ADDENDUM REPORT

EVALUATION OF THE COMMONWEALTH PARTNERSHIPS FOR ANTIMICROBIAL STEWARDSHIP PROGRAMME

Prepared for the Tropical Health and Education Trust (THET) and the Commonwealth Pharmacists Association (CPA)

Final Report | 29 September 2021

UKaid
from the British people

The Fleming Fund

INGENTIUM
www.ingentium.co.uk

CONTENTS

Disclaimer 1
Abbreviations, Acronyms & interpretations 2
Executive Summary 3
1. Introduction 9
2. CwPAMS Programme Background 9
2.1. Aims and Objectives 9
2.2. The Health Partnership Approach 9
2.3. Locations, themes and duration of the health partnerships 10
3. Purpose & Scope 12
4. Methodology 13
4.1. Data collection methods and sources 13
4.2. Analysis and evaluation 14
4.3. The Report Structure 15
4.4. Limitations to the evaluation 16
5. Presentation of Programme Level Findings 18
5.1. Overarching Evaluation Question 1 19
5.2. Overarching evaluation question 2 33
5.3. Overarching evaluation question 3 39
6. Conclusion 48
6.1. Relevance: 73 (Very Good) 49
6.2. Impact: 85 (Very Good) 49
6.3. Effectiveness: 96 (EXCELLENT) 49
6.4. Efficiency: 58 (Good) 49
6.5. Sustainability: 85 (Very Good) 50
7. Lessons Learnt 51
8. Annexures 53

© 2021 Ingentium Limited

This research is funded by the Department of Health and Social Care using UK aid funding and is managed by the Fleming Fund

DISCLAIMER

This report is an independent assessment prepared by Ingentium Limited. The views expressed are those of the authors based on information obtained by them through desk-based research and one-to-one interviews. The findings of this Report do not represent the views of the Fleming Fund, UK Department of Health and Social Care or any other organisations involved in or affiliated to the Commonwealth Partnerships for Antimicrobial Stewardship Programme.

© 2021 Ingentium Limited

ABBREVIATIONS, ACRONYMS & INTERPRETATIONS

AMR	Antimicrobial resistance
AMS	Antimicrobial stewardship
CPA	Commonwealth Pharmacists Association
CPhO GH Fellowship	Chief Pharmaceutical Officer's Global Health Fellowship
CwPAMS	Commonwealth Partnerships for Antimicrobial Stewardship
DHSC	(UK) Department of Health and Social Care
GESI	Gender Equality and Social Inclusion
GPPS	The Global Point Prevalence Survey is a standardized tool that is used worldwide to characterize inpatient antimicrobial usage.
HP / HPs	Health Partnership(s)
IPC	Infection prevention and control
LMIC	low- and middle-income countries, as categorised by the World Bank
MoH	Ministry of Health
MTC	Medicines and Therapeutics committee
NAP(s)	Refers to National Action Plans for Antimicrobial Resistance
PPS	Point Prevalence Survey
Programme	Refers to the CwPAMS Programme
Project / Projects	Refers to individual HPs and the work for which they were funded under CwPAMS. For the avoidance of doubt any reference to "Projects" shall be deemed to include the work carried out under multiple HPs funded under CwPAMS.
THET	Tropical Health and Education Trust
ToR	Terms of reference

EXECUTIVE SUMMARY

This report sets out findings from Ingentium's evaluation of quarters 4 and 5 of the Commonwealth Partnerships for Antimicrobial Stewardship Programme ("CwPAMS"/ "Programme"), a collaborative initiative between the Tropical Health and Education Trust ("THET") and Commonwealth Pharmacists Association ("CPA"). The evaluation reviews and assesses how and to what extent CwPAMS realised its three high-level Programme outcomes (as set out below) across 12 Health Partnerships ("HPs" / "Project(s)") between 1st of November 2019 and 31st of January 2021. This evaluation is a continuation of the Interim CwPAMS Evaluation carried out by Ingentium which focused on Q1 to 3 of the Programme ("Interim Evaluation" / "Interim Report").

The CwPAMS Programme is part of the Fleming Fund, a UK Aid initiative funded by the UK Department of Health and Social Care ("DHSC"). The Programme's aim is to see an increase in the rational use of antibiotics, and subsequent reduction in morbidity and mortality associated with antimicrobial resistance ("AMR"). The Programmes activities directly contribute to the achievement of following Fleming Fund objectives: 2 - Developing and supporting the implementation of protocols and guidance for AMR surveillance and antimicrobial use, 6 - Collating and analysing data on the sale and use of antimicrobial medicines, and 7 - Advocating for the application of data to promote the rational use of antimicrobials.

The CwPAMS Programme comprises 12 HPs formed between UK health institutions and their counterparts in four Commonwealth countries: Ghana, Tanzania, Uganda and Zambia, which have been funded to achieve the aforementioned objectives but within the context of their own local needs based on National Action Plans ("NAP") and on scoping exercises at the start of the Programme. The HPs consist of health workers and experts from UK and LMIC institutions who volunteered their time to co-develop strategies and share skills and knowledge to address priority health system issues relating to AMR and antimicrobial stewardship ("AMS").

MAIN FINDINGS

PROGRAMME OUTCOME 1: To what extent have LMIC healthcare Institutions and the LMIC health workforce demonstrated improved practice related to AMS and prescribing practice?

The CwPAMS Programme has produced empirical evidence to demonstrate improved practice relating to AMS and prescribing practice within the LMIC workforce and their associated health care institutions.

In Q4 and 5, HPs continued to build on the work of previous quarters with most Projects continuing to pursue their original objective targets in spite of the COVID-19 pandemic. By basing their work on the Fleming Fund objectives, HPs ensured that even when they were unable to meet their original targets, they produced something of equivalent value and importance. As such, approximately 75% of HPs were able to meet their outcome targets which focused on AMS and/or improved prescribing practice.

In Q1 to 3, HPs were focused on AMS knowledge building, scoping exercises and the Global Point Prevalence Survey ("GPPS") to assess the capacity of participating LMIC hospitals. In Q4 and 5 the focus shifted towards addressing the identified problem areas and creating structures such as AMS and Medicines and Therapeutics committees ("MTCs") which could champion AMS. During this period, pharmacists and other health practitioners also began to apply the knowledge they had gained through workshops and seminars in their day-to-day work. This resulted in both positive intended, and unintended, changes demonstrated through clear empirical evidence such as pharmacist upskilling and role creation, reduction in the prescription of antibiotics, increased presence of pharmacists in wards and greater emphasis on AMS in hospitals.

Most HPs had not been able to undertake comprehensive monitoring and evaluation in this last quarter of the Programme, or were still in the process of evaluating their work as of the publication of this repot; however, early results provided to Ingentium show improved practice and behavioural change with respect to AMS. COVID-19 brought about a great deal of positive unintended higher-level changes giving HPs an opportunity to take advantage of unexpected opportunities to collaborate with government bodies, members of civil society and other relevant groups to demonstrate the value of AMS within a global health pandemic.

Notably as the CwPAMS objectives correlate with the World Health Organization ("WHO") Global Action Plan, the Programme has additionally ensured that LMIC health institutions are compliant with WHO AMR recommendations, namely those that advocate for increasing knowledge on AMS through relevant campaigns, promoting the rational use of medicines, improvements to patient care, and the creation of multidisciplinary teams to advocate for AMS and understand the challenges of AMR.

PROGRAMME OUTCOME 2: Are AMS strategies, guidelines and tools in place and being used in each LMIC healthcare institution? How useful are they?

All HPs have developed and implemented AMS strategies, guidelines and tools within their hospitals which are important in ensuring the sustainability of CwPAMS' interventions and have also played a key role in tackling COVID- 19.

As at Q3, all 12 HPs had rolled out new or revised guidelines, protocols or documents relating to AMS and antibiotic prescribing practices in participating LMIC healthcare institutions through awareness campaigns, training and knowledge sharing. In Q4 and 5, 11 of the 12 HPs produced additional guidelines / protocols / tools and all of these documents were aligned with national action plans and in some cases disseminated to surrounding hospitals or formalised in to AMS modules and IPC Standard Operating Procedures ("SoP").
A significant factor in Q4 and 5 was the establishment / reintroduction of MTCs and AMS committees who were at the forefront of introducing many of the above measures in most hospitals and elevating the status of AMS at the local, regional and in some cases national level. Many hospitals found that the AMS guidelines and strategies developed during CwPAMS enhanced health workers' response to COVID-19 and tasked MTCs with formulating COVID-19 specific protocols and procedures.
An assessment found that the CwPAMS Programme has significantly influenced AMS policy in LMIC healthcare institutions by supporting the implementation of NAPs, informing national guidelines and establishing new spaces for policy dialogue at institutional and national levels. Notably as these results correlate with the WHO Policy Package, CwPAMS has further ensured that LMIC strategies, guidelines and tools also meet international standards.

PROGRAMME OUTCOME 3: Have NHS staff demonstrated improved leadership skills and understanding of the global context of AMR in their work?

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. They felt their participation in CwPAMS made them better equipped to deal with the limited resources and additional stresses brought on by COVID-19.

The Interim Report projected that the results from the final quarters of the Programme would demonstrate a larger (positive) impact accrued by the NHS through volunteer participation in comparison to Q1-3. This was accurate as the vast majority of HPs achieved a majority of their NHS-related targets (or something equivalent) and reported that their experience with CwPAMS enhanced their work abilities during the pandemic (for example, they had some experience working in low resource settings and were less affected by the stresses of the pandemic in comparison to their colleagues). From a workforce perspective, gaining international project experience has enhanced the professional development of numerous UK volunteers who have since moved on to new jobs or have been promoted in their organisations. Another key healthcare success within the Programme was the Chief Pharmaceutical Officer's ("CPhO") Global Health Fellowship programme which solely focused on enhancing the leadership and project management skills of NHS pharmacists.

Despite the disruption caused by COVID-19 in Q4 and 5, there were clear instances of knowledge exchange between LMIC and UK partners, both on and offline. In some instances, HPs used the shift to online communication to their advantage-showcasing their skills and interventions to a broader audience. The high number of NHS-affiliated websites that have shared information concerning their UK volunteers is a testament to the improved leadership and understanding demonstrated by UK volunteers and the value of CwPAMS.

CONCLUSIONS

The Health Partnership Approach

Throughout the duration of CwPAMS the health partnership approach has shown itself to be a key factor contributing to the success of HPs and the overall Programme. It facilitated shared learning, mutual respect and cooperation between UK health institutes and their counterparts in LMICs which enabled partners to be accountable to one another even in the midst of a pandemic. The support of THET and CPA was integral, providing an additional layer of support and encouragement for HPs. The strength of the partnership approach was demonstrated by the fact that all partnerships remained in close contact throughout the pandemic, often sharing experiences, good practice and resources, despite the fact that they were under very little obligation to do so. The amount of work done by HPs during Q1 to 3, coupled with the effort put towards resolving issues around division of labour, leadership and planning meant the majority of interventions scheduled for Q4 and 5 went ahead even though only a few members of the LMIC partnership were able to devote themselves to the work.

Benefits gained by the NHS volunteers

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. Some volunteers found that throughout the pandemic it was easier to complete their NHS-related goals (as they had additional time to study whilst home or found that online communication actually enhanced their work).

In addition, 16 individuals participated in CwPAMS as the first cohort CPhO GH Fellowship. All 16 Fellows successfully graduated from the programme in Q5. All participating Fellows agreed that the skills and knowledge they gained during their fellowship was useful for the current stage in their career.

© 2021 Ingentium Limited

Benefits gained by NHS institutions

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. Throughout the Programme UK partners acknowledged reduced brain drain, increased retention and much happier staff. These benefits had a positive impact on their work where volunteers were referenced as good role models for their respective departments.

Due to the COVID-19 disruptions, the shift to remote working became a common day occurrence when the pandemic affected the UK, however NHS teams involved with various partnerships were already using remote communication with their respective partners. Hence, Project members were versed and comfortable with communicating with staff inside and outside the NHS, using online resources, and conducting consultations remotely.

From a workforce perspective, international project experience has been known to assist with the professional development of healthcare professionals, this has been demonstrated by the various partnerships that have seen UK-based pharmacists become involved in the Projects, and graduate as CPhO GH Fellows. A number of UK academic institutions have also reached out to CwPAMS to collaborate in future iterations or incorporate the Programme into their courses.

Sustainability - potential for scaling up antimicrobial stewardship in national antimicrobial resistance action plans

The successes of the HPs demonstrate great potential for scaling up Projects to support the implementation of NAPs. This was also evident through the last two quarters of the Programme in which LMIC Project partners achieved some objectives of their NAPs. Furthermore, there is strong indication that CwPAMS as a programme will enter a second phase, allowing the Programme to further champion the importance of AMS.

- Many CwPAMS pharmacists are now core members of their respective AMS committees, MTCs and multidisciplinary teams and providing a sustainable model for AMS within their hospitals. Despite challenges, the vast majority managed to sustain their relationships with local AMS and pharmacy groups.
- HPs forged strong ties with government and civil society actors influencing policy at a national level which will undoubtedly contribute to AMS and AMR prevention in the long-term.
- THET and CPA took considerable steps to ensure that all activities were implemented in an economically justifiable way. This included negotiating a no-cost extension for HPs, reducing costs where necessary and reallocating budgets with regards to underspend.
- Overall progress was achieved at a reasonable cost demonstrating that the HP model is an economically justifiable model for scaling up.

OECD-DAC CRITERIA

RELEVANCE

The Programme adequately demonstrated knowledge exchange and its relevance during a global health Pandemic. The success of various online conferences and webinars showcasing CwPAMS held at the Programme level demonstrate that the principles of AMS and the health partnership approach are transferable and tools such as the CwPAMS Toolkit will enable this in the future.

© 2021 Ingentium Limited

IMPACT

Despite COVID-19 disruptions which delayed the achievement of certain project milestones, the Programme achieved overall positive effects- creating activities and interventions that have benefited the skills exchange between UK and LMIC partners, producing a range of dissemination materials for different audiences, training fellow healthcare workers and engaging local and international policymakers in the areas of AMR.

EFFECTIVENESS:

most HPs managed to meet the vast majority of their Programme output and outcome targets and complete all but a few of their planned activities. HPs often had to adapt their (original) activities either to minimise risks or to make them relevant to COVID-19 efforts in different countries; however, even then, the Programme always ensured that its activities and interventions correlated with at least two of the Fleming Fund objectives.

EFFICIENCY

A great deal of risk management had to be performed at the Project and Programme level in Q4 and 5 of CwPAMS. Most HPs revised/reallocated resources by rescheduling/cancelling/redesigning activities, reallocating (travel) costs and in some cases restaffing HPs when Project leads and volunteers were seconded to the frontline. Despite this, as at Q5 a minority of HPs had achieved allocational efficiency with most having fairly large underspends. This was understandable as most HPs had prioritised achieving objectives above optimising budgets during the Pandemic

SUSTAINABILITY

All HPs set objectives and outcomes that could be sustained within the LMIC health systems. The development of guidelines, protocols, processes and the formation of MTCs and accompanying AMS and IPC committees in LMIC institutions are the main drivers of change in AMS and will help sustain the newly developed practises after the CwPAMS funded Projects are completed. CwPAMS has also created a wide range of tools that can be used on multiple platforms by different groups. Overall, most of the processes and tools that have been established can be sustained without additional funding.

LESSONS LEARNT

Based on observations made through the review of documentation and interviews with key information, it has been noted that:

- Often the people who are heavily involved in AMR policy development are remote from hospital local contexts, which makes prescription of guidelines harder to adopt.
- Behavioural change is a key tool for tackling long-term global health issues; however, the duration of CwPAMS is not long enough to ascertain whether meaningful behaviour change within AMS has taken place
- THET and CPAs flexibility and agility with respect to the HPs enabled them to achieve their goals by generating similar outcomes and outputs which were more in tune with the situation caused by the Pandemic.
- The Pandemic increased the Programme's ability to engage with WHO members, NHS leaders, and local and global stakeholders as part of the fight against the Pandemic.
- The (successful) shift to online engagement has shown that the CwPAMS programme can be replicated anywhere and that partnerships do not have to be physically in the same place to achieve the same level of output.
- Although THET and CPA relaxed the format for reporting, COVID-19 disruptions meant that some HPs were unable to fully capture their activities and outcomes.
- THET and CPA failed to make references or interrogate HPs on GESI objectives throughout the Programme; however, they have future plans in this regard

- The skills and knowledge NHS volunteers gained during their involvement in the Programme were pertinent to their work and helped the NHS deal with a lack of resources and pressured working environment during the Pandemic

1. INTRODUCTION

Tropical Health and Education Trust ("THET") has commissioned Ingentium Limited ("Ingentium" / "us" /" we" / "our") to carry out and evaluate quarters four and five ("Q4" and "Q5", respectively) of the Commonwealth Partnerships for Antimicrobial Stewardship Programme ("CwPAMS" / "Programme"). The evaluation is a continuation of the first interim report which evaluated the first three quarters of the Programme. This evaluation seeks to review and assess how and to what extent CwPAMS realised its Programme objectives across 12 health partnership projects ("HPs" / "Project(s)"). This report and the attached annexures (collectively, the "Report" or "Addendum") set out our findings with respect to the individual HPs, and the CwPAMS Programme as a whole over Q4 and Q5. Key stakeholders and audience for this Report include the Fleming Fund and its implementing partners, UK Department of Health and Social Care ("DHSC") and the respective ministries of health ("MoH") in Ghana, Tanzania, Uganda and Zambia and the NHS.

2. CWPAMS PROGRAMME BACKGROUND

2.1. AIMS AND OBJECTIVES

CwPAMS is a collaborative health partnership programme between THET and the Commonwealth Pharmacists Association ("CPA"). The Programme is part of the Fleming Fund, a (separate) £265 million initiative funded by UK Aid.[1] The initiative's ultimate aim is to see an increase in the rational use of antibiotics, and subsequent reduction in morbidity and mortality associated with antimicrobial resistance ("AMR").[2]

CwPAMS aims to contribute to the achievement of objectives 2, 6 and 7 of the Fleming Fund:

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

2.2. THE HEALTH PARTNERSHIP APPROACH

The Health Partnership Approach is a model for improving health and health services based on ideas of co-development between actors and institutions from different countries. Health partnerships are defined as long-term partnerships between UK health institutions and their counterparts in LMICs and are based on ideas of reciprocal learning and mutual benefits. [3] These partnerships seek to address priority gaps and needs identified by the LMIC partners, and usually focus their activities on a series of projects that support human resources for health development through the training and education of healthcare workers in the LMIC partner institutions. Activities, especially when the partnership has been well-established over a number of years, can broaden to include strengthening aspects of a health system, such as clinical pathways and policies, and a scale up of their activities.[4] The health partnership approach enables institutions in different countries to work more collaboratively and at scale, because it is grounded in the concept of mutual benefit, co-development and co-learning.

[1] THET and CPA websites
[2] [Interim] Evaluation of the Commonwealth Partnerships for Antimicrobial Stewardship Terms of Reference
[3] THET Strategic Plan 2016-2021.
[4] CwPAMS Call for Applications: Questions and Answers

In support of this, THET developed "Principles of Partnership[5]" which are hallmarks of good practice for health partnerships and the way they manage projects. They include working consistently within local and national plans and planning and implementing projects together with a clear commitment to joint learning.

CwPAMS reports in their official documentation that through the Department for International Development ("DFID") funded Health Partnership Scheme, which THET managed, it has been possible to demonstrate that this model of partnership and capacity development offers an effective, sustainable and value for money approach to strengthening national capacities, whilst also resulting in the strengthening of the UK workforce that is involved in this work.[6]

2.3. LOCATIONS, THEMES AND DURATION OF THE HEALTH PARTNERSHIPS

The CwPAMS programme comprises 12 HPs between UK health institutions and their counterparts in four Commonwealth countries: Ghana, Tanzania, Uganda and Zambia, which have been funded to achieve the Fleming Fund objectives. The HPs consist of health workers and experts from UK and LMIC institutions who volunteered their time to co-develop strategies and share skills and knowledge to address priority health system issues relating to AMR and antimicrobial stewardship (AMS). Through this partnership approach, the HPs were expected to strengthen the capacity of the health workforce and institutions in the target LMICs.

The Projects were expected to target themes and areas of investment currently not being explored by other Fleming Fund funded projects. With support from the Fleming Fund, National Action Plans ("NAPs") on AMR, including AMS activities, have been developed in all countries. NAPs detail national-level plans and strategic interventions to promote public awareness for AMR, improve infection prevention and control ("IPC"), implement AMR surveillance and promote appropriate access to and use of antimicrobials. HPs were therefore to focus on AMS particularly with respect to the following themes:

- AMS, including building surveillance**;**
- Antimicrobial pharmacy expertise and capacity and**;**
- IPC, if contextually appropriate.

The Projects began in February 2019 and were originally expected to last 15 months, ending in April 2020; however, in March 2020, due to the disruption caused by the COVID-19 Pandemic ("COVID-19" / the "Pandemic"), the HPs were granted no-cost extensions until January 2021.

Table 1 lists out the 12 HPs, including their Project title, participating institutions and Project value.

[5] https://www.thet.org/principles-of-partnership/
[6] CwPAMS Call for Applications: Questions and Answers

Table 1: A Description of the 12 Health Partnerships[7]

ID	UK Lead Partner	LMIC Lead Partner	Country	Project Title	Grant £
A02	Norfolk and Suffolk NHS Foundation Trust	The Assemblies of God Hospital, Saboba	Ghana	Optimising the use of antibiotics and increasing knowledge of antimicrobial resistance in a rural healthcare setting in Northern Ghana and wider community	£29,500
A04	UK Faculty of Public Health	Ghana Public Health Association	Ghana	To strengthen Antimicrobial Stewardship through improving surveillance and building sustainable capacity in Ledzokuku Krowor Municipal Assembly [LEKMA] Hospital, Ghana.	£27,628
A05	North Middlesex University Hospital NHS Trust	Korle-Bu Teaching Hospital	Ghana	Building Professional Capacity and Sustainability to Deliver Effective Antimicrobial Stewardship and IPC Programmes in Accra, Ghana.	£21,151
A07	University College London Hospitals NHS Foundation Trust	University of Health and Allied Sciences	Ghana	Enhancing Hospital Pharmacists Roles to support the Delivery of Antimicrobial Stewardship programmes in Volta Regional Hospital, Ho, Ghana	£29,985
A11	Healthcare Improvement Scotland	Ghana Police Hospital	Ghana	Utilising a Scottish triad approach to developing and implementing antimicrobial stewardship in Ghana and Zambia: Information, Education, Quality Improvement	£28,640
B01	Cambridge University Hospitals NHS Foundation Trust	Makerere University and Mulago National Referral and Teaching Hospital	Uganda	Kampala Cambridge Antimicrobial Stewardship and Infection Prevention and Control project	£74,180
B02	University of Sussex; Brighton and Sussex Medical School	University Teaching Hospital, Lusaka	Zambia	Championing Pharmacists as Antibiotic Guardians in Zambia; the Brighton-Lusaka Pharmacy Link Initiative.	£55,941
B03	University of Salford	Pharmaceutical Society of Uganda	Uganda	Anti-Microbial Resistance and Maternal Sepsis in a Ugandan Regional Referral Hospital	£60,000
B08	Health Education England	Gulu Regional Referral Hospital	Uganda	Establishing Effective Antibiotic Stewardship in Gulu Regional Referral Hospital (GRRH), Northern Uganda	£74,495
B09	Northumbria Healthcare NHS Foundation Trust	Kilimanjaro Christian Medical Centre	Tanzania	Interventions that are designed to change antimicrobial use for better patient outcomes and avoiding AMR	£65,465
B10	Nottingham Trent University	Makerere University School of Public Health	Uganda	Strengthening antimicrobial stewardship in Wakiso district, Uganda	£59,998
B12	London School of Hygiene and Tropical Medicine	Makerere University College of Health Sciences and Infectious Diseases Research Collaboration (IDRC)	Uganda	Capacity Sharing for AntiMicrobial Stewardship (CaSAMS) through the medicines and therapeutic committee at Jinja hospital	£71,700

[7] Seven of the 12 HPs (B01, B02, B03, B08, B09, B10, B12) represent established partnerships; however, within this group of established partnerships some the individuals that made up the UK and LMIC partners (B02, B08) had not previously worked together prior to CwPAMS

3. PURPOSE & SCOPE

The evaluation seeks to review and assess how and to what extent CwPAMS realised its Programme objectives across the 12 HPs between Q4 and Q5 of the Programme duration i.e. 1st November 2019 to 31st January 2021. This evaluation is intended to serve as an Addendum to the Interim CwPAMS Evaluation that reviewed quarters one to three of the CwPAMS Programme, coinciding to 30th October 2019 (hereinafter referred to as the "Interim Report" or "Interim Evaluation"). The Interim Report solely focused on quarters one to three and information pertaining to quarters four and five of the Programme was limited to beneficial higher-level effects, hence this Evaluation will carry on from the Interim Report. In order to gain better contextual understanding of this Addendum report, readers are encouraged to read the Interim Report for quarters one to three.

Quarters 4 – 5	1st Nov 2019 - 31st Jan 2021 ← *focus of this Report*
Quarters 1 – 3	1st Jan 2019 – 30th Oct 2019

The findings of the evaluation and the lessons learned will serve to inform THET, CPA and key stakeholders, including DHSC, the Fleming Fund and the NHS on the successes, challenges and the next steps for the CwPAMS health partnership approach. The full scope and criteria for carrying out this evaluation are set out in detail within the THET Proposal which readers are encouraged to read first in order to gain better contextual understanding of this report (see Annexure A).

Our evaluation will seek to answer the following specific questions, as specified in the evaluation terms of reference, focused on CwPAMS Programme outcomes:

PROGRAMME OUTCOME QUESTIONS

1. To what extent have LMIC healthcare Institutions and the LMIC health workforce demonstrated improved practice related to AMS and prescribing practice?
2. Are AMS strategies, guidelines and tools in place and being used in each LMIC healthcare institution? How useful are they?
3. Have NHS staff demonstrated improved leadership skills and understanding of the global context of AMR in their work?

In order to answer the above Programme Outcome Questions, the evaluation will be guided by three Overarching Evaluation Questions (each an "OAQ") as specified by THET and CPA and set out below:

OVERARCHING EVALUATION QUESTIONS

1. ''Proof-of-concept''
   a. To what extent has the CwPAMS Programme improved antimicrobial stewardship in LMIC partner healthcare institutions?

   b. Does the health partnership approach improve antimicrobial stewardship in LMIC partner healthcare institutions and staff?
2. What is the value to the NHS of its volunteers participating in the CwPAMS project, in particular how are skills and experiences absorbed within the UK healthcare institution, and is there evidence of a "skills *exchange*" between UK volunteers and their counterparts in the LMIC?
3. What is the potential for scaling up AMS in National AMR Action Plans?

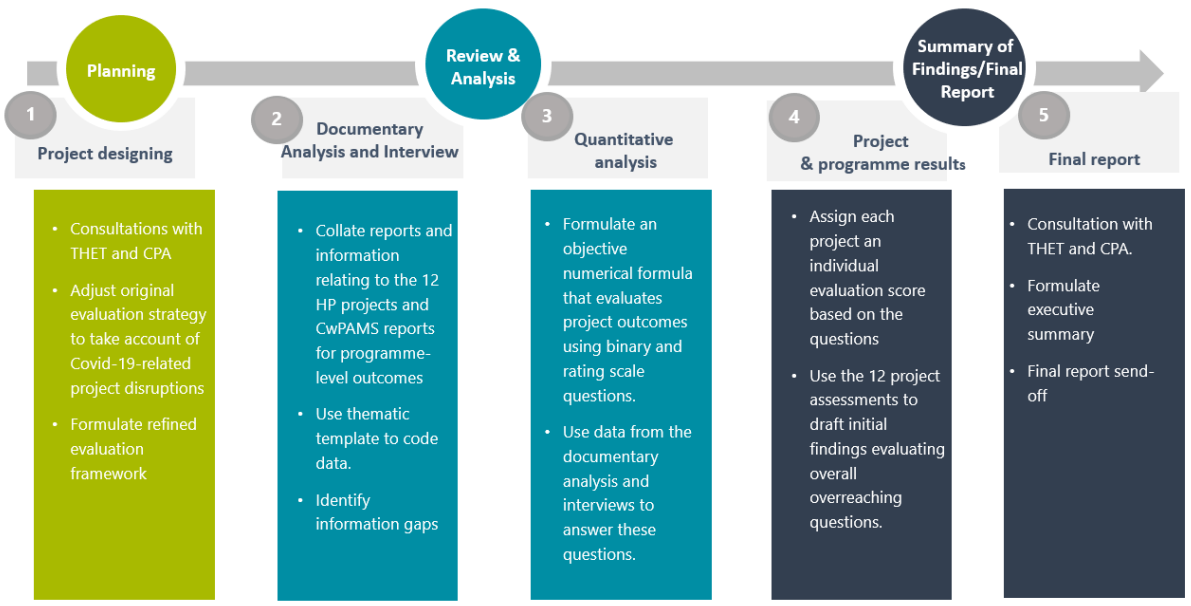
The continuation of this report will provide an overview of the methodology utilised for assessing the evaluation's findings, an assessment of the CwPAMS Programme performance with respect to its objectives, notable lessons learned which may help improve the Programme's performance in terms of future activities.

4. METHODOLOGY

Our strategy for evaluating the CwPAMS Programme and individual HPs is based on the three OAQs, and the OECD-DAC Evaluation Criteria and indicators that were developed internally which correlate with the individual OAQs. A more detailed explanation of our approach is provided below.

The evaluation for this report took place between March and May 2021. It consisted of three main phases- (1) Planning, (2) Review and Analysis and (3) Summary of Findings/Final Report. All the information obtained was assessed and evaluated using an objective numerical scorecard. This approach enabled us carry out a "multidimensional" evaluation of the Programme as described further below. Figure 1 (following page) summarises the key steps in our evaluation approach.

4.1. DATA COLLECTION METHODS AND SOURCES



This evaluation employed a mix method research approach. This consisted of (i) qualitative research methods in the form of documentary analysis, supplemented by additional input from THET and CPA personnel and (ii) quantitative research methods, in the form of applying a numerical formula to score individual HPs to inform the Programme's overall performance (see Section - Analysis and Evaluation). Below is a summary of key data collection methods and sources relied upon to complete the evaluation:

a. **Documentary review** of the following relevant reports provided by THET and CPA;
   i. Project-level documents including, Financial reports and Quarterly narrative reports for Q4 and Q5; and
   ii. Programme-level reports including the Fleming Fund Reports, Change Exchange reports, Policy Brief and accompanying case studies, CPA and THET reports, CPA Clinical surveys, CPA Volunteer Surveys, AMS Checklist results and THET CPA Dissemination of Findings presentations.

b. **Follow-up emails and discussions** with CPA and THET personnel to either clarify information, resolve data inconsistencies and incongruencies, or request certain additional documentation.

c. **Interview** with two members of the Change Exchange team with respect to their input into four HPs and any additional information on the Programme. It is noted that interviewees were assured anonymity insofar as this report does not attribute any findings to anyone by name.

4.2. ANALYSIS AND EVALUATION

4.2.1. Framework

Using the same approach from the Interim Evaluation, the Evaluation Framework relied upon for this evaluation (see Annexure B) was designed to assess the 12 HPs individually, as well as the Programme collectively, as is described below.

a. With respect to individual HPs:
   i. The extent to which each HP achieved its own Project objectives; and
   ii. How well each HP performed with respect to the OECD-DAC evaluation criteria.

b. With respect to CwPAMS:
   i. How well CwPAMS performed against its Programme Outcomes (see Section 3 - Purpose and Scope); and
   ii. The extent to which CwPAMS achieved Programme (Fleming Fund) objectives.

The Evaluation Framework is underpinned by an extensive list of questions and indicators which Ingentium developed with input from THET and CPA, and sought to address/assess for each individual HP based on the data it obtained. These questions and indicators were fixed across all 12 HPs to ensure consistency in the evaluation, with the exception of some questions/indictors being specific to the Programme only. Each individual question/indicator was associated (or tagged) against one of the five OECD-DAC Evaluation Criteria, and similarly also associated to one of the three OAQs.

It should be noted, that due to information and resource constraints, we did not use the full or same set of questions and indicators from the Interim Evaluation. Due to resource constraints we opted to reduce the number of questions and indicators by circa 50 percent, often excluding those questions or indicators that were no longer relevant to, or unlikely to have significantly changed (in terms of results), in Q4 and 5 of the Programme. Indicators that explored COVID-19 related activities, dissemination and work performed to further the World Health Organization's ("WHO") Global Action Plan were instead added to the Evaluation Framework.

4.2.2. Scoring

Using the questions/indicators described above, a scorecard system was developed in order to rate each HP's performance with respect to each of the five OECD-DAC evaluation criteria. A similar scorecard system was developed in order to ascertain the extent to which each individual HP, and collectively the Programme, performed with respect to the three OAQs. In order to calculate an HP's rating with respect to an OECD-DAC Evaluation Criteria, the sum of the scores (for all of the questions/indicators relating to that OECD DAC Evaluation Criteria) was divided by the number of questions asked. The higher the value of the resulting number, the better an HP's rating with respect to that OECD-DAC Evaluation Criteria. Similarly, in order to

calculate the Programme's performance, all relevant question/indicators scores obtained on the HP level were collated and averaged.

Ingentium used a five[8]-tier traffic light system to rate its findings (and scores) across the 12 individual HPs as well as the Programme. This is set out below in Figure 2:

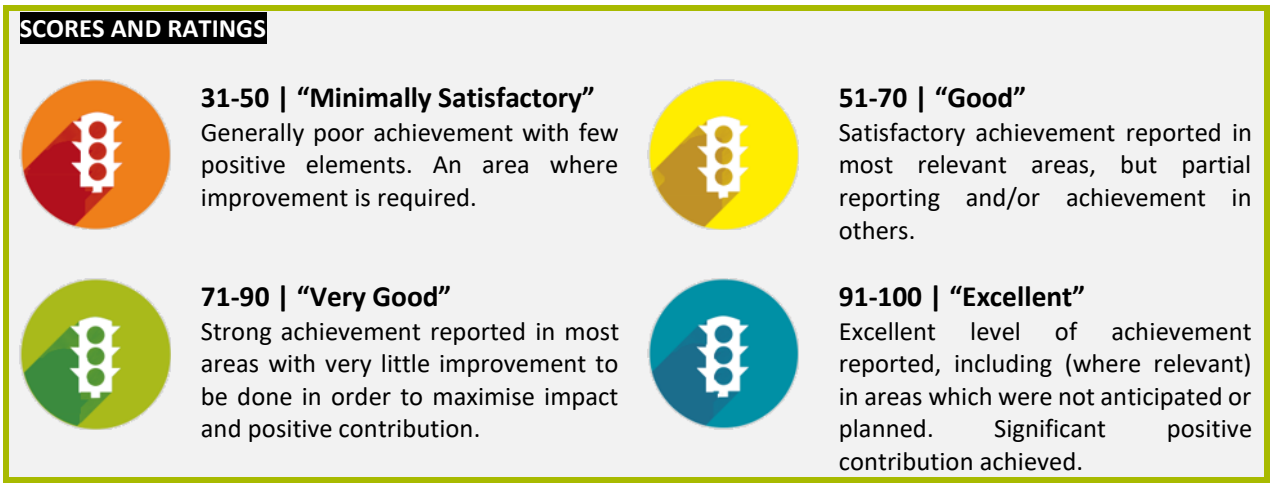


Figure 2: Score and ratings description

4.3. THE REPORT STRUCTURE

Although the findings presented in this Report are specifically related to Q4 and Q5 of the Programme, the Report does build on (and to an extent, reflects upon) the Interim Evaluation. Readers of this Report will benefit from knowing that the presentation of the Programme-level findings (Section 5) has been structured such that:

a. the overall Programme score presented in Figure 3 is an assessment of the CwPAMS Programme from quarters one through five and overlayed with scores specific to Q4 and Q5;

b. the Summary of Key Findings (grey box with a green border) that immediately precedes each of the OAQs presented in Section 5 reflects all findings associated to CwPAMS (and the respective OAQ) from quarters 1 through 5;

c. for ready reference, scores from the Interim Evaluation and the current evaluation of Q4 and Q5, have also been included in order to allow readers of the report to quickly ascertain how performance may have changed when comparing quarters 1-3 of CwPAMS, with quarters 4-5; and

d. all scoring, assessments and reflections presented with regards to individual sub-questions associated to each OAQ (these appear below the Summary of Key Findings) are exclusively focused on Q4 and Q5, as this period of the CwPAMS Programme had not been evaluated or scored in the Interim Report.

Readers of this Report should note that the evaluation carried hereunder constitutes a continuation of the previous Interim Evaluation report. It is therefore suggested that the reader review the Interim Evaluation of CwPAMS, with respect to each OAQ prior to reviewing the sub questions in this Report.

[8] It is noted that this evaluation did not identify any Project or Programme elements that scored below 31 and therefore the lowest-tier "Poor" is not relevant or featured in this Report.

4.4. LIMITATIONS TO THE EVALUATION

There are a number of limitations and caveats readers of this Report should consider whilst reviewing the Evaluation results. These limitations and caveats have been set out below:

a) **COVID-19 Pandemic Programme Disruption**: The global spread of COVID-19 which remains on-going has affected the health system both in the UK and in LMICs. At the end of Q4 the effects of the pandemic were heavily felt by the UK partners, and in Q5 the LMIC partners also felt the burden as 3 out of the 4 LMICs[9] were placed under national lockdowns. COVID-19 affected the Programme and HP outcomes as the daily activities of Projects could not be completed, hence THET and CPA granted a no-cost extension until January 2021. Furthermore, the pandemic continued to affect participant availability as many of the volunteers involved in Projects also served as front-line health workers. Along with disruptions to HP activities, COVID-19 also presented a challenge to the evaluation, for example – limiting access to key informants (see below). In order to mitigate the disruptions caused by COVID-19, it was agreed that the evaluation would be primarily undertaken through desk-based research incorporating additional information from interviews or discussions with Change Exchange, THET and CPA personnel, as well as through follow-up email correspondences. The Pandemic also meant the Projects were less able to complete comprehensive reports (see Section 4.4 c), and as such this resulted in information gaps which THET and CPA are aware of. Special care and consideration have been taken to ensure that the evaluation carried out by Ingentium did not prejudice the CwPAMS Programme and individual HPs, where unanticipated external factors, such as the COVID-19, hindered the carrying out of activities and achievement of objectives.

b) **Ability to access key informants:** The Interim Evaluation collected primary data by conducting interviews, surveys and questionnaires from HP leaders and volunteers; the evaluation carried out under Q4 and Q5 did not allow for the same sample group to be interviewed. Hence, the Q4 and Q5 evaluation has relied heavily on data from each HPs quarterly report, CPA quarterly reports, Fleming Fund reports and relevant documentation received from the CwPAMS. The lack of access to informants within the HPs was caused by COVID-19 disruptions; however, a great deal of information was elicited from them in previous interviews carried out in circa June 2020 for the Interim report (see Section 4.4 a). That said, Ingentium was able to engage Change Exchange to help mitigate the information gaps as Change Exchange were on the ground conducting training with four of the HPs on behavioural change associated with AMS. This was an important objective for the CwPAMS programme during Q4 and Q5.

[9] Ghana, Zambia and Uganda

c) **Depth of Reporting across HPs:** Evaluating Q4 and Q5 has been difficult due to the lack of reporting, and delayed activity plans**.** Reports required further clarifications from Project leaders who could not be accessed due to COVID-19 disruptions. The North Middlesex Hospital in London which was involved in Project A05, was one of the most affected hospitals during the Pandemic, hence the hospital's priorities duringQ5 of the Programme were elsewhere. Nonetheless, even though North Middlesex Hospital completed some of its goals, and was reportedly working on their final narrative report at the time this evaluation was being written, we did not have access to said narrative report and hence their performance had a limited influence on the scores/findings in this current report. This consequently made it appear as the A05 did not achieve its goals, even though that is not necessarily the case. Other HP reports, namely B09[10], required further clarification but because of COVID-19 related challenges, the involved partners found it difficult to engage and meet reporting deadlines. To minimise the gap within HP reports, CPA and THET provided extra information through summaries, policy documents, surveys, and dissemination materials.

[10] With B09, lack of communication with the HP also came about because of government issues in Tanzania during Q5 of the Programme. i.e. elections, the death of the President of Tanzania, and the widespread denial of the impact of the COVID pandemic by the government.

5. PRESENTATION OF PROGRAMME LEVEL FINDINGS

This section presents findings from our Q4 and Q5 evaluation of the CwPAMS Programme. It is worth noting that during the period covered by the Interim Evaluation, namely January to October 2019, the Programme scored 80. Under this Addendum, covering Nov 2019 - Jan 2021, the Programme scored 83. Thus, CwPAMS has a total score of 82 for Q1 through 5.

Quantitative assessment of the Programme was based on a scorecard system which used the answers to sub-question/indicators associated to each of the three OAQs to ascertain the extent to which each individual HP, and collectively the Programme, performed. The collective Programme-level results are displayed in Figure 3 below.

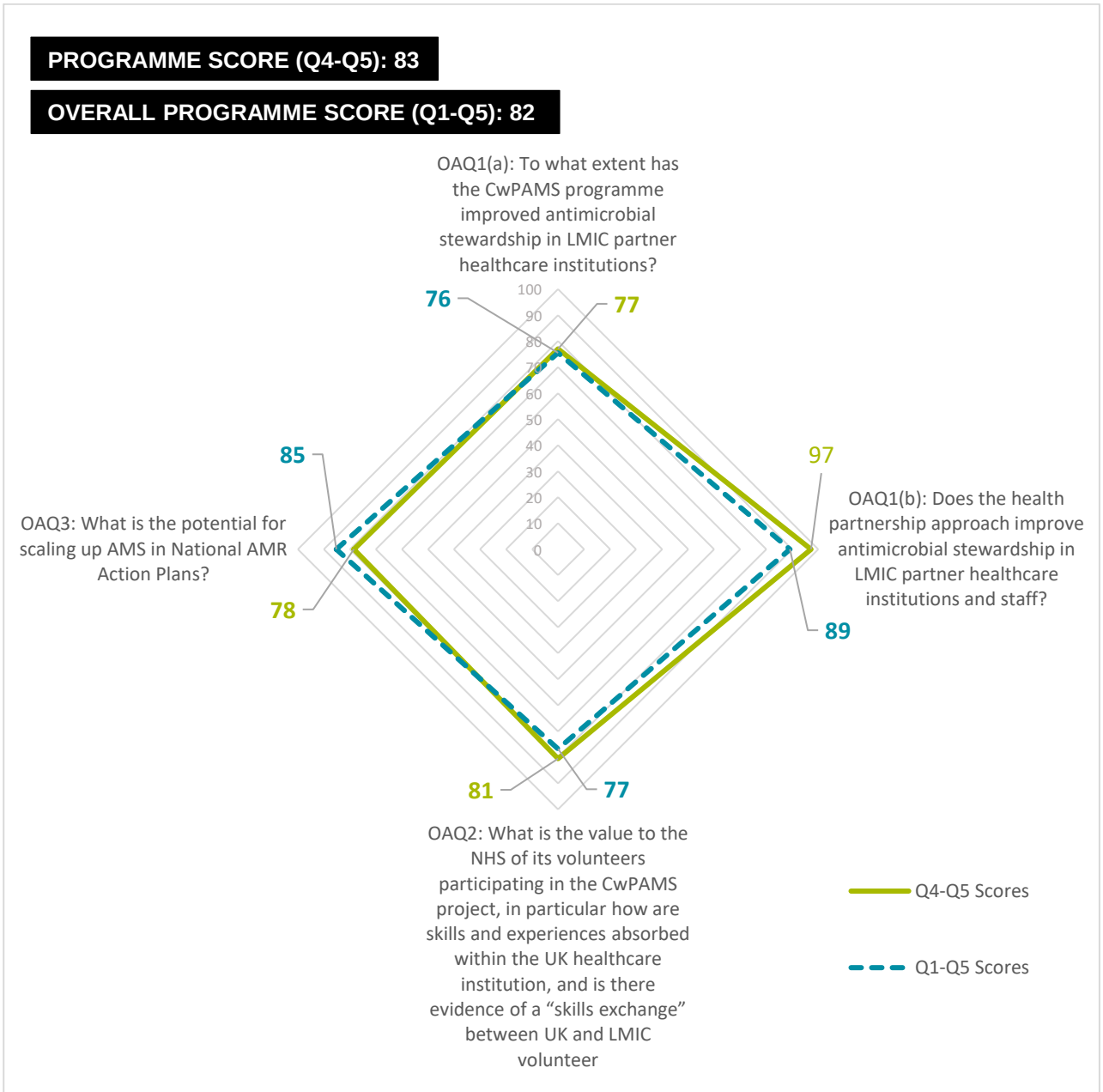


Figure 3: Overall Programme performance across the three Overarching Evaluation Questions during Q4-Q5, as well as average scores from Q1-Q5 (note that Proof of Concept is represented as two separate questions)

The subsequent sub-sections present our findings for each of the three OAQs. Key findings are outlined, followed by a score and/or justification for each sub-question/indicator associated to the OAQ and an

analysis of the score that concisely summarises the information we obtained from various sources which informed our evaluation. We note that subsections that are informed by qualitative questions or where data could not be quantified have not been scored; however, this data has still informed the summary of key findings for the three OAQs and has been factored into the overall Programme evaluation. Furthermore, no significant baseline data was available for utilisation as part of this evaluation.

The section concludes with a summary of the findings expressed in terms of their correlation with the OECD-DAC Evaluation Criteria.

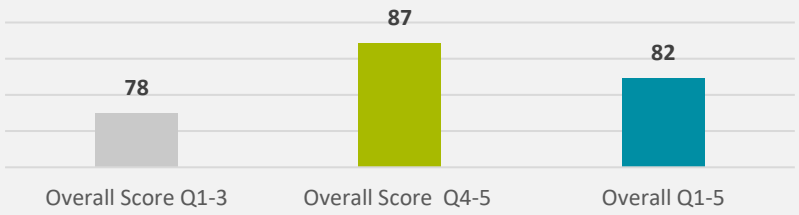
5.1. OVERARCHING EVALUATION QUESTION 1

'PROOF-OF-CONCEPT"

To what extent has the CwPAMS Programme improved antimicrobial stewardship in LMIC partner healthcare institutions?

Does the health partnership approach improve antimicrobial stewardship in LMIC partner healthcare institutions and staff?

SUMMARY OF KEY FINDINGS | SCORE (Q4-5): 87 (VERY GOOD)| OVERALL SCORE (Q1-5): 82 (VERY GOOD)



The CwPAMS Programme has improved AMS in LMIC partner health care institutions with the health partnership approach being a key factor to success

- THET and CPA provided essential support which enabled the Programme to not only adapt to COVID-19, but demonstrate its higher-level relevance. Both have made progress responding to some of the recommendations they received in the Interim Evaluation.
- CwPAMS has significantly influenced AMS policy in LMIC healthcare institutions by supporting the implementation of NAPs, informing national guidelines and establishing new spaces for policy dialogue at institutional and national levels.
- CwPAMS has achieved the vast majority of its Programme outputs and outcomes by continuously pursuing original objectives or, adapting them to something of equivalent value. As the CwPAMS objectives correlate with the WHO Global Action Plan, the Programme has additionally ensured that LMIC health institutions are compliant with WHO AMR recommendations.
- Despite limitations brought on by COVID-19, all 12 HPs have continued to engage with the Programme- a testament to the importance of IPC and AMS during the Pandemic. Relationships between UK and LMIC teams have also remained robust.
- The HP approach incurred intentional and unintentional higher-level effects by increasing the existing capacity for implementation of AMS in LMIC hospitals, addressing weak areas identified during GPPS/PPSs, and by responding to health demands, taking advantage of unexpected opportunities and collaborating with government bodies, members of civil society and other relevant groups in both the LMIC countries and the UK.

5.1.1. TO WHAT EXTENT HAS THE CWPAMS PROGRAMME IMPROVED ANTIMICROBIAL STEWARDSHIP IN LMIC PARTNER HEALTHCARE INSTITUTIONS?

5.1.1.1. How relevant was the support of CPA and THET to the CwPAMS Programme in Q4 and 5?

83 **Very Good**	There is strong evidence that THET and CPA provided essential support which enabled the CwPAMS Programme to not only adapt to COVID-19, but demonstrate its higher-level relevance.

a) Did the Projects report to have received support from CPA/THET in adapting their approach?
b) Did CPA/THET provide Programme-level support to CwPAMS in Q4 and 5? In what form?

11 out of 12 HPs (A02, A04, A07, A05, A11, B01, B03, B08, B09, B10, B12) report to have received support from THET in adapting their approach as a result of COVID-19. HPs noted that they appreciated the prompt responses they received from the organisation and how flexible and understanding they were when it came to repeated revisions to budget, staff replacements and activity plans. A number of HP also alluded to appreciating the relaxation towards reporting obligations. During the Interim Evaluation, overly cumbersome reporting obligations was a significant issue reported by 7 out of 12 HPs. THET was instrumental in revising the frequency and structure of the narrative reports for HPs. Regarding the final narrative report for both Q4 and 5, THET ensured that 11 of the 12 HPs submitted their reports timeously.

9 out of 12 HPs (A02, A04, A07, A05, A11, B01, B09, B10, B12) reported to have received support from CPA in adapting the more technical aspects of their approach, stating that they appreciated the provision of tools such as implementation guides and that events such as workshops were always well planned and informative. In comparison to Q1 to 3, more HPs (10) made use of the CPA tools such as AMS Checklist, the volunteer survey and the Antibiotic Guideline App. That said, with respect to the latter (Antibiotic Guideline App), at least 3 HPs reported that the tool was not always best suited to the context of their operations. The issues ranged from poor dissemination efforts to make hospital members aware of the App, a hesitation to engage with it, internet access issues undermining the ability to use to the App and it being was too large to download to HP members' phone. To overcome this latter issue of phone storage, one HP, B09, demonstrated clear risk management and adaptability by downloading the application to hospital computers, one in each ward, to facilitate ease of access.

It is not possible to comprehensively gauge the amount of support given by THET and CPA by only reviewing such input on the Project level. A great deal of project management was being performed both in unison and separately (by both THET and CPA) in the background to ensure the Programme was able to run throughout the Pandemic despite numerous disruptions. At the onset of the pandemic (March 2020) both THET and CPA undertook a joint survey of the 12 HPs to ascertain their ability and capacity to engage with the Programme. As CwPAMS targeted mostly front-line workers, both organisations agreed most HPs would not be able to sufficiently engage with the Programme within the original timeframe and therefore opted for a no-cost extension and a cancellation of Q4 reports thereby giving HPs additional time to meet their objectives and a much-extended final reporting deadline for Q5. With regard to their own work, both organisations adopted a flexible and proactive approach to their respective responsibilities which included increasing the frequency of meetings, the flexibility of budgets, and their engagement with and use of digital platforms.

With respect to the HPs, CPA sought ways to adapt their technical assistance to meet the moment. They responded to calls by the HPs for additional support for COVID-19 related activities. CPA not only provided technical guidance to the HPs when it came to relevant AMS and IPC topics such as alcohol-based

sanitiser/hand rub and correct AM prescribing practices, but were also at the forefront of disseminating this information to both local and international audiences. At a Programme level, much of the networking and collaborative work that CPA would normally perform with medical professional was done online, this includes the CwPAMS Toolkit[11], Continuing Professional Development ("CPD") Platform and various webinars (See Section 5.3.4). Lastly CPA jointly designed the abstract selection process to fund five CwPAMS publications in the Antibiotics Journal. After selection, CPA worked further to see if those not selected could be published as blogs or case studies.

THET, on the other hand, worked to ensure that HPs were not overwhelmed. They did this by maintaining strong lines of communication between HPs and THET grant coordinators, often working hard to simplify all documentation that HPs found hard to engage with. Grant coordinators kept abreast of all HP developments and were central to making decisions to reassign underspends. To keep morals high within the HPs, THET also made funds available through the Health Worker Action Fund ("HWAF")[12] with two recipients (B01 and B02) using the money to scale up COVID-19 related activities that had not been factored into original budgets (See Section 5.1.1.3).

A number of HPs reported that both CPA and THET (often through their in-country representatives) facilitated introductions with local contacts such as government officials from the MoH who helped them better understand the local context and needs. HPs also reported that both organisations helped with networking and enabling shared learning amongst HPs. HP remarked that hearing about how other HPs were navigating through similar challenges concerning project management and adapting AMS activities was helpful. With one Project in particular, A05 it is clear that both organisations went beyond their mandates. When it became clear that the UK partner, North Middlesex Hospital, located within a region that was badly affected by the Pandemic, did not have the capacity to engage with the Programme, both CPA and THET were understanding. They remained in contact with the UK team keeping abreast of developments at the hospital and how their experiences in CwPAMS enabled them to cope when their area became a COVID-19 "hotspot". The LMIC partner, Korle Bu Hospital, was also supported by both organisations throughout and this likely enabled it to continue to pursue a number of AMS activities in Q4 and 5. Both teams ensured that the HP should be included in this evaluation and worked to compile a commentary on the A05's activities when the HP was unable to submit a narrative quarterly report.

c) Did THET and CPA take steps to act on the recommendations they received during the Interim Evaluation?

60 **Good**	Both CPA and THET have made some progress responding to the recommendations they received in the Interim Evaluation.

A list of recommendations for the second iteration of CwPAMS was generated in the Interim Report and whilst neither THET or CPA have acted on the entire list of recommendations there has been visible and broad general progress in this regard. It is important to appreciate that COVID-19 and the limitation of time equally affected THET and CPA as well as all of the HPs in their ability to act-on or implement change with respect to Programme level recommendations. As such we have chosen not to develop entirely new recommendations for this Addendum, however have listed some of recommendations provided in our Interim Report, and described the progress that has been made on each by both THET and CPA.

[11] CwPAMS-Toolkit.pdf (commonwealthpharmacy.org)

[12] It is worth noting that the HWAF is independent of CwPAMS, and all HPs located were not an eligible for such funds.

I. THET and CPA support

For future programmes, THET and CPA have pledged to ensure that clearly defined roles are established at the inception of projects and communicated to stakeholders at induction meetings, workshops, and other relevant events. This came after CPA and THET had joint calls with HPs after the Interim Report.

II. Management Information System

As the grant manager for this particular Programme, THET is reportedly in the process of developing/ implementing an online platform for monitoring grants that will go live in early summer 2021. Provided funding for licences is available, grant holders will be able to upload qualitative and quantitative information relating to their indicators. It will enable reporting to be automated (giving grant holders the opportunity to upload qualitative and quantitative data on their indicators) and be conducted in a transparent and collaborative way.

III. NHS endorsement and support

Through the Programme, a number of the UK partners have actively engaged with senior management at their NHS Trusts, i.e. B02 – Brighton, and B10 – Buckinghamshire (see NHS Section 4.2). THET and CPA have also raised awareness for CwPAMS at a high-level meeting with the DHSC, UK Special Envoy on AMR, Dame Sally Davies and Chief Pharmaceutical Officer for England (Dr Keith Ridge), to highlight the successes of the Programme and garner support for future AMS programmes for Health Partnerships. Both parties are in support of a successor CwPAMS.

IV. Funding and remuneration

In recognition that clinical staff are unable to dedicate the time or expertise for meeting reporting requirements, THET have committed to ensuring that, for future grants programmes, sufficient funds will be included in budgets for project management activities. When reviewing applications for funding, special consideration will therefore be given to whether project management costs have been adequately budgeted for.

V. Gender Equality and Social Inclusion (GESI)

THET has developed a GESI toolkit for Health Partnerships[13] which has been made available to all HPs. In addition, a joint THET and CPA GESI workshop for HPs is scheduled for July 2021. This workshop will outline how HPs can make their projects be more transformative and mindful of GESI disparities. The workshop is to be delivered by ReAct Africa, a global network of health professional and advocates dedicated to AMR, who have experience delivering similar GESI workshops specifically for professionals working in the field of AMS. Workshop participants will cater to a wide range of cadres and roles (e.g., clinicians, managers). The objectives of the workshop will include:

- For participants to understand the importance of gender equality and social inclusion in relation to AMR in the LMIC setting;
- For participants to be able to identify areas where gender inequality and social exclusion is occurring by talking through the specifics of their work and settings (biological, social, cultural, political, economic), and how to overcome associated limitations;
- For participants (e.g., CwPAMS Programme team) to understand how the design of grant calls / programmes can affect GESI; and
- For participants to be able to identify contextual barriers and challenges of including GESI-focused activities in their work, and how these can be overcome.

[13] https://www.thet.org/resources/gender-and-social-inclusion-toolkit/

d) Did THET/CPA take steps to publicise the relevance of the CwPAMS programme?

100 **Excellent**	Conscious of the severe impact that COVID-19 has had in the UK and LMIC countries, both THET and CPA were quick to adapt their approach to publicise the relevance of the CwPAMS Programme to a wide range of audiences and in relevance to the Pandemic.

An unintended consequence of COVID-19 was to highlight the relevance of AMR, IPC and other central tenants of the CwPAMS programme to health systems in both the UK and Africa. CPA and THET were quick to adapt to the realities and limitations of the Pandemic and sought to highlight the relevance of CwPAMS in a multitude of ways:

- As previously stated, THET and CPA were invited to present the findings of the CwPAMS evaluation and proposal for a successor programme to the DHSC and UK Special Envoy on AMR, Professor Dame Sally Davies. Through this meeting both organisations were able to garner support for future AMS programmes using the HP model and a second iteration of CwPAMS. The results of the evaluation have also been disseminated to various stakeholders, including AMR Coordinating Committees.
- Both THET and CPA have continued to re-share/tweet the work that various HPs were doing both in Africa and the UK to combat COVID-19. CPA has also gone on to produce their own "How to Manufacture Alcohol Hand Rub" animation. Using their own resources to promote the WHO's formulation and guidance and making use of their audiences to scale the interventions and awareness being done by their HPs (See Section 5.3.4).
- CPA have held a webinar series[14] focused on COVID-19, often highlighting or using CwPAMS as a case study (See Dissemination Section 5.3.4) and inviting CwPAMS members to present at the webianrs. These events have had impressive attendance including pharmacists from hospitals both affiliated and non-affiliated to CwPAMS in the UK and LMIC countries and high-level representatives of health ministries. This has placed CPA at the forefront of shared learning on how best to diagnose, manage, and treat patients with COVID-19.
- THET moved their annual conference to be online, thereby significantly expanding their audience, with over 400 attendees across 4 days. CwPAMS was represented by B10 that was invited to present on how it adapted its HP model to incorporate a One Health perspective and CPA who were invited to sit on a panel to discuss the contributions HPs were making to the COVID-19 pandemic response. THET also hosed 'Partnerships in a Time of COVID-19', a virtual conference to facilitate discussions around how health partnerships can respond to the Pandemic. Numerous HPs were in attendance.
- CwPAMS was also showcased at the fifth Antibiotic Guardian Awards where the Programme won an award for 'Multi-Country collaboration'. Several HPs from the Partnerships were given commendations (See Section 5.3.4).
- The work undertaken by the Programme was also showcased during *World Antibiotic Awareness Week*. THET promoted CwPAMS during a week-long digital campaign to raise awareness of the global threat posed by antimicrobial resistance. Along with these efforts, CPA published a piece in the Guardian Newspaper on CwPAMS (See Section 5.3.4).

5.1.1.2. To what extent has the CwPAMs influenced AMS policy

92 **Excellent**	In Q4 and 5 CwPAMS built on the AMS policy initiative of Q1-3, continuing to formulate in-hospital policies and protocols on IPC and AMS and empowering MTCs. The Programme has successfully supported the implementation and highlighted the necessity of NAPs.

[14] COVID-19 Resource: Webinar Events - Commonwealth Pharmacist Association (commonwealthpharmacy.org)

11 out of 12 HPs (A02, A04, A05, A11, B01, B02, B03, B08, B09, B10, B12) reported to have incorporated AMS protocols, guidelines or knowledge into their hospitals in Q4 and 5. These include IPC policies (B09), in-hospital AMS programmes aligned with national action plans and scaled up to surrounding hospitals (A11) and AMS modules and IPC Standard Operating Procedures ("SoP").

In Q4-5 newly established Medicine and Therapeutics Committees ("MTCs") were given a central role in influencing AMS policy. Specifically, the MTC established at Jinja Regional Referral Hospital (B12) was responsible for formulating protocols for the treatment of COVID-19 confirmed cases, as well as procedures for isolating suspected and confirmed cases and the necessary IPC processes that should be utilised.

According to the CwPAMS Policy Impact Report, it has been shown that through this Programme, HPs have supported the implementation of NAPs, informed national guidelines, established new spaces for policy dialogue at institutional and national levels, and promoted the recognition of health professionals and the crucial role they play in AMS. This approach is in line with the WHO Policy Package to combat AMR, which encourages countries to "commit to a comprehensive, financial national plan with accountability and civil society engagement". The Policy Impact Report shows that the Programme has successfully influenced AMS policy through:

B02: Considered a pioneer in AMS, University Teaching Hospital ("UTH") is the training lead in IPC and AMS education in Zambia. During Q4/5 UTH received recognition from the Zambian MoH for its efforts and will now mentor other hospitals in Zambia on AMS.
The outcomes of CwPAMS have enhanced UTH's capacity to lead the AMS, IPC and local hand rub production initiatives as part of the National AMR Action Plan.

The team, made up of volunteers from Zambia and the UK, produced a contextually relevant AMS training modules and a handbook of SoPs for hand rub making, bare below the elbow doctor's coats and handwashing practice in the [beneficiary] hospital. These training and practice tools will inevitably enhance health workers' response to COVID-19 in Zambia.

1. Framing AMS debates and getting these issues on to the political agendas of key stakeholders. Activities such as influencing national organisations and sharing evidence have been key here;
2. Encouraging discursive commitments from states and other policy actors to promote multidisciplinary approaches to AMS and the recognition of pharmacists at hospital, regional, national, and international levels;
3. Securing procedural change at domestic or international level by creating new spaces for policy dialogue to take place in MTCs at hospitals;
4. Legislative changes that are the direct result of structural and procedural changes brought about by the Programme; and
5. Influencing behavioural change of key stakeholders in the AMS domain.

5.1.1.3. To what extent has the COVID-19 Pandemic illustrated the relevance of AMS and IPC?

72 **Very Good**	The Pandemic highlighted the relevance of AMS and IPC, beneficiary hospitals continued to engage with the Programme and almost all HPs adapted their activities to incorporate COVID-19 interventions.

Despite COVID-19 restrictions preventing most in-contact activities, and hospitals facing additional pressures, all 12 beneficiary hospitals continued to engage with the CwPAMS Programme- a testament to the particular importance of IPC and AMS during the Pandemic.

The Programme encouraged HPs to restrict the inappropriate use of antimicrobials (specifically during the Pandemic) but 11 HPs (A07 being the exception) went beyond this and were involved in COVID-19 interventions during Q4 and 5. These included partially funding infrastructure for hand hygiene (installations of sinks, procurement of wall mounted sanitiser dispensers), encouraging the use of face mask and other PPE, reaching the greater public through awareness campaigns on radio, and ensuring beneficiary hospitals met WHO standards regarding hand hygiene and other IPC mechanism. B10 also demonstrated how UK volunteers, despite not being able to travel, were able to contribute to LMIC COVID-related activities. Buckinghamshire Healthcare NHS Trust spearheaded a crowdfunding campaign that generated resources that supported purchase and distribution of 110 handwashing facilities for community health workers, health facilities and schools in rural Uganda. As none of these interventions were planned or budgeted for at the outset of the Programme, this demonstrated how HPs were able to successfully adapt to the particular health challenges facing each individual country and how the Programme provided them with the relevant tools, resources and guidance to do so.

Pharmacists were also heavily involved in COVID-19 efforts. At the training of health practitioners in Uganda, 42 healthcare workers received training in AMS, five of whom were pharmacists. Using the train-the-trainer model, the pharmacists were trained on how to make large quantities of alcohol-based hand rub. The trainers then trained five other pharmacist interns on how to produce the hand rub and a second cohort of interns, making the total trainers six. Hospital administrators and managers were found to be more receptive in supporting pharmacists with the local production of alcohol hand rub, initially at one hospital then rolling it to the second hospital in Kampala. The train-the- trainer model allowed for positive effects as different hospitals were now trained on the local production of alcohol hand rub, which in hindsight made a significant impact as the trainings finished in February 2020 and the first reported COVID-19 case in Uganda was in March 2020.

Two HPs (B02 and B01) managed to secure additional funds from THET via the HWAF. The former, B02, also managed to secure Foreign, Commonwealth & Development Office ("FCDO") funding via the UK-Africa COVID-related health research partnerships and innovation communications grant. This additional funding enabled these two HPs to enact larger interventions and also to scale-up the same. With the additional funding, B01 were able to provide key PPE and IPC materials, allowing them to continue manufacturing alcohol-based hand rub as part of their COVID-19 efforts. B02 was able to scale-up their hand rub manufacturing across four public tertiary hospitals in Zambia, which included procuring tools and start-up materials and facilitating training of staff.

> **"The emergence** *of the COVID-19 pandemic opened a new frontier of critical need for our project in Zambia... [By] expanding hand rub making across four public tertiary hospitals in Zambia our Project further contributed to Programme objectives of enhancing IPC practice for frontline health workers, especially during the COVID-19 pandemic."*- B02 HP
>
> *Alcohol-based hand rub is the formation of hand sanitiser that is used in hospital environments as an alternative to antiseptic soaps

5.1.1.4. To what extent were the Programme objectives achieved?

82 **Very Good**	To a large extent, CwPAMS has achieved its Programme outputs and outcomes by either pursuing their original objectives or, when this was not possible, adapting them to something of equivalent value but relevant to the Fleming Fund.

In Q4 and 5, all 12 HPs continued to run activities that correlated with at least two of the three Fleming Fund objectives that the CwPAMS Programme aimed to achieve, with most HPs (10 out of 12) pursuing their original objectives as stated in their Project Log Frames. In relation to the CwPAMS outcome 1, all

HPs have demonstrated strengthening of LMIC healthcare workforce in the areas of AMS and prescribing practice and all the HPs have continued to use the data collected from GPPS to identify challenges and deliver improved antimicrobial stewardship interventions, including improved antimicrobial prescribing practice in their beneficiary hospitals. HPs have ensured that hospital practices are synchronised with NAP(s) and adhere to WHO standards. According to multiple narrative reports, multidisciplinary teams (established during Q1 to 3) improved prescribing at most hospitals. The inclusion of pharmacists in-ward has empowered them and given them more responsibility, for example in conducting PPS. MTCs have successfully led AMS initiatives in many LMIC hospitals and this has helped elevate the importance of AMR in-hospitals and nationally. One MTC (associated to B12) has had influence at the national level 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 (See Section 5.1.1.3)

For CwPAMS outcome 2, the Interim Evaluation found that all 12 HPs had developed and implemented protocols/guidelines for AMR surveillance and antimicrobial use within their hospitals (in LMICs). In Q4 and 5 we saw HPs remark on how these protocols and guidelines were beginning to have effect in the beneficiary hospitals, increasing the efficiency of work and being especially relevant in hospitals which saw an influx of Covid patients. During Q4 and 5, nine out of 12 HPs developed additional protocol/guidelines/handbooks relating to AMS, prescribing practices, pharmacist roles and IPC to further influence hospital procedure and process in the long-term. Further, all HPs now have access to the CwPAMS Toolkit which provides a collation of resources, strategies and examples to underpin and support the work HPs in future pursuits.

Lastly, with regards to outcome 3, 10 out of 12 HPs met their NHS related targets, demonstrating improved leaderships skills and understanding of AMR in both the LMIC and global context in Q4 and 5. Many UK volunteers were able to demonstrate their skills and understanding in the context of their own UK health institutions where they served as frontline workers during the Pandemic. This, along with the numerous NHS-affiliated websites that have recognised the CwPAMS programme and/or particular volunteers/HPs, is proof of the value of the Programme to the NHS (the effects on NHS volunteers are further explored in Section 5.2).

To a large extent the CwPAMS objective and outputs have been achieved, albeit with much modification (7 out of 12 HPs reported they had to reallocate resources to adjust to the disruptions brought on by COVID-19, elections and other events in both the UK and LMIC nations). The support provided by THET and CPA was integral in encouraging HPs to continue and providing the necessary assistance to such HPs so that they can adapt to new challenges.

5.1.1.5. To what extent was CwPAMS successful in implementing the WHO Global Action Plan on antimicrobial resistance in all four LMICs?

The CwPAMS programme has managed to contribute to the implementation of the three WHO Global Action Plan objectives on AMS in all four countries where HPs operated. This was achieved through HPs' efforts on increasing knowledge on AMS through various relevant campaigns, promotion on the rational use of medicines, improvements to patient care, and the creation of multidisciplinary teams to advocate for AMS and understand the challenges to AMR. Some HPs went even further to focus on objectives that were unintended for the CwPAMS programme in respect to the WHO Global Action Plan, such as focusing on IPC interventions.

There is substantial evidence that the majority of LMICs represented in CwPAMS were able to meet their WHO Global Action Plan objectives under the Programme. The objectives of the WHO Global Action Plan that CwPAMS focused on 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.
(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.
(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.

Zambia: **The partnership (B02) has been able to influence AMS policy at local levels with evidence of strong engagement and implementation across local, regional and national levels**. Colleagues within the partnership demonstrated AMS stewardship through the formation of national committees such as the National Hospital Pharmacists Association, which makes decisions on pharmaceutical training and practice across all sectors and informs the national curriculum for pharmacists. The ability to create networks for information exchange, through MTCs for example, allowed the HPs to involve different stakeholders in order to improve the understanding of AMR. This was demonstrated by B02 who used their networks within their hospital pharmacy services and links to the MoH and Pharmaceutical Society of Zambia to enact multilevel change in Zambian AMR policy. With regards to IPC, the HP was also able to successfully introduce the concept of the '*bare below the elbow*' ("BBE") dress code at hospitals, and obtain recognition of the practice at a national level. This concept promotes IPC measures by 'reducing transmission of pathogens that may occur due to contact of the patient with healthcare workers' contaminated clothing'. Thus, Zambia was able to achieve more than three of the WHO Global Action Plan objectives under the CwPAMS programme.

Tanzania: **Objectives 1 and 3 of the WHO Global Action Plan were the key target areas that Tanzania excelled in.** B09 aimed to improve antibiotic prescribing practices and raise the level of public awareness and understanding about AMR. This was achieved by addressing local priorities, ensuring that AMS was on the policy agenda at the hospital level, increasing training in hospitals and community settings to promote a more suitable use of antibiotics and effective infection control practices. The HP also undertook public health campaigns to encourage behaviour change. These interventions empowered pharmacists to alter antimicrobial use, contributed towards improved patient outcomes, and helped reduce incidences of AMR by encouraging patients to responsibly take their prescribed 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 in general. They illustrated that in clinical settings, the prevalence of multidrug-resistant bacteria ranged from 25 to 50 percent with antibiotics often over-prescribed in community and pharmacy settings. A major success for this partnership was encouraging the empowerment of clinical pharmacists by deploying them in hospital wards with the correct tools.
One of the lead partners within the HP highlighted that the '*authority given to pharmacists to enforce changes that impact the medical profession reinforces how much they have been empowered*'.

Ghana: **All three goals of the WHO Global Action Plan were achieved in most of the partnerships in Ghana**. HPs have been able to influence AMS policy at local levels with evidence of regional and national engagement. The A07 partnership improved AMS awareness and empowered the role of pharmacists through hospital-based polices and protocols for the staff, which were shared at a national level, with the aim to expand the initiative nationally. The Ghanaian HPs successfully achieved the second WHO Global Action Plan objective by creating various networks and hospital-based polices and protocols for staff, which

was shared at a national level. As well as promoting awareness, these HPs also introduced AMR to the public through campaigns via TV, Radio and Twitter and through advice sharing sessions with the Ghana Pharmacy Council. One HP (A02) increased awareness of appropriate use of antibiotics amongst patients in Saboba district via question-and-answer sessions with outpatient groups to improve the understanding of AMR.

Uganda- **HPs were focused on raising awareness on AMR with two HPs focusing on IPC concerns of women in post-natal surgery and obstetrics ward specifically**. The HP established guidelines to form national policies on managing infection in postpartum women, promoting the rational use of antibiotics and training courses for staff. The WHO Global Action Plan objectives were achieved through educational campaigns, and capacity building by highlighting the key role of nurses and midwives. Some partnerships, such as B10, focused on increasing the awareness of healthcare professionals and improving clinical practices within hospitals by setting up various committees, including Community of Practice networks and MTCs. They also adopted a One Health approach in their work targeting a variety of health professionals (i.e. veterinary medicine professionals) in their activities.

© 2021 Ingentium Limited

5.1.2. DOES THE HEALTH PARTNERSHIP APPROACH IMPROVE ANTIMICROBIAL STEWARDSHIP IN LMIC PARTNER HEALTH CARE INSTITUTION AND STAFF?

5.1.2.1. What intentional/unintentional benefits did HPs incur through participation in the CwPAMS Programme?

96 **Excellent**	By increasing the existing capacity for implementation of AMS in LMIC hospitals and addressing weak areas identified during GPPS/PPS, HPs were able to generate significant, positive intended higher-level effects. HPs were also able to incur unintentional higher-level results through unexpected opportunities to further develop their protocols and guidelines into formal publications, collaborations with government bodies and members of civil society in both the LMIC countries and the UK.

Similar to Q1-3, all 12 HPs were able to provide evidence of significant positive, intended higher-level[15] effects. Data from the Narrative reports showed that most Projects were able to achieve their output and outcome targets, or something of equal nature. In Q4 and 5 Most HPs demonstrated this by assessing the existing capacity for implementation of AMS in their respective hospitals and carrying out activities according to this. With regard to prescribing, HPs have begun to build capacity in problem areas. For example, A04 has introduced an audit system to help regulate and monitor antimicrobial prescribing. Policies and protocols implemented in Q1-3 began to produce the desired results in Q4 and 5, not many HPs managed to carry out comprehensive monitoring or evaluation of the effects of their policies or protocols, but some like B01 noted a 30 percent reduction in antibiotic consumption post-training when comparing relevant data from April - June 2019 (pre-AMS training) and October - December 2020. B03 reported that "p*erhaps the greatest achievement has been the ability to maintain the reduction in sepsis deaths from the start of the Project right through the COVID-19 period*".

> B03 has begun a pilot to develop inventories of antimicrobials (and other consumables and equipment) across level 3 and 4 health centres in Kabarole District of Uganda. They are in the process of searching for funding which will enable them to use this research to develop an electronic management tool to manage antimicrobial facility supplies and enable the sharing of supplies between all the facilities, depending on the relative supply and demand in each facility. The intervention will also involve training both pharmacy and clinical staff within health facilities on drug management.

Dissemination of knowledge was also prioritised. Leads, Fellows and volunteers from various HPs attended numerous webinars and conferences to showcase their work. Data collected during Q1 – 3 was analysed and HPs began to prepare academic manuscripts, policy briefs and blogs based on this. In many hospitals, newly promoted-pharmacists became members of MTCs and AMS Committees and were regularly involved in clinical wards. HPs scaled up their AMS strategies, targeting areas where there could be improvement. For example, B12 was at the forefront of reviewing and issuing recommendations for the treatment practices for UTI in pregnancy. Through coordinated learning and sharing sessions online, both LMIC and UK volunteers were able to maintain AMS training and knowledge exchange even throughout disruptions caused by the Pandemic.

Eleven of 12 HPs (A02, A04, A05, A11, B01, B02, B03, B08, B09, B10, B12) were able to show that they had generated significant positive, unintended higher-level effects. A number of these were in relation to the Pandemic including publicity drives, training in relation to IPC and funding infrastructure changes to improve hygiene and hand gel/hand rub manufacturing (see Section 5.1.1.3). Inspired by the findings of

[15] This report defines higher level as any results over and above the precise targets HPs specified in their original Log Frames.

B09: through Kilimanjaro Christian Medical Centre (KCMC) Community Health Department, this HP was given with the opportunity to work 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'*. The training was very well received and included a lengthy and productive Q&A session with participants.

As part of the same event, AMS awareness training was provided to:

- 206 medics, pharmacists and medical interns;
- 130 Nurses;
- 196 University Students; and
- 524 members of the public, Boda boda* drivers and school children.

*Boda Boda is an informal term referring to the drivers of bicycle and motor cycle taxis in and around East Africa

their work and the hospital policies they developed in Q1- 3, some HPs produced specific handbooks and publications for LMIC hospitals. One example is B01, whose in-hospital (Mulago Hospital) Antimicrobial Prescribing Policies inspired the writing of a book on infection in postpartum women and B03 who were unexpectedly invited to co-produce a policy brief with members of the Pharmaceutical Society of Uganda. Additionally, a number of HPs have also received audience at the national level in Q4 and 5, B10 reports to have collaborated with the Ugandan Ministries of Health, Agriculture and Animal Industry and Fisheries in Q4 and 5 and B01 and B02 have received recognition from government for their work.

Not all the unintended changes had higher level impact in LMIC countries. Northumbria Healthcare NHS Foundation Trust (B09) was given the opportunity to partake in discussions with Newcastle University about the development of an AMR module for undergraduate medical students and the establishment of a student elective exchange programme related to AMS.

5.1.2.2. Which factors contributed to the positive changes that were generated?

HP narrative reports and quarterly reports from THET and CPA revealed the following factors which contributed to the positive changes that HPs were able to generate. (See Figure 4 below)

Figure 4: The major factors that contributed to the (positive) changes that HPs were able to generate as seen in Q4/5 Narrative Reports

One key factor that was meant to significantly influence positive change was the participation of The Change Exchange behavioural scientists. Their inclusion in CwPAMS was to incorporate behavioural science activities into the HPs' work in AMS. This entailed conducting context-specific research into the particular behavioural changes that are required to improve health systems, services and care delivery. Throughout Q1 – 5, The Change Exchange worked with four HPs (A11, B01, B08, B12), and informally with A02, to better understand their particular needs from a behavioural change perspective and use this knowledge to identify drivers and barriers of change, as well as develop evaluation tools and other relevant materials.

The Change Exchange reports illustrate they performed most of their interventions in Q1-3. This is largely due to the impact of COVID-19 in Q4 and 5 which prevented them from travelling and performing most of their work which relies on direct observation and scoping. Despite this, they made lasting changes that have significantly impacted the sustainability and scalability of the CwPAMS model. Just before the Pandemic affected Ghana, The Change Exchange were working with hospital prescribers in pre-surgery care to understand why patients were not finishing their antibiotic course. The Change Exchange was able to conclude that this was as a product of the overall work culture- prescribers were obliged to have a follow-up review with patients, during which they would ascertain how the treatment was going. Instead, it had become common practice for them to forgo the consultation and simply tick the box indicating that they had done so (unaware that patients were not actually completing the prescribed course of antibiotics). In this case The Change Exchange advised that prescribers receive information that would reshape their attitudes towards their responsibilities. They also reminded HPs that some of the most relevant work they could do to further AMS would be changing the way in which practitioners on the ground carried out their everyday responsibilities.

The Change Exchange also brought to light the significant impact that hierarchical structures were having on the way clinicians worked, often finding that LMIC staff were very candid with them in their interviews and discussions. Again, in Ghana they noted that doctors were prescribing medicines that were not specified in the National Guidelines however, due to previous experiences pharmacists were either too afraid or felt they were too junior, to speak with a prescriber and so they simply continued with the incorrect medicines. The Change Exchange were instrumental in assessing the specific work structures and available mechanisms, and then providing recommendations for how these challenges could be overcome through solutions such as discussions around the ways that employees relate to hospital structures. These recommendations would be integrated into existing HPs structures. For example, by adding a behavioural change perspective into a pre-scheduled clinician training event.

As some of the planned activities did not take place in Q4 and 5, The Change Exchange used their underspend to create resources to influence CwPAMS behaviour change and sustainability model. They made a toolkit which included, a theory of change workshop guide to enable HPs to conduct future behavioural change, a Cards for Change game which looks at how different behaviour change techniques can be used in teaching events, and a training guide that outlines how behaviour change can be a mechanism to support AMS. A11 managed to get extra funding through the CwPAMS programme to do a follow up study on Minimally invasive surgery ("MIS") in dentistry as it was found it was a high focus area[16]. The Change Exchange will work with them to identify the challenges and provide techniques for change. Additionally, The Change Exchange has an upcoming peer-reviewed publication to assess how the training materials produced by CwPAMS are affecting behaviour changing practices around AMS. They have also contributed to the publications released by the four HPs.

[16]An area containing a high concentration of disease and from which the disease probably spreads.

Overall, we can conclude that The Change Exchange played an important role in contributing to the higher-level effects that HPs were able to achieve. By incorporating a behavioural element into the objectives of 4 HPs, they were able to unearth that the solution to a number of what-were-originally perceived to be complex problems lay in shifting mindsets and attitudes. The participation of the Change Exchange enabled a more nuanced approach to AMS and although most of their work was in the background and unacknowledged it will likely go on to impact LMIC hospitals in the long run.

5.1.2.3. Did the UK and LMIC partners continue to maintain activities/a relationship in Q4 and 5?

80 **Very Good**	The continuous activity and relationship between UK and LMIC partners in Q4 and Q5, is a testament to the strength of the health partnership approach.

> **"At the end of 2020** *and beginning of 2021 communications with our partners became extremely difficult due to the changing political landscape and continuing pressures on health services due to the pandemic. This meant that people were not readily available to provide time for project activities and, more importantly, provide some essential data for the report. The UK team thought that it was not reasonable to apply pressure at this time of global health emergency and expect health colleagues in Tanzania to prioritise this work whilst coping with other challenging issues within their work delivery."*- B09 HP

UK and LMIC partners in all 12 HPs, even A05 which faced significant limitations, continued to maintain a relationship and/or activities in Q4 and 5. Considering that no HP was forced to remain in the Programme following the no-cost extension, this serves as a testament to the success of the health partnership approach in building sustainable partnerships between health institutions in different regions of the world. The strength of partnerships, even during the Pandemic, was aptly demonstrated particularly by B09, through the consideration that each of the UK and LMIC partners had with respect to one another. We saw that despite these disruptions, this particular HP was still able to meet the majority of their objectives.

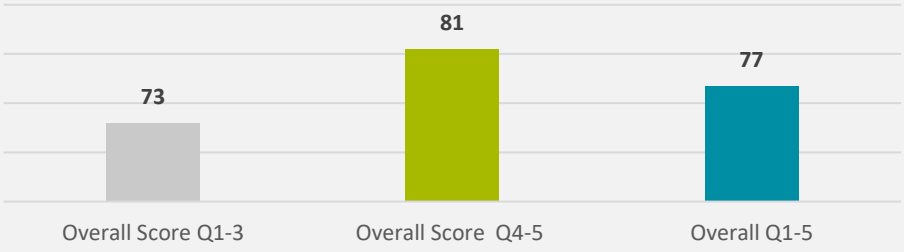
Despite challenges, most HPs expressed that communication was key to maintaining activities and partners kept in touch via email, Zoom and WhatsApp where they conducted meetings and shared Covid-related resources and experiences. In this way, many HPs were able to coordinate activities, and share writing responsibilities when it came to CwPAMS reporting obligations, manuscripts and grant applications. Some HPs, like B08 have reported that UK partners are also willing to provide informal support to their LMIC partners in the future. Other HPs, like A07, are aspiring to have a closer relationship, with UK partners continuing to collaborate in order to support AMS programmes in LMIC partner hospitals.

The Pandemic caused unique challenges to the Programme such as the shift to online engagement and the inability to travel to beneficiary hospitals. This had some effects on the equity of partnerships. A UK staff member in B01 noted that that they weren't necessarily connected with what was happening in the clinical context and they felt quite removed from the LMIC context. This inability to be on the ground and work with their LMIC counterparts resulted in them feeling as if they were merely dictating actions to their partners, as opposed to working *with* them.

5.2. OVERARCHING EVALUATION QUESTION 2

> What is the value to the NHS of its volunteers participating in the CwPAMS Programme, in particular how are skills and experiences absorbed within the UK healthcare institution, and is there evidence of a "skills exchange" between UK volunteers and their counterparts in the LMIC?

SUMMARY OF KEY FINDINGS | SCORE (Q4-5): 81 (VERY GOOD) | OVERALL SCORE (Q1-5): 77 (VERY GOOD)



There is strong evidence to demonstrate that the health partnership approach resulted in a beneficial skills exchange between UK and LMIC volunteers

- From Q1 through 5, HPs provided their [UK] volunteers with training and skills that were beneficial to the NHS. In the final two quarters over 80 percent of HPs achieved a majority of their NHS-related targets showing improved leadership skills and improved knowledge, and acquired skills in effective management of limited resources.
- One of the key successes for the NHS was The CPhO GH Fellowship Programme, funded separately by Health Education England following recommendation by the Chief Pharmaceutical Officer, Dr Keith Ridge. This Programme which solely focused on enhancing the leadership and project management skills of NHS pharmacists. All participating Fellows agreed that the skills and knowledge they gained during their fellowship was useful for the current stage in their career.
- 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. They felt their participation in CwPAMS made them better equipped to deal with the limited resources and additional stress during the Pandemic.
- From a workforce perspective, gaining international project experience has enhanced the professional development of numerous healthcare professionals who have upskills and received promotions and recognition for their improved work.
- CwPAMS is also involved in plans to institute change in the UK. The Change Exchange secured a NIHR grant to examine the behaviour change content of AMS education and training materials in the UK NHS secondary care system. A project that will emphasise the benefits of CwPAMS to the UK.

5.2.1. *What is the Programme impact on the pharmacy workforce (upskilling, roles created, inclusion in/leading of AMS teams, policy groups etc.)?*

81 **Very Good**	Pharmacists enhanced their skills through training, practical workshops and the CwPAMS App which aided in their prescribing practices. Many CwPAMS pharmacists are now core members of their respective AMS committees, MTCs and multidisciplinary teams and providing a sustainable model for AMS within their hospitals. In spite of challenges the vast majority managed to sustain their relationships with local AMS and pharmacy groups.

Under the CwPAMS programme, a large number of pharmacists benefitted across the 12 Projects. This is demonstrated by a Q4 Clinical Pharmacy Survey in the LMICs[17] during which 94.7 percent of participants reported that the Programme had a positive impact on them. 83 percent said it had resulted in new [pharmacy] services being created or increased recognition and 95 percent said they would recommend a similar partnership approach in improving clinical pharmacy in their hospital.

Throughout the Programme pharmacists enhanced their skills through various events, seminars and workshops that were held. They also upskilled via the CwPAMS App (see Figure 6) which aided in their everyday tasks, and gave them easy access to relevant prescribing practices, NAPs and other information relevant to their work. 16 individuals participated in CwPAMS as the first cohort CPhO GH Fellowship. All 16 Fellows successfully graduated from the programme in Q5.

One key Project to note is B09 which established a clinical pharmacy team at KCMC, Tanzania with new roles for pharmacists as an integral part of multidrug therapy, contributing regularly to clinical ward rounds. This change marked the introduction of a clinical, ward-based pharmacy service for the first time at KCMC, creating a spring-board for the team to highlight the need for the service and benefits of a clinical pharmacy service by providing advice, and ensuring the safe and effective use of medicines within and beyond AMS.

Similarly, the same partnership also linked the hospital committee to support national efforts to tackle AMR through AMS training modules as part of the healthcare school's curriculum within medicine pharmacy and dentistry, and surveillance of antimicrobial use.

Figure 5: Members of A02- discussing the global issue of antimicrobial prescribing and barriers to using medicines in Zambia

[17] This survey was conducted on pharmacists in LMIC hospitals in Uganda and Ghana, 53.5 percent of which were part of the Programme

Many of the pharmacists that were part of the CwPAMS Programme are now considered core members of their respective AMS committees, providing a sustainable model for AMS within their hospitals. Others have been recognised as key figures in multidisciplinary teams which aim to empower internal healthcare staff with respect to AMS, and improve compliance within AMR policies and associated conduct.

In spite of challenges Projects managed to sustain their local relationships. All of the HPs reported that they either forged new links or continued previous relationships with policy groups and AMS teams and seven have either forged new links or continued previous relationships with pharmacy groups. B01 invited the Uganda MoH during their delivery of training and remarked that the collaboration was mutually beneficial. For the pharmacists, the direct involvement of the MoH in the course delivery highlighted that their work was "valuable and important" to the government in tackling AMR. It also invertedly elevated the status of pharmacists involved. As one Project partner explained - prior to this Project "*what we noticed traditionally, is that the pharmacists weren't heard as much, and their input wasn't valued as much*." A number of pharmacists including one senior pharmacist are working with the Infectious Disease Institute in Uganda in order to inform national legislation on AMR.

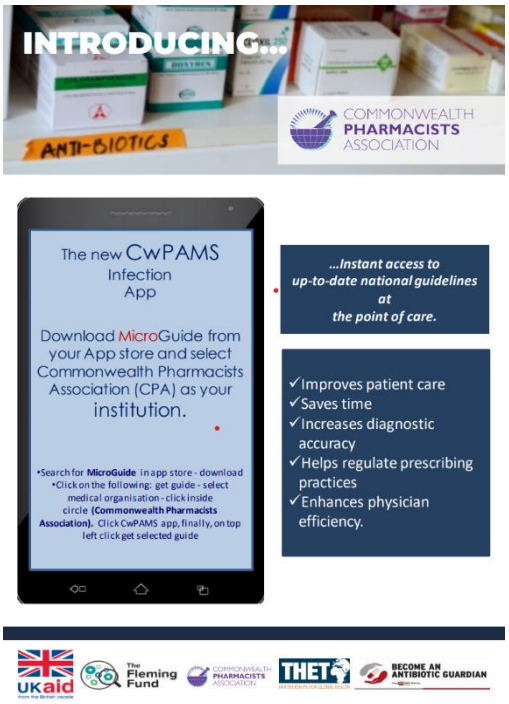


Figure 6: Launch brochure for the CwPAMS App promoted by CPA

5.2.2. What is the benefit of the CwPAMS Programme to the NHS?

81 **Very Good**	The Interim Report projected that the results from the final quarter of the Programme would demonstrate a larger (positive) impact accrued by the NHS through volunteer participation in comparison to quarters one to three. Carrying on from Q1-3, the activities that were meant to take place during Q4 and 5 were successful and achieved a higher score than the first three quarters. This illustrates that the role of the NHS within the CwPAMS Programme has significant benefits with long term effects for the Health Partnerships. Data demonstrated that most HPs achieved their NHS-related targets and this has been acknowledged by the high number of NHS-affiliated websites that have shared information concerning the Programme.

a) Did the Projects achieve the majority of their NHS-related targets for Q4 and Q5? (if not did they achieve something of equivalent value)?

b) Have any NHS-related websites or platforms highlighted the efforts/achievements of volunteers?

This evaluation finds that most HPs provided their [UK] volunteers with training and skills that were beneficial to the NHS. Ten HPs (A02, A04, A07, A11, B01, B03, B08, B09, B10, B12) achieved a majority of their NHS related targets by showing improved leadership skills and improved knowledge, and acquired skills in effective mangement of limited resources. One of the key healthcare successes within the Programme was The CPO Global Health Fellowship Programme which solely focused on enhancing the leadership and project management skills of NHS pharmacists.

> **"Vastly useful and applicable.** *I feel I learned more than I taught during my visit! Although I do believe we made a difference for our partnership as well"* -CPhOG Fellow

For Q4 onwards the data shows that as a result of the Pandemic disruption, the *way* in which UK volunteers contributed to AMS strategy with HPs changed. Some found it was now easier to complete their NHS-related goals (as they had additional time to study whilst home or found that online communication actually enhanced their work). For example, A11 was able to support volunteers showcasing their skills to broader audiences to promote global citizenship goals that are expected to further support a new global health organisation set up in March 2021 by Health Improvement Scotland. Another success was the HP involving University of Salford and the Pharmaceutical Society of Uganda (B03) which improved delivery within their curricula in areas of non-medical prescribing by creating a virtual wound management clinic.

That said, COVID-19 disruptions caused various travel bans which ultimately did affect certain HPs, such as B08, whose volunteers were not able reach their goals. Other HPs failed for different reasons. B02, for example, struggled to achieve its goals of having volunteers be supported at an executive level. This was largely due to the inability to get the Brighton and Sussex University Hospital NHS Trust on-board to approve volunteering policies in order to increase the overall number of volunteers to implement formal policies.

In Q4 and 5 there were clear instances of knowledge exchange between LMIC and UK partners, both on and offline. The former was demonstated in the numerous webinars and conferences hosted by THET and CPA (see Section 5.3.4). An excellent example of the latter is HP A05 which, at the beginning of Q4, hosted a doctor, nurse, and pharmacist from Ghana in the UK to demonstrate the process of stewardship and quality improvement programmes at the respective UK NHS trust. The visit was highly successful as it also gained recognition at the NHS trust board level and was featured in the highly influential Chief Medical Officer's Annual Report.

5.2.3. Did NHS Project members report their experience enhanced their abilities during the pandemic? Have any NHS-related websites highlighted the efforts of volunteers?

75 **Very Good**	NHS staff were able to translate their knowledge and skills from CwPAMS trainings into clinical practice in response to COVID-19 challenges. From a workforce perspective, gaining international project experience has enhanced the professional development of numerous healthcare professionals who have since moved on to new jobs or been promoted.

When the COVID-19 pandemic disrupted the world, the HPs were worried about the impact it could have on their efforts within the CwPAMS Programme. However, due to the extensive training the health practitioners had received prior to the pandemic, NHS staff were able to translate their knowledge and skills from the trainings into the clinical practice in response to COVID-19 challenges.

> **"Josephine Mary Oyella, Clinical Pharmacist with B09** noted her experience helped form an AMS committee in the hospital, prescribers are now conscious on use of some antimicrobials though there are still minimal irrational prescriptions due to lack of adequate information, about 60 percent of healthcare providers have grasp the concept of checking the guidelines, prescriptions of antimicrobials have slightly improved, guarding use of unnecessary prescription of antimicrobial.

Knowledge exchange and the ability to learn from one another are important elements for the Programme, as UK teams learned a lot from their African partners and vice versa. A great example of knowledge transfer was at the start of the pandemic; alcohol hand gel was in short supply in the UK and one hospital learned how to manufacture alcohol hand gel from its African partners. This was done by the School of Pharmacy at University of Brighton (B02) which manufactured and distributed the hand rub to wards and departments in BSUH. Reports further demonstrated that the general lack of resources in some UK hospitals during the COVID-19 was managed better by HP participants, as they were better prepared due to previous experience in dealing with resource challenges during the Project implementation and activity period. These effects have not gone unnoticed by employers, as 9 out of 12 HPs report that their work was shared on NHS or NHS-affiliated websites.

A number of HPs held frequent online meetings for HPs to update each other and share strategies and good practice regarding the pandemic. In narrative reports, Project team leads remarked that this knowledge exchange was an important part of HP activities when in-person activities were not possible.

From a workforce perspective, the opportunity for international project experience to assist with professional development of healthcare professionals has been well documented. At Northumbria (B09), two of the key project pharmacists were awarded the CPhO GH Fellowships. In addition, one of the junior pharmacists has since been promoted to a senior role.

5.2.4. Did the program generate higher level effects in the UK? What was the effect of these?

At the Programme level, 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. Throughout the Programme HPs acknowledged reduced brain drain, increased retention and much happier staff. These benefits had a positive impact on their work where volunteers were referenced as good role models for their respective departments.

Due to the COVID-19 disruptions, the shift to remote working became a common day occurrence when the Pandemic affected the UK, however NHS teams involved with various partnerships were already using remote communication with their respective partners. Hence, Project members were versed and comfortable with communicating with staff inside and outside the NHS, using online resources, and conducting consultations remotely. Overall, the CwPAMS Programme has allowed the understanding and appreciation of AMS activities, provided more flexible, resilient and responsive teams, influenced increased staff retention, developed interpersonal skills such as confidence, leadership and provided opportunities to discuss global health and managing infections within NHS trusts and external volunteers.

LMIC visits to the UK have generated positive results and facilitated beneficial collaborations. B03 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. These fellowships have created new relationships with various unexpected departments such as the Tissue Viability Department at Salford University and Salford Royal Hospital. Similarly, A05 invited and hosted Ghanaian counterparts (a doctor, nurse and pharmacist) to the UK to understand the process, stewardship, training and quality improvement programmes in a UK NHS Trust. This particular visit was high profile and

empowering for the visiting guests. It also led to visibility, at NHS Trust board level, which resulted in the visit being featured in the much quoted and highly influential Chief Medical Officers Annual report 2019 'Partnering for Progress' raising the profile of the Trust as well as the partnership.

From a workforce perspective, international project experience has been known to assist with the professional development of healthcare professionals, various partnerships including A11, B09, and B10 have seen UK-based pharmacists become involved in the Projects, and graduate as CPhO GH Fellows. The opportunity to further develop the CwPAMS programme has also been considered by some academic institutions. Although it has yet to be finalised, HP B09 has had discussions with Newcastle University about the development of an AMR module for undergraduate medical students and also for the establishment of a student elective exchange programme. This is a work in progress and is on hold as of the time of the writing of this Addendum because of travel restrictions. However, an agreement to continue with this development as soon as possible is in place.

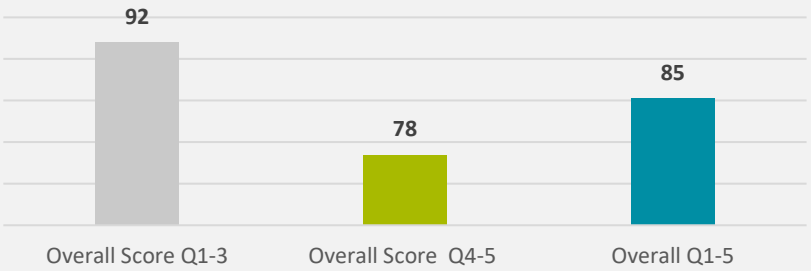
At the Programme level, activities have also created an impact in the UK. The Programme has received the support of UK Special Envoy on AMR, Professor Dame Sally Davies, the DHSC (See Section 5.1.1.1) and at the request of the Foreign and Commonwealth Development Office ("FCDO"), CPA and CwPAMS volunteer Clare Brandish was invited to present CwPAMS at an Effective Institutions Partnership event. These are beneficial relationships that raise the profile of CwPAMS domestically and could assist in future scaling up. Awareness campaigns over the internet and in national papers have educated the UK population on AMR (see Section 5.3.4 - Dissemination). Notably the Change Exchange have secured a National Institute for Health Research ("NIHR") grant to examine the behaviour change content of AMS education and training materials in the UK NHS secondary care system. This 21-month project will have implications on how nursing in the UK is carried out in the future. They are also are supervising a medical student, who is exploring decision making around antifungal prescriptions in the UK.

© 2021 Ingentium Limited

5.3. OVERARCHING EVALUATION QUESTION 3

> What is the potential for scaling up antimicrobial stewardship in national antimicrobial resistance action plans?

SUMMARY OF KEY FINDINGS | SCORE (Q4-5) 78 (VERY GOOD) | OVERALL SCORE (Q1-5): 85 (VERY GOOD)



The successes of the HPs up to Q3 of the Programme demonstrates great potential for scaling up Projects to support the implementation of NAPs. This was also evident through the last two quarters of the Programme in which LMIC Project partners achieved some objectives of their NAPs. Furthermore, there is strong indication that CwPAMS as a programme will enter a second phase, allowing the Programme to further champion the importance of AMS.

- All HPs successfully implemented mechanisms to ensure sustainability- developing tools, and guidelines specific to the LMIC context to ensure that the knowledge gained by the workforce would continue to have impact. MTCs and AMS/IPC committees established in Q1-3 were at the forefront of continuing the work started by CwPAMS.
- HPs forged strong ties with government and civil society actors influencing policy at a national level which will undoubtedly contribute to AMS and AMR prevention in the long-term.
- At the Programme level, THET and CPA took considerable steps to ensure that all activities were implemented in an economically justifiable way. This included negotiating a no-cost extension for HPs, reducing costs where necessary and reallocating budgets with regards to underspend.
- Overall progress was achieved at a reasonable cost demonstrating that the HP model is an economically justifiable model for scaling up.
- THET and CPA encouraged HPs to undertake dissemination towards the end of the Programme when the interventions were starting to generate results. There is strong evidence that the Programme performed successful dissemination at the local and international level which ultimately allows for effective knowledge-exchange and translation to a wider audience group. Furthermore, this dissemination both highlights the efforts of CwPAMS but also emphasises the particular global risk associated to AMR.

5.3.1. What systems have been put in place that will influence sustainability?

78 **Very Good**	All HPs successfully implemented mechanisms to ensure sustainability - developing tools, and guidelines specific to the LMIC context to ensure that the knowledge gained by workforce would continue to have impact. MTCs and AMS/IPC committees established in Q1-3 were at the forefront of continuing the work started by CwPAMS. HPs forged strong ties with government and civil society actors influencing change at a national level.

a) Did the Project implement systems to encourage (long-term) sustainability?

Continuing from Q1 to 3, the health partnership approach continued to generate positive results in Q4 and 5. All HPs reported that they had successfully implemented mechanisms to ensure sustainability by developing tools, processes and guidelines specific to the LMIC context. Such mechanisms are designed to facilitate the longer-term impact of the knowledge, skills and practises gained by workforce under the CwPAMS programme in beneficiary LMIC hospitals. Projects did remark that they would have achieved more had it not been for the Pandemic disruptions. Monitoring and evaluations results demonstrated substantial improvement on AMR and AMS knowledge. One of the areas where the Programme was able to significantly demonstrate long term change was in equipping LMIC hospitals (including some that were not affiliated with the Programme) with the skills to manufacture WHO-grade hand-rub for improved hand hygiene. While this manufacturing process is not complex, it was an essential part of the fight against COVID-19 in many of the beneficiary hospitals, particularly those that are remote and underfunded. Many of these hospitals failed to procure additional supplies when their own supplies ran out. These gels are now produced in-house and also complement existing and revised (by HPs) hygiene policies.

Ten HPs (A04, A07, A11, B02, B03, B08, B01, B09, B10, B12) have operational MTCs or AMS/IPC committees (each with a distinct agenda). These bodies are now tasked with continuing the interventions started by the HPs. A good example is the B03 Project where the relevant MTC (initially under the guidance of the HP) 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. Surprisingly, a number of HPs found that some of the processes that they put in place in response to COVID-19 have positively influenced sustainability and have now become a permanent fixture of their AMS initiatives.

Through HPs' experiences we can see that one key factor undermining long-term sustainability is hierarchical systems and the divisions that exist in the health sector within LMICs. The Ugandan partnerships have highlighted that academics and policymakers are often disconnected from what is happening at a clinical and ground level and this is why policies get minimal buy-in from the health practitioners on the ground who are heavily involved in AMR. There is some indication that the root-cause of the disconnect may be due to insufficient resources and limited access to healthcare in rural locations both of which can hinder effective knowledge-exchange, implementation and follow-up between Project partners.

Notably at the end of quarter 3, CPA was developing an AMS Toolkit[18] which aimed to provide a roadmap for designing AMS interventions to enable the CwPAMS model to be duplicated elsewhere. This Toolkit was successfully launched in Q5 at an online event that was attended by various governments and stakeholders in the global health community.

b) Did the Programme maintain a link with government departments during the last two quarters on COVID-19?

In Ghana, members of THET met various governmental bodies to ensure that AMS activities continued to take place for long-term impact. These governmental bodies included, the MoH, Director of Pharmaceutical Services, Standing Executive Committee of Pharmaceutical Society of Ghana, Pharmacy Council of Ghana, and Registrar and Deputy Registrars, and Pharmacy Council of Ghana. One outcome of such meetings was the commitment to build sufficient capacity to enable pharmacists to be posted to rural and hard to reach communities which can otherwise remain ignored. In particular, the Director of Pharmaceutical Services is working with human-resource departments in relevant hospitals to ensure that underserved areas have registered pharmacists. In Q5, THET shared the results of the Interim Evaluation with such government bodies. The results of the evaluation served to communicate how critical such

[18] CPA AMS Toolkit

government bodies are in ensuring ongoing AMS and thus how important the engagement with government is in achieving NAPs and AMS in general.

In Uganda, the THET Country Director attended the One Health Technical Working Group quarterly meeting in July 2020. She shared an update on the Projects noting that despite disruptions, HPs were continuing to leverage AMS and IPC knowledge, skills and infrastructure to respond to COVID-19. THET highlighted that one of the sites - Kawempe National Referral Hospital, received additional funds through THET's Health Worker Action Fund to scale up their AMS and IPC activities and provide practical support to health workers.

Relations between Tanzanian health practitioners and the Tanzanian government were tense in Q4 and 5 as a result of the government position on dealing with the Pandemic, as led by former President Magufuli. As at Q4, Fleming Fund reports noted that there was a new incoming deputy Minister for Health, Chief Medical Officer and Permanent Secretary. Around the same time, the THET Tanzania country office recruited Prof. Muhammad Bakari Kambi as an honorary advisor. Kambi has government ties having served as the former Chief Medical Officer and had been leading AMR initiatives at the national level. THET hoped that Prof. Kambi would create a relationship with the new Minister for Health and provide further advice and links to funding for B09. It is unclear to us whether these efforts have been successful.

In Zambia, the results of the Interim Evaluation were shared with the Centre for Infectious Disease Research Zambia, the global health NGO - PATH and the MoH. The LMIC partner – University Teaching Hospital (UTH) is considered as a pioneer in AMS programming and have been recognised by the MoH as such. Hence, going forward, UTH will provide mentorship to other hospitals in Zambia on AMS. Outcomes of B02 have enhanced UTH's capacity to lead on AMS, IPC and local hand rub production agenda as part of the National AMR Action Plan.

In the UK, CPA participated in the virtual global consultative meeting to review and amend the draft WHO Policy Guidance on Integrated Antimicrobial Stewardship Activities. This enabled exchange with over 100 global key stakeholders with the final draft of the document currently in consultation. Additionally, the Programme has been in correspondence with the WHO regarding CwPAMS, to ensure they are aware of the initiative and that CPA/THET are aware of any relevant updates/developments in their AMS policies. Additionally, CPA has had the opportunity to present an overview of CwPAMS at the Commonwealth Advisory Committee for Health, garnering support for a One Health Approach on AMR. This topic was also included on the agenda for the Commonwealth Health Ministers Meeting in May 2021. CPA has further requested for audience at the Commonwealth Heads of Government Meeting in June 2021.

Overall, CwPAMS has helped implement NAPs, raised AMS awareness and highlighted the role of pharmacists and other healthcare workers with respect to countering AMR.

c) Did the Projects maintain a link with government departments during the last two quarters/COVID -19 pandemic? Have any local /regional or related policies concerning AMS been enacted in Q4/5?

All 12 HPs have maintained a link with government departments in some manner. In Zambia the work of B02 has enabled the HP to develop a strong relationship with the MoH. The AMS training manual and IPC SoP handbook developed by the Project has been endorsed by government and will be utilised by the Health Professionals Council of Zambia. It will also be rolled by the MoH in their public health facilities.

Many of the individuals in MTCs and other committees have dual roles in government Pharmacy, AMS and IPC bodies. In B09, the head of the Pharmacy Department at the time, Dr. Muro of KCMC, was also the chair of the national Tanzania AMR steering group. These positions allowed Dr. Muro to disseminate

information and feedback on AMR and AMS to a national audience. Similarly, projects based in Uganda have used their CoPs to connect with the MoH Technical Working Committees on the optimal use and access to antimicrobials and AMS. In the A04 HP, the AMS committee drafted prescribing guidelines for common infections based on the Standard Treatment Guidelines for Ghana. The B12 HP (Uganda) has a strong involvement with stakeholders at the MoH which has enabled some members of the LMIC partner - Makerere Hospital to serve on the MoH Technical Working Committees where they have played an important role in adapting the national COVID-19 management protocols for suspected and confirmed cases.

The Projects A11 and B01 (in Ghana and Uganda, respectively) used their government connections to scale up activities. A11 successfully established the AMS Programme in both of its beneficiary hospitals, aligning them with ambitions of Ghana's NAP. The UK partners in A11 also had the opportunity to meet the Ghanaian MoH, university staff and Pharmaceutical Society and offered support for education and skills development. IPC infrastructures and activities initiated by B01 were recognised by the MoH and the Kawempe Hospital Superintendent. Such recognition gave the HP stronger credentials when seeking out extra funding from UK Partnerships for Health Systems with the aim of going forward with IPC activities and further build on the CwPAMS Programme.

5.3.2. Did the Programme take steps to implement its activities in an economically justifiable way under the new circumstances (COVID-19 etc)?

100 **Excellent**	At the Programme level, THET and CPA took considerable steps to ensure that all activities were implemented in an economically justifiable way. This included negotiating a no-cost extension for HPs, reducing costs and reallocating budgets.

This evaluation did not have access to the Programme finance reports. As a result, our findings concerning whether or not the implementation of the Projects and the Programme as a whole was economically justifiable are based information found in HP financial and narrative reports, as well as CPA and THET quarterly reports.

From the outset of the pandemic, THET and CPA granted a no-cost extension for HPs and were regularly assessing them to gauge their capacity to participate in CwPAMS. Programme deliverables were revised and considerably scaled back to give HPs more time to conduct their activities. Furthermore, a great deal of time and consideration went into reallocating Project underspend and reallocating budgets. Even whilst holding excess funds due to HP underspend, THET looked to where they could reduce costs, particularly with regard to country offices. Through Q4 and 5, THET kept abreast of all of the budgetary issues facing HPs, including the level of underspend they may have, and their plans for using it. Through June 2020 no THET staff were allocated salaries as THET awaited flight refunds of £696.

CPA looked to reallocate £33,000 to final events and tech support for HPs, the continued professional development (CPD) platform and COVID-19 activities.

5.3.3. Was progress achieved at reasonable costs?

58 **Good**	Overall progress was achieved at a reasonable cost demonstrating that the HP model is an economically justifiable model for scaling up.

The HPs struggled to utilise their funds efficiently. Only three HPs were able to achieve allocational efficiency[19] (A02, B02, B09) in comparison to quarters one to three where 10 HPs achieved allocational efficiency. This can largely be blamed on the Pandemic where HPs often had to prioritise effectiveness and necessity above (allocational) efficiency and following the stipulations of their original budgets would have resulted in greater inefficiencies given the circumstances. HPs were constantly adjusting their budgets and some ended over/underspending on items such as project equipment, project resources, and dissemination activities as their initial budget plans would have changed. Various HPs noted that their plans for dissemination shifted as a result of the pandemic, hence the lack of spending within that scope. Proactive and knowledgeable LMIC volunteers and hospital staff, along with agile project management became an asset with regard to expenditure in Q4 and 5. The A04 Project (Ghana) noted that "although the budget was sufficient to get a reasonable amount of work done with positive benefit, a lot of this was facilitated by having a team member with local knowledge of Ghana, and all partners being flexible and generous with their time and personal resources". The prescribed volunteer-based approach allowed HPs to utilise relevant experts at no cost to the Project, however Change Exchange noted that the low budgets mean some volunteers incurred their own costs (a concern that was raised in the Interim Evaluation). Budgetary challenges forced some HPs to engage in creative problem solving with respect to various operational elements of their Project. Lacking a designated Project Manager, A11 made use of online platforms for project management and thus incurred no costs with regards to project management tasks. They also found innovative ways to reduce communication and administrative costs.

Overall, despite obvious challenges, progress within the CwPAMS Programme was achieved at a reasonable cost as 10 HPs were able to successfully carry out their activities and did not exceed their given budgets. Overall, the majority of the HPs were operating within their budgets and achieved their outputs and outcomes as well as significant unintended effects. This is a strong indication that the HP model is an economically justifiable model for scaling up.

5.3.4. Has the Programme undertaken health dissemination?

100 **Excellent**	THET and CPA encouraged HPs to undertake dissemination towards the end of the Programme when the interventions were starting to generate results. There is very strong evidence demonstrating the Programme performed successful dissemination of its message and outputs at both the local and international level.

a) To national/international audiences or meetings of professional associations?

The CwPAMS Programme successfully disseminated adapted media material, participated in conferences, global events, and launched various tools and resources to publicize the relevance and achievements of CwPAMS.

Digital and Social Media

During World Antibiotic Awareness Week, CPA and THET launched a week-long Twitter campaign[20] to raise awareness of the global threat posed by antimicrobial resistance and the work being undertaken by HPs. The campaign included the publication of a newsletter with the theme '*Leave no one behind*'[21] that highlighted the impact of COVID-19 on the mental health of health workers, and a focus on non-communicable diseases around the globe.

[19] Under allocational efficiency, all goods, services, and capital are allotted and distributed to their very best use. By definition, efficiency means that capital is put to its optimal use and that there is no other distribution of capital that exists which would produce better outcomes.
[20] CPA's Twitter Account
[21] THET's November E-bulletin: Leaving No One Behind (mailchi.mp)

One of the most successful widely shared media pieces was a short 6-minute video[22] on how to manufacture hand rub/ hand sanitiser, which was inspired by the B02 HP. The video was produced to support COVID-19 efforts at a time when there was a global shortage of hand sanitisers. The video was first shared on Youtube on the 29th of May 2020 and in the first 15 days the video had amassed more than 500 views. At the time of writing this evaluation this figure had gone up to 1013 views. Links to the video were also shared on Twitter, Facebook, the CPA website and Pharmacy magazine.

On Twitter a short press release with a link to the YouTube video got 27 retweets (Figure 7 below) and was shared by the likes of Professor Didier Pittet, who is the Director of the Infection Control Programme and WHO Collaborating Centre on Patient Safety- a world leader in hand hygiene research and practice[23]. B02 used the video as a training tool for other hospitals in Zambia, they also promoted the video online getting likes from the British High Commissioner of Zambia. Twitter was also used to promote other CwPAMS activities such as the Global Health Fellows' events and the day-to-day experiences of both UK and LMIC volunteers.

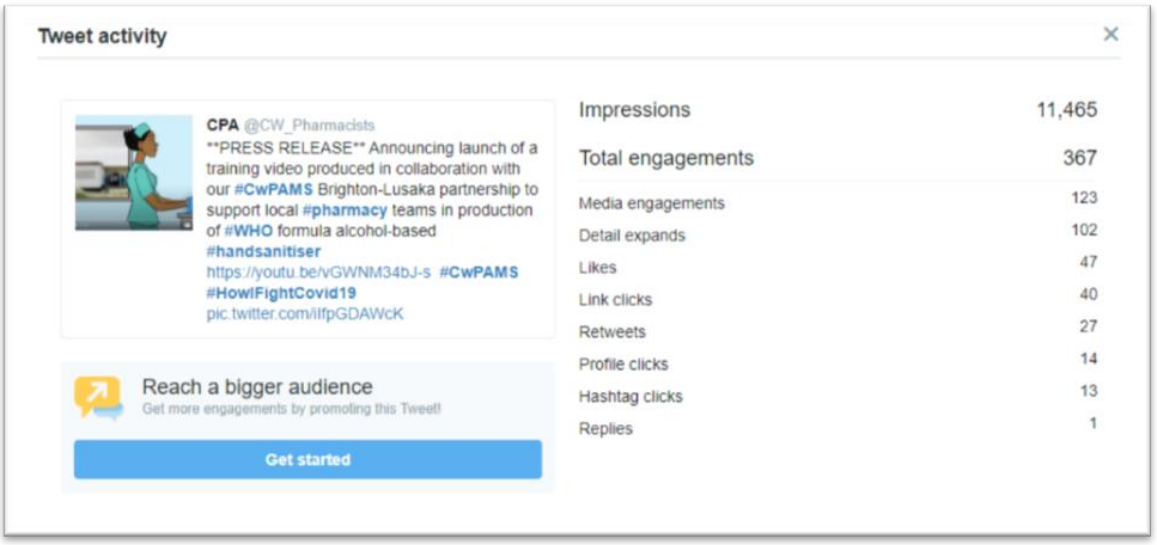


Figure 7: Annex 2- Impact of Hand Sanitiser Video, shared by CPA.

Awards, Conferences and Webinars

CPA and THET won the "Multi-Country Collaboration" award for CwPAMS at the Antibiotic Guardian Awards, an annual event which champions organisations and individuals who have demonstrated achievements in tackling antimicrobial resistance at a local, regional or global level. CwPAMS won the overall 2020 Multi-Country Collaboration prize for its commitment to strengthening the capacity of national health workforces and institutions in Ghana, Tanzania, Uganda and Zambia. The award was given to CwPAMS because of its main achievements in advocating for the collection and application of data, the advocacy to promote the rational use of antimicrobials and a fully completed GPPS across all HPs. Additionally, five HPs (A07, A11, B02, B08, B12) were shortlisted for their influence in tackling AMR in different LMICs. Their nominations increased global reach with each individual HP's goal and outcomes published on the Antibiotic Guardian website[24]. Another form of recognition gained by CwPAMS participants was that of the 16 pharmacists who undertook the CPhO GH Fellowship. These individuals were

[22] Hand Sanitiser Youtube video
[23] CPA quarterly Report July 2020.
[24] Antibiotic Guardian 2020 Shared Learning & Awards |

commended for their achievement and contributions made to their respective HPs at a virtual graduation ceremony[25].

THET hosted a virtual conference in April 2020 on the Medics Academy[26] digital educational platform for health professionals who are looking for innovative ways to increase their professional development through learning. The first of its kind conference entitled "*Partnerships in a Time of COVID-19*" focused on discussions around how the health partnership model can be leveraged to respond to pandemic situations. CwPAMS HPs were able to present their work in order to demonstrate how each of them adapted their health partnership model to incorporate a One Health perspective. CPA were also invited to sit on a panel that discussed the contribution that health partnerships were making to the COVID-19 pandemic response. Speakers from CwPAMS included members from two different HPs (B09, B02) Dr Sara Urassa of the Kilimanjaro Christian Medical Centre, and Dr Aubrey Kalungia from the University of Zambia. THET also hosted their Annual conference in Q5. The event was held virtually as a result of COVID-19, however attendance was particularly high, as more than 400 attendees attended across four days, 30 percent of which were from an LMIC.

CPA has run three COVID-19 Webinars[27], two in Q4 and one in Q5. CwPAMS has featured in all three, with the three webinars focusing around the CwPAMS COVID-19 response and more broadly promotion of the benefits of CwPAMS in a pandemic situation. The first webinar focused on resources available for pharmacy professionals, whilst the second webinar highlighted the way pharmacists have been tackling COVID-19 across the HPs, with the most recent webinar (July 2020) focused on the role of CwPAMS in the four LMICs supporting COVID-19 responses.

Tools and Resources

Due to safety concerns brought on by the Pandemic, many technical events during the last two quarters of the Programme were held virtually. This included launch event for the CwPAMS Toolkit[28] and Continuing Professional Development (CPD) platform[29]. Remote working also served as the catalyst for the development of the Pulse Community Platform. These resources were primarily created so that healthcare workers could use them as open and interactive spaces to share resources, attend events and exchange the best practices within various HPs, remotely and even after the Programme has ended.

During World Antibiotic Awareness Week, CPA and THET collaborated with Focus Games, a France-based video game publisher.[30] As a result of this, HPs now have free access to a virtual "Sepsis Game"[31] which is an innovative way for healthcare workers and other audiences, such as students, to learn more about the signs and effective response methods for the condition. The Sepsis Game was particularly relevant to one HP (B03) as it resulted in the establishment of a specific sepsis group committed to scaling-up understanding and early identification of the condition.

[25] Graduation of first cohort of Chief Pharmaceutical Officer's Global Pharmacy Fellows - Commonwealth Pharmacist Association (commonwealthpharmacy.org)
[26] Partnerships in a time of COVID-19 (medics.academy)
[27] Covid-19 Resource: Webinar Events - Commonwealth Pharmacist Association (commonwealthpharmacy.org)
[28] CwPAMS Toolkit - Commonwealth Pharmacist Association (commonwealthpharmacy.org)
[29] Launch of the CPA Global Continuing Professional Development (CPD) Platform - Commonwealth Pharmacist Association (commonwealthpharmacy.org)
[30] Latest CwPAMS CPA quarterly narrative report Feb 2021
[31] Sepsis is a life-threatening condition that arises when the body's response to an infection becomes uncontrolled and injures its own tissues and organs.

Publications, Blogs and Manuscripts

Most of the HPs had collected data in Q1-3 with the aim of publishing their research in Q4 and 5 of the Programme; however, as a result of COVID-19, only three HPs (A04, A11, B10) have successfully published their manuscripts in peer-reviewed journals. Two additional peer-reviewed publications by HPs are near to completion. It is likely that the number of peer-reviewed publications will increase as more HPs complete their activities. The Programme also resulted in non-peer reviewed publications include a white paper entitled "*Lessons from a behaviourally-informed approach to improving Antimicrobial Stewardship in Gulu, Uganda*" authored by behavioural scientists in the B08 Project for a Special Issue WHO Bulletin on Behavioural Science Approaches in LMICs.

Two major organisations have both featured the CwPAMS Programme. Deloitte published a blog[32] written by one of the pharmacists linked with the A02 partnership – Samrina Bhatti. The blogpost discussed how COVID-19 stands to undermine the initiatives to reduce the global threat of AMR. On 24th November 2020, a printed publication was enclosed with every copy of in The Guardian newspaper featuring an article[33] written by two CPA employees, Dr. Diane Ashiru-Oredope, Global AMR Lead and Victoria Rutter, Executive Director, during Global AMR week, in which they discussed how health partnerships and pharmacists can help support the tackling of AMR through a one holistic and multisectoral approach such as the one of CwPAMS. The exposure and impact that such publications can have, particularly with general audiences, cannot be ignored and only serve to further the cause of AMS and highlight the achievements of CwPAMS and its participants.

b) To local hospitals/community groups

One successful dissemination tool developed under CwPAMS is the aptly named CwPAMS App, which became a finalist at the 4th Commonwealth Digital Health Awards[34]. The CwPAMS App provides instant access to guidance on antimicrobial use as well as other key AMS topics, along with additional resources and training documentation. While the CwPAMS App is a very powerful tool, achieving an overall subscription rate of over 50 percent, the adoption of the app in LMICs has not been without issues. Poor internet connectivity, lack of computer/phone storage space, and generally poor uptake are some of the feedback HPs have provided with respect to the app. Notably, "page hits" on the app between May 2019 to March 2021 have significantly reduced, while the page that contains the National Prescribing Guides has remained fairly consistent in terms of use, which shows different parts of the CwPAMS App have more traffic than others. Figure 8 represents the overall downloads of the CwPAMS App since launch.

> **"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"* - Darius Obeng Essah, Pharmacist, Keta Municipal Hospital, Ghana

[32] https://blogs.deloitte.co.uk/health/2020/07/why-covid-19-risks-undermining-initiatives-to-reduce-the-global-threat-of-antimicrobial-resistance.html
[33] International collaboration tackling the next global health crisis - Global Cause
[34] 4th Commonwealth Digital Health Awards Finalists (cwcdh.org)

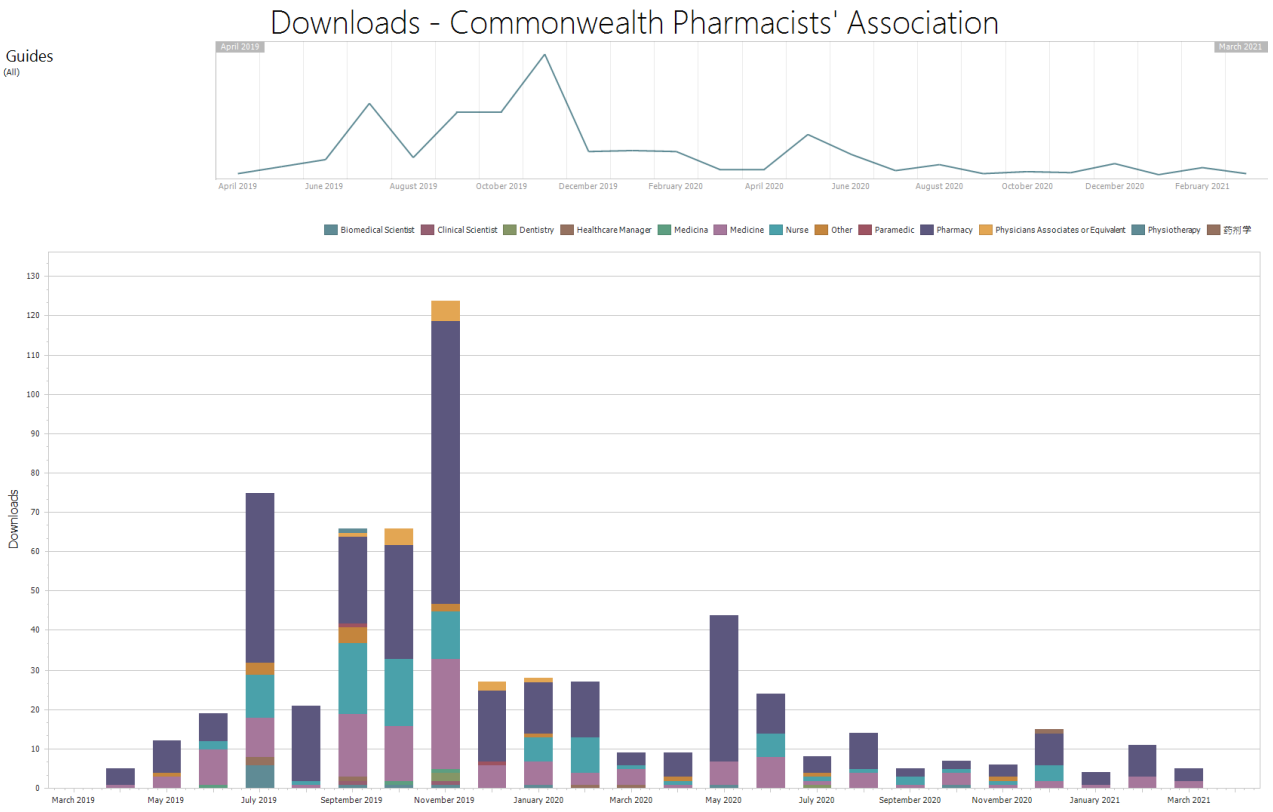


Figure 8: CwPAMS App download statistics since launch

Figure 9 represents engagement of the guide open page (within the CwPAMS App), segmented by access from different healthcare practitioners. The data shows a huge uptake of the guides by pharmacists and physicians throughout the life term of the app. Whilst access has decreased over time, it can be inferred that this is as a result of health practitioners successfully applying the information from the guides and no longer needing to refer to them.

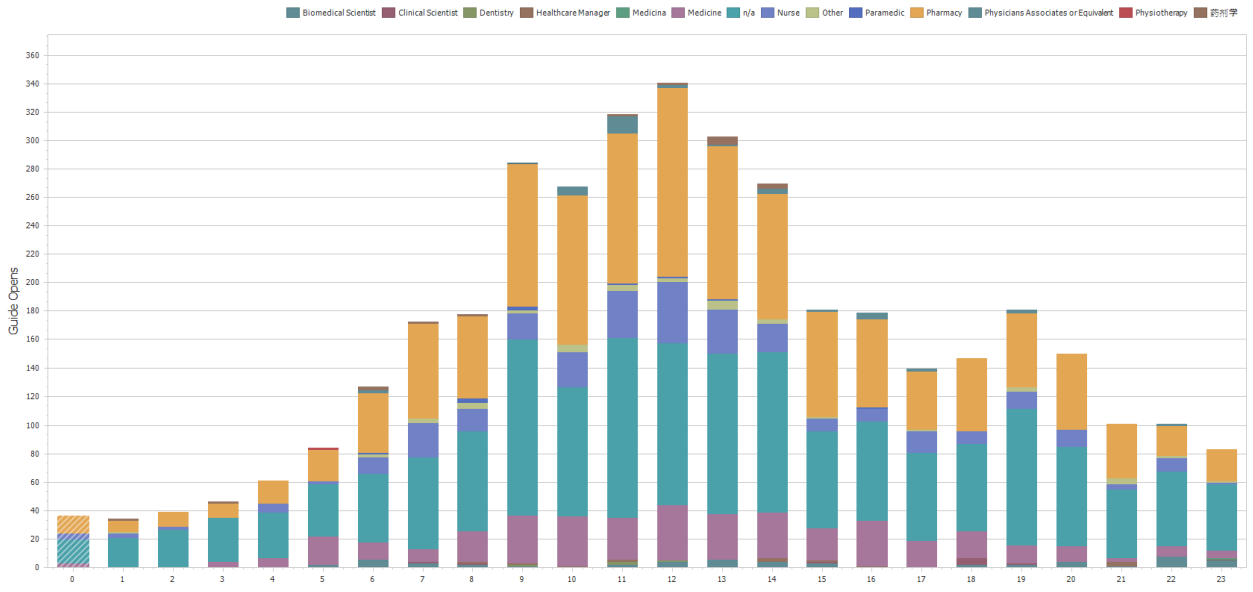


Figure 9: CwPAMS App access statistics for the Guides Open Page

6. CONCLUSION

The CwPAMS Programme provided sufficient evidence to demonstrate the value of applying the health partnership approach to AMS in both the UK and LMICs. This includes taking clear steps to demonstrate its adaptability and relevance in a Global Pandemic. It has shown the necessity of employing AMR surveillance, facilitating meetings between AMR practitioners and government actors, engaging the greater public in AMS/IPC campaigns and utilising multidisciplinary approaches to counteract AMR. Findings from the previous section demonstrated that the CwPAMS Programme largely achieved its Programme-level outcomes attaining an overall average rating during Q4-5 of VERY GOOD (Score: 83) and an aggregate (Q1-5) score of VERY GOOD (Score: 82). This section summarises our findings with respect to Q4 and 5 of the CwPAMS Programme according to OECD-DAC Evaluation Criteria.

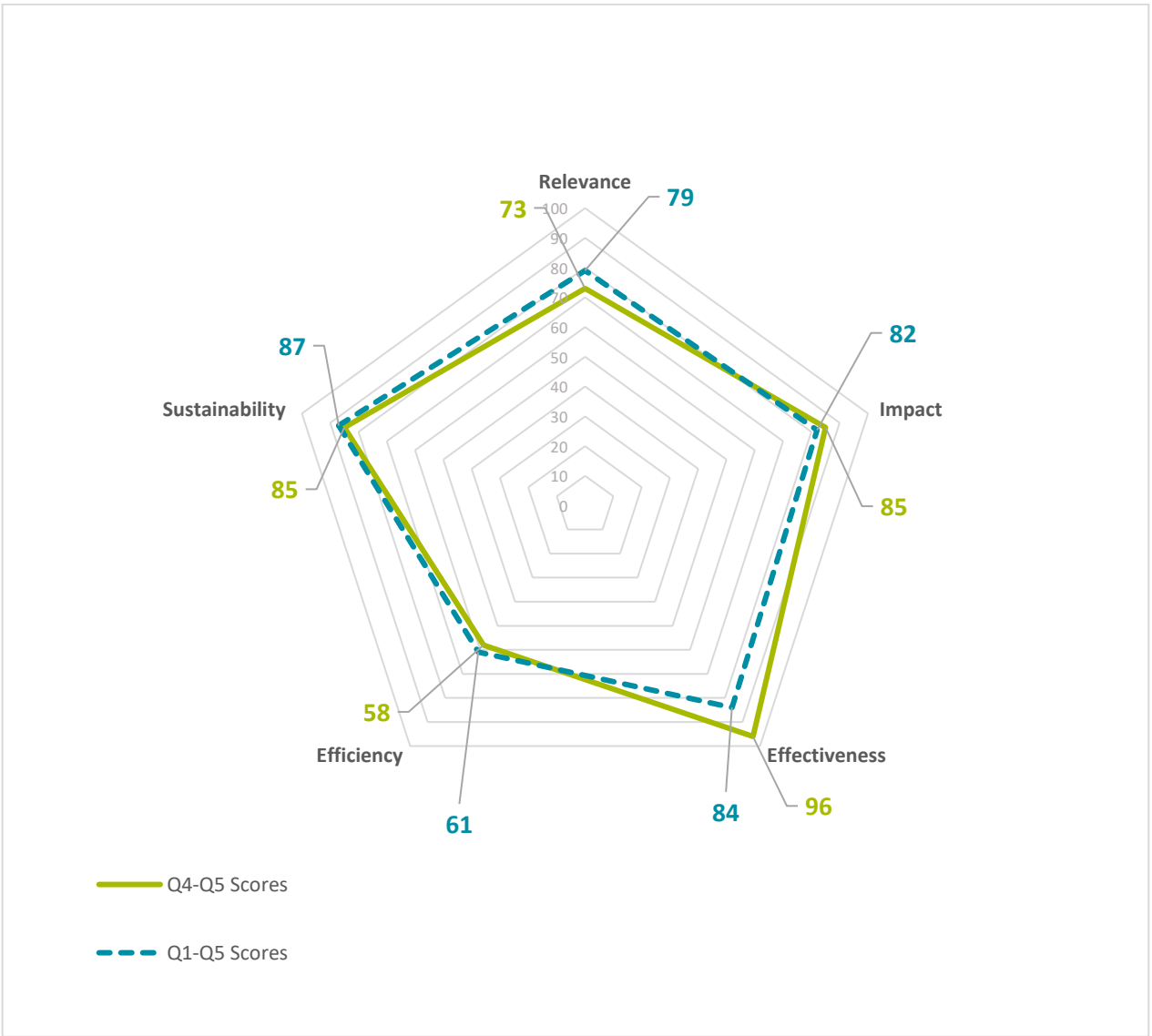


Figure 10: Overall average rating of Q4-5 and Q1-5 of the CwPAMS Programme according to OECD-DAC criteria

6.1. RELEVANCE: 73 (VERY GOOD)

From Q1 through Q5 HPs within the Programme averaged a "Very Good" score of relevance in this evaluation. In Q4 and 5, with the help of a no-cost extension and strategic project management by THET and CPA, the Programme was able to further demonstrate its significance in LMIC countries and the UK. The Programme adequately demonstrated knowledge exchange and its relevance during a global health Pandemic. The success of various online conferences and webinars showcasing CwPAMS held at the Programme level demonstrate that the principles of AMS and the health partnership approach are transferable and tools such as the CwPAMS Toolkit will enable this in the future. Central to this success was the ground work performed in Q1 to 3 as that ensured that the Programme design and purpose were able to effectively balance the needs of beneficiaries and LMIC national priorities against the objectives of the Fleming Fund and affiliated stakeholders.

6.2. IMPACT: 85 (VERY GOOD)

From Q1 through Q5 more than 7 HPs averaged a "Very Good" score of impact in the evaluation. The impact score has significantly increased over the last 2 quarters, making the CwPAMS Programme commendable for their ability to achieve significant long term intended and unintended effects within the partnerships. The HPs created activities and interventions that have benefited the skills exchange between UK and LMIC partners, produced a wide range of dissemination materials for different audiences and target groups, successfully trained fellow healthcare workers such as Pharmacists who have gone to positively influence their hospitals, and engage local and international policymakers in the areas of AMR. The Programme achieved overall positive effects despite COVID-19, which disrupted several activities within their Projects, thus delaying project milestones. Despite the disruptions, the Programme engaged various stakeholders in government, educational institutions, and healthcare clinics. The adaptation and agility to complete the Programme with an on-going global Pandemic makes the CwPAMS Programme versatile as some HPs were also involved in COVID-19 interventions but still achieved the Fleming Fund objectives originally envisaged.

6.3. EFFECTIVENESS: 96 (EXCELLENT)

HPs within the Programme averaged a "Very Good" score of effectiveness in this evaluation. Remarkably, most HPs managed to meet the vast majority of their Programme output and outcome targets and complete all but a few of their planned activities. Despite a lack of travel and limited in-person activities in some countries, most partners remained in constant communication, making use of various online platforms in Q4 and 5 to facilitate shared learning and host events and initiatives in both the UK and LMIC countries. HPs often had to adapt their (original) activities either to minimise risks or to make them relevant to COVID-19 efforts in different countries; however, even then, the Programme always ensured that its activities and interventions correlated with at least two of the Fleming Fund objectives. In addition to good working relationships and project management, flexibility and target-driven work styles were the most significant factors that positively influenced the effectiveness of the Projects throughout the entire Programme. These factors, demonstrated by both HPs and coordinators at THET and CPA, allowed the Programme to "meet the moment" and achieve significant intended and unintended higher-level effects.

6.4. EFFICIENCY: 58 (GOOD)

The HPs within the Programme averaged a "Good" score of efficiency in this evaluation. A great deal of risk management had to be performed at the Project and Programme level in Q4 and 5 of CwPAMS. 7 out

of 12 HPs are reported to have revised/reallocated resources and this included rescheduling/cancelling/redesigning activities, reallocating (travel) costs and in some cases restaffing HPs when Project leads and volunteers were seconded to the frontline. Despite this, as at Q5 a minority of HPs had achieved allocational efficiency with most having fairly large underspends. This was understandable as most HPs had prioritised achieving objectives above optimising budgets during the Pandemic. According to narrative reports, a number of HPs had plans to reallocate the underspend towards research and dissemination. THET, CPA and the Change Exchange all sought to optimise allocational efficiency in different ways. For example, Change Exchange used their underspend to create a behavioural toolkit for the Programme. Understanding that the Pandemic undermined their ability to provide professional development to LMIC healthcare workers, CPA reallocated a portion of their budget to fund the Continuing Professional Development (CPD) platform which provides online training and educational material to pharmacists across the Commonwealth.

6.5. SUSTAINABILITY: 85 (VERY GOOD)

HPs within the Programme averaged "Very Good" scores for sustainability in this evaluation. Initially CwPAMS was a short-term Programme and thus it was challenging to conclusively evaluate the sustainability of its interventions; however, as a result of the no-cost extensions, the Programme has been able to follow the long-term impacts as the time period for Projects was extended to 2021. All HPs set objectives and outcomes that could be sustained within the LMIC health systems. The development of guidelines, protocols, processes and the formation of MTCs and accompanying AMS and IPC committees (as well as the appointment of AMS champions) in LMIC institutions are the main drivers of change in AMS and will help sustain the newly developed practises after the CwPAMS funded Projects are completed. CwPAMS has also created a wide range of tools that can be used on multiple platforms by different groups so that the HPs are able to continue the same level of involvement outside the timeframe of CwPAMS. Some HPs have been lucky enough to receive additional funding for different activities to continue pursuing their outcomes, but overall, the processes and tools that have been established can be sustained without additional funding. Some HPs have built strong relationships between the both UK and LMIC team members, and plain to continue to support shared learning and peer support. However, continued and effective operations of such initiatives will likely require some form of remuneration to motivate and retain volunteers.

7. LESSONS LEARNT

7.1. *Partnership approach*

It is our opinion that without a doubt, the partnership approach does lend to the overall success of the CwPAMS Programme and the longevity of the Projects. The CwPAMS programme created an environment of cooperation and collaboration across HP institutions and personnel. This in effect meant that the HPs saw their projects as collective responsibility rather than activities undertaken in silos. In terms of risk events (particularly as they relate to COVID-19), this allowed HPs to proactively co-and achieving Project goals and outcomes (i.e. Project partners could step-in for one another and support each other). The overall feel is that both the LMIC and UK partners benefitted from the partnership. One HP noted that the UK partners were dictating policies while LMIC health practitioners were on the ground contending with real health challenges, which created an environment in which the partnership was not equitable. However, this appears to be an isolated case and does not overshadow the value of the HP model.

7.2. *Differences in health practitioner and policy maker perspectives*

Some of the Ugandan partners (See Section 5.3.1) acknowledged that a gap exists between individuals involved in health research and policy development and those who are health practitioners, in so far as this relates to AMR. The two groups are somewhat disconnected as to the nuances of theory development and ground level practice. This highlights that often the people who are heavily involved in AMR policy development are remote from hospital local contexts, which makes prescription of guidelines harder to adopt.

7.3. *Behavioural Change perspectives*

One of the goals of CwPAMS is to incorporate behaviour change, however the timeframes given to the Programme are not significant to establish if meaningful behaviour change within AMS has taken place or will continue to take place in order to effect change at a higher policy level (especially in LMICs). One HP noted the fear of hierarchical systems have deterred any behavioural change, hence prescribers have reverted back to older prescribing habits prior to any CwPAMS training.

Furthermore, the Change Exchange acknowledged the importance of behavioural change in the context of dealing with long-term global health issues and the need to ensure follow-up of any initiatives aimed at driving behavioural change amongst health practitioners.

7.4. *Flexibility of THET and CPA*

COVID-19 has significantly impacted each HP's ability to carry out all the activities envisaged under its respective Project. Nonetheless, as has been noted in this Report, HPs were in fact able to achieve their goals by generating similar outcomes and outputs which were more in tune with the situation caused by the Pandemic. This is primarily as a result of THET and CPAs flexibility and agility with respect to the HPs. Often, donor funded projects are restricted in terms of how activities may be amended and/or the virement of budgets. Nonetheless, it appears that in CwPAMS this did not serve as a hindrance, and both THET and CPA were quick to respond to HP needs. Furthermore, both the Fleming Fund and DHSC should be commended in allowing such freedom and flexibility by allowing projects to adapt to support the COVID-19 response while still being in line with programme objectives. It is our opinion that this model should be considered and replicated by other funders as this did in effect help ensure the success of CwPAMS even throughout the Pandemic.

7.5. *Demonstration of effective risk management during the pandemic*

The Interim Report acknowledged that the most successful HPs overcame operational challenges by using agile project management methods and, in some circumstances, managed to make use of adverse situations to demonstrate their competence and relevance. Therefore, the Pandemic (in one way) can be

viewed as a door-opener for CwPAMS as it increased the Programme's ability to engage with WHO members, NHS leaders, and local and global stakeholders as part of the fight against the Pandemic. These are individuals who may not have otherwise become involved or made aware of CwPAMS. Through these new networks CwPAMS has been better able to demonstrate the relevance and importance of AMS within a global health crisis.

7.6. Online engagement and innovation

With the pandemic, the CwPAMS shifted most of its events and Project activities to be completed through online platforms. This demonstrated to have a positive effect on outcomes as some HPs remarked that the online environments were better suited to complete tasks in an effective and efficient manner. This was also the case for CwPAMS as CPA and THET conducted various conferences and webinars virtually, which allowed them to reach broader audiences. The shift to online engagement has shown that the CwPAMS programme can be replicated and done anywhere and partnerships do not have to be physically in the same place to achieve the same level of output.

Additionally, the creation of innovative resources for a wide range of audiences has helped to engage different user groups that might not necessarily think about issues of AMR and AMS, hence have only served to further the cause of CwPAMS globally.

7.7. Programme Reporting

Although THET and CPA relaxed the format for reporting, COVID-19 disruptions meant that some HPs were unable to fully capture their activities and outcomes. We understand that in the future, reporting will be through an online platform where grant holders will be able to automatically upload qualitative and quantitative documents at their own convenience, and allow multiple individuals to be involved in the reporting process – thereby helping reduce reporting burden.

7.8. Gender equality and social inclusion

THET and CPA have developed a GESI toolkit for Health Partnerships[35] however this did not translate to any in-depth reporting. As was highlighted in the Interim Report, THET and CPA failed to make references or interrogate HPs on GESI objectives throughout Q1-3 of the Programme. COVID-19 disruptions further hindered the Programme's ability to address this point in greater detail during Q4 and 5. That said, the Programme has prepared a report on gender demographics of volunteers and training participation, however this was the extent to which GESI featured under CwPAMS. THET and CPA have future plans to conduct a GESI toolkit workshop for HPs scheduled for July 2021. This workshop will outline how HPs can make their projects be more transformative and mindful of GESI disparities.

7.9. Contributions to the NHS

Information obtained during quarters four and five indicate that the Programme contributed positively to the NHS. The healthcare volunteers noted that the skills and knowledge they gained during their involvement was pertinent to their career and has helped some volunteers earn new roles within their hospital departments. The training received by volunteers has also helped the NHS when dealing with COVID-19, in particular with respect to the lack of resources and pressured working environments. This has in fact been essential for hospitals such as the North Middlesex Hospital which was at the centre of COVID-19 infections in London.

[35] https://www.thet.org/resources/gender-and-social-inclusion-toolkit/

8. ANNEXURES

(see following pages)

1. PROJECT INTRODUCTION AND OBJECTIVES

1.1 Ingentium Limited ("Ingentium" / "we" / "our") has been invited by The Tropical Health and Education Trust ("THET" / the "Client") to submit this Proposal for carrying out an **Addendum Evaluation** (the "Assignment"/ "Evaluation") **of the Commonwealth Partnerships for Antimicrobial Stewardship Programme** ("CwPAMS" / the "Programme"). Specifically, the objectives of the Assignment are to:

(i) Review and establish the contribution of health partnership ("HP") results from quarters 4 and 5 to overall programme achievement. This will include:
   a. highlighting and listing COVID-19 related responses; and
   b. updating lessons learned and good practices from CwPAMS under each of the three Fleming Fund objectives (if applicable).

(ii) Ensure that the dissemination section of the Assignment includes peer reviewed publications and other publications on relevant websites, as well as the Fellows event, activities implemented at the UK level, and shortlisted and winning entries to Antibiotic Guardian Awards or other awards, for example, the Commonwealth Digital Health Awards (where the CwPAMS app was highlighted); and

(iii) Review how CwPAMS has contributed to the implementation of WHO Global Action Plan on antimicrobial resistance within the relevant countries.

(iv) Review how the Change Exchange supported and influenced the programme.

2. UNDERSTANDING OF THE ASSIGNMENT

2.1 We understand that AMR is a global health threat which is often neglected within the global health agenda. Informed by past experiences, we appreciate the relevancy and need for global partnerships such as CwPAMS, that leverage and encourage cross-national expertise to strengthen capacity and capabilities in LMICs, particularly with regards to the registration, prescription and pharmacovigilance.

2.2 We are aware that CwPAMS was originally meant run between February 2019 and April 2020; however, it was extended to January 2021 following the awarding of a no-cost extension due to COVID-19 disruptions.

2.3 As such, when the (initial) CwPAMS evaluation was undertaken by Ingentium between May to August 2020, reports from Quarters 4 and 5 of the Programme were unavailable. It was therefore agreed that the evaluation would proceed utilising the available documentary information and

© 2021 Ingentium Limited

resources. Final results incorporating the last two quarters would be factored into the evaluation by way of an addendum to be compiled at a later date.

2.4 As with the previous evaluation, Ingentium will evaluate the success of CwPAMS in achieving its objectives within the overall Fleming Fund goal of tackling AMR across the globe. It will employ the same scoring system as the initial evaluation, linking this to the OECD-DAC criteria. Further details of our approach can be found below in our proposed Evaluation methodology for this Assignment and work plan. Based on discussions we have had with THET as well as input from colleagues at the Commonwealth Pharmacist Association ("CPA"), we estimate the Assignment will take 15 working days of effort across the prescribed term.

2.5 The success of the Assignment will rely on effective collaboration between Ingentium and THET/CPA. This will include open lines of communication and an undertaking to provide relevant information and data in a timely manner.

3. OUTLINE OF THE PROPOSED EVALUATION METHODOLOGY

3.1 The Assignment will be carried out using a mixed method approach and will result in a standalone addendum report. All research will be desk-based, incorporating limited qualitative data from interviews and quantitative research methods, in the form of applying a numerical formula to score individual HPs to inform the Programme's overall performance.

3.2 Details of our approach is set out below:

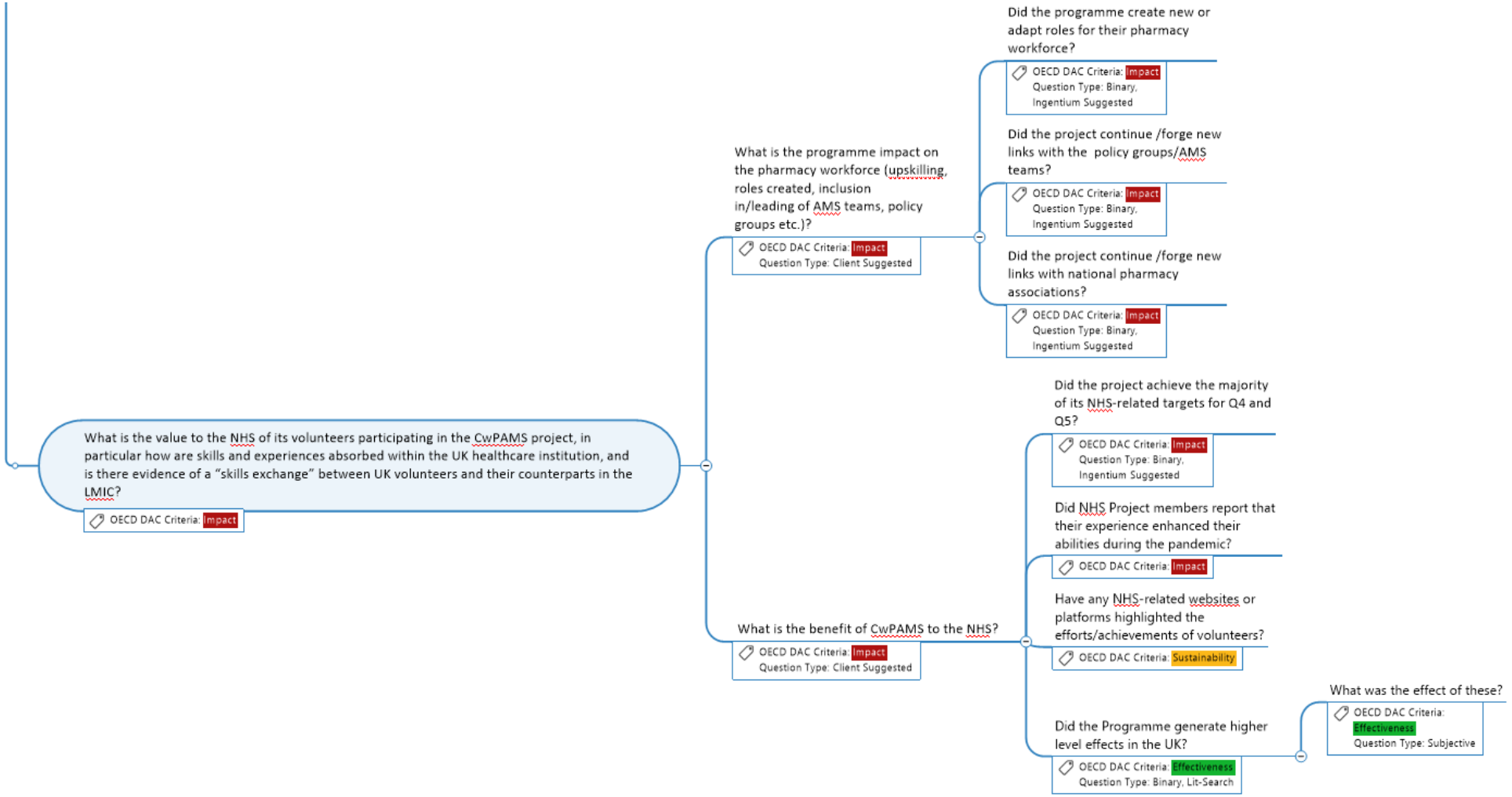
3.2.1 Updating Methodology and Evaluation Framework

(i) In order to ensure that the Assignment is manageable within 15 effort days, the Evaluation Framework will be revised to reduce the number of indicators by circa 50 percent. Indicators such as those that are not relevant to, or unlikely to have significantly changed (in terms of results) in Q4 and 5 of the Programme will be removed, while new indicators that explore Covid-19 related activities, dissemination and work performed to further the WHO Global Action Plan will be added to the Framework.

(ii) Ingentium will revise the indicators associated with the three Overarching Questions ("OAQs"). Figure 1 below is an example of the potential HP and Programme-level indicators for OAQ 2, which examines the value of CwPAMS to the NHS. It has included indicators that examine higher-level effects generated in the UK as a result of CwPAMS and dissemination activities that may have occurred through NHS-affiliated websites and platforms. We have reduced the indicators from 13 (in the initial evaluation) to 8.

© 2021 Ingentium Limited

Figure 1. The Revised Indicators Pertaining to OAQ 2



© 2021 Ingentium Limited

(iii) As before, the set of indicators will be associated to one of the three OAQs and uniformly applied to each of the 12 HPs to enable us to ensure consistency in the Evaluation, with the exception of some indictors being specific to the CwPAMS Programme only. Each individual indicator will also be associated against one of the five OECD-DAC Evaluation Criteria.

(iv) Ingentium will work to reduce and revise the indicators associated to the each of the three OAQs and present these to THET/CPA during a kick-off call in the first week of the Assignment. During this call Ingentium would welcome any feedback and/or suggestions to ensure that the final revised framework is the result of an iterative process between all the relevant parties. We fully appreciate that this step of the Assignment has caused angst with respect to the scientific validity of the approach in light of the reduced number of indicators. We therefore provide the Client the option to revert back to the full set of original indicators provided that resources and fees for this Assignment are increased to 22 days of effort.

3.2.2 Data Gathering

(i) Following the receipt of all relevant documentary materials, Ingentium will conduct a documentary review identifying and obtaining information to be organised into a thematic template in the form of a Microsoft Excel spreadsheet. This framework will enable comparison between the 12 HP projects.

(ii) Interviews with individuals from the Change Exchange behavioural science team will be conducted to ascertain the extent to which THET and CPA gave adequate support to the HPs. A short list of questions will be sent to the participants ahead of the interviews which are to be conducted over the phone or through video conferencing.

3.2.3 Scoring, Analysis and Results

As before, Ingentium will rate each HP's performance with respect to the three OAQs, as well as each of the five OECD-DAC Evaluation Criteria. Finally, to calculate the Programme's performance, all relevant question/indicators scores obtained on the HP and Programme level will be collated and averaged to form a sum total "score" for CwPAMS.

3.2.4 Presenting Findings

(i) Our Evaluation will be presented as a standalone addendum report, evaluating Q4 and Q5 of the Programme, it will present updated scores and justifications for each HP and the overall Programme utilising the same structure and five-tier traffic light rating system from the initial evaluation. Ingentium will review the entirety of information gathered and assessed to generate lessons learnt and good practices. Lastly, the report will include an updated executive summary referencing the main findings from Quarters 1 through 5 of the Programme.

(ii) After submission of the first draft Ingentium will work to review and integrate comments and feedback into the final version of the report.

© 2021 Ingentium Limited

4. WORKPLAN AND CONFIRMATION OF AVAILABILITY

4.1 We anticipate that the entire Assignment will require 15 days of effort. The Assignment timescales proposed by Ingentium are contingent on the client's ability and timeliness in providing required information.

4.2 Throughout the Assignment, THET/CPA and Ingentium will carry-out bi-weekly teleconference/videoconference calls to discuss progress and any intermediary outputs.

4.3 Subject to the timely start of the Assignment, we intend to deliver the final report by the week of the 12th of April. The table below sets out key dates for the proposed Assignment outputs:

Activity no.	Description	Weeks from start of Project
1	Finalise methodology and revised evaluation framework. Meeting with THET/CPA to review this	Week 1
2	Review of key background documents, reports, data and Publications. Data coded into thematic templates	Week 2
3	Draft list of questions, conduct video interviews with relevant (Change Exchange) personnel incorporating their responses into the thematic template.	Week 3
4	Scoring exercise of the OAQs and the OECD-DAC criteria	Week 3
5	Draft complete report of findings, analysis and lessons learnt.	Week 4
6	Meeting with THET/CPA to receive/review report feedback	Week 5
7	Finalise report	Week 5

5. OUTPUTS

i) Revised Evaluation Framework (Week 1)
ii) List of Questions (Week 3)
iii) Draft report (Week 4)
iv) Final Report (Week 5)

© 2021 Ingentium Limited

ANNEX B: EVALUATION FRAMEWORK (QUESTIONS)

1. PROOF OF CONCEPT

1.1 TO WHAT EXTENT HAS THE CWPAMS PROGRAMME IMPROVED ANTIMICROBIAL STEWARDSHIP IN LMIC PARTNER HEALTHCARE INSTITUTIONS?

OECD-DAC Criteria: Relevance, Effectiveness, Efficiency, Impact, Sustainability

1.1.1. How relevant was the support of CPA? THET?

- Did CPA/THET provide Programme-level support to CwPAMS in Q4 and 5? In what form?
- Did the Project report to have received support from CPA in adapting their approach?
- Did the Project report to have received support from THET in adapting their approach?
- Did THET take steps to act on any of the recommendations they received during the interim evaluation?
- Did CPA take steps to act on any of the recommendations they received during the interim evaluation?
- Did THET/CPA take steps to publicize the relevance of the CwPAMS programme?

1.1.2. To what extent has CwPAMS influenced AMS policy?

- Have the Project's AMR protocols/guidelines/knowledge been incorporated into hospital policy during Q4 and 5?
- Has the Programme established/maintained formal partnerships/links with any government/ civil society actors or other groups active in the AMS policy domain (local, regional or national level)?
    - Has this led to the drafting/publication of any formal policy papers?

1.1.3. To what extent has the COVID-19 pandemic illustrated the relevance of AMS and IPC?

- Has the beneficiary hospital maintained close relations with the Project?
- Did the Project secure additional funds for its work in Q4 and 5?
- Was the Project involved in any Covid- 19 interventions during Q4 and 5?

1.1.4. To what extent were the objectives achieved?

- Did the Project's activities in Q4 and 5 correlate with at least two of the three objectives of the Fleming Fund?
- Did the Project continue to pursue its objectives (not penalising them for activities that were unable to occur due to travel restrictions and/or Covid 19?
    - If not, did they adapt their approach to achieve something of equivalent value?

© 2021 Ingentium Limited

- Did Projects revise/ reallocate resources to adjust to the disruptions?

1.1.5. To what extent was CwPAMS successful in implementing the WHO Global Action Plan on antimicrobial resistance in all four LMIC countries?

- Did the programme implement the 3 target objectives in at least 3 of the 4 host countries?
    - What interventions were established in each of the 4 countries?

1.2 DOES THE HEALTH PARTNERSHIP APPROACH IMPROVE ANTIMICROBIAL STEWARDSHIP IN LMIC PARTNER HEALTHCARE INSTITUTIONS AND STAFF?

OECD-DAC Criteria: Effectiveness, Impact

1.2.1 Did the Project generate significant positive intended higher-level effects in Q4 and 5? not penalising them for covid -19 disruptions)

- Which factors contributed to the changes that were generated?
- What effects were these?

1.2.2 Did the Project generate significant positive unintended, higher-level effects in Q4 and 5?

- Which factors contributed to the changes that were generated?
- What effects were these?

1.2.3 Did the UK and LMIC partners maintain activities/a relationship in Q4 and 5?

2. WHAT IS THE VALUE TO THE NHS OF ITS VOLUNTEERS PARTICIPATING IN THE CWPAMS PROJECT, IN PARTICULAR HOW ARE SKILLS AND EXPERIENCES ABSORBED WITHIN THE UK HEALTHCARE INSTITUTION, AND IS THERE EVIDENCE OF A "SKILLS EXCHANGE" BETWEEN UK VOLUNTEERS AND THEIR COUNTERPARTS IN THE LMIC?

OECD-DAC Criteria: Impact, Sustainability, Effectiveness

2.1 WHAT IS THE PROGRAMME IMPACT ON THE PHARMACY WORKFORCE (UPSKILLING, ROLES CREATED, INCLUSION IN/LEADING OF AMS TEAMS, POLICY GROUPS ETC.)?

- In Q4 and 5 did the programme create new or adapt roles for their pharmacy workforce?
- Did the Project continue /forge new links with the policy groups/AMS teams?
- Did the Project continue /forge new links with national pharmacy associations?

2.2 WHAT IS THE BENEFIT OF CWPAMS TO THE NHS?

- Did the Project achieve the majority of its NHS-related targets for Q4 and Q5?
    - If not, did they adapt their approach to achieve something of equivalent value?
- Did NHS Project members report that their experience enhanced their abilities during the pandemic?
- Have any NHS-related websites or platforms highlighted the efforts/achievements of volunteers?

- Did the Programme generate higher level effects in the UK?
    - What effects were these?

3. WHAT IS THE POTENTIAL FOR SCALING UP AMS IN NATIONAL AMR ACTION PLANS?

OECD-DAC Criteria: Efficiency and Sustainability

3.1 WHAT SYSTEMS HAVE BEEN PUT IN PLACE/UPDATED THAT WILL INFLUENCE SUSTAINABILITY?

- Did the Project implement systems to encourage (long term) sustainability?

- Did the Programme maintain a link with government departments during the last two quarters/Covid 19 pandemic?

- Did the Project maintain a link with government departments during the last two quarters/Covid 19 pandemic?
    - As a result of this, have any local/regional or related policies concerning AMS been enacted/drafted in Q4/5?

3.2 DID THE PROGRAMME TAKE STEPS TO IMPLEMENT ITS ACTIVITIES IN AN ECONOMICALLY JUSTIFIABLE WAY UNDER THE NEW CIRCUMSTANCES (COVID 19, ETC)?

3.3 WAS PROGRESS ACHIEVED AT REASONABLE COSTS?

- Did the budget achieve allocational efficiency? i.e represent an optimal distribution of financial capital to projects (inputs= actual/realised benefits)
    - Did the Project exceed its budget?

3.4 HAS THE PROGRAMME UNDERTAKEN HEALTH DISSEMINATION?

- To national/international audiences or meetings of professional associations?
    - Have these activities generated higher level effects?

- To local hospitals/ community groups?
    - Have these activities generated higher level effects?

© 2021 Ingentium Limited