

Tackling antimicrobial resistance in Africa, adopting lessons from Africa's success in navigating the COVID-19 pandemic

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To the Editor:

Antimicrobial resistance (AMR) is a global health problem. Antibiotics that were once very efficient in treating bacterial infections are now inactive. When antibiotics were discovered about, we believed the battle against infectious diseases has been won but the age of antibiotics, spanning only 80 years, is now entering a period of progressive and widespread emergence of drug-resistant organisms that threaten to bring this era to an end. The problem of AMR is serious because bacteria are almost resistant to all available classes of antibiotics, and a new pipeline of antibiotics is not produced. Although AMR is a natural phenomenon, we are responsible for accelerating it. The increased and unguided use of antibiotics across multiple sectors, that is, humans, animals, and agriculture, has further exacerbated this problem.^[1] When microorganisms are faced with antibiotics selection pressure, they enhance their fitness by acquiring resistance determinants through mechanisms such as horizontal gene transfer (transduction, conjugation, and transformation) and then sharing them with other bacteria and by other mechanisms, for example, gene overexpression and silencing and phase variation.^[2] The effect of AMR in Africa could be catastrophic because of the poor health systems and infrastructure, inadequate surveillance of infectious diseases, and the inadequate health personnel, which is motivated partly by the mass exodus of health practitioners from Africa to foreign continents to seek greener pastures. The higher burden of AMR in low-resource health systems highlights the importance—both for the management of individual patients and for the surveillance of AMR—of well-developed national action plans and laboratory infrastructure in all African regions and countries.^[3]

Surprisingly, Africa was one of the least affected continents in direct morbidity, mortality, and absolute cumulative cases of COVID-19. This is because most countries in Africa reacted quickly and imposed tough restrictions such as banning local and international travel, closing industries, schools and universities, banning public transportation, and restricting healthcare to emergency mode. Some of these countries in Africa adopted guidance from the

WHO, stratifying their COVID-19 public health responses into several pillars, including surveillance, case management, infection prevention and control, ports of entry, logistics, security, risk communication and community engagement, and laboratory.

Taking a cue from how Africa handled the COVID-19 pandemic, AMR can also be tackled effectively by adopting the strategies used in combating the COVID-19 pandemic. The report by Murray et al estimated that Africa had the highest number of deaths attributable to AMR infections, that is, 27.3 deaths per 100,000 compared with other continents, and surprisingly, Africa had a lower number of COVID-19 deaths.^[3] If the strategies such as surveillance, infection prevention, community engagement, collaborative research and putting stringent policies on antibiotic use are in place just as the wearing of facemasks and physical distancing was strictly imposed to curb the spread of the SARS-CoV-2 and this achieved great success. This is also in agreement with the WHO global action plan to tackling AMR, which includes five main pillars—Improve Awareness and Understanding of AMR through Effective Communication, Education and Training, Strengthen the Knowledge and Evidence Base through Surveillance and Research, Reduce the Incidence of Infection through Effective Sanitation, Hygiene and Infection Prevention Measures, Optimize the Use of Antimicrobial Medicines in Human and Animal Health and develop the economic case for Sustainable Investment that Takes Account of the Needs of All Countries, and Increase Investment in New Medicines, Diagnostic Tools, Vaccines, and Other Interventions.^[4,5] These are similar tactics that provided success in tackling the COVID-19 pandemic and can also succeed with AMR mitigation if implemented effectively on the African continent.

Another successful approach was the One Health approach which could help promote and sustain the strategic solutions to the problems of AMR through whole-genome sequencing surveillance of microbes in humans, animals, and environments, and this helped to better understand AMR and to develop effective preventive and control strategies. A lot of research has been conducted across all sectors to size up the burden of AMR, but solutions that help prevent the emergence and acceleration of AMR are not implemented efficiently using the single discipline approach strategy but with the One Health approach where different disciplines such as professionals in human health (doctors, nurses, public health practitioners, epidemiologists), animal health (veterinarians, paraprofessionals, agricultural workers), environment specialists (ecologists, wildlife experts), policy makers, agriculture, and communities are brought together to communicate and collaborate on how to develop and sustain strategies to tackle AMR effectively. No one person, organization, or sector can address issues at the animal-human-environment interface alone. Lessons from tackling the COVID-19 pandemic where different professionals pooled resources together, that is, knowledge, expertise to better understand the virus, and its mode of transmission, which helped in developing prevention

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strategies and hasten up vaccine production, helped in stemming the serious waves of the pandemic. We should also try to use this approach in tackling AMR through regular data sharing, surveillance across all sectors, policy formulations and implementations on AMR mitigation, and efficient antibiotic stewardship programs.

In conclusion, it is essential to better prevent infections, reduce overprescribing and overuse of antimicrobials in humans and animals, stop resistant bacteria from spreading by improving hygiene and infection control, drinking water and sanitation, and committing more funding to AMR research on the African continent. If we adopt some of the strategies used in tackling COVID-19 on the African continent in the fight against AMR, we will achieve similar success in reducing the burden of AMR-related infections and deaths in Africa.

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