Comment
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Confronting antimicrobial resistance beyond the COVID-19 pandemic and the 2020 US election

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Globally, the USA has recorded the highest number of COVID-19 cases and deaths,[1] and still needs to simultaneously respond to another looming potential pandemic. The rise in multidrug-resistant bacterial infections that are undetected, undiagnosed, and increasingly untreatable threatens the health of people in the USA and globally. In 2020 and beyond, we cannot afford to ignore antimicrobial resistance (AMR).

Bacterial infections unsuccessfully treated due to AMR claim at least 700 000 lives per year worldwide and are projected to be associated with the deaths of 10 million people per year by 2050, at a cost of US$100 trillion to the global economy through loss of productivity.[2] In the USA, more than 2·8 million multidrug-resistant bacterial infections occur annually, causing at least 35 000 deaths and $20 billion in health-care expenditures.[3]

COVID-19 is exacerbating AMR (panel). Data from five countries suggest that 6·9% of COVID-19 diagnoses are associated with bacterial infections (3·5% diagnosed concurrently and 14·3% post-COVID-19), with higher prevalence in patients who require intensive critical care.[4] However, a US multicentre study reported that 72% of COVID-19 patients received antibiotics even when not clinically indicated,[4] which can promote AMR. AMR might worsen under COVID-19 due to the overuse of antibiotics in humans, continuing misuse in agriculture,[5] and the dearth of antimicrobials in the development pipeline. Competing global priorities are reducing AMR eradication activities, including measures for multidrug-resistant tuberculosis.[6]

In 2015, the White House released a comprehensive action plan for the USA proposing milestones to curtail antibiotic misuse and accelerate new antimicrobials and vaccines.[7] Steps taken to address these targets have been uneven and, at times, contradictory. In 2017, the US Food and Drug Administration banned use of antibiotics as growth promoters in livestock—a welcome move, following several other countries. Yet that same year, the US Department of Agriculture (USDA) rejected WHO's guidance to limit antibiotic use in livestock feed and maintained that appropriate use includes "treating, controlling and preventing" disease under veterinary supervision.[8] The US Federal Government also proposed unprecedented nationwide budget cuts to hospital-based AMR programmes. In 2018, the US Environmental Protection Agency condoned expansion of medically important antibiotics such as streptomycin and oxytetracycline as pesticides to maximise crop yields,[9] and the USDA removed federal oversight of meat inspection at pork processing plants. In a 2019 AMR threat assessment, the US Centers for Disease Control and Prevention reported 18% fewer deaths due to AMR since 2013, but increases

***Panel:* COVID-19 related antimicrobial resistance challenges and opportunities**

Challenges

- Resources directed away from AMR surveillance
- Increase in pre-emptive antibiotic prescribing to prevent secondary bacterial infections
- Antibiotic overuse in agribusiness
- Delays in AMR legislation
- Antimicrobial drug shortages
- Empty pharmaceutical pipeline
- USA withdrawal of support for WHO
- Low public awareness of AMR
- Crisis fatigue

Opportunities

- Subsidise hospital AMR surveillance
- Integrate AMR risk into investment practices
- Prioritise antimicrobial stewardship programmes
- Develop rapid diagnostics
- Embrace One Health approach
- Ban medically important antibiotics in agribusiness
- Promote consumer and supplier/private sector awareness and action on food choices
- Pass legislation (eg, DISARM and PASTEUR Acts)
- Incentivise new antibiotics and other promising anti-infectives
- Strengthen global collaboration and governance architecture
- Enact PACCARB and UN IACG recommendations
- Develop collaborative public information campaigns
- Leverage infection control principles from COVID-19 experience

AMR=antimicrobial resistance. DISARM=Developing an Innovative Strategy for Antimicrobial Resistant Microorganisms. PASTEUR=Pioneering Antimicrobial Subscriptions to End Up Surging Resistance. PACCARB=Presidential Advisory Council on Combating Antibiotic-Resistant Bacteria. UN IACG=UN Interagency Coordination Group on AMR.

in several severe multidrug-resistant bacterial infections, including a 315% increase in erythromycin-resistant group A *Streptococcus*, a 124% increase in drug-resistant *Neisseria gonorrhoeae,* and a 50% increase in extended-spectrum β-lactamase-producing Enterobacteriaceae.[3] A 2019 report from the US Presidential Advisory Council on Combating Antibiotic-Resistant Bacteria endorsed most priorities from the 2015 national action plan and proposed new targets for 2020–25.[10] The US approach to AMR has been mixed and, looking ahead, needs to move beyond priority setting to concrete action.

Curtailing the spread of AMR is possible. Laudable progress is being made to mitigate AMR worldwide through regulations and policies. In January, 2020, the Indian Government introduced draft legislation to place limits on antibiotic residues released into the environment at pharmaceutical manufacturing sites. In Norway, the implementation of a vaccine to prevent furunculosis at salmon farms reduced antibiotic use by 99·8%,[11] while Chile's salmon industry pledged to reduce its antibiotic use by 50% by 2025. In the UK, human antibiotic use decreased by 7·3% between 2014 and 2017, and the UK Government launched the world's first experiment to pay for antibiotics by subscription rather than per pill, which could incentivise market entry of two new antibiotics by 2022.[12]

The speed at which new antibiotic resistance genes emerge and spread globally requires that the USA and other countries take immediate action. The recommendations of the UN Interagency Coordination Group on AMR provide a roadmap by taking a One Health approach to intervene on AMR at the interface between humans, animals, and the environment.[5] The US Federal Government could accelerate progress on its AMR national action plan in several ways: first, by permanently ceasing use of medically important antibiotics in agribusiness; second, by supporting antibiotic stewardship programmes; third, by encouraging the development of new antibiotics through bipartisan initiatives such as the Developing an Innovative Strategy for Antimicrobial Resistant Microorganisms (DISARM) Act,[10,13] which some legislators have proposed as part of a COVID-19 relief bill, as well as the Pioneering Antimicrobial Subscriptions to End Up Surging Resistance (PASTEUR) Act, which incorporates an antibiotic subscription programme similar to that in the UK; and, finally, by simultaneously investing in innovation to identify and evaluate other anti-infectives. As the COVID-19 pandemic has shown, efforts are needed to strengthen AMR surveillance and health-care infrastructure and create policies to ensure global equitable access to antimicrobials, diagnostics, and vaccines.

No matter the outcome of the 2020 US election, the path forward is not only one that builds back from the COVID-19 pandemic, but also addresses AMR in the context of pandemic preparedness (panel). A coordinated One Health response is needed, with action from multisectoral and cross-sectoral stakeholders in human and veterinary medicine, agriculture, finance, environment, industry, and consumers, to address what is as much an environmental issue as an economic one.[2,5,10,13] The USA cannot do this alone, but should be an active participant in the global system to accelerate action and advance a shared global vision on tackling AMR. Through leadership and accountability, national governments can be greater than the sum of their parts. Finally, to accelerate and sustain progress against AMR, the USA should support the multilateral global architecture needed to confront AMR, including WHO, the UN Food and Agriculture Organization, and the World Organisation for Animal Health. Failing to confront AMR will undermine decades of advances in medicine and public health and progress towards the UN Sustainable Development Goals.[2,5,10,13] The COVID-19 pandemic is a wake-up call that global collaboration is the most effective way to tackle global health threats.

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