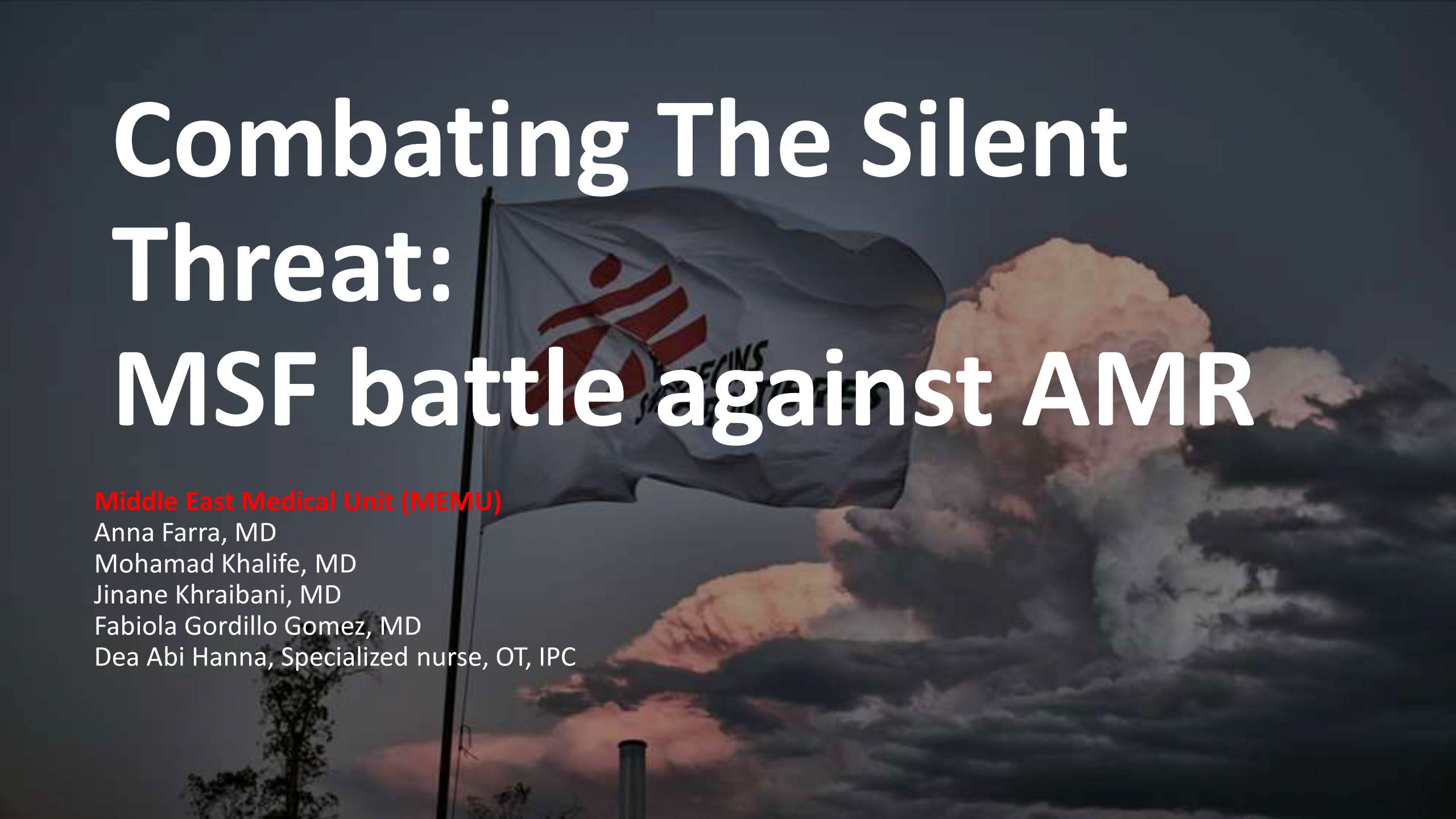
Combating The Silent Threat: MSF battle against AMR



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MEDICAL

INTERNATIONAL

MEDECINS SANS FRONTIERES

HUMANITARIAN

INDEPENDENT

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أطبّاء بلا حدود

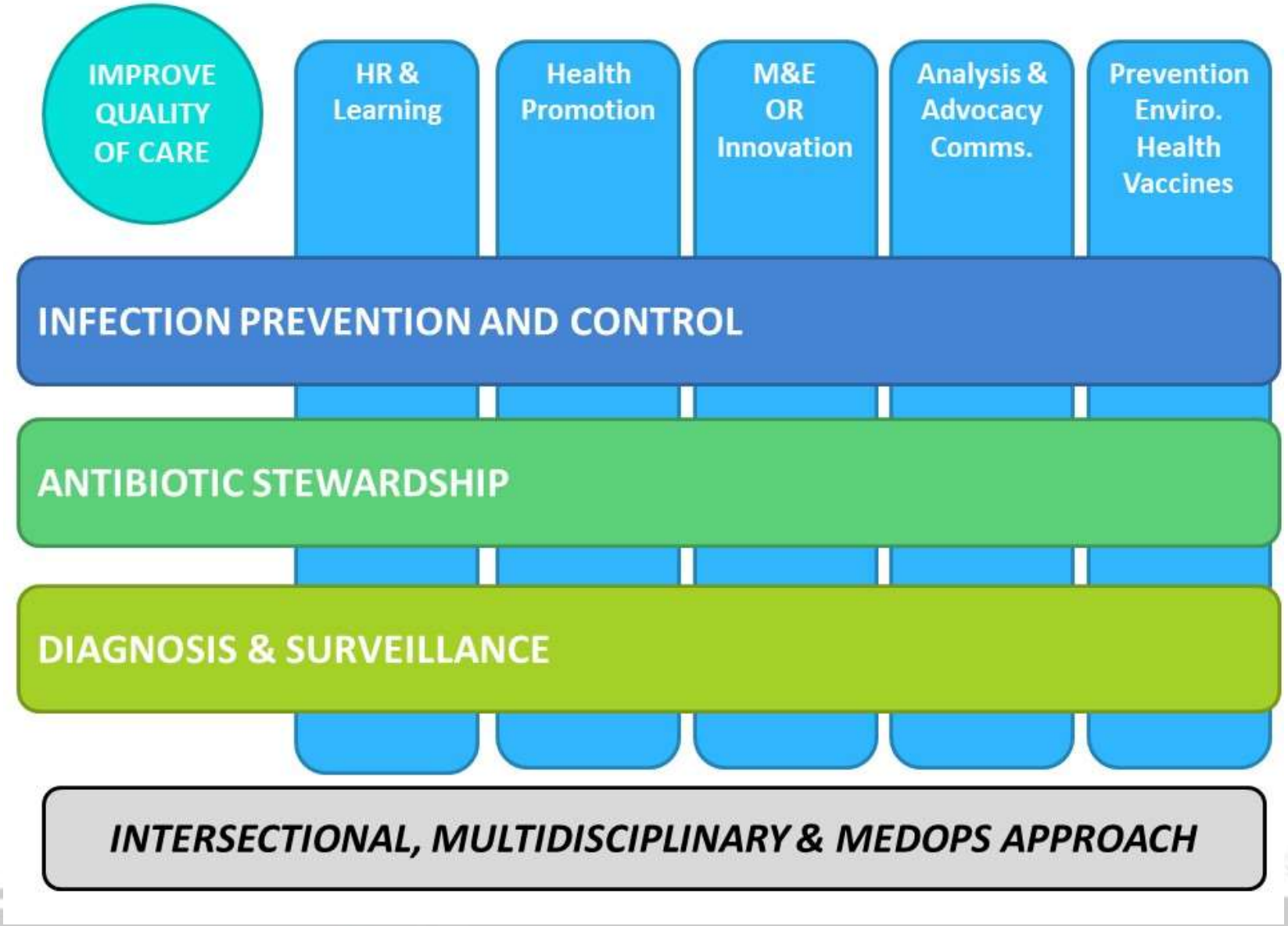
CHALLENGES IN MSF SETTINGS


HAZARD
PELIGRO


MEDICINES
SHOULDN'T BE
A LUXURY

HOW DOES MSF TACKLE THESE CHALLENGES?

Transversal axis



The three pillars

Microbiology

Note: Microbiology cannot be improved without strong IPC & AS in place

Antibiotic Stewardship (AS)

Infection, Prevention, & Control (IPC)

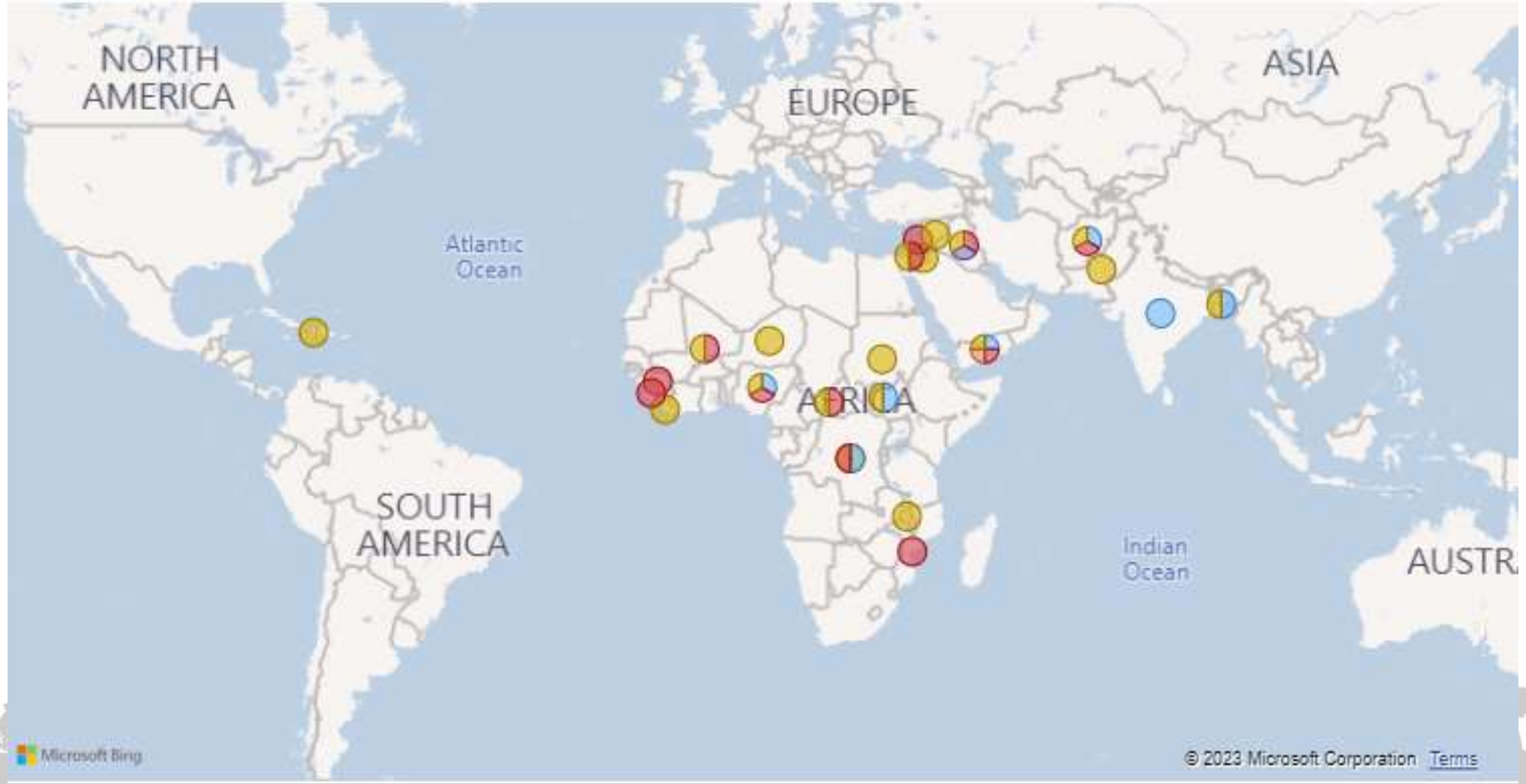
FULL PACKAGE

Includes all components

BASIC PACKAGE

All projects should include Antibiotic Stewardship and IPC components

MSF AMR full package map



AMS implementation

- AMS committee
- Action plan
- AMS focal points
- AMR referents
- Restrictive, persuasive stewardship strategies
- Prescription audits, consumption audits, quantitative and qualitative audits

AMS implementation

- MSF guidelines specific to MSF settings (LMIC)
- Local guidelines/Adapted antibiotic guideline according to lcoal antibiograms

AMS implementation

- Advocacy
- Collaboration with MOH/Hand-over to MOH
- Primary health care, electronic Clinical Decision Support System (eCDSS: MSF E-care) for children (Kenya): up to 50% reduction in antibiotic prescription

Claudia Truppa et al, Antimicrobial stewardship in primary health care programs in humanitarian settings: the time to act is now, Antimicrobial Resistance & Infection Control, sep 2023

IPC strategic framework

3 pilars:

1- Hand Hygiene

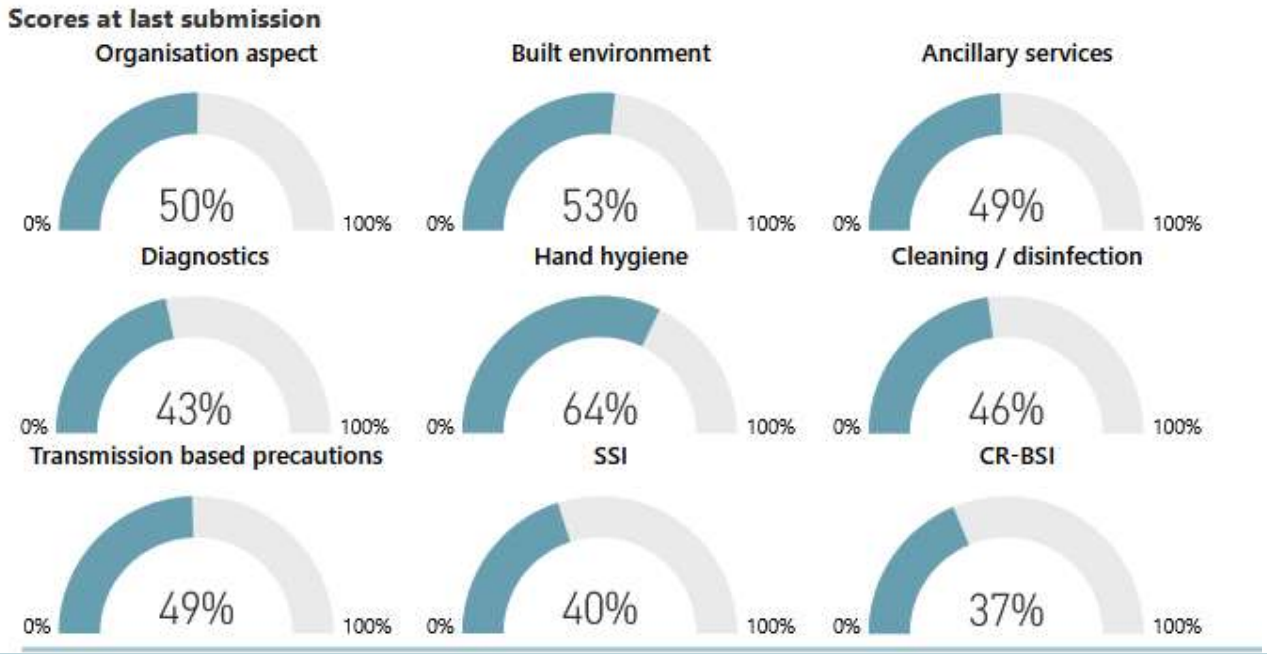
2-cleaning and disinfection of the environment and reprocessing of reusable medical devices

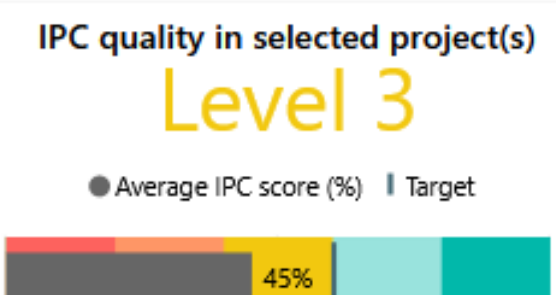
3- transmission-based precautions

Multimodal strategies: tailored to local context

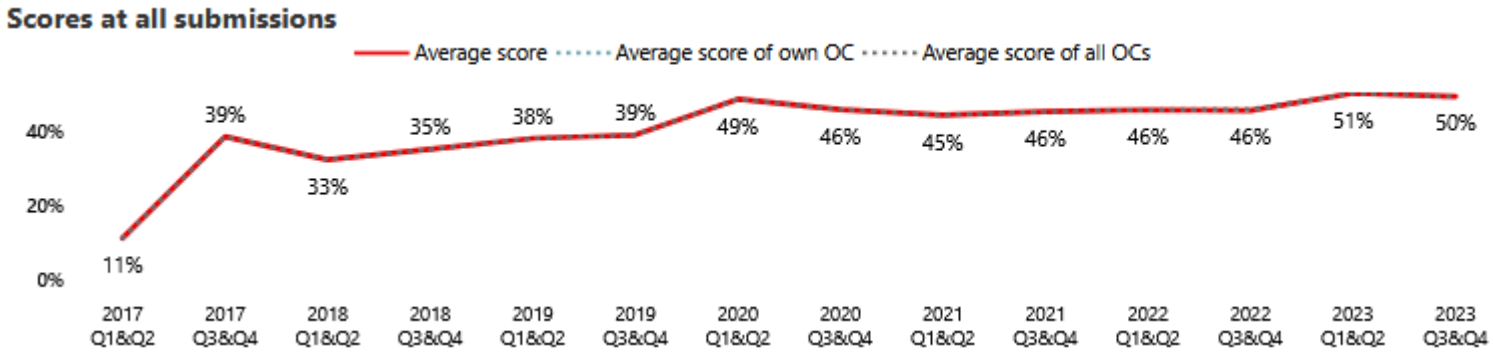
Multidisciplinary approach: medical, WaSH, logistics, human resources, and management staff.

SIPCA (Stepwise IPC improvement approach)





MSF's strategic framework focuses on these 9 categories



#Observations per half-year

606

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Water And Sanitation

MSF Academy (AMR learning initiative)

3 cohorts till now:
156 participants
26 countries

Created with mapchart.net

Tuberculosis and antimicrobial resistance - new models of research and development needed

Grania Brigden [1], José Luis Castro [1], Lucica Ditiu [2], Glenda Gray [3], Debra Hanna [4], Marcus Low [5], Malebona Precious Matsoso [6], Greg Perry [7], Melvin Spigelman [8], Souyma Swaminathan [9], Els Torreele [10], Sidney Wong [11]

Epub 2021 Apr 28.

AMR in low-resource settings: Médecins Sans Frontières bridges surveillance gaps by developing a turnkey solution, the Mini-Lab

Jean-Baptiste Ronat [1], Alessandra Natale [2], Thomas Kesteman [3], Antoine Andremont [4], Wael Elamin [5], Liselotte Hardy [6], Rupa Kanapathipillai [7], Justine Michel [2], Céline Langendorf [8], Olivier Vandenberg [9], Thierry Naas [10], Felix Kouassi [2]

Antimicrobial resistance in West Africa: a systematic review and meta-analysis

Kerlly J Bernabé [1], Céline Langendorf [2], Nathan Ford [3], Jean-Baptiste Ronat [4], Richard A Murphy [5]

Clinical bacteriology in low-resource settings: today's solutions

Sien Ombelet [1], Jean-Baptiste Ronat [2], Timothy Walsh [3], Cedric P Yansouni [4], Janneke Cox [5], Erika Vlieghe [6], Delphine Martiny [7], Makeda Semret [8], Olivier Vandenberg [9], Jan Jacobs [10]; Bacteriology in Low Resource Settings working group

Antibiotic Resistance in Pacific Island Countries and Territories: A Systematic Scoping Review

Nicola D Foxlee [1], Nicola Townell [2], Lachlan McIver [3], Colleen L Lau [4]

Antimicrobial stewardship in primary health care programs in humanitarian settings: the time to act is now

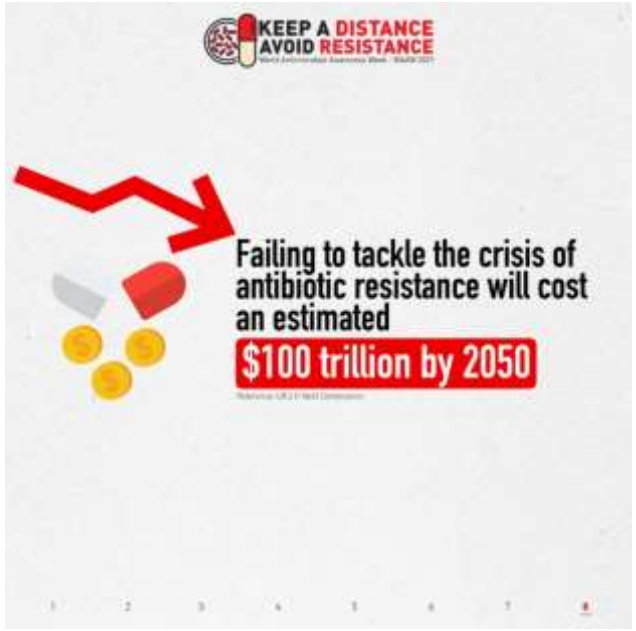
Claudia Truppa ✉, Beatriz Alonso, Kate Clezy, Carole Deglise, Carole Dromer, Silvia Garelli, Carolina Jimenez, Rupa Kanapathipillai, Mohamad Khalife & Ernestina Repetto

Antimicrobial Resistance & Infection Control **12**, Article number: 89 (2023) | Cite this article

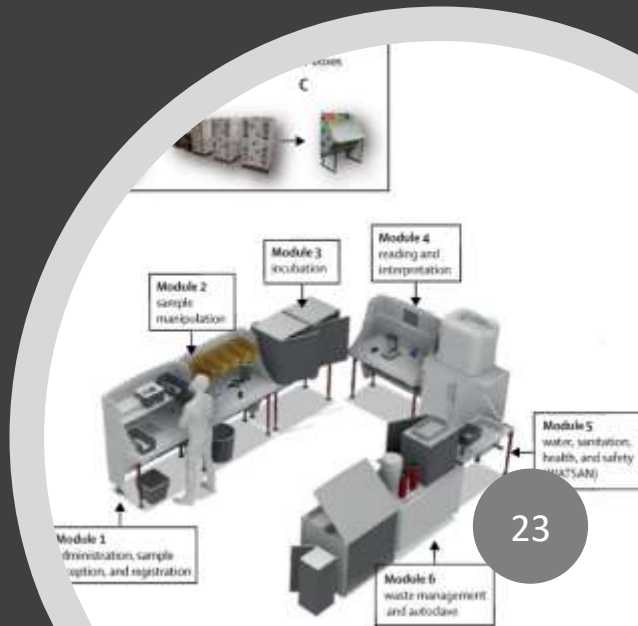
Leaving no one behind: the need for a truly global response to antimicrobial resistance

Jacob Goldberg ✉ • Kate Clezy • Dušan Jasovský • Angela Uyen-Cateriano

Health Promotion



Microbiology laboratories in MSF



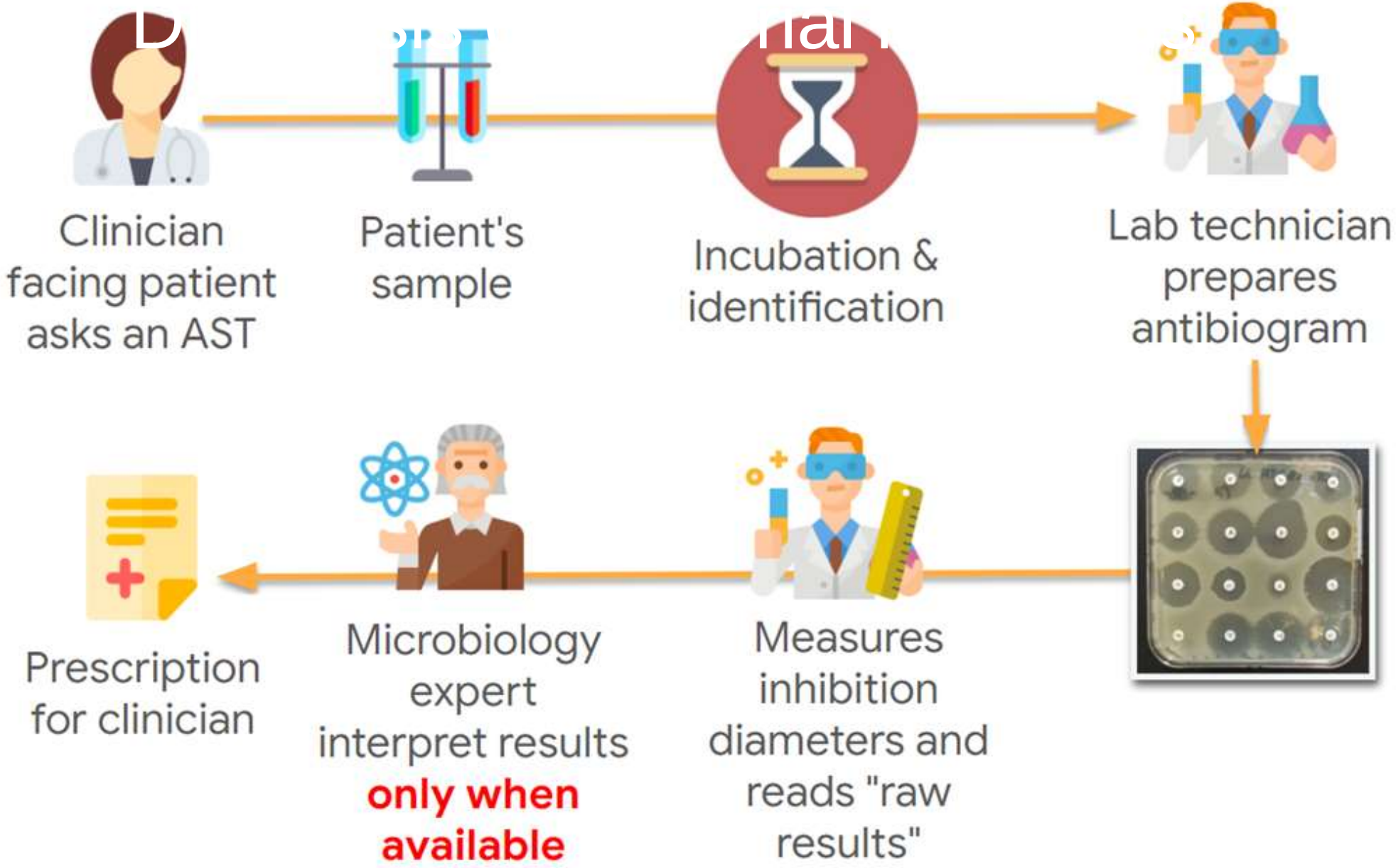
Antibiotic resistance and MSF experience: acces to diagnostic

- Assessment of local bacteriology laboratories
- OR
- Implementation of MSF bacteriology laboratories

Lack of trained HR +++Microbiologists for interpretation

Today: all MSF labs are managed by MSF trained lab techs

MICROBIOLOGY LABORATORY TEAMS


Clinician facing patient asks an AST
Patient's sample
Incubation & identification
Lab technician prepares antibiogram
Prescription for clinician
Microbiology expert interpret results only when available
Measures inhibition diameters and reads "raw results"

Antibiogo

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LA FONDATION

Antibiogo

Smartphone based application**, Free, Offline and open source**, supports laboratory technicians to **read and interpret antibiograms**

1. Take picture
2. Image processing+ AI: semi automatic measurement of IZD
3. Application of Breakpoint and Expert rules
4. Identification of resistance mechanism
5. IPC alert in case of MDR
6. Results with comments to lab tech and clinicians
7. Extrapolation to Antibiotics not tested
8. Possibility of sending report for approval by external microbiologist

https://youtu.be/Kvp7ofx-h4w

AST information

AST ID
QA2-SAU-442

Sample type
Tissue

Performed
20 October 2022

Bacteria
Staphylococcus aureus

Technician name
MA

Patient information

ID
442

Name

Age

Gender

Methi Resistant Staphylococcus

Antibiotics

Susceptible, standard dosing regimen

A microorganism is categorised as "Susceptible, standard dosing regimen", when there is a high likelihood of therapeutic success using a standard dosing regimen of the agent.

- S Clindamycin
- S Erythromycin
- S Fusidic Acid
- S Gentamicin
- S Norfloxacin
- S Rifampicin
- S Tobramycin
- S Trimethoprim + Sulfamethoxazole

Inferred: Moxifloxacin, Netilmicin, Oleandomycin, Thiamphenicol

Susceptible, increased exposure

A microorganism is categorised as "Susceptible, Increased exposure" when there is a high likelihood of therapeutic success because exposure to the agent is increased by adjusting the dosing regimen or by its concentration at the site of infection.

- I Ciprofloxacin

Inferred: Levofloxacin

Resistant

A microorganism is categorised as Resistant when there is a high likelihood of therapeutic failure even when there is increased exposure.

- R Cefoxitin
- R Penicillin G 1u
- R Tetracycline

Inferred: Amoxicillin + Clavulanic Ac. (cystitis), Amoxicillin + Clavulanic Ac. (MIC), Amoxicillin + Clavulanic Ac. Iv, Amoxicillin + Clavulanic Ac. Oral, Amoxicillin + Clavulanic.ac, Amoxicillin + Clavulanic.ac, Amoxicillin + Clavulanic.ac + Cloxa, Amoxicillin, Amoxicillin Iv, Amoxicillin Iv (meningitis), Amoxicillin Iv (non Meningitis), Amoxicillin (MIC), Amoxicillin Oral, Ampicillin (meningitis), Ampicillin (MIC), Ampicillin (non Meningitis), Ampicillin + Sulbactam, Ampicillin, Ampicillin, Azlocilline, Aztreonam, Carbenicillin, Cefacetrile, Cefaclor, Cefadroxil, Cefalexin, Cefaloridine, Cefalotin, Cefamandole, Cefapirin, Cefatrizine, Cefazolin (MIC), Cefazolin, Cefepime (meningitis), Cefepime (MIC), Cefepime (non Meningitis), Cefepime + Clavulanic.ac, Cefepime + Clavulanic.ac + Cloxacillin, Cefepime, Cefepime + Cloxacillin, Cefixime (MIC), Cefmenoxime, Cefoperazone, Cefotaxime (meningitis), Cefotaxime (MIC), Cefotaxime (non Meningitis), Cefotaxime + Clavulanic.ac, Cefotaxime + Clavulanic.ac + Cloxa, Cefotaxime + Clavulanic.ac, Cefotaxime + Clavulanic.ac + Cloxacillin, Cefotaxime, Cefotaxime + Cloxacillin, Cefotaxime, Cefotaxime + Cloxacillin, Cefotetan *, Cefotiam, Cefotiam-hexetil, Cefpirome, Cefpirome (MIC), Cefpodoxime (MIC), Cefpodoxime, Cefradine, Cefsulodin *, Ceftazidime + Avibactam 10-4 Mg, Ceftazidime + Clavulanic.ac, Ceftazidime + Clavulanic.ac + Cloxa, Ceftazidime + Clavulanic.ac, Ceftazidime + Clavulanic.ac + Cloxa, Ceftazidime + Cloxacillin, Ceftazidime, Ceftazidime, Ceftazidime + Cloxacillin, Ceftizoxime, Ceftolozane-tazobactam (pneumoniae), Ceftriaxone (meningitis), Ceftriaxone (MIC), Ceftriaxone (non Meningitis), Ceftriaxone, Cefuroxime (MIC), Cefuroxime Iv, Cefuroxime Oral (MIC), Cefuroxime Oral, Cloxacillin, Colistin (MIC), Colistin, Colistin, Dicloxacillin, Doripenem (MIC), Doripenem, Ertapenem (MIC), Ertapenem, Ertapenem + Cloxacillin, Flucloxacillin, Flumequine, Imipenem (MIC), Imipenem + Cloxacillin, Imipenem + Edta, Imipenem + Edta (MIC), Imipenem, Imipenem-relebactam, Loracarbef, Mecillinam, Meropenem (meningitis), Meropenem (MIC), Meropenem (non Meningitis), Meropenem + Cloxacillin, Meropenem, Meticillin, Mezlocillin, Moxalactam, Nafcillin*, Nalidixic Acid, Oxacillin (MIC), Oxacillin, Oxacillin, Oxolinic Acid, Penicillin (meningitis), Penicillin (MIC), Penicillin (non Meningitis), Penicillin (str.pneumo), Penicillin V, Pipemidic Acid, Piperacillin + Tazobactam, Piperacillin, Piromidic Acid, Polymyxin B 300ui, Temocillin, Ticarcillin + Clavulanic.ac, Ticarcillin

Notes

Interpretation

- Methicillin resistance detected. isolates are considered resistant to all penicillins and most cephalorsporins.
- For systemic infections, aminoglycosides should be used in combination with other active therapy.
- For systemic infections, aminoglycosides should be used in combination with other active therapy.

This AST was prepared using Antibiogo. Learn more at antibiogo.org

Antibiogo

In addition to Diagnostic aid: support the lab tech and clinicians for an easy interpretation of results

For Lab tech

Incompatibility of results

- ❑ Warning : drug profile corresponds to Micrococcus. Check identification.
- ❑ Warning : Ampicillin and Amoxicillin + Clavulanic acid results are not compatible. Please check results.

Expected phenotype/intrinsic resistance

- ❑ Warning : This species is intrinsically resistant to CEFOXITIN. Please check the result of the antibiotic and the identification.

Uncommon phenotype

- ❑ Penicillin-resistance has not been described for this organism. Confirm this resistance using another method. In case of confirmation send the strain to a reference laboratory.

Testing recommandation

- ❑ Streptococcus pneumoniae susceptibility to B-lactams must be tested using Oxacillin 1µg disc (Oxa screening) or Penicillin G MIC
- ❑ Warning : Gentamicin I or R. Please test Gentamicin with high concentration (to determine level resistance).
- ❑ To use Ampicillin in meningitis you should determine the MIC.

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For clinicians

- ❑ Quinolone resistance NOT detected. In uncomplicated UTIs ciprofloxacin and levofloxacin can be considered susceptible.
- ❑ For systemic infections, aminoglycosides should be used in combination with other active therapy.
- ❑ Extended-spectrum beta-lactamase production dectected. In isolates that test susceptibile to amoxicillin-clavulanate and/or piperacillin-tazobactam, treatment with these agents should be avoided in serious infections (including isolates from blood cultures).
- ❑ No beta-lactam resistance detected. Isolate is considered to be susceptible to all beta-lactam agents.

Diagnostic

- Antibiogo manages Internal quality control
- Antibiotic panel management
- Selective reporting

Surveillance

- Interoperability
- %SIR analysis

Capacity building

- Guidance for Inhibition zone measurements based on Eucast
- Main interpretation/ and OR resistance mechanism explained

Thank you