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Duration of antibiotic therapy in Gram-negative infections: is shorter better? Fatima Allaw*, Sara F. Haddad* and Souha S. Kanj Division of Infectious Diseases, American University of Beirut Medical Center, Beirut, Lebanon *Contributed equally Sara Haddad Fatima Allaw Souha Kanj

that has recently captured the attention of physicians all shortening the regimen treatment of VAP to 4 days⁶. over the world¹. Limiting antibiotic exposure is of utmost However, one should be careful generalising the evidence importance in the fight against AMR as it has been well to non-fermenting (NF) GNB. First, organisms like established that prolonging duration of antibiotics Acinetobacter spp., and Stenotrophomonas spp. are not incidence multidrug increases the of antibiotic-related adverse effects, including Clostridiodes patients with secondary bacteremia, MDR strains and slow difficile infection, and increases hospital length of stay response to therapy. The iDIAPASON study is a randomised (LOS) and health costs. However, shortening antibiotic control trial (RCT) published this year and showed no risk of treatment failure and relapse.

Antimicrobial resistance (AMR) is a major global threat ongoing studies such as the DATE trial are investigating resistant commonly represented in the trials. Second, the optimal pathogens^{2,3}. Moreover, using unnecessarily prolonged DOT of *P. aeruginosa* pneumonia is yet uncertain and antibiotic courses exposes the patient to the risks of prolonged duration might be needed particularly in therapy in certain settings may be associated with a higher difference in mortality between 8 and 15-day antibiotic for P. aeruginosa VAP. However, patients who received a shorter course were twice as likely to have P. aeruginosa

Hence, determining the right duration for antibiotic therapy (DOT) remains a challenging question notably for Gram -negative bacilli (GNB) and multidrug-Gram-negative resistant bacteria (MDR-GNB) that account for a vast proportion of hospital-acquired or ventilation-associated pneumonias (HAP/VAP), intra-abdominal infections (IAI), bloodstream infections (BSI) and urinary tract infections (UTI). These pathogens are of particular concern as they have been associated with high morbidity and mortality and are often seen in patients with comorbidities or

emergence of MDR-GNB, many novel antibiotics including that 23.5% of patients who received less than 10 days of cefiderocol. ceftazidime-avibactam, tazobactam, imipinem-cilastin-relebactam meropenem-varbobactam have been a welcome addition aiming at comparing 28 days of antibiotics to the standard to the armamentarium in the treatment of various hospital duration in patients in intensive care units (ICU) with IAI acquired infections⁵. However, the recently published with up to 180 days of follow-up¹⁰. Thus, more robust data trials did not draw firm recommendations about the is needed to make standardised clinical guidance on DOT optimal DOT. Moreover, published studies addressing the for IAI. DOT for GNB in various infection sites mostly included Enterobacterales, with underrepresentation of non- When it comes to BSI including MDR-GNB, there is no need fermenting organisms and MDR-GNB.

antibiotic therapy has been established and recommended showed no difference between short and long duration of by the Infectious Diseases Society of America / American treatment of uncomplicated GN-BSI in mortality and Thoracic Society (IDSA / ATS) and the European Societies, recurrence of bacteremia^{12,13}. This also applies to catheter-



VAP recurrence⁷.

As for IAI, it is well established that the cornerstone of effective treatment is control (ASC). adequate source However, shortening the DOT should be done carefully and with close patient monitoring, as studies have shown conflicting results and included different patient populations with variable outcomes; while some showed no significant difference in intensive care unit (ICU) stay, LOS and mortality rate between patients who received short (< 7 days) and long (> 7

in immunocompromised hosts (ICH)⁴. With the recent days) antibiotics after ASC⁸, the recent CABI RCT showed ceftolozane- antibiotics had a relapse of IAI⁹. A current multicenter and study being conducted in the UK, the EXTEND trial, is

to prolong DOT beyond 7 days based on the most recent guidance¹¹. Recent studies including patients with Starting with HAP/VAP, while the duration of 7 days of extended spectrum beta lactamase (ESBL) producing E. coli

the central line is removed¹⁴. As for patients with febrile profile, the rapidity of response to therapy, the site of neutropenia and BSI, uncertainty remains about the infection and adequacy of source control. optimal DOT as one should take into consideration the References patient's degree of immunosuppression and severity of ¹. infection. In a recently published study, there was a 2. successful attempt in decreasing antibiotic treatment to 7 days without increasing the risk of infection complications in patients with febrile neutropenia after implementing the 4th European Conference on Infections in Leukemia (ECIL-4) recommendations¹⁵. Nonetheless, it is difficult to generalise the current findings to some pathogens such as P. aeruginosa. Studies showing that a short DOT is as effective as long DOT in the treatment of *P. aeruginosa* BSI excluded patients with persistent bacteremia and those with metastatic infectious foci¹⁶. In fact, *P. aeruginosa* BSI tends to occur in immunocompromised or ICU patients or those with co-morbidities and treatment duration should vary according to the primary source of bacteremia, host 8. factors and susceptibility of the isolate. As for BSI caused by other MDR-GNB, there are no published studies to 9. guide on the optimal DOT in various infection sites.

Finally, although the guidelines for the DOT in pyelonephritis still recommend a variable duration according to the choice of drug and the presence of an abscess, there is a tendency towards shortening the treatment in patients with UTI and secondary bacteremia 11. Tamma PD et al. Infectious Diseases Society of America Guidance on the to 7 days including those caused ESBL-producing Enterobacterales^{17,18}. This strategy might also apply to afebrile UTI in men when treated with trimethoprim / sulfamethoxazole or ciprofloxacin as both drugs are highly 12. Li X et al. Short-course versus long-course antibiotic treatment in patients excreted in the urine¹⁹. However, one should be careful when treating a complicated acute prostatitis as studies have shown that a shorter course was associated with earlier relapse and therefore a 14-day course is still recommended²⁰.

It is also important to highlight that the evidence on the 15. Verlinden A et al. Safety and Efficacy of Antibiotic De-escalation and optimal DOT for GNB infections in ICH is scarce, and this population is of particular interest as their inadequate innate and adaptive immune systems may alter the infection course and its outcome. Prolonging antibiotic duration might be needed to achieve an effective cure; however, it is a double-edged sword as it might predispose the ICH to future colonisation and infections with resistant pathogens²¹. Meanwhile, a patient centered approach 18. Benfield T. Short Course Antibiotic Treatment of Gram-negative Bacteremia: should be the cornerstone for deciding on DOT for GNB infections in ICH.

While recent studies have supported shorter antibiotic regimens in some scenarios, further studies are still needed to draw definitive conclusions in various sites of 20. Lipsky BA et al. Treatment of Bacterial Prostatitis. Clin Infect Dis. 2010 infection and when dealing with different GN pathogens and host factors. The new paradigm is to treat infections only for as long as it is necessary taking into consideration

related GNB BSI where DOT can be shortened to 7 days if the patient's host factors, the pathogen's resistance

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Monkeypox: what do we know about treatment and vaccination?

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Monkeypox is a viral infection, caused by the DNA virus randomised control trial of over 4,000 participants, found monkeypox, part of the orthopox genus, in the family no significant safety concerns and described a good poxviridae. Although it is named "monkeypox" after first tolerability profile⁵. Previous replication competent being identified in research monkeys, the original host is smallpox vaccines, such as DryVax, were associated with not known but is likely to be smaller rodents. Human cardiac complications such as myocarditis and pericarditis⁶, monkeypox was first noted in the Democratic Republic of but this is not the case with MVA as adverse events in Congo in 1970. Typical symptoms include vesicles or relation to the cardiovascular system were similar between ulceration and may include systemic symptoms such as the vaccinated group and placebo group⁵. Efficacy data for fever, lymphadenopathy and myalgia. Monkeypox virus MVA against MPXV in humans is currently scarce. It is (MPXV) is spread by close contact with lesions of those known that the virus is efficacious against smallpox and infected and is spread via face-to-face, skin-to-skin, mouth- this knowledge is used to infer efficacy against monkeypox to-mouth or mouth-to-skin contact. The incubation period virus, alongside primate studies'.

is typically 5-21 days. Monkeypox has previously been

confined to Western and Central Africa, whereby two distinct clades have been identified, Clade I (formerly Congo Basin) and Clade II monkeypox have been reported sporadically in various countries, but sustained community transmission in countries that are not usually.

"Imported cases of monkeypox have been reported sporadically in various countries, but sustained (West African). Imported cases of *community transmission in countries* that are not usually endemic have not been reported prior to May 2022."

MVA is recommended for healthcare workers who may come in to contact with MPXV, laboratory workers who are likely to handle MPXV and those who have had close contact exposure to a case of confirmed MPXV. In the Joint Committee UK, the on Vaccination and Immunisation (JCVI) has also now recommended that

endemic have not been reported prior to May 2022.

and the Americas reported cases of Monkeypox. Between treatment for MPXV in the UK. Treatment is based on 1 January 2022 and October 21 2022 a total of 75,441 knowledge of smallpox. laboratory confirmed cases have been reported to WHO¹. The virus has mostly been identified amongst men who Tecovirimat has been used in the UK for inpatients with the identify as Gay, Bisexual and Men who have Sex with Men severe disease. Tecovirimat, an anti-viral which inhibits (GBMSM), but this not always the case. Monkeypox, in the p37, a protein present in orthopox viruses, has been used context of this outbreak, is described as mild with most in the treatment of smallpox in animals and has a people recovering without treatment, although in those reasonable safety profile in humans⁹. In animal studies, who are immunocompromised monkeypox virus can be Tecovirimat showed good efficacy, and the best outcome more severe². Diagnosis is made by Polymerase Chain was when given in combination with post exposure Reaction (PCR), which can be done on lesion swabs, throat prophylaxis MVA¹⁰. swabs, or blood. Treatment options are not yet well established and options will be discussed.

In terms of prevention, Modified Vaccinia Ankara (MVA) have in vitro activity against orthopox viruses and in vivo can be used to prevent more serious complications. MVA is activity against pox viruses in animal studies¹³. Cidofivir is live attenuated vaccine, which contains modified vaccinia used in humans, but there is caution over its safety profile Ankara, a vaccinia virus closely related to smallpox⁴. given nephrotoxicity concerns¹¹. Vaccinia Ankara does not cause disease in humans as it is unable to replicate. Similar antibodies are produced which Brincidofivir is a lipid analogue of Cidofivir. There is no are protective against MPXV. MVA is given intra-muscularly human data available but it has been shown to be and most efficacious in the first four days following efficacious against MPXV in vitro¹². In case reports, exposure, although some efficacy has been demonstrated Brincidofivir has been shown to cause liver derangement up to 14 days following administration⁴. In a 2013 and did not lead to any clinical benefit¹³.

GBMSM who are at highest risk are vaccinated with MVA⁸.

In May 2022, an increasing number of countries in Europe At the start of the 2022 outbreak, there was no licensed

Cidofivir, an acyclic nucleoside analogue, is used for DNA virus infections, primarily CMV retinitis. It has known to



Vaccinia Immune Globulin Intravenous (VIGIV) may be a 10. treatment option, but efficacy is not known¹⁴ and access may be limited.

In summary, the 2022 monkeypox outbreak has risen 11. Andrei G et al. Cidofovir Activity against Poxvirus Infections. rapidly and unexpectedly. It was reported in early 2022 that monkeypox may become a threat given the 12. cessation of the smallpox vaccination¹⁵, but it could not be predicted or expected that an outbreak of this scale would arise. With vaccinations being rolled out on a large scale, cohort data will become available in due course on 14. Information for Healthcare Professionals. CDC. Accessed MPXV protectivity of MVA. Similarly, observational data and planned clinical trials will provide further insight to 15. Bunge EM et al. The changing epidemiology of human MPXV treatment options.

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ISAC Webinar: Monkeypox: a new human threat?

In case you missed the recent webinar organised by ISAC's Viral Infections Working Group, you can watch the on-demand recording for free on ISAC's YouTube Channel



Artificial intelligence in infectious diseases: is it real?

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technologies and devices, artificial intelligence (AI) has trends¹⁰. changed the modern world, and medicine is no exception. simulated by analysing the chain of contacts using AI Al is being extensively used in various clinical settings to algorithms¹¹. For example, an Al algorithm was used to improve patient care and hospital operations, and in 2016, predict outbreaks of methicillin-resistant Staphylococcus the largest investments in AI research were made in its aureus (MRSA) and influenza in different hospital application in healthcare¹. Learning algorithms can collect departments and helped in early initiation of the needed increasing amounts of diverse data to generate a more interventions¹¹. Also, ML applications were used to accurate diagnosis. Al is a novel technical profession that estimate the risk of hospital acquired Clostridium difficile imitates human intelligence by utilising computer infection¹⁰. Regarding infectious diseases diagnosis, AI was technology and providing new concepts and solutions for applied in the identification of Mycobacterium tuberculosis complex problems².

virtual². The physical part consists of the application of AI in radiology specialists¹². Also, ML image analysis helps in

in robots capable of performing surgeries and various medical procedures¹. Whereas the virtual aspect is represented by machine learning², which is used in medical applications such as electronic health records (EHR)¹. In machine learning (ML) algorithms programmed by engineers use medical data to learn and clarify unexplained events³.

The application of AI in the medical

field is certainly growing¹, and AI is being employed bacteremia¹⁵. The positive predictive value of this tree nowadays for the improvement of diagnosis, thus helping was 90.8% and it was proved that it can be used in clinical healthcare workers by decreasing the workload and settings and help start the appropriate empirical antibiotic shortening the time required for diagnosis⁴ (Figure). Al is therapy¹⁵. Furthermore, there are multiple applications of applied in various medical domains including radiology, AI in microbiology through image analysis and ophthalmology, pathology, dermatology gastroenterology ^{4,5,6}. For example, in the radiology field, images are used to train the machine to identify bacterial computer assisted diagnosis helped in early detection of Gram stain in positive blood cultures¹⁴, and to identify COVID-19 infection⁷ and in the classification of lung parasites in fecal samples¹³. The same mechanism of ML is nodules as malignant or benign⁸. And in ophthalmology, used to analyse the growth of microbes on agar plates, machines with AI algorithms are used for the diagnosis and thus decreasing the number of negative plates that need screening of retinal diseases ⁹.

applications of AI were studied, including infection control, presence of AMR genes in bacteria such as in disease diagnosis and microbiology¹⁰. Regarding infection *Staphylococcus aureus*, *MTB*, control, a few established health-care associated infection *aeruginosa*¹⁶. In addition, AI has also been used to aid in (HAI) surveillance programmes are used to analyse the development of new antimicrobial drugs. An example information from multiple data sources and observe would be the COVID-19 pandemic where researchers

"Multiple developed algorithms smears¹³ and in the diagnosis of are applied to predict the presence of AMR genes in bacteria such as in Staphylococcus aureus, MTB, and Pseudomonas aeruginosa"

With the unprecedented tsunami of novel digital patterns to identify clusters and predict the upcoming The transmission of an infection can be (MTB) infections on chest images by image analysis computer aided diagnosis. The latter was notably There are two subtypes of AI in medicine: physical and beneficial in areas with high MTB prevalence and shortage

> the diagnosis of malaria through reading of thick and thin blood bacterial vaginosis after training the machine on smears that are classified by Nugent rules¹⁴. In addition, at Johns Hopkins hospital AI algorithms were used to make a classification tree based on specific provided variables to identify the risk patients at of extended spectrum beta lactamase (ESBL) producing organisms causing

and convolutional neural network (CNN)^{13,14}. Millions of to be reviewed by the microbiology technician¹⁴. Al is used in the antimicrobial resistance (AMR) field as well¹⁶. When it comes to infectious diseases (ID), multiple Multiple developed algorithms are applied to predict the and Pseudomonas

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studied how the SARS-COV-2 virus infected hosts and used Al algorithms to search for approved medications that can counter the viral infection mechanism and cytokine storm, 8. Gong J et al. Computer-aided diagnosis of lung cancer: the and this has led to the identification of Baricitinib as a treatment option for COVID-19 infection¹⁷.

The future of ID relies on novel diagnostic tools¹⁸. This evolution is possible through the combination of AI and ML with various information (such vital as patients' signs, laboratory results, inflammatory markers and medical notes) to produce excellent clinically useful results and impact outcomes¹⁸. More research is being done to identify potential uses of AI in ID such helping bacterial in as identification¹⁴, and in the of discovery new antimicrobials¹⁷. Health care

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personnel must be trained on the uses and applications of Al in medicine, as it will be an essential component of healthcare in the future¹.

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Antibiotic Resistance in the News

WHO releases first-ever list of health-threatening fungi

AMR burden in Europe comparable to global estimates

The World Health Organization (WHO) has published a report highlighting the first-ever list of fungal "priority pathogens" - a catalogue of 19 fungi that represent the greatest threat to public health. The <u>WHO Fungal Priority Pathogens List (FPPL)</u> aims to focus and drive further research and policy interventions to strengthen the global response to fungal infections and antifungal resistance.

The WHO FPPL list is divided into three categories: critical, high and medium priority. The fungal pathogens in each priority category are ranked according to their public health impact and / or emerging antifungal resistance risk. The report sets out strategies for policymakers, public health professionals and other stakeholders to improve the overall response to these priority fungal pathogens including preventing the development of antimicrobial resistance.

Quadripartite release One Health plan of action

A new <u>One Health Joint Plan of Action</u> has been launched by the Quadripartite – the Food and Agriculture Organization of the United Nations (FAO), the United Nations Environment Programme (UNEP), the World Health Organization (WHO) and the World Organisation for Animal Health (WOAH). This initiative seeks to improve the health of humans, animals, plants and the environment at global, regional and country levels.

The five-year plan (2022-2026) is a response to international requests to prevent future pandemics and to promote health sustainably through the One Health approach. The report is built around six action tracks: One Health capacities for health systems; emerging and re-emerging zoonotic epidemics; endemic zoonotic, neglected tropical and vector-borne diseases; food safety risks; antimicrobial resistance; and the environment. Each action track consists of specific activities, deliverables and a timeline. The report aims to build on and complement existing global and regional One Health initiatives.

Keys to successfully reducing antibiotics in food animals

A <u>new report</u> from the Food and Agricultural Organisation of the United Nations and the Veterinary Medicines Directorate outlines the multisectoral, collaborative, voluntary approach to antibiotic stewardship in agriculture taken by the UK and Northern Ireland.

The UK has seen antibiotic sales for food-producing animals halve since 2014 (which was when the UK commissioned an independent review on antimicrobial resistance (AMR) chaired by Lord O'Neill). Over the same period, the use of highest-priority critically important antibiotics (HP-CIAs) has reduced by almost 80%. The UK's reduction in antibiotic consumption in agriculture makes it one of the lowest users of antibiotics across Europe and the lowest of those countries with a significant livestock farming industry.

The report highlights the UK's keys to success which includes development of strong relationships between producers, veterinarians and government, industry-led target-setting and cross-sectoral learning and sharing of experiences.

Authors of a new report in <u>The Lancet Public Health</u> estimated 541,000 deaths were associated with bacterial antimicrobial resistance (AMR) and 133,000 deaths were attributable to bacterial AMR across the 53 countries in the WHO European region in 2019.

Bloodstream infections accounted for the largest burden of AMR deaths (195,000) followed by intra-abdominal infections (127,000) and respiratory infections (120,000). Seven pathogens were responsible for approximately 457,000 deaths associated with resistance with Escherichia coli and Methicillin-resistant Staphylococcus aureus presenting the largest burden.

The highest mortality rates per 100,000 people were seen in eastern Europe (19·9 attributable to AMR and 74·0 associated with AMR) followed by central Europe (16·6 attributable and 68·0 associated). In comparison, western Europe had 11·7 deaths attributable to and 52·5 deaths associated with AMR.

In comparison with recently published global estimates, the AMR burden in this region (approximately 12% of the world's population) makes up 10.5% of the total estimated 1.27 million global deaths attributable to and 10.9% of the 4.95 million global deaths associated with AMR.

Knowledge gaps in antibiotic use in refugees and migrants

The <u>fourth report</u> from the WHO in the Global Evidence Review on Health and Migration (GEHM) series captures evidence related to antibiotic access and use in migrant and refugee populations.

It finds that the available evidence on refugees' and migrants' access to and use of antibiotics is scarce and is largely constrained to high-income contexts. For example, published evidence on access to antibiotics, comparisons with host populations, and quality of available antibiotics is almost non-existent for refugee camp settings in low and middle-income countries. However, it is clear that refugees and migrants face significant barriers to access and appropriate use of antibiotics along the care continuum for various reasons (including legal and financial barriers, resorting to use of informal networks to obtain antibiotics etc). The authors conclude that as international refugee and migrant populations may be particularly vulnerable to rising AMR, additional efforts are needed at a national level to align action plans on AMR with those on migrant and refugee health and access to health care more broadly.

New antibiotic combination effective against UTIs

A study in <u>JAMA</u> showed a combination of cefepime / enmetazobactam was more effective in treating complicated urinary tract infections (UTI) and acute pyelonephritis than a standard treatment of piperacillin / tazobactam.

The randomised trial included 1,034 patients across 90 sites in Europe, North and Central America, South America and South Africa.

79.1% of patients receiving cefepime / enmetazobactam were successfully treated compared with 58.9% receiving piperacillin / tazobactam. Of the 21% who had extended-spectrum β -lactamases infections, 73% who received cefepime / enmetazobactam were successfully treated compared with 51% on the standard therapy.

Incomplete AMR data in Africa

New data on antimicrobial resistance (AMR) collected and analysed by the <u>Mapping Antimicrobial Resistance and</u> <u>Antimicrobial Use Partnership (MAAP)</u> (headed by African Society for Laboratory Medicine) from sub-Saharan countries found only 5 / 15 antibiotic-resistant pathogens designated by the World Health Organization (WHO) as priority pathogens are being consistently tested. All five demonstrated high resistance.

MAAP reviewed 819,584 AMR records from 2016 to 2019 from 205 laboratories across 14 countries. MAAP also reviewed data from 327 hospital and community pharmacies and 16 national-level antimicrobial consumption (AMC) datasets.

Only 1.3% of the 50,000 medical laboratories forming the laboratory networks of the participating countries conduct bacteriology testing. Researchers also found that in 8 / 14 countries, more than 50% of the population is out of reach of any bacteriology laboratory.

The research also found that only four drugs comprised more than two-thirds of all the antibiotics used in healthcare settings. Stronger medicines to treat more resistant infections (e.g severe pneumonia, sepsis and complicated intra-abdominal infections) were not available, suggesting limited access to some groups of antibiotics.

MAAP is calling for a drastic increase in the quality and quantity of AMR and AMC data being collected across the continent along with revised AMR control strategies and research priorities.

New advice on AMS in hospitals for future pandemics

A statement from the <u>Society for Healthcare Epidemiology of</u> <u>America (SHEA)</u> offers healthcare providers (HCPs) guidance on preventing inappropriate antibiotic use in public health emergencies based on lessons learned during the COVID-19 pandemic. The pandemic exacerbated antibiotic resistance by increasing inappropriate antibiotic prescribing, particularly at the start of the pandemic. But this continued even after it became clear that coinfection with bacteria is uncommon with COVID-19, clinical indicators used to differentiate viral from bacterial infection were no longer valid and the harm of overuse became evident.

The statement urges facilities and HCPs to utilise antimicrobial stewardship programmes (ASPs) to counter inappropriate antibiotic prescribing. During a pandemic, ASPs can lead multidisciplinary teams to compile up-to-date evidence and disseminate care protocols; monitor prescribing and lab assay ordering to detect and mitigate over or improper use; and partner with infection prevention and control and incident command partners to integrate and support response efforts.

Pharmacists to prescribe antibiotics in England

From 2023, pharmacists in England will be able to prescribe antibiotics without involving a GP as part of a pilot scheme funded by NHS England.

The <u>pilot scheme</u> will allow prescribing pharmacists to treat a wider range of conditions including hypertension, high cholesterol, and minor illnesses. It is hoped the scheme will reduce the need for GP appointments.

Scotland and Wales already run similar schemes. The Department of Health and Social Care said data from Scotland indicate that enabling pharmacists to prescribe antibiotics for urinary tract infections alone could save 400,000 GP appointments a year and a total of £8.4m.

High levels of antibiotic used to treat UTIs in wastewater

Researchers have discovered that the levels of ciprofloxacin (commonly used to treat respiratory, skin and urinary tract infections, amongst others) are likely to result in increased antibiotic resistance (AMR) in wastewater.

Authors of a study in <u>Environment International</u> investigated the risk of AMR selection in UK wastewater and receiving waters by determining where measured environmental concentration data (n = 8,187) for four antibiotics (ciprofloxacin, azithromycin, clarithromycin, and erythromycin) collected in England and Wales from 2015–2018 (sites n = 67) exceeded selective concentration thresholds derived from experiments undertaken previously.

The authors found selection for AMR by ciprofloxacin is likely to have occurred routinely in England and Wales wastewater during that period, with some seasonal and regional trends. Wastewater treatment reduces the selection risk posed by ciprofloxacin significantly, but not completely, and predicted risk in surface waters remains high in several cases. Conversely, the potential risks posed by the macrolides (azithromycin, clarithromycin, and erythromycin) were lower than those posed by ciprofloxacin.

Supermarkets failing to reduce antibiotics meat supplies

A <u>new report</u> by the US PIRG Education Fund and several members of the Antibiotics Off the Menu coalition has found the majority of the top US grocery stores are not acting to stop antibiotic use in their meat and poultry supply chains.

The authors examined company policies of 12 major supermarkets regarding permitted or prohibited antibiotic use in meat and poultry produced for their private label products (this is the area in which supermarkets can make the most direct change) as well as the level of progress towards full implementation of any such policies. Based on this, the supermarkets were then graded (A—F). Eight out of 12 of the largest US supermarkets (including Walmart and Aldi) received the lowest ranking of 'F'. No supermarket received a rating higher than 'C'.

The report demonstrates that the grocery sector has taken little action to protect the health of their customers, ensure the welfare of animals on supplying farms or promote more sustainable food systems. It also highlights that most grocery companies lack any meaningful policies requiring their meat and poultry suppliers to eliminate the overuse of antibiotics.

Rapid test distinguishes between bacterial/viral infections

Authors of a new study in <u>JAMA Open Network</u> found a rapid diagnostic test based on immune host response could help differentiate between bacterial and viral infections in acute respiratory infections (ARI). The authors investigated whether the FebriDx – a rapid, point-of-care immunoassay – can distinguish bacteria from viral infections by measuring myxovirus resistance protein (MxA) and C-reactive protein (CRP) in finger-prick blood samples.

The test correctly classified 68 / 73 bacterial infections demonstrating a sensitivity of 93.2%, a specificity of 88.4%, negative predictive value (NPV) of 98.7% and positive predictive value (PPV) of 58.1%. The test correctly classified 208 / 296 viral infections demonstrating a sensitivity of 70.3%, a specificity of 88.0%, NPV of 66.7% and PPV of 89.7%. In the 158 patients with confirmed negatives, the bacterial and viral test results were negative in 156. The test could help reduce unnecessary antibiotics for viral ARIs.

Society News



ISAC Academy

ISAC pleased is to announce the launch its first e-module. of "Respiratory Tract Infections: Vaccination as tool for reducing AMR" а This course 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 and diagnostics before discussing the role of vaccines in reducing antimicrobial resistance.

The course was developed by ISAC's Immunisations and Vaccines Working Group, led by Dr David MacIntosh and Dr Mario Ramirez.



The course is free and participants will receive a certificate of completion on passing the course. <u>View the course here</u> or scan the QR code.

On demand webinars

ISAC has hosted numerous free, educational webinars as part of the ISAC Academy (www.ISAC-Academy.world) on a variety of infectious disease-related topics in collaboration with its Working Groups and Member Societies.

All ISAC webinars can be watched on the ISAC YouTube Channel free of charge. Scan the QR code or <u>click</u> <u>here to view the content</u>.





ISAC Project Grants

In 2020, ISAC launched its Project Grant initiative to award up to £10,000 for antimicrobial resistance / infectious disease research involving low- to middle- income countries (LMICs). We are pleased to share the summary from Dr Eric Ngyedu (*Cape Coast Teaching Hospital, Cape Coast, Ghana*) and colleagues, one of the first projects to have been awarded as part of the initiative.



Assessing the prevalence and drivers of over-the-counter sales of antibiotics among community pharmacies and over-the-counter medicine sellers in Ghana to develop mitigatory behaviour change interventions to tackle AMR: a mixed-methods study

Evidence from Ghana indicates high levels of over-the-counter (OTC) non-prescription antibiotic dispensing among pharmacies and over-the-counter medicine sellers (OTCMS) in community settings despite the illegality of this practice thus contributing to bacterial antimicrobial resistance (AMR).

Our study determined the prevalence of antibiotic dispensing, dispensers' knowledge of AMR and identified enablers of this practice to develop interventions via the COM-B behaviour change model using mixed methods. Simulated client visits and questionnaires assessed actual versus reported practice and knowledge of AMR respectively. In-depth interviews identified underlying drivers of OTC dispensing in four Ghanaian metropoles included in the study (i.e. 11% of Ghana's population).

High levels of willingness to dispense (88.3%, 234 / 265) were found across all simulated client visits with a significant difference seen among three demand levels for simulated viral upper respiratory tract infections (p=0.0005). Questionnaire responses revealed clients frequently requested antibiotics without a prescription and more than 80% of respondents at these outlets willing to dispense. Knowledge of AMR and its importance was highly variable among respondents. In-depth interview themes will be analysed to develop interventions aimed at curbing drivers of OTC dispensing among community drug outlets. This will ultimately enhance the proper use of antibiotics to mitigate AMR in Ghana.

Future congresses





Turkish Society of Hospital Infections and Control

33rd INTERNATIONAL CONGRESS OF ANTIMICROBIAL CHEMOTHERAPY November 3-6, 2024 | Istanbul





The 19th Asia Pacific Congress of Clinical Microbiology and Infection

July 6 (Thu) - 8 (Sat), 2023 COEX, Seoul, Korea





www.apccmi2023.com





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 95 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: 15.441)

• Journal of Global Antimicrobial Resistance (JGAR) - gold open access (impact factor: 4.349)

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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