

Proceeding Paper

Scaling-Up Interventions for Strengthening Antimicrobial Stewardship Using a One Health Approach in Wakiso District, Uganda [†]

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Abstract: We implemented a multidisciplinary project between Uganda and the UK aimed at strengthening antimicrobial stewardship (AMS) in Wakiso district, with a focus on capacity building, stakeholder engagement, and knowledge exchange using a One Health approach. Project activities included: trainings and workshops on antimicrobial resistance (AMR), AMS, infection prevention and control (IPC); Global Point Prevalence Survey (GPPS) data collection and analysis; and the mentorship of lower level health facilities. Our project demonstrated that AMS interventions using a One Health approach can enhance understanding of the prudent use of antimicrobials and improve practices at health facilities and within communities.

Keywords: antimicrobial resistance; antimicrobial stewardship; One Health approach



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1. Project Overview

The partnership between Nottingham Trent University (NTU), Makerere University, Buckinghamshire Healthcare NHS Trust (BHT), and Entebbe Regional Referral Hospital (ERRH) has been promoting antimicrobial stewardship (AMS) in Wakiso District since 2019 using a One Health approach [1]. Other key stakeholders involved in this project include Wakiso district local government, the Ministry of Health, health practitioners, local leaders, and other policy makers. Various professionals including pharmacists, microbiologists, environmental health and public health scientists, and animal health experts have supported project activities.

Our most recent 7-month phase of the project, which ran from October 2021 to May 2022, was part of the Commonwealth Partnerships for Antimicrobial Stewardship (CwPAMS) grants. The project aimed to scale-up AMS interventions in Wakiso district, with a focus on capacity building, stakeholder engagement, and knowledge exchange using a One Health approach. Several activities were conducted, mainly at ERRH, including

training eight pharmacy staff on conducting a Global Point Prevalence Survey (GPPS) [2]; collecting and analysing GPPS data; carrying out an AMS workshop among 24 members of the Medicines and Therapeutics Committee (MTC); holding a workshop among 25 laboratory staff and clinicians on AMS/antimicrobial resistance (AMR); developing a 2–3 year AMS action plan; providing mentorship support on AMS to five lower level health facilities; training 52 health practitioners (HPs) (community pharmacy staff, other human health, and animal health practitioners) and 151 community health workers (CHWs) on AMS, AMR, infection prevention and control (IPC), gender equality and social inclusion (GESI); and increasing membership/continuing to engage members of the earlier established Communities of Practice (COPs) on AMS for health professionals and students, which have grown to over 540 and 250 members, respectively.

Both the Uganda and UK teams were involved in co-designing and implementing the project interventions. The UK team facilitated AMS trainings and workshops virtually through blended learning. In addition, the UK team supported ERRH remotely in drafting the hospital's AMS Action Plan through online platforms such as Zoom for meetings and email for the review of documents. The Uganda team was involved in the day-to-day implementation of project activities.

2. Outcomes and Impact

We shared the project findings at the national One Health Technical Working Group (OHTWG) quarterly virtual meeting in March 2022 in Uganda. We also contributed to the education and awareness survey in the World Health Organization African region to inform regional education and awareness implementation from 2017 to 2021. During the GPPS at ERRH, four pharmacy interns, in addition to four hospital staff, were trained on data collection and analysis. The GPPS enabled ERRH to identify areas of improvement in AMS practice, and the upskilling of existing staff will contribute to the sustainability of interventions. In addition, the hospital staff attended an online GPPS training by the University of Antwerp, which made the in-person training more engaging and easy to understand for the participants.

By the end of the mentorship visits, all five lower level health facilities had formed AMS committees, selected AMS champions, and carried out health education on AMR/AMS among patients. Below is a quote from the project evaluation following the AMS mentorship sessions of a lower level health facility:

The interventions suggested during the mentorship visits have been feasible among which was the creation of an AMS committee. We have also been guided about how we can reduce antimicrobial resistance. Previously, we did not know how to talk to patients but now with the different education materials we have, it is easier. We now have posters that increase awareness, and platforms from which we get information about AMS. We are very thankful for this mentorship by Entebbe Regional Referral Hospital.

—Health officer in charge of a lower level health facility, Wakiso District.

Our training assessments showed that HPs and CHWs had gained more knowledge on AMR/AMS/IPC after the trainings. Of the 52 HPs who participated in the post-training assessment (File S1), 100% (52) correctly identified that antibiotics are effective against bacteria, compared to 78.8% (41/52) who had done so during the pre-training assessment. Meanwhile, out of the 151 CHWs who participated in the post-training assessment (File S2), 98.7% (149/151) reported that microorganisms can fail to respond to antimicrobials, compared to 49.7% (75/151) in the pre-training assessment. Overall, approximately 90% of ERRH staff, 95% of lower level health facility staff, and 98% of CHWs at our project sites have been trained on AMR/AMS/IPC. Furthermore, about 1,000 community members were reached and educated about AMS by the trained health practitioners, as established during the project evaluation. The human and animal health workers trained, as well as communities reached during the project, were empowered to act as change agents in their respective settings regarding the proper access and use of

antimicrobials. Our project activities target all five objectives of Uganda's AMR National Action Plan related to: (1) public awareness, training, and education; (2) IPC; (3) the optimal access and use of antimicrobials; (4) surveillance; and (5) research and innovation, by providing local, measurable, and sustainable actions [3].

The BHT project pharmacy staff, who have had previous experience working on CwPAMS projects as a part of this health partnership, have taken on a mentorship role to support new pharmacists on the team. One pharmacist undertook the Chief Pharmaceutical Officer's Global Health Fellowship alongside their involvement in this project. The pharmacists have additionally been able to develop their leadership skills and knowledge of global health due to their engagement in ongoing activities [4]. The lessons learned through project activities have allowed the pharmacists to consider different methods and communication techniques for engaging with the public and working across sectors, which was helpful during the COVID-19 pandemic in the UK. Furthermore, the review of AMS materials for the training enabled the UK team to optimise resources for future activities both in Uganda and the UK.

3. Future Development

We hope to further scale-up project activities to reach other parts of Wakiso district and Uganda, enabling more health workers to be educated and take actions to support AMS. We also hope to educate more animal health practitioners on AMS, in order to raise awareness and strengthen the One Health approach of tackling AMR. As a means of ensuring the adoption of the AMS activities, we plan to engage behavioural specialists to consider how interventions implemented can be sustained at the facilities and within the community [5]. Our research and that of others has shown that many community members access antimicrobials without receiving a consultation from a health professional [6–8]. To combat this, we plan to expand the community engagement aspects of the project and training/increasing awareness among other community pharmacists and drug shop staff. In addition, we shall have further project dissemination to other local, national, and international audiences to have a wider impact. We shall also continue to seek more funding to carry out further AMS activities in Wakiso district and beyond.

Supplementary Materials: The following supporting information can be downloaded at: <https://www.mdpi.com/article/10.3390/msf2022015007/s1>, Figure S1: Poster presentation for scaling-up interventions for strengthening antimicrobial stewardship using a One Health approach in Wakiso district, Uganda; File S1: PDF on health practitioners' pre- and post-assessment report after training on AMR/AMS/IPC; File S2: PDF on community health workers' pre- and post-assessment report after training on AMS/ AMR/IPC.

Author Contributions: Conceptualization and methodology, D.M., C.B., J.W. and L.G.; project implementation: G.B.L., S.N., D.M., B.Y.N., C.B., F.N., F.E.K., J.G., K.R.-H., L.M., M.O.B. and L.G.; data collection and formal analysis, G.B.L., F.N., J.G., S.N. and D.M.; writing—original draft preparation, S.N., G.B.L. and D.M.; writing—review and editing, D.M., S.N., G.B.L., F.N., J.W., L.G., L.M., B.Y.N., C.B. and M.O.B.; funding acquisition, D.M., L.G. and C.B.; project administration, M.O.B., C.B., K.R.-H., B.Y.N., L.M., F.E.K., J.W., G.B.L. and S.N. All authors have read and agreed to the published version of the manuscript.

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Institutional Review Board Statement: The study was conducted in accordance with the Declaration of Helsinki and approved by the Institutional Review Board of Makerere University College of Health Sciences, School of Health Sciences Research and Ethics Committee (MakSHS-REC) 2019-051, renewed on 2 December 2021 and registered at the Uganda National Council of Science and Technology (HS 2711) on 6 February 2020.

Informed Consent Statement: Written informed consent was obtained from all subjects involved in the study.

Data Availability Statement: Data are contained within the article or supplementary material. The data presented in this study are available in [File S1: PDF on health practitioners' pre- and post-assessment report after training on AMR/AMS/IPC; File S2: PDF on community health workers' pre- and post-assessment report after training on AMS/ AMR/IPC].

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