



The Prudent Use of Antibiotics: Reason to Hope!

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The Alliance for the Prudent Use of Antibiotics (APUA) recently merged with the International Society of Antimicrobial Chemotherapy (ISAC) to promote the better use of antibiotics, a fight of paramount importance.

Looking back at the activities of both organisations over the years, one may feel somewhat discouraged as antibacterial resistance is much worse than it was when ISAC was founded almost 60 years ago and when Stuart Levy began his long journey advocating for appropriate use of antibiotics 40 years ago. The sobering facts that methicillin-resistant *Staphylococcus aureus* (MRSA) and Extended Spectrum Beta-Lactamases (ESBL) producing Enterobacteriaceae are now regularly encountered in patients with no link to the healthcare system in many countries are a dramatic illustration of failure, despite numerous interventions undertaken. One should not give up however, as this demonstrates that the warnings raised by a few prophetic voices decades ago were absolutely right: overuse of antibiotics leads to the emergence of multidrug resistant (MDR) bacteria and this is not being matched by the development of new antibiotics. The most affected countries daily face the clinical impact of MDR with common infections only controlled by complex antibacterial treatment or, worse, are left with no active antibiotic. As with climate change, the proportion of non-believers has gradually decreased so now no observer can *bona fide* state that overuse of antibiotics is harmless.

Although the level of MDR in many parts of the world testifies that humans failed to preserve the efficacy of antibiotics, there are still reasons to hope. Firstly, several countries that implemented ambitious policies towards more appropriate use of antibiotics have demonstrated that MDR may be reversed within a few years, as could be predicted from the fast evolution of bacterial genes. Secondly, thanks to the free exchange of knowledge internationally via websites, meetings, publications and social media, innovative interventions have emerged with documented efficacy that could be replicated around the world. This has led to the development of 'antimicrobial stewardship' (AMS) interventions that have now fully matured, as demonstrated by the multiplication of dedicated AMS sessions in medical conferences. Looking back at the

dramatic development of the AMS concept over the last ten years, one may be optimistic that with more commitment and investment from stakeholders the payback will be substantial. Thirdly, as with climate change, the costs associated with the emergence of MDR have led major policymakers to strengthen regulation of antimicrobials across multiple sectors including human health, animal health and agriculture.

The most spectacular demonstration of this awareness was the high-level meeting on antimicrobial resistance (AMR) at the United Nations (UN) headquarters in 2016; this was only the fourth time a health issue has been addressed by the UN General Assembly. Noting that AMR threatens the achievement of sustainable development goals, member states committed to develop national AMR action plans based on the "Global Action Plan on Antimicrobial Resistance" developed in 2015 by the World Health Organization in

collaboration with the Food and Agriculture Organisation of the UN and the World Organisation for Animal Health. National strategies for combating AMR were not only released in so-called 'wealthy countries' such as the USA (Figure. The CDC's "Get Smart About Antibiotics Week"), but also in some low- and middle-income countries, sometimes supported by multinational and/or

private-public partnerships.

Of course, this is not the time for complacency. The current situation is very bad and must be seen for what it is in most parts of the world: a failure to prevent the emergence of MDR despite the early warnings of pioneers in the field such as Stuart Levy and colleagues when they founded APUA. The medical community, policy makers and general population were informed that overuse of antibiotics would lead to disaster but we did little, or not enough, resulting in the current dire levels of MDR in many parts in the world with unprecedented burdens and high human tolls. However, as detailed above, there are many reasons to hope so we may reasonably expect that within a few years, if we are successful in advocacy, effective multidisciplinary and multinational collaboration and in the implementation of interventions that have been shown to be successful we will reverse the trend. The APUA / ISAC merger is one step forward in that direction!

