

Improving Infection Prevention and Control Practices at Health Facilities in Resource-Limited Settings: SIAPS Technical Report

July 2016



USAID
FROM THE AMERICAN PEOPLE

SIAPS 
Systems for Improved Access
to Pharmaceuticals and Services

Improving Infection Prevention and Control Practices at Health Facilities in Resource-Limited Settings: SIAPS Technical Report

July 2016

Wonder Goredema
Jane Briggs
Mupela Ntengu
Bayobuya Phulu
Tenaw Andualem
Workneh Getahun
Kiley Workman Diop
Mohan P. Joshi



USAID
FROM THE AMERICAN PEOPLE

SIAPS 

The SIAPS logo consists of the word "SIAPS" in a bold, green, sans-serif font. To the right of the text is a stylized blue icon of a person with arms raised, suggesting movement or achievement.

This report is made possible by the generous support of the American people through the US Agency for International Development (USAID), under the terms of cooperative agreement number AID-OAA-A-11-00021. The contents are the responsibility of Management Sciences for Health and do not necessarily reflect the views of USAID or the United States Government.

About SIAPS

The goal of the Systems for Improved Access to Pharmaceuticals and Services (SIAPS) Program is to ensure the availability of quality pharmaceutical products and effective pharmaceutical services to achieve desired health outcomes. Toward this end, the SIAPS result areas include improving governance, building capacity for pharmaceutical management and services, addressing information needed for decision-making in the pharmaceutical sector, strengthening financing strategies and mechanisms to improve access to medicines, and increasing quality pharmaceutical services.

Recommended Citation

This report may be reproduced if credit is given to SIAPS. Please use the following citation:

Goredema W, Briggs J, Ntengu M, Phulu B, Andualem T, Getahun W, Diop K, Joshi MP. *Improving Infection Prevention and Control Practices at Health Facilities in Resource-Limited Settings: SIAPS Technical Report*. 2016. Submitted to the US Agency for International Development by the Systems for Improved Access to Pharmaceuticals and Services (SIAPS) Program. Arlington, VA: Management Sciences for Health.

Key Words

Infection prevention and control, antimicrobial resistance, continuous quality improvement, infection control assessment tool, health care facility, nosocomial infections

Systems for Improved Access to Pharmaceuticals and Services
Center for Pharmaceutical Management
Management Sciences for Health
4301 North Fairfax Drive, Suite 400
Arlington, VA 22203 USA
Telephone: 703.524.6575
Fax: 703.524.7898
E-mail: siaps@msh.org
Website: www.siapsprogram.org

CONTENTS

Acronyms and Abbreviations	iv
Acknowledgments.....	v
Executive Summary	vi
Introduction.....	1
Background.....	1
Goal and Objectives for Improving Infection Prevention and Control.....	3
SIAPS IPC Goal.....	4
The ICAT/CQI Approach	4
Country Activities and Key Accomplishments Under SIAPS.....	8
South Africa	8
Namibia.....	13
Jordan.....	15
Ethiopia	15
Conclusion	18

ACRONYMS AND ABBREVIATIONS

AMR	antimicrobial resistance
CQI	Continuous Quality Improvement
CS	cesarean section
DTC	Drug and Therapeutics Committee
FMHACA	Food, Medicines and Health Care Administration and Control Authority
GARP	Global Antibiotic Resistance Partnership
MTC	Medicine and Therapeutics Committee
IC	infection control
ICAT	Infection Control Self-Assessment Tool
ICC	Infection Control Committee
ICU	Intensive Care Unit
IPC	Infection Prevention and Control
KPIs	key performance indicators
LMIC	low- and middle-income countries
MOH	Ministry of Health
MoHSS	Ministry of Health and Social Services
MSH	Management Sciences for Health
NDoH	National Department of Health
OT	operation theater
PHC	primary health care
PTC	Pharmaceutical and Therapeutics Committee
QA	quality assurance
RCQI	Rapid Cycle Quality Improvement
RMU	rational medicine use
RPM Plus	Rational Pharmaceutical Management Plus
SIAPS	Systems For Improved Access to Pharmaceuticals and Services
SPS	Strengthening Pharmaceutical Systems
TA	technical assistance
TOR	terms of reference
TOT	training-of-trainers
USAID	United States Agency for International Development
WHO	World Health Organization

ACKNOWLEDGMENTS

The authors gratefully acknowledge the contributions from the following experts:

- Evans Sagwa – Country Project Director, SIAPS/SCMS, Namibia
- Wolhe Alemayehu –Senior Technical Advisor, SIAPS/Ethiopia
- Terry Green – Former SIAPS Senior Technical Advisor
- Salah Gammouh – Former SIAPS Senior Technical Advisor
- Stephanie Berrada – Deputy Country Project Director, SIAPS/South Africa
- Bada Pharasi – Country Project Director, SIAPS/South Africa and MSH Country Representative
- Jean-Pierre Sallet– Senior Principal Technical Advisor, PHT/MSH
- Hailu Tadeg – Country Project Director, SIAPS/Ethiopia
- Edmealem Ejigu –Deputy Country Project Director, SIAPS/Ethiopia

EXECUTIVE SUMMARY

Infection prevention and control (IPC) is essential to reduce the spread of health facility-acquired (nosocomial) infections, including drug-resistant ones.

The USAID-funded Systems for Improved Access to Pharmaceuticals and Services (SIAPS) Program's goal in global technical assistance in IPC is to reduce the development and spread of nosocomial infections and antimicrobial resistance. This contributes to an improved quality of patient care and safety in public health facilities in resource-constrained countries.

This report summarizes key accomplishments and lessons learned in implementing SIAPS' approach to improving IPC practices in four countries: South Africa, Namibia, Jordan, and Ethiopia. All activities address SIAPS's overall objective to build or enhance national and facility capacity to develop, implement, and monitor IPC programs by focusing on the principles of health systems strengthening.

In each of the four countries, activities and implementation were adapted to meet the needs of the national and local structures. Key activities executed were use of the infection control self-assessment tool (ICAT) coupled with continuous quality improvement (CQI) approach, waste management training, and development and strengthening of national IPC policy. SIAPS' country ownership approach promoted local leadership and, in several cases, led to institutionalization of the IPC approach, advocacy, and tools. Despite challenges, including a shortage of staff members and other resources, health facilities in the implementing countries have managed to improve practices with these various SIAPS-supported interventions.

ICAT/CQI is a simple and practical approach that helps assess the adequacy of existing IPC practices and then provides specific recommendations for improving practices and monitoring the effectiveness of interventions over time. National stakeholders have found the tool to be useful, were able to adapt sections or the entire tool to local context and needs, and assumed ownership, thereby promoting an IPC culture in their hospitals.

Stakeholders, including international development partners and donors interested in AMR containment, should consider prioritizing support for IPC systems-strengthening interventions.

INTRODUCTION

Background

Antimicrobial resistance (AMR) is a rapidly increasing global problem that is making many first-line antimicrobial medicines ineffective. The situation is increasing the costs of treatment of infections and threatening the major gains of reduced morbidity, improved treatment outcomes, reduced mortality, and increased life expectancy that followed the discovery and use of antimicrobial medicines.

Two major causes of AMR are irrational antimicrobial use and poor infection prevention and control (IPC) practices.¹ The 2001 WHO Global Strategy for Containment of Antimicrobial Resistance recommends IPC as a key intervention to slow the emergence and spread of AMR. This was also included as one of five strategic objectives in the WHO Global Action Plan on Antimicrobial Resistance that was endorsed by the 68th World Health Assembly in May 2015.^{2, 3}

Health facilities are a major source of infection transmissions. The combination of susceptible patients, prolonged antimicrobial use, and cross-infection often results in nosocomial infections, often with resistant pathogens. These infections pose a risk to patients, health care workers, and health facility visitors. Furthermore, resistant nosocomial infections are expensive to control and extremely difficult to eradicate.⁴

Strong IPC programs are needed to fight infections of public health importance such as HIV, malaria, tuberculosis, and emerging infectious diseases such as Ebola virus disease and Middle East Respiratory Syndrome. In 2014–2015, the Ebola virus disease epidemic struck in West Africa. IPC gaps resulted in its fast spread and consequently high morbidity and mortality within the region. In Nigeria, Senegal, and Mali, the rapid introduction of strong IPC, among other response measures aimed at health facilities and the community, is cited as having contributed to limiting the spread of the Ebola virus within these countries; such rapid actions by these countries provided “success stories” during the Ebola epidemic.⁵ This illustrates that in today’s global village there is an urgent need for policy makers in all countries to prioritize strengthening IPC programs.

Though there is limited evidence available for low- and middle-income countries, strong IPC programs can provide a considerable return on investment. In 1986–1989, a Brazilian hospital implemented an IPC program and experienced a 71% reduction in nosocomial infections in its intensive care unit, and significant decrease in wound infection rates and surgical

¹ WHO (World Health Organization). 2014. *Antimicrobial resistance: global report on surveillance*. Geneva: WHO < http://apps.who.int/iris/bitstream/10665/112642/1/9789241564748_eng.pdf?ua=1>

² WHO (World Health Organization). 2001. *WHO Global Strategy for Containment of Antimicrobial Resistance*. WHO/CDS/CSR/DRS/2001.2a. Geneva: WHO.

³ WHO (World Health Organization). 2015. *Global action plan on antimicrobial resistance* < http://apps.who.int/iris/bitstream/10665/193736/1/9789241509763_eng.pdf?ua=1>

⁴ Orrett FA, Brooks PJ, Richardson EG. 1998. *Nosocomial Infections in a Rural Regional Hospital in a Developing Country: Infection Rates by Site, Service, Cost, and Infection Control Practices*. *Infect Control Hosp Epidemiol.* 19(2):136-40.

⁵ WHO. 2015. *One year into the Ebola epidemic*. Chapter 11. <<http://www.who.int/csr/disease/ebola/one-year-report/nigeria/en/>>

prophylactic use of antibiotics; the intervention led to a total cost savings of approximately two million US dollars (USD).⁶ However, although numerous guidelines exist and the returns on investment are clearly demonstrated, developing and implementing effective IPC programs in resource-constrained countries is frequently hampered by financial gaps and limited capacity of staff.⁷

By minimizing or eliminating the risk of spread of nosocomial infections, IPC interventions decrease the volume of antimicrobials used and thus reduce selection pressure and the risk of AMR development. Preserving the effectiveness of less expensive first-line antimicrobials results in less use of more expensive second- and third-line antimicrobial treatments, thereby saving limited resources. An effective hospital IPC program improves patient safety and quality of patient care, and reduces adverse socioeconomic and psychological impact of infectious diseases to patients and health systems.^{8,9,10}

In a review of studies from 1998 to 2005, the prevalence of nosocomial infections in resource-limited countries was found to be 15.5 per 100 patients, which is more than double the prevalence in Europe (7.1 per 100 patients).^{11, 12} As outlined in a 2010 article by Lul Raka, LMICs have unique constraints to prevention and control of nosocomial infections.¹³

As can be seen in the Management Sciences for Health (MSH) IPC Framework (figure 1), an effective IPC program involves a combination of three types of interventions—administrative, environmental, and personal.

⁶ Cavalcante MD, Braga OB, Teofilo CH, Oliveira EN, Alves A. Cost improvements through the establishment of prudent infection control practices in a Brazilian general hospital, 1986-1989. *Infect Control Hosp Epidemiol* 1991; 12: 649-53.

⁷ Raka L. 2010. *Prevention and Control of Hospital-Related Infections in Low and Middle Income Countries*. The Open Infectious Diseases Journal (4): 125-131.

⁸ Pittet, D. 2005. *Clean Hands Reduce the Burden of Disease*. *Lancet* 366(9481): 185-7.

⁹ Luby, S. P., M. Agboatwalla, D, R, R. Feikin, et al. 2005. *Effect of Hand washing on Child Health: A Randomized controlled trial*. *Lancet* 366(9481): 225-33.

¹⁰ WHO. 2009. *WHO Guidelines on Hand Hygiene in Health Care*. Geneva: WHO.

<http://www.who.int/gpsc/5may/tools/9789241597906/en/>

¹¹ Allegranzi, B, Nejad, S Bagheri et al. Burden of endemic health-care-associated infection in developing countries: systematic review and meta-analysis. *Lancet*. 2010; (published Dec 10. DOI S0140-6736(10)61458-4.)

¹² European Centre for Disease Prevention and Control. Annual epidemiological report on communicable diseases in Europe 2008: report on the state of communicable disease in the EU and EEA/EFTA countries. European Centre for Disease Prevention and Control, Stockholm; 2008.

¹³ Raka L. 2010. *Prevention and Control of Hospital-Related Infections in Low and Middle Income Countries*. The Open Infectious Diseases Journal (4): 125-131.

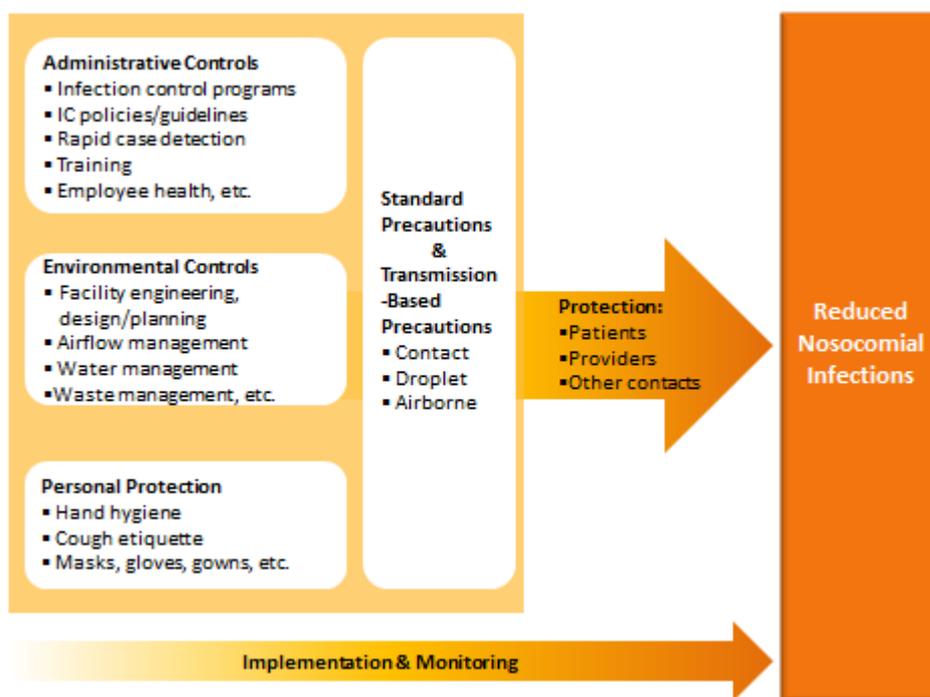


Figure 1. MSH Infection Prevention and Control Framework

For good IPC outcomes, particularly in LMICs, the development and application of an evidence-based approach is critical to effective implementation of interventions in all the three areas depicted in the framework. Such an approach based on infection control self-assessment followed by continual improvement methods was developed by US Agency for International Development (USAID)-supported Rational Pharmaceutical Management (RPM) Plus and Strengthening Pharmaceutical Systems (SPS) Programs lead by MSH and continues to be implemented through USAID-funded Systems for Improved Access to Pharmaceuticals and Services (SIAPS) Program, implemented by MSH.

Goal and Objectives for Improving Infection Prevention and Control

The goal of the SIAPS Program is to assure the availability of quality pharmaceutical products and effective pharmaceutical services to achieve desired health outcomes. Toward this end, the program focuses on identifying and closing the gaps in the various core functions of health systems (governance, human resource capacity, information systems, financing, medicines and technologies, and service delivery), in line with the US government/USAID and local counterparts' strategic goals. SIAPS' intermediate result (IR) number 5 for USAID consists of improving pharmaceutical services. Besides product availability, this IR covers patient care, patient safety, rational medicine use, and AMR containment-related areas. IPC is included as a key intervention to assure patient safety and good health outcomes.

SIAPS IPC Goal

SIAPS provides global technical assistance in IPC to reduce the development and spread of nosocomial infections and AMR, thereby contributing to an improved quality of patient care and safety in health facilities in resource-constrained countries.

Overall Technical Objective —

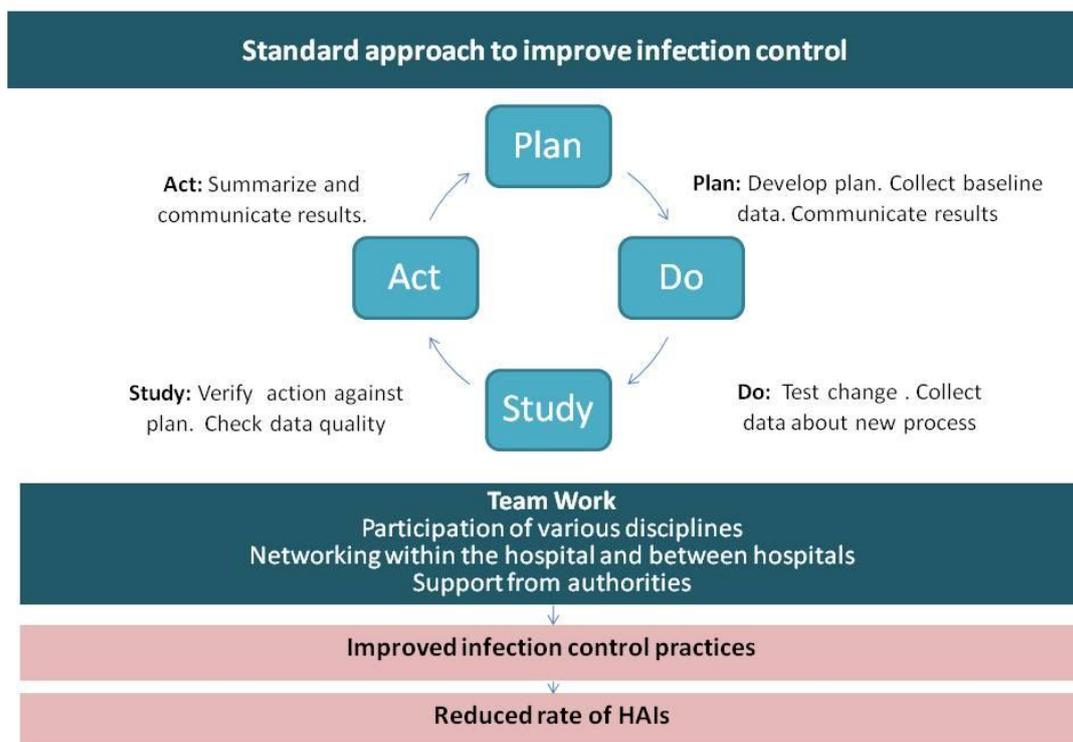
- Build or enhance national and facility capacity to develop, implement, and monitor IPC programs by focusing on the principles of health systems strengthening

Specific Objectives —

- Improve the awareness of health professionals and health care stakeholders, including health facility staff and decision-makers, on the importance of IPC in patient care and safety
- Build local capacity to implement a cost-effective, adaptable, and locally customizable IPC-strengthening approach that is based on ICAT and CQI
- Promote development and implementation of proven, cost-effective, locally-appropriate and sustainable IPC interventions, such as improved hand-hygiene and waste management
- Strengthen the technical capacity of health facility IPC committees, and where possible link them with Medicine and Therapeutics Committees, microbiology labs, pharmacies and clinical departments to promote multi-disciplinary collaborative efforts to enhance IPC practices

The ICAT/CQI Approach

Figure 2 illustrates the SIAPS approach to infection control in health facilities, which combines an initial diagnostic step using ICAT with continuous CQI to design, implement, monitor, and readjust interventions to maintain improvements. This approach ensures sustainable improvements in IPC practices, contributing to reduction in nosocomial infections and increased containment of AMR.



Source: South Africa National Department of Health; adapted from—Massoud, R., K. Askov, J. Reinke, et al. 2001. *A Modern Paradigm for Improving Healthcare. Quality QA Monograph Series 1(1)*. Bethesda, MD: Published for the U.S. Agency for International Development (USAID) by the Quality Assurance Project.

Figure 2. ICAT/CQI Approach

The ICAT provides health facility teams with an evidence-based methodology and approach to identify and prioritize gaps in infection control, and in combination with CQI methods, helps health facility staff members develop and implement low-cost interventions. The ICAT is available in English, French, and Spanish.

The ICAT consists of individual modules containing questions for self-assessment at a health facility or unit level (depending on the module), a scoring system, and reference notes outlining current internationally recognized practices. The 22 ICAT modules listed below cover various hospital infection control areas including hand hygiene, isolation, standard precautions, and waste management. Certain modules are complemented with observation checklists to help staff objectively assess adherence to important infection control practices.

Our experience has shown that the tool can be easily adapted to suit local country contexts.

1. Airway suctioning
2. Employee health
3. General ward
4. Hand hygiene
5. Hospital information
6. Infection control program
7. Injections
8. Intensive care unit
9. Intravenous catheters

10. Intravenous fluids and medications
11. Isolation and standard precautions
12. Labor and delivery
13. Microbiology laboratory
14. Pharmacy
15. Sterilization and disinfection: equipment and intravenous fluids
16. Sterilization and disinfection: needles and syringes
17. Sterilization and disinfection: sterile gloves
18. Surgical antibiotic use and surgical equipment procedures
19. Surgical area practices
20. Tuberculosis precautions
21. Urinary catheters
22. Waste management

While implementing the above hospital-level ICAT, we identified a need for a more basic tool to use in primary health care (PHC) facilities and developed an ICAT for PHCs. Validated in Guatemala, ICAT–PHC is appropriate for a lower-level health facility. It contains fewer modules, which are listed below, because not all modules apply in primary levels of care.

1. Health facility information
2. Employee health
3. Cleaning the health facility
4. Hand hygiene
5. Waste management
6. Isolation and standard precautions
7. Labor and delivery
8. Sterilization and disinfection of equipment
9. Preparation and administration of parenteral medications



Similar to the hospital ICAT, each module has self-assessment questions and a numerical scoring system that allows a qualitative grading of the existing infection control practices. The document also includes several observation checklists and suggested indicators to monitor at PHC facilities. The application of ICAT–PHC—either as a whole tool or as extracted modules—is also intended to be used as part of a CQI process.

The ICAT/CQI approach is in line with US Global Health Initiative and SIAPS’s overall health system strengthening approach and core operating principles such as building on and strengthening existing systems to enable country ownership, building capacity of local organizations and people, and supporting sustainability.

The RPM Plus Program collaborated with Harvard University to develop the ICAT/CQI tool and approach in 2006. The approach was piloted and refined through its application in the Philippines and Uganda. The refined tool and approach was then further applied progressively and successfully in several resource-constrained countries in Africa and Southern America (South Africa, Swaziland, Guatemala and Namibia). In each country, the tool was customized to the local context and Medicine and Therapeutics Committees (also known as Pharmaceutical and Therapeutics Committees (PTCs) or Drug and Therapeutics Committees (DTCs)) or Infection Control Committees (ICC) were capacitated at health

facilities and district levels to implement the tool as part of an initial pilot in a few selected hospitals. The tool was then further revised incorporating feedback arising from the pilots, finalized and rolled out. Pilot facilities experienced measurable improvements.^{14,15,16} Building on the RPM Plus and SPS work, SIAPS has provided further technical assistance to integrate and institutionalize the ICAT/CQI approach to strengthen IPC programs in several countries.

In each country, health facility IPC teams conduct initial ICAT assessments to identify gaps; collect baseline data on key performance indicators (KPIs) of the IPC program, such as adherence to optimum hand hygiene and waste management practices, and availability of IPC supplies; and develop interventions to close the gaps. The teams then implement ICAT/CQI cycles to measure the effectiveness of the solutions. They review progress; share experiences; and collect post-intervention outcome data on the same KPIs used during the pre-intervention baseline. Team members then adjust or develop, implement, and test new interventions, as needed, to ensure and maintain improved practices. Ministry of Health (MOH) national and regional supervisors periodically check with and support implementing health facility IPC teams through site visits and virtual follow-up. Key immediate outcome measures include percentage improvement in the KPIs selected and monitored by the team.

SIAPS applies a country ownership approach that promotes local leadership and institutionalization of the tool and approach. The program supports interested countries to scale up and implement locally customized versions of the tool beyond the initial pilot through extensive capacity development trainings and follow up supportive supervision and on-the-job mentoring. Consistent with US Global Health Initiative principles, the in-country SIAPS team engages local counterparts and stakeholders, and supports country-led leadership and coordination.

¹⁴ Goredema . et al. *Implementing a Self-Assessment and Continuous Quality Improvement Approach to Improve Hospital Infection Control Practices in Africa and Latin America*. Poster presented at the Third International Conference for Improving Use of Medicines (ICIUM₂₀₁₁), in Antalya, Turkey. 2011. http://www.msh.org/projects/sps/SPSDocuments/upload/ICIUM2011_1116Poster-Infection-Control-Poster.pdf

¹⁵ Briggs CJ. *Infection Control in Guatemala: Life of Project Report. 2008-2011*. 2012
Submitted to the US Agency for International Development by the Strengthening Pharmaceutical Systems (SPS) Program. Arlington, VA: Management Sciences for Health

¹⁶ SIAPS. 2013. Supporting Infection Control in Resource-limited Settings: Flyer

COUNTRY ACTIVITIES AND KEY ACCOMPLISHMENTS UNDER SIAPS

The SIAPS Program continued to support infection control activities by collaborating with MOH counterparts and local partners in South Africa, Namibia, Jordan, and Ethiopia. Briefly described below are the activities and accomplishments in these countries.

South Africa

Employing a country ownership approach, SIAPS has continued to provide technical support to the South Africa National Department of Health (NDoH) to strengthen the National IPC Program and implement IPC interventions to improve patient safety and effectiveness of antimicrobial therapy. The previous work centered mainly on AMR/infection control (IC) advocacy, raising awareness and transferring skills to build local stakeholders' IPC capacity. By the end of SPS, a large number of health care workers had been trained in IPC; the ICAT/CQI tool and approach had been rolled out nationwide; an IPC position had been created at the NDoH; a National IPC Policy and Strategy had been implemented; the NDoH's IPC capacity had been improved; and NDoH enjoyed improved collaboration with local and international IPC stakeholders.



SIAPS Headquarters and country staff collaborate with NDoH and Provincial Health Department staff in conducting provincial IPC capacity-building trainings

Courtesy: South Africa NDoH

SIAPS South Africa continued to engage local stakeholders and partners and support country-led coordination, in line with the Global Antibiotic Resistance Partnership (GARP)/South Africa Collaborative Initiative framework (figure 2).¹⁷

¹⁷ Kim Faure. 2013. CDDEP *GARP South Africa Status Update Report*. Center for Disease Dynamics Economics and Policy. Washington, DC.

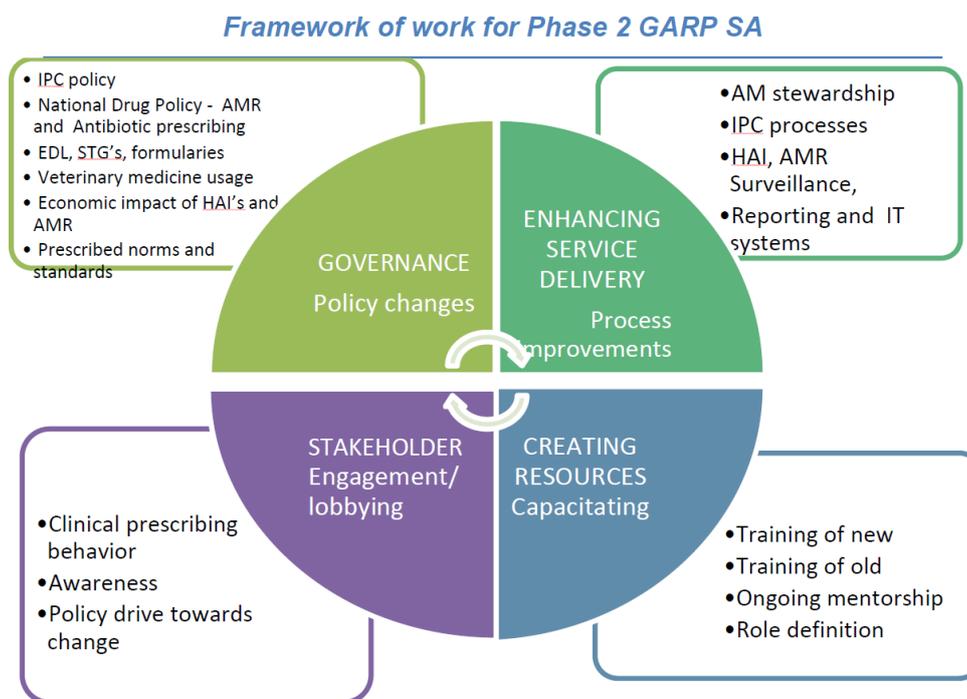
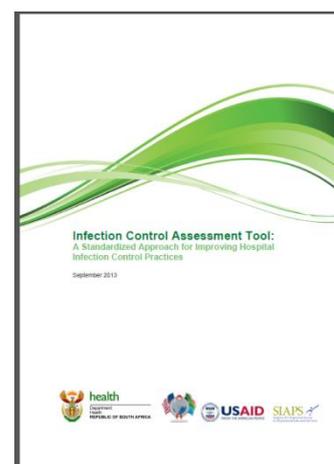


Figure 2. Framework for Phase 2 South Africa GARP work

Key activities and accomplishments thus far include:

- When the GARP collaborative initiative started in South Africa in 2013, SIAPS participated in helping develop the national AMR strategy as well as national core standards for IPC. The infection prevention mandate included in the national core standards and reference to the ICAT will help ensure institutionalization and regular use of the ICAT for continued improvement and monitoring of IPC practices.
- In March 2014, the Director General of Health and Minister of Health endorsed and commissioned the South Africa ICAT,¹⁸ as the official standardized tool and approach to improve the country's health facility IPC. The endorsement signifies South Africa's ownership of the ICAT as a national tool to be used at all health facilities. The authorities emphasized the systematic quality improvement approach of the ICAT and its key role in providing the necessary governance, support, and guidance needed by health facilities.



ICAT/South Africa

Courtesy: South Africa NDoH

¹⁸ National Department of Health. 2014. Infection Control Assessment Tool: A Standardized Approach for Improving Hospital Infection Control Practices. Pretoria: Government of South Africa

This document can be accessed online here: <http://siapsprogram.org/publication/infection-control-assessment-tool-a-standardized-approach-for-improving-hospital-infection-control-practices/>

- In a foreword statement in the South Africa ICAT, the Minister of Health, Dr. A. Motsoaledi, MP, noted: “This Infection Control Assessment Tool provides the required systematic approach that infection control teams can on a daily basis apply in our health facilities to firstly identify risky practices and physical areas of work and to subsequently develop and implement corrective measures that reduce risks of poor and unsafe care.... Developed with extensive inputs from many different partners, the tool directly aligns with the expected levels of care as described by the infection prevention and control sections of the *National Core Standards for Health Establishment*, thus becoming another valuable tool that health care professionals can use to help meet our vision of a long and healthy life for all South Africans.”

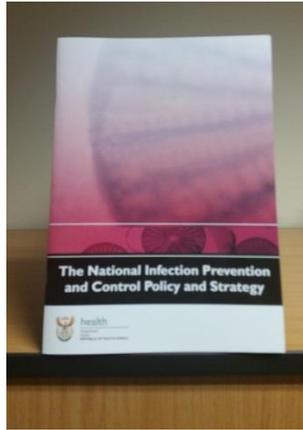
The Director General of Health Ms. M. P. Matsoso added: “This Infection Control Assessment Tool has been designed to assist managers and provide quality improvement teams such as the countrywide Health Facility Improvement Teams with a framework to use to identify, control and prevent health care-acquired infections through the implementation of risk assessments and clinical audits.... This assessment tool comes at a time when a renewed focus is being placed on providing the necessary governance, support and guidance needed by facilities to meet the required levels of care as respectively described in the *National Core Standards for Health Establishments* and the *National Infection Prevention and Control Policy and Strategy*.”

In an e-mail to SIAPS, the NDOH Director of Quality Assurance Dr. Louis Claassens noted: “The distribution of the ICAT really looks impressive. But, more important, I have been around many of the provinces lately and they are all using it!! That is really good news. Should we not start thinking of a process whereby we obtain the inputs of the users of the ICAT that could inform a revised (if necessary) second edition of the ICAT?”

- As the NDoH identified AMR as a public health priority, SIAPS worked with the national team to organise a stakeholder consultative meeting on the topic. The meeting provided a platform for stakeholders to discuss and collaboratively develop a national AMR strategy with a strong IPC component. At this high level meeting that was chaired by the Director General of Health, copies of the ICAT were distributed to all the participating experts. During the meeting, the strengths, weaknesses, opportunities and threats of the health system in relation to AMR were analysed and later compiled in the AMR Background Document, which specifically identifies the ICAT as the national IPC tool and one of the key current IPC strengths. The National AMR Strategy Framework 2014–2024 is now a national top priority and falls under the Director General of Health. The strategy includes promotion of proper hand hygiene, a key IPC intervention, which is also recommended in the ICAT, the World Health Organization’s (WHO) Global Strategy for Containment of AMR, and the WHO Global Action Plan on AMR.^{19, 20}

¹⁹ WHO (World Health Organization). 2001. *WHO Global Strategy for Containment of Antimicrobial Resistance*. WHO/CDS/CSR/DRS/2001.2a. Geneva: WHO.

²⁰ WHO Global Action Plan on Antimicrobial Resistance
http://apps.who.int/iris/bitstream/10665/193736/1/9789241509763_eng.pdf?ua=1



South Africa National IPC Policy and Strategy

Courtesy: South Africa NDoH

Subsequently, SIAPS provided technical assistance to NDoH in preparation for and during the AMR Summit that was held in Johannesburg on October 16, 2014. The summit’s purpose was to obtain “high-level commitment from key stakeholders to invest relevant resources and implement sound strategies and interventions to manage antimicrobial resistance, to limit further increase in resistant microbial infections, and improve patient outcomes and create awareness of intersectoral collaboration activities on antimicrobial resistance.” The meeting was chaired by the Director General of Health and attended by the Minister of Health. To ensure an intersectoral approach to the fight against AMR, the Department of Agriculture, Forestry and Fisheries; and Department of Sciences and Technology were represented as well as universities, the private sector, regulatory bodies, civil societies, and partners. A commitment poster was developed based on the strategic objectives of the Antimicrobial Resistance National Strategy Framework 2014-2024 and signed by key stakeholders, including MSH, as they pledged to support the implementation of the strategy (picture).

Antimicrobial Resistance National Strategy Framework Commitments

The purpose of the Antimicrobial Resistance National Strategy Framework is to provide a framework for managing Antimicrobial Resistance (AMR), to limit further increase in resistant microbial infections, and improve patient outcomes.

Strategic objectives	Strategic enablers	Commitments	Time Frames & Actions
Governance Structures Strengthen, coordinate and institutionalise interdisciplinary efforts through national and health establishment level governance structures. Surveillance Develop surveillance and early detection of antimicrobial resistance to enable reporting of local, regional, and national resistance patterns to national entities and targeted antibiotic choice. Infection Prevention & Control Enhance infection prevention and control of the quality of patient care in healthcare settings, training on improvement in hand hygiene and the identification and isolation of patients with resistant organisms. Community measures include preventing infection through wide-reaching vaccination programmes and interventions in water and agriculture. Antimicrobial Stewardship Promote appropriate use of antimicrobials in human and animal health through stewardship. Effective policies and protocols. Stewardship at point-of-care. National stewardship guidelines. Appropriate antibiotic choice.	Legislative and policy reforms for health systems strengthening to support the quality of antimicrobials in the country and to enable control over prescribing of antimicrobials in the animal health sector. Education of all levels of health providers in human health and agriculture in the correct concepts of antimicrobial stewardship, infection control, infection prevention, microbiology and pharmacology. Communication to educate the public, create awareness of the dangers of inappropriate antimicrobial use and enhance patient advocacy to combat antimicrobial resistance. Research into novel diagnostics, such as point-of-care testing, new antimicrobials and implementation of stewardship guidelines, treatment outcomes, antimicrobial stewardship.	1. To establish an intersectoral, multidisciplinary organisation and government is strengthened, to enhance and institutionalise efforts to address antimicrobial resistance. 2. To establish a national surveillance system to track and report resistant organisms and antimicrobial use in agriculture and human health. 3. To strengthen processes, systems, stewardship at point-of-care, national stewardship guidelines, effective infection prevention & control. 4. To provide the appropriate use of Antimicrobials in human and animal health through antimicrobial stewardship, to facilitate its effective enabling legislation and regulation. 5. To build the capacity and strengthen the competencies of clinical and laboratory professionals and improve the staffing levels of the workforce in antimicrobial stewardship and infection prevention & control. 6. To increase the community awareness of Antimicrobial Resistance. 7. To promote research into novel diagnostics and stewardship in Infection Prevention & Control and antimicrobial resistance.	Short term – March 2014: Establishment and initial meeting of Antimicrobial Stewardship Committee. Short to medium term 2015 - 2019: Strengthen governance at Health Establishment level. Short term 2015 - Develop an Antimicrobial Resistance map for South Africa through data sharing between the private and public sector laboratory services. Short term 2015 - Ensure the equipment and Infection Prevention & Control manuals required to practice effective hand hygiene are available at all times in all Health Establishments. Medium term 2015 - 2018 - All Health Establishments meeting objectives of the National Core Standards relating to Antimicrobial Stewardship and Infection Prevention & Control. Short term 2015 - Ensure availability of Antimicrobials according to Essential Medicines List of all Health Establishments. Medium term 2015 - 2018 - Review of antimicrobials use in food systems. Medium term 2015 - 2018 - Development of strategy and operational plan for the regulation and management of antimicrobial resistance and infection prevention & control training for all health professionals and provide regular continuing education of health care professionals in South Africa. Short term 2014 - 2015 - Develop of awareness campaigns relating to Antimicrobial Resistance based on past successful campaigns. Long term 2018 - 2024 - Define research capabilities.

National Department of Health of the Republic of South Africa
Participating Stakeholders from Various Sectors, each Company represented herein as follows:

GOVERNMENT	LABORATORY SERVICES	CLINICIAN SOCIETIES	CIVIL SOCIETY	REGULATORY SOCIETIES

Signed on this 16th day of October 2014 in Johannesburg as The Antimicrobial Resistance National Strategy Framework Commitments

South Africa AMR National Strategy Framework Commitments

Courtesy: South Africa NDOH

- SIAPS also contributed to the development of the “Implementation Plan for the Antimicrobial Resistance Strategy Framework in South Africa: 2014–2019,” which has IPC as a key component.²¹
- SIAPS collaborated with the University of KwaZulu Natal and other local stakeholders in implementing IPC activities. The SIAPS Program helped train the KwaZulu Natal Medical University’s honor’s degree students on IPC and ICAT. The students subsequently used different ICAT modules as part of their research projects at health facilities in the KwaZulu Natal Province. A PhD student at the same university also used the ICAT intensive care unit (ICU) module at the public and private facilities for his thesis.
- Master degree students at the School of Pharmacy, Medunsa Campus, University of Limpopo, were trained on IPC and ICAT. They were given assignments on the modules of their choice to assess IPC practices in facilities and to develop quality improvement plans. It has been agreed with the University management to include IPC and ICAT in the curriculum.

- SIAPS also assisted the NDoH to train senior pharmacists in the public sector.

- SIAPS helped reprint and widely disseminate the hand hygiene posters that were developed under SPS.

- In addition to advocating for IPC staff at the NDoH, SIAPS continues to support the following–



SIAPS supports countries in the development and use of IPC guidelines, tools, and job aids like this hand hygiene poster from South Africa.

Courtesy: South Africa NDOH

- Dissemination of the ICAT to all the districts and provinces according to the national dissemination plan
- Implementation of one-day refresher courses in the districts with support from provincial IPC quality assurance coordinators with focus on hand hygiene to support NDoH activities on Ebola
- Provision of pre-service training to under and postgraduate students
- Collaboration with the Office of Health Standards Compliance in the implementation of the IPC-related aspects of the National Core Standards for Health Establishments

IPC is a high priority action for the South African NDoH. There is clear country ownership, local leadership, and high-level support and coordination in this area, along with a participatory quality improvement approach that involves multiple local partners and stakeholders. This environment supports sustainability of IPC activities in the country. However, lack of designated staff to lead IPC activities at NDoH level continues to be a challenge. There is need for a dedicated staff member in the NDoH to guide the process.

²¹ South Africa Department of Health. Implementation Plan for the Antimicrobial Resistance Strategy Framework in South Africa – 2014–2019. <http://www.health.gov.za/index.php/component/phocadownload/category/199-antimicrobial-resistance>

Namibia

Following adoption and successful piloting of the ICAT and CQI approach in a few hospitals with support from SPS, the Namibian Ministry of Health and Social Services (MoHSS) adopted the ICAT as the official tool for IC and further implemented it in collaboration with SIAPS. SIAPS provided technical assistance to the MoHSS's Quality Assurance Division in the implementation of IPC and medical waste management activities. As part of the IPC improvement effort, the MoHSS adopted and implemented the ICAT/CQI tool and approach in all the 35 district hospitals in Namibia.²²

SIAPS collaborated with the MoHSS and a local firm, AAB Consulting CC, to implement the following activities:

- Strengthened the MoHSS' infection prevention control (IPC) technical policy manuals and guidelines. Specifically, four guidelines—infection prevention and control (IPC), Operation Theater (OT), Central Sterilization Services Department (CSSD), and Phlebotomy—were developed, reviewed by key health workers, and finalized. Forty health professionals including regional staff, nurses and environmental health practitioners from all 14 regions of the country were then trained on how to apply the tools to strengthen IPC in healthcare facilities. Training of trainers (TOT) workshops²³ were conducted with key health workers from the country's 35 health districts to capacitate them to disseminate and roll out implementation of the IPC guidelines and tools nationwide.



Participants at national workshop to review IPC guidelines. Photo by SIAPS, Namibia

- Provided ongoing technical support to 35 district hospital IPC committees to capacitate and broaden their scope to other IPC areas by revising IPC Committee terms of reference (TOR) and training nurses on them. Held a national workshop with IPC nurses to review TOR for national, regional, and district level IPC committees.

²² DAAB CONSULTING CC Quarterly Progress Report, D Witbooi July – September 2014, submitted to SIAPS, Namibia

²³ DAAB CONSULTING CC Quarterly Progress Report, D Witbooi July – September 2014, submitted to SIAPS, Namibia

Oriented 47 health care workers on the revised TOR implementation during the TOT on IPC guidelines (the participants of the two workshops were essentially the same).²⁴

Photo by SIAPS, Namibia

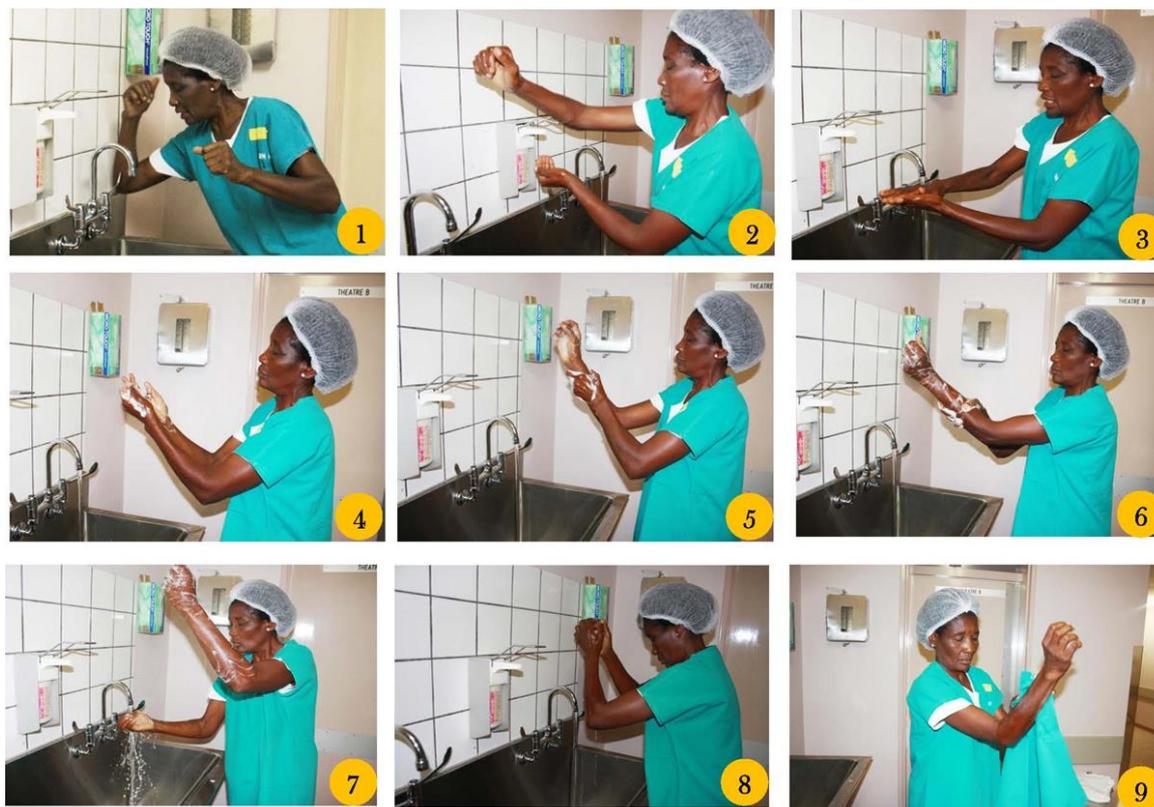


Figure 3. An instructor demonstrates key steps for hand washing during a TOT workshop in Namibia.

- Contributed to health facility medical waste management by training health staff to enforce guidelines on how to properly segregate waste at the source and review alternative methods of disposing of potentially infectious waste. This activity includes supporting the MoHSS in printing the ICAT and disseminating the integrated health care waste management plan.
- Trained nurses, waste handlers, hospital managers, procurement officers and environmental health assistants on aspects of segregation of waste and waste management for Central and Katutura Intermediate Hospitals.
- Ongoing technical support to review existing medical waste management and injection safety/infection control recording and reporting tools, and to integrate the revised tools into the national reporting and surveillance systems.

SIAPS Namibia is also collaborating with the University of Namibia's School of Medicine to help coordinate activities related to IPC, including hospital-acquired infections.

²⁴ DAAB CONSULTING CC Quarterly Progress Report, D Witbooi July – September 2014, submitted to SIAPS, Namibia

Jordan

Jordan has an objective to strengthen national and institutional capacity for effective, safe, and cost-efficient use of antimicrobials to help contain antimicrobial resistance and improve patient outcomes. To support this, SIAPS/Jordan provided technical assistance to key hospital staff and relevant IC stakeholders at three Jordanian public sector hospitals in pilot program of a CQI approach-based intervention to improve the prophylactic use of antibiotics in cesarean section (CS). The process engaged all related hospital stakeholders, including the ICC. The intervention involved

- Measuring baseline antibiotic prescribing practices
- Developing evidence-based protocols and procedures for prophylactic use of antibiotics in CS
- Tracking and monitoring indicators on prescribing practices, surgical site infections, and cost
- Applying team problem-solving techniques in designing and implementing appropriate, evidence based solutions to correct identified problems²⁵

Key decision-makers at hospital and central MOH directorate level were also engaged to institutionalize CQI activities into their budgeted work plans. A training workshop on Review of the CS Antibiotic Prophylaxis Program and Rational Medicine Use and Infection Control in Jordan was conducted to capacitate key staff from the participating hospitals to identify medicine use problems, conduct medicine use evaluations, and improve infection control practices using ICAT combined with CQI.

Prior to the workshop, SIAPS provided orientation to the hospital teams on the ICAT and assisted to conduct sample IC assessments for key practice areas at each hospital. Hospitals conducted the following assessments:

- Prince Faisal Hospital—hand hygiene, waste management
- Prince Hussein Hospital—hand hygiene, IV fluids; and medication injections
- Totanji Hospital—hand hygiene, labor and delivery.

Through these preliminary assessments, the stakeholders were able to get a general overview of problems with practices in their respective hospitals, and appreciate the value of self-assessments in identifying specific problems and developing targeted interventions to improve infection control practices.²⁶

Ethiopia

SPS supported the Ethiopian Food, Medicines, and Healthcare Administration and Control Authority (FMHACA) to conduct the Antimicrobial Use, Resistance, and Containment

²⁵ Gammouh S and Joshi M. 2013. Improving Antibiotic Prophylaxis in Cesarean Section in Jordanian Hospitals: SIAPS Technical Report. Submitted to the US Agency for International Development by the Systems for Improved Access to Pharmaceuticals and Services (SIAPS) Program. Arlington, VA: Management Sciences for Health. <http://apps.who.int/medicinedocs/documents/s21698en/s21698en.pdf>

²⁶ Green, T. and S. Gammouh. 2012. *Review of the Cesarean Section Antibiotic Prophylaxis Program in Jordan and Workshop on Rational Medicine Use and Infection Control, Amman, Jordan, March 25 – 28, 2012: Trip Report*. Submitted to the U.S. Agency for International Development by the Strengthening Pharmaceutical Systems Program. Arlington, VA: Management Sciences for Health

Baseline Survey²⁷ in 2009. After this baseline survey, the SPS program had helped the Ethiopian Government develop the “National Strategic Framework for the Prevention and Containment of Antimicrobials Resistance in 2011”²⁸ and a national plan of action. Infection prevention and control is one of the five objectives included in this national strategy.

Based on the AMR baseline survey and the National Strategy, SIAPS has supported FMHACA in implementing the following activities:

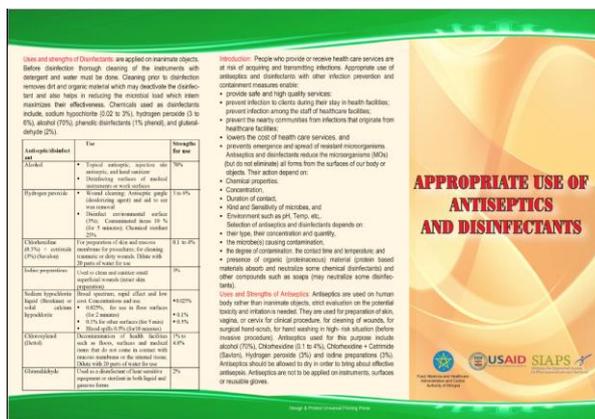
- Assisted key hospital-based structures, including ICCs and Medicines (Drugs) and Therapeutics Committees in implementing AMR advocacy or containment-related activities in Ethiopia.
- IPC in health facilities, and individual and environmental hygiene and sanitation are part of the capacity building training courses on AMR and rational medicine use for journalists/media personnel. This provides the news media with solid information on AMR containment and rational use of antimicrobials that they can then utilize to inform, educate, and empower the public about these issues. As a result of these efforts, the TV, radio, and print media have disseminated a wide range of information. Five of the media pieces were on infection prevention, and personal and environmental hygiene and sanitation.^{29,30} An Amharic poster that describes the containment of AMR also indicated infection prevention as a top priority intervention.
- SIAPS contributed to the National Technical Working Group (TWG) on Infection Prevention and Patient Safety (IPPS) and in the preparation of a facilitators’ guide on management training for health care facilities managers (July 2012).
- To improve health care providers’ awareness about AMR containment, a brochure titled “Appropriate Use of Antiseptics and Disinfectants,” which deals with the proper selection, preparation and use of antiseptics and disinfectants, was developed and used in health facilities. Another brochure titled “Antimicrobials Resistance: Basic Facts for Healthcare Providers” was developed featuring IPC and distributed to health facilities.

²⁷ DACA and MSH/SPS (2009). Antimicrobials Use, Resistance and Containment Baseline Survey Syntheses of Findings. DACA and MSH/SPS, August 2009, Addis Ababa.

²⁸ EFMHACA (August 2011). National Strategic Frame Work for the Prevention and Containment of Antimicrobials Resistance, August 2011.

²⁹ Andualem, Tenaw. 2014. Outcomes of the Journalists’ Capacity-Building Intervention in the Prevention and Containment of Antimicrobials Resistance in Ethiopia, 2012 to 2014. Submitted to the US Agency for International Development by the Systems for Improved Access to Pharmaceuticals and Services (SIAPS) Program. Arlington, VA: Management Sciences for Health.. <http://siapsprogram.org/publication/outcomes-of-the-journalists-capacity-building-intervention-in-the-prevention-and-containment-of-antimicrobial-resistance-in-ethiopia-2012-to-2014/>
<http://siapsprogram.org/publication/outcomes-of-the-journalists-capacity-building-intervention-in-the-prevention-and-containment-of-antimicrobial-resistance-in-ethiopia-2012-to-2014/>

³⁰ Tenaw Andualem (May 2015). AMR blog: Containing AMR in Ethiopia: What role do the media play? <http://siapsprogram.org/2015/06/11/containing-amr-in-ethiopia-what-part-does-the-media-play/>



Appropriate Use of Antiseptics and Disinfectants
Courtesy: Ethiopia FMHACA

- SIAPS supported and presented a paper as a panelist at the Annual Scientific Conference of the Ethiopian Society of Internal Medicine (ESIM) organized on June 13–14, 2015, with the theme “Nosocomial Infections and AMR.”
- The Strategy for the Prevention and Containment of Antimicrobial Resistance for Ethiopia has been revised for the period 2015 to 2020 to reflect changing evidence and development in combatting AMR. This includes the objective “Improve Infection Prevention and Contain the Spread of Resistant Microorganisms across Humans and Animals and in Healthcare Setting through Individual and Environmental Sanitation and Hygiene and Infection Prevention Measures.”
- The SIAPS Program also provided technical assistance to the FMHACA to organize five regional popularization workshops at different locations covering all regions of the country following the finalization and publication of the “Medicines Waste Management and Disposal Directive” to ensure prevention of environmental hazards. The objectives of the popularization workshop were: to familiarize stakeholders on how to protect public health and the environment by ensuring safe disposal of medicines waste; to introduce stakeholders to cost-effective safe disposal methods based on international best practices and country context; to familiarize stakeholders working at different levels with their roles and responsibilities; to emphasize the importance of complying with the national disposal directives; to promote the involvement of the private sector in medicines waste management and disposal services; and to strengthen monitoring and evaluation system for medicines waste management and disposal practices.³¹



Participants gather at a waste management workshop held at Mekelle, Tigray Regional State from October 20–21, 2012. Photo credit: MSH.

³¹ Ejigu E, Tadege H, Mekonnen N. Establishment of Medicines Waste Management and Disposal System in Ethiopia: a Report on Progress and Achievements. 2012. Submitted to the US Agency for International Development by the Systems for Improved Access to Pharmaceuticals and Services (SIAPS) Program. Arlington, VA: Management Sciences for Health.

CONCLUSION

The WHO Global Strategy and Global Action Plan on AMR recommend IPC as a key intervention to support AMR containment.

SIAPS has supported IPC interventions in several countries. The SIAPS-supported ICAT/CQI is a simple and practical approach for assessing the adequacy of existing IPC practices and provides specific recommendations for improving practices and monitoring their effectiveness over time. The approach promotes teamwork, is easy to use, yields quantifiable improvements in health facility IPC, can be tailored to unique country context, and is sustainable. The approach can also be applied at the primary health care level.

Through the use of ICAT and CQI, health facilities have coordinated implementation of simple, locally appropriate low-cost IPC interventions, such as hand hygiene and waste management. Despite challenges, including a shortage of staff and other resources, health facilities in the implementing countries have managed to improve IPC practices.

SIAPS' ICAT/CQI implementation experiences have been shared through trainings and reports, and as presentations at international and local conferences.^{32,33}

The ICAT and its complementary user manual are available for download in English, French, and Spanish. The ICAT–PHC is also available for download in English. They can be accessed at: <http://siapsprogram.org/approach/pharmaceutical-services/antimicrobial-resistance/>

³² Goredema, W. et al. 2011. *Implementing a Self-Assessment and Continuous Quality Improvement Approach to Improve Hospital Infection Control Practices in Africa and Latin America*. Poster presented at the Third International Conference for Improving Use of Medicines (ICIUM₂₀₁₁), in Antalya, Turkey <https://docs.google.com/viewer?a=v&pid=sites&srcid=bXNoLm9yZ3xzczHMtYXJjaGl2ZXxneDo0MTQzMGY1YjkwMjc3OTM3>

³³ Goredema W et al. 2015. Strengthening Infection Prevention and Control Systems in Resource-Limited Settings Using a Self-Assessment and Continuous Quality Improvement Approach. Poster presented at the 15th International Congress of the International Federation of Infection Control and XIII National Conference of the Hospital Infection Society, New Delhi, India, 22nd to 24th March, 2015. <http://siapsprogram.org/publication/strengthening-infection-prevention-and-control-ipc-systems-in-resource-limited-settings-using-a-self-assessment-and-continuous-quality-improvement-cqi-approach/>