

CGIAR Antimicrobial Resistance Hub

Antimicrobial resistance: CGIAR research and response to a global problem

The challenge of antimicrobial resistance

Antimicrobials are among the most important tools available to medical and veterinary professionals for curing disease and improving welfare. However, their use to combat common infections in people and animals is increasingly failing, thereby posing a major threat to global development, including food and nutrition security, and resulting in greater losses of life. The World Bank estimates that antimicrobial resistance could lead to a drop in annual global gross domestic product by more than one trillion United States dollars annually by 2030 and a 7.5% reduction in global livestock production; investments of USD 6–8 billion annually to address this issue could mitigate this loss.

However, at present, in the absence of investments, the antimicrobial resistance problem grows rapidly worse, rather than better. Large quantities of antimicrobials are used in livestock and fish — a reasonable estimate is on the order of 100,000 tons annually and growing fast in low- and middle-income countries — often in a suboptimal way. Humans, livestock and fish excrete unmetabolized drugs, leading to environmental contamination, including water systems. While the main driver of antimicrobial resistance emergence is the selection of resistant bacteria following use of antibacterial compounds, use in agriculture to control plant disease also has a potentially significant link, the severity of which is currently unknown.

The greatest challenges and burdens of antimicrobial resistance will be felt in low- and middle-income countries by poor producers and consumers. While these countries face the greatest demand for increased food production, with rapidly growing populations, they also tend to have poorer knowledge among actors throughout the process, lack of regulations and efficient surveillance, and closer interaction of livestock, fish, people and antimicrobials.

Solutions to antimicrobial resistance

To address the antimicrobial resistance challenge, research on practical solutions appropriate for and effectively applied in low- and middle-income countries is critical. The solutions will require combining technical, institutional and policy innovations and leveraging the contributions of different sectors and different public and private actors. The antimicrobial resistance challenge will require effective partnerships to support solutions at global, national and local levels. CGIAR will mobilize international partners to support national governments and key actors in identifying, implementing and improving local and national solutions.

CGIAR's comprehensive plan to address antimicrobial resistance

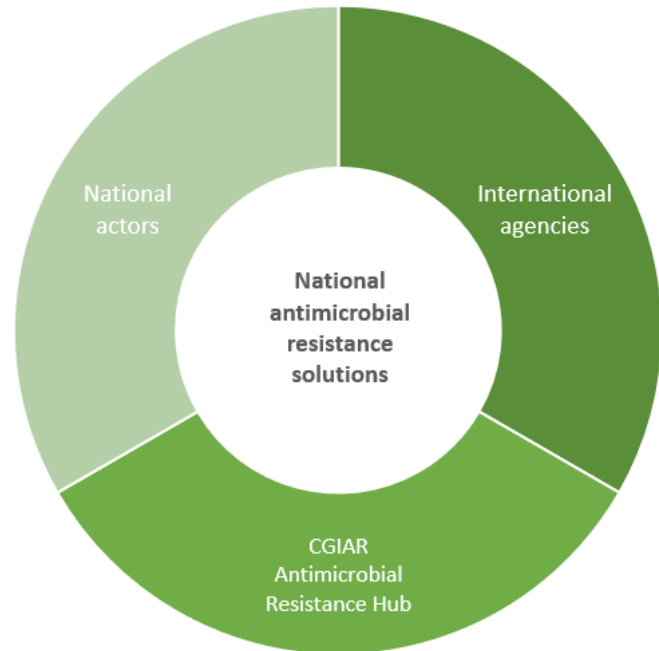
With its mandate to improve livelihoods of poor people, improve food and nutrition security and improve natural resource management through agriculture and food research, CGIAR is ideally positioned to tackle agriculture-related antimicrobial resistance risks in low- and middle-income countries and to develop, test and promote solutions to mitigate risks. To tackle antimicrobial resistance challenges in low- and middle-income countries and ensure the sustainability of global food and health systems, CGIAR has launched an international antimicrobial resistance hub to channel global research and development efforts. This approach will help foster learning from past experiences, support antimicrobial resistance research excellence in the Global South and ensure a critical mass of research to find suitable and sustainable solutions.

The hub is hosted by the International Livestock Research Institute (ILRI). Through its leadership of the CGIAR Research Program on Livestock and co-leadership of research on One Health and antimicrobial resistance under the CGIAR Research Program on Agriculture for Nutrition and Health (A4NH), ILRI is responsible for bringing in other important CGIAR and partner capacity. The London School of Hygiene and Tropical Medicine, as co-lead with ILRI in this work under A4NH, provides an ongoing and effective public health partnership that can be built upon in the hub. ILRI will also work closely with the International Food Policy Research Institute (IFPRI), A4NH's lead centre, to leverage IFPRI's in-country policy support activities to link antimicrobial resistance policy and regulation discussions into the broader food and development policy arena in multiple low- and middle-income countries and globally.

The CGIAR antimicrobial resistance strategy

CGIAR's strategy to address antimicrobial resistance builds on five pillars of research and interventions:

1. Understand knowledge, attitude, practices and incentives for antimicrobial use or reduction in use and the role of formal and informal markets. This includes distribution networks, types of products used and the way in which new antimicrobials are used, particularly those classified by the World Health Organization as critical important antibiotics.
2. Research antimicrobial resistance transmission dynamics at the human–animal–environmental interface in different agricultural systems.
3. Design and evaluate interventions and incentives to reduce and more effectively use antimicrobials in agriculture in low- and middle-income countries.
4. Support evidence-based policy dialogue for antimicrobial surveillance and antimicrobial resistance strategies.
5. Capacity development.



The hub aims to support the efforts of low- and middle-income countries globally, drawing on the lessons from high-income countries, particularly Denmark and others in Europe. The current research partnership around ILRI has a strong presence in Africa and Asia, with links in South America under development.

CGIAR research programs and centres involved in the CGIAR antimicrobial resistance hub

CGIAR Research Program on Agriculture for Nutrition and Health

CGIAR Research Program on Fish

CGIAR Research Program on Livestock

International Food Policy Research Institute

International Livestock Research Institute

International Water Management Institute

WorldFish

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