

# HOSPITAL-BASED INTERVENTIONS TO CONTAIN ANTIBIOTIC RESISTANCE IN LOW-RESOURCE SETTINGS (AIM)

(Course leader: Jan Jacobs)

## GENERAL DESCRIPTION

Antibiotic resistance (ABR) is a fast-growing problem worldwide, considered as a major threat to public health by the World Health Organization and disproportionately hitting low resource settings (LRS). The short course “Hospital-based Interventions to Contain Antibiotic Resistance in Low-resource Settings (AIM)” is a 3-week course which offers an interdisciplinary and interactive training on relevant aspects of antibiotic resistance and its containment at the hospital level. It includes a truncus communis and 3 specific learning tracks on Antibiotic Stewardship (ABS), Infection Prevention & Control (IPC) and Microbiological Surveillance (MS), in the hospital setting, closely linked key components in the successful containment of antibiotic resistance.

The course targets health care professionals from LRS already involved in ABR-containment. Antibiotic resistance is quickly becoming an important public health problem in these contexts because of the high burden of resistant pathogens, the scarce options for diagnosis and therapy, the lack of technical and managerial competences or the lack of adapted guidelines and trainings. The course focuses on hospitals because they concentrate the most ill and vulnerable patients; in addition, they are hotbeds of healthcare-acquired infections, act as referral sites for difficult-to-treat infections and host trainees and postgraduate educational programs.

## NUMBER OF CREDITS

5 ECTS

## CONTENT

The course focuses on the three main components of ABR-containment in a low-resource hospital setting as well as on their interactions: Antibiotic Stewardship, Infection Prevention & Control and Microbiological Surveillance.

It consists of:

- A truncus communis addressing topics common to the three themes:
- Key pathogens and antibiotics
- Key aspects in Infection Prevention and Control, including hand hygiene, cleaning disinfection of environment and equipment
- Interventions to contain ABR including Hospital Committee
- Antiseptics/disinfectants, organizational aspects
- Transmission based precautions
- Essential requirements water and sanitation
- Surveillance on health care associated infections and outbreak investigation
- Antibiotics: over and under access
- Principles of Antibiotic Stewardship
- Carrousel: exercises on blood sampling, hand hygiene and preparation of hand alcohol
- Blood & other cultures: indications, sampling and transport

- Turn laboratory data into report
- Communication individual laboratory results

Specific modules on themes of particular relevance for each of the three disciplines:

**Antibiotic Stewardship track:**

- (Ir)rational use of antibiotics
- Gathering/understanding antibiotic use data (DDD, PPS)
- From antibiotic susceptibility testing to surveillance report
- Translation ABR data into guideline
- Prescriber and patient perspective
- Clinical casestudies
- Surgical site infections

**Infection Prevention & Control track:**

- Framework Hospital IPC
- Cleaning / disinfection of the environment and equipment
- Transmission based precautions
- Hand hygiene
- Microbiological sampling and processing of the hospital environment
- IPC in the care
- Invasive devices and care bundles
- Surgical site infections
- Monitoring IPC

**Microbiological Surveillance track:**

- Working-up cultures in the laboratory
- Selection of appropriate clinical samples
- Reading and interpreting antimicrobial susceptibility testing results
- Use of EUCAST/CLSI guidelines
- Translation ABR data into guideline
- Aggregate laboratory data into surveillance report.
- Microbiological sampling and processing of the hospital environment

## LEARNING OUTCOMES

After having successfully completed the course, participants should be able to develop and implement actions in the containment of ABR in hospitals in LRS, in at least one of the three topics (Antibiotic Stewardship, Microbiological Surveillance and Infection Prevention & Control).

In addition, after having successfully completed the Antibiotic Stewardship track, participants should be able to:

- Implement principles of rational use of antibiotics at patient and hospital level.
- Collect/interpret quantitative/qualitative data on antibiotic use and antibiotic susceptibility results.
- Translate ABR-data into antibiotic treatment guidelines and a local antibiotic policy.

- Implement and evaluate an antibiotic policy at hospital level.

After having successfully completed the Infection Prevention & Control track, participants should be able to:

- Develop a strategy to improve hand hygiene, cleaning / disinfection of the environment and equipment.
- Implement and teach principles of transmission based precautions.
- Propose possible solutions for his/her setting regarding organizational aspects and core components of IPC.
- Outline care bundles for invasive devices and apply basics of good nursing practices.
- Assess the evidence based measures in his/her facility with regards to the prevention of surgical site infections.
- Have an understanding of surveillance of health care associated infections and outbreak investigation.

After having successfully completed the Microbiological Surveillance track, participants should be able to:

- Perform quality assured clinical bacteriology, from indications to reporting
- Collect, interpret and report antibiotic resistance data for individual patients.
- Aggregate laboratory-based data into passive surveillance data and report them efficiently.
- Sample, work-up and report selected specimens as a support for infection control.

## TEACHING AND WORKING METHODS

The course offers a mixture of lectures, hands-on sessions (including benchwork, practical exercises and a carousel), case discussions, data analysis and role plays. It contains joint sessions and sessions tailored to each of the three topics.

The role-plays, exercises and group work (organized as a Hospital Committee with participants from the different tracks) allow for maximal interdisciplinary interaction, mirror real-life in the hospital, offer the opportunity to exchange ideas and skills and allow to build-up the synergism required for successful action.

During the course, as a personal project, each participant will develop, present and defend an Antibiotic Resistance (ABR)-containment plan for his/her facility in front of an expert committee.

The objectives of the personal project are the following:

- define the main problems and challenges in ABR containment in your hospital;
- list ideas and activities for ABR containment in your hospital;
- develop a personal intervention plan, clarifying how these activities will be implemented;
- implement a limited set of activities in your hospital after the course.

As part of the application candidates are asked to submit a short document (1,000 words maximum) including:

- a short description of the main problems and challenges related to containment of ABR in their structure;
- an action plan with a limited set of activities to contain ABR;
- activities should be pragmatic, feasible, affordable, measurable and possibly implemented within a reasonable timeframe in their structure. The action plan does not have to include a long list of activities: we would like candidates to focus on a realistic set of activities;
- the expected results.

## MODE OF STUDY

This course (component) is organized :  
 - Face-to-face (Antwerpen)

## ASSESSMENT AND ASSESSMENT CRITERIA

Summative assessment of the participants is based on a multiple-choice test at the end of the course, the personal project and the group work. After successful completion of the course students receive an ITM Credit Certificate.

## LITERATURE

### 1. Antibiotic stewardship

Literature recommended:

- Cox et al., 2017
- O'Neill 2016 Review AMR
- WHO Global Action Plan, 2015

### 2. Microbiological surveillance

Literature recommended:

Barbé et al 2017 : Implementation of quality management for clinical bacteriology in low-resource settings

Jacobs et al 2019 (submitted to 'Frontiers of Medicine') : Diagnostic bacteriology in district hospitals in low-resource settings: at the front-line of containment of antimicrobial resistance.

## OTHER STAFF INVOLVED IN THE COURSE

- Anne-Sophie Heroes, Birgit De Smet, Séverine Caluwaerts, Jan Kennis, Marina Cloetens/Lauranne Ghysels, Sien Ombelet - Institute of Tropical Medicine Antwerp, Department of Clinical Sciences
- Raffaella Ravinetto, Wim Van Damme - Institute of Tropical Medicine Antwerp, Department of Public Health

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