



**MIDDLE EAST ANTIMICROBIAL STEWARDSHIP [AMS]
NETWORK
TRAINING THE TRAINER COURSE
DEVELOPING AN AMS ACTION PLAN
DILIP NATHWANI**



**University
of Dundee**

DUBAI

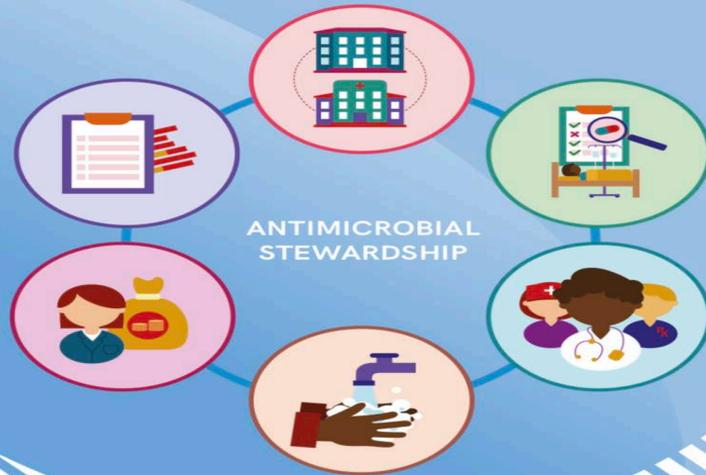
3-4TH FEBRUARY 2020

ANTIMICROBIAL STEWARDSHIP PROGRAMMES

IN HEALTH-CARE FACILITIES IN LOW- AND

MIDDLE-INCOME COUNTRIES

A WHO PRACTICAL TOOLKIT



Antimicrobial stewardship programmes in health-care facilities in low- and middle-income countries.
A WHO practical toolkit

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BOX 1

Key steps in establishing a national AMS programme to enable facility AMS

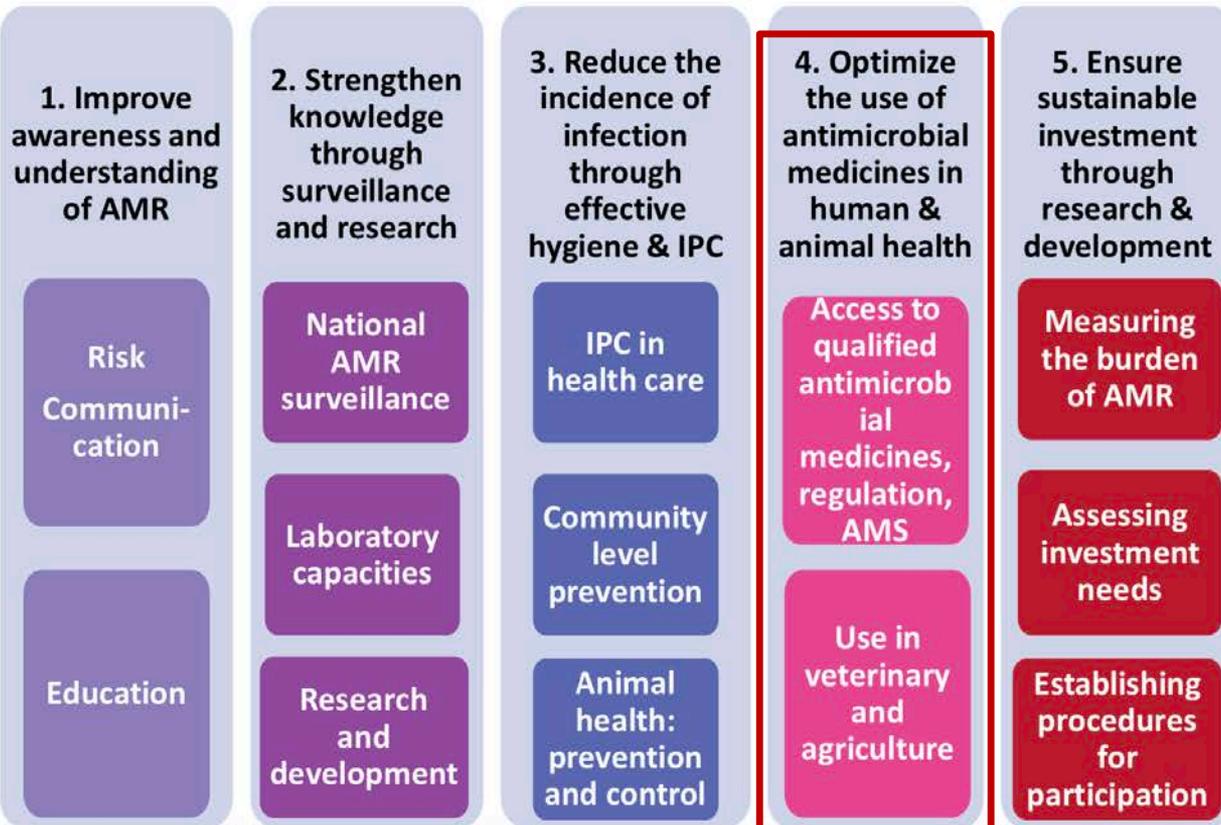
Audience: Ministry and/or department/s responsible for delivering quality-assured medical care and access to and rational use of medicines

1. Establish a governance structure – e.g. a national AMS technical working group (TWG) (Annex I) linked to the national AMR steering committee.
2. Review and prioritize the national core elements (Chapter 2):
 - 2.1. Identify what is already in place and the level of implementation required.
 - 2.2. Identify the short- and medium/long-term priority core elements.
 - 2.3. Identify the resources required.
3. Identify pilot health-care facilities (public and private) for initial AMS rollout:
 - 3.1. Tertiary teaching facilities;
 - 3.2. Regional/state and/or district facilities; and
 - 3.3. Primary care and/or community (as part of community AMS programmes not covered in this toolkit).
4. Develop a national AMS strategy* with national indicators.
5. Dedicate financial and human resources as required.
6. Monitor and evaluate implementation of the national AMS strategy (Chapter 6).
7. Facilitate access to and/or support pre- and in-service training on optimized antibiotic prescribing (Chapter 7).

* Include community and/or primary care AMS programmes (not covered in this toolkit).

Global Action Plan: Priority areas

GLOBAL ACTION PLAN
ON ANTIMICROBIAL
RESISTANCE



World Health Organization

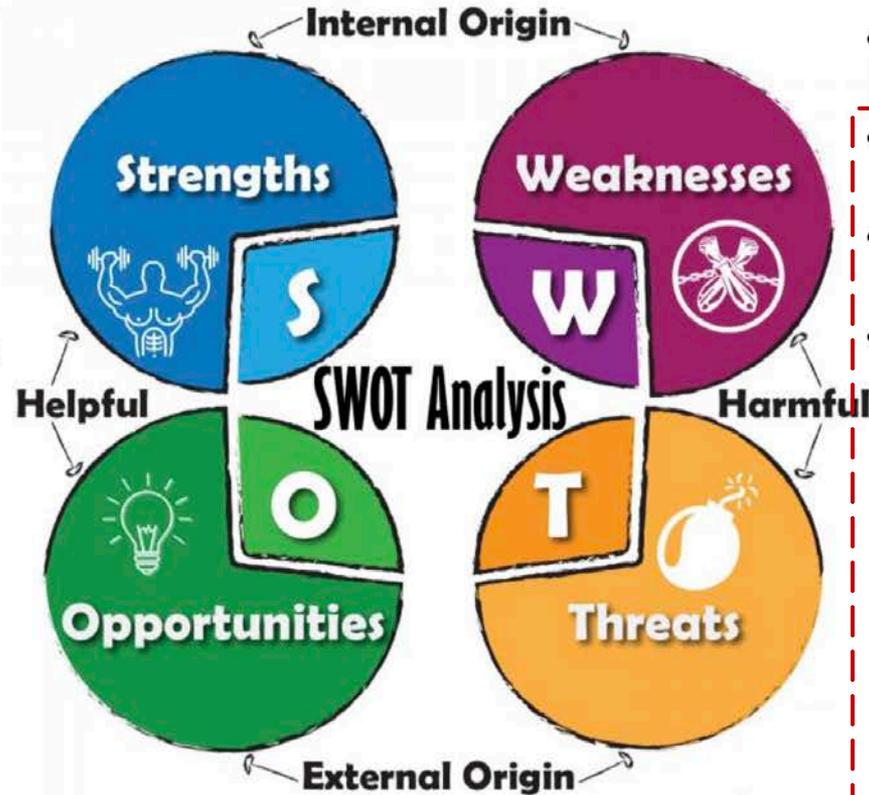
- Strengthening surveillance and monitoring, and moving towards national 'One Health' surveillance systems
- Limiting the exposure of antimicrobial-resistant pathogens to the environment
- Fostering R&D of new antimicrobial therapies, diagnostics and vaccines

SITUATIONAL ANALYSIS OF NATIONAL AMR PLAN

UAE

SWOT Analysis

- More than 60% of facilities have international accreditation
- Report to GLASS
- Test food for Pathogenic organism, imported food tested for AB residue
- Hospital standard mandate IPC and soon ASP
- No antibiotic dispensing without a prescription
- Many facilities with strong ASP&IPC
- Research and SDG encouraged



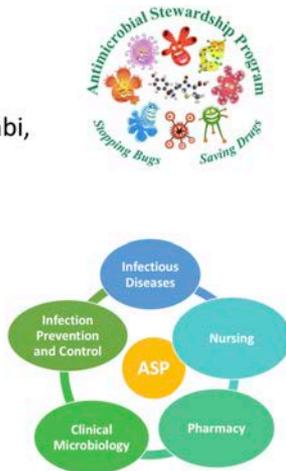
- No national reference lab
- Data mainly Abu Dhabi and Dubai
- Limited AMR surveillance in animal
- No national coordination for IPC nor ASP
- ASP is still fragmented in hospitals
- Need to audit implementation
- Population mainly expats
- Sustainability is a issue
- Different cultures and health background to deal with

NATIONAL UAE
RECOMMENDATIONS AFTER
SITUATIONAL ANALYSIS-
ACTION PLAN

UAE

Antibiotic Stewardship

- National sub-committee represents different healthcare sectors including MOHAP, DoH, Abu Dhabi, DHA and private healthcare facilities, in addition to the veterinary, agriculture and environment
- ASP mandated (Abu Dhabi) – March 2016
- Promote self-governance by requiring strong commitment from hospital leadership offering support to ASP activities
- Legislation of ASP to be a requirement in licensing standards of hospitals



Antibiotic Stewardship – outpatient clinics

- outpatient clinics should participate in ASP activities related to outpatients
- provide outpatient clinics with National Guidelines for common outpatient ID
- ABX consumption or point prevalence



Antibiotic Stewardship – Animal/food sectors

- Laws for antibiotic use in animals
- Quantify and trend antibiotic use in the veterinary practice
- Improve the awareness of veterinarians and farmers on the use of antibiotic
- Submit a yearly list of educational activities about antibiotic use in animals and agriculture through the country and use of alternatives
- Encourage research about alternatives to antibiotic in animals
- To present the results of antibiotic residue in food to ASP committee



Antibiotic Stewardship - hospitals

- Surgical antibiotic prophylaxis
- Mandate to hospitals to report to national AMR committee the KPI results of surgical antibiotic prophylaxis
- Develop national guidelines for common infections
- Surveillance of antibiotics use in humans
- Audit of baseline situation of ASP in hospitals and follow up



BOX 2

Key steps to establishing a health-care facility AMS programme

Audience: Health-care facility leadership, AMS committee and/or AMS team

1. Undertake a facility AMS situational/SWOT analysis (Chapter 4) of:
 - 1.1. Health-care facility core elements – identify what is in place and the implementation level required (Chapter 3);
 - 1.2. Available data on antimicrobial consumption (AMC) and/or use, prescription audits and AMR surveillance data (Chapter 4); and
 - 1.3. Existing AMS competencies at the facility (Chapter 7).
2. Establish a sustainable AMS governance structure based on existing structures (Chapter 4; Annexes II and III).
3. Prioritize the health-care facility core elements based on the situational analysis (Chapter 3):
 - 3.1. Identify the immediate priorities.
 - 3.2. Identify the resources required.
4. Identify AMS interventions starting with the low-hanging fruit (Chapter 5):
 - 4.1. Identify who, what, where and when.
5. Develop a health-care facility AMS action plan that specifies the human and financial resources required (Chapter 4).
6. Implement AMS interventions (Chapter 5).
7. Monitor and evaluate AMS interventions (Chapter 6).
8. Offer basic and continued educational resources and training on optimized antibiotic prescribing (Chapter 7).

Preparation for developing and implementing an AMS programme in a health-care facility

Situational or SWOT analysis

Conduct a situational or SWOT analysis using the checklist of health-care facility core elements to identify existing and missing (but priority) elements, as well as possible enablers for and barriers to implementing a facility AMS programme. Pay attention to:

- *Structures, policies and guidelines*: Identify which structures, policies and guidelines are in place and which are critically in need of being put in place according to the checklist of facility core elements (see Chapter 3).
- *Human resources*: Identify the existing and required human resources (including competencies) needed for a functioning governance structure for AMS, including the AMS committee and/or AMS team, and clinical and other staff to be involved in implementing the AMS activities.
- *Antimicrobial use and resistance data*: Review data on antimicrobial consumption and/or use, and identify challenges related to antibiotic prescribing practices in the facility and/or departments. Review existing surveillance data on AMR and aggregate antibiograms from the facility.
- *AMS activities*: Identify any existing AMS activities (including ad hoc) in the facility/wards that can be built on and made sustainable.

Facility AMS action plan

Based on the situational analysis, develop a health-care facility AMS action plan to ensure accountability, prioritize activities and measure progress. This should include the following key components:

- *Core elements*: Determine priority core elements to be implemented in the short and medium term, including accountability, timeline and indicator.
- *Governance*: Identify leadership commitment and oversight, and establish an AMS committee (new or incorporated into an existing structure) and an AMS team that is endorsed by the facility leadership.
- *AMS activities*: Identify areas for improvement, implement AMS interventions (who, what, where, when and how), monitor and evaluate, and report and feed back the results.
- *Health-care facility-wide engagement*: Ensure facility-wide engagement in the AMS programme, and empower the AMS committee and/or AMS team to undertake the AMS interventions and monitor their implementation.
- *Education and training*: Identify competencies that need to be strengthened to effectively implement AMS, and develop a facility AMS education and training plan.
- *Budget*: Develop a budget for the AMS programme, including human and financial resources required for the day-to-day running of the programme as well as for education and training on AMS of the AMS team and health-care professionals. The budget should be endorsed by the health-care facility leadership.

DEVELOPING HOSPITAL ACTION PLAN



Preparation for developing and implementing an AMS programme in a health-care facility

Situational or SWOT analysis



Conduct a situational or SWOT analysis using the checklist of health-care facility core elements to identify existing and missing (but priority) elements, as well as possible enablers for and barriers to implementing a facility AMS programme. Pay attention to:

- *Structures, policies and guidelines*: Identify which structures, policies and guidelines are in place and which are critically in need of being put in place according to the checklist of facility core elements (see Chapter 3).
- *Human resources*: Identify the existing and required human resources (including competencies) needed for a functioning governance structure for AMS, including the AMS committee and/or AMS team, and clinical and other staff to be involved in implementing the AMS activities.
- *Antimicrobial use and resistance data*: Review data on antimicrobial consumption and/or use, and identify challenges related to antibiotic prescribing practices in the facility and/or departments. Review existing surveillance data on AMR and aggregate antibiograms from the facility.
- *AMS activities*: Identify any existing AMS activities (including ad hoc) in the facility/wards that can be built on and made sustainable.

TOOL FOR CONDUCTING A SITUATIONAL OR SWOT ANALYSIS OF AMS USING CHECK LIST: AN GENERIC EXAMPLE- CAN BE USED IN LMC

GLOBAL CORE STANDARDS FOR HOSPITAL ANTIMICROBIAL STEWARDSHIP PROGRAMS

* Translations – Arabic, Mandarin, Portuguese and Spanish – are available online at the LHSN website: www.leadinghealthsystemnetwork.org/chasp

Suggested reference for this report: Ribero Pombo MH, Gandra S, Thompson D, Lamkang A, Pulcini C, Laxminarayan R. Global Core Standards for Hospital Antimicrobial Stewardship Programs: International Perspectives and Future Directions. Doha, Qatar: World Innovation Summit for Health, 2018

ISBN: 978-1-912865-11-6

CHECKLIST FOR HOSPITAL ANTIMICROBIAL STEWARDSHIP PROGRAMMING*



1. Senior management leadership towards AMS

- 1.1 Has your hospital management formally identified AMS as a priority objective for the institution and included it in its key performance indicators?
 Yes No
- 1.2 Is there dedicated and sustainable budgeted financial support for AMS activities (eg support for salary, training or IT)?
 Yes No
- 1.3 Does your hospital follow any (national or international) staffing standards for AMS activities (eg number of full-time equivalent per 100 beds for the different members of the AMS team)?
 Yes No



2. Accountability and responsibilities

- 2.1 Does your hospital have a formal, written ASP or strategy accountable for ensuring appropriate antimicrobial use?
 Yes No
- 2.2 Does your hospital have a formal organizational multidisciplinary structure responsible for AMS (eg a committee focused on appropriate antimicrobial use, a pharmacy committee, a patient safety committee or other relevant structure)?
 Yes No
- 2.3 Is there a healthcare professional identified as a leader for AMS activities at your hospital and responsible for implementing the program?
 Yes No
- 2.4 Is there a document clearly defining roles, procedures of collaboration and responsibilities of the AMS team members?
 Yes No

- 2.5 Are clinicians, other than those part of the AMS team (eg from the intensive care unit, internal medicine and surgery) involved in the AMS committee?
 Yes No
- 2.6 Does the antimicrobial stewardship committee produce regularly a dedicated report which includes, for example, antimicrobial usage data and/or prescription improvement initiatives, with time-committed short-term and long-term measurable goals for optimizing antimicrobial use?
 Yes No

- 2.7 Is there a document clearly defining the procedures of collaboration of the AMS team/committee with the infection prevention and control team/committee?
 Yes No



3. Available expertise on infection management

- 3.1 Do you have access to laboratory/imaging services and timely results to be able to support the diagnosis of the most common infections at your hospital?
 Yes No
- 3.2 In your hospital are there, or do you have access to, trained and experienced healthcare professionals (medical doctor, pharmacist, nurse etc) in infection management (diagnosis, prevention and treatment) and stewardship willing to constitute an AMS team?
 Yes No



4. Education and practical training

- 4.1 Does your hospital offer a range of educational resources to support staff training on how to optimize antimicrobial prescribing?
 Yes No
- 4.2 Do the AMS team members receive regular training in antimicrobial prescribing and stewardship?
 Yes No



5. Other actions aimed at responsible antimicrobial use

- 5.1 Is a multidisciplinary AMS team available at your hospital (eg more than one trained staff member supporting clinical decisions to ensure appropriate antimicrobial use)?
 Yes No

- 5.2 Does your hospital support the AMS activities/strategy with adequate information technology services?
 Yes No

- 5.3 Does your hospital have an antimicrobial formulary (that is, a list of antimicrobials that have been approved for hospital use, specifying whether the drugs are unrestricted, restricted – approval of an AMS team member is required – or permitted for specific conditions)?
 Yes No

- 5.4 Does your hospital have available and up-to-date recommendations for infection management (diagnosis, prevention and treatment), based on international/national evidence-based guidelines and local susceptibility (where possible), to assist with antimicrobial selection (indication, agent, dose, route and duration) for common clinical conditions?
 Yes No

- 5.5 Does your hospital have a written policy that requires prescribers to document an antimicrobial plan (includes indication, name, dosage, duration, route and interval of administration) within the medical record or during order entry for all antimicrobial prescriptions?
 Yes No

- 5.6 Does the team review or audit courses of therapy for specified antimicrobial agents or clinical conditions at your hospital?
 Yes No

- 5.7 Is advice from AMS team members easily available to prescribers?
 Yes No

- 5.8 Are there regular infection and antimicrobial prescribing-focused ward rounds in specific departments in your hospital?
 Yes No



6. Ongoing monitoring and surveillance

- 6.1 Does your hospital monitor the quality of antimicrobial use at the unit and/or hospital-wide level?
 Yes No

- 6.2 Does your stewardship program monitor compliance with one or more of the specific interventions put in place by the stewardship team (eg indication recorded in the medical notes for all antimicrobial prescriptions)?
 Yes No

- 6.3 Does your hospital monitor antibiotic susceptibility rates for a range of key bacteria?
 Yes No



7. Regular reporting and feedback

- 7.1 Does your stewardship program share hospital-specific reports on the quantity of antimicrobials prescribed, dispensed or purchased with prescribers?
 Yes No

- 7.2 Does your stewardship program share facility-specific reports on antibiotic susceptibility rates with prescribers?
 Yes No

- 7.3 Are results of audits and reviews of the quality or appropriateness of antimicrobial use communicated directly with prescribers?
 Yes No

• SWOT ANALYSIS

CHECKLIST FOR HOSPITAL ANTIMICROBIAL STEWARDSHIP PROGRAMMING*

1. Senior management leadership towards AMS

- 3.1 Has your hospital management formally identified AMS as a priority objective for the institution and included it in its key performance indicators? *Not in their priorities*
 Yes No
- 3.2 Is there dedicated and sustainable budgeted financial support for AMS activities (eg support for salary, training or IT)?
 Yes No
- 3.3 Does your hospital follow any (national or international) staffing standards for AMS activities (eg number of full-time equivalent per 100 beds for the different members of the AMS team)?
 Yes No

2. Accountability and responsibilities

- 3.1 Does your hospital have a formal, written ASP or strategy accountable for ensuring appropriate antimicrobial use?
 Yes No
- 3.2 Does your hospital have a formal organizational multidisciplinary structure responsible for AMS (eg a committee focused on appropriate antimicrobial use, a pharmacy committee, a patient safety committee or other relevant structure)?
 Yes No
- 3.3 Is there a healthcare professional identified as a leader for AMS activities at your hospital and responsible for implementing the program?
 Yes No
- 3.4 Is there a document clearly defining roles, procedures of collaboration and responsibilities of the AMS team members?
 Yes No

- 3.5 Are clinicians, other than those part of the AMS team (eg from the intensive care unit, internal medicine and surgery) involved in the AMS committee?
 Yes No *A surgeon*
- 3.6 Does the antimicrobial stewardship committee produce regularly a dedicated report which includes, for example, antimicrobial usage data and/or prescription improvement initiatives, with time-committed short term and long-term measurable goals for optimizing antimicrobial use?
 Yes No
- 3.7 Is there a document clearly defining the procedures of collaboration of the AMS team/committee with the infection prevention and control team/committee?
 Yes No

3. Available expertise on infection management

- 3.1 Do you have access to laboratory/imaging services and timely results to be able to support the diagnosis of the most common infections at your hospital?
 Yes No *only limited laboratory*
- 3.2 In your hospital are there, or do you have access to, trained and experienced healthcare professionals (medical doctor, pharmacist, nurse etc) in infection management (diagnosis, prevention and treatment) and stewardship willing to constitute an AMS team?
 Yes No

4. Education and practical training

- 4.1 Does your hospital offer a range of educational resources to support staff training on how to optimize antimicrobial prescribing?
 Yes No
- 4.2 Do the AMS team members receive regular training in antimicrobial prescribing and stewardship?
 Yes No

5. Other actions aimed at responsible antimicrobial use

- 5.1 Is a multidisciplinary AMS team available at your hospital (eg more than one trained staff member supporting clinical decisions to ensure appropriate antimicrobial use)?
 Yes No *microbiologist, pharmacist, IPC nurse only*

- 5.2 Does your hospital support the AMS activities/strategy with adequate information technology services?
 Yes No *No IT / No electronic prescribing*

- 5.3 Does your hospital have an antimicrobial formulary (that is, a list of antimicrobials that have been approved for hospital use, specifying whether the drugs are unrestricted, restricted - approval of an AMS team member is required - or permitted for specific conditions)?
 Yes No

- 5.4 Does your hospital have available and up-to-date recommendations for infection management (diagnosis, prevention and treatment), based on international/national evidence-based guidelines and local susceptibility (when possible), to assist with antimicrobial selection (indication, agent, dose, route and duration) for common clinical conditions?
 Yes No

- 5.5 Does your hospital have a written policy that requires prescribers to document an antimicrobial plan (includes indication, name, dosage, duration, route and interval of administration) within the medical record or during order entry for all antimicrobial prescriptions?
 Yes No

- 5.6 Does the team review or audit courses of therapy for specified antimicrobial agents or clinical conditions at your hospital?
 Yes No *only in ICU*

- 5.7 Is advice from AMS team members easily available to prescribers?
 Yes No *Mainly in ICU, surgery*

- 5.8 Are there regular infection and antimicrobial prescribing-focused ward rounds in specific departments in your hospital?
 Yes No *All advice by phone except ICU*

- 6.4 Does your hospital monitor the quantity of antimicrobials prescribed, dispensed or purchased at the unit and/or hospital-wide level?
 Yes No

7. Regular reporting and feedback

- 7.1 Does your stewardship program share hospital-specific reports on the quantity of antimicrobials prescribed, dispensed or purchased with prescribers?
 Yes No

- 7.2 Does your stewardship program share facility-specific reports on antibiotic susceptibility rates with prescribers?
 Yes No *ICU only*

- 7.3 Are results of audits and reviews of the quality or appropriateness of antimicrobial use communicated directly with prescribers?
 Yes No *Not done*

*Translations - Arabic, Mandarin, Portuguese and Spanish - are available online at the LHSN website: www.leadinghealthsystemnetwork.org/chaio

Source: Pulcini C et al. (2018)¹⁰

Example of a SWOT analysis for AMS readiness in a health-care facility

	HELPFUL	HARMFUL
INTERNAL/PRESENT FACTORS	<p>Strengths</p> <p><i>Core elements:</i></p> <ul style="list-style-type: none"> • AMR and AMS are a leadership priority. • IPC programme/committee is active. <p><i>Human resources:</i></p> <ul style="list-style-type: none"> • There is enthusiasm for AMS in the facility/wards. • There is clinical knowledge of AMS. <p><i>Antimicrobial use and resistance data:</i></p> <ul style="list-style-type: none"> • Prescription audit is conducted in one ward. • Facility aggregate antibiogram is available. <p><i>AMS activities:</i></p> <ul style="list-style-type: none"> • A pharmacist is involved in some AMS activities in one ward. 	<p>Weaknesses</p> <p><i>Core elements:</i></p> <ul style="list-style-type: none"> • No medical record or prescription pad is available. <p><i>Human resources:</i></p> <ul style="list-style-type: none"> • No dedicated health-care professional is available to lead the AMS team. <p><i>Antimicrobial use and resistance data:</i></p> <ul style="list-style-type: none"> • The supply of microbiology reagents is poor. • The supply of antibiotics is poor. <p><i>AMS activities:</i></p> <ul style="list-style-type: none"> • Health-care professionals have competing priorities and little time for AMS work.
	SWOT	
EXTERNAL/FUTURE FACTORS	<p>Opportunities</p> <p><i>Core elements:</i></p> <ul style="list-style-type: none"> • Active implementation of the NAP on AMR • Increasing national awareness of AMR and its consequences for health <p><i>Human resources:</i></p> <ul style="list-style-type: none"> • Incorporating AMS responsibility into the IPC committee <p><i>Antimicrobial use and resistance data:</i></p> <ul style="list-style-type: none"> • Funds for conducting a facility PPS <p><i>AMS activities:</i></p> <ul style="list-style-type: none"> • Presenting findings from AMS activities to other wards/health-care professionals 	<p>Threats</p> <p><i>Core elements:</i></p> <ul style="list-style-type: none"> • Unstable access to essential antibiotics • Increased costs for antibiotics • Prioritization of issues other than AMS in the facility • Low facility budget <p><i>Human resources:</i></p> <ul style="list-style-type: none"> • Too many nonfunctional committees in the health-care facility <p><i>Antimicrobial use and resistance data:</i></p> <ul style="list-style-type: none"> • Increasing AMR rates, including carbapenem-resistant Enterobacteriaceae (CRE) <p><i>AMS activities:</i></p> <ul style="list-style-type: none"> • Opposition from clinical leaders

Facility AMS action plan



Based on the situational analysis, develop a health-care facility AMS action plan to ensure accountability, prioritize activities and measure progress. This should include the following key components:

- *Core elements*: Determine priority core elements to be implemented in the short and medium term, including accountability, timeline and indicator.
- *Governance*: Identify leadership commitment and oversight, and establish an AMS committee (new or incorporated into an existing structure) and an AMS team that is endorsed by the facility leadership.
- *AMS activities*: Identify areas for improvement, implement AMS interventions (who, what, where, when and how), monitor and evaluate, and report and feed back the results.
- *Health-care facility-wide engagement*: Ensure facility-wide engagement in the AMS programme, and empower the AMS committee and/or AMS team to undertake the AMS interventions and monitor their implementation.
- *Education and training*: Identify competencies that need to be strengthened to effectively implement AMS, and develop a facility AMS education and training plan.
- *Budget*: Develop a budget for the AMS programme, including human and financial resources required for the day-to-day running of the programme as well as for education and training on AMS of the AMS team and health-care professionals. The budget should be endorsed by the health-care facility leadership.

DEVELOPING A HOSPITAL AMS ACTION PLAN OVER 2 YEARS

Data on antimicrobial use



- Stepwise approach
- Start small
- Build on what is existing
- Doable
- Measurable
- Assign responsibility



Hospital Antimicrobial Stewardship Programme

HOSPITAL AMS /PPS ACTION PLAN OVER 2 YEARS

1. Identify high level goals:

- Leadership commitment for AMS/PPS
- Identify accountability and responsibilities including reporting for AMS/PPS
- Sustainable monitoring: antimicrobial use surveillance (baseline and routine monitoring) – PPS
- Sustainable surveillance: diagnostics and microbiology (including antibiograms)
- Implement AMS interventions: plan, do, study, adjust
- Implement additional AMS actions: guidelines, hospital formulary restricted list, IT services
- Education and training on AMR/AMS/PPS and other infection management principles

2. Identify activities over the next 2 years (stepwise approach):

- Timeline, indicator, who is responsible, support required (internal and external)



TEMPLATE FOR AMS/PPS ACTION PLAN

Activities	Timeline (2 years)	Indicator	Responsibility	What support is required (internal/external)
Leadership commitment for ASP/PPS				
1. Develop a budget for the AMS programme and present to hospital leadership	August 2019	Budget approved for AMS programme	AMS champion (e.g. clinical pharmacist)	N/A
Accountability and responsibilities including reporting of ASP/PPS interventions				
1. Identify the draft AMS committee members, governance structure and reporting mechanism	June 2019	Draft list of committee meeting and agreement for involvement	AMS champion (e.g. clinical pharmacist)	N/A
2. Develop TOR/SOP for the AMS committee and gain endorsement from the hospital management	July 2019	AMS committee established	AMS committee	Hospital administration

HOW TO START A HOSPITAL ANTIMICROBIAL STEWARDSHIP PROGRAMME: H-ASP

PLANNING PHASE MONTH 1-2

80% PLANNING

- Prepare- training in AMS/infection management
- Toolbox of AMS interventions [process- adapt, endorse, adopt]
 - Seek multi-stakeholders support, especially clinicians, hospital leadership
 - Be familiar with core elements and checklist
 - Be familiar with regional/national plans, regulations, requirements
 - Assess local situation [SWOT analysis- use checklist]
 - Assess systems, organization-structures, governance, laboratory capacity
 - Assess/familiarize with prescribing culture/etiquette
 - Meet with people, observe-listen, understand barriers-facilitators, identify champions and early adopters
 - Set up AMS multi-disciplinary team committee, work with other key /enabling structures- IPC, Patient safety, QI, ID consultation
 - Start to design an action plan- see WHO LMIC tool kit
 - Embrace/seek QI/implementation science resource if available
 - Consider monitoring/ dissemination, evaluation and communication plan

Depends on resources, readiness, culture, priority, etc

20% IMPLEMENTATION

Providers and/or ASP Team Overwhelmed by Scope of Interventions

Suggested Solutions

- Meet with key stakeholders to survey areas of unmet need.
- Develop a priority matrix and start with one stewardship intervention based on the facility's local needs and available data and guidance in literature (e.g., surgical prophylaxis e-order set and community-acquired pneumonia); establish a sequential rollout that is inclusive of key stakeholders.
- Assess antibiotic use to look for areas where there is clear evidence of need for improvement (e.g., evaluate treatment of most commonly seen or most severe infections to identify areas for improvement).

Table 2 – Identifying Potential Areas and Activities to Include in the Action Plan		
Potential Area to Include in Action Plan	On a scale of 1-5, where 1 is of low importance and 5 is of high importance, how important is the area to include in the Action Plan? (circle only one number for each area)	Please explain your rating as to why the area is important or not to include in the Action Plan
a. Evidence informed best practices (e.g., addressing prescribing practices and prudent antibiotic use).	1 2 3 4 5 Low High Importance	
b. Management and organization of the stewardship program (e.g., including leadership, expertise, team membership and roles, an effective change management process, adequate funding).	1 2 3 4 5 Low High Importance	
c. Knowledge exchange and translation (e.g., training, education and awareness for	1 2 3 4 5 Low High	

Table 2 – Identifying Potential Areas and Activities to Include in the Action Plan		
healthcare professionals and the public; regular updates and communication to ensure providers have rates and trends of antimicrobial prescribing and are aware of new antimicrobials).	Importance	
d. Evaluation and metrics (e.g., monitoring data through local labs, measuring success of interventions and areas to improve, providing feedback and follow-up).	1 2 3 4 5 Low High Importance	
e. Patients (e.g., education, accountability).	1 2 3 4 5 Low High Importance	
f. Other areas? (please indicate, rate and explain)	1 2 3 4 5 Low High Importance	

PRIORITISING ACTION PLAN THROUGH STAKEHOLDER ENGAGEMENT AND DATA

AUDIT/REVIEW METHODS TO UNDERSTAND PROBLEM AREAS

Health-care facility PPS

Step 1: Structures and governance

- Identify the team/committee in the facility with the overarching responsibility of the PPS, often the committee also responsible for AMS
- As part of this team/committee, appoint a facility PPS focal point responsible for the coordination and the day-to-day management of the survey

Step 2: Objectives and methodology

- Define the objectives and output of the PPS in the facility
- Select a standardized PPS protocol to for the survey, e.g. WHO PPS protocol, Global PPS.
- Train the hospital PPS focal point and team in the methodology

Step 3: Preparation

- Obtain ethical approval and other necessary permissions to undertake the survey
- Agree on the days to conduct the surveys in the respective wards
- Prepare the necessary materials for undertaking the survey

Step 4: Data collection and validation

- Undertake a pilot survey in one ward and validate the data
- Conduct the survey in all wards according to predefined timelines
- Transfer data from paper form to electronic format when applicable, and validate the data.

Step 5: Data analyses and reporting

- Clean and analyse the data according to a pre-defined data analysis plan
- Report results to the responsible team/committee, the facility management etc..
- Identify areas for improvement for antimicrobial prescribing and use based on results and agree on AMS interventions to address these areas
- Monitor and evaluate the AMS interventions with e.g. a targeted PPS or audits or audits

WHO Methodology for Point Prevalence Survey on Antibiotic Use in Hospitals

Version 1.1



5.8. Audit with feedback

5.8.1 Prospective (real-time) audit with feedback

5.8.2 Retrospective audit with feedback

5.8.3 Selecting one or more infections for audit

Point prevalence surveys

Local point prevalence surveys (PPS) are recommended on a bi-annual or annual basis(5) as a tool to assess compliance with antimicrobial guidelines. Results of PPS should be shared with the executive team and disseminated to specialities who are responsible for developing action plans within their area. Key metrics which should be included in PPS are shown in figure 23

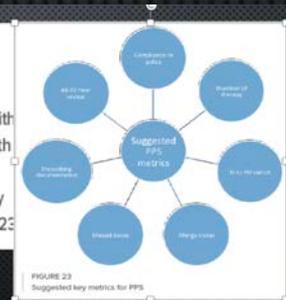
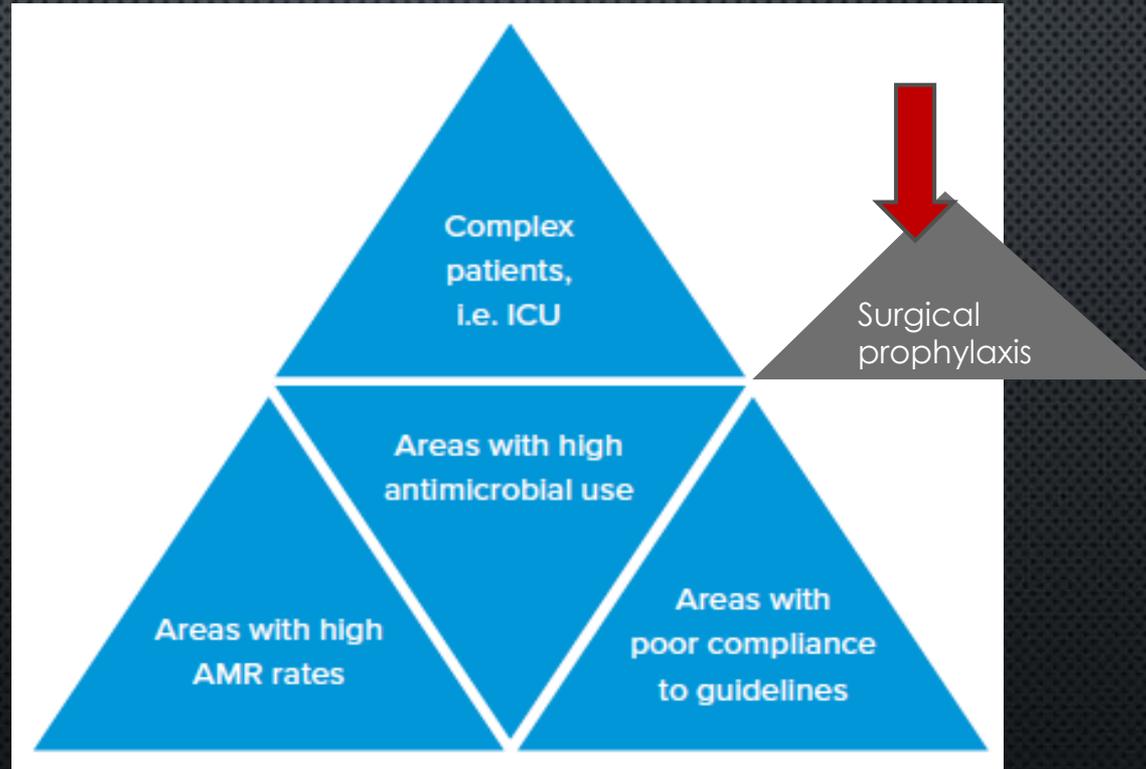
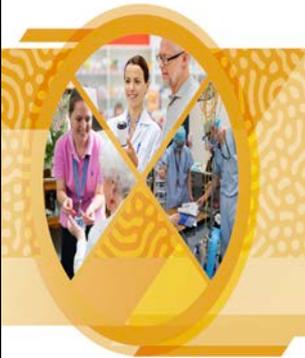


FIGURE 23
Suggested key metrics for PPS

**IDENTIFY PRIORITY AREAS FOR AMS INTERVENTIONS- USE ANTIMICROBIAL USE/
QUALITY DATA OR RESISTANCE DATA OR AREAS WHERE PATIENTS AT HIGH RISK
OF AMR**

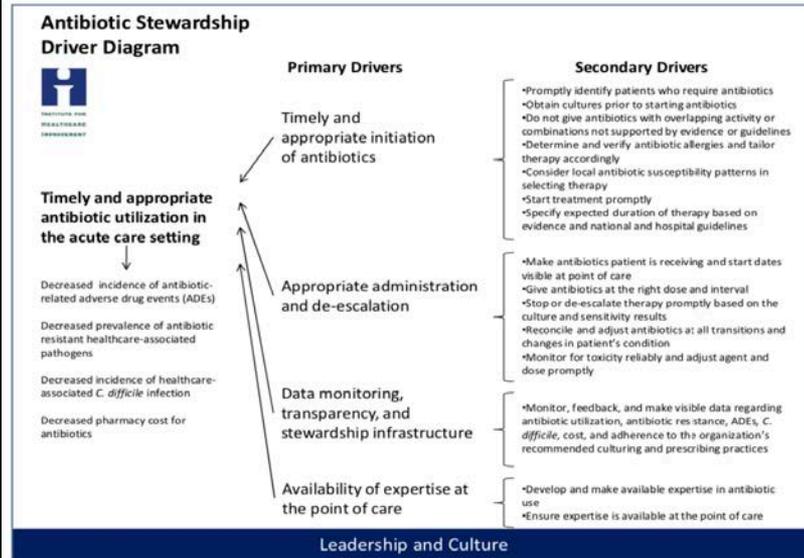




Antimicrobial Stewardship
in Australian Health Care

2018

Figure 2.2: Example of a driver diagram for hospital-based antimicrobial stewardship



Source: Centers for Disease Control and Prevention²⁰

A driver diagram is a useful approach to determine which interventions to include in the AMS program.

A driver diagram organises information on proposed activities so the relationships between the aim of the improvement project and the changes to be tested and implemented are clear. A driver diagram is typically set out using columns and comprises:

- An aim statement – the project goal or vision
- Primary drivers – high-level factors that you need to influence to achieve the aim
- Secondary drivers – specific factors or interventions that are needed to achieve the primary drivers; these are targeted areas for specific changes or interventions
- Change ideas – well-defined change concepts or interventions to consider for the secondary drivers, and what exactly will be done and how it will be done.

AIM

Timely and appropriate antimicrobial use in all health and care settings

- Improved clinical outcomes for patients with infections
- Decreased incidence of antimicrobial-related adverse drug events (ADEs)
- Decreased prevalence of antimicrobial resistant healthcare-associated pathogens
- Decreased incidence of healthcare-associated *Clostridium difficile* infection (CDI)
- Improved cost-effective use of antimicrobials

PRIMARY DRIVERS

Timely and appropriate initiation of antimicrobial treatment

Appropriate administration and de-escalation

Stewardship infrastructure, data monitoring and staff education

Availability of expertise at the point of care

SECONDARY DRIVERS

- Identify and reassure patients who do not require antibiotics
 - Promptly identify patients who require antibiotics and in patients with sepsis syndrome start treatment within one hour
 - Obtain cultures (where appropriate) prior to starting antibiotics
 - Do not give antibiotics with overlapping activity or combinations not supported by evidence or guidelines
 - Determine and verify antibiotic allergies and tailor therapy accordingly
 - Consider local antibiotic susceptibility patterns in selecting therapy
 - Start treatment promptly following local guidelines
 - Specify expected duration of therapy based on evidence and national and local guidelines
- Clearly identify currently prescribed antibiotics, indication for treatment, start dates and intended duration or review date for each patient at the point of care.
 - Give antibiotics at the right dose and interval
 - Stop or de-escalate therapy promptly based on culture and sensitivity results; consider role of biomarkers
 - Ensure therapeutic drug monitoring and dosage adjustment is carried out reliably
 - Reconcile and adjust antibiotics at all transitions and changes in patient's condition
 - Consider need for use of IV route throughout the patient's episode of treatment; consider IVOST
 - Monitor for toxicity reliably and adjust agent and/or dose promptly when required
- Establish stewardship as an organisational priority, ensure resources are made available and identify accountability
 - Ensure local structures for antimicrobial stewardship and links to management, infection prevention and control and patient safety are in place
 - Monitor, feedback, and make visible data regarding antibiotic utilisation, antibiotic resistance, ADEs, CDI, cost, and adherence to the organisation's recommended microbiology and prescribing practices
 - Ensure national and local education programmes on antimicrobial stewardship meet the training needs of health and care staff and promote patient and public awareness about use of antimicrobials
- Develop and make available multi-professional expertise in antimicrobial use
 - Ensure expertise is available at the point of care across all health and care settings



Define goals and process measures

Define collective antimicrobial stewardship programme goals for the hospital group:
Reduction in overall antibiotic consumption (outcome goal)
Implementation in all institutions (spread goal)
Define process measures on the basis of local and international guidelines and best practice adapted to the South African setting (panel 1)

Targeted process measures

- Cultures not done before commencement of empirical antibiotics
- More than 7 days of antibiotic treatment
- More than 14 days of antibiotic treatment
- Use of more than four antibiotics concurrently
- Redundant or so-called double antibiotic coverage

Seek endorsement of the antimicrobial stewardship programme

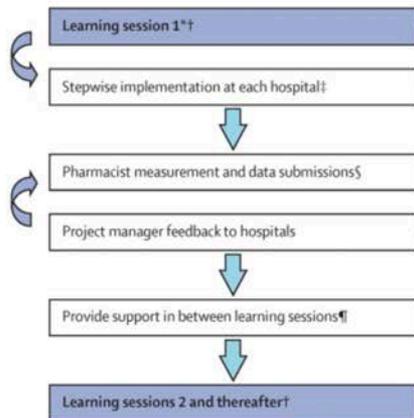
Form multidisciplinary antimicrobial stewardship programme committees
Presentation of the model to each participating institution by the quality improvement director
Adapt and modify the measures, if needed
Seek consensus and endorsement from doctors, and hospital, pharmacy, and nursing management

Antimicrobial stewardship across 47 South African hospitals: an implementation study

*Adrian J Brink, Angeliki P Messina, Charles Feldman, Guy A Richards, Piet J Becker, Debra A Goff, Karri A Bauer, Dilip Nathwani, Dena van den Bergh, on behalf of the Netcare Antimicrobial Stewardship Study Alliance**

**Lancet Infect Dis 2016;
16: 1017-25**

Implement learning cycles



Aims of the joint learning cycles

- Collaborative learning between hospitals
- Clarify requirements of antimicrobial stewardship programme implementation
- Brainstorm ideas to overcome obstacles to implementation
- Share success
- Evaluate accuracy and consistency of data
- Provide comparative feedback on progress and improvements or otherwise

Aims of feedback by the project manager to hospitals

- Provide monthly feedback to pharmacists and their managers to facilitate adjustments to hospital action plans following self-monitoring, specifically regarding:
 - Improvements in compliance with the measures (or otherwise)
 - Improvements in antibiotic consumption data (or otherwise)
 - Individualised goals
- Followed by feedback to doctors, hospital management, and the antimicrobial stewardship programme committee, including infection prevention practitioners of each hospital

Panel 1: Definition of the process measures*

Cultures not done before commencement of empirical antibiotics

Patients started on empirical antibiotics and no cultures done within 48 h before or on initiation of treatment.

More than 7 days of antibiotic treatment

Prolonged duration of treatment (continued for 8–14 days [inclusive])—ie, antibiotic treatment duration exceeded the length deemed appropriate for effective treatment of that particular infection according to local guidelines.

More than 14 days of antibiotic treatment

Prolonged duration of treatment (continued beyond 14 days)—ie, antibiotic treatment duration exceeded the length deemed appropriate for effective treatment of that particular infection according to local guidelines.

More than four antibiotics at the same time

The unintentional[†] overprescribing and concurrent systemic use of four or more antimicrobials in a given patient on the same calendar day for at least 2 consecutive days.

Concurrent double or redundant antibiotic coverage‡

The intentional[§] concurrent administration of two or more antibiotics with overlapping or duplicate spectra in terms of Gram-negative, Gram-positive, and anaerobic cover, on the same calendar day for at least 2 consecutive days. Redundant coverage can be subdivided into three categories. First, redundant Gram-negative coverage: defined as the concurrent administration of two or more of any of the following drugs in

or between groups: cephalosporins (cefuroxime, ceftriaxone, ceftazidime, cefotaxime, and cefepime), fluoroquinolones (ciprofloxacin and levofloxacin), β -lactam plus β -lactamase-inhibitor combinations (amoxicillin/clavulanate and piperacillin/tazobactam), aminoglycosides (amikacin, gentamycin, and tobramycin), carbapenems (meropenem, ertapenem, doripenem, and imipenem), and tigecycline. Second, redundant Gram-positive coverage: defined as the concurrent administration of two or more of any of the following drugs in or between groups: β -lactams (amoxicillin, amoxicillin-clavulanate, cefazolin, and cloxacillin), tigecycline, clindamycin, linezolid, and glycopeptides (vancomycin and teicoplanin). Third, redundant anaerobe coverage: defined as the concurrent administration of two or more of any of the following drugs in or between groups: metronidazole, β -lactam plus β -lactamase-inhibitor combinations (amoxicillin/clavulanate and piperacillin/tazobactam), carbapenems (meropenem, ertapenem, doripenem, and imipenem), moxifloxacin, clindamycin, ceftioxin, and tigecycline.

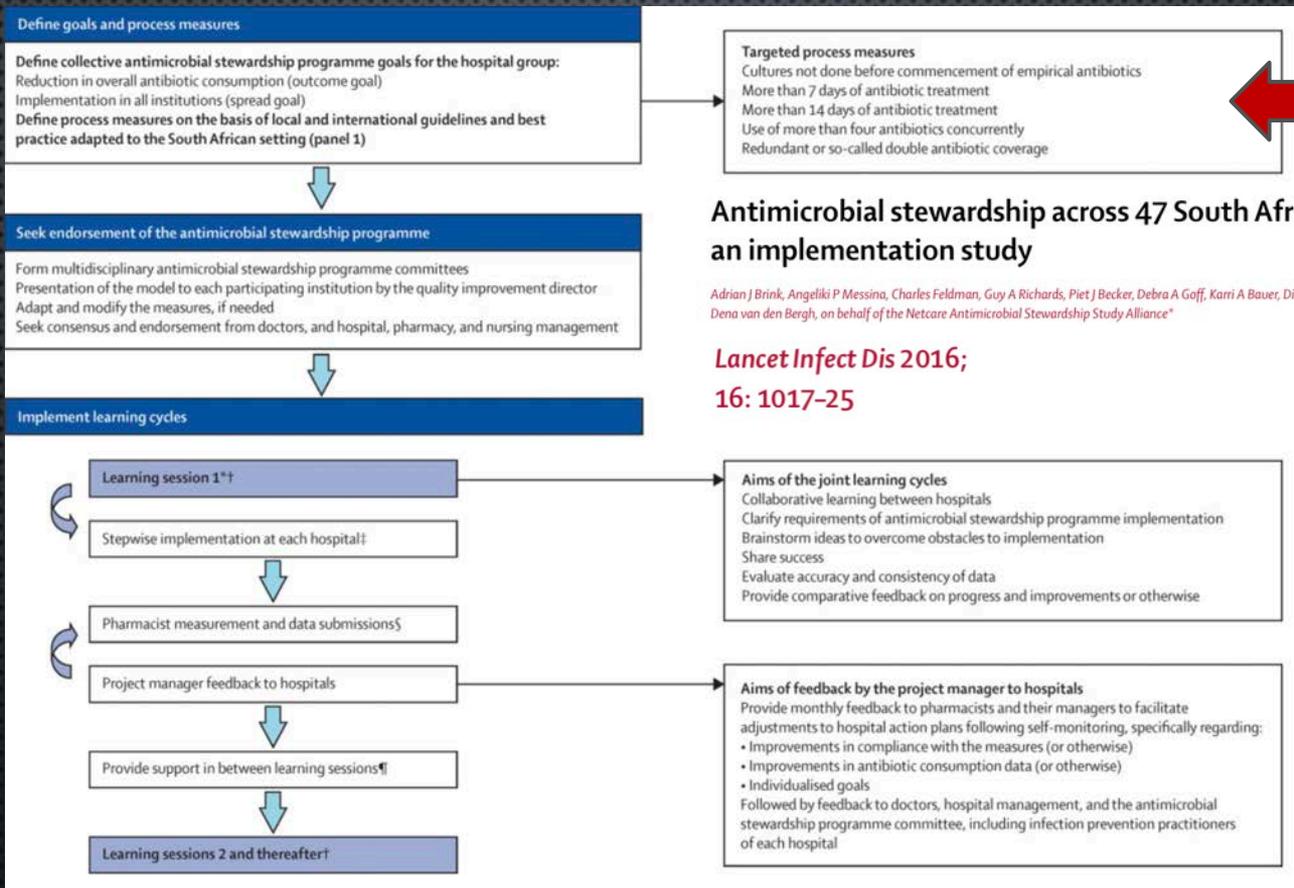
*For all process measures, doctors were consulted before any changes were effected. †We defined unintentional prescribing errors by doctors as inadvertent prescription of multiple antibiotics, incomplete knowledge of the patient's antimicrobial regimen (eg, multiple doctors' prescriptions for the same patient), or failure to discontinue previous treatments on initiation of a new antibiotic. ‡In consultation with the doctor, ascertainment of the clinical indications for each episode was necessary to determine the appropriateness of the potentially redundant antibiotic combination. §We defined intentional prescribing errors by doctors as antibiotic combinations prescribed with intended overlap but which, according to local best practice and guidelines, are insufficiently proven or provide likely clinical benefit. †

Lancet Infect Dis 2016;
16: 1017–25

Panel 2: Key components of implementing the antimicrobial stewardship model

- Formalise measurable goals for the hospital group (quality improvement director). The aim was to achieve at least a 10% reduction in antibiotic consumption and implement the antimicrobial stewardship programme in 33% or more of the institutions at 6 months, 66% of the institutions at 12 months, and 100% of the institutions (n=47) at 24 months.
- Form antimicrobial stewardship programme committees (consisting of hospital, pharmacy, and nursing managers; pharmacists; infection prevention practitioners; doctors; and, if available, clinical microbiologists) and consult with prescribers to ensure endorsement of the antimicrobial stewardship programme.
- Mandate so-called protected pharmacist stewardship time to do antibiotic audit rounds.
- Audit the five process measures (panel 1) either in a stepwise manner or all five at once.
- Develop and launch (through regional training workshops) a toolkit consisting of a standardised template using Microsoft Excel to facilitate uniform process measurement and data recording.
- Record the pharmacist's interventions every week for all inpatients on antibiotics either initially in the intensive care and high-care units and thereafter in selected wards or in all units at once.
- Submit data every month to an antimicrobial stewardship programme project manager via email.*
- Provide feedback to the pharmacists regarding progress of implementation, improvements (or otherwise) in the five measures, and antibiotic consumption delivered in both written (monthly emails) and verbal format during learning cycles.
- Concurrently, define and provide individualised hospital implementation progress, process improvement, and antibiotic consumption goals on the basis of historical trends.
- Regular (every 1–3 months) verbal and written feedback to doctors, hospital managers, and the antimicrobial stewardship programme committees, including infection prevention practitioners, of each hospital.
- Adapt action plans following hospital self-monitoring according to how many of the targeted interventions had been implemented, what improvements had taken place, and what the effect on individual hospital antibiotic consumption had been.
- Stimulate further improvement by providing feedback on the progress of the antimicrobial stewardship programme and its effects on compliance with the measures and antibiotic consumption via monthly emails to all hospitals in the form of comparative tables and graphs.†

*In the post-implementation phase, submission of monthly data to the project manager was compulsory. †Comparative graphs and tables were introduced in the post-implementation phase (n=47).



Antimicrobial stewardship across 47 South African hospitals: an implementation study

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Lancet Infect Dis 2016;
16: 1017–25

Article

A Point Prevalence Survey of Antibiotic Use in 18 Hospitals in Egypt

Maha Talaat ¹, Tamer Saied ^{1,*}, Amr Kandeel ², Gehad A. Abo El-Ata ³, Amani El-Kholy ³, Soad Hafez ⁴, Ashraf Osman ⁵, Mohamed Abdel Razik ⁵, Ghada Ismail ⁶, Sherine El-Masry ⁶, Rami Galal ², Mohamad Yehia ⁷, Amira Amer ⁴ and David P. Calfee ⁸

Antibiotic Prescriptions (number, (%))

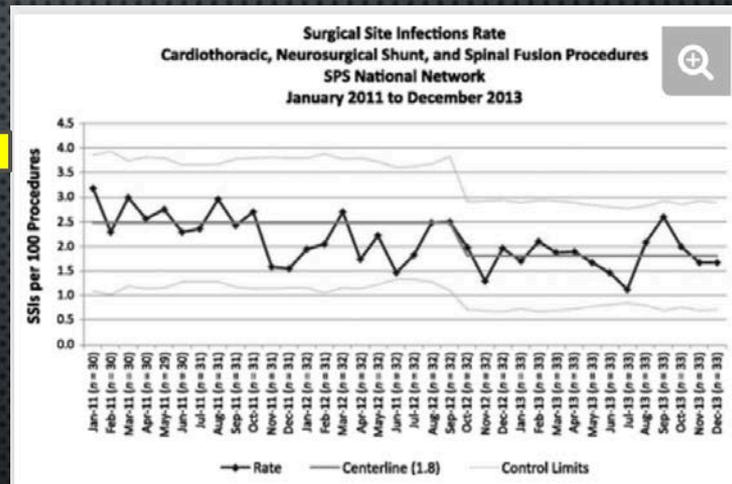
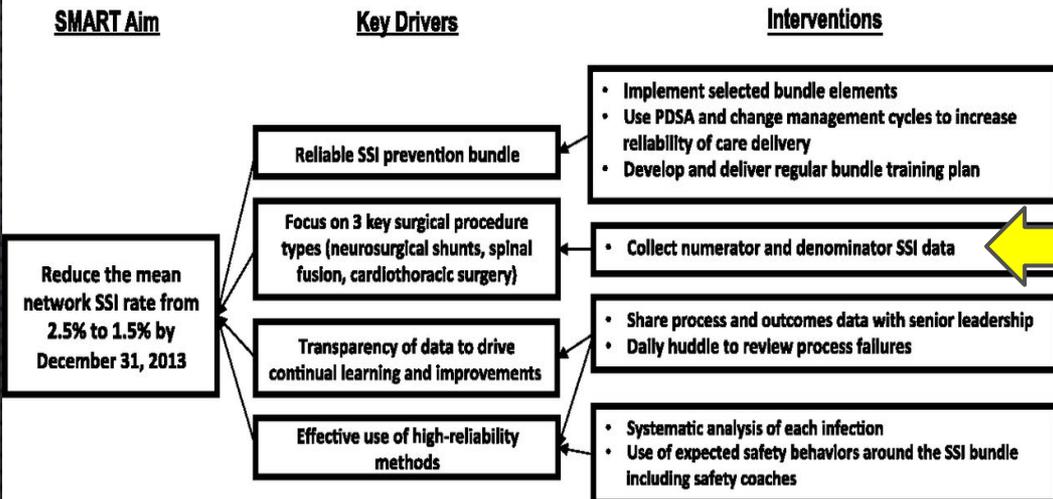
for <24 h. The prevalence of antibiotic use in Egyptian hospitals was high with obvious targets for antimicrobial stewardship activities including provision of antibiotic prescription guidelines and optimization of surgical and medical prophylaxis practices.

Type of surgery	No. of operations with known start time	>2 h before incision No. (%)	≤2 h before incision No. (%)	After incision No. (%)	No. of operations with known duration of antibiotic prophylaxis	Single dose No. (%)	≤24 h after incision No. (%)	>24 h after incision No. (%)
Cardiothoracic surgery	43	10 (23.3)	14 (32.5)	19 (44.2)	29	0	0	29 (100)
ENT surgery	28	5 (17.9)	16 (57.1)	7 (25)	11	0	2 (18.2)	9 (81.8)
Burns and plastic surgery	9	5 (55.6)	1 (11.1)	3 (33.3)	2	0	0	2 (100)
General surgery	122	37 (30.3)	35 (28.7)	50 (41.0)	67	1 (1.5)	12 (17.9)	54 (80.6)
Neurosurgery	41	12 (29.3)	2 (4.9)	27 (65.9)	4	0	0	4 (100)
OB/GYN	267	44 (16.5)	99 (37.1)	124 (46.4)	76	11 (14.5)	49 (64.5)	16 (21.1)
Ophthalmology	40	2 (5.0)	16 (40.0)	22 (55.0)	40	2(5.0)	2(5.0)	36 (90.0)
Orthopedic surgery	83	22 (26.5)	46 (55.4)	15 (18.1)	74	4 (5.3)	5(6.8)	65 (87.9)
Urology	22	4 (18.2)	8 (36.4)	10 (45.5)	11	0	0	11 (100)
Vascular surgery	5	0	5 (100)	0	6	0	0	6 (100)
Other *	42	15 (35.7)	10 (23.8)	17 (40.5)	13	0	0	13 (100)
Total	702	156 (22.2)	252 (35.9)	294 (41.9)	333	18 (5.4)	70 (21.0)	245 (73.6)

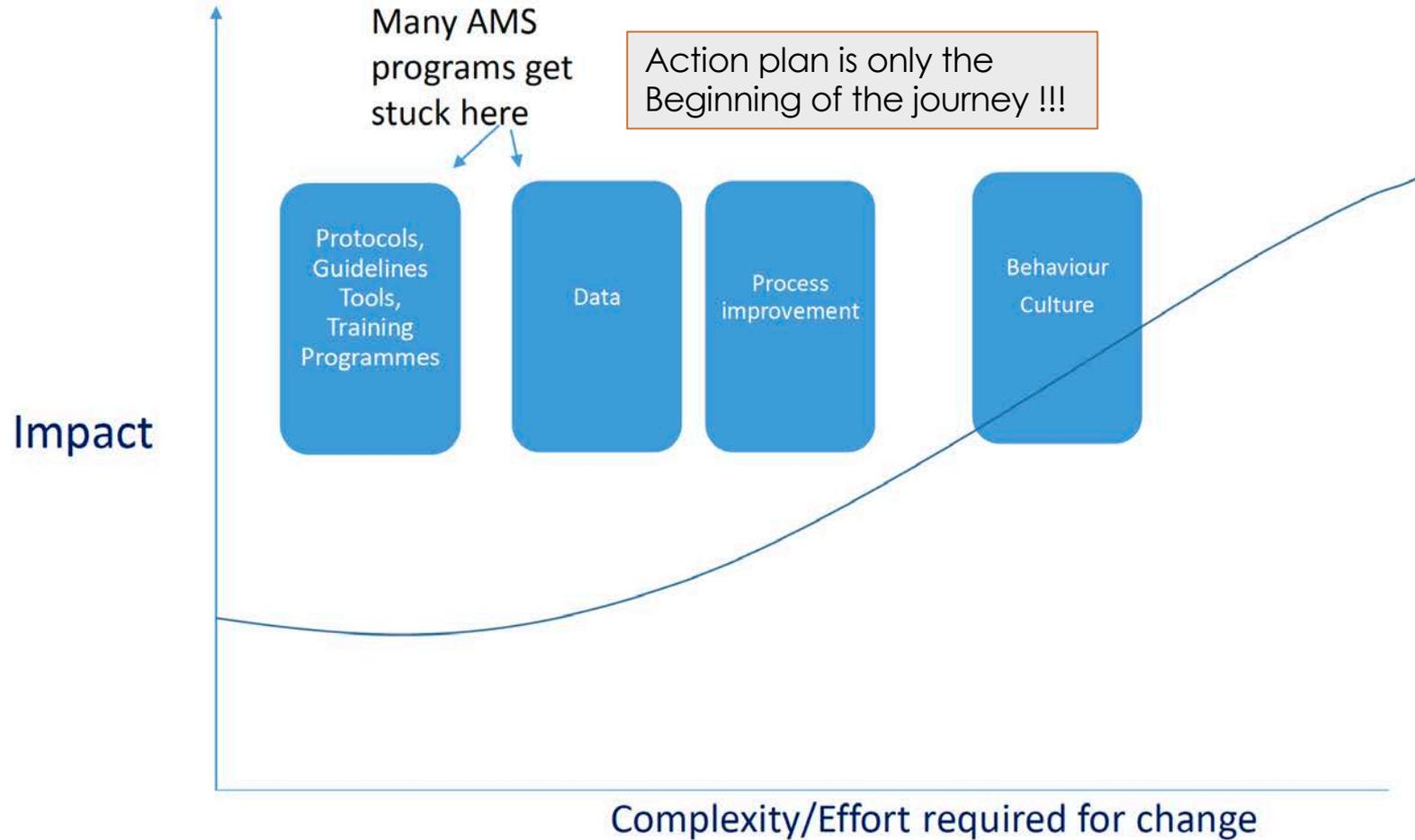
Key drivers.

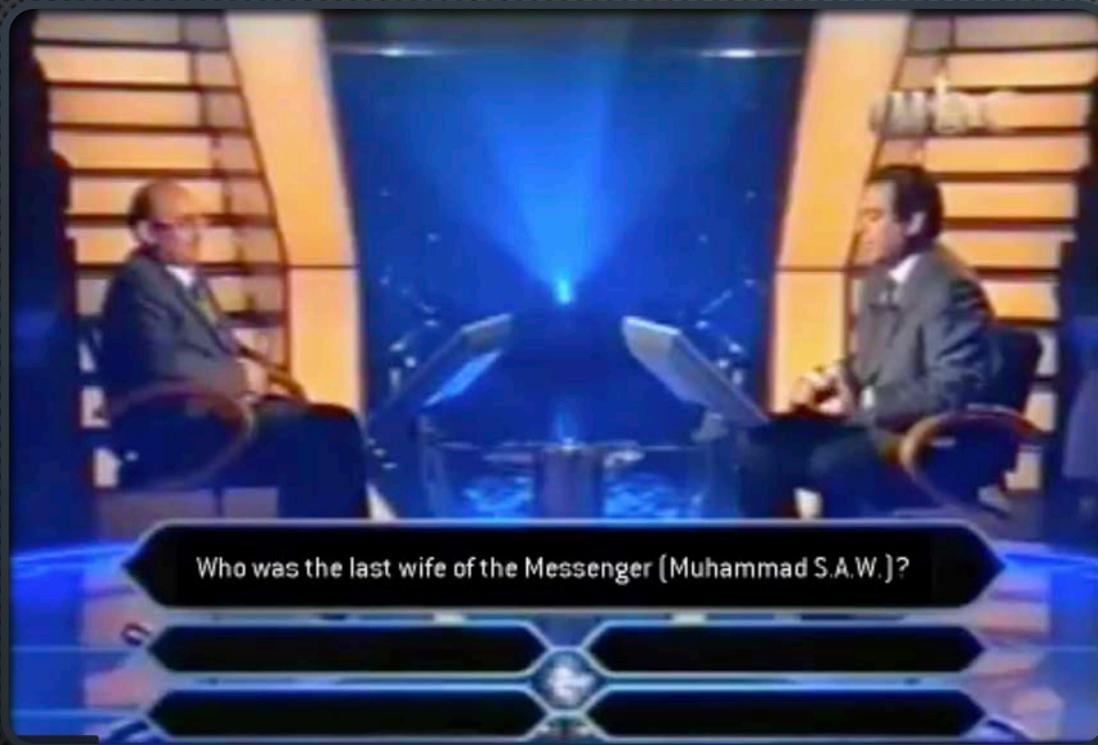
**SURGICAL PROPHYLAXIS
"A LOW HANGING FRUIT"**

KEY DRIVER DIAGRAM



Joshua K. Schaffzin et al. Pediatrics 2015;136:e1353-e1360





Who was the last wife of the Messenger (Muhammad S.A.W.)?

QUIZ TIME

QUIZ: TRUE OR FALSE?



1

A SWOT or Situational analyses in the context of AMS provides an assessment of the strengths, weaknesses, outcomes and talents

2

The SWOT analysis can be done at an organisational, operational or population level

3

AMS Checklists are the only method of collecting information for a SWOT analysis

4

Governance is about ensuring an adequate and appropriate AMS team

5

The lack of a laboratory or one that is not functional is a weakness for a AMS programme

QUIZ: TRUE OR FALSE?



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SUMMARY

Preparation for developing and implementing an AMS programme in a health-care facility

Situational or SWOT analysis

Conduct a situational or SWOT analysis using the checklist of health-care facility core elements to identify existing and missing (but priority) elements, as well as possible enablers for and barriers to implementing a facility AMS programme. Pay attention to:

- *Structures, policies and guidelines*: Identify which structures, policies and guidelines are in place and which are critically in need of being put in place according to the checklist of facility core elements (see Chapter 3).
- *Human resources*: Identify the existing and required human resources (including competencies) needed for a functioning governance structure for AMS, including the AMS committee and/or AMS team, and clinical and other staff to be involved in implementing the AMS activities.
- *Antimicrobial use and resistance data*: Review data on antimicrobial consumption and/or use, and identify challenges related to antibiotic prescribing practices in the facility and/or departments. Review existing surveillance data on AMR and aggregate antibiograms from the facility.
- *AMS activities*: Identify any existing AMS activities (including ad hoc) in the facility/wards that can be built on and made sustainable.

Facility AMS action plan

Based on the situational analysis, develop a health-care facility AMS action plan to ensure accountability, prioritize activities and measure progress. This should include the following key components:

- *Core elements*: Determine priority core elements to be implemented in the short and medium term, including accountability, timeline and indicator.
- *Governance*: Identify leadership commitment and oversight, and establish an AMS committee (new or incorporated into an existing structure) and an AMS team that is endorsed by the facility leadership.
- *AMS activities*: Identify areas for improvement, implement AMS interventions (who, what, where, when and how), monitor and evaluate, and report and feed back the results.
- *Health-care facility-wide engagement*: Ensure facility-wide engagement in the AMS programme, and empower the AMS committee and/or AMS team to undertake the AMS interventions and monitor their implementation.
- *Education and training*: Identify competencies that need to be strengthened to effectively implement AMS, and develop a facility AMS education and training plan.
- *Budget*: Develop a budget for the AMS programme, including human and financial resources required for the day-to-day running of the programme as well as for education and training on AMS of the AMS team and health-care professionals. The budget should be endorsed by the health-care facility leadership.