



GLOBAL BRIDGES HEALTHCARE ALLIANCE  
FOR ANTIMICROBIAL STEWARDSHIP

# GRANTEE PROJECTS OVERVIEW

Global  Bridges™  
Healthcare Alliance for Antimicrobial Stewardship

# Leadership Letter

Dear colleagues,

Significant health disparities exist in risk for, and outcomes of, infections caused by organisms resistant to antimicrobials around the world, especially in resource-limited settings. Since 2022, Global Bridges at Mayo Clinic has worked to support independent quality improvement projects to address these health disparities through antimicrobial stewardship (AMS). With generous funding from Pfizer Global Medical Grants, 11 independent projects around the world are addressing this formidable challenge. In addition to improving the quality of care locally and regionally through these projects, each grantee contributes to improving global health through sharing and disseminating their findings, and forming a new global network of professionals with unique insights and expertise but common goals.

In the following pages, each grant project's objectives and impact to date are described. We thank each grantee for the dedication, enthusiasm, and professionalism they bring to this challenge.

It continues to be an honor to work together.



**NATHAN CUMMINS, M.D.**  
Medical Director,  
Global Bridges AMS



**KATIE KEMPER, M.B.A.**  
Executive Director,  
Global Bridges

## 11 Grantee Organizations, Global Project Focus



GRANTEE HIGHLIGHT

# University Institute in Primary Care Research Jordi Gol

## Improving Antibiotic prescribing In Nursing homes in Spain. A before and after intervention study (IMAGINE Study).



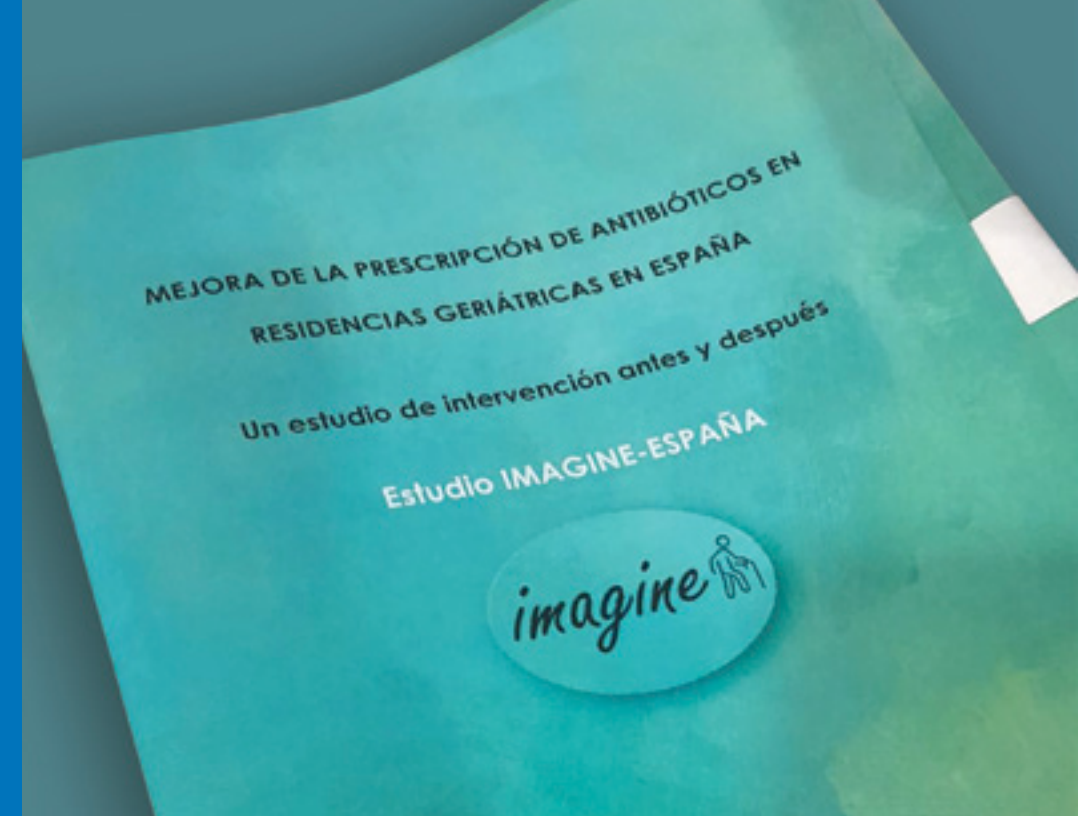
The absence of effective infection prevention and control measures contributes to antimicrobial over-prescribing in long-term care facilities. This overuse of antibiotics is a primary driver of antimicrobial resistance, a significant concern given the vulnerability of frail elderly individuals to frequent and severe infections. Healthcare associated infections, particularly respiratory and urinary tract infections, are common in these facilities, with some caused by resistant bacteria. However, these infections could be mitigated through antibiotic stewardship and improved hygiene practices. A 2017 European survey revealed that Spain had the highest antibiotic prescribing rate in nursing homes among the 27 member states. Despite this, there has been a lack of antimicrobial stewardship interventions in nursing homes in the country. Additionally, long-standing resource deficits and health inequalities in this setting have been exacerbated, particularly evident during the recent COVID-19 pandemic. Nursing homes, historically lacking in health and care resources, directly impact the residents' health.

Given these challenges, nursing homes represent a critical target for initiatives aimed at reducing inappropriate antibiotic use. The objective of this project is to enhance the prevention of healthcare-associated infections and decrease the inappropriate use of antibiotics in these infections. This is to be achieved through the implementation of an intervention specifically targeting healthcare professionals working in nursing homes. During a two-month period in late winter 2023, healthcare professionals in each nursing home recorded information about all urinary and respiratory tract infections using simple registration sheets. Following the intervention, the registration process will be repeated in the late winter months of 2024. In January 2024, a one-day intervention took place, involving the presentation of results from the initial registration and facilitating discussion among peers.

The preliminary findings from the initial registration audit reveal insights from 34 participating nursing homes across five nodes. Residents with infections had an average age of 85.8, predominantly female (69.2%). Of the 1,505 registered infections, 47.8% were urinary tract infections, more prevalent in women (51.5%), while respiratory infections were more common in men (40.4%). Antibiotic prescription rates varied from 56% to 100%, exceeding 80% in 27 homes and reaching 100% in 14. The average antibiotic therapy duration was 6.8 days.

Fosfomycin, cephalosporins, and quinolones were the most prescribed for urinary tract infections (40.1%, 17.9%, and 12%, respectively). Respiratory tract infections numbered 533 (35.4%), with varying antibiotic prescribing rates for different conditions. Tonsillitis reached 100%, pneumonia 95.9%, acute bronchitis 92%, pharyngitis 91.3%, bronchoaspirative respiratory infection 88.9%, COPD exacerbations 85%, COVID-19 infection 61.5%, influenza 47.8%, and the common cold 29.5%. These findings, when finalized, will enhance the quality of antimicrobial administration, leading to fewer side effects among nursing home residents.

### PROJECT TIMELINE



These findings, when finalized, will enhance the quality of antimicrobial administration, leading to fewer side effects among nursing home residents.



GRANTEE HIGHLIGHT

# Indiana University Health

## Impact of infection prevention care bundles on surgical site infections post-cesarean section in Kenya



Indiana University Health

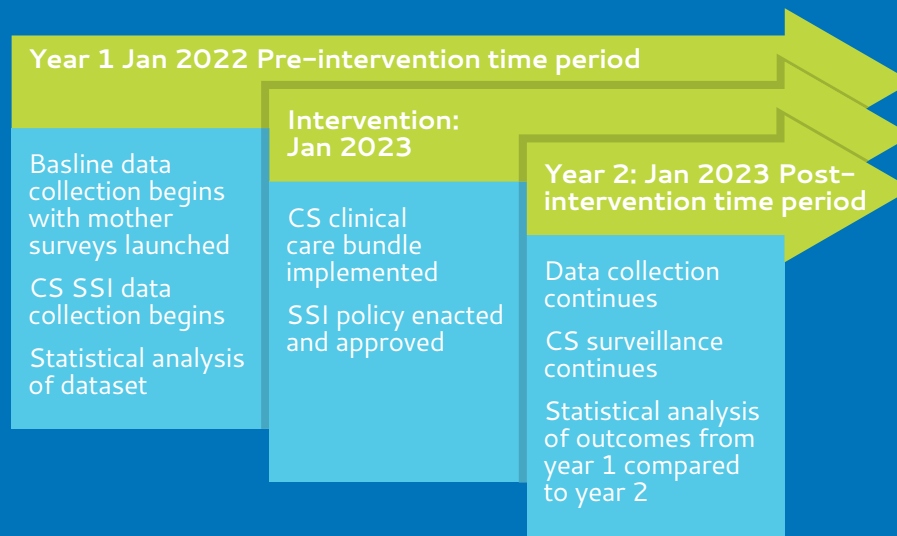
Surgical site infections (SSI) represent a significant, yet preventable, cause of morbidity and mortality while remaining disproportionately prevalent in lower middle-income countries. Our interdisciplinary team conducted a time series study with pre- and post-intervention periods to evaluate the effects of an infection prevention bundle on reducing SSIs on mothers undergoing Cesarean-Section (CS) surgery at Kenyan tertiary referral hospital. The study objectives were to: 1. Implement CS surgical site surveillance and identify the current healthcare provider antimicrobial prescribing patterns for patients undergoing CS; 2. Determine the antimicrobial susceptibility patterns in c-section wound infections and compare against antimicrobials prescribed; 3. Identify the baseline prevalence of surgical site infections and analyze the short- and long-term complications of SSI after cesarean section; 4. Based on objectives 1-3, develop and implement a surgical site bundle around pertinent risk factors: determinants of health, antimicrobial use, modifiable risk factors, and clinical gaps in care. During the first year of the project, the Indiana University Health Infection Prevention team trained several team members from Moi Teaching and Referral Hospital in Kenya to accurately identify SSI cases using a modified version of the National Healthcare Safety Network Criteria. After training was complete, the team enrolled every third mother undergoing CS surgery into the

study and followed up with them through phone call interviews on post-op days 7, 14, and 30. Any patient who had signs or symptoms of an SSI was asked to return to the hospital for further evaluation and treatment. After 14 months of surveillance and data collection, the team recognized an important need for registrar education, preoperative bathing, and postoperative patient education. Each of these interventions was implemented in a stepwise manner while enrollment continued. Final analysis will be performed to understand the impact these interventions had in reducing CS SSI rate.

During the pre-intervention phase of the study, the CS SSI rate declined from 12.2% to 5.3%. Subsequently, the intervention period included implementation of various strategies to reduce SSIs including routine registrar education on SSI prevention in the operating room, postoperative patient education on wound healing, and the introduction of preoperative chlorhexidine gluconate (CHG) baths on the pre-natal ward. After implementation it was observed that the SSI rate continued to decrease.

This study underscores the efficacy of using telephone interviews for patient follow-up in enhancing education and awareness regarding signs and symptoms of infection, leading to early identification and treatment of SSIs. Notably, an unforeseen positive outcome of the follow-up phone calls was the extension of community health outreach. Mothers involved in the study frequently shared their phones with neighbors facing health issues, seeking advice from our MTRH outreach Nurse. Our nurse, in turn, offered guidance and directed them to appropriate resources or recommended hospital visits. Additionally, the mothers expressed gratitude for the follow-up calls, citing an increased sense of care from the hospital and enhanced comfort during the post-surgery period at home.

PROJECT TIMELINE



PARTNERS



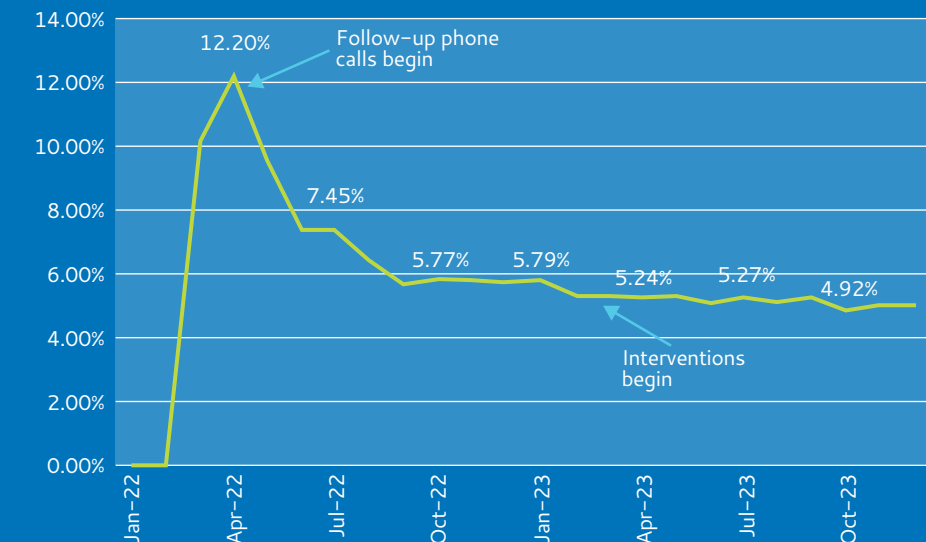
MOI TEACHING AND REFERRAL HOSPITAL

Excellent Healthcare Delivery

An ISO 9001:2015 Certified Hospital



Percent Positive SSI Rate Over time



GRANTEE HIGHLIGHT

# Henry Ford Health

## Addressing patient social determinant of health barriers to improve equity in antimicrobial stewardship in Detroit



People experiencing homelessness (PEH) and people who inject drugs (PWID) are hospitalized frequently and experience health disparities and worse outcomes relating to appropriate antimicrobial use due to social determinant of health (SDOH) barriers, including lack of stable housing, limited financial resources, lack of transportation for follow-up care, substance use and addiction, and other social barriers.

This quality improvement (QI) project aimed to improve health equity, adherence, and antimicrobial stewardship outcomes by addressing SDOH barriers among PEH and/or PWID hospitalized for complicated infections at Henry Ford Health in Detroit, Michigan, USA, as well as to document barriers and provide recommendations.

This project brought together an interdisciplinary team comprising of infectious diseases, pharmacy, addiction medicine, case management, and population health. Our QI interventions included: tailoring antibiotic education to the specific needs of PEH and/or PWID for both providers and patients (i.e., storage considerations); addiction medicine, street medicine, and pharmacy discharge medication cost inquiry consults when indicated; a Meds-to-Beds program to ensure

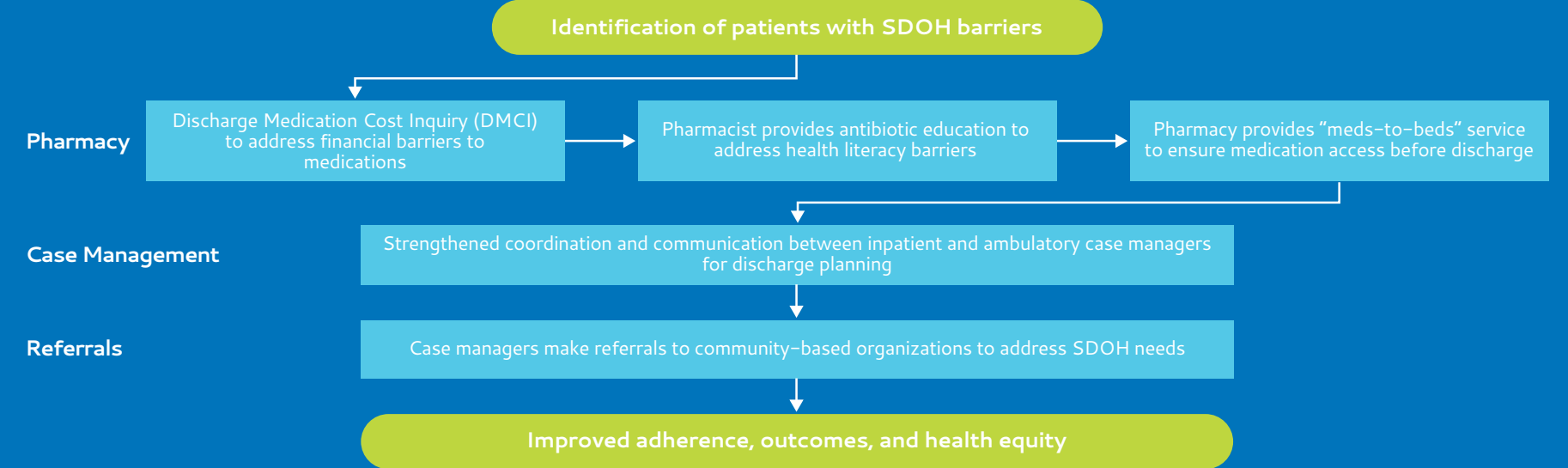
oral antibiotics were in hand at discharge; strengthening discharge planning communication between inpatient and ambulatory case managers; and referrals to community-based organizations to address SDOH needs.

Forty-two patients were identified from June 2022–May 2023. Among those treated, less than half achieved clinical cure, almost a third had disease progression, and 36% were readmitted within 30 days. The QI interventions contributed to addressing SDOH barriers, including improving health literacy, reducing financial burden, ensuring access to medications, and mitigating transportation barriers. However, our project identified multiple barriers and challenges to improving adherence and outcomes, including patient loss to follow-up and non-adherence, high healthcare utilization, high behavioral health and addiction medicine needs, limited staff capacity and placement options after discharge, lack of affordable housing and transportation access, and limited behavioral health resources.

This subsequently led to the development of recommendations based on our findings, including: provide cultural competency training for staff on the needs of PEH and PWID and patient-centered terminology; increase staffing capacity; expand utilization of the Street Medicine Consult Order to improve follow-up with PEH after discharge; strengthen internal processes to place consults and referrals quickly; conduct qualitative research to better understand patients’ perspective of barriers and reasons for self-discharging; and build additional community-based partnerships to meet SDOH needs.

Having an interdisciplinary team is critical to holistically address SDOH barriers for PEH and PWID to improve health outcomes.

### PROJECT FLOWCHART



“Our project identified multiple barriers and challenges to improving adherence and outcomes, leading to the development of recommendations for future work to improve health equity.”



GRANTEE HIGHLIGHT

# The Aga Khan University

## Age and gender inequity in antibiotic utilization: Impact of a multifaceted intervention based on an interactive dashboard and clinical decision support tool at a tertiary care center in a low-middle income country



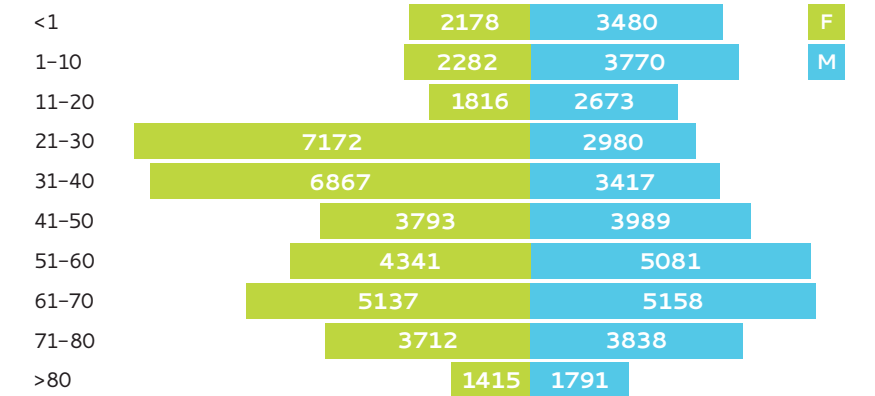
Our project aims to address inequities in antibiotic prescribing by age and gender at a large tertiary care hospital in Pakistan, through implementation of an interactive dashboard highlighting areas of concern and a clinical decision support tool to guide antibiotic selection. Our baseline surveillance data showed that children under 10 and women aged 20–40 received a higher proportion of inpatient antibiotic prescriptions compared to other groups from 2007–2019. Clinical decision support systems (CDSS) have demonstrated a reduction in medical errors and improvement in the quality of healthcare. However, the potential of this technology for improving antibiotic stewardship efforts, especially through an equity lens in resource-constrained settings, is largely unexplored. Our first intervention is an administration-level dashboard providing different stratified views to highlight areas exhibiting inequities in antibiotic prescriptions and their details. The second intervention targets areas of inequities utilizing a clinical decision support system,

assessed by pre- and post-CDSS-Implementation surveys. The intervention directly benefits our patients, particularly addressing inequities based on age and sex, by reducing their exposure to inappropriate antibiotics. It helps clinicians in their clinical decisions, promoting the optimal selection of antibiotic regimens, doses, and durations. Moreover, it indirectly benefits the community by reducing antimicrobial resistance. This pragmatic quasi-experimental pre-post study will evaluate changes in rates of antibiotic use measured by defined daily doses (DDD), types of antibiotics prescribed, and multi-drug-resistant organism rates before and after intervention implementation. Physician surveys pre/post-intervention allow for assessment of usability and impact. Hence, this multifaceted intervention has the potential to significantly reduce overall antibiotic consumption and address age/gender inequities in utilization. Successful implementation has the potential for significant public health impact by promoting appropriate antimicrobial use.

As the project enters the post-intervention surveillance phase, the impact is already significant with the development of the first-of-its-kind local antibiotic guidelines app PrescribePro available to all prescribing physicians in a resource-constrained setting to enhance adherence to guidelines as a crucial step toward optimizing patient outcomes. Notably, healthcare professionals utilizing the app have reported a substantial improvement in their knowledge and competence in prescribing antibiotics across diverse clinical scenarios. Some testimonials are as follows: A medicine physician remarked, "Today I made sure that guideline for cellulitis is followed in ED." A Cardiothoracic surgeon shared, "Superb app. Well done." Another physician commented, "It's so user-friendly especially with search bar." Additionally, preliminary data on patient-related outcomes indicate positive shifts in antibiotic prescription practices, suggesting a promising reduction in inappropriate antibiotic use. The most remarkable reduction has been observed in the utilization of Azithromycin with improvement in average DDDs/1000 patient-days from 63 to 36 in 2023. Hence, PrescribePro's role as a decision support system underscores its potential to address the challenge of antimicrobial resistance.



Antibiotic Prescriptions Stratified by Age and Gender



... the impact is already significant with the development of the first-of-its-kind local antibiotic guidelines app PrescribePro available to all prescribing physicians in a resource-constrained setting to enhance adherence to guidelines as a crucial step toward optimizing patient outcomes.



## GRANTEE HIGHLIGHT

# Fundação Oswaldo Cruz

## Application of an antimicrobial stewardship program in Brazilian ICUs using machine learning techniques and an educational model

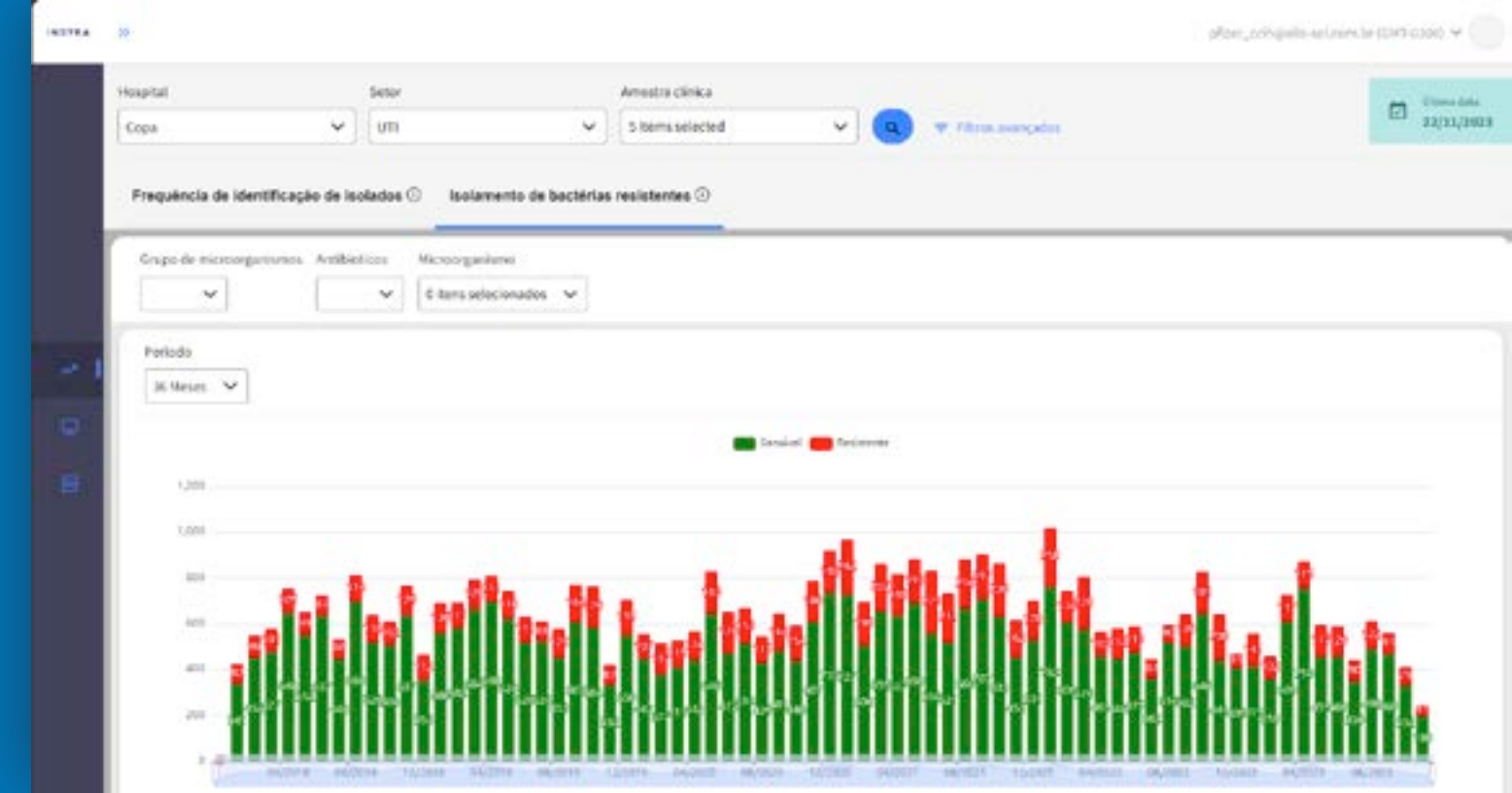


Antimicrobial agents are frequently used empirically and include therapy for both Gram-positive and Gram-negative bacteria. In Brazil, multidrug-resistant Gram-negative pathogens are the cause of most nosocomial infections in ICUs. Therefore, the excessive use of antimicrobials to treat Gram-positive bacteria represents an opportunity to reduce unnecessary antibiotic use in critically ill patients. Besides, the success of a program aimed at reducing the use of antibiotics to treat gram-positive bacteria could also evolve to include other micro-organisms, such as gram-negative bacteria and fungi. Analyzing data from the ICUs in our associated network of hospitals, we found high use of broad-spectrum antibiotics and vancomycin, even though MRSA infections rarely occur. Thus, if physicians could identify patients at high risk of infection by gram-positive bacteria, we could reduce antibiotic consumption. The more accurate treatments could result in better patient outcomes, reduce the antibiotics' adverse effects, and decrease the prevalence of multidrug-resistant bacteria. Therefore, our main goal is to reduce antibiotic use by applying an intervention with three main objectives: (i) to educate the medical team, (ii) to provide a tool that can help physicians pre-

scribing antibiotics, and (iii) to find and reduce differences in antibiotic prescription between hospitals with low- and high-resources. To achieve these objectives, we will apply the same intervention in ICUs of two hospitals with different access to resources. Both are part of a network of hospitals associated with our group.

The integration of data we performed is a relevant step for physicians and managers to better understand the hospitals' status regarding antimicrobial stewardship. The network of hospitals currently has three individual datasets that are not usually combined: microbiology tests, antimicrobial consumption, and ICU admissions. We developed a data curation and integration pipeline that combines the three datasets with the collaboration of data and physician specialists. The final dataset is an input for our proposed analytical platform. The platform has been internally validated for monitoring main AMR indicators in eight hospitals. The tools have encouraged the team and interviewees to pursue more information regarding antimicrobial stewardship, promoting multidisciplinary discussions that would not usually occur. Regarding the research outputs, one research article was published about prescribing antibiotics in Brazilian ICUs. The discussions among the team members during the platform development stage have generated research publications: One evaluates the impact of the COVID-19 pandemic on resistance and prevalence of microorganisms in ICU; and a second article regarding the clinical characteristics of community-acquired infections in ICU admission.

The benefits of collaboration with Global Bridges are related to the opportunity of engagement and connection with different research groups regionally and globally. During the current grant, we were able to conduct research with a multidisciplinary team (physicians, engineers, developers, researchers, and HICC members, etc.) that enabled a high-quality output of our deliverables. Globally, the Global Bridges meetings were very insightful and provided our group various perspective of how AMR has been addressed, according to the necessities of the corresponding country, which assisted our research steps.



During the current grant, we were able to conduct research with a multidisciplinary team that enabled a high-quality output of our deliverables.



GRANTEE HIGHLIGHT

# University of Colorado School of Medicine/ Children’s Hospital Colorado

## Colorado Antimicrobial Stewardship Endeavor (CASE)

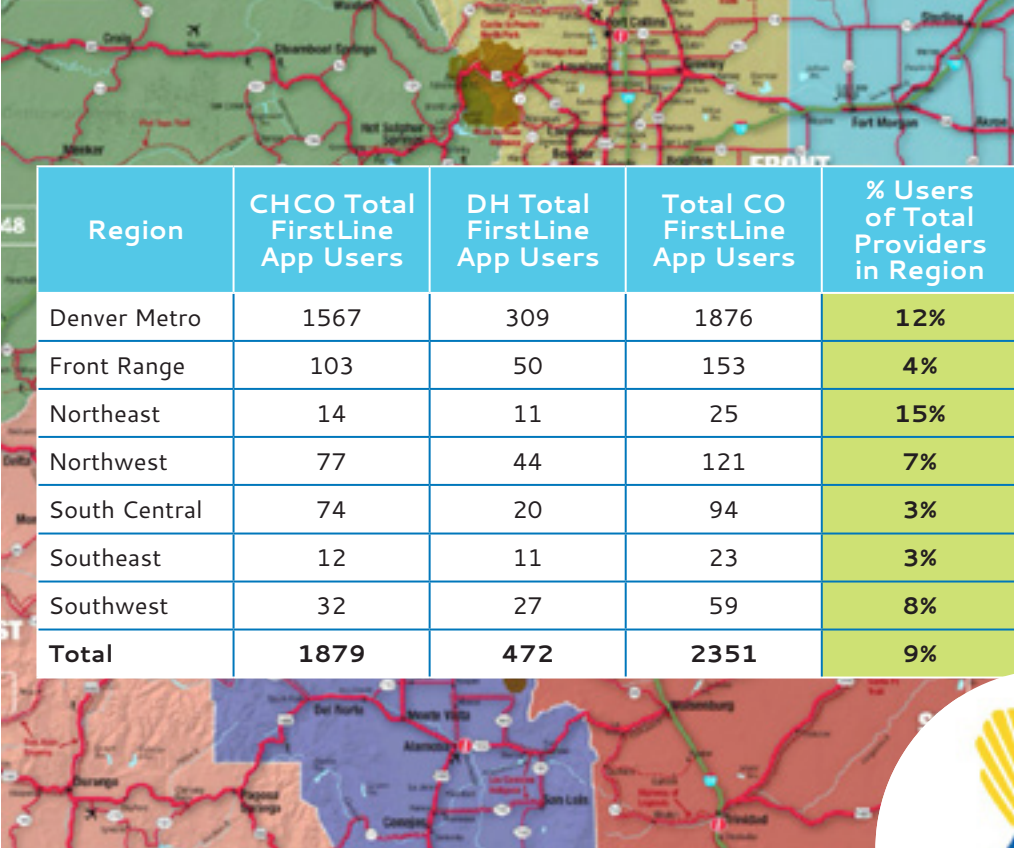


Antimicrobial resistance, fueled by antibiotic use and overuse, is a global epidemic that is recognized as an urgent health threat. To combat this threat, antimicrobial stewardship programs are now required by many US regulatory agencies. Colorado (CO), US, is made up of 7 regions and 64 counties; 23 counties are designated frontier, and 24 are rural (see figures). CO Hospital-based programs were surveyed and interviewed in conjunction with the Colorado Department of Health and Environment (CDPHE), and self-identified barriers and needs identified. Particularly in critical access hospitals, significant barriers included lack of guidance in terms of clinical care guidelines, understanding and implementation of stewardship tools and measurement, infection prevention protocols, and a desire to learn from peers. The target audience for this proposal is all Colorado hospitals and providers, with particular attention to critical access hospitals. This proposal’s overall goal is to fill this gap using local expertise from Denver Health (DH) and Children’s Hospital Colorado (CHCO), in collaboration with the CDPHE and our content experts, and deploy the information in an easily accessible mobile phone application, through a contract with FirstLine. The application launched in October of 2023, and is out-facing to all Colorado

providers (and the world). We aim to collect data about app use, provider satisfaction with the app, and impact of app use on various antibiotic consumption metrics.

The FirstLine application launched in October of 2023, the CHCO application on October 10 and the DH version on October 30. Significant dissemination efforts accompanied the launch and are ongoing. Since launch, 2,351 users have downloaded the CHCO and DH versions of the application. The majority of the users are in the populated Denver metro area (1,876/2,351, 80%). In the less-populated regions, while percentage of the total CO users is 20% (475/2,351), it represents an encouraging percentage of providers in those rural and frontier areas (see table). The most used guideline on Children’s Colorado platform was acute otitis media, whereas community-acquired pneumonia was most used on Denver Health platform. For both, amoxicillin and Streptococcus pyogenes were the most viewed antibiotic and pathogen, respectively. For future analyses, a satisfaction survey will be deployed via app push notifications in March/April, and tools to assess guideline compliance will launch in April. Antibiotic use assessment is ongoing via an assessment tool built for users in FirstLine (linked to Redcap) and we will use hospital-specific Standardized Antimicrobial Administration Ratio (SAAR) information to assess changes in hospital antibiotic prescribing.

Global Bridges made this project possible. We were faced with knowing what our hospitals needed to improve antibiotic use, but not being able to provide it in a useful platform. Global Bridges filled that gap. In addition, the people at Global Bridges are understanding and supportive and understand the research process. Hearing about the other projects is also very enlightening and inspiring. We hope other collaborations will grow out of our cohort.



Keeping Colorado Healthy, One Antibiotic Choice at a Time.



“ We were faced with knowing what our hospitals needed to improve antibiotic use, but not being able to provide it in a useful platform. Global Bridges filled that gap. ”



GRANTEE HIGHLIGHT

# Oxford University

## Extending antimicrobial stewardship programs to underserved clinical activities in Northern Vietnam



In low- and middle-income countries, antimicrobial stewardship (AMS) programs are primarily concentrated in in-patient departments of central and referral hospitals. While antimicrobial resistance (AMR) is spreading rapidly, AMS policies are still in their early stages. Therefore, OUCRU set up a project aimed to improve AMR control by extending AMS to underserved clinical activities in Vietnam, i.e., outpatient departments (OPD) and district hospitals (DH) in Vietnam.

The interventions consist in a comprehensive AMS program in which prescribing practices will be improved through a learning process of five stages in the provincial hospitals. It includes training by an infectious diseases expert, tracking and providing feedback on antibiotic prescribing, evaluating and improving laboratory stewardship, point-prevalence survey for OPD retrospective audit and feedback for DH, and development of treatment guidelines. The interventions also encompass innovative clinical bacteriology solutions for DH without pre-existing bacteriology laboratory capacity. In one DH, we implemented a small-scale, standalone microbiology laboratory developed by Medecins Sans Frontieres, called Mini-Lab; in another DH, we organized daily transport of samples to the provincial hospital, in a hub-and-spoke fashion; a third DH serves as control and receives AMS intervention only.

We are monitoring several indicators to evaluate the impact of these interventions through a before-after design. These indicators include the proportion and amount of antibiotics prescribed by AWaRe classification, the proportion of antibiotics and lab tests that are prescribed appropriately, changes in clinicians' knowledge, and a wide range of lab performance indicators.

As of March 2024, the baseline data collection was completed, and interventions were being rolled out. To achieve this, the Oxford University Clinical Research Unit (OUCRU) collaborated with the National Hospital for Tropical Diseases, Dong Thap Provincial Hospital, Uong Bi Vietnam-Sweden Hospital, Ha Hoa District Hospital, Yen Lap District Hospital, Tan Son District Hospital, and Phu Tho Provincial Hospital.

The interventions are currently being successfully implemented. For example, clinicians practicing at the outpatient department of Dong Thap Provincial Hospital have expressed gratitude to trainers from Hanoi for presenting the Access-Watch-Reserve (AWaRe) classification, as it helped them with establishing priorities for drug-sparing policies. In district hospitals where microbiology solutions have been implemented, clinicians were surprised to discover that some presumptive antibiotic treatment missed the target, e.g., a skin and soft tissue infection due to an MRSA in an infant but treated with a combination of third-generation cephalosporin and metronidazole, and that the laboratory was critical to identify these situations and propose the most appropriate drug for each infection. The post-intervention data collection will happen between June and September 2024.

The Global Bridges grants scheme is much more than a funding mechanism. They initiated an active regular follow-up of our projects that allows us to present and discuss our challenges with leading experts. These specialists understand perfectly the technical aspects of the project but are also aware of the context and are able to propose adapted solutions.

Moreover, connecting with other grantees has allowed us to discover a broad range of innovative solutions to improve AMS programs in low- and middle-income countries. It is also a formidable opportunity for networking with resourceful and inspiring scientists around the world.

PARTNERS



We are monitoring several indicators to evaluate the impact of these interventions through a before-after design. These indicators include the proportion and amount of antibiotics prescribed by AWaRe classification, the proportion of antibiotics and lab tests that are prescribed appropriately, changes in clinicians' knowledge, and a wide range of lab performance indicators.



GRANTEE HIGHLIGHT

## AIDS Healthcare Foundation

### Development and implementation of an antimicrobial stewardship program in Maputsoe SDA Clinic in Lesotho



Maputsoe Seventh Day Adventist (SDA) clinic is an urban-based primary healthcare facility that is run by Maluti Adventist Hospital (MAH). Maputsoe SDA clinic is supported by AIDS Healthcare Foundation (AHF Lesotho) to ensure high-quality patient care with focus in HIV/AIDS and treatment of opportunistic infections (TB, STIs, Cervical Cancer Screening, etc.) that is associated with the use of antimicrobials for their treatment. This makes the task of antimicrobial stewardship imperative, although it may be complex.

In recent years, the quality improvement committee of the clinic has identified the need to shift its focus towards infection prevention control and antimicrobial stewardship (AMS). The project was created to develop and implement a formal AMS program in the clinic; to improve appropriate antimicrobial prescribing in the clinic; and develop an interdisciplinary collaboration model between clinicians, the laboratory and pharmacy departments. As part of the project we are able to measure the quality of antimicrobial prescribing and antimicrobial resistance at Maputsoe SDA Clinic with specific interest in antibiotics in the treatment of VDS, UDS, and UTI, as well as implement and monitor

the impact of AMS strategies on appropriate antimicrobial prescribing and patient outcomes.

The clinic has development of AMS policy statement to guide antimicrobial stewardship in the Clinic. This has promoted vigilance among healthcare workers regarding antibiotic prescribing, dispensing use, and handling, and great feedback has been obtained as everyone sees it as their responsibility to learn and teach their patients about appropriate use of antibiotics.

We have some baseline data that demonstrated the local antimicrobial susceptibility patterns to commonly used antibiotics in the clinic. This will help guide antibiotic prescribing decision making. The project has improved the diagnostic capacity to confirm the diagnosis of the target infections (UDS, VDS, and UTI), which was not feasible before.

Education has been provided to 185 healthcare workers and 1103 patients to improve awareness of AMS.

Global Bridges has provided us with technical and moral support and a platform to exchange knowledge and skills, share information and ways to address the challenges among ourselves as grantee organizations. Global Bridges has always been there to answer questions and provide guidance on matters concerning the project.



Global Bridges has provided us with technical and moral support and a platform to exchange knowledge and skills, share information and ways to address the challenges among ourselves as grantee organizations.

GRANTEE HIGHLIGHT

# University of Sussex (Brighton and Sussex Medical School)

## Developing optimal antimicrobial stewardship capacity and practice in hospitals in Zambia



University Hospitals Sussex  
NHS Foundation Trust



The World Health Organization has declared that antimicrobial resistance (AMR) is one of the top 10 global public health threats facing humanity. The main drivers are misuse and overuse of antimicrobials which lead to the emergence of drug-resistant pathogens. Inappropriate use of antimicrobials in hospitals is widely reported, particularly in low- and middle-income countries including Zambia. However, the extent of this issue remains largely unquantified, and data are not readily available to facilitate policy making.

In Zambia, there is a paucity of national data on the quantity and quality of antimicrobial utilization, especially in rural settings that face inequitable access to requisite infrastructure, workforce, and capacity. This has been a key barrier to the successful implementation of a national Antimicrobial Stewardship (AMS) program by the Zambian National Action Plan for AMR. The goal of this project is to enhance AMS capacity in hospitals in Zambia using a hub and spoke model.

AMS capacity building through education and training has targeted medical doctors, pharmacists, nurses, and laboratory scientists who are based in selected rural and peri-urban public hospitals in Zambia. Nine spoke hospitals were selected and, in addition to the hub hospital, this covered all 10 provinces in Zambia to provide national coverage.

The tertiary hospital with established AMS capacity (hub) is the University Teaching Hospital, Lusaka. The project will potentially impact the majority of the Zambian population of 18 million people.

A descriptive cross-sectional survey of baseline antimicrobial utilization in the selected hospitals was conducted using a validated Global Point Prevalence Survey (GPPS) methodology. An assessment of pre-intervention adherence to AMS guidelines in clinical practice was performed.

Healthcare teams were trained in the practice of AMS using structured training modules developed as part of the Brighton-Lusaka Health Link partnership. Pre- and post-intervention assessment of knowledge, attitude towards, and practice of AMS was performed. Antimicrobial utilization and adherence to AMS guidelines are prospectively monitored and evaluated using follow-up assessments in the intervention sites.

Following the educational intervention described above, monitoring and evaluation visits were conducted in all 9 participating Zambian hospitals. All spoke hospitals participated in World AMR Awareness Week (WAAW), celebrated in November every year. The theme for WAAW 2023 was "Preventing antimicrobial resistance together." Activities included AMR sensitization meetings in the hospitals and community, Radio and TV and School sensitization programs, and various banner displays on AMR.

Collection of post-interventional GPPS data in the spoke hospitals is expected to conclude by mid-March 2024. A project results dissemination meeting in Lusaka is planned for April 11 and 12, 2024.

Two members of the Zambian Team will attend the European Congress of Clinical Microbiology and Infectious Diseases (ECCMID) in Barcelona to present the key learning from this project.

The team in Zambia remains fully committed to the success of the project and continues to travel thousands of kilometers to the various spoke hospitals. Although the results are not yet fully available, the hub and spoke approach appears to help build AMS capacity in rural and peri-urban hospitals.

PARTNERS



AMS-CHIPATA TRAINING



AMS-KABWE TRAINING



AMS-KITWE TRAINING



“  
The team in Zambia remains fully committed to the success of the project and continue to travel thousands of Kilometers to the various spoke hospitals.  
”

## GRANTEE HIGHLIGHT

# Addis Ababa University

## Implementation and evaluation of antimicrobial stewardship program in the pediatric oncology unit at a tertiary care hospital in Ethiopia



Pediatric Febrile Neutropenia is an oncological emergency condition that requires broad-spectrum antibacterial drugs to lower the risk of death and serious complications. In low- and middle-income countries, because of health inequities such as delayed diagnosis, lack of training in pediatric cancer management and support, limited access to curative care, cultural barriers, treatment abandonment, poor adherence to treatment, poverty, financial inequities, and fragmented healthcare delivery system, pediatric patients with cancer often experience unfavorable outcomes. Studies confirm that inappropriate antibiotic use is widespread, and antimicrobial resistance (AMR) is of great concern. Hence, an antimicrobial stewardship (AMS) program is warranted for this population.

An AMS is established at the inpatient ward of Tikur Anbessa Specialized Hospital, which does not include the pediatric oncology unit. Introducing customized AMS and clinical decision support tools in the pediatric oncology unit will enable a more comprehensive approach to improve appropriate antimicrobial use and tackle resistance.

This is a quasi-experimental study involving intervention and post-intervention assessment. All pediatric patients with cancer will be

eligible for the study. The intervention phase involves validation and use of a Multinational Association of Supportive Care of Cancer (MASCC) risk-index score, AMS team establishment and febrile neutropenia guideline preparation. It also includes preparation of frequently prescribed antibiotics administration and dosing guidelines, and other customized decision support tools, including targeted training, and clinical pharmacy service. Compliance with guidelines will be assessed regularly. Finally, days of therapy, antibiotic use pattern, rate of inappropriate antimicrobial use, and clinical outcome (rate of mortality) in the post-intervention phase are computed to determine the effectiveness of the intervention.

As of March 2024 the following steps have been completed:

1. Data collection on quantitative and qualitative measures (pre-intervention) for a total of 360 patients
2. Preparation of an audit-feedback antimicrobials stewardship tool to conduct interventional research activities
3. Data collection for the interventional study is in process.
4. Dissemination of intervention tools including febrile neutropenia guidelines
5. The AMS team conducts a weekly antimicrobial stewardship pharmacist-lead intervention using an audit-feedback tool. (AMS team includes pediatric ID specialist, oncologist, hematologist, clinical pharmacist, ward doctors, nurses.)

When the project is completed, findings will be submitted for publication at a reputable international journal. Also, prepared guidelines will be shared across the nation with the collaboration of Ethiopia Ministry of Health. This work is of paramount importance for our hospital pediatric cancer patients and at large for our community and hospitals.



**PROF. WORKEABEBA ABEBE**  
Principal Investigator



**ALEMSEGED BEYENE**  
Co-Investigator

In addition to Alemseged Beyene, the co-investigators include Prof. Ephrem Engidawork, Gobezie Temesgen, Melaku Tieku, Getachew Alemkere, and Daniel Hailu.



Introducing this program will have paramount importance to the national resource pool and experience required to improve appropriate antimicrobial use and tackle resistance.



GRANTEE HIGHLIGHT

## VA Medical Center Memphis

### Improving antimicrobial stewardship in the VA Medical Center through Beta-Lactam Allergy Assessment and Challenge (BLAAC)



Beta-lactam allergic subjects, including veterans, are more likely to be treated with an alternate broad-spectrum antibiotic. Broad-spectrum antibiotics use has multiple negative consequences e.g., increased incidence of C diff, VRE, MRSA infections, adverse drug events, and treatment failure, leading to prolonged hospital stays and higher cost. Surprisingly more than 95% of patients, including veterans with reported PCN or beta-lactam allergy, ultimately tolerate PCN and related beta-lactam antibiotics. Routine assessment for PCN and beta-lactam allergies is an effective tool for optimizing the use of beta-lactam antibiotics and reducing the use of broad-spectrum antibiotics. Allergy assessment and testing would serve to promote several core elements of antimicrobial stewardship, including the simplification of antibiotic therapy, optimization of antibiotic dosing, and potential conversion from injected to oral treatment regimens.

The overall goal of the program is to utilize clinical pharmacists to perform allergy assessment and drug challenges among beta-lactam allergic veterans to optimize beta-lactam antibiotics utilization and minimize cost and multiple adverse sequelae associated with broad-spectrum antibiotics use.

The project will be implemented at the VA Medical Center, Memphis TN. The hospital serves about 206,000 veterans residing in 53 counties

of eastern Arkansas, western Tennessee, and northern Mississippi. Most of the counties are part of the delta region, considered Health Professional Shortage Areas (HPSAs) by the US Department of Health and Human Services. Veteran populations are racially and ethnically diverse. Twenty-one percent (21%) of the veteran populations are minorities and most of them are African Americans (11%) and Hispanics (7%).

The medical center allergist is responsible for the overall implementation of the project and will train the clinical pharmacist to perform beta-lactam drug allergy assessment, testing, and challenge in the inpatient settings. Clinical pharmacists are already trained and doing this in the outpatient setting. Subjects with penicillin or beta-lactam allergy will be identified by the clinical surveillance tool "TheraDoc" program integrated into the VA electronic medical record. The pharmacist will classify the subjects as low-risk vs. moderate to high-risk based on prior allergy history. Then clinical pharmacist will do a single dose amoxicillin drug challenge through standard procedure. Moderate- and high-risk patients will be referred to an outpatient beta-lactam allergy clinic for further assessment. Subjects not reacting to drug challenges will be cleared of allergy and will be eligible for further antibiotics administration.

We will assess the number of beta-lactams allergic veterans eligible for beta-lactam antibiotics administration, cost savings, reduction of hospital-acquired infections, and antibiotics-related adverse events.

“

We will assess the number of beta-lactams allergic veterans eligible for beta-lactam antibiotics administration, cost savings, reduction of hospital-acquired infections, and antibiotics-related adverse events.

”

Global  Bridges™  
Healthcare Alliance for Antimicrobial Stewardship

Significant health disparities exist in risk for, and outcomes of, infections caused by organisms resistant to antimicrobials around the world, especially in resource-limited settings. Since 2022, Global Bridges at Mayo Clinic has worked to support independent quality improvement projects to address these health disparities through antimicrobial stewardship (AMS).

We thank each grantee for the dedication, enthusiasm, and professionalism they bring to this challenge.



Global  Bridges™  
Healthcare Alliance for Antimicrobial Stewardship

[globalbridges.org](http://globalbridges.org)