

These emergencies arise in the context of the larger global climate emergency. According to the Intergovernmental Panel on Climate Change, the window for reductions in greenhouse gas emissions to avoid catastrophic climate change is rapidly closing.<sup>22</sup> Similarly, the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services warns that there is only a short time to act on threats to biodiversity.<sup>23</sup> Continued reliance on fossil fuels, destruction of ecosystems, dissemination of persistent toxic chemicals, and other environmental depredations—many of them permitted, if not promoted, during the Trump presidency—are inconsistent with a healthy future for humanity. The alternative is a transition to ways of living that protect both natural systems and the health of current and future generations. This path requires new approaches to generating energy, producing and consuming food, chemicals, and other manufactured goods, travelling, and designing and building cities. The vast public investments some governments are making during the COVID-19 pandemic could spur this transition,<sup>24</sup> and US leadership could be catalytic. The outcome of the US election will have far-reaching consequences for planetary health.

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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,<sup>1</sup> 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.<sup>2</sup> 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.<sup>3</sup>

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.<sup>4</sup> However, a US multicentre study reported that 72% of COVID-19 patients received antibiotics even when not clinically indicated,<sup>4</sup> which can promote AMR. AMR might worsen under COVID-19 due to the overuse of antibiotics in humans, continuing misuse in agriculture,<sup>5</sup> and the dearth of antimicrobials in the development pipeline. Competing global priorities are reducing AMR eradication activities, including measures for multidrug-resistant tuberculosis.<sup>6</sup>

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.<sup>7</sup> 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.<sup>8</sup> The US Federal Government also proposed unprecedented nation-wide 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,<sup>9</sup> 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 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

$\beta$ -lactamase-producing Enterobacteriaceae.<sup>3</sup> 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.<sup>10</sup> The US approach to AMR has been mixed and, looking ahead, needs to move beyond priority setting to concrete action.

Curtailling 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

#### 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.

by 99.8%,<sup>11</sup> 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.<sup>12</sup>

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.<sup>5</sup> 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,<sup>10,13</sup> 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.<sup>2,5,10,13</sup> 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.<sup>2,5,10,13</sup> 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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## Challenges and priorities for delivering on the Beijing Declaration and Platform for Action 25 years on



This year marks the 25th anniversary of the 1995 Beijing Declaration and Platform for Action<sup>1</sup> in which 189 governments made commitments to remove obstacles to women's equal and active participation in all spheres of public and private life. Progress in gender equality and women's empowerment during the past 25 years is undeniable. Based on the indicators set to measure the achievements, many countries are able to report progress in addressing areas such as violence against women, in increasing access to sexual and reproductive health services, and in widening career opportunities through improved education.<sup>2</sup> Within the context of health, this progress has come with a substantial reduction in maternal morbidity and mortality, improvements in general health outcomes, increased opportunities for women in the health workforce, and recognition of the importance of gender in ensuring the quality of care.<sup>3</sup>

However, the progress is fragile. There has been an absence of real political, societal, and cultural transformation in the past 25 years, and transformation that recognises the need for redistribution of power and privilege across all aspects of life and that would impact on health and wellbeing.<sup>4</sup> And now the COVID-19 pandemic has worsened this situation by recreating barriers to participation and removing choices that enable a balance between effective engagement in public and private spaces.<sup>5</sup> In many settings, women have resumed the role of unpaid carers within the home, including home schooling, at the cost of employment or in addition to maintaining standards of productivity where possible.<sup>5</sup> Measures to control COVID-19 have also seen an escalation in interpersonal violence, including gender-based violence.<sup>6</sup>

The 25th anniversary of the Beijing Declaration was to have been commemorated with Generation Equality Forum events in Mexico and Paris in 2020, culminating in celebrations during the UN General Assembly.<sup>7</sup> The

plans have been pared down as a result of the pandemic with some activities postponed to 2021. The anniversary, nonetheless, provides an opportunity to reset and recommit to strategies that strengthen achievements in gender equality. Current global security threats, including the COVID-19 pandemic, increasing global inequalities and social unrest, and the climate crisis, together with a geopolitical climate characterised by increased conservatism, nationalism, and tensions over national security, influence, and values, present very different pressures from the drivers of gender equality 25 years ago.<sup>8,9</sup> Gender equality must be robust enough to withstand these new threats and enable women to contribute equally to solutions.

Climate change, for instance, was not the political priority 25 years ago that it now is. For low-income and middle-income countries (LMICs), the climate crisis carries substantial risk of exacerbating poverty and inequalities. The need for adaptation is a key priority. However, attempts to address gendered implications of the climate crisis have largely been overlooked; the climate crisis is too often framed as a matter of human security, with no

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