



USAID
FROM THE AMERICAN PEOPLE

SIAPS
Systems for Improved Access
to Pharmaceuticals and Services

TECHNICAL BRIEF

Antimicrobial Stewardship

ENSURING THE CONTINUED EFFECTIVENESS OF MEDICINES THROUGH APPROPRIATE USE

The rapid rise in antimicrobial resistance (AMR) has increased global momentum to establish antimicrobial stewardship programs in health facilities, clinics, and hospitals. The overuse or misuse of antimicrobial medicines is a key driver of AMR and a growing global health problem.¹ Antimicrobial stewardship programs can address inappropriate use of antimicrobials and help slow the spread of AMR through systems-level approaches supported by policies, structures, and interventions.²



CONTEXT

Comprehensive antimicrobial stewardship programs have demonstrated success in reducing inappropriate antimicrobial use by as much as 36% in hospitals.³ These strategies help preserve the efficacy and future use of antimicrobials which can in turn reduce adverse drug events, lower healthcare costs, and ultimately, improve patient outcomes.⁴

Antimicrobial stewardship refers to coordinated interventions designed to improve and measure the appropriate use of antimicrobials by promoting the selection of the optimal antimicrobial drug regimen, dose, duration of therapy, and route of administration.⁵

Although many countries have begun to adopt and promote antimicrobial stewardship policies and practices, these programs are largely absent from health facilities in low-income countries.

- Development and implementation of standard treatment guidelines, essential medicines lists, and medicine formularies
- Medicine use evaluations
- Development of antimicrobial stewardship strategies and committees
- Revision of pre-service curricula to include rational medicines use and AMR
- Training journalists and dissemination of appropriate materials for media
- Collaboration and coordination with professional associations
- Use of early warning indicators (EWI) for HIV drug resistance

The case study further outlines how the SIAPS technical framework was used to implement antimicrobial stewardship programs in several Jordanian hospitals.



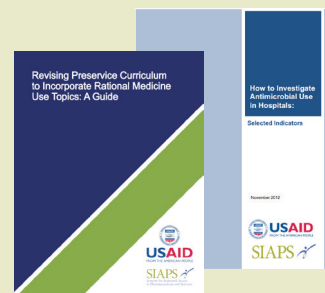
TECHNICAL APPROACH

SIAPS follows an evidence-based and systems-focused framework to implement program activities. Whenever possible, an initial baseline analysis is conducted, followed by interventions driven by data, rooted in a country's specific context, and focused on strengthening the various building blocks of the health system. Using this approach, SIAPS promotes antimicrobial stewardship and works to increase appropriate use of antimicrobials in low- and middle-income countries through:

- Local advocacy and coalition building for stewardship programs

Key SIAPS Reference Materials:

- *How to Investigate Antimicrobial Use in Hospitals: Selected Indicators*
- *Revising Pre-service Curriculum to Incorporate Rational Medicine Use Topics: A Guide*
- *Infection Control Self-Assessment Tool for Primary Health Care Facilities (ICAT-PHC)*
- *Preventing and Minimizing Risks Associated with Anti-TB Medicines*





Case Study: Evidence-Based Antimicrobial Stewardship Initiatives in Jordan Improve Antibiotic Prophylaxis for Cesarean Section⁶

Antibiotics used to prevent surgical infections account for as much as half of all antibiotics used in hospitals but are a frequent source of incorrect or inappropriate medicines use.⁷ A recent study conducted by the Jordan Food and Drug Administration (JFDA) found antimicrobials used for prophylaxis during common surgical procedures, like cesarean section, were frequently administered inconsistently or inappropriately.⁸ To help address this issue, SIAPS and its predecessor program SPS provided technical assistance to three hospitals in Jordan to strengthen antibiotic prophylaxis practices for cesarean section.

Working with a multidisciplinary team of stakeholders in each hospital, baseline data were collected and evidence-based recommendations were made. The hospital stakeholders fully owned this initiative, spearheading the development of customized protocols and procedures for the prophylactic use of antibiotics. A cesarean section log, Excel monitoring tool, and indicators were established, which standardized tracking of antibiotic prophylaxis practices in each facility.

Applying the principles of continuous quality improvement (CQI) to help implement the new protocols and procedures in their respective facilities, stakeholders from each facility worked together to identify gaps and improve processes. Results from all three hospitals indicate good compliance to the protocols and procedures as measured by the use of the preferred prophylactic antibiotic (cefazolin), the timing of administration, and the number of doses administered.

In addition, when compared to baseline costs, the hospitals experienced cost savings of approximately 10,905 Jordanian Dinars, or 15,397 USD, in 2012. Based on the experience from the three hospitals, the Ministry of Health developed, approved, and mandated in February 2013 a unified antibiotic prophylaxis protocol for cesarean section in all public, ministry-run hospitals providing obstetrics and gynecology services.

Application of the SIAPS Technical Framework to Help Improve Antibiotic Prophylaxis for Cesarean Section in Jordan⁹

■ Initial analysis

- Initial rapid appraisal and options analysis performed

- Local data on antimicrobial use in Jordan collected

■ Evidence-based approach

- International evidence and best practices regarding antibiotic prophylaxis in cesarean section compiled
- Baseline data on antibiotic prophylaxis for cesarean section at the three participating hospitals collected
- Medicines use protocols and procedures developed by hospital stakeholders

■ Stakeholder engagement

- Participation and engagement from a wide range of stakeholders from each hospital and from the Hospital Administration arm of the Ministry of Health

■ Health system strengthening building blocks

Leadership and governance

- Interdisciplinary effort coordinated between health providers, departments, and units
- Roles and responsibilities delineated through protocol/procedures
- Engagement of medicines and therapeutics committees and infection control committees
- Aligned with hospital accreditation process

Human resources

- Training of stakeholders on current evidence, best practices, and recommendations
- Skills development on CQI principles

Information

- Use of worksheet, cesarean section log, and Excel monitoring tool to track key indicators over time

Medical products

- Ensuring availability of the preferred antibiotic (cefazolin) in hospitals (not available when the program started)

Finance

- Evidence-based, cost-effective interventions
- Analysis and tracking of financial costs

Service delivery

- Development of evidence-based standard protocol and procedures
 - Selecting the right antibiotic
 - Specifying appropriate timing of use
 - Specifying number of doses

■ Data-driven results

Combined results for the three participating hospitals

- Average cost for antibiotic prophylaxis per case decreased by 79%
- Average surgical site infection rate of 1.59% (within international rates^{10,11})

Indicator	2010	2012*
Correct antibiotic use	0%	86%
Correct timing of first dose (less than one hour before skin incision)	0%	92%
Correct number of doses (single dose except for pre-identified exceptions)	0%	88%

*Per the cesarean section log which captured data from 81% of all cesarean sections performed at the participating hospitals

■ Institutionalization and sustainability

- Antibiotic prophylaxis protocol for cesarean section developed and mandated for all MOH hospitals providing ob/gyn services
- Spill-over effect
 - Initiation of similar programs by other hospitals not included in the initial pilot
 - Expansion to other surgical procedures (hernia)
- Contributed to Health Care Accreditation Agency's national quality and safety goals, one of which is appropriate use of prophylactic antibiotics during surgeries

ENDNOTES

1. Holloway K, van Dijk L. *The World Medicines Situation 2011: Rational Use of Medicines*, WHO, 2011.
2. *Guidelines for Antimicrobial Stewardship in Hospitals in Ireland*. Published on behalf of SARI by HSE Health Protection Surveillance Centre, Dublin, 2009.
3. Dellit TH et al. Infectious Diseases Society of America and the Society for Healthcare Epidemiology of America Guidelines for Developing an Institutional Program to Enhance Antimicrobial Stewardship. *Clinical Infectious Diseases* 2007; 44:159–77
4. McKenzie D et al. Antimicrobial Stewardship: What's It All About? *Australian Prescriber* 2013;36:116–20
5. Antimicrobial Stewardship page. IDSA website. http://www.idsociety.org/stewardship_policy/. Accessed June 4, 2014.
6. 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.
7. Munckhof W. Antibiotics for Surgical Prophylaxis. *Australian Prescriber* 2005; 28: 38-40.
8. Jordan Food and Drug Administration. Rational antibiotic use in Jordan: auditing antibiotic use targeting surgical prophylaxis at Jordanian hospitals. JFDA, Rational Drug Use Department, May 2009.
9. 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.
10. National Collaborating Centre for Women's and Children's Health. Caesarean Section. National Institute for Clinical Excellence; April 2004.
11. Ghuman M et al. Post-caesarean section surgical site infection: rate and risk factors. *The New Zealand Medical Journal* 2011; 124.

SIAPS TECHNICAL BRIEF SERIES | This document is part of a series describing the technical approaches and tools used to implement SIAPS work in Pharmaceutical Systems, Pharmaceutical Services, and Supply Chain Management. The information provided does not reflect or represent the position or views of the US Agency for International Development or the US Government.

ABOUT SIAPS | The Systems for Improved Access to Pharmaceuticals and Services (SIAPS) program works to assure access to quality pharmaceutical products and effective pharmaceutical services through systems-strengthening approaches to achieve positive and lasting health outcomes. SIAPS is funded by the US Agency for International Development (USAID) and is implemented by Management Sciences for Health. For more information, visit www.SIAPSprogram.org.



July 2014

4301 N. Fairfax Drive, Suite 400 | Arlington, VA 22203 USA

Tel: +1 (703) 524-6575 | Fax: +1 (703) 524-7898 | E-mail: siaps@msh.org | Web: www.siapsprogram.org