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Re-aligning antimicrobial resistance research with response to the pandemic

The COVID-19 pandemic has changed how healthcare workers (HCWs) and the public behave and think about infections; in particular, the best methods of prevention and when to seek help and treatment\textsuperscript{1,2}. This pandemic has impacted population groups differently, placing those with socio-economic vulnerabilities at greatest risk of poor outcomes\textsuperscript{1,3}. Evidence is emerging on identifying changes to infection prevention practices and antibiotic prescribing behaviours during this pandemic\textsuperscript{4}.

Despite this, little focus has been placed on how the attitudes, experiences and behaviours of HCWs and members of the public influence and shape uptake of, and adherence to, desired infection prevention and control (IPC) practices and antimicrobial stewardship (AMS).

The misuse and overuse of antibiotics has been of major global concern prior to this pandemic\textsuperscript{4}, with increasing calls for better and more sustainable international collaborations to tackle it. Since the pandemic, the bi-directional interplay between antimicrobial resistance (AMR) and COVID-19 has contributed to increased secondary bacterial and fungal infections in hospitalised patients, particularly in low- and middle-income settings where there is already a high burden of AMR\textsuperscript{5–9}.

The ASPIRES project (Antibiotic use across Surgical Pathways - Investigating, Redesigning and Evaluating Systems) is a collaborative project funded by the Economic and Social Research Council (ESRC) as part of the Antimicrobial Cross Council initiative supported by the seven UK research councils\textsuperscript{10,11}. It is a collaboration of eight universities across four countries – the UK, South Africa, India and Rwanda – which aims to address AMR through a systems approach and implementation of behaviour change interventions to optimise antibiotic use along surgical pathways\textsuperscript{10,11}. Focused on building capacity for research in AMR using a social sciences approach in low– to middle– countries (LMICs), this research project has been impacted by the pandemic\textsuperscript{12}. The qualitative research undertaken as part of this partnership has highlighted the challenges in implementing AMS and IPC in surgical pathways and helped identify a framework for integrating AMS in surgical specialties\textsuperscript{13}. As part of this research, the experiences, perceptions and contributions of the surgical patients and their carers are being investigated, shedding a light on the significant role that they play in IPC and AMS whilst under surgical care\textsuperscript{14–20}.

As the pandemic unfolded, and in response to the recommendation of the International Advisory Board of the ASPIRES project, the decision was made to realign some of the research capacity to investigate the knowledge, attitudes and practices of healthcare workers and the public to IPC and AMS during the pandemic. Using an online platform, we developed two separate but closely aligned surveys investigating the knowledge, attitudes and practices of HCWs and the public in relation to the COVID-19 pandemic, the related IPC measures and antibiotic use. The surveys were first developed for India and South Africa and subsequently we were awarded a British Society for Antimicrobial Chemotherapy (BSAC) grant to extend the study to mainland China with colleagues at the University of Bristol and University of Beijing.

**Piloting and rolling out the surveys**

Two self-administered surveys were developed for HCWs and the public following iterative revisions for reliability, validity and internal consistency. Academic and clinical colleagues, and lay person representatives have piloted and contributed to the content of the surveys. Ethical approval for the international roll out of the HCW survey was obtained from Imperial College London. Local ethical approval for the roll out of the public survey was also obtained in UK, India and South Africa.
Preliminary findings
Survey dissemination in India and South Africa was between 15 September to 15 December 2020. During this time, there were 851 responses from the public across the two countries and 329 responses from HCWs. Understandably, the lower response from HCWs is due to the prioritisation of the clinical response to the pandemic. Nonetheless, the preliminary findings have highlighted important considerations, including:

Healthcare worker Survey
- Whilst both HCWs and the public identified the correct IPC measures required to avoid infection and to treat those who are suspected of or are diagnosed with COVID-19, a considerable number of HCWs did state that they required further training in appropriate use of personal protective equipment.
- Over half of respondents reported increased participation of inpatients in IPC practices.
- The majority of respondents strongly believed that complications from COVID-19 infection would increase the use of antibiotics and the threat of AMR.

Public survey
- Social media remains a key source of information on the pandemic for the public.
- Fever, cough, loss of taste or smell were identified as the most popular symptoms of COVID-19.
- Most respondents reported an improvement in their hand sanitising practice and some of the respondents commented that this change is sometimes against their will because of the rules and restrictions imposed in workplaces and general public places.
- Among the respondents who stated they had symptoms of COVID-19, almost half chose not to seek medical help. Among those who received medical help, most of them visited a GP while a few treated themselves with medicines at home and homemade remedies.

One in five respondents said they do not want to get vaccinated and the most common reason given was either because they were confident that they have a good immune system and are not among the high-risk population or because they felt the vaccine testing is a rushed process and cannot be trusted.

Participate in the survey
We are now extending this survey to more countries and welcome you to participate as a HCW, to provide information on your perspective. Click here to participate.

References
16. Nampoothiri P et al. The elephant in the room - The role and experiences of the patient in healthcare and decision-making in relation to antibiotic prescribing in India [Poster]. In: The 19th International Congress on Infectious Diseases (ICID); 2020. Poster No. EP.025
18. Singh S et al. Mapping the roles and responsibilities for infection prevention and antibiotic prescribing along the surgical pathway in India and South Africa: case studies [conference presentation] In: European Congress of Clinical Microbiology and Infectious Diseases (ECCMID). 2020. Session #01103
Global pharmacists’ contributions during the COVID-19 pandemic

Debra A. Goff1, Khalid Eljaaly2,3, Bradley J. Langford4,5

1The Ohio State University Wexner Medical Center, The Ohio State University College of Pharmacy Columbus, OH, USA; 2Faculty of Pharmacy, King Abdulaziz University, Jeddah, Saudi Arabia; 3College of Pharmacy, University of Arizona, Tucson, AZ, USA; 4Public Health Ontario, Toronto, 5Hotel Dieu Shaver Health and Rehabilitation Centre, St. Catharines, Ontario, Canada

Introduction
Pharmacists are medication experts and among the most accessible healthcare professionals. During the COVID-19 pandemic, physicians and nurses were recognised by the World Health Organisation (WHO), the news media and others due to their heroic frontline efforts. However, the pharmacists were overlooked1-3. Numerous COVID-19 educational resources were provided by pharmacy societies and organisations [Table 1]. This paper summarises the article5 “Global Contributions of Pharmacists during COVID-19 Pandemic” published in the Journal of American College of Clinical Pharmacy in December 2020. The purpose was to describe how pharmacists from selected high and low-income countries contributed to patient care and the public well-being during the COVID-19 pandemic [Fig 1 & 2].

The United States
An emergency medicine pharmacist was deployed to New York City to help in the city surge of COVID-19 patients. Pharmacists established a new ambulatory care COVID-19 clinic to assist in the management of COVID-19 patients post hospital discharge. The Ohio State University Wexner Medical Centre public relations team worked with an infectious diseases (ID) pharmacist for numerous COVID-19 education strategies. “ID Stewardship” is an online educational platform for ID pharmacists and antimicrobial stewardship (AMS) and managed by pharmacists5. The COVID-19 resources for pharmacists’ blog pages is frequently updated with clinically relevant COVID-19 pharmacotherapy literature. Numerous monthly Twitter chats in an international, multidisciplinary discussion about AMS in COVID-19 were organised.

United Kingdom
Pharmacists in the United Kingdom (UK) led on public health interventions, clinical and medicine supply management and policy changes. They developed national training guidance to support pharmacist redeployment to critical care settings, surveillance of antimicrobial utilisation as well as development and implementation of interventions to address antimicrobial resistance in the context of the COVID-19 pandemic. Some UK pharmacists, through the Commonwealth Partnerships for Antimicrobial Resistance and Commonwealth Pharmacists Association provided support outside the UK to colleagues in four African Commonwealth countries6.

Australia
Clinical pharmacists sit on the National COVID-19 Clinical Evidence Taskforce to develop national COVID-19 guidelines. A dynamic medication demand model was developed to project critical medication usage and availability across Australia. Clinical pharmacy services were expanded to a 24-hour service within one week. The pharmacists participating in this service were credentialed for Partnered Pharmacist Medication Charting to help with prescribing medications, ordering pathology investigations and documentation during ward rounds7. Pharmacists implemented “Telehealth” and provided clinical reviews for rural and regional outpatients of existing state-wide services including solid organ transplantation.

Canada
Pharmacists at Public Health Ontario (PHO) provided advice to healthcare stakeholders in Ontario and provincial government partners on safe medication use during the pandemic. Pharmacists at PHO are leading multidisciplinary research on bacterial co-infections8 and antibiotic prescribing in COVID-19 patients. A team of pharmacists from several institutions with patient advisors developed patient educational resources to address common myths about regarding COVID-19 medications, prevention and treatment9. At Hotel Dieu Shaver Health and Rehabilitation Centre, pharmacists developed guidelines and educated hospital staff on prevention and treatment of COVID-19 by creating a web forum to address common therapy-related questions.

Saudi Arabia
At King Abdulaziz University (KAU) and Hospital, a team of both ID physicians and ID pharmacists was initiated to manage COVID-19 patients and create relevant protocols. To reduce COVID-19 spread, restriction of antimicrobials was modified from a paper based to an electronic based process. An ID pharmacist won a COVID-19 grant and was a member of a few data safety monitoring boards of randomised clinical trials of COVID-19 patients. The faculty of pharmacy at KAU added new lectures and activities to include COVID-19 content in the PharmD curriculum and created a COVID-19 rotation for pharmacy interns.
Qatar

The pharmacy department at Hamad Medical Corporation (HMC) promoted social safety through a medication home delivery service, staff re-distribution and installing glass shields in outpatient pharmacies. HMC’s pharmacy driven anticoagulation clinic started a drive-through service to monitor the international normalised ratio and make therapeutic changes as appropriate10. The drug information and toxicology centre initiated a national helpline for the public to answer general questions about medications and provide medication counselling if necessary. A team of clinical pharmacists was involved in the country’s core team for COVID-19 responsiveness.

South Africa

Pharmacists in the 54 Netcare private hospital network played a significant role in the maintenance and supply of critical medications used for COVID-19. Pharmacists contributed to preparation of the material ‘packs’ for commonly used surgical items as well as therapeutic packs to facilitate supply of medication in the wards. A Monitored Emergency Use of Unregistered Interventions study was designed by a pharmacist and aimed to monitor patients receiving off-label medications for COVID-19. Pharmacists published a national COVID-19 guideline for pharmacists11. The Sefako Makgatho Health Sciences University staff initiated the manufacturing of hand sanitisers.

Lebanon

Managerial roles in the Ministry of Public Health and in the Ministerial National Committee on COVID-19 were assigned to Lebanese pharmacists12. Guidance was issued by the Order of Pharmacists in Lebanon to promote the role of community pharmacists in public education on disease prevention and in referral of suspected patients to COVID-19 centres.

Retail pharmacists played important roles as gatekeepers in containing shortages in drugs and medical supplies by controlling over-dispensation and black-market pricing. Despite the economic crisis, political unrest and poor healthcare system, Lebanese pharmacists contributed to the successful emergency response plans.

Nigeria

Pharmacists at the University of Nigeria dedicated their time to managing over-prescribed antimicrobials and immune boosters in the face of no approved treatment for COVID-19. A pharmacist from the Clinical Pharmacy Department is part of the National Scientific Advisory Committee on verification of COVID-19 cure claims. In the face of illegal and large-scale production of low-quality products by unapproved chemical product vendors, the pharmacy laboratories produced high-quality sanitisers and disinfectants, which are currently being used in hospitals across Enugu State in Nigeria and are sold at lower prices at pharmacies.

Conclusion

Although pharmacists were often overlooked as essential frontline health care providers by the news media, the public and politicians, the authors are hoping that this list of pharmacist contributions from nine countries can help to change this perspective.

References


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An innumerable number of publications and articles have appeared in the scientific and mainstream literature on the impact of COVID-19 on the antimicrobial resistance (AMR) scenario and the challenge of AMR on the COVID-19 pandemic. AMR is one of the biggest challenges the healthcare system ever faced. The medical community and the policymakers are well versed with the seriousness of AMR, though the public perception of AMR is still patchy. COVID-19 locked down the world and taught every living human being how mighty the microbes are and what they can achieve!

The COVID-19 pandemic made humanity slow down and rethink their priorities. Politicians and policymakers are now willing to go to any extent to tackle the microbial armies’ attacks. The world, despite genuine efforts, failed to implement AMR action plans and policies in most countries. Why can’t we utilise the new momentum generated by the pandemic to implement the AMR action plans in all countries?

The collective efforts of countries, organisations and activists succeeded in bringing AMR to the forefront, culminating in the WHO Global AMR Action Plan and UN political declaration on AMR. Unfortunately, in most countries the plans at national and subnational have been at a snail’s pace. Sadly, we could not utilise the momentum we created.

The COVID-19 pandemic has generated an unprecedented level of awareness about the challenges created by microbes. Let us relaunch the global AMR action plan and convince the policymakers and politicians to implement the action plans.

We do know that the public is the most crucial stakeholder in implementing AMR action plans. It is doubtful whether we previously understood this aspect and involved the public, especially in the low-middle-income countries (LMICs). Nonetheless, we now unmistakably know that the public is the essential stakeholder in controlling the COVID-19 pandemic. At least now we should apply this principle to AMR. Diagnostics, vaccines and therapeutics play a colossal role in controlling COVID-19. At the same time, the scientific community and the public debated every component’s role in detail. The public became the judge and the jury. So let us be prepared to answer the public's questions while reattempting to implement the AMR action plans.

The pharmaceutical industry is an essential stakeholder in AMR action plans. At the same time, we should never allow the industry to monopolise the plans. We followed the strategy during the COVID-19 pandemic—acknowledging the industry’s importance—but keeping it at arm’s-length, without blindly following its commands like a flock of sheep following a shepherd.

The public and the media analysed every component of the clinical trials and implementation plans during COVID-19. Now that the public antenna is up, let us try our best to maintain the transparency during the implementation of the AMR action plans. The public expects it. Let us take the public along with us. Let us utilise the visual and print media to the best possible extent. Let us discuss each component of the AMR action plans in the media debates, clarify the public’s doubts and involve them actively in the decision-making. We can successfully implement the OTC (Over the Counter) sales rule if we convince the public. We can significantly reduce the growth promotional use of antibiotics in animal farming if we convince the public of this practice’s dangers. If we can convince the public of the dangers of hospital-acquired infections, they will lead advocacy to improve the hospitals’ infection control standard.

COVID-19 has taught us how to survive a pandemic. Let us utilise this experience to tackle the AMR pandemic!
50% of COVID-19 patients prescribed antibiotics despite low rate of bacterial infection
The Pew Charitable Trusts published a report which found more than 50% of COVID-19 related hospitalisations incurred at least one antibiotic prescription in the first six months of the pandemic. The authors used electronic health records of 5,000 – 6,000 hospitalised patients to evaluate the frequency of bacterial infections and antibiotic prescriptions from February to July 2020. Compared to the number of hospitalised COVID-19 patients who received antibiotics, far fewer patients admitted for COVID-19 had common bacterial infections (20% with bacterial pneumonia and 9% with a urinary tract infection). Although it typically takes 48 hours to confirm a bacterial infection, in 96% of admissions for patients diagnosed with COVID-19 in which an antibiotic was prescribed, the patient received the first antibiotic at admission or within the first 48 hours of hospitalisation. Antibiotic stewardship programmes should play a critical role in helping to reduce inappropriate antibiotic prescribing in COVID-19 patients.

Increased AMR during the COVID-19 pandemic
A review published in *International Journal of Antimicrobial Agents* shows a rapid increase in multidrug resistant organisms (MDROs), pan-echinocandin-resistant *Candida glabrata* and multi-triazole-resistant *Aspergillus fumigatus* during the COVID-19 pandemic. The rise is mainly due to high rates of antibiotic prescribing in COVID-19 patients. The unnecessary use of antibiotics would be associated with a significant economic burden on healthcare systems, which could be directly caused by the drug itself and indirectly by healthcare cost for the management of the drug-related adverse events. Following the principles of antimicrobial stewardship programmes, quality diagnosis and aggressive infection control measures may help prevent the occurrence of MDROs during this pandemic.

Social science recommendations to address antibiotic use
A report published by *London School of Hygiene and Tropical Medicine* provides insight into how social science research can inform efforts to alter antibiotic use. The report is a collaborative work with leading social scientists who work across various institutions, disciplines and countries. The authors collated insights from social science research into antibiotic use in humans and animals in a diverse range of global economic, social and health system settings. The report raises important questions including how to move from standardised approaches to developing, refining and monitoring impacts of interventions locally.

New antimicrobial resistance resource for vets
The Australian Department of Agriculture, Water and the Environment has funded a new, free antimicrobial resource, for veterinary practitioners. The *AMR Collective* is a website and learning resources to assist practitioners by keeping them up to date with the latest information on antimicrobial resistance in animals and humans and promote antimicrobial stewardship in daily practice.

No “one-size-fits-all” solution to global AMR battle
Antibiotic misuse is particularly prevalent in low- to middle-income countries (LMICs). To gain more insight into this problem, the authors of a study published in *The Lancet Global Health* compared community-based antibiotic access and use across communities in Africa and Asia over 2.5 years. Vietnam and Bangladesh had the largest proportions of non-licensed antibiotic dispensing points. Self-medication with antibiotics was found to be widespread in Vietnam (55-2% of antibiotics dispensed without prescription), Bangladesh (45-7%), and Ghana (36-1%) but less so in Mozambique (8-0%), South Africa (1-2%) and Thailand (3-9%).

“A tailored approach is needed in each country,” says Heiman Wertheim of RadboudUMC / ISAC and APUA Board member.

"There is no "one-size-fits-all’ solution."

Soap linked to rise in superbugs
The Director of Monash University’s *Centre to Impact Antimicrobial Resistance*, Prof. Lithgow has warned that antibacterial soaps are causing a global rise in superbugs. Use of antimicrobial soaps has risen during the COVID-19 pandemic, with people believing they provide better protection against germs and disease. However, antimicrobial soaps are no more effective than regular soaps. When antimicrobial or antibacterial soaps are rubbed on hands and then washed down the sink, they contribute to antimicrobial resistance and create superbugs. Prof. Lithgow has called for a public campaign - the message is not how to wash your hands – it’s what to wash your hands with.

AMS programme reduced antibiotic use and *C. difficile*
A study of 402 US hospitals, published in *JAMA Open Network*, has found that implementation of the Agency for Healthcare Research and Quality Safety Program for Improving Antibiotic Use was associated with a reduction in antibiotic use and hospital-onset *Clostridioides difficile* (*C. difficile*) infection rates. The Safety Programme worked with hospitals to establish antimicrobial stewardship programmes (ASPs) and with frontline clinicians to improve antibiotic decision making. Adherence to key components of ASPs improved from 8% to 74% over the one-year period of study. The incidence rate of hospital-onset *C. difficile* laboratory-identified events decreased by 19.5%.

The greatest reduction in antibiotic use was observed in sites most actively engaged in the Safety Program.

Five days of antibiotics to treat paediatric pneumonia
Researchers from McMaster University showed that five days of high-dose amoxicillin in the treatment of pneumonia in children was as effective as ten days of the same antibiotic. The study, published in in *JAMA Pediatrics*, included 281 children with community-acquired pneumonia in an outpatient setting. 85.7% of those receiving short-course treatment and 84.1% of those receiving the longer-course were cured after 14 – 21 days. The authors recommend clinical practice guidelines consider recommending five days of amoxicillin for paediatric pneumonia.
Intervention lowers antibiotic prescriptions in companion animals

Antibiotics are amongst the most commonly prescribed pharmaceutical agents in companion animals, particularly cats. A study in *Nature Communications* by the University of Liverpool’s Small Animal Veterinary Surveillance Network (SAVSNET) looked at whether prescriptions of the highest priority critically important antimicrobials (HPCIA) could be reduced. The authors used electronic prescription data to identify above average antibiotic prescribing practices which were assigned to either a control group, a heavy intervention group or a light intervention group. Both intervention groups were provided with educational material, in-depth benchmarking and follow-up meetings. Over eight months after intervention, the heavy intervention group saw a reduction in prescriptions of 23.5% and 39.0% for canines and felines respectively compared with the control group (0.6% and 7.4%).

International travel contributes substantially to global spread of MDR Gram-negative bacteria

A recent study in *The Lancet Microbe* found exposure to multidrug-resistant (MDR) bacteria during travel to certain parts of the world may be far greater than previously thought. Scientists collected daily stool samples from 20 European visitors to Laos over 22 days. 74% contained MDR Gram-negative bacteria – previous studies found this to be between 30 – 70%.

Most previous studies of travellers have only described acquisition of extended-spectrum β-lactamase-producing (ESBL) *E. coli*. In addition, a substantial number of ESBL-producing non-*E. coli* Gram-negative bacteria, such as *Citrobacter* (9%), *Klebsiella* (5%), *Acinetobacter* (4%), and *Enterobacter cloacae* (4%). Even low numbers of *Aeromonas spp* and *Stenotrophomonas maltophilia* were identified. Seven different ESBL-producing species and 83 unique strains were detected in the stool samples over the course of three weeks.

Antibiotics in Swedish hospital wastewater

The authors of a study published in *Environmental International* investigated wastewater at a large Swedish hospital and at the inlet and outlet of the local municipal treatment plant for comparison. The authors first removed bacteria from the wastewaters by filtering and then tested how the filtered wastewater affected bacteria in different controlled test systems in the laboratory.

“In all assays, antibiotic-sensitive bacteria were rapidly killed by the hospital wastewater, while the multi-resistant ones continued to grow,” said Joakim Larsson, lead investigator.

“The wastewater entering the municipal treatment plant, primarily made up of wastewater from households, showed a very slight effect, while we could not see any effect of the filtered wastewater.”

Although the wastewater entering the Göta Älv river is not selecting for resistant bacteria, the strong selection by hospital wastewater is a concern. As antibiotic use is low in Sweden compared to other countries, hospital wastewaters from other countries may also favour resistant bacteria, but this would need to be investigated.

CBD effective against antibiotic-resistance pathogens

A study published in *The Lancet* evaluated antimicrobial activity of cannabidiol (CBD), the main non-psychoactive component of cannabis. CBD and other cannabinoids have selective activity against a subset of Gram-negative bacteria that includes drug-resistant pathogen *N. gonorrhoeae*. The authors demonstrate that it is effective against a much larger number of Gram-positive bacteria than previously reported, including antibiotic-resistant pathogens such as *E. faecium* and methicillin-resistant *Staphylococcus aureus* (MRSA). Authors also show that CBD does not lead to resistance after repeated exposure, is effective at breaking down biofilms (a common example of which is dental plaque) and topical *in vivo* efficacy.

FDA approved sweeteners may cause AMR

Commonly used non-nutritive sweeteners (saccharine, sucralose, aspartame, and acesulfame potassium) can promote the spread of antibiotic-resistant genes in the intestine, according to a new study in *ISME Journal*. The authors used three model conjugation systems to investigate if artificial sweeteners would encourage the transfer of antibiotic resistance genes between bacteria. They found that sweeteners do promote plasmid-mediated conjugative transfer between the same bacteria and different phylogenetic strains. The findings provide insight into antimicrobial resistance spread and indicate the potential risk associated with the presence of non-nutritive sweeteners.

MDR strains of *S. aureus* spread between pigs and humans

A study published in *Emerging Infectious Diseases* investigated antimicrobial-resistant (AMR) *Staphylococcus aureus* (*S. aureus*) transmission between pigs and humans. Over the years, the authors have been collecting samples of *S. aureus* from pigs, farmworkers, farmworkers’ family members and community residents in 10 pig-producing counties in North Carolina. For the findings, DNA was sequenced from 49 of these samples to determine how the strains found in pigs and people are related.

One finding was that all these isolates, whether taken from humans or pigs, belonged to a grouping of *S. aureus* strains known as clonal complex 9 (CC9), a novel and emerging subpopulation of *S. aureus*. Authors also found that the strains were very closely related, providing evidence for transmission between pigs and people. Most of the strains

Almost half of women prescribed wrong UTI treatment

Almost 50% of women in both rural and urban settings are receiving inappropriate antibiotics for urinary tract infections (UTIs), according to a study published in *Infection Control and Hospital Epidemiology*. The study of over 670,450 US commercially insured women with uncomplicated UTIs between the ages of 18 and 44 also found that over three quarters were prescribed antibiotics for too long. Rural women were more likely to receive prescriptions for longer than necessary. Over the course of the study, there was only a slight improvement in proper antibiotic prescriptions based on current clinical guidelines. The findings highlight the need for antimicrobial stewardship interventions to improve UTI antibiotic prescribing, particularly in rural settings.
ISAC has hosted the first two webinars in its COVID-19 series. The third free webinar in the series is:

**COVID-19 Variants: what are they and what do they mean for the global pandemic?**
on 12 April 2021 at 12.00 GMT / 14.00 CET.

**Register today.**

As the pandemic has progressed, molecular epidemiology has been an important tool in monitoring the progress of the infection across the world. Novel variants of SARS-CoV2 have been identified and there has been much speculation about the characteristics of these variants in terms of transmissibility, pathogenicity and vaccine escape. This exciting webinar will explore these issues and the role of new virus variants in the development of the pandemic. Find out more at ISAC.world.

**COVID-19: Around the World in 80++ Minutes**
This webinar brought a global view of the pandemic from those on the front-line in diverse parts of the world. It covered aspects of epidemiology and genomics, screening, control, treatment and consequences of infection. The speakers, all leaders in their fields, have a unique perspective of how the pandemic affects their regions. Watch the webinar here.

**COVID-19 Vaccines**
The second timely ISAC webinar reviewed the three major vaccine candidates currently licensed for use. Three experts in their field who are also involved in their national vaccination programmes each covered one of the vaccine types. Both webinars were well attended with attendees from 76 countries joining the Vaccines symposium. Watch the webinar here.

**MRSA Surveillance Programmes Webinar**
ISAC’s MRSA Working Group hosted a recent webinar to review national and regional surveillance programmes for Methicillin-Resistant *Staphylococcus aureus* (MRSA). The first meeting included brief presentations from laboratories in several countries that undertake MRSA surveillance. This was followed by discussion to assess best practices. The goals were to understand the variety of approaches to surveillance worldwide and to develop principles that may underlie future harmonisation of surveillance methods. Watch the webinar here.

**New Early Career Working Group – call for members**
ISAC is looking for members active in the field of antimicrobial resistance / antimicrobial chemotherapy to join and develop its new Early Career Working Group. This Working Group aims to serve as a platform for communicating with senior researchers and provide young researchers opportunities to build long-lasting networks. The criteria to join is as follows:

- Must identify as Early Career Professional under the age of 35 or awarded PhD degree in the last five years in antimicrobials or a related field.
- Be a member of an ISAC Member Society (preferable, not essential).

The group is Chaired by Jinxin Zhao, PhD candidate at the Laboratory of Antimicrobial Systems Pharmacology, Monash University, Australia. Find out more at ISAC.world.
To acknowledge World Antibiotic Awareness Week 2020, APUA Board members recorded a series of short, informative videos on antibiotic resistance (AMR) during COVID-19. AMR has been largely neglected during the pandemic and these videos aimed to raise awareness of AMR. Watch all the videos on APUA’s YouTube channel.

**ISAC Project Grant Awardees**

Member Societies were invited to apply for ISAC Project Grants (up to £10,000) to fund antimicrobial research projects in low- to middle-income countries. The decision on which projects to fund was difficult — many more applications were received than could be funded and the competition was strong. After careful consideration by a panel of experts, three important projects were selected that address research gaps with demonstrable and achievable goals.

The call for 2021 applications will open soon. Visit the website for more information.

**APUA News**

**AMR videos for World Antibiotic Awareness Day**

To acknowledge World Antibiotic Awareness Week 2020, APUA Board members recorded a series of short, informative videos on antibiotic resistance (AMR) during COVID-19. AMR has been largely neglected during the pandemic and these videos aimed to raise awareness of AMR. Watch all the videos on APUA’s YouTube channel.
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”.

APUA has affiliated Chapters in 19 countries. The APUA network facilitates the exchange of objective, up-to-date scientific and clinical information among scientists, healthcare providers, consumers and policy makers worldwide.

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 the APUA website for more information.

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 92 national and regional societies, which in turn have over 50,000 individual members. Visit the website 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. Visit the website for more information

ISAC has two society journals:

- International Journal of Antimicrobial Agents (IJAA)
- Journal of Global Antimicrobial Resistance (JGAR) - gold open access

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

Map illustrating ISAC / APUA’s global reach