

# Launch of the São Paulo Wellcome Trust-funded multidisciplinary research program on optimising antimicrobial use in highly populated urban environments

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Antimicrobial resistance (AMR) is considered an increasing threat to public health and a cause of great concern worldwide.

AMR is a complex One Health issue, in which agriculture, livestock, companion animals, and the environment play roles. Transmission of organisms and resistance genes occurs across these pathways and antibiotics and their metabolites reach the environment via a range of routes, including directly from humans or through waste. The accumulation of antimicrobials within the environment can contribute to selective pressures for the acquisition or development of AMR.<sup>1</sup>

The use of antimicrobials is a major driver of AMR, thus optimising the prescribing of antimicrobials is a potentially effective strategy to reduce AMR. The term “antimicrobial stewardship programme” (ASP) defines a set of actions that promote and enforce the adequate use of antimicrobials (ATM) to reduce selective pressure while improving patient outcomes.<sup>2</sup> It focuses on avoiding ineffective prescriptions, finding the adequate moment to start treatment, the adequate choice of drugs, the adequate/short duration of treatment, de-escalation once there is a diagnosis, and PK/PD optimisation of antimicrobial use.

ASPs have proven effective in hospitals.<sup>3</sup> However, the majority of antimicrobial prescriptions occur in primary care, and up to half of antibiotic prescriptions are inappropriate.<sup>4</sup> In primary care, the key known drivers of inappropriate use or prescribing of ATM are rural environment; lack of clinician training, resulting in their poor knowledge and prescribing behaviour; insufficient access to follow-up of patients; financial incentives to prescribing; and patient health-seeking behaviour via demanding for antibiotics.<sup>5</sup>

Although there is strong evidence of an association between antibiotic prescribing and antimicrobial

resistance, there is little evidence supporting the long-term sustainability and environmental impact of ASPs in primary care. Transmission of resistance can occur between interconnected healthcare institutions and primary care units.

All these considerations lead to the question: Should we be focusing our efforts on the last-tier ATM that are used in complex health care? Or should we act early and prevent the escalation towards last-resort drugs?

The Centres for Antimicrobial Optimisation Network (CAMO-Net) is an international consortium, led by Professor Alison Holmes in the UK and funded by the Wellcome Trust, that aims to conduct research for optimising antimicrobial use in humans through three interlinked themes: medicines management; technology and innovation for optimised prescribing; culture, context, and behaviour. It involves 5 National Hubs: Brazil, India, South Africa, Uganda and the UK. It also involves 3 shadow sites in Bangladesh, Pakistan and Timor Leste, as well as 3 technical support centres in Ghana, Malawi and Thailand.

In Brazil, the CAMO-Net research programme was launched in June 2023 and will be led by University of São Paulo. The study will focus on integrated community interventions in primary healthcare, to improve antimicrobial use in a highly populated urban environment (the entire municipality, São Caetano do Sul, with 162,000 inhabitants). The intervention strategies will be directed by the evaluation of the beliefs of health workers and the population using quantitative and qualitative methods. The intervention will be directed towards adequate antimicrobial prescribing for physicians and nursing staff as well as towards public awareness. One of the components of the intervention is to introduce a guideline on the management of infections in primary health care accompanied by a tool for decision support.



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We expect the intervention to improve the appropriateness of prescriptions; to decrease the overall volume of ATM prescribed; and to decrease the presence of AMR in infections and asymptomatic carriers, as well as in the water supply and wastewater.

Studies that evaluate the effect of ASPs focus on antimicrobial consumption or prescribing.<sup>3</sup> There is a lack of studies focusing on the final goal: reduction of resistance in humans and in the environment.

The challenge is making an effective and long-lasting intervention towards short-term goals (improve prescriptions and public awareness and lower the overall load of consumed antimicrobials) without compromising patient outcomes; plus, a lasting effect on the long-term objectives of reducing resistance, decreasing the presence antimicrobials and antimicrobial resistance genes in the environment (potable water and wastewater).

Finally, there is the challenge of creating an intervention that is widely applicable with small adaptations to all settings, countries, and levels of economic development.

#### Contributors

ASL: writing, coordination; SFC: writing, methodology; MTR: methodology; MCP: methodology; FLSN: data curation.

#### Declaration of interests

The authors declare that they do not have conflicts of interest.

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#### Appendix A. Supplementary data

Supplementary data related to this article can be found at <https://doi.org/10.1016/j.lana.2023.100574>.

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