

An African One Health network for antimicrobial resistance and neglected tropical diseases



International health and development projects have commonly included the transfer of knowledge and research capacities from countries in the global north to the those in the global south. However, local capacity, self-sufficiency and autonomy have not always been fostered in such knowledge and development transfers¹. Disease prevention and management for antimicrobial resistance (AMR) – a major global health threat – and for neglected tropical diseases (NTDs) remain a challenge across sub-Saharan Africa, the region with the highest prevalence of AMR globally².

To best understand and tackle AMR, it is necessary to trace the linkages between human, animal, and environmental factors that contribute to AMR transmission via a One Health approach³. The African One Health Network for Disease Prevention (ADAPT) seeks to build the capacity for improved, sustainable, locally led management of AMR and NTDs (particularly helminthic infections), as well as for the stewardship of antimicrobials, across seven sub-Saharan African countries (Uganda, Senegal, Ghana, Nigeria, Democratic Republic of the Congo, Ethiopia, and Sudan) in partnership with state, local, and regional stakeholders. This mission of the ADAPT network is aligned with United Nations Sustainable Development Goal 3 (ref. 4) and the quadripartite One Health joint plan of action (2022–2026)⁵.

The ADAPT network will use south–south collaboration and knowledge exchange between partner institutions, with African institutions supporting African institutions. Research hubs will be built for AMR surveillance (Senegal), digitalization and mobile health (Uganda), therapeutics (Nigeria), diagnostics (Ghana), antimicrobial stewardship training (Ethiopia), and hygiene management (Sudan). The network is part of the Research Networks for Health Innovations in sub-Saharan Africa, which is funded by the German Federal Ministry of Education and Research (BMBF) to strengthen health systems across sub-Saharan Africa with the support of German academic institutions.

The ADAPT network plans to overcome several challenges to antimicrobial stewardship. For example, a lack of diagnostics, particularly in remote areas, presents a challenge in many African contexts⁶, where cases of AMR are often underdiagnosed. Diagnostics to detect local bacterial isolates prevalent in Africa will be developed and sustained by the project consortium. Hygienic practices will be fostered by the network team in collaboration with local farmers to lower the burden of AMR at the animal level in remote areas.

Across sub-Saharan Africa, the public is heavily reliant on social media for scientific information⁷. Therefore, simple mobile phone apps will be implemented throughout the network to support bidirectional communication between the respective ministry or AMR control program and the end-user, whether healthcare worker, farmer, veterinarian, or community members. By building local capacity for digital One Health, the ADAPT network will foster the development of digital health and mobile health simultaneously across sub-Saharan Africa, which should improve equitable access to health care.

During the COVID-19 pandemic, many African nations were unable to access medical supplies⁸. As a consequence, African countries have encouraged local production of these products. The ADAPT network will help to screen the effectiveness of local disinfectants and topicals so that they can be implemented in a hygienic plan at the human–animal–environment interconnection. The six comprehensive tasks required to develop the capacity for AMR capabilities across sub-Saharan Africa are shown in Box 1.

Building capacity – including new portable laboratory facilities for the rapid diagnosis of AMR – is the core work of this network. Short-term training for all project staff over the course of the project will include good clinical laboratory practice, research ethics, financial management, and management of research data, to ensure standardized data handling, good scientific practice, open data, and data security. Mid- to long-term

training for project teams will include master's degrees and PhD training, and development of laboratory manuals, training curricula, training modules, guidelines, and standard operating procedures.

Fostering collaborations with local, regional, and global networks and stakeholders in antimicrobial stewardship is needed to build self-sufficiency across sub-Saharan Africa. To ensure sustainability and strengthen local collaboration, the ADAPT network will be linked to the national One Health platform of each partner country. Through these platforms the network will establish ongoing communication with local non-governmental organizations, societies, and other local entities involved in the health, agriculture, and environmental sectors. The ADAPT consortium will collaborate with policymakers, multilateral organizations (including the World Health Organization and the Food and Agriculture Organization), and international non-governmental organizations, as well as civil society, and other pertinent networks in order to raise awareness and the capacity for antimicrobial stewardship among stakeholders.

The ADAPT network has the support not only of local health authorities and partner country ministries, but also of regional African health networks, including The African Forum for Research and Education in Health (AFRE-health) and the Africa One Health University Network (AFROHUN), which will support the implementation of the ADAPT network's objective: research for direct impact.

The ADAPT network is prepared for the many challenges that could interfere with our activities. Pandemics, epidemics or political instability can lead to travel restrictions, deployment of team members to control an outbreak, and interruption of supply chains that are essential for laboratory activities. A lack of digital infrastructure presents another challenge, requiring collaboration between the consortium and local enterprises to improve local digital capabilities. Difficulties in establishing communication with local

BOX 1

Research tasks for the ADAPT network

1. Surveillance and genetic mapping of circulating AMR strains to screen for AMR in humans, livestock, and poultry.
2. Examination of relationships between helminthic infections and drug-resistant bacteria to better understand coinfection between pathogens.
3. Development of capacity for point-of-need diagnostics of AMR and NTDs, using mobile tests for field use.
4. Identification of changes in antimicrobial use and AMR incidence during the COVID-19 pandemic.
5. Control of transmission of communicable diseases, particularly of AMR, by identification and improvement of existing hygienic practices at the human–animal–environment interface.
6. Building of capacity for sustainable leadership in antimicrobial stewardship.

and international stakeholders – which could be due to constrained resources, lack of information sharing, or realignment of priorities – remain a challenge to creating research for impact, which depends on networking with policymakers. The ADAPT network is prepared for these obstacles through multiple program tasks developed by each of the partner countries to promote local ownership, engagement, and sustainability without the exclusion of any country.

The ADAPT network ultimately aims to have local and regional, as well as global, relevance. In alignment with biologist Patrick Geddes' maxim 'Think globally, act locally', the ADAPT network's activities to redress local health challenges will have regional and global implications for AMR and antimicrobial stewardship. This collaborative network will foster opportunities for countries across the global south to learn from one

another, and to inform the global north on effective antimicrobial stewardship.

Ahmed Abd El Wahed¹✉, **Paul Kadetz**^{2,3}, **Julius Boniface Okuni**⁴, **Yakhya Dieye**⁵, **Michael Frimpong**⁶, **George Olusegun Ademowo**⁷, **Sheila Makiala-Mandanda**⁸, **Yimtubezinash Woldeamanuel**⁹, **Kamal Hassan Eltom**¹⁰, **Georgina Yeboah**¹¹, **Annemarie Käsbohrer**¹², **Henry Kajumbula**², **Uwe Truyen**¹ & **Damalie Nakanjako**²✉

¹Institute of Animal Hygiene and Veterinary Public Health, Leipzig University (ULEI), Leipzig, Germany. ²College of Health Sciences (MAK-CHS), Makerere University, Kampala, Uganda. ³Institute for Global Health and Development, Queen Margaret University, Edinburgh, UK. ⁴College of Veterinary Medicine, Animal Resources and Biosecurity (MAK-COVAB), Makerere

University, Kampala, Uganda. ⁵Institut Pasteur de Dakar (IPD), University Cheikh Anta Diop, Dakar, Senegal. ⁶Kumasi Centre for Collaborative Research in Tropical Medicine (KCCR), Kwame Nkrumah University of Science and Technology, Kumasi, Ghana.

⁷Institute for Advanced Medical Research and Training, College of Medicine, University of Ibadan, Ibadan, Nigeria. ⁸Institut National de Recherche Biomédicale (INRB), Kinshasa, Democratic Republic of the Congo.

⁹Centre for Innovative Drug Development & Therapeutic Trials for Africa (CDT-Africa), Addis Ababa University, Addis Ababa, Ethiopia. ¹⁰Institute for Studies and Promotion of Animal Exports, University of Khartoum (UofK), Khartoum, Sudan. ¹¹African Forum for Research and Education in Health, Kumasi, Ghana. ¹²The German Federal Institute for Risk Assessment (BfR), Berlin, Germany.

✉ e-mail: ahmed.abd_el_wahed@uni-leipzig.de; dnakanjako@gmail.com

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Competing interests

The authors declare no competing interests.