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Comment

Title: Global burden of antimicrobial resistance: essential pieces of a global puzzle

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Christopher Murray and colleagues[1] provide a compelling contribution to the understanding of the burden of disease attributable to bacterial antimicrobial resistance (AMR) in 2019. Focusing on 23 bacterial pathogens, they used two-stage spatiotemporal modelling to estimate this burden to be larger than diseases such as HIV and malaria, with the highest rates in sub-Saharan Africa. This new information should raise this issue higher on the global health agenda. They also, however, highlight the scarcity of high-quality data for infectious diseases and antibiotic consumption, with the authors having to rely on antibiotics sales data for an indication of antibiotic consumption. Unfortunately, as we have described previously,[2] equitable and accessible strategies to optimise antibiotic prescribing and consumption remain out of reach. This gap is a major concern because of increasing threats to the sustained and safe supply of antibiotics globally, compromising access to effective therapies and leading to their sub-optimal use.[3] There is widespread agreement on some things that must be done, including taking a One Health approach to reduce emergence of resistance and investing in research and development to develop new antibiotics. We have also identified a need for research that offers greater understanding of how we can preserve and sustain the efficacy of existing and future antibiotics in countries with differing resources and governance systems, recognising how the goals of antibiotic stewardship and infection prevention and control efforts are threatened by critical population and geographical inequities.[4] We concur with Murray and colleagues when they highlight the disproportionate burden of AMR faced by low-income and middle-income countries. Addressing these inequities requires a systems approach to research and implementation strategies for AMR that incorporates an understanding of four aspects: (1) diversity of national and international policies and their implementation in different sectors; (2) fragmented health care; (3) complexity of human behaviours; and (4) differences in access to expertise and resources.[5] It will also require a long-term commitment to build capacity for locally driven research that draws on and supports existing expertise and talent. Supporting strategies that address these gaps should be a priority for funders engaged in global health in general and in AMR in particular. From a research and policy perspective, addressing the

burden of AMR requires development of economic and contextually appropriate AMR-specific policy interventions, better use of data and prescribing systems across health-care settings, appropriate and scalable technological innovation and data linkage and evaluation, and a better understanding and accounting for sociocultural and behavioural factors.2 However, above all, this agenda must be developed in partnership with those most affected namely, the patients and prescribers.

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