



# The Multidrug-resistant Organism Repository & Surveillance Network (MRSN)



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## Background

Nosocomial transmission of multidrug-resistant organisms (MDRO) throughout the military health system (MHS) has contributed to an epidemic of wound and health care associated infections.

No centralized entity exists for collecting and characterizing MDRO to inform infection control and clinical practice.

## Objective

Establish a central repository and surveillance network to assist in determining full burden of MDRO throughout the MHS, their origins of entry, channels of spread, and mechanisms of resistance.

## Mission

Conduct epidemiologic surveillance of MDRO to enhance performance improvement and focus infection control.

## Vision

A national resource for characterizing and archiving MDRO to influence infection control and clinical practice.

## Methods

### Pre-implementation:

Staffing required at or through Program Analysis and Evaluation Division, OTSG; Resource Management Division, OTSG; Armed Forces Health Surveillance Center (AFHSC); AMEDD C, MIO; and Director of Executive Agencies

Information and decision briefs required by CDR MRMC, DSG, OTSG and ASD(HA)

Approval and funding for phased implementation of the MRSN obtained through MEDCOM

### Phased\* Implementation:

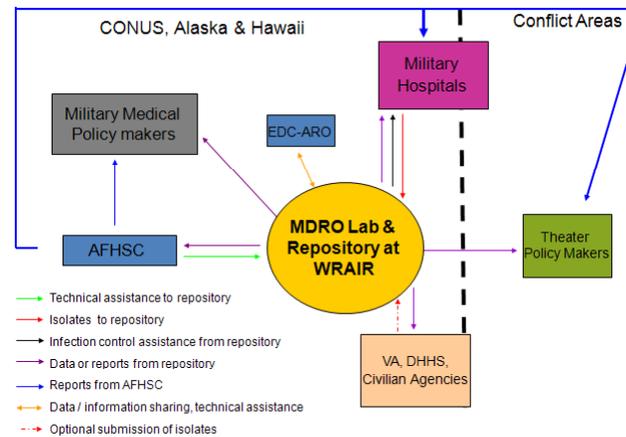
Isolates undergo phylogenetic, phenotypic, and molecular characterization and long-term storage

Associated clinical and demographic data also captured

Following characterization, isolates undergo analysis for epidemiologic linkage, MIC creep, and emergence of new phenotypes or resistance mechanisms

\*Sequentially larger groups of hospitals (including those in theater) send MDRO isolates to the repository

## Concept of Operation



### Legend:

Groups of Level III, IV, and V medical treatment facilities submit isolates and associated clinical data to the repository at WRAIR and in turn receive reports and assistance from WRAIR. Reports and guidance will also be provided to combatant medical leaders via the repository over secure internet or the AFHSC.

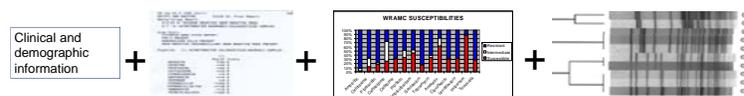
Information sharing and bi-directional technical assistance to enhance isolate capture and reporting occurs between the repository and the Navy's public health Epi-data Center Antibiotic Resistance Organization. EDC-ARO

Data and reports from the repository are forwarded to the AFHSC for broad dissemination. The AFHSC assists the repository with epidemiologic analysis or generation of the final reports.

Reports and information are provided to MEDCOM, consultants for microbiology, infectious diseases, surgery, trauma, the surgeons general, and Civilian agencies who can submit isolates on an optional basis.

# Raw data and analyses will also be available on a secure Web-enabled data base.

### Examples of tools used to produce deliverables:



## Discussion

The MRSN is based, in part, on the Duke Infection Control Network, where in addition to forwarding reports, infection control and infectious diseases specialists occasionally visit facilities to discuss reports and trends in person.

Unlike the Duke network, we will also collect, fully characterize and archive isolates. This will result in a valuable asset of globally obtained MDRO isolates available for new drug development and assay validation.

Target organisms will change in response to current and emerging threats. Initial focus: *A. baumannii*, *E. coli*, *P. aeruginosa*, *K. pneumoniae* and MRSA.

Another unique feature will be the ability of clinicians, including those deployed, to view local and regional antibiograms on the database to guide empiric therapy.

Active surveillance will allow earlier and more accurate identification of originating sources. The collection of isolates over time will facilitate identification of trends in resistance and point prevalences. It will also make possible the comparison of isolates from previous and future conflicts.

The views expressed here are those of the authors and do not reflect the official policy of the Department of the Army, Department of Defense or U.S. Government.

### Deliverables:

1. Regional and global antibiograms
2. Point estimates, prevalences & trends
3. Originating sources
4. Patterns of spread
5. New or emerging MDRO