

Drive-AMS: the data-driven AMS programme using implementation science for sustainable behaviour change

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AMS remains key tool for addressing AMR

There is an evident need to address antimicrobial resistance (AMR) globally. An effective response to AMR entails ensuring improved surveillance and prudent antimicrobial use. Both are among the key strategic priorities of global and regional related policies, such as the WHO Global AMR Action Plan and the EU One Health Action Plan on AMR. Antimicrobial stewardship (AMS) is an established and proven approach to addressing AMR, but needs to be further developed and strengthened¹

as an essential component of the WHO people-centred approach to addressing AMR in human health².

AMS should be applied in any situation where decisions about antimicrobial therapy are made - whether at the community level, in outpatient care, nursing homes or hospital settings. The setup of an antimicrobial stewardship

programme (ASP) at the healthcare facility level is a complex process that requires an enabling environment, dedicated resources, appropriate knowledge and established processes. But, even when prerequisites for a functional and effective ASP are in place and desired improvements are defined, the challenge remains as to how to actually implement and achieve those goals.

Why are current AMS models underperforming?

In most existing AMS training programmes, much emphasis is placed on the “prerequisites” and the “what” of AMS, i.e. the basic requirements of an ASP and the activities performed as part of appropriate antimicrobial practice respectively. The “what” - what the AMS team is aiming for - has been operationalised as the “**five rights**”: *right* antibiotic for the *right* patient, *right* dose, *right* route and *right* time (start and duration). Yet consistently, little attention is paid to the “how” within an ASP: how to make sure that professionals comply with these “what” recommendations (**Supplementary textbox 1**). Thus, a behaviour change imposes itself as a need, in order to increase the potential of the existing knowledge to create sustainable impact.

In addition, ASP activities often focus on so-called “short cycle” improvement strategies, such as daily monitoring and advice. For example, a microbiologist may give immediate feedback on the result of a (blood) culture and recommend a (change in) antimicrobial therapy. Similarly,

when a high concentration of vancomycin is measured, the clinical pharmacist notifies the attending physician to adapt dose and / or dosing interval. Finally, a clinical ID physician may review the patient's chart, consider whether antimicrobial therapy is appropriate and suggest alternative treatment. This is a valuable, albeit often time-consuming and costly, part of the daily work of an AMS team. It is a repetitive activity that may lead to better *ad hoc* prescribing but not necessarily to an overall improvement in antibiotic prescribing practices by professionals.

However important it is, there should also be room for so-called “slow cycle” interventions to improve prescribing practices structurally.

These interventions are essentially AMS quality improvement projects based on behaviour change strategies (**Supplementary Fig. 1**)³.

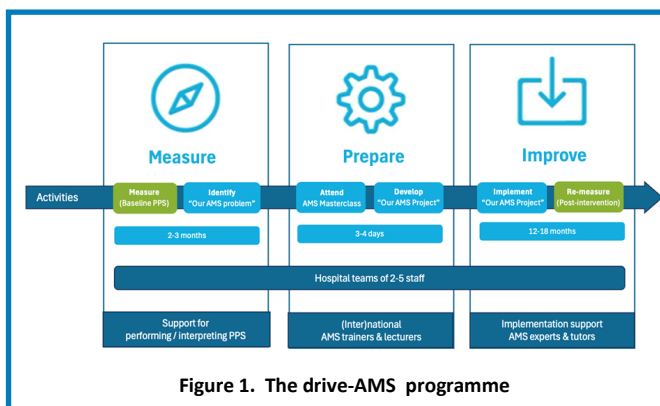


Figure 1. The drive-AMS programme

What is drive-AMS?

Based on this philosophy, Radboud University Medical Center developed the AMS masterclass and expert consultancy in 2018, which, combined with a Global point prevalence survey (PPS) measurement tool developed by the University of Antwerp, resulted in the drive-AMS programme in 2022: a **Data-dRIVEN** implementation of a behavioural **AntiMicrobial Stewardship** approach to improve antimicrobial use practices in hospitals. drive-AMS applies implementation science and quality of care research methodology in a stepwise approach to support hospital AMS teams in their efforts to improve antimicrobial use practices.

In other words, the aim of the drive-AMS programme is to address the identified disconnect between theoretical knowledge on appropriate use, current practices and the capability for using effective AMS strategies as part of an existing ASP at the hospital level.

The drive-AMS programme has three core pillars (**Fig 1.**):

- AMS is the effort to measure and improve how antibiotics are prescribed by clinicians and used by patients⁴. Measurement should always accompany development and performance of AMS interventions. The drive-AMS programme provides support for measurement, teaches how to apply PPS methodology, how to measure and interpret quantity of antimicrobial use metrics, and how to perform an audit in order to measure quality indicators for appropriate antimicrobial use.

- ii. Teams learn about changing antimicrobial use practices by “doing”. The 3-4-day interactive masterclass has a step-by-step approach where AMS teams (not individual healthcare providers) develop their own AMS project starting from identified antibiotic use problems in their own hospital setting using implementation and behavioural science techniques.
- iii. After the masterclass, teams perform and evaluate their own AMS project in their setting with further expert support through the Specialized Program for Infectious Disease Care Everywhere (SPICE), for 12 – 18 months to ensure sustainable implementation of the AMS projects. See page 11.

Achievements and impact of drive-AMS

Drive-AMS has provided training and support to hospitals around the world (Fig. 2). So far, more than 500 participants forming over 160 hospital teams in nearly 60 countries across Europe, Africa, Asia and the Caribbean have participated in the drive-AMS programme.

In addition, drive-AMS has achieved several significant milestones that can be considered crucial on the pathway to sustainable AMS capacity at a national level and ensuring continuity of AMS implementation across healthcare systems, contributing to improved antimicrobial use, mitigation of AMR and reaching national, regional and global AMR targets:

1. **Ensuring drive-AMS nation-wide implementation:** In Portugal, the drive-AMS programme was endorsed by the Directorate General of Health and, in 2024, was selected by the Ministry of Health for the first phase of the Sustainable Health Pact 2024 - 2030, within the scope of the National Health Plan 2030, as part of the national activities on AMR⁵.
2. **Expanding drive-AMS methodology across the EU:** The Dutch Ministry of Health, Welfare and Sports, as part of the EU-JAMRAI partnership, provided funding for drive-AMS masterclass for other EU countries, namely Cyprus in 2025⁶. Drive-AMS is also showcased as an innovative approach contributing to the efforts for strengthening the EU response to prevention and control of AMR⁷.
3. **Embedding drive-AMS approach in the competence-based AMS curriculum:** Since its conception in 2022, the 2-year ESCMID-AMS Certificate programme is founded on the tailored AMS masterclass and modified implementation support provided by experienced tutors⁸. Building on this, the first ESCMID AMS Certificate - Latin America programme was launched in August 2025⁹.
4. **Building drive-AMS capacity in East-Africa:** After a regional drive-AMS masterclass in Tanzania in 2023, co-courses were organised and co-delivered by local trainers in Tanzania, Rwanda and Kenya in 2024-2025. Ten Teams that completed these masterclasses

receive ongoing support by international and regional SPICE experts.

5. **Using a combined AMS/IPC approach for building capacity in the Caribbean:** Ten countries of the Caribbean Community (CARICOM-10) take part in the new model combining infection prevention & control (IPC) and AMS.

6. **Institutionalisation of drive-AMS in Indonesia:** Strategic involvement of the Indonesian Ministry of

Health, supported by the WHO Office in Indonesia, for drive-AMS implementation at national level, combined with nationally adopted quality indicators for antimicrobial use, for assuring effective follow-up and country-wide programme sustainability.

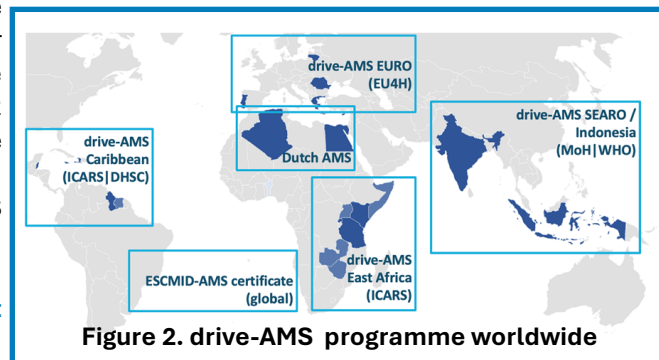


Figure 2. drive-AMS programme worldwide

Conclusion: what next?

The drive-AMS programme, including the knowledge and

skills transfer in the AMS masterclass, the measurement support through G-PPS and the implementation support through the SPICE expert registry, is time- and expertise-intensive. In the coming years, drive-AMS strategies envisage further capacity building of national trainers and establishing national and regional training and expertise hubs, using the blueprint from countries with successful implementation such as Greece, Indonesia, Lithuania, Portugal, Romania, Rwanda and Tanzania.

The drive-AMS approach of using implementation science for behaviour change and providing expert support to implement sustainable data-driven AMS solutions should become the norm and not the exception in mitigating the human-induced AMR tide.

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