) showed widespread high-level resistance to older, inexpensive drugs like ampicillin, cotrimoxazole 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 βlactam 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 <u>global</u> <u>research agenda for AMR</u> 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 <u>first article</u>, 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 <u>second article</u>, 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 <u>health and economic impacts of AMR</u> 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 "<u>One Health Priority Research Agenda for Antimicrobial</u> <u>Resistance</u>" 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 Society News**

# **ISAC Project Grants**



ISAC is now accepting Project Grant applications from ISAC Member Society applicants to fund antimicrobial research in low- to middleincome 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 l 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

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.

therapy. Cumulative AST data are critical for infection also 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



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;

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

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 <u>ISAC Academy</u> on a variety of infectious disease-related topics in collaboration with its Working Groups and Member Societies.



- <u>The benefits of routine-based sequencing of pathogens</u> Speakers: Eric Bathoorn , Mariette Lokate, Matt Holden and John Rossen
- Journey into the anti-infective field: academic, clinical and industry perspectives Organised the ISAC Anti-Infective Pharmacology and Early Career Working Groups Speakers: Sebastian Wicha, Thomas Tängdén and Cuong Vuong

Watch all ISAC's webinars for free on the ISAC YouTube Channel

# **E-modules**



ISAC offers free E-modules as part of the <u>ISAC Academy</u> 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. <u>Access the module here.</u>

#### **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.

#### 32nd International Congress of Antimicrobial Chemotherapy (ICC)





#### **On-demand recordings**

Watch the <u>recordings of the plenary and</u> <u>keynote sessions</u> presented at the 32nd International Congress of Antimicrobial Chemotherapy (ICC) in Perth, Australia by top speakers in the field of infectious diseases and antimicrobial chemotherapy.

#### **ICC Abstracts**

The Abstracts from the 32nd ICC have been published in ISAC's journal, the Journal of Global Antimicrobial Resistance (JGAR). Read the abstracts here.

#### In memoriam



Sadly, Professor Mary-Louise McLaws, a renowned Australian and international epidemiologist passed away at the age of 70 after a long illness. Highly respected by all

who knew her Mary-Louise was a professor of epidemiology at the University of New South Wales for over 30 years specialising in infectious diseases.

We offer our sympathies to Mary-Louise's family, friends and colleagues. We will miss her immensely for her intelligence, enthusiasm and kindness. <u>Read about Mary-</u>Louise's extraordinary career here.

# 33rd International Congress of Antimicrobial Chemotherapy (ICC)



# **ISAC Member Society News**

#### Asia Pacific Society of Clinical Microbiology and Infection (APSCMI)

#### **New President**

<u>APSCMI</u> 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. <u>Find out more here</u>.

#### Iranian Journal of Microbiology

ISM is pleased to announce that the society's official journal, <u>Iranian Journal of Microbiology</u>, has received it first impact factor of 1.4. The journal welcomes submissions on medical, veterinary, food and water, applied and environmental microbiology.

If your society has any news to share, email secretariat@ISAC.world

# **Future APUA Webinar**



BEYOND

TRANSFORMATIVE APPROACHES TO COMBAT ANTIMICROBIAL RESISTANCE

Beyond the pill: transformative approaches to combat AMR

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

#### 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 panellists 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; Role of vaccinations.

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 Reghukumar (India)
- Abdul Ghafur (India, Moderator)

# **Publications**

REGISTER

.

- The battle against fungi: lessons in antifungal stewardship from COVID 19 times (Kanj et al on behalf of APUA). International Journal of Antimicrobial Agents. 2023 Jul;62(1):106846.
- Diagnostic stewardship in infectious diseases: a continuum of antimicrobial stewardship in the fight against antimicrobial resistance (Zakhour *et al* on behalf of APUA). *International Journal of Antimicrobial Agents*. 2023 Jul;62(1):106816.

# 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 <u>download them all from the website</u>.







#### 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. <u>Visit www.ISAC.world to see how your society can become an ISAC Member Society</u>.

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 <u>www. ISAC.world</u> 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.

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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 <u>secretariat@ISAC.world</u>

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