# A Technical Guide to Implementing Facility-Level Antimicrobial Stewardship Programs in MTaPS Program Countries

## Background

The major global leaders in combating antimicrobial resistance (AMR) agree that improving antimicrobial stewardship (AMS) programs should be a major focus of AMR containment if we expect to prevent infections caused by multidrug-resistant organisms and ensure sustainable access to effective therapy. For example, a focus on AMS is recommended in the World Health Organization's (WHO) Global Action Plan on AMR,[1] and AMS is an AMR technical capacity area in the Joint External Evaluation (JEE).[2] In its target countries, the US Agency for International Development (USAID) Medicines, Technologies, and Pharmaceutical Services (MTaPS) program bases its efforts to prevent the emergence and spread of AMR on AMS, infection prevention and control (IPC), and multisectoral coordination.

MTaPS' technical assistance approach for strengthening AMS in low- and middle-income countries (LMICs) is shown in figure 1. Our standardized approach uses an iterative process to achieve incremental improvements—with the goal of reaching WHO benchmarks[3] and advancing JEE country scores in P3.4, Optimize use of antimicrobial medicines in human and animal health and agriculture.

[1] Strategic objective 4 in World Health Organization. 2015. Global Action Plan on Antimicrobial Resistance.
[2] Joint External Evaluation Tool Second Edition - January 2018.
[3] WHO Benchmarks for International Health Regulations (IHR) Capacities. 2019.

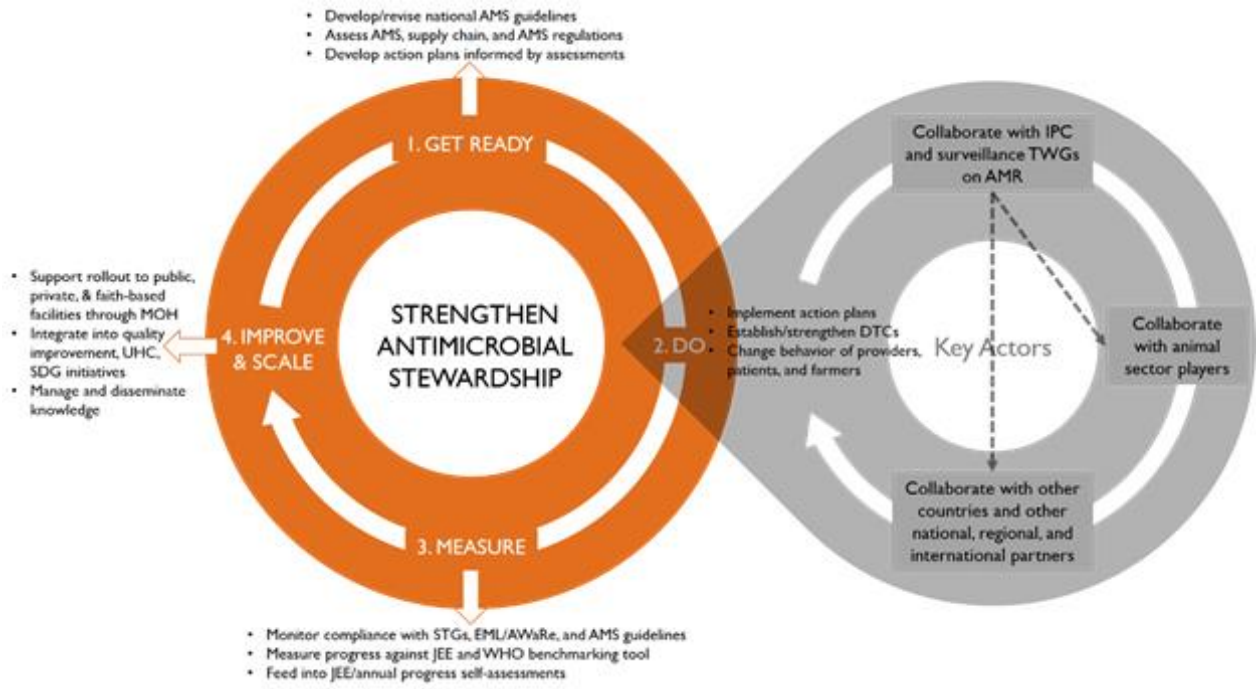


Figure 1. MTaPS' approach to strengthening AMS in LMICs

## Purpose of this Implementation Guide

Effective AMS programs involve integrated and coordinated interventions at the national, subnational, and facility levels—primarily hospitals. This mini-guide focuses on AMS programs at health care facilities in LMICs and particularly on enlisting and strengthening Drug and Therapeutics Committees[4] (DTCs) to advance AMS efforts. In places where DTCs do not exist or are not feasible or easy to establish, this guide will help countries mobilize standalone AMS committees or other entities such as quality improvement teams to advance AMS programs.

This mini-guide complements other AMS guidance by offering a how-to tool that includes a process checklist and useful tips for helping establish and strengthen facility-level AMS programs in LMICs. Here, we focus on health facility-level interventions, including the development and implementation of action plans, establishment and strengthening of DTCs, and behavior change activities that target providers and patients to optimize the use of antimicrobials. WHO identifies the establishment of DTCs as one of the 12 key interventions to promote rational medicine use.[5] DTCs help health facilities and hospitals establish standards, select and manage antimicrobials and other medicines for the formulary, evaluate medicine use,

Box 1. Complementary AMS Guidance

WHO. *Antimicrobial stewardship programmes in health-care facilities in low- and middle-income countries. A practical toolkit*. 2019.
CDC. *The core elements of human antibiotic stewardship programs in resource-limited settings: national and hospital levels*. 2018.
WHO-MSH. *Drug and therapeutics committees: a practical guide*. 2003.

[4] Also known as Medicines and Therapeutics Committees in some countries.
[5] http://www.who.int/medicines/areas/rational_use/en/

and implement strategies to address reported problems. They also serve as a forum that allows stakeholders to work together to improve health care delivery and patient outcomes. Although this guide is focused on facility-level actions, it is critical that the facility actors maintain alignment, linkages, and feedback loops with national-level AMS initiatives to help ensure visibility and success of activities.

## Measures of Success that AMS Governance Structures are Functioning Effectively

Key measures of success that help demonstrate that a facility's AMS structure is functioning efficiently include:

- Defined terms of reference (TOR) and reporting process in place
- Monitoring performance and evaluation frameworks (with indicators and data sources) for the AMS committee's own functioning and for AMS plan implementation
- Evidence of coordination among the AMS program and relevant facility departments and providers (e.g., those who prescribe and dispense), as well as with the IPC program
- Evidence of regular AMS committee meetings with documented agendas, preparation and distribution of meeting notes, and follow up on action items
- Activities updated; achievements and results documented and shared
- Implementation plan and budget with budget gap analysis and prioritization
- Implementation of and results from priority activities, including:
    - Increased prescribing adherence to standard treatment guidelines
    - Increased patient knowledge of antimicrobials prescribed to them
    - Based on AWaRe classification, increased use of Access antimicrobials and streamlined use of Watch/Reserve products
    - Longitudinal tracking of locally identified AMS indicators

Box 2 summarizes WHO's aim for an AMS program from its AMS toolkit (box 1). These objectives are applicable for AMS activities at any level—national, subnational, or facility.

Box 2. An AMS program should:

- Optimize the use of antibiotics
- Promote behavior change in antibiotic prescribing and dispensing practices
- Improve quality of care and patient outcomes
- Save on unnecessary health care costs
- Reduce further emergence, selection, and spread of AMR
- Prolong the lifespan of existing antibiotics
- Limit the adverse economic impact of AMR
- Build the best practices capacity of health care professionals regarding the rational use of antibiotics

The following are examples of how hospital DTCs have executed interventions to improve AMS.[6]

**Ethiopia**. A drug use evaluation showed that ceftriaxone was prescribed inappropriately in 45% (46/102) of patients and that general practitioners were the most frequent prescribers (67% of cases). Taking action, the hospital DTC developed a ceftriaxone use policy that specified proper indications, dosing, and duration and required complete documentation of medical records, including clinical outcomes, following its use. Woldia General Hospital's study showed that blood tests were ordered for 87.5% (196/224) of fever cases, and 36.7% (72/196) of the cases were deemed appropriate indications for artemether-lumefantrine. However, the remaining 124 cases, which tested negative for malaria, were also given the antimalarial. Woldia's DTC then developed a plan to improve prescribing practices, including orienting all physicians to follow the country's malaria standard treatment guideline.

**Jordan**. Multidisciplinary teams that included DTCs in three public hospitals implemented a program combining drug use evaluation with continuous quality improvement methods to improve antibiotic prophylaxis in cesarean sections. Over two years, this AMS program increased the use of the correct antibiotic from 0% to 86% (1,984/2,303); the correct timing of the first dose from 0% to 92% (2,118/2,303); and the correct number of doses from 0% to 88% (2,033/2,303). In addition, the average antibiotic prophylaxis cost per case decreased by 79%, while the average surgical site infection rate was low at 1.6%.

**Swaziland**. To advocate and act for AMR containment, the Raleigh Fitkin Memorial Hospital DTC implemented a quality improvement program that included performing culture and sensitivity tests on inpatients prescribed antibiotics. The results showed high levels of pathogen resistance to several antibiotics, including ceftriaxone and vancomycin. In response, the DTC led the development and implementation of hospital guidelines on prescribing antibiotics and switching from intravenous to oral antibiotic therapy. The Laboratory Department provides monthly culture and sensitivity test reports to the DTC to monitor drug sensitivity patterns for appropriate antibiotic prescribing.

## Checklist of Major Steps

Most of the 11 Global Health Security Agenda/AMR countries supported by MTaPS plan to strengthen facility-level AMS programs. WHO's AMS toolkit has identified the following steps for establishing AMS programs at health care facilities:

1. Undertake a facility AMS situational/strengths, opportunities, weaknesses, threats (SWOT) analysis of:
   1.1. Health care facility core elements—identify what is in place and the implementation level required
   1.2. Available data on antimicrobial consumption and/or use, prescription audits, and AMR surveillance data
   1.3. Existing AMS competencies at the facility
2. Establish a sustainable AMS governance structure based on existing structures
3. Prioritize the health care facility core elements based on the situational analysis:
   3.1. Identify the immediate priorities
   3.2. Identify the resources required

[6] Adapted from Getahun W et al. Strengthening Local Capacity to Establish or Improve Performance of Drug and Therapeutics Committees in Low- and Middle-Income Countries. Poster presented at the 75th International Pharmaceutical Federation (FIP) World Congress, Dusseldorf, Germany, 29 September to 3 October 2015.

4. Identify AMS interventions, starting with the low-hanging fruit:
   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

6. Implement AMS interventions

7. Monitor and evaluate AMS interventions

8. Offer basic and continued educational resources and training on optimized antibiotic prescribing

9. The checklist below elaborates on these WHO toolkit steps and provides more detailed guidance and a visual way to track progress when supporting facilities to establish/strengthen AMS programs. Different checklist sections may be relevant for different countries, depending on the existing strengths and weaknesses and the current level of AMS support in the facility. The checklist also provides links to useful resources and some examples of what others have done.

| **Activity** | **☑=Y** |
|---|---|
| Choose health care facilities to support for AMS program start-up/pilot | ○ Done ○ In progress ○ Not done |
| ■ Consider locally relevant criteria when making initial selection, which may include:<br>○ Anecdotal evidence or studies showing high levels of inappropriate antimicrobial use<br>○ Data showing high levels of AMR<br>○ Facilities that are already sensitized or have already done some AMS activities<br>○ Presence of motivated/committed champions for the AMS cause<br>○ Presence of other AMR or rational medicine use activities<br>○ Presence of other partners already working in the facility doing AMS, diagnostic stewardship, or IPC work (opportunities to leverage efforts to achieve greater results)<br>○ Presence of staff already well trained/competent in AMS<br>○ Potential for the facility to become a center of excellence or learning site | ○ Done ○ In progress ○ Not done |
| ■ Provide evidence-based advocacy with facility-level leaders to forge interest | ○ Done ○ In progress ○ Not done |
| Conduct a situational analysis | ○ Done ○ In progress ○ Not done |
| ■ Identify key actors to engage in planning, implementation, analysis, and dissemination; look for champions that can drive the initiative | ○ Done ○ In progress ○ Not done |
| ■ Convene a pre-analysis meeting to agree on scope, roles, and process and to foster ownership; ensure the scope is manageable and relevant | ○ Done ○ In progress ○ Not done |
| ■ Develop data collection tool<br>○ Select core elements relevant for the country and facility from the essential health care core elements list in the WHO AMS | ○ Done ○ In progress ○ Not done |

| Activity | ☑=Y |
|---|---|
| toolkit (table 4, pp. 13–14) (consider facility size and type, needs and priorities, and local situation)<br>○ Incorporate baseline survey of antimicrobial use; refer to AMS toolkit (table 5, p. 18) for other components to include | |
| ■ Conduct the assessment, analyze data, and prepare a short report/policy brief<br>○ Identify which core elements exist, the level of function, and key gaps<br>○ Analyze baseline antimicrobial use and highlight major issues<br>○ Ascertain what has been done in the past, how well interventions have worked, and any enablers or risks/challenges to consider using a root[7] cause analysis methodology<br>○ Consider presenting findings as a SWOT analysis (refer to AMS toolkit figure 6 p. 19 for an example of a SWOT analysis) | ○ Done ○ In progress ○ Not done |
| Establish/revitalize champion groups and AMS governance structure | ○ Done ○ In progress ○ Not done |
| ■ Form/revitalize the AMS governance structure, which will depend on facility size and may include:<br>○ AMS committee—leadership team—as a standalone committee or as part of an existing structure such as a DTC[8]<br>○ Multidisciplinary AMS team responsible for implementing AMS activities | ○ Done ○ In progress ○ Not done |
| ■ Assist AMS committee/DTC to initiate advocacy activities using existing data or problems to build support for AMS with facility stakeholders who will implement the activities | ○ Done ○ In progress ○ Not done |
| ■ Build on what exists:<br>○ Broaden membership and mandate of existing groups to address AMS issues and revitalize/sensitize/train on AMS<br>○ Adapt existing secretariat functions and reporting mechanisms<br>■ If nothing exists, build momentum by starting small; form a two- to three-person interest group and see what can be done | ○ Done ○ In progress ○ Not done |
| ■ Develop/update TOR, decide on membership, ensure representation of all stakeholders, and establish mandate<br>○ Ensure committee includes representation from all departments that prescribe and dispense antimicrobials as well as facility's IPC actors<br>***Resources***: Refer to the following resources for examples of generic TOR: WHO AMS toolkit (Annex II for sample TOR and membership, p. 64); Gauteng Province, South Africa (Annex C for generic TOR for hospital DTC, p. 67); WHO-MSH DTC Guide (Seeking a mandate, p. 9); | ○ Done ○ In progress ○ Not done |

[7] Six Sigma Training Certifications. What Are Common Root Cause Analysis (RCA) Tools? https://www.6sigma.us/etc/what-are-common-root-cause-analysis-rca-tools/

[8] WHO-MSH, Drugs and therapeutics committees: a practical guide; SIAPS-Gauteng Province, Guidelines for Implementation of Pharmaceutical and Therapeutics Committees in Gauteng Province, South Africa http://apps.who.int/medicinedocs/documents/s21654en/s21654en.pdf

| Activity | ☑=Y |
|---|---|
| and Australia Clinical Excellence Commission: Sample TOR for an AMS Committee<br><br>***Resources***: Refer to the following resources for more information on the composition of the AMS committee/multidisciplinary team: WHO AMS toolkit, pp. 21–23; Pharmacy OneSource Blog. How to Assemble Key Members for an Antimicrobial Stewardship Team; and Australia Clinical Excellence Commission, Antimicrobial Stewardship Teams & Committees Fact Sheet | |
| ■ Define mechanisms for collaboration/linkages among AMS and IPC programs/teams | ○ Done ○ In progress ○ Not done |
| Develop an AMS facility action plan | ○ Done ○ In progress ○ Not done |
| ■ Convene workshop(s) to analyze options and develop an action plan that identifies priorities<br>○ Refer to WHO AMS toolkit (table 5, p. 18) for key components of an action plan | ○ Done ○ In progress ○ Not done |
| ■ Start small, select relevant and feasible activities (low-hanging fruit) to build motivation, and gradually expand coverage and types of AMS activities. Initial activities may include:<br>○ Review/adapt national policy documents/guidelines for facility use (e.g., develop/update facility standard treatment guidelines, particularly to incorporate WHO AWaRe categorization) (see MTaPS AwaRe mini-guide)<br>○ Conduct point prevalence surveys; audit antibiotic prescriptions; collect and analyze data; and provide feedback on antibiotics consumption, adverse drug reactions, or compliance to guidelines<br>○ Select some common issues to address to improve antibiotic prescribing (see DTC tools in Box1 above)<br><br>***Resources***: Illustrative list of basic AMS interventions in WHO AMS toolkit (box 8, p. 35); comprehensive list of AMS interventions for improving antibiotic prescribing practices in AMS toolkit (tables 7 and 8, pp. 37–42) | ○ Done ○ In progress ○ Not done |
| ■ Ensure each action plan activity/subactivity includes timeline for implementation; person, department, or institution responsible for implementation; major outputs or deliverables; and resources needed and their sources | ○ Done ○ In progress ○ Not done |
| ■ Identify indicators and benchmarks to monitor activity progress and report on progress quarterly at minimum. Activities may be facility-wide, target specific diseases/syndromes, or focus on specific antimicrobials | ○ Done ○ In progress ○ Not done |
| ■ Develop the budget, identify available resources, secure approval and financial support for planned activities, and reprioritize based on resources available | ○ Done ○ In progress ○ Not done |

| Activity | ☑=Y |
|---|---|
| Implement AMS interventions | ○ Done ○ In progress ○ Not done |
| Build capacity of AMS committee/DTC | ○ Done ○ In progress ○ Not done |
| ■ Provide tools, skills, and resources<br>○ In addition to technical skills, consider competencies in leadership, committee, and program management; advocacy and stakeholder/political economy analysis; building a business case for investing in AMR; communications/media relations; and program monitoring and evaluation<br>○ Approaches can include on-the-job training, mentoring, blended learning with face-to-face and e-Learning courses, and visiting another hospital that can serve as a learning site | ○ Done ○ In progress ○ Not done |
| Establish monitoring and evaluation systems | ○ Done ○ In progress ○ Not done |
| ■ Support facilities to introduce a continuous quality improvement (CQI) process (see MTaPS CQI for IPC mini-guide) to:<br>○ Monitor AMS committee function<br>○ Monitor AMS activities and outcomes | ○ Done ○ In progress ○ Not done |
| ■ Select a manageable number of indicators/measures to track related to:<br>○ Functioning of AMS committee team; help establish a self-monitoring/evaluation process as well as indicators for reporting out<br>○ Progress on priority activities | ○ Done ○ In progress ○ Not done |
| ■ Ensure indicators include baselines and targets; name responsible entities for measuring each indicator<br>***Resources***: Process measures/indicators for antimicrobial use in AMS toolkit (table 12, p. 52) | ○ Done ○ In progress ○ Not done |
| ■ Develop a plan for establishing a facility-level surveillance system<br>***Resources***: Step-by-step guide for setting up an antimicrobial consumption surveillance program in WHO AMS toolkit (table 5, p. 25); outcome measures/indicators for antimicrobial use in WHO AMS toolkit (table 10, pp. 50–51); outcome measures/indicators for patients and microbiology in WHO AMS toolkit (table 11, pp. 51–52); WHO Global Action Plan on AMR indicators relevant to AMS programs in AMS toolkit (table 3, p. 10); andindicators to measure functionality of local PTCs (Gauteng Province, South Africa (Annex K, p. 85) | ○ Done ○ In progress ○ Not done |
| ■ Establish systems for reporting out on activities to:<br>○ Facility management<br>○ Facility clinical staff<br>○ National program<br>○ External groups, such as media | ○ Done ○ In progress ○ Not done |

## Practical Considerations for Sustaining a Facility-Level AMS Program

- The facility AMS program must align with a national AMS program and plan (where they exist) and be based on the country's national action plan on AMR
- Where available, infectious disease experts at all levels should be fully engaged in systematically implementing AMS interventions and integrating AMS program considerations into current and future standard treatment guideline revisions
- Facility-level pharmacies and supply chain and logistics management systems should be engaged to ensure availability of antimicrobial products and also in collecting and reporting data on antibiotic consumption by measuring absolute antibiotic consumption and then relative consumption per each AWaRe category (see MTaPS mini-guide on AWaRe categorization)
- Training programs should, as much as possible, integrate AMS programming into established in-service training programs to ensure that health workers are informed
- At the facility level, DTCs/AMS committees should play a strong role in advocating for, promoting, training, and monitoring AMS best practices, including adherence to AWaRe categorization
- Monitoring systems at higher levels should provide regular feedback to the district and facility levels regarding the performance of their programs
- Facility leadership should institutionalize systematic mentorship of managers and prescribers to increase adherence to program requirements and consider peer-to-peer mentoring and exchange visits with high-performing facilities