



Antimicrobial resistance: time for action*

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The year 2020 will be remembered for the SARS-CoV-2 coronavirus pandemic, responsible for more than 10 million cases and more than 500 000 deaths in the first half of the year alone, and receiving unprecedented political and social attention.¹ This global public health crisis should draw attention to other silent epidemics, such as antimicrobial resistance (AMR), responsible for 700 000 annual deaths worldwide, 230 000 of them from multi-drug-resistant tuberculosis.²

In the Region of the Americas, multidrug-resistant microorganisms are the leading cause of health care-associated infections. Surveillance data from the Latin American Network for Antimicrobial Resistance Surveillance (RELAVRA) show an increasing trend in the resistance of hospital pathogens such as *Klebsiella pneumoniae*, whose non-susceptibility to carbapenem antibiotics has been increasing significantly in Latin America since 2014, reaching an average of 21%.³ There are significant consequences for health systems in terms of mortality, disability, and economic costs. For example, *Staphylococcus aureus* causes a wide range of infections and is one of the most commonly isolated microorganisms in health care-associated infections; in Latin America, more than 25% of *S. aureus* isolates are resistant to methicillin. The result is 45.2% excess mortality attributable to methicillin resistance, compared to susceptible strains, and increased antibiotic treatment costs (6.7 times greater) and hospitalization (almost 3 times greater).⁴

AMR has begun receiving international political attention only during the last five years, following the 2015 launch of the World Health Organization (WHO) Global Action Plan on Antimicrobial Resistance. This was supported by the Member States of the Pan American Health Organization (PAHO) in a resolution adopted in September 2015,^{5,6} underlining the political commitment of all countries in the Americas to develop and implement their respective national AMR action plans. These plans are structured around the five strategic objectives for AMR containment set out in the Global Action Plan: education and awareness; surveillance and research; infection prevention and control; appropriate use of antimicrobials and

research; and development of the economic case for sustainable investment. A multisectoral *One Health* response is key to implementing these action plans. Since the adoption of the Global Action Plan, countries have made progress in policies, measures, and interventions to ensure effective design and implementation of their action plans, in accordance with the regional plan of action and the One Health approach to containing AMR.

In order to make progress towards reducing the rapidly changing situation of AMR, countries require the latest scientific evidence. In 2011, the *Pan American Journal of Public Health* devoted a special issue to antimicrobial resistance, calling for the production and dissemination of evidence on the problem.⁷ In nearly a decade, the Region has undergone a major shift in understanding the magnitude and impact of AMR, not only on human health, but also on veterinary health, agricultural production, the economy, and development.

This progress is reflected in national public policies; at the end of 2019, 29 countries in the Americas (83%) reported developing national action plans to contain AMR, with a multisectoral approach.⁸ A well-known example of progress in multisectoral regulations on antimicrobials was prohibiting colistin as a growth promoter and as a veterinary drug in four countries (Argentina, Ecuador, Paraguay, and Uruguay), after demonstrating colistin resistance in hospital bacteria related to the spread of the *mcr-1* gene through plasmids. However, according to a recent review by the Pan American Foot-and-Mouth Disease and Veterinary Public Health Center (PANAFTOSA, a Pan American Health Organization/World Health Organization scientific center), eight countries in Latin America and the Caribbean still use colistin as a growth promoter and in veterinary therapeutics. Information was not available for 27 other countries and territories.⁹

The gradual introduction of molecular techniques in AMR surveillance, such as pulse field gel electrophoresis, has led to a more accurate understanding of resistance mechanisms and their dissemination patterns, particularly when these

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techniques are widely applied to the environment, food, veterinary care, and human health under the *One Health* multisectoral approach. Paraguay recently completed a study in the Asunción River (communication with PAHO, unreleased data), finding that the same genes responsible for multidrug-resistance in human isolates are present in wastewater. These molecular techniques are also currently very useful for studying hospital outbreaks caused by multidrug-resistant pathogens.¹⁰ Advances in research and development of new technologies should be applied to benefit public health decision-making.

Greater efforts are needed to monitor the use of antimicrobials for human and animal health in the Region. Nonetheless, some countries (including Bolivia, Brazil, Costa Rica, Paraguay, and Peru) contributed data on the sale of antimicrobials for human health to the WHO Report on Surveillance of Antibiotic Consumption, 2016-2018.¹¹

Preventing the health care-associated transmission of multidrug-resistant pathogenic microorganisms is one of the most cost-effective strategies for AMR containment.¹² National infection control programs, operating according to international

standards, constitute one of the areas of greatest progress in the Region of the Americas. At the end of 2019, six out of seven countries had a national infection control program;⁷ however, some aspects must still be strengthened in order to monitor and evaluate the results of these programs.

The COVID-19 pandemic has firmly reminded us that communicable diseases are far from controlled. They remain one of the leading causes of morbidity and mortality in public health, and AMR is one of the main factors preventing control. PAHO supports the fight against AMR in different areas, such as developing and strengthening sustainable capacity in countries to prevent the selection of resistant microorganisms, preparing for early detection, and implementing a coordinated response to established or emerging multidrug-resistant pathogens. Joint and multisectoral efforts, cooperation among countries, and research development are the keys to success; and evidence, research, and dissemination of results are always valuable tools to sustain political commitment, stimulate quality scientific production, and raise public awareness of the negative consequences of AMR on human health and development.

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