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| Host department: Oxford |
| Project Title: A Mixed-Methods Analysis of Antimicrobial Stewardship Quality Indicators for Primary Care in Latin America and the Caribbean |
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| Proposed supervisory team: Professor Chris ButlerAssociate Professor Gail HaywardDr Sarah Tonkin-CrineAssociate Professor Ly-Mee Yu(Director of Graduate Studies and Professor of Primary Care– Anthony Harnden) |
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| Potential for cross-consortium networking and educational opportunities: |
| This project builds on the integration of experts in public health institutions such as the Caribbean Public Health Agency (CARPHA), top transregional academic institutions such as The University of the West Indies (UWI), intergovernmental agencies, and the University of Oxford. Its elements present opportunities for collaboration across decision-making bodies and hands-on education and training of prescribers, public health professionals, and wider patient groups. It offers the student a unique ability to engage with health experts and ministry actors in Belize and the wider Caribbean within Pan American Health Organization (PAHO/WHO) network and learn from hypothesis-generating research conducted over the past 5 years in this region. Antimicrobial resistance (AMR) and antimicrobial use (AMU) surveillance is a research priority in Belize and the wider Caribbean as of 2019, with growing external support as of 2021 through the Antimicrobial Resistance module of the Global Action in Healthcare Network (GAIHN-AR).[1] |
| Project description:Background:AMR disproportionately affects low-and-middle-income countries and is a growing global threat to life. Of the 33 countries in Latin America and the Caribbean (LAC), 26 (79%) are LMICs (World Bank, 2018). Although healthcare-associated infections (HAIs) represent the most frequent adverse event in healthcare, their health and socioeconomic burden in the LAC region is unknown. What is known, is that LAC has recorded overall increases in multidrug- and extensively drug-resistant organisms (MDR/XDR), particularly carbapenem-resistant organisms (CROs), which have been associated with the COVID-19 pandemic. [3]In 2021, Belize, like its regional counterparts detected carbapenemase-producing CRO in isolates in its national referral hospital for the first time, highlighting the need to accelerate action to monitor and control AMR. Therefore, this research would serve as a valuable strategic interrogation into AMR and AMU surveillance to design AMS programs that incorporate behavioural change strategies to enhance interprofessional collaboration between laboratory services and the primary care workforce in and beyond COVID-19. Research Objective and Questions:The primary research objective is to determine regionally relevant quality indicators (QIs) for AMS in primary care and describe the current patterns of and influences on antimicrobial use and resistance in ambulatory isolates, thereby contributing to evidence-based guidelines and targeted stewardship strategies with ongoing evaluation. The proposed project utilises a mixed-methods approach integrating qualitative and quantitative research methodologies and engages a transnational, multilateral expert network for AMR action for the first time in the region.It asks the following questions:1. What is the LAC regional consensus on quality indicators for routine monitoring and evaluation of AMS in the primary care setting?
2. What are the patterns of antimicrobial prescription for prevalent infectious disease aetiologies in the primary care setting in Belize and the related quality indicator appraisal?
3. What are the systemic (structure and process) factors influencing health professional and patient antimicrobial use behaviours in primary care in Belize?

Scientific Plan:There are three proposed phases of this study, each with unique data sources summarized below:

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| Phase  | Objective | Description  |
| Phase 1  | Iterative Quality Indicator (QI) tool development and modification with regional consensus  | * RAND-modified Delphi Panel Method: Systematic Review of QIs for AMS in Primary Care with Expert Panel Opinion sharing and development of QI agreement summary.
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| Phase 2  | Quantitative and Qualitative data collection on AMU in the Belize Primary Care Setting | * Utilizing mixed research methods to capture data on healthcare worker and patient behaviours using the national health information system and qualitative research methods in primary care.
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| Phase 3 | Triangulation of Phase 2 Findings | * Uses Qualitative and Quantitative findings to highlight the level of awareness and determinants of behaviour and systemic contributors to antimicrobial use in health professionals, patients in the primary care setting.
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| Phase 4 | Dissemination and engagement  | * Regional and Global Engagement with AMS Primary care indicators through Publication.
* Generation of good-quality evidence and awareness of the magnitude of the problem.
* Dissemination to Civil Society, Professional Societies, Private Sector, Patient communities
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Impact:This project aims to contribute to the global discourse on antimicrobial resistance and use surveillance in non-tertiary care settings from a comprehensive and in-depth LAC vantage point. We hope to advance simultaneously policymaker and government engagement, public advocacy and education, scientific community engagement, patient advocacy groups and clinical care impact.  |

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| Training and development provision by host: |
| Formal training: DPhil Primary Health Care will cover study design, academic writing, data set integration, qualitative and quantitative research methods, behaviour change science, policy engagement. Masters level modules on qualitative research and statistical methods will be accessed as needed given the prior experience of the candidate. |
| Informal training: Links with data scientists in the Nuffield Department of Primary Care Health `sciences, including the teams from the Royal College of General Practitioners Research Surveillance Centre, Open Prescribing, and Q Research. We have world leading qualitative research expertise in relation to antimicrobial stewardship and quantitative analysis. Training will take the form of:* Fortnightly attendance at infection and Acute Care group seminars
* Departmental seminars
* Intra-departmental training programme offered to doctoral students
* Qualitative and statistical research support clinics
* Opportunities for networking within wide global health community at the university
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| PPIE: The Nuffield Department of Primary Care Health Sciences will support PPIE input through its dedicated PPIE coordinator who will advise and support bespoke PPI work required to fully embed patients in the research. Standing PPIE panels that have been assembled and expertise developed specifically to input into projects related to infections and their managements.  |

[1] GAIHN AR | Global Safe Healthcare | Infection Control | CDC, https://www.cdc.gov/infectioncontrol/global/GAIHN-AR.html (accessed 8 September 2022).

[2] Belize Ministry of Health. Belize Health Information System. *MOH Belize* 2009; 1–9.

[3] García-Betancur JC, Appel TM, Esparza G, et al. Update on the epidemiology of carbapenemases in Latin America and the Caribbean. *Expert Review of Anti-Infective Therapy* 2021; 19: 197–213.

[4] MacPherson EE, Reynolds J, Sanudi E, et al. Understanding antimicrobial resistance through the lens of antibiotic vulnerabilities in primary health care in rural Malawi. *https://doi.org/101080/1744169220212015615* 2021; 1–17.

[5] Creswell JW, Clark VLP. *Designing and conducting mixed methods research*. 3rd ed. Thousand Oaks, CA: SAGE Publications Inc., 2017.