

Newsletter

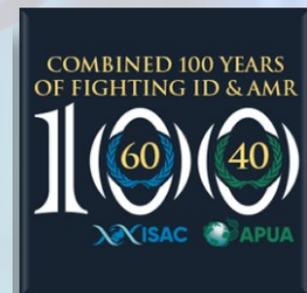
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100 years of fighting ID and AMR: celebrating ISAC & APUA

2. **The way forward: ISAC 2025**
Andreas Voss and Geoff Coombs
4. **The impact of COVID-19 on antimicrobial stewardship
and antimicrobial resistance**
Pierre Tattevin
5. **Antimicrobial stewardship in the ICU in COVID times: the
known unknowns**
Sara Haddad, Anthony Kerbage, Jeroen Schouten and Souha S. Kanj
7. **History of the International Society of Antimicrobial
Chemotherapy (ISAC)**
Alasdair Geddes

ISAC & APUA and Other Antimicrobial Resistance News

10. **Antimicrobial Resistance in the News**
12. **ISAC's Society News**
14. **About ISAC / APUA**





The way forward: ISAC 2025

Professor Andreas Voss and Professor Geoff Coombs

ISAC President and President Elect



After recently celebrating the International Society of Antimicrobial Chemotherapy's (ISAC) and the Alliance for the Prudent Use of Antibiotics' (APUA) "combined 100-years anniversary of fighting infectious diseases and antimicrobial resistance", it is now time to look at the way forward. ISAC currently has a worldwide membership composed of 94 member societies, which in turn have over 60,000 individual members. As ISAC membership continues to grow, the ISAC Executive Committee believes the Society's future focus should be to ensure membership for the societies under the ISAC umbrella becomes more attractive and rewarding.

Although the COVID-19 pandemic has prevented all of us from traveling around the globe, thanks to online meetings it has brought the Executive Officers and Executive Committee members closer and more frequently together. Furthermore, we have taken this opportunity to "virtually meet" the leadership of some of our ISAC Member Societies. As we have found online meetings to be very successful, we have decided most future communication between the Executive Members and with our Member Societies will be online. By reducing the number of face-to-face meetings, ISAC anticipates it will be able to increase its financial support for more prolific activities whilst at the same time reducing its carbon footprint.

ISAC will continue online meetings as the main form of communication, which will increase the Society's financial support towards other activities and decrease its carbon footprint.

A request by one of our societies for more educational material resulted in ISAC establishing the 'ISAC Academy'. In 2020 we commenced a series of free webinars which initially focused on COVID-19. The first webinar was on "COVID-19: Around the World in Eighty Minutes" which brought a global view of the pandemic from those on the front-line in diverse parts of the world. In 2021 we continued the COVID theme with webinars on "COVID-19 Vaccines", "COVID-19 Variants", "COVID-19 Effective Treatments" and "What is Long COVID?". In collaboration with our Working Groups, we also arranged webinars on "Regional and National MRSA Surveillance Programs Worldwide", "Rapid Diagnostics and Biomarkers at the Heart of Patient Management" and "Hot Topics in Infections in Critical Care". Recordings of all the webinars are freely available on the [ISAC website](#).

In 2022, in cooperation with the British Society for Antimicrobial Chemotherapy (BSAC), we will commence developing e-Learning modules. BSAC and ISAC will also provide a massive open online learning course (MOOC) on infection prevention and control.

In co-operation with our Working Groups / Member Societies we will further develop the ISAC Academy to provide free and open access education.

One of ISAC's principal activities is production of the *International Journal of Antimicrobial Agents* (IJAA) in collaboration with Elsevier. IJAA provides comprehensive and up-to-date peer reviewed reference information on the physical, pharmacological, *in vitro* and clinical properties of individual antimicrobial agents. In addition, it signals new trends and developments in the field through highly authoritative review articles on antimicrobial agents, immunomodulators and immunotherapy. The journal's impact factor continues to increase and in 2021 was 5.283, ranking it 17 out of 92 in Infectious Diseases.

Every month, the Editor-in-Chief, Jean-Marc Rolain and his Scientific Assistant, Dr Sophie Baron, choose one or two articles for the Editor's Choice section. These articles are open access for a limited time and can be [viewed here](#). ISAC member societies can take advantage of reduced subscription rates. [For further information please click here](#).

ISAC member societies can take advantage of reduced IJAA subscription rates.

ISAC's second journal, *Journal of Global Antimicrobial Resistance* (JGAR) is a collaboration between ISAC, the Asia-Pacific Society of Clinical Microbiology and Infection (APSCMI) and the Global Chinese Association of Clinical Microbiology and Infectious Diseases (GCACMID). JGAR is a quarterly online journal run by an international Editorial Board headed by Editor-in-Chief Stefania Stefani and supported by Dr Simona Purrello, Scientific Assistant.

The journal focuses on the global spread of antibiotic-resistant microbes and aims to track the resistance threat worldwide and to give a comprehensive view of how infectious disease experts are challenging the problem. The journal's impact factor is 4.035 ranking it 34 out of 92 in Infectious Diseases.

In 2020, JGAR became a fully open access journal with no subscription charges. Authors publishing in JGAR can make their work immediately, permanently and freely accessible to researchers worldwide. JGAR automatically applies Article Publishing Charge (APC) waivers or discounts to those articles for which all authors are based in a country eligible for the Research₄Life programme. If an author group from a non-Research₄Life country cannot afford the APC to publish an article and they can demonstrate they have had no research funding, ISAC will consider individual waiver requests on a case-by-case basis.

JGAR article publishing charges are automatically waved for authors in a country eligible for the Research₄Life programme.

Over the last two years, the Society's website has significantly developed and has become a useful educational resource. On the website members can access many of ISAC's resources including publications, antibiotic resistance resources, ISAC activities, the ICC 2019 abstracts and the ISAC webinars. This will be developed in 2022 when the ISAC Academy is launched. In addition, information on ISAC's Working Groups, Member Societies, future events, awards and research projects grants is available.

Due to the ongoing COVID-19 pandemic, the Society's 32nd International Congress of Antimicrobial Chemotherapy (ICC), which was due to take place in November 2021, had to be postponed. The ICC which will be co-hosted by the Australian Society for Antimicrobials (ASA), will now be held in Perth, Australia from **27-30 November 2022**.

The programme is currently being put together by the scientific programme committee, which is jointly chaired by Serhat Unal from ISAC and John Turnidge from ASA. The programme will cover many different aspects of antimicrobials and infectious diseases which we believe you will find both scientifically stimulating and informative. The committee will be calling for abstracts from **1 February 2022**. Future updates and announcements can be found on the congress website. We look forward to meeting you in Perth in 2022.

32nd ICC2022
Perth, Australia 27 – 30 November 2022
(<https://32icc.org/>)

Over the last few years ISAC has reached a secure and stable financial position that allows us to invest in our Society. Having the right technical and personnel support has allowed us to employ most of the activities we had envisioned. Our two excellent executive officers, Fiona MacKenzie and Fee Johnstone, have largely been responsible for implementing most of the Society's new initiatives. Although finance, accounting and legal support remains outsourced, and other specialised functions are presently regarded as unneeded, other tasks may grow between now and 2025.

While tasks and capacity within the executive office are presently aligned, additional support might be necessary on the way to 2025.

For the ISAC Working Groups, we believe those groups that are active should be rewarded which is why we have initiated financial support for yearly reports and publications, as well as a small yearly budget.

To re-establish APUA as a brand under ISAC, APUA has its own budget. All working groups have been invited to develop e-Learning modules and establish webinars.

Working Groups will receive increasing support over the years, but the amount of support will be based on performance standards and goals.

In addition to travel-grants for the ICC, ISAC has awarded small research grants for projects in low to middle income countries (LMICs). Three were awarded in 2020 and another three will be awarded in 2021 – the awardees will be announced soon.

In 2021 we committed to a large, 3-year-guidance development project for antimicrobial use in LMICs in collaboration with APUA.

ISAC, however needs to identify other possibilities for (other types of) grant support in the coming years.

While spending more on (grant) support within the present limits, ISAC should find new ways and/or partners to develop new type of support models and generate possibilities for additional research, education, and guidance.

As we look forward, please don't forget the past...

To celebrate the combined 100 years anniversary of fighting infectious diseases and antimicrobial resistance for ISAC and APUA, ISAC held a webinar which can be watched via the ISAC website or ISAC's YouTube Channel. We would like to thank Emeritus Professor Alasdair Geddes and Professor Pierre Tattevin for their wonderful reflections on ISAC and APUA.

And of course, we thank all Executive Committee members, past and present, who have helped and continue to help shape the society.

Not an ISAC member...

...ISAC encourages national and regional professional societies active in antimicrobial chemotherapy, clinical microbiology, and infectious diseases to affiliate with ISAC. Membership costs nothing but there are many advantages to your society being affiliated:

Benefits of Membership includes:

- i. **Reduced subscription** to the ISAC's very successful journal, International Journal of Antimicrobial Agents.
- ii. ISAC also has a **gold open access** journal, the *Journal of Global Antimicrobial Resistance*.
- iii. **Reduced registration** for many conferences and workshops ISAC organises worldwide.
- iv. Priority to join **ISAC Working Groups** on specialist subjects.
- v. **ISAC Project Grants** are available exclusively to ISAC Member Society applicants.
- vi. **ISAC travel grants** to attend the bi-annual International Congress of Chemotherapy (ICC); only available to members of affiliated societies.
- vii. ISAC also offers **education fellowships** for periods of travel to a foreign centre of excellence for up to 3 months; only available to members of affiliated societies.
- viii. Priority to **publish articles in ISAC / APUA newsletter**.
- ix. Priority to submit proposals for **collaborative webinars**.

To apply for ISAC affiliation is easy. Email secretariat@ISAC.world for an application form.



The Impact of COVID-19 on Antimicrobial Stewardship and Antimicrobial Resistance

Professor Pierre Tattevin

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The impact of the COVID-19 pandemic on health care systems will probably never be fully characterised, as it extends to so many topics. Antimicrobial stewardship (AMS) is no exception, as documented by the rich and expanding medical literature in the field. One of the most striking features of the data on this issue is the heterogeneity of this impact according to the health care systems and the robustness of pre-existing AMS programmes: the same trigger (COVID-19 pandemic) could have the opposite impact, from a dramatic decrease, to a dramatic increase in antimicrobial consumption. Interestingly, most studies that extended during a long period documented an improvement of this impact, as if a better knowledge of the features of COVID-19 pneumonia allowed the prescribers to decrease their rate of antibiotic prescriptions as they gained expertise in this puzzling disease.

The impact of respiratory virus outbreaks on antibiotic use was documented long before COVID-19 and is not unexpected given that i) respiratory viral diseases may mimic bacterial infections; ii) the use of rapid diagnostic tests that would discriminate bacterial from viral infections remains limited in most settings; iii) respiratory viral infections may be associated with bacterial coinfections and superinfections, that would in turn lead to increased antibiotic use¹. In addition, COVID-19 is responsible for a tricky viral pneumonia, with a clinical and radiological presentation very close to that of bacterial pneumonia, which led to a 100% rate of antibiotic prescriptions for cases managed early in the pandemic². Furthermore, severe COVID-19 cases that require intensive care unit (ICU) admission could be considered as a perfect storm for increased use of antibiotics as i) it commonly occurs in patients with comorbidities; ii) it requires treatments that induce immunosuppression (dexamethasone, etc.); iii) the duration of mechanical ventilation and ICU stays may extend to several weeks; iv) ICUs were often largely understaffed during the pandemic and health care workers with limited experience in ICUs were involved in patient care, which is a well-known risk factor for increased antibiotic use³. The combination of these factors led to an increased risk of antimicrobial resistance (AMR)⁴.

However, the COVID-19 pandemic was also associated with parameters that may decrease antibiotic use, including the postponement of non-essential surgeries and the decreased risk of human-to-human transmission of many pathogens, due to increased use of personal protective equipment (masks, hand hygiene), and decreased social interactions (lockdowns). In addition, as we gained experience with COVID-19 pneumonia, it became clear that bacterial coinfections or superinfections were rare, estimated at, respectively, <5%, and <20% in patients admitted for COVID-19⁵. However, in ICU patients, inadequate empiric antibacterial therapy was associated with increased mortality in COVID-19 patients, which justifies the use of broad-spectrum antibiotics in patients with high suspicion of bacterial infections¹¹.

The resulting effect on antibiotic use has been dramatically heterogeneous according to country and timing of the pandemic, as illustrated in the meta-analysis by Langford *et al*⁶. In some countries, (e.g. Canada), antibiotic use in the community decreased by >30% during the first wave of the pandemic⁷. In France, similar trends were observed overall, although the use of antibiotics initially thought to be active on COVID-19 pneumonia (e.g. azithromycin), increased. Other countries documented a dramatic increase of antibiotic use, and, as could be expected, of AMR^{8,9,10}. Despite this heterogeneity, most studies found that antibiotic use decreased over time, illustrating that prescribers improve when they gain experience with a disease⁴.

What are the main take-home messages from this overview on the impact of the COVID-19 pandemic on AMS and AMR? Firstly, keep in mind that bacterial infections, and superinfections, are rare in COVID-19 pneumonia. Hence, most patients admitted with COVID-19 pneumonia should not be treated with antibiotics. As for the motivational poster produced by the British government in 1939 in preparation for World War II, 'Keep calm and carry on' would apply for the physicians fighting this unprecedented crisis. Secondly, the heterogeneity of COVID-19 impact on antibiotic use worldwide illustrates the importance of AMS programmes: when these programmes were in place for a long time, with dedicated staff, antibiotic use tended to decrease during the pandemic, while it dramatically increased in other countries. This advocates for increased investment on AMS programmes worldwide.



These data were partly presented during the APUA/ISAC symposium of the XXth congresso de la Asociacion Panamericana de Infectologia and the XVth congresso de la Dociedad Dominicana de Infectologia

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Antimicrobial stewardship in the ICU in COVID times: the known unknowns

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Since the start of the COVID-19 pandemic, there has been concern about the concomitant rise of another hidden but equally relevant pandemic: antimicrobial resistance (AMR)¹. Distinction between infectious and non-infectious (inflammatory) causes of respiratory deterioration in COVID-19 patients is difficult and the much-debated relevance of bacterial, fungal and viral co-infections adds to the complexity. In a recent paper, we addressed some of the challenges that are faced in applying stewardship principles in the management of COVID-19 patients admitted to intensive care units (ICU)². Below is a summary of the points raised.

Bacterial infections in COVID-19

Severe COVID-19 infection presents with clinical, radiological and laboratory signs that mimic those of bacterial pneumonia, and initiation of empirical antibiotic treatment has therefore been common practice³. However, this widespread empirical antibiotic use upon admission is not supported by contemporary data as bacterial coinfections seem rare in COVID-19 patients admitted to hospital wards and ICUs⁴⁻⁷.

In addition, it is very challenging to diagnose bacterial superinfection in patients with COVID-19 as there are no specific radiographic features that distinguish between viral and bacterial pneumonia. Moreover, in a recent systematic review and meta-analysis, procalcitonin (PCT) was shown to have a pooled sensitivity and specificity of 0.55 for bacterial infections when using a cut-off value of 0.5 µg/L, making it too low to be of real clinical value⁸. However, the specificity of PCT increases with increasing levels. Thus, the measurement of PCT on diagnosis of COVID-19 may influence the decision to initiate or withhold antibiotics. In addition, serial measurements of PCT offer insight into the “inflammatory dynamics” of patients. PCT-guidance may also be used once antibiotic therapy has been initiated to shorten the duration of treatment⁹⁻¹¹.

For patients developing septic shock however, empirical antibiotics should be started promptly according to standard antibiotic guidelines and based on local epidemiology with the aim of providing as optimal antibiotic coverage as possible.

On another note, COVID-19 infection often presents with a prolonged state of pro-inflammatory response, and it can therefore be challenging to assess treatment response based on the normalisation of laboratory and clinical markers such as leukocyte count, C-Reactive Protein (CRP), fever, need for vasopressors etc. This may be even more difficult when patients are treated with immunomodulatory agents such as

corticosteroids, Tocilizumab or Anakinra. Studies have shown that CRP and PCT levels are markedly influenced by immunomodulatory therapy and do not follow their classic kinetics¹². Fixed duration of therapy is therefore recommended and available evidence indicates that shorter duration of 5-8 days is without disadvantages compared to older recommendations of 10-14 days¹³.

Coronavirus associated pulmonary aspergillosis (CAPA)

Early in the course of the pandemic there was a concern about the emergence of invasive pulmonary aspergillosis¹⁴ complicating severe COVID-19 disease, including reports on azole resistant aspergillus pneumonia¹⁵. Overuse and abuse of antifungal agents might be partly responsible.

Coronavirus associated pulmonary aspergillosis (CAPA) poses diagnostic challenges as it is difficult to differentiate colonisation from invasive disease in critically ill COVID-19 patients. Previously established diagnostic criteria may not be

valid in COVID-19 patients for a number of reasons¹⁶: first, characteristic radiological features (nodular lesions ± halo signs, cavitation) may not be present in COVID-19 Acute Respiratory Distress Syndrome (ARDS) and findings may overlap with superimposed infiltrates from viral or bacterial infections. Second, the galactomannan (GM) test does not have the same sensitivity as in neutropenic patients¹⁷. Third, histopathologic diagnosis, which is the gold standard for diagnosis, is

difficult to obtain because lung biopsy has been considered unsafe in this pandemic. Similarly, bronchoscopy and bronchoalveolar lavage are not favoured in this population because of the risk of viral transmission to health care workers and the risk of bronchoscopy leading to intubation. On the other hand, relying on deep tracheal or sputum samples may yield false positive cultures (confounded by aspergillus environmental contamination). Therefore, determining clear diagnostic criteria for CAPA helps in guiding the decision to initiate antifungal treatment in order to reduce the risk of emergence of resistance.

Cytomegalovirus (CMV) reactivation during COVID-19

CMV reactivation is important to consider in COVID-19 patients as it may have a role in modulating patient immune response and therefore increasing the risk of other opportunistic pathogens, as well as a potential effect on COVID-19 viral elimination and response to the cytokine storm. CMV reactivation is common in critically ill ICU patients, presenting from viraemia to end-organ damage; and is usually associated with poor outcomes and increased morbidity and mortality¹⁸⁻²⁰.

“Widespread empirical antibiotic use upon admission is not supported by contemporary data as bacterial coinfections seem rare in COVID-19 patients admitted to hospital wards and ICUs”

Adverse events of CMV treatment include acute kidney injury and bone marrow suppression, among others. Unfortunately, treatment of CMV reactivation in critically ill COVID-19 patients may lead to further complications, especially in the context of existing lymphopaenia and sepsis. Therefore, treatment of CMV reactivation should be considered on a case-by-case basis weighing the risks versus benefits of therapy.

Pharmacokinetics/pharmacodynamics (PK/PD) alterations in COVID-19 patients

COVID-19 patients are at high risk for PK changes, just like any patient in the ICU^{21,22}. The most important contributors to PK changes in critically ill patients are changes in the volume of distribution (VD), changes in protein binding and changes in drug clearance²³⁻³¹. Thus, inadequate drug concentrations may be encountered, putting the patients at risk for both under-dosing and over-dosing, with associated toxicity.

In order to increase target attainment, a variety of strategies including extended and continuous infusion of selected antibacterials, with loading dose is mandatory in this setting. Renal function should be closely monitored to identify impairment. Monitoring should not only include creatinine levels / clearance or urine volume, but also other factors, such as the presence of haematuria and proteinuria^{32,33}. As reduced kidney function and acute kidney injury may be more prevalent in patients with COVID-19 compared to sepsis from other causes, therapeutic drug monitoring is of particular relevance for antibiotics with potential toxicity such as vancomycin or aminoglycosides³⁴.

Also, considering that nosocomial pathogens with higher MICs may be more often encountered, the importance of antimicrobial dosing cannot be overestimated and leniency towards higher concentrations for many antimicrobials is justified.

Conclusions

General stewardship principles regarding starting, adapting and stopping antimicrobial treatment remain relevant in COVID-19 patients. However, some of the established principles of ICU antimicrobial stewardship may need adaptation in this population. Therefore, we point to the need for more studies and suggest the direction of such research.

Antimicrobial Stewardship domain	COVID-19 patients
Empirical therapy on ICU admission (community acquired)	Refrain from empirical antibacterial therapy unless in septic patients
Empirical therapy during ICU admission (nosocomial)	Consider using PCT to decide upon starting antibacterial therapy in patients who did not receive immunomodulatory therapy Regimen in septic patients should include coverage for Gram positive pathogens and resistant Gram negative pathogens in the right scenario guided by the local epidemiology If <i>Candida auris</i> is identified in the centre, empiric coverage needs to be considered if bacterial infections are less likely
COVID associated invasive pulmonary aspergillosis (CAPA)	Consider CAPA as a nosocomial infection but do not routinely use antifungal prophylaxis Perform appropriate diagnostics to establish CAPA upon clinical findings Therapy should be started in some patients if they fulfill certain criteria
Management of CMV reactivation	Uncertainty: treatment of CMV reactivation should be considered on a case-by-case basis
Antimicrobial dosing	Consider altered Pk/Pd due to COVID-19: there is a risk for both underdosing and overdosing
ICU: intensive care unit; PCT: procalcitonin; PK/PD: Pharmacokinetics/pharmacodynamics	

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History of the International Society of Antimicrobial Chemotherapy (ISAC)

Professor Alasdair Geddes

Former ISAC Trustee / Editor of International Journal of Antimicrobial Agents (IJAA)

Chemotherapy

The word **Chemotherapy** originally signified compounds used for the treatment of infection and was initially defined in 1910 by the Nobel Laureate Paul Ehrlich, discoverer of the therapeutic use of Salvarsan, an arsenical compound, for the treatment of syphilis. The word literally means “treatment of diseases by chemicals” from the German “Chemotherapie” and its roots, the scientific prefix chemo- “chemical,” and the Greek therapeia, “healing.”



Antimicrobial Agents

It was not until 1936 that the next antimicrobial chemotherapeutic agents were introduced - the sulphonamides, discovered by Domagk, another Nobel Prize winner. This was later followed in the early 1940s by the development of penicillin by Fleming, Florey and Chain, who were also awarded the Nobel Prize. In 1952, Streptomycin was discovered by Waksman, yet another Nobel Laureate. The name Chemotherapy therefore had a distinguished antimicrobial origin! Whereas a chemotherapeutic agent signifies any compound active against microbes, the term “antibiotic” was initially reserved for compounds, such as penicillin, derived from micro-organisms which have activity against other micro-organisms.

Anti-cancer agents

In the 1940s, nitrogen mustard and folic acid antagonists, the first drugs with clinical activity against malignant cells, were introduced, soon followed by methotrexate in 1951. 6-mercaptopurine was introduced in 1953 by Hitchings and Elion, who subsequently discovered the antimalarial compound pyrimethamine, the antibacterial trimethoprim, and the anti-viral compound acyclovir. Hitchings and Elion were awarded the Nobel Prize jointly in 1988.

International Society of Chemotherapy for Infection & Cancer

In the 1950s, several European physicians and scientists, headed by Helmut Kuemmerle of Germany, proposed a society dedicated to studies of drugs used for the treatment of infections and cancer. They named it the International Society of Chemotherapy for Infection and Cancer (ISC).

International Congresses of Chemotherapy

It was further proposed to hold regular meetings and discussion groups and the first International Symposium of Chemotherapy was held in Geneva in 1959. Fifty delegates

were expected, but 600 delegates from 30 countries attended! However, it was not until 1961 that the ISC was formally established on the occasion of the Second International Symposium of Chemotherapy, held in Naples, Italy. The third meeting in Stuttgart in 1963 was renamed the International Congress of Chemotherapy (ICC), which has remained its title to the present date. These Congresses have continued to be held every two years and have attracted 5,000 registrants or more. The fourth Congress was held jointly with Interscience Conference of Antimicrobial Agents & Chemotherapy (ICAAC) in Washington DC in 1965 as were the 1979 congress (Boston) and the 2015 congress (San Diego). Joint Congresses were also held jointly with ESCMID in 2007 (Berlin) and 2011 (Milan).



Change of Name

Although intrinsically linked in the early years, the specialties of antimicrobial and anti-cancer chemotherapy diverged and became independent specialties. The International Society of Chemotherapy for Infection and Cancer gradually oriented towards antimicrobial chemotherapy as more and more antimicrobials emerged. Those dealing with anti-cancer drugs developed their own societies. Indeed the word chemotherapy has been high-jacked by the oncologists!

In 2017, the ISC Executive Committee undertook a strategy review in consultation with its Member Societies. The review process resulted in a new name for the society: the International Society of Antimicrobial Chemotherapy (ISAC), reflecting the principal focus of the society. The Society’s future congresses will be titled the International Congress of (Antimicrobial) Chemotherapy (ICC).

Aim of ISAC

ISAC aims to advance the education and the science of therapy of infection through the establishment of an international federation of affiliated national and regional societies with similar aims and objectives to its own. ISAC is a federation of Member Societies. It currently has a worldwide membership composed of 94 Member Societies (**Figure**) which in turn have over 60,000 individual members. The Society is governed by its Executive Officers, Executive Committee and Council. The ISAC Council consists of the Executive Committee and representatives of ISAC Member Societies and meets at least every two years during the society’s biennial ICC congress.



Society Presidents

Originally, ISC / ISAC Presidents served for four year periods. However, more recently this has been changed to a two-year tenure (Image).

Personal Reminiscences of Congresses

My first attendance at an ICC was in Washington DC in 1965; I attended most of the subsequent congresses until 2015. I have special memories of two

Congresses, both in the UK and both under the aegis of the British Society for Antimicrobial Chemotherapy (BSAC). I was a member of the planning committees of both meetings. The first was in London in 1975, held in Imperial College. The venue was obtained free of charge, by courtesy of Sir Ernst Chain (see above), who had an honorary appointment in the college and whom I met at the Congress. Much of the Congress Secretariat came from our own hospitals, again free of charge! The Proceedings of the Congress were published in eight hardback volumes. The genesis of this first UK based Congress was unusual; it should have been held in an Eastern European city, but circumstances prevented this. This only became known at the previous (8th) Congress in Athens, at which the Congress President, George Daikos, suggested to several senior UK delegates that London was the only place where a congress could be organised at two years' notice –flattery of course! A very small Professional Conference Organising company run by two mature ladies was hired; a most successful congress resulted with several thousand attending delegates. When the second UK ICC was held in Birmingham in 1999, I was the Congress President. Distinguished scientists from around the world added lustre to the presentations and several thousand registrants attended. By that time, costs had risen dramatically and no longer was everything free; however, an operational profit was made. The Birmingham ICC was the last Congress at which anti-tumour chemotherapy featured as a significant entity. Another Congress memory was meeting a guest speaker, Professor Omura from Japan, the co-discoverer of ivermectin, a widely used anthelmintic which has recently been shown to be active against SARS CoV-2 (the COVID-19 causative virus). Professor Omura became a Nobel Laureate in 2015.

Topics discussed at Congresses

Subjects discussed at the congresses include the assessment of new antibiotics, their antimicrobial spectrum, pharmacology, adverse reactions and clinical use. In the 1950s, when I was a medical student, there were less than a dozen available antibiotics, but by the 1970s and 1980s the numbers had increased dramatically. Alas, so had bacterial resistance. A genuine fear of a lack of effective therapeutic agents emerged

and indeed, in later years, the development of new antibiotics has decreased significantly. Antimicrobial drugs are generally

very safe and few have serious side-effects compared to most other groups of drugs. The principal problem associated with their use is the development of microbial resistance which was first observed with streptomycin and *Mycobacterium tuberculosis* in the late 1960s. Indeed, Sir Alexander Fleming

commented on the possibility of resistance developing in his Nobel Laureate address in 1945.

Resistance is now a major problem and has led to the concept of Antimicrobial Stewardship, attempting to prevent the development of resistance and to preserve the usefulness of antibiotics. These matters have become major topics at international conferences whereas the introduction of new antimicrobial agents dominated earlier congresses. Commencing in the late 1960s and burgeoning in later decades the relationship between the pharmaceutical industry and the ISC developed in the mutual pursuit of investigation of new antimicrobial classes of compounds. In addition to very significant scientific input, the industry additionally provided generous financial support and sent many of their distinguished scientists to participate in Congresses, often presenting novel antimicrobial compounds.

Journals

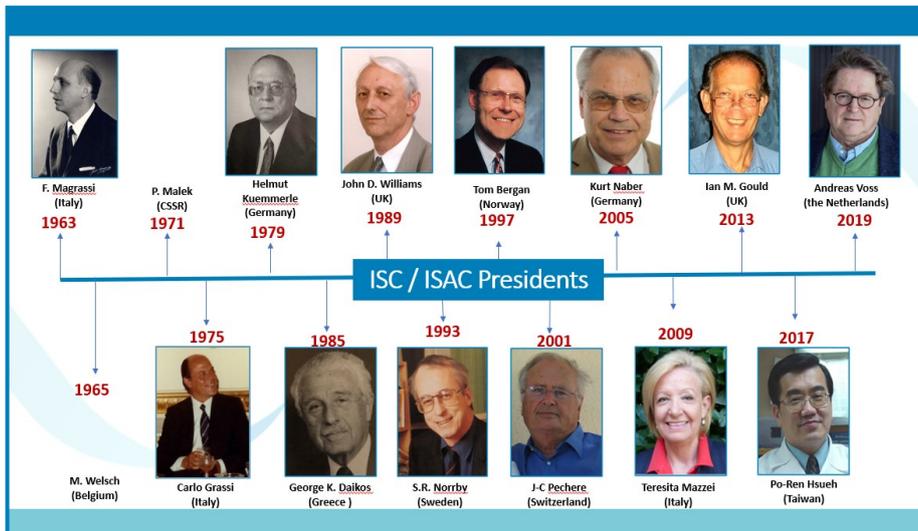
The *International Journal of Antimicrobial Agents* (IJAA), founded initially by the publishing company Elsevier, became the flagship journal of the Society in 1999. The *Journal of Global Antimicrobial Resistance* (JGAR) was founded in 2013. Both journals are very successful with increasing Impact Factors, currently 5.283 for IJAA and 4.035 for JGAR.

Working Groups

The Society has 22 Working Groups in specific areas of interest) ([see the website for all groups and to find out how you can join](#)).

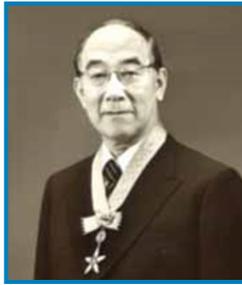
APUA

In 1981, Stuart Levy founded the **Alliance for the Prudent Use of Antibiotics (APUA)**; the first organisation to address antibiotic preservation; a topic which has become a specialty in its own right; that of "antimicrobial stewardship". Coinciding with Stuart's retirement, APUA merged with ISAC in 2019, given ISAC's further refining of its focus towards antimicrobial stewardship and antimicrobial resistance. The mission of APUA is to strengthen global defences against infectious disease by ensuring access to effective treatment and promoting appropriate antibiotic use to contain drug resistance.



Awards & prizes

The premier award of the Society is the Hamao Umezawa Memorial Award (HUMA) which is funded by the Japanese Microbial Chemistry Research Foundation in memory of Professor Hamao Umezawa (1914-1986), a distinguished Japanese scientist who discovered inter alia the antibacterial drug kanamycin and the anti-cancer compound bleomycin. The HUMA is awarded biennially in association with the ICC. It honours individual researchers, scientists or clinicians who have made outstanding contributions in the field of antimicrobial chemotherapy. Each awardee delivers a keynote lecture at the ICC. [See list of previous awardees.](#)

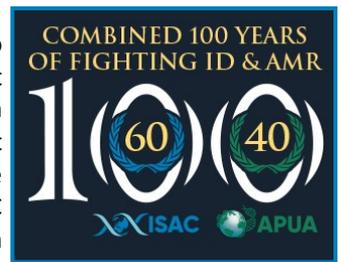


Other Society awards include the Masaaki Ohkoshi Award sponsored by the Japanese Urinary Tract Infection Committee, the Yen Award sponsored by the Taiwan Society of Microbiology, the Tom Bergan Award (in memory of ISC President, 1997-2001) and the JD Williams Award (in memory of ISC President, 1989-93). Young Investigator Awards are awarded to suitable applicants to attend ISAC Congresses.

Combined 100 years of “Fighting ID and AMR”

2021 marks 100 combined years of fighting infectious diseases (ID) and antimicrobial resistance (AMR) for ISAC and APUA, as ISAC and APUA celebrate their 60th and 40th anniversaries respectively.

Originally, there were plans to celebrate these milestones at the 32nd ICC in Australia in 2021. However, the current pandemic has resulted in the postponement of the next ICC which will now take place in 2022. Undoubtedly, the celebrations will go ahead albeit a year late, but it was felt important to mark these anniversaries during 2021. The COVID-19 pandemic has seen a shift towards a more virtual world and fewer face-to-face meetings – hopefully a temporary measure. Consequently, ISAC launched a series of online webinars during 2021 as part of a wider “ISAC Academy” initiative.



[A special ISAC / APUA anniversary webinar was held in October 2021 and can be watched here.](#)

The full version of this article can be found in both ISAC's journals—[International Journal of Antimicrobial Agents \(IJAA\)](#) and [Journal of Global Antimicrobial Resistance \(JGAR\)](#)





Antibiotic Resistance in the News

Public consultation on draft Antibiotic Book

The World Health Organization (WHO) has launched a public consultation on a draft of its “WHO Essential Medicines List Antibiotic Book”.

The publication provides information on prescribing and use of the antibiotics on the WHO Model List of Essential Medicines for the empiric treatment of common infections in adults and children. It also includes information on epidemiology, common causative pathogens, diagnostic strategies and the impact of antimicrobial resistance on antibiotic selection. It has been developed by an international expert working group of specialists in infectious diseases, antimicrobial resistance and public health. [The consultation is open until 31 January 2022.](#)

National Health Service: removing drug traces from wastewater

NHS Scotland has identified reducing pharmaceutical and medicine waste as a priority for action in its draft Climate Emergency and Sustainability Strategy (2022 – 2026).

Residues of pharmaceuticals not properly disposed of or those that pass through the body can be found in water, soil and sludge and in organisms. The paper sets out plans to trial methods to eliminate pharmaceutical residues from hospital wastewater by building on the work carried out by [NHS Highland](#) and the [One Health Breakthrough Partnership](#) which tested one hospital’s wastewater for eight commonly used medicines. Seven were found including painkillers, antibiotics, heart medicines and antidepressants.

NHS Scotland will also work to reduce pharmaceutical waste through improved prescribing, dispensing and patient support as well as by supporting clinicians to consider environmental impacts when making prescribing decisions.

[The consultation is open until February 2022.](#)

Effects of AMS programme on urology outpatients

Authors of a new study published in the [American Journal of Infection Control](#) evaluated antibiotic consumption in patients with lower urinary tract symptoms (LUTS) including neurogenic bladder (NB), with urinary tract infections (UTI) or suspected UTI between the Infection Control Team (ICT) era (pre-2014) and Antimicrobial Stewardship Programme (ASP) era (post-2014). The study compared ASP and ICT data at Hyogo Central Rehabilitation Hospital, Kobe, Japan.

The authors studied antimicrobial use density (AUD), antimicrobial agent costs, isolation of urinary tract infection (UTI)-causing organisms and their antimicrobial susceptibilities.

The authors found the ASP contributed to decreased AUD and related costs, improved susceptibilities of *E. coli* (cefotiam, levofloxacin, sulfamethoxazole / trimethoprim) and *K. pneumoniae* (minocycline) to several kind of antibiotics compared with the ICT era. The ASP had a better method of infectious disease (UTI) treatment than the ICT model.

Appropriate interventions have been shown to reduce antibiotic use, antibiotic resistance and health care costs.

Treating infections in the elderly cost the US healthcare system almost \$2 billion

A new article in [Clinical Infectious Diseases](#) reports estimated healthcare costs, length of stay and mortality associated with infections due to multidrug-resistant (MDR) bacteria among elderly patients admitted for inpatient stays in the Department of Veterans Affairs healthcare system between 2007—2018. The authors included both community and hospital acquired infections.

The authors estimated the burden of six MDR infections in 87,509 patients ≥65 years of age compared with 835,048 matched controls without infections.

Overall, authors found that drug-resistance infections in the elderly cost \$1.9 billion in healthcare costs, 400,000 days in hospital and more than 10,000 deaths among patients.

The paper is accompanied by an editorial on [Urgent, Comprehensive Federal Action Needed To Stem Mortality and Medicare Costs Associated With Antimicrobial Resistance](#) – a call to action for the policies necessary to reduce the burden of antimicrobial resistance, including federal investments in antibiotic stewardship, antibiotic innovation, surveillance, research, diagnostics, infection prevention, the infectious diseases workforce, and global coordination.

Minimal effect of amoxicillin in paediatric chest infections

Authors of a study in [The Lancet](#) assessed whether amoxicillin reduces the duration of moderately bad symptoms in children with uncomplicated (non-pneumonic) lower respiratory tract infection (LRTI) in primary care.

432 children aged 6 months to 12 years with symptoms for less than 21 days were randomly assigned to receive amoxicillin versus a placebo three times a day for seven days.

Duration of moderately bad or worsening symptoms were only slightly better in the group assigned to antibiotics than to those assigned to the placebo group (5 days versus 6 days). No differences were seen for the primary outcome between the treatment groups in the five pre-specified clinical subgroups (patients with chest signs, fever, physician rating of unwell, sputum or chest rattle, and short of breath). The authors conclude that amoxicillin for uncomplicated chest infections in children is unlikely to be clinically effective either overall or for key subgroups in whom antibiotics are commonly prescribed.

Superbugs website to educate children on AMR

Researchers from the universities of Bristol and Cardiff in the UK have created a new website to educate children on how infection takes place and the growing threat of antimicrobial resistance (AMR). “[Superbugs](#)” was created by a group of scientists and teachers and provides interactive content on the microbial world with a specific focus on AMR. Superbugs is a joint initiative run by staff from the universities of Bristol and Cardiff and funded by the Wellcome Trust ISSF and Cardiff University Systems Immunity Research Institute.

Thawing permafrost threatens to release bacteria & viruses

As part of the [ESA-NASA Arctic Methane and Permafrost Challenge](#), new research published in [Nature Climate Change](#) reveals that ancient biological, chemical and radioactive materials could be released as warming temperatures thaw permafrost.

Over millennia, natural processes, accidents and intentional storage have contributed to the accumulation of the diverse compounds that are currently sequestered in northern high-latitude permafrost, ice and snow. With the Arctic warming at two to three times the mean global rate, up to 65% of the Arctic's near-surface permafrost may be lost by 2100, releasing known and unknown hazards into the global environment.

Deep permafrost (>3m) is one of the few environments on planet earth that has not been exposed to modern antibiotics. More than 100 diverse microorganisms in Siberia's deep permafrost have been found to be antibiotic resistant. These antibiotic-resistant bacteria were identified in permafrost dating back tens of thousands of years with species even more abundant in active layers in older, deeper permafrost. As the permafrost thaws, there is potential for these bacteria to mix with meltwater and create new antibiotic-resistant strains.

Global antimicrobial use increases by 46%

Authors of a new study in the [Lancet Planetary Health](#) incorporated antibiotic usage and consumption data and used geostatistical modelling techniques to estimate global antibiotic consumption for 204 countries between 2000 – 2018. The study provides a comparative analysis of total antibiotic consumption rates in humans globally, expressed as defined daily doses (DDD) per 1,000 population per day.

The global volume of antibiotic consumption increased by 46%, an increase mainly driven by low- to middle- income countries (LMICs) (+76%). High- and upper-middle income countries (HIC) consumption rates remained stable over the period. Authors found the largest increases in North Africa and the Middle East (+111%) and South Asia (+116%). However, overall antibiotic consumption was not equally distributed and was considerably greater in high- and upper-middle income countries (particularly in North America, Europe and the Middle East) than in low-income countries (such as sub-Saharan Africa and parts of southeast Asia).

Authors also studied classes of antibiotics and showed particularly high increases in fluoroquinolones and third-generation cephalosporins.

The analysis identifies both high rates of antibiotic consumption and a lack of access to antibiotics, providing a benchmark for future interventions.

Antibiotics in livestock falls by 50%

The UK Government's Veterinary Medicines Directorate UK-Veterinary Antibiotic Resistance and Sales Surveillance ([UK-VARSS](#)) has found the UK to have one of the lowest levels of antibiotic use in Europe. The use of Highest Priority Critically Important Antibiotics in animals continues to decline with a total reduction of 79% since 2014. Since 2019, reductions in antibiotic use were reported by the pig, chicken, turkey and gamebird sectors.

The success in reducing antibiotic use can be attributed to effective stewardship; farmers and vets working together to tackle antimicrobial resistance through proper use of antibiotics. The full report will be available later this year.

Antibiotic resistance bacteria found in Swedish bears

Researchers analysed historical DNA scrapings to study the temporal progression of antimicrobial resistance (AMR) in wild brown bears in Sweden.

The samples were obtained from the Swedish National Museum and date back 180 years.

The authors divided the sampling period into five time periods based on historical antibiotic use in Sweden:

1. Pre-1951 (pre-antibiotics era before commercial production began in Sweden);
2. 1951–1970 (antibiotic production and use was increasing);
3. 1971–1985 (concerns about increasing AMR were first voiced but no official measures put in place);
4. 1986–2000 (control measures were implemented);
5. Post-2000 (ongoing control measures in Sweden have resulted in decreased sales of antibiotics)

The authors found that AMR load in the bear samples mirrored the use of antibiotics in Sweden in the last 80 years. There was a spike in AMR load from 1950s – 1990s when antibiotics were introduced and increasing and a decrease in the 2000s after the implementation of national control measures including the ban of agricultural use of antibiotics. The study, published in [Current Biology](#), suggests public health policies can be effective in limiting human-associated AMR contamination of the environment and wildlife.

Lower dose and shorter duration of antibiotics for children with pneumonia

The CAP-IT Randomized Clinical trial published in [JAMA](#) compared the effect of amoxicillin dose and treatment duration on the need for retreatment in 814 children with community-acquired pneumonia (CAP). An antibiotic was prescribed at discharge from the emergency department, observational unit, or inpatient ward. Retreatments within 28 days was assessed.

Children were randomly assigned to receive oral amoxicillin at either a lower dose (35–50 mg/kg/d) or a higher dose (70–90 mg/kg/d) and to receive either a shorter course (3 days) or a longer course (7 days).

Retreatment for those on the lower dose was virtually the same as those on the higher dose (12.6% vs 12.4%). Similarly, the results were exactly the same for those taking the antibiotic for 2-days vs 7 days (12.5%).

β-lactams over vancomycin may reduce early mortality in BSI patients

In a study published in [Clinical Infectious Diseases](#), authors studied 3,376 patients with bacterial blood stream infections (BSIs) between 2016 and 2020. Of these patients, 79% received a β-lactam and 20.5% received vancomycin as their first antibiotic.

The β-lactam agents were piperacillin-tazobactam (47.9%), cefepime (42.0%), and meropenem (5%).

Authors found that when the first antibiotic given is a β-lactam, as opposed to vancomycin, the risk of 7-day mortality is reduced by 52%. Similar results were observed when evaluating 48-hour mortality. Administration of vancomycin prior to a β-lactam was not associated with improved survival in the subgroup of 524 patients with methicillin-resistant *Staphylococcus aureus* BSI. Authors state 'prioritizing initial β-lactam administration has the potential to save 737 lives per year, underscoring the significant impact of a relatively simple practice change.

Society News

Upcoming webinars

Hot topics on infections in critical care

Organised by ISAC's Infections in the ICU & Sepsis Working Group

8 December 2021 @ 10.00 (CET)

Programme

Introduction & welcome
Diagnosis and management of severe community-acquired pneumonia
Diagnosis and management of abdominal sepsis
Management of infections caused by MDR Gram-negative pathogens
Management of *S. aureus* bacteremia
Viral infections in the Intensive Care Unit
Role of biomarkers for sepsis diagnosis in critically ill patients
Antibiotic de-escalation
Antibiotic stewardship (in COVID-19 era)
Therapeutic Drug Monitoring and antibiotic optimisation in the Intensive Care Unit
Host-targeted immunotherapies in the Intensive Care Unit
COVID-19 in haematological malignancies: outcome of infection and the effects of vaccination
Ventilator-associated pneumonia in COVID-19 patients
Management of severe COVID-19 infection
Closing remarks

ISAC Webinar

Despoina Kourenti, *Australia / Greece*
Antoni Torres, *Spain*
Jan De Waele, *Belgium*
Patrick Harris, *Australia*
Stefan Hagel, *Germany*
Sotirios Tsiodras, *Greece*
Pedro Pova, *Portugal*
Liesbet DeBus, *Belgium*
Jeroen Schouten, *Netherlands*
Hafiz Abdul-Azi, *Australia*

Antoine Roquilly, *France*
Evangelos Terpos, *Greece*

Andrew Conway Morris, *United Kingdom*
John Marshall, *Canada*
Despoina Kourenti, *Australia / Greece*

Hot topics on infections in critical care

ISAC is delighted to invite you to join this webinar organised by ISAC's Infections in the ICU and Sepsis Working Group.

Internationally leading experts will provide short presentations with up-to-date information on trending topics of infection and sepsis in critical care.

The webinar is free, open all and will take place on:

8 December 2021 at 10.00 (CET).

[Register here](#)

New roles of beta-lactamase enzymes

Please join the first of two **free** webinars that will be held in December by ISAC's **Anti-infectives Working Group**. The first session is by IJAA Editor in Chief, Jean-Marc Rolain on "New Roles of beta-lactamase enzymes" on **15 December 2021**.

[Register here.](#)

More details on the second webinar with speaker Dr Jaime Lora-Tamayo (Spain) on **22 December 2021** will follow soon [on ISAC.world](http://on.ISAC.world).

Email antiinfectives@ISAC.world with any queries.

New roles of beta-lactamase enzymes

Organised by
ISAC's Anti-Infective Pharmacology Working Group /
China Agricultural University

ISAC Webinar



Professor Jean-Marc Rolain

IHU Méditerranée Infection

Editor-in-Chief of International Journal of Antimicrobial Agents

Over the last years, the discovery of beta-lactamase encoding sequences in different organisms and also in humans and arthropods, has opened a new field of research of their roles, since these enzymes are multi-functional and have a very ancient evolution in kingdom of life. This talk will provide some examples of such discovery, including new roles of these enzymes in different fields.

Wednesday 15 December 2021
08.00 CET (Marseille, France)
15.00 CST (Beijing, China)
18.00 AEDT (Melbourne, Australia)

Register now

<https://forms.gle/yXLEP89Fopq9iWpN6>

For any queries, please email Anti-Infective Pharmacology Working Group at antiinfectives@ISAC.world

ISAC Webinars On Demand

WHAT IS LONG POST COVID ?
28 September 2021
13.00 - 14.30 (UK)
14.00 - 15.30 (CET)

Program
13.00 - 13.05 Introduction (Chair, Yampa Gant)
13.05 - 13.25 Immunological changes in long COVID - Preliminary data Yampa Gant
13.25 - 13.45 Microbiology and immunology aspects Maimo de Jong
13.45 - 14.05 Clinical aspects - Neuropsychiatry Igin Ünal Çevik
14.05 - 14.25 Clinical aspects - General Itzhak Levy

Speakers
Maimo de Jong
Igin Ünal Çevik
Itzhak Levy

Watch on [YouTube](#)

www.isac.world

What is Long COVID?

Long COVID, also known as post COVID, is a condition thought to impact millions of patients (as many as 1 in 5). It can cause post-viral fatigue, lasting organ damage or post-intensive care symptoms, cognitive dysfunction and depression among many other symptoms. ISAC, together with its international experts, delivered a webinar to explore the pathology, microbiology, immunology and neurology of the condition.

[Watch it again >](#)

Rapid diagnostics & biomarkers at the heart of patient managements

In this webinar, ISAC's Rapid Diagnostics & Biomarkers Working Group provided a number of short presentations on how rapid and novel diagnostics and technologies and their application can impact clinical practice and the provision of microbiology, infectious disease, antimicrobial stewardship and infection control services.

[Watch it again >](#)

Rapid diagnostics & biomarkers at the heart of patient management
14 September 2021
13.00 - 14.30 (UK Time)
14.00 - 15.30 (CET)

Speakers
Dr Karim Saad
Dr Eric Howard Gluck
Professor Philipp Schütz
Professor Heiman Wertheim
Dr Peter Laszlo Kintzalis

Watch on [YouTube](#)

You can watch all ISAC's webinars for free on the [ISAC YouTube Channel](#).

ISAC Journals



Every month, Editor Jean-Marc Rolain and Scientific Assistant, Sophie Baron, choose one or two articles to highlight as Editor's Choice in the *International Journal of Antimicrobial Agents* (IJAA). There were two selected for the November issue:

1. Extended spectrum beta-lactamase-producing *Escherichia coli* from extraintestinal infections in humans and from food-producing animals, in Italy: a "One Health" study (Giufre *et al*)
2. Longitudinal Genomic Characterization of Carbapenemase-producing Enterobacteriaceae (CPE) Reveals Changing Pattern of CPEs Isolated in Hong Kong Hospitals (Zhu *et al*)

JGAR transitioned to a Gold Open Access journal at the beginning of 2021. The cost to publish can be a barrier to publish for many colleagues. As a result, Elsevier grants waivers in cases of need. Elsevier automatically applies article publishing charge (APC) waivers or discounts to those articles in gold open access journals for which all author groups are based in a country eligible for the [Research4Life program](#).

Keep your eye on [ISAC.world](#) for details on the ISAC / Elsevier publishing webinar which is coming soon.



The 13th International Symposium of Antimicrobial Agents & Resistance (ISAAR) 2021 was held virtually in September.

You can now read all the abstracts in *International Journal of Antimicrobial Agents* (IJAA).

International Congress of Antimicrobial Chemotherapy (ICC)



The 32nd ICC, co-hosted by ISAC and the Antimicrobial Society of Antimicrobials (ASA) will be held in Perth in November 2022. The Scientific Programme Committee, co-chaired by Serhat Unal (ISAC) and John Turnidge (ASA), is currently finalising the programme. In addition to five plenary and six keynote sessions, 24 symposia are planned. Workshops and poster sessions are also scheduled. Further information on the congress, including abstract submission deadlines and young investigator travel awards, will be available on the website soon. Register your interest at www.32icc.org

Member Society News

The **Asia Pacific Congress of Clinical Microbiology & Infection (APCCMI)** was held as a hybrid meeting from 11–13 November 2021. Due to restrictions, only 250 delegates were allowed to attend in person in Singapore but delegates from 37 countries attended online.

The Asia Pacific Society of Clinical Microbiology & Infection are pleased to announce Farah Naz Qamar as awardee of the APSCMI / Institut Mérieux Young Investigator Award. Farah Naz Qamar is an Associate Professor at the Department of Paediatrics and Child Health at the Aga Khan University, Pakistan. Thank you to all applicants who applied and we hope you will consider applying for future awards.

Find out more about APSCMI at www.APSCMI.net



Antimicrobials 2022

The Australian Society for Antimicrobials (ASA) is holding its Annual Scientific Meeting, "Antimicrobials 2022", at the Brisbane Convention and Exhibition, Brisbane from **24–26 February 2022**.

Sharon Lewin (University of Melbourne) will be presenting the plenary "Lessons from COVID-19 and Implications for Pandemic Preparedness in the Future"; Lloyd Reeve-Johnson (University of the Sunshine Coast) will present on "A Holistic Approach to Future Healthcare for Man, Animals and Our Environment"; and David Paterson (University of Queensland) will present on "Treatment of Resistant GNBs – Now and in the Future".

The 2022 Howard Florey Oration will be delivered by Sally Roberts from Auckland Hospital, New Zealand.

The programme's symposia cover many different aspects of antimicrobials and sessions include "GNBs – The Red Plague", "Surfing the Pipeline", "COVID", "The Pros and Cons of Rapid Phenotypic Susceptibility Testing" and "AMS". In addition, there will be pharmacy and EUCAST workshops on Saturday afternoon. Two literature review sessions will also be presented, including Tony Korman's "The Year in Clinical Microbiology" and Trish Peel's "The Year in AMS". Six proffered papers and two poster sessions are also planned for the meeting.

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 94 national and regional societies, which in turn have over 60,000 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](http://www.ISAC.world)

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.](#)

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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 100 countries. The material provided by ISAC / APUA is designed for educational purposes only and should not be used or taken as medical advice. We encourage distribution with appropriate attribution to ISAC / APUA. See previous editions of the Newsletter on the APUA website.

***ISAC welcomes contributions. Please send us your article ideas. All content may be edited for style and length. Please email secretariat@ISAC.world**

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