

IMPACT REPORT

COMMONWEALTH PARTNERSHIPS FOR ANTIMICROBIAL STEWARDSHIP (CWPAMS)

2024

Acknowledgements

The Tropical Health and Education Trust (THET) and the Commonwealth Pharmacists Association (CPA) would like to express their sincere gratitude to all those who enabled Phase 1 of the Commonwealth Partnerships for Antimicrobial Stewardship (CwPAMS) programme to achieve such successes; our funding and implementation partner, the UK Department of Health and Social Care's Fleming Fund, The Change Exchange, and the UK and low/middle income country (LMIC) institutions and Health Partnerships who designed and led the programmes. We would also like to say a special thank you to the thousands of volunteers and health workers across the world whose dedication and expertise made this programme possible.

CwPAMS is funded by the UK Department of Health and Social Care's [Fleming Fund](#) using UK aid programme supporting up to 25 countries across Africa and Asia to tackle AMR, a leading public health threat across the world. The Fleming Fund invests in strengthening surveillance systems through a portfolio of country grants, regional grants and fellowships managed by [Mott MacDonald](#), and global projects managed by partners. The views expressed in this publication are those of the authors and not necessarily those of the UK Department of Health and Social Care.

Foreword

Antimicrobial Resistance (AMR) is a growing threat to modern medicine and our ability to treat infections for humans, animals and plants. Antibiotics matter, without them, even simple procedures could become dangerous enough to kill patients; and the illnesses that we have made global progress on treating, such as TB and malaria, would become untreatable. Drug-resistant infections, like any infections, do not respect borders and have the ability to catastrophically impact people wherever they are in the world.

Low- and middle-income countries (LMICs) are disproportionately affected by the antibiotic emergency, in part due to the higher prevalence of infectious disease and would therefore experience greater drops in economic growth as a result of any outbreak, threatening development gains. With AMR directly responsible for 1.27 million deaths globally and associated with almost 5 million deaths we are accelerating towards the projected 10 million deaths a year by 2050 at a worrying rate.

Antimicrobial stewardship and infection prevention and control remain cornerstones for tackling AMR. Practices, guidelines and behaviours are critical in preventing the spread of hospital-acquired infections and protecting the marvels of medicine and health infrastructures for when they are needed. I am grateful for the Commonwealth Partnerships for Antimicrobial Stewardship (CwPAMS) programme for being key leaders in this space, promoting strong antimicrobial stewardship (AMS) practices by strengthening the global health workforce, supporting the development and implementation of LMIC health institutions, and improving knowledge and understanding of the importance of using antibiotics sustainably and appropriately.

The impact report demonstrates the real-world impacts that CwPAMS delivers for communities across the world. Over 6,500 healthcare workers have received training, and there is clear empirical evidence that these practices are being shared and implemented in healthcare settings. We have seen more pharmacists on wards and committees; greater confidence and decision-making around AMS resulting in changes to prescribing behaviours; and key contributions made to guidelines and protocols now being used in nearly 70 institutions across the eight countries. Through collaborating across sectors, CwPAMS is building equitable, resilient, sustainable healthcare systems that contribute to the achievement of Universal Health Coverage.

CwPAMS shows the value of partnerships and collaboration. I am proud that the UK's Fleming Fund is the largest official development aid programme supporting strengthened AMR surveillance globally, having committed £210 million over 3 years to support up to 25 low- and middle-income countries generate, share and use data on antimicrobial resistance. To this end, the Fleming Fund and CwPAMS are working together to improve antimicrobial stewardship practices, infection prevention control measures and build antimicrobial expertise, in this fight against AMR.

I want to extend my gratitude to the leadership and collaboration of the UK government, including Dr Keith Ridge (Retired Chief Pharmaceutical Officer for England), and the Ministries of Health and National Pharmacy Associations in our participating countries for their collaborative efforts and support. This also could not be done without the support of NHS institutions creating opportunities for their staff members to take part in the programme, and the NHS employees who volunteered their valuable time.

At the close of the first phase of CwPAMS, they are rightfully proud of the great strides made in AMS across eight African countries and the UK – but I know they will not stop here. There will be a United Nations High-Level Meeting this year on AMR at which all countries and sectors will come together to chart a road forward that contains and controls AMR. With exciting global initiatives ongoing, I look to CwPAMS to continue its work at national and local levels. The second phase of the programme is expanding its AMS capacity development to more health institutions across the eight countries and seeking to explore the link between AMS and microbiology surveillance, expanding capacity building and training to community pharmacists, and enhancing substandard and falsified medicines detection and reporting.



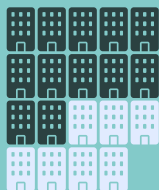
Dame Sally Davies, UK Special Envoy for AMR

CwPAMS at a glance - Phase 1

PARTNERSHIPS

19

Partnerships were involved across Phase 1



12

Partnerships from CwPAMS 1

7

Partnerships from CwPAMS Extension



4

LMIC countries in CwPAMS 1

8

LMIC countries in CwPAMS Extension

TRAINING

All CwPAMS partnerships demonstrated improved knowledge and practice of AMS prescribing practice

6500

trained healthcare workers



of health workers tested in CwPAMS 1, showed an increase in knowledge after training.



of health workers in CwPAMS Extension trained specifically in AMS principles, prescribing, and consumption surveillance, showed an increase in knowledge after training.

VOLUNTEERS

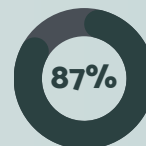
370

volunteers have been involved in the projects



2164

volunteering days provided by volunteers



of volunteers noted that their NHS institution has benefited through their participation in CwPAMS; with



stating they have increased their capacity for AMS activities in their team.

Programme overview

Funded by the Fleming Fund, the CwPAMS programme aimed to leverage the expertise of UK health institutions and technical experts to strengthen the capacity of the national health workforce and institutions in eight Commonwealth countries to address AMR challenges, as well as creating opportunities for bidirectional learning. Delivered by the Tropical Health and Education Trust (THET) and the Commonwealth Pharmacist Association (CPA), CwPAMS aimed to help tackle three of the seven Fleming Fund objectives:

- Objective 2: Developing and supporting the implementation of protocols and guidance for AMR surveillance and antimicrobial use.
- Objective 6: Advocating the application of data to promote the rational use of antimicrobials.
- Objective 7: Collating and analysing data on the sale and use of antimicrobial medicines.

These objectives were addressed by using the well-tested methodology of Health Partnerships. Partnerships between UK health institutions and their peers in LMICs, where UK health workers volunteer their time to co-develop strategies and share skills and knowledge to address priority health system issues, in this case relating to antimicrobial stewardship (AMS). This approach provides mutual benefit for both the LMIC health workforce and institutions and the UK teams, who develop project-related and leadership skills, and gain a greater understanding of AMS in the global context and how to find innovative approaches to tackle it in resource-limited settings.





Overview of the Health Partnerships

This impact report outlines the CwPAMS programme outcomes from the first two rounds of grants under Phase 1:

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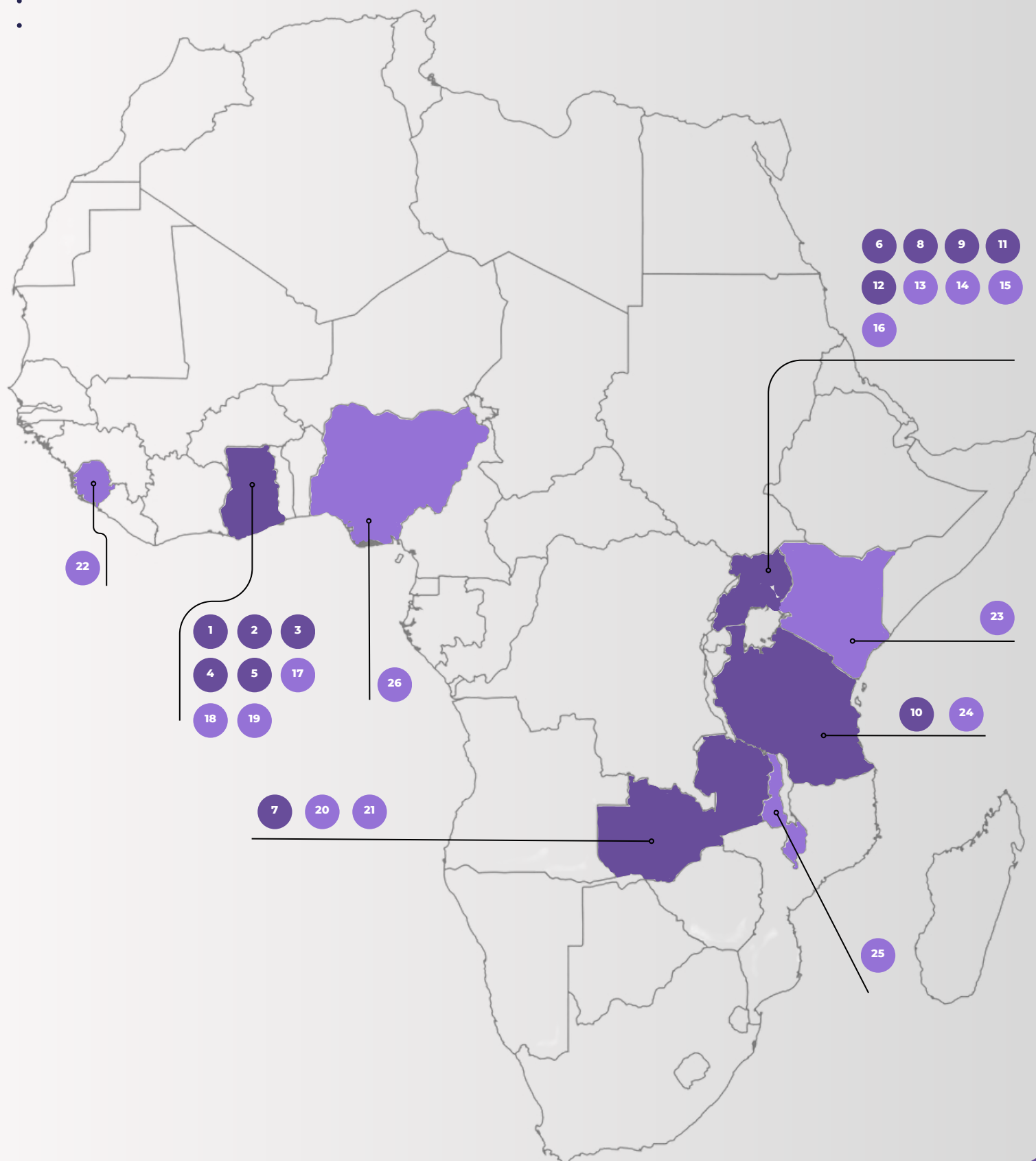
- CwPAMS 1: The first round, from March 2019 to June 2021, comprised 12 Commonwealth partnerships involving UK multidisciplinary teams who travelled to Ghana, Tanzania, Uganda, and Zambia to work in partnership with local health workers to tackle the growing challenge of AMR.
- CwPAMS Extension: The second round, from October 2021 to June 2022, comprised 14 partnerships, incorporating the additional countries of Kenya, Malawi, Nigeria and Sierra Leone.

The projects primarily focused on the following three themes:

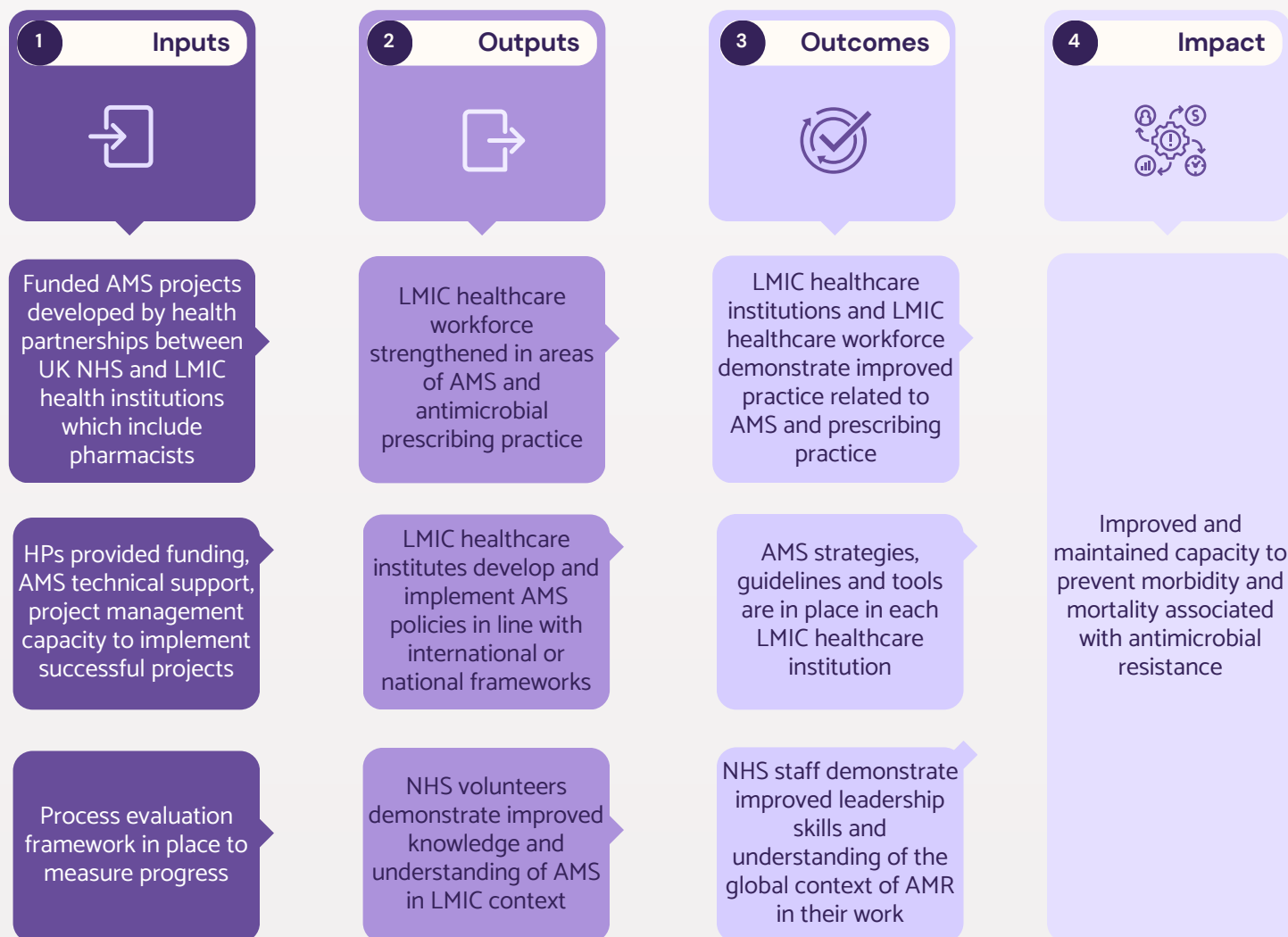
- AMS, including surveillance.
- Antimicrobial pharmacy expertise and capacity.
- Infection Prevention and Control (IPC).

CwPAMS Phase 1 - in numbers (map)

*List of projects in Annex 1



Theory of change for CwPAMS Phase 1



CwPAMS programme highlights

Key Programme Data

Indicator	Indicator	CwPAMS Extension	Total (cumulative)
Number of Health Partnerships	12	14 (7 new)	19
Number of LMICs involved	4	8	8
Number of awarded grants	12	14	26
Number of UK institutions involved	26	23	n/a*
Number of LMICs institutions involved	33	26	n/a*
Total number of health workers trained	3324	3432	6756
Number of health workers trained in AMS principles, antimicrobial prescribing, and consumption surveillance	1714	1452	3166
Number of health workers trained in Infection Prevention and Control (IPC)	628	706	1334
Number of LMIC healthcare staff tested applying their new skills	555	1276	1831

Indicator	Indicator	CwPAMS Extension	Total (cumulative)
Number of operational Medicine Therapeutics Committees (MTCs) or AMS/IPC committees	10	n/a*	10
Number of Point Prevalence Survey (PPS) sites	12	18	30
Number of peer-reviewed publications	14	6	20
Number of volunteers who can name 5 barriers to functional AMS in LMICs (at the end of the programme) ***	83% (10)	84% (70)	80

*Seven partnerships were involved in both CwPAMS 1 and CwPAMS Extension, so some institutions are the same.

**Data not collected as not a priority activity for CwPAMS Extension

***Based on then number of volunteers completing the survey

CwPAMS Extension indicators only

CwPAMS Extension Indicator	Results
Number of LMIC healthcare institutions who have completed an assessment of the implementation sites*	24
% of grants held AMS Assessment Tool meetings where AMS interventions have been identified and an action plan drafted	100%
Number of LMIC healthcare staff trained in utilising/developing pharmacy expertise and capacity	1272

The AMS Assessment Tool assesses essential, multi-faceted AMS interventions that are considered core elements for a successful AMS programme in health-care facilities. This tool can help identify gaps at the beginning of the project and direct AMS activities to achieve the greatest impact.

Health workers trained by the programme

	CwPAMS 1	CwPAMS Extension	Total
Total healthcare workers trained	3324	3432	6756

Health workers trained by cadre*

Cadre	Total reached - CwPAMS 1	Total reached - CwPAMS Extension**	Total
Doctors	407	693	1,100
Nurses	822	820	1,642
Pharmacists	407	342	749
Medical/clinical officers	49	1	50
Community health workers	422	n/a	422
Midwives	89	21	110
Technicians	102	93	195
Healthcare assistants	44	4	48
Other**	725	52	777

*CwPAMS Extension disaggregated by training area, but CwPAMS 1 did not.

**Not all CwPAMS Extension HPs disaggregated results by cadre.

*** E.g., hospital management, hospital maintenance staff.

Policies and protocols developed

	CwPAMS 1	CwPAMS Extension	Total
Number of new or revised documents related to AMS and antibiotic prescribing developed	29	34	63
Number of guidelines and protocols rolled out in the LMIC healthcare institutions through awareness campaigns, training, printing and/or sharing	27	40	67

Facilities reached by the programme

	CwPAMS 1	CwPAMS Extension	Total
Number of UK health institutions actively including returned volunteers' skills and experience in their workplace	16	23	39*

*Seven Health Partnerships were involved in both CwPAMS 1 and CwPAMS Extension. Volunteers provided qualitative evidence through interviews and surveys of how they are using the new skills and knowledge in NHS Trusts.

Volunteers

	CwPAMS 1		CwPAMS Extension		Total	
	Male	Female	Male	Female	Male	Female
Total volunteers by sex	119	168	33	50	152	218
Overall total volunteers	287		83		370	

	CwPAMS 1	CwPAMS Extension	Total
Total number of volunteering days contributed by UK volunteers	1842	322*	2164

*Significantly fewer volunteering days in CwPAMS Extension due to the shorter timeframe and COVID-19 restrictions preventing some in-country volunteering time. Volunteering days may involve in-person or remote engagement in project activities.

Outcomes

CwPAMS contributed to the three Fleming Fund objectives (as above); a core focus of the programme, in line with its impact statement, was improving and maintaining capacity to prevent morbidity and mortality associated with antimicrobial use, demonstrated through the following outcomes:

- Institutions and workforce demonstrate improved knowledge and practice related to AMS prescribing practice and IPC.
- Evidence of effective AMR interventions, with standardised tools and guidance being used by local institutions and/or national partners.
- NHS staff demonstrate improved leadership skills and a better understanding of the global context of AMR in their work.



Evidence of this contribution is outlined below under each outcome, highlighting relevant themes and examples from CwPAMS 1 and CwPAMS Extension.

Overall, as a result of CwPAMS activities, LMIC health practitioners have begun to apply the knowledge gained into AMS practices. This has resulted in positive changes demonstrated through clear empirical evidence such as pharmacist upskilling and recognition, resulting in increased inclusion of pharmacists on the wards and on committees. Further, there has been an increase in confidence and decision-making around AMS by healthcare workers resulting in changes to prescribing behaviours. This is outlined in the sections below.

CwPAMS outcome 1: Institutions and workforce demonstrate improved knowledge and practice related to AMS prescribing practice and IPC.

Building AMS capacity and capability

All CwPAMS partnerships demonstrated improved knowledge and AMS prescribing practice: in CwPAMS 1, 96% (1682/1752) of health workers showed increased knowledge after training in AMS principles; in CwPAMS Extension, 91% (1323/1454) of health workers showed increased knowledge after training in AMS principles, prescribing, and consumption surveillance.

Improved antibiotic use has been achieved using Point Prevalence Surveys (PPS) to identify poor practices and inform and deliver interventions to address these. PPS is a methodology used to measure the prevalence of antimicrobial use and is conducted by recording data on the number of patients and antibiotics prescribed in a health facility at one certain date and time. Health partnerships provided training to the LMIC workforce so that the PPS tool could be utilised for data collection and sustained monitoring of antibiotic use, and then adopted for use at additional health facilities. In response to PPS findings, a variety of AMS interventions were developed and implemented across health partnerships. Examples included: new guidelines developed, a catalyst for forming an AMS committee, improved access to guidelines within the hospital, updated drug charts, AMS awareness campaigns. The use of a locally developed out-patient PPS tool was used by several health partnerships during the CwPAMS Extension which acknowledges the setting whereby most antibiotics are supplied and provides additional data for further interventions. This directly addresses the Fleming Fund objectives 6 and 7 [Programme Overview Section].

For example, one partnership in Ghana, through the use of PPS data, identified that guideline compliance could not be assessed for many indications due to the high levels of missing guidelines. The partnership collaborated with local clinical staff to develop guidelines for obstetrics/gynaecology infections and surgical prophylaxis. The post-intervention PPS showed 100% compliance with the newly developed guidelines.

AMS knowledge also increased amongst key stakeholders, wider groups of clinicians, school children, and the public.

For example, in Tanzania, the partnership between Kilimanjaro Christian Medical Centre Community Health Department and the Northumbria Healthcare NHS Foundation Trust worked with the local police commissioner's office to present information on AMR as part of a training course on 'how to respond to a road traffic accident'. In the CwPAMS Extension, partnerships also engaged community pharmacy staff and animal health practitioners.

The involvement of multidisciplinary teams in AMS activities was noted by health partnerships as a key component of AMS capacity building and undoubtedly supported the increase in AMS capacity at health facility level, increased the sharing of knowledge and skills, and increased health workers' confidence. Partners noted that multidisciplinary working promoted enthusiasm and interest towards AMR and highlighted the need for a team approach that included pharmacists, laboratory technicians, cleaning staff, nurses, and clinicians to make progress with AMS. Staff involved in CwPAMS capacity building training and committees expressed their increase in confidence for prescribing.

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“A good committee is one that is made up of different cadres. And the decisions by that committee can easily be impressed by presentation from the clinician side, the nursing side, the pharmacy side. When we empower this committee to make those decisions and guidelines.”

- Senior Pharmacist, Malawi

In Uganda, the partnership between University of Salford and Pharmaceutical Society of Uganda evidenced the effectiveness of multidisciplinary teams to optimise the use of antimicrobials. The nurses in charge were pivotal in ensuring AMS interventions were embedded within the wards. For example, to tackle maternal sepsis, nurses and midwives were able to improve the culture and sensitivity testing for caesarean wounds to 100%. Culture sensitivity testing helps to inform the appropriate selection of antibiotics based on the results of the sensitivity reports. This optimised the treatment of patients, the use of antimicrobials, and saved money for the hospital. One partner reflected, “...we haven't gone in doing anything big and fancy. And it's been a very low-cost project. And so I think the key policy message is, this is entirely doable in the in terms of health systems change, and it saves money.”

Partnerships and healthcare professionals have learned skills that can be passed on, creating a self-sustaining system.

“Through the training, I acquired knowledge which I need in my daily work. I have been able to change how I prescribe drugs to my patients. I now first identify whether it is a viral or a bacterial infection.” - Nurse, Wakiso district, Uganda.

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“People are receiving the knowledge and skill so when they go to teach, they have this knowledge, skill and experience.” - Head of Pharmacy, Zambia

Improved knowledge and use of IPC

Throughout CwPAMS, health partnerships have demonstrated improved knowledge and awareness of IPC practices; with 76% of CwPAMS Extension healthcare workers trained in IPC demonstrating improved knowledge after training. IPC practices were also particularly evident, and enhanced, during the height of the COVID-19 pandemic during CwPAMS 1.

For example, in Uganda, a major outcome of the partnership between Makerere University and Mulago National Referral and Teaching Hospital and Cambridge University Hospitals NHS Foundation Trust was increasing knowledge and awareness of IPC by promoting hand hygiene via three methods:



Implementing an information and poster campaign on the importance of hand hygiene



Empowering staff to locally source and manufacture alcohol hand gel at the start of the COVID-19 pandemic.



Implementing an IPC training programme for multi-disciplinary teams.

The partnership secured support from the senior directorate level for their IPC activities and promoted multidisciplinary working. The Ministry of Health (MoH) recognised these activities and sent a letter of appreciation to both UK and Ugandan partners and signed a Memorandum of Understanding with the partnership.

Partnerships used a variety of different approaches to training, including trainers/trainees from a variety of healthcare professions. Many had an emphasis on behaviour change which proved to be an effective way to bring learning into different environments. The use of practical IPC training (for example the use of agar plates demonstrating bacteria growing on hands) enabled trainees to recognise the importance of IPC within their hospital setting and incorporate it within their clinical practice.

In Uganda, Makerere University Department of Obstetrics and Gynaecology and Cambridge University Hospitals (CwPAMS 1 and CwPAMS Extension) saw good progress in IPC on the neonatal intensive care unit (NICU) ward, with one stakeholder noting, “staff training in IPC on the NICU and the celebration of world hand hygiene day was a highlight. It was fantastic to monitor progress from when I first started working on the unit a year ago.” The hospital improved IPC at the facility through procurement of alcohol dispenser, alcohol, and an alcohol-gel making machine. Alcohol is now given priority amongst the items to purchase, demonstrating improved recognition from hospital management about the importance of IPC.

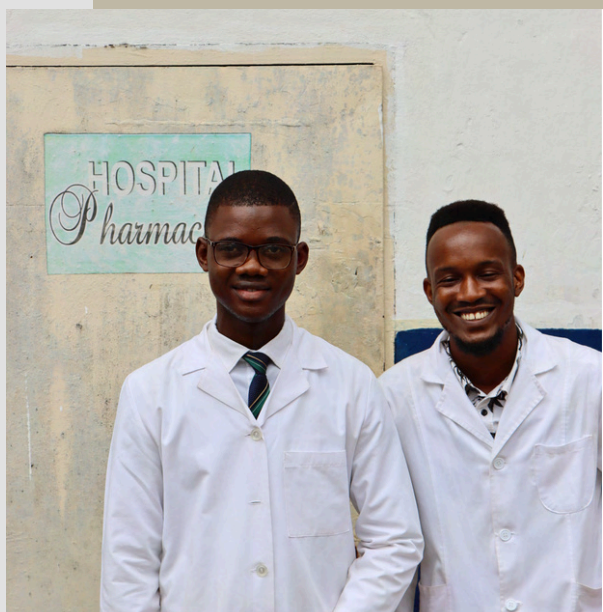
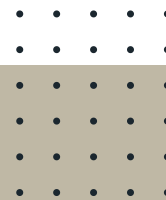
Supporting sustainability of practices through AMS Committees

Health partnerships established AMS Committees and Medicine Therapeutics Committees (MTCs) at their respective hospitals. AMS Committees, working alongside MTCs play a fundamental role at the hospital by guiding institutional decision-making on AMS and helping to solve the problems that arise. These committees collate hospital-level information on antibiotic use and AMR to share with the MoH and national committees, such as Antimicrobial Resistance Coordination Committee (AMRCC), and subsequently inform the progress of the country’s National Action Plan (NAP).

For example, at Entebbe Regional Referral Hospital (ERRH) in Uganda, the MTC developed action points to support their functionality, such as integrating MTC activities in the general hospital plan, conducting regular meetings, and holding continuous medical training for staff on relevant topics including AMR/AMS.

The MTCs and AMS/IPC committees have increased the generation and review of data, sharing of information, promoted the role of pharmacists, and formalised AMS decision-making processes at health facility level. More importantly, they serve as a mechanism to sustain these practices past the end of grant funding. These committees are now tasked with continuing the interventions, started by the health partnerships, and reviewing local AMS action plans. In several cases, members of the partnership are now both members of their local AMS Committee/MTC as well as at the national AMS committees or advisory boards. This expanded the reach of the CwPAMS programme through disseminating data, sharing learning, and highlighting the role of CwPAMS projects to national stakeholders.

For example, in Uganda, the AMS Committee at the Fort Portal Regional Referral Hospital (initially under the guidance of the partnership) embarked on a plan to increase the capacity of local health workers who play a key role in educating the community on AMR and guiding antibiotic prescribing behaviour. The committee is now supported by the hospital senior management and has ensured that clinical teams, laboratory, and the nursing department are all involved in decision-making going forward. In another example, in the partnership between Makerere University College of Health Sciences and Infectious Diseases Research Collaboration (IDRC) and London School of Hygiene and Tropical Medicine (LSHTM), the AMS Committee has had influence at national level by playing a key role in adapting the national COVID-19 Management Protocols for handling confirmed cases and the procedures for isolating patients affected with COVID-19.



Supporting sustainability of practices through AMS Champions

Health partnerships implemented multidisciplinary mentoring schemes and identified AMS champions to reinforce learning and support the sustainability of the work. For example, in Sierra Leone, the Kings Global Health Partnerships and Connaught Hospital partnership implemented an AMS champions scheme; 10 AMS champions were recruited to work in the partnership from

a variety of pharmacy sectors, such as hospital, community, and administration. All 10 AMS champions stated that they had been able to encourage engagement in AMS by other healthcare professionals, patients and members of the public. There was also an appetite for improvement of AMS protocols at other hospitals across Sierra Leone, showing how the AMS champions were able to promote AMS more widely. As one respondent stated,



“I was able to interact with doctors with regards to their prescriptions. Most of them were not aware of the treatment guidelines. Some are not complying. I was also able to interact with nurses with regards to mis documentation on the patient treatment record. At my (regular) workplace, I was able to conduct the first ever Global PPS involving other workers at the hospital.”

Recognition of antimicrobial pharmacy expertise



Inclusion of pharmacists in training and on the wards has increased their knowledge, confidence, and recognition, and has empowered pharmacists to conduct the PPS in their facilities.

87%

of health workers (749 of which pharmacists) showing an increase in knowledge after training (CwPAMS Extension).

For example, in Tanzania, Kilimanjaro Christian Medical Centre (KCMC) Community Health Department and the Northumbria Healthcare NHS Foundation Trust encouraged the empowerment of clinical pharmacists by deploying them on hospital wards. One of the lead partners highlighted that, as a result of CwPAMS, pharmacists and other staff now “feel enthusiastic and engaged in AMS and it has helped to raise the profile of AMS through a wide range of wards and departments [at KCMC]. AMS Ambassadors (the project leads) at each hospital are further motivated to progress and build on work around AMS.”

Health partnerships were able to increase pharmacy expertise in AMS through training, with those trained stating that they had changed their practice because of the project. An example is the implementation of AMS drug charts on the wards in Zambia, at UTH and Chipata Central Hospital, leading to a change in the prescribing process and behaviour by clinicians on the ward.

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“I have seen a big change in terms of how the antibiotics have been handled. Whenever they get a prescription when they are not sure, they are able to ask the prescriber why are we doing this? A thing that was not happening in the past. That engagement with the prescriber we have not seen [before].” - Senior Pharmacist, Malawi

Participation in the CwPAMS programme has also led to national recognition of pharmacists. For example, in Ghana, the Ghana Public Health Association and UK Faculty of Public Health partnership has been recognised as AMS experts, with PATH Ghana deciding to recruit facilitators from LEKMA hospital for an antenatal infection control project which targets pregnant women, nursing mothers and new-born babies aiming to reduce maternal and infant mortalities in the region.

CwPAMS outcome 2: Evidence of effective AMR interventions, with standardised tools and guidance being used by local institutions and/or national partners.

All 19 health partnerships (26 grants) developed and implemented protocols/guidelines for AMR surveillance and antimicrobial use within the LMIC institutions through awareness campaigns, training, and knowledge sharing, directly addressing the Fleming Fund's Objective 2.

Supporting sustainability through the development and implementation of protocols/guidelines/processes

The development of protocols and guidelines ensures that the work by the health partners is sustained and used in daily practice. Partnerships developed protocols, guidelines, and AMS drug charts that are aligned with National Action Plans and international standards and, in several cases, these were disseminated to surrounding hospitals or formalised in AMS modules and IPC Standard Operating Procedures (SOPs).

In Ghana, the partnership between Ghana Public Health Association (GPHA) and UK Faculty of Public Health (FPH) developed its own hospital protocol for antibiotic use in adults, known as 'Antibiotic Man'. This protocol, which covers antimicrobials for various diseases, is used in conjunction with the Ghana Standard Treatment Guidelines and the British National Formulary (BNF), as one partner explains, "...we looked at it in comparison to BNF that we have in the UK and compared it with other parties." This enables clinicians to adhere to this hospital-specific protocol to guide their prescribing patterns when antibiotics are needed. By using the Antibiotic Man protocol, the partnership is able to distribute these guidelines on a national scale through the National Technical Coordinating Committee.

In Uganda, prior to the CwPAMS project, the Nottingham Trent University; Makerere University School of Public Health; Buckinghamshire Healthcare NHS Trust partnership noted that only one copy of the prescribing guidelines existed and was not accessible to most staff within the hospital. Through the training, as well as disseminating the guidelines more broadly on the wards, the partnership noted a 50% uptake of using the guidelines for prescribing, as one partnership noted "These guidelines exist in a Ugandan context, whereby health practitioners are supposed to refer to these guidelines while prescribing, which wasn't necessarily being done at the time. So [we] really emphasize this in the training. And the evaluation showed that indeed, over half are now using these guidelines during the course of their practice."

In Nigeria, gaining support of hospital management of AMS activities was a crucial step in ensuring successful interventions and in promoting every member of staff to be involved in AMS activities. Sharing information about the project with hospital management helped to solidify an agreement on staff protected time for AMS activities, and to ensure that the antibiotic policy and guidelines are turned into administrative directives. Although the CwPAMS project was ending, hospital management requested the AMS committee to continue with the AMS activities and assured the committee of more support.

Evidencing change in practice, behaviour, and reduction in use of antimicrobials

The implementation of protocols, guidelines, and training has started to have an impact in the hospitals through a reduction in antibiotic consumption and in the management of COVID-19 patients. This has been evidenced throughout the projects, with a few highlighted below.

In Ghana, the partnership between the Ghana Public Health Association and UK Faculty of Public Health, through training and audits, established a local hand hygiene policy in the hospital for all staff. This promoted regular intensive training on IPC, with an emphasis on hand hygiene techniques along with the preparation equipment needed. The partnership ensured that the logistics required for proper hand hygiene were always available, including hand sanitizers, soap, and clean water. This policy became extremely useful in the management of COVID-19 at the hospital. During CwPAMS Extension, the partnership implemented AMS systems at LEKMA hospital which resulted in a change in prescribing behaviour, including delayed prescription and prescription auditing. LEKMA hospital was recognised as the best health facility in the Greater Accra Region largely due to the AMS systems in place. The partnership carried out an audit to assess how the hospital identified bacterial agents and profiled their antimicrobial susceptibility within the outpatient department. This enabled the partnership to provide further training and increase the level of surveillance towards AMR spread.



Another partnership in Ghana (Keta Municipal Hospital) undertook a quality improvement project to increase compliance in outpatients with the pneumonia treatment guidelines. The data from the departmental audits was discussed with prescribers and the partnership designed interventions which improved access to guidelines and provided prescribers with regular feedback on their progress. By the end of the quality improvement project, compliance with the guidelines had improved from 18% to 70% within three months.



“The training was good and we learnt a lot of things that even some of our seniors don’t know. It has changed my practice, there are now fewer cases where I recommend antibiotics just because chickens and goats are sick.” - Veterinary Extension Community Worker, Wakiso district, Uganda.

In Uganda, the partnership between Makerere University and Mulago National Referral and Teaching Hospital and Cambridge University Hospitals NHS Foundation Trust noted a 30% reduction in antibiotic consumption post training and switching the IV antibiotics to oral antibiotics earlier for post-caesarean section patients. This led to improved outcomes for patients, such as enabling them to be discharged earlier. For the hospital, it has reduced the costs for managing these patients, whilst also improving the patient flow. As for staff, it has increased rational prescribing, specifically for those on the maternal wards.



“I learnt that even when we do not finish the medicines, it makes the germs resistant. I also educate others not to just throw the expired drugs in our environment because it also increases the possibility of antimicrobial resistance.” - Community Health Worker, Wakiso district, Uganda.



You see people adhering to standards because now they know why they should”, and people are now “enquiring the rationale behind prescriptions.” - Pharmacist, Malawi.

In Sierra Leone, the partnership recognised the changes in behaviour of senior stakeholders, including senior pharmacists and the senior store manager at the National Medicines Supply Agency. Changes in behaviour were seen in prescribing and dosing, with the pharmacists reporting that now some of the prescribers double check with them before prescribing. They noted that this is especially significant in Sierra Leone, as there is normally less recognition of the role of pharmacists within the hospital system.

In Kenya, at the beginning of the project, there was very little interest in AMS mainly due to a lack of appreciation of the relevance of AMS. One of the main goals of the project was to promote awareness and understanding of the severity of AMR. The project was able to improve knowledge and skills amongst healthcare staff in AMS by 50% as well as directly engage hospital management and help stakeholders appreciate the role that they play in addressing AMR. This not only had an impact on prescribing practices at the hospital but has encouraged other institutions within Kakamega county to consider implementing AMS and IPC programmes.

CwPAMS expected outcome 3: NHS staff demonstrate improved leadership skills and a better understanding of the global context of AMR in their work

During CwPAMS 1 and CwPAMS Extension, 16 and 23 UK health institutions actively included returned volunteers' skills and experiences in their NHS institution, respectively. From the CwPAMS Extension volunteer survey, 87% (72) of volunteers noted that their NHS institution has benefited through their participation in CwPAMS; with 72% stating they have increased their capacity for AMS activities in their team. The three areas most cited by volunteers for developing and using skills and experiences from CwPAMS in the NHS or UK are: 1) Leadership and project management, 2) Use of new tools (digital / virtual) for training / use of AMS in another sector, 3) Mentoring / teaching / counselling. Many of the first cohort of UK Fellows also undertook mentorship of the second cohort of UK pharmacy Fellows in CwPAMS Extension.

Improved leadership in the NHS

The UK pharmacists who participated in the CwPAMS programme felt that they had many opportunities to develop skills which they could utilise in their careers in both the NHS and academia. The areas stated by volunteers include leadership, communication, team working, and project management skills. Working in resource limited settings encouraged the pharmacists to work beyond their traditional boundaries and many were able to appreciate the need for different ways of working and innovating, which is especially important when working in healthcare in the UK.

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“It allowed me to think differently about the barriers to implementing AMS in other countries and in the NHS Trust, I worked it facilitated us making a video on the activities we undertake and thinking more about the governance processes in place to deliver AMS in the UK.” - UK volunteer



Pharmacists are in possession of key knowledge and skills to improve the rational use of antimicrobials but are frequently underutilised in this role. Through this programme, UK pharmacists were able to engage with senior hospital staff at LMIC institutions, which subsequently motivated them to interact with senior managers in their NHS institutions. Additionally, several of the CwPAMS projects gave the pharmacists the opportunity to work with health psychologists (via the Change Exchange) exploring the impact of behaviour change techniques applied to AMS.

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“Improved appreciation of global healthcare and how to change practice in resource-poor settings. Working with The Change Exchange has improved my personal skills/knowledge. Writing up work for publication - concerted effort on this which I have then applied to work by my own UK group.” - UK volunteer

Throughout the programme HPs acknowledged reduced brain drain and happier staff, and the NHS Trusts reported an improvement in retention. These benefits had a positive impact on their work where volunteers were referenced as good role models for their respective departments.

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“Mentoring as part of the Fellowship, and teamwork as part of the project, has been transformative in altering my approach to working with others – resulting in an even better team dynamic locally.” - UK volunteer



Participation in CwPAMS led to professional development for several NHS healthcare workers. For example, pharmacists who were involved in the partnership between Makerere University Health Services and Buckinghamshire Healthcare NHS Trust, took on a mentorship role to support the UK volunteers who were new to working in global health. One of the volunteers who was new to CwPAMS in the Extension phase has accepted a leadership and management promotion since completing the project. Similarly, in the partnership between Cambridge University Hospital and Kakamega County Referral Hospital, a pharmacist involved in the CwPAMS Extension project became a line manager for the first time and is currently providing increased input to senior working groups within the hospital, such as in IPC Surgical Site Infections and Sepsis. Other members of the team also reported increased confidence and skills in project management and service development.

Better understanding of the global context amongst NHS volunteers

UK pharmacists felt that participating in the CwPAMS programme made them better equipped to deal with the limited resources and additional stresses brought on by COVID-19, gave them the opportunity to work differently and innovatively, and “expect the unexpected”. Bidirectional learning from the CwPAMS partnerships was an important element; a great example of this was at the start of the COVID-19 pandemic; alcohol hand gel was in short supply in the UK and one UK hospital learned how to manufacture alcohol hand gel from their African partners.

International exchanges took place throughout the programme to build understanding of the global problem of AMR. For example, the partnership between Pharmaceutical Society of Uganda and the University of Salford was awarded two Commonwealth Professional Fellowships to bring two of the Ugandan midwives who have been at the forefront of AMR work to the UK to undertake further work on wound management.

In addition, the first and second cohort of the Chief Pharmaceutical Officer (CPhO) Global Health Fellowship was successfully implemented, with 16 and 13 NHS UK Pharmacists respectively, co-leading on the delivery of CwPAMS objectives. An assessment of the fellowship impact in the first cohort showed that there was a significant improvement in Fellows’ perception of their confidence, teaching abilities, understanding of behaviour change, management, and communication skills. At the mid-term evaluation of the second cohort, the fellows reported gaining experience of implementing health service improvements resource-limited settings and were proud of the practical knowledge obtained in leadership as illustrated by one of the Fellows, “I have gained project management skills, better understanding of global health and AMS barriers in LMICs, negotiation and delegation skills.”

In Malawi, the partnership between the Pharmaceutical Society of Malawi and the Betsi Cadwaladr University Health Board reported taking more of a prudent approach to improving AMS locally, trying to work within the confines of available resources where possible. The Wales team have an improved understanding of global health and are acting as ambassadors within their organisations.

In Uganda, the partnership between Makerere University Health Services and Buckinghamshire Healthcare NHS Trust highlighted how the project gave both partners a deeper understanding of their two contexts. The involvement of a nurse in the UK volunteer group gave a deeper understanding of challenges faced by nurses within the NHS and could be related to the in-country partners. Parallels were felt upon discussion and similarities of challenges shared, with ideas to overcome them, such as the use of blue trays to create a sterile environment within a clinical area.

In Tanzania, the Kilimanjaro Christian Medical Centre (KCMC) Community Health Department and the Northumbria Healthcare NHS Foundation Trust partnership found that through their participation in CwPAMS, they were more connected to the NHS department, and there were new opportunities for pharmacy colleagues to engage in global health discussions and exchange insight and ideas to facilitate learning.

Influencing policy

Our research shows that the CwPAMS HPs have influenced AMS and IPC policy at local, regional, and national levels. This is primarily through the following ways:

Improving AMS awareness of key stakeholders (e.g., through lobbying national organisations and sharing evidence at events, meetings, publications, online platforms).

Promoting the recognition and key role of pharmacists in AMS (E.g., Partners have successfully advocated for pharmacists at the hospital level by highlighting their knowledge of AMR and AMS, securing positions on the hospital committee, and utilising the positions they hold at national committees).

Opening new spaces for policy dialogue (e.g., Partnerships expressed that the MTCs, especially through the AMS steering committees, play a fundamental role in hospital policy by guiding institutional decision-making on AMS and by serving as a problem-solving structure for any challenges that arise).



Initiating legislative change (e.g., One HP has informed the coverage of antimicrobials under the national health insurance scheme).

Influencing behaviour change in key actors (e.g., One HP's communication on IPC practices (e.g., 'bare below the elbow' campaign), confirming a pharmacist on the MTC/AMS Committee to inform hospital policy on IPC, and the urgency of the COVID-19 pandemic, have resulted in behaviour change at the hospital level, sharing and implementation of this practice at regional levels, and recognition of this change at a national level).

Programme outputs



CwPAMS has produced several AMS training initiatives, tools, and resources that can be used beyond the programme both for facilities with established AMS processes and those looking to start. This includes the CwPAMS toolkit which outlines strategies and projects that a healthcare organisation could implement as part of an AMS workplan, as well as provide and signpost resources, in conjunction with the WHO AMS Practical Toolkit. Furthermore, all CwPAMS Extension partnerships created multi-faceted, local, 2 to 3 year action plans, with many using the AMS Action plan template that was provided.

Scoping Reports

At the inception of both CwPAMS 1 and CwPAMS Extension phase, scoping was carried out to understand the AMR and AMS landscape and to explore relevant actors in the target CwPAMS countries, to thereby inform the grant applications. The scoping reports identified the priority target themes and areas of investment currently not being developed by other Fleming Fund funded projects, but which will contribute to achievement of the programme's objectives. These target areas aim to increase the rational use of antibiotics and ultimately a reduction in morbidity and mortality associated with AMR. The recommendations from the scoping studies are available for all eight countries.

CwPAMS Board Game

An educational board game aimed at health professionals in LMIC countries was developed and is available both in an online format and as a physical board game.

So far, the board game has been distributed to 10 international locations (approx. 87 physical games in total). The game is self-contained and could be used by anyone without the need for external support and is aimed at any cadre of health worker.

CwPAMS partnerships were introduced to the board game as part of Word Antimicrobial Awareness Week (WAAW) 2021, when a Global AMS Game Tournament was held so partnerships could gain experience in playing the game, to replicate in their projects. The tournament had over 100 health professionals across 23 registered countries, with 60 in attendance. Following the tournament, the initial feedback gathered was analysed and together with the development process published in a journal. Each partnership was given a board game to use in their project training sessions and workshops. AMS committees have incorporated the game into their AMS awareness raising activities, including wards visits to involve the nurses in the game.

Publications

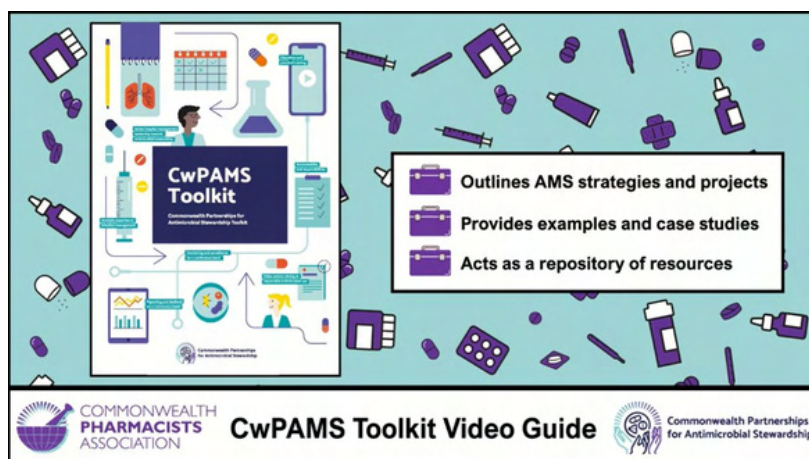
Collectively, the partnerships, THET and CPA have published over 20 peer-reviewed articles which evidence their work during the CwPAMS programme so far and provide recommendations for others working in AMS.



AMS Explainer Animation Videos

With input from over 50 stakeholders, culturally and contextually appropriate Explainer AMS Animation Videos were developed in eight different accents (to include the four additional countries added to the CwPAMS Extension programme). The videos show different scenarios and explain AMS in easy-to-understand ways for both health practitioners and the public. During CwPAMS Extension, HPs piloted the videos in several ways, including clinical waiting rooms, trainings, and AMS meetings and provided feedback in a survey. 94% of survey respondents stated that the videos were 'useful' or 'very useful'. The videos can be used for both training and patient awareness purposes. They focus on the following areas:

1. The patient and doctor experience with antimicrobials - explores a mother and father's experience with seeking medical help for their child's illness, when it is appropriate to use antimicrobials or not, and preventative actions one can take to reduce the chances of AMR.
2. Continuum of care - explores the different roles involved in the whole journey of care. For example, for the doctor, it is about carrying out the appropriate test or using relevant tools/guidelines to assess the patient. For the pharmacist, providing advice to colleagues and dispensing the correct antimicrobials; for the nurse, giving the antibiotic on time and appropriately; and the patient, taking the medicine correctly and not sharing antimicrobials with family, friends, pets.
3. Surgical prophylaxis - explores the journey for healthcare professionals (doctor, nurse, and pharmacist) for managing surgical site infection, using the WHO Surgical Safety Checklist, and deciding the appropriate use of antimicrobials in a patient's journey to reduce the risk of AMR.
4. What is AMR and AMS? - explores what is antimicrobial resistance and stewardship, global organisations involved in AMR prevention, why it is important that we tackle it, and actions that individuals (both patients and health professionals) can take to reduce AMR.



Gender Equality and Social Inclusion

A virtual training workshop was facilitated by ReAct Africa in July 2021, covering the following areas:

- The importance of gender equality and social inclusion (GESI) in relation to AMR in the LMIC setting.
- Identifying areas where gender inequality and social exclusion takes place by talking through the specifics of their work and settings (biological, social, cultural, political, economic), and how to overcome them.
- How to write a funding proposal to incorporate GESI elements within the proposed project.
- Identifying contextual barriers and challenges of including GESI-focused activities, and how to overcome them.
- Understanding GESI specific tools and strategies that they can action in their day-to-day work within AMR/AMS.

Subsequently, all CwPAMS Extension partnerships included a GESI objective as part of their monitoring framework. As well as ensuring an equal gender balance within their training programmes and within the partnership projects teams themselves, many partnerships chose to focus their GESI objective towards the community and patients.

The Sierra Leone partnership champion scheme focused on patient education, specifically vulnerable patients and communities. The champions were tasked with raising awareness of AMS in vulnerable and marginalised groups through a variety of methods, including media campaigns (Freetown Television and Radio Network), directly addressing unlicensed drug peddlers on bus routes, and targeting teenage girls at schools to educate on using antibiotics after menstruation.



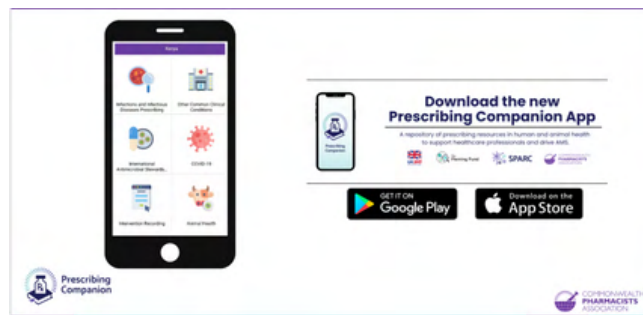
One girl said, "Now we know that when we have a common cold, we should drink plenty of fluids and rest than take antibiotics".'

The champion scheme concept was also successful in other partnerships. For example, in Kenya, the Kakamega-Cambridge partnership identified GESI champions based in Kakamega. The champions developed a GESI toolkit which explains GESI project-related concepts to members of the partnership and a wider audience.

In Zambia, the NHS Highlands and Chipata Central Hospital partnership focused on patient education, providing caregivers' IPC training to those on the maternity and paediatric wards. Groups of patients from lower-economic backgrounds were selected as they were the most vulnerable to infections, including hospital-acquired infections. The workshop was also an opportunity to explore the challenges, such as social and financial, faced by this patient group both in hospital and post discharge. The partnership stated this could be a focus of a future AMS intervention. They achieved their GESI objective with 65% of patients on the hospital maternity ward participating in the IPC workshop.

In Nigeria, the partnership focused on providing information to healthcare workers about health insurance schemes, so healthcare staff can advise patients appropriately, who might otherwise be at risk of purchasing cheap substandard drugs from unregulated shops, as they may be unable to afford medicines.

In Uganda, the Cambridge University Hospitals and Makerere partnership received feedback from healthcare workers that, during CwPAMS Extension, this was the first time they were learning about GESI, especially appreciating and considering how GESI affects AMR and how manifestation of AMR related diseases and healthcare seeking behaviour is influenced by GESI. All the healthcare workers pledged to be conscious about GESI and to take it into account as they provide health care.



CwPAMS AMS App

The first iteration of the CwPAMS AMS app was developed and launched to inform healthcare professionals about the appropriate antimicrobial use and support stewardship initiatives. The app included national treatment guidelines for Ghana, Tanzania, Uganda, and Zambia but has now been updated to the [Prescribing Companion app](#) (launched in 2022). The original app has been used by national level leads and clinical staff during ward rounds to check antibiotics and their doses, making it easier to access vital guidelines. For example, in Uganda, (Korle-Bu Teaching Hospital) 12 pharmacist superusers promoted the use of the CwPAMS app across their organisation. The superusers were able to use data from the app metrics to demonstrate the success of the launch of the app within their local area and promote further use.



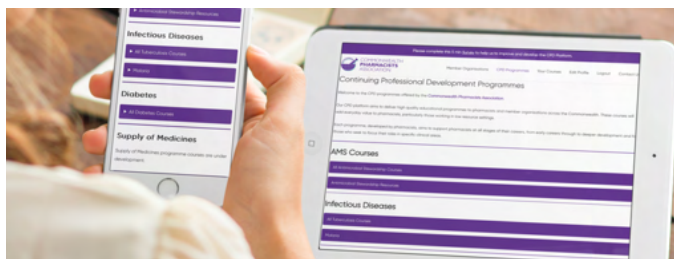
“The app is very helpful to use during ward rounds to check antibiotics and their doses. It is much easier to do this with the app than carrying the Standard Treatment Guidelines book around” – Pharmacist, Keta Municipal Hospital, Ghana.

Virtual PPS training

A [virtual PPS training](#) was provided in June 2021 and supported individual health institutions to develop local antimicrobial stewardship interventions after a key point of collecting data.

Continuing Professional Development (CPD) Platform

The CPA worked in collaboration with the Pharmaceutical Society of Zambia (PSZ), Saint Vincent and the Grenadines Pharmaceutical Association (SVGPA Inc), and the Kingdom of Eswatini Pharmacy Association (KEPA) to develop a CPD platform specifically designed for low- and middle-income (LMIC) nations.



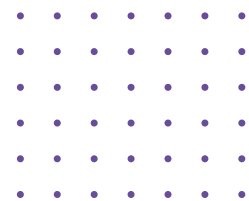
The platform enables users to access bitesize AMS modules (sessions between 30 - 60 minutes), accessible on any device at any time. Users can track their progress and are also assessed through a short multiple-choice quiz, receiving a certificate upon successful completion of the programme. The modules are free to access for pharmacists who are National Pharmacy Association (NPA) members. All eight CwPAMS countries have signed up to use the CwPAMS platform as the main training platform for AMS. The platform has over 9000 pharmacists onboarded, of which 6970 are from the CwPAMS countries, with 1117 engaging with the AMS courses and 666 completions. Several NPAs have reported increased members due to access to the platform AMS resources. This helps to upskill the pharmacy workforce and strengthen advocacy efforts of NPAs and the profession in the country.

Chief Pharmaceutical Officers' Global Health Fellowship (CPhOGHF)

Through Phase I of CwPAMS, the first and second cohort of the CPhOGH Fellowship was successfully implemented, with 16 and 13 NHS UK Pharmacists respectively, co-leading on the delivery of CwPAMS objectives. An impact assessment study among the first cohort showed that the fellowship facilitated increased opportunities and new experiences for the Fellows with extended networks and visibility on a national and international level. For instance, seven pharmacists reported a change in job role, five pharmacists received a promotion, and at least 12 pharmacists reported having new experiences in their profession and in leadership and project management. At the mid-term evaluation of the second cohort, the fellows reported gaining experience of implementing health service improvements in resource-limited settings and were proud of the practical knowledge obtained in leadership as illustrated by one of the Fellows, "I have gained project management skills, better understanding of global health and AMS barriers in LMICs, negotiation and delegation skills." The lessons and benefits realised from the CPhOGH Fellowship inspired the development and design of a similar programme for LMIC pharmacists, that will run as part of the CwPAMS 2 to support addressing Africa's gaps in AMS capabilities and strategies as established in a scoping study conducted during CwPAMS Extension.

National and global coordination

Implementing LMIC AMR National Action Plans (NAPs)



The WHO has recognised the work of CwPAMS by expressing the programme's ability to utilise international, national, and regional in-country networks in creating impact through the implementation of NAPs and servicing as an example of how other partnerships can adopt similar good practice. In all eight countries, the partnerships addressed several of the NAP objectives. For example, in Uganda, the partnerships addressed all five objectives to differing degrees but primarily focused on the objectives¹ that centred around promoting awareness and training of AMS, to improve IPC practices, and to optimise the use of antimicrobials.

The partnerships have developed links to national stakeholders within each of the eight countries, such as national pharmacy and medical associations. Several individuals within the partnerships have become members of national committees and have established collaborative and long-term links with national groups. These links have enabled partnerships to disseminate data on a national level.

For example, in Ghana, the partnership between University of Health and Allied Sciences (UHAS), Ho and University College London Hospitals NHS Foundation Trust works in collaboration with the Pharmaceutical Society of Ghana, who directly review and promote national policies for all pharmacists. Within their formal meetings, individuals share data the Society and can participate in national decision-making. For example, the partnership collaborated on leaflets which were distributed to pharmacists on a national scale, on topics such as making hand sanitizers for IPC. Furthermore, the partnership has shared insights on antibiotic use with the hospital management and other stakeholders, such as the Pharmaceutical Society of Ghana, to inform what is covered under national insurance.

Global alignment

The programme has ensured that LMIC health institutions are compliant with WHO AMR recommendations. This is namely through advocating for increasing knowledge on AMS through relevant campaigns, promoting the rational use of medicines, improving patient care, and creating multidisciplinary teams to advocate for AMS and understand the challenges of AMR.

The CwPAMS programme has contributed to the implementation of three WHO Global Action Plan (GAP) objectives on AMS in all eight countries where the partnerships operated. The three GAP objectives are:

1. To improve awareness and understanding of antimicrobial resistance; by raising knowledge of antimicrobial resistance and promoting behavioural change through public communication programmes that target different audiences.

For example, the partnership between Ghana Public Health Association and UK Faculty of Public Health, executed several awareness campaigns during WAAW, including on antibiotic treatments for specific infections that are based on standard guidelines. These campaigns were conducted across the hospital to raise awareness amongst staff. Healthcare professionals delivered educational sessions in local schools, local communities, and to several members of the Department of Education. One campaign used T-shirts to disseminate their key messages, which was found to be effective. This campaign has inspired the partnership to expand their campaigns to a national level, such as through AMR tailored video campaigns.

2. To strengthen knowledge through surveillance and research; by creating networks of information sharing and a global strategic research agenda involving different stakeholders that would improve global understanding of AMR.

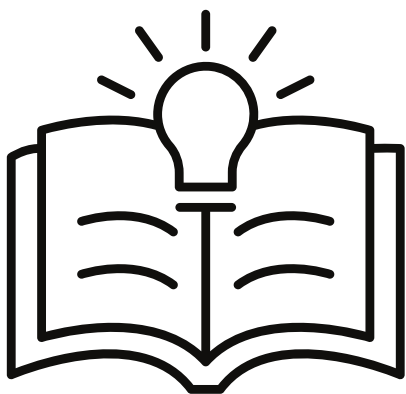
For example, the partnership between Nottingham Trent University and Makerere University School of Public Health established two Community of Practice (CoP) networks, one for health professionals and one for students, to create a community of people together to strengthen good practice on AMR, AMS, and IPC. The CoP enables the sharing of evidence, project findings, and resources amongst UK and Ugandan partners. The CoP also enables dissemination of findings to the MoH, particularly around AMS training for the community workforce, as well as collaboration amongst members to submit applications, awards, and abstracts for international conferences.

3. To optimise the use of antimicrobial agents by improving prescribing practices, the global community must adjust patients' and the inappropriate and unregulated use of antimicrobial agents by eliminating unnecessary dispensing.

For example, the partnership between Northumbria NHS Foundation Trust and Kilimanjaro Christian Medical Centre (KCMC) aimed to improve antibiotic prescribing practices by ensuring that AMS was on the policy agenda at the hospital level and by ensuring training in hospitals and community settings promote a more suitable use of antibiotics and effective IPC practices. The partnership's interventions empowered pharmacists, contributed towards improved patient outcomes, and helped reduce incidences of AMR by encouraging patients to responsibly take their antibiotics. The partnership addressed the areas of rational use of medicines by eliminating unnecessary dispensing and fostering new methods and alternatives to conventional use of medicines. A major success for this partnership was encouraging the empowerment of clinical pharmacists by deploying them in hospital wards with the correct tools to inform prescribing practices. The skills and confidence gained from the project has established the integral role that pharmacists have in the multidisciplinary team. The project introduced a clinical, ward-based pharmacy service for the first time, enabling pharmacists to provide prescribing advice on the ward and ensure the safe and effective use of medicines.

Lessons learnt

Several partnerships within the CwPAMS programme outlined reflections and lessons learned from their projects thus far. For example, during CwPAMS 1 partnerships identified important areas to emphasise in next phases of the programme. As one partnership expressed, representing all relevant professional groups – e.g., IPC, Microbiology, Pharmacy, Public Health, Surveillance, Epidemiology and Academia “was essential for the success of the project.”



Partners identified several technical areas to focus on in the future phases of their projects. These areas include:

- Further engage with animal/agriculture health organisations and bring One Health into behaviour change activities.
- Engage with community pharmacists to reach wider communities and collect data at the community.
- Engage all cadres in the training sessions around prescribing practices as different cadres prescribe in different settings.
- Explore how partnerships can make better use of laboratory data and how labs across the country can collaborate.
- Explore further opportunities for policy makers to meet and discuss with clinicians to inform government decisions.
- Ensure AMS committees are established and functioning to support AMR decision-making.
- Build links and promote regular communication with national committees and groups to promote buy-in for AMS work.
- South-South collaboration for the development of treatment guidelines, prescribing tools, and training objectives.
- Increase the use of media for raising awareness.

Programme/project adaptation

COVID-19 adaptations

The COVID-19 pandemic impacted the programme and severely disrupted the activities of seven of the partnerships, who had to adapt, delay or cancel some activities. Despite the pressure all health workers have been under, all partners demonstrated a real desire to continue supporting one another throughout the pandemic, and they have done so by keeping in touch remotely and providing advice and support to their peers.

The pandemic has shown that the relationships built through the Health Partnership approach, and skills and tools developed through the CwPAMS projects, enabled partners to utilise new skills and practices useful in the response to COVID-19. For instance, the Northumbria Healthcare NHS Foundation Trust and Kilimanjaro Christian Medical Centre partnership were able to deploy over 100 gel dispensers across the hospital which became an essential part of the hospital's COVID-19 response.

The quick facilitation of support, bidirectional sharing of knowledge and resources, and increased confidence between partners to share opinions and ideas, developed through the implementation of their CwPAMS projects, were also key elements enabling partners to adapt their interventions to respond to COVID-19. Partners were able to overcome adverse operational challenges brought on by COVID-19 and produce rapid treatment protocols for health facilities. For example, at Kawempe National Referral Hospital, the MTC, with the support of the Cambridge-Makerere partnership, was able to implement widespread use of alcohol hand rub, handwashing practices, as well as drive forward IPC practices and mainstream them into the hospital.

Partner contributions

- [Antibiotic Awareness: Ensuring Pharmaceutical Care in Ghana](#)
- [A Collective Effort to Tackle AMR: CwPAMS One Year On](#)
- [Northumbria – Tanzania CwPAMS Project 2](#)
- [The World Together Solving the Antibiotic Emergency](#)
- [Combatting AMR: reflections on CwPAMS successes in Nigeria](#)
- [World AMR Awareness Week 2023: Recognising the #VoicesOfAMR](#)
- [Empowering pharmacists in antimicrobial stewardship: A conversation with Ivan](#)
- [Ensuring effective antibiotic use across Ghana's Volta Region](#)

What next?

Through CwPAMS 2 we have seen the need to:

1. Invest in a health system strengthening approach by leveraging the full skill set of the health workforce through the encouragement of multidisciplinary working, including the empowerment of more pharmacists to lead alongside doctors and nurses in their respective areas of expertise, and to encourage skills' retention and consider succession planning aligned with UK National Action Plan.
2. Urgently and properly fund a health systems approach to delivering AMR National Action Plans, including the establishment of reliable systems to identify resource and sustainability limitations for AMS interventions at health facilities, including timely and equitable access to lab consumables, IPC supplies, and safe, quality medicines.
3. Establish sustainable mechanisms for generating and disseminating data between clinical teams and to raise awareness at local, regional, and national stakeholder level. This will help to inform AMS decision-making, monitor the impact of interventions, and create policy that reflects real, impactful actions that are replicable in everyday settings
4. Support the Health Partnership approach and scale up the work of CwPAMS to continue promoting long-term exchange of knowledge, data and best practice across health systems
5. Invest in patient and public engagement and awareness activities to improve understanding and behaviours for AMS supported by behavioural theory of change to promote more effective AMS

We will continue to work with Ministries of Health and the UK Department of Health to advocate for increased AMR funding commitments.

Evaluation highlights

The first round of CwPAMS (CwPAMS 1) underwent an independent evaluation (between 2019-2021) which showed the “CwPAMS Programme has improved the AMS in LMIC partner health care institutions...with the health partnership approach being a key factor to success”; and scored the overall programme 82% - ‘very good’ against the OECD-DAC Evaluation Criteria². The evaluation demonstrated four key elements about the programme: 1) the health partnership approach has shown itself to be a key factor contributing to the success of HPs and the overall programme; 2) NHS staff were able to translate the knowledge and skills they had received early on in the programme into clinical practice in response to COVID-19 challenges; 3) The partnerships and fellows cohort generated anticipated and unexpected higher-level effects in the UK. The NHS trusts involved saw an increase in the retention of staff members; 4) The successes of the HPs demonstrate great potential for scaling up Projects to support the implementation of NAPs.

Annex 1. List of projects in CwPAMS 1 and CwPAMS Extension

- Optimising the use of antibiotics and increasing knowledge antimicrobial resistance in a rural healthcare setting in Northern Ghana and wider community - The Assemblies of God Hospital & Norfolk and Suffolk NHS Foundation Trust
- To strengthen Antimicrobial Stewardship (AMS) through improving surveillance and building sustainable capacity in Ledzokuku Krowor Municipal Assembly [LEKMA] Hospital, Ghana - Ghana Public Health Association (GPHA) & UK Faculty of Public Health (FPH)
- Building Professional Capacity and Sustainability to Deliver Effective Antimicrobial Stewardship and IPC Programmes in Accra, Ghana - Korle-Bu Teaching Hospital (KBTH) & North Middlesex University Hospital NHS Trust (NMUH)
- Enhancing Hospital Pharmacists Roles to support the Delivery of Antimicrobial Stewardship programmes in Volta Regional Hospital, Ho, Ghana - University of Health and Allied Sciences (UHAS) & University College London Hospitals NHS Foundation Trust
- Utilising a Scottish triad approach to developing and implementing antimicrobial stewardship (AMS) in Ghana and Zambia: Information, Education, Quality Improvement - Ghana Police Hospital & Healthcare Improvement Scotland
- Kampala Cambridge Antimicrobial Stewardship and Infection Prevention and Control project - Makerere University and Mulago National Referral and Teaching Hospital & Cambridge University Hospitals NHS Foundation Trust
- Championing Pharmacists as Antibiotic Guardians in Zambia; the Brighton-Lusaka Pharmacy Link Initiative - University Teaching Hospital (UTH) & University of Sussex; Brighton and Sussex Medical School (BSMS)
- Implementing the AMR National Action Plan in Community Outpatient Settings in Kabarole District, Uganda - Pharmaceutical Society of Uganda & University of Salford
- Establishing Effective Antibiotic Stewardship in Gulu Regional Referral Hospital (GRRH), Northern Uganda - Gulu Regional Referral Hospital & Health Education England
- Interventions that are designed to change antimicrobial use for better patient outcomes and avoiding AMR (Antimicrobial resistance) - Kilimanjaro Christian Medical Centre (KCMC) & Northumbria Healthcare NHS Foundation Trust
- Strengthening antimicrobial stewardship in Wakiso district, Uganda - Makerere University School of Public Health (MakSPH) & Nottingham Trent University
- Capacity Sharing for AntiMicrobial Stewardship (CaSAMS) through the medicines and therapeutic committee at Jinja hospital - Makerere University College of Health Sciences and Infectious Diseases Research Collaboration (IDRC) & London School of Hygiene and Tropical Medicine (LSHTM)
- KamCamWIMN - Antimicrobial Stewardship and Infection Prevention Control - Makerere University Department of Obstetrics and Gynaecology & Cambridge University Hospitals (CUH)
- Establish a Sustainable Centre of Excellence for Integrated AMS and IPC at Makerere University Hospital in Uganda - Makerere University Health Services & Buckinghamshire Healthcare NHS Trust
- Capacity Sharing for Antimicrobial Stewardship through the Medicines and Therapeutic Committee at Jinja Regional Referral Hospital - Infectious Disease Research Collaboration & London School of Hygiene and Tropical Medicine

Annex 1. List of projects in CwPAMS 1 and CwPAMS Extension

- Scaling-up interventions for strengthening antimicrobial stewardship in Wakiso district, Uganda - Makerere University School of Public Health & Nottingham Trent University
- Enhancing Capacities of Healthcare Providers in the Practice of Antimicrobial Stewardship Programmes: The Role of Local Data and Safe Medicine Practices - University of Health and Allied Sciences & University College London Hospitals (UCLH) NHS Foundation Trust
- Strengthening Antimicrobial Stewardship through improving surveillance and building sustainable capacity and capability in Ledzokuku Krowor Municipal Assembly [LEKMA] Hospital and LEKMA polyclinic, Ghana - Ghana Public Health Association (GPHA) & UK Faculty of Public Health (FPH)
- Development and Institution of Antimicrobial Stewardship in the University Hospital, Knust, Ghana - University Hospital Knust & Ulster University
- Developing optimal antimicrobial stewardship capacity and practice in rural and peri-urban healthcare settings in Zambia - Hospital Pharmacy Association Zambia & University of Sussex Brighton and Sussex Medical School (BSMS)
- Developing Reliable Systems and Practices for Antimicrobial Stewardship in a Hospital Setting in Eastern Province, Zambia: Modelled on Scottish-Ghana AMS programme - Chipata Central Hospital & NHS Highland
- Institutionalising AMS at Connaught Hospital - Connaught Hospital & King's Global Health Partnerships
- Kakamega and Cambridge Partnership - Working to strengthen Antimicrobial Stewardship at Kakamega County Teaching and Referral Hospital - Kakamega County Referral Hospital & Cambridge University Hospital NHS Foundation Trust
- Building the KCMC-NHCFT antimicrobial stewardship partnership - Kilimanjaro Christian Medical Centre & Northumbria Healthcare NHS Foundation Trust (NHCFT)
- Training pharmacists as antimicrobial stewardship leads in Malawi - Pharmaceutical Society of Malawi & Betsi Cadwaladr University Health Board
- Building capacity of healthcare workers for AMS at a university teaching hospital in Lagos, Nigeria - College of Medicine of the University of Lagos (CMUL) & UK Faculty of Public Health (FPH)

About the partners



www.thet.org

THET is a global health organisation that has managed programmes across LMICs for over 30 years to strengthen health systems and Human Resources for Health. We do this through a model of Health Partnerships, providing grants to build mutually beneficial, long-term relationships between UK and LMIC health institutions. With country teams in Ethiopia, Myanmar, Somalia/Somaliland, Uganda, and Zambia, as well as a presence in Bangladesh, Ghana, Kenya, Malawi, Nigeria, North-West Syria, Nepal, Sierra Leone, and Tanzania,

THET offers a comprehensive health system strengthening (HSS) fund management services for government, private sector, NGO, and donor partners. Through this work, we improved access to services for 446,244 people last year. By working closely with Ministries of Health, we ensure our programmes are sustainable, responding to local priorities. THET has extensive experience in policy work and event management to facilitate international health engagement and partnerships. We work closely with the UK Government and devolved administrations and are an NGO in Official Relations with the World Health Organization (WHO). Our conferences and policy work are highly regarded for their role in improving the efficiency and effectiveness of Health Partnership approaches.



commonwealthpharmacy.org

An accredited organisation of the Commonwealth, the Commonwealth Pharmacists Association (CPA) is a global health charity dedicated to leading and developing the pharmacy profession for the benefit of the 2.5 billion residents of 56 member states. The CPA works collaboratively with partners across the Commonwealth to develop the pharmacy workforce and build capacity through education and training; strengthen healthcare systems and ensure the safe and effective use of medicines, prevention of disease and promotion of healthier lifestyles; and advocate for improved access to and quality of medicines and vaccines, seeking to embed pharmacists at all levels of medicines management. The CPA has a growing collaboration with the World Health Organisation to ensure the strategic alignment of its work to delivering the Sustainable Development Goals (SDGs) through its networks of member organisations and relationships with governments and policy makers.



**Commonwealth Partnerships
for Antimicrobial Stewardship**

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