

2nd EDITION

MULTI-DRUG RESISTANT ORGANISM (MDRO) & METHICILIN RESISTANT STAPHYLOCOCCUS AUREUS BACTEREMIA (MRSAB) SURVEILLANCE MANUAL



**Multi-drug Resistant Organism (MDRO)
&
Methicillin Resistant Staphylococcus Aureus
Bacteremia (MRSAB) Surveillance
Manual**

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Multi-drug Resistant Organism (MDRO) & Methicillin Resistant Staphylococcus Aureus Bacteremia (MRSAB) Surveillance Manual

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ABBREVIATION

BSI	<i>Blood Stream Infection</i>
CDC	<i>Centre for Disease Control</i>
CRE	<i>Carbapenem-resistant Enterobacteriaceae</i>
CSF	<i>Cerebrospinal Fluid</i>
ESBL	<i>Extended-spectrum beta-lactamase</i>
HAP	<i>Hospital-acquired Pneumonia</i>
HCAI	<i>Health care-associated infection</i>
HIACC	<i>Hospital Infection and Antibiotic Control Committee</i>
ICN / ICP	<i>Infection Control Nurse / Infection Control Personnel</i>
MDRO	<i>Multi-drug Resistant Organism</i>
MOH	<i>Ministry of Health</i>
MRSA	<i>Methicillin-resistant Staphylococcus aureus</i>
MRSAB	<i>Methicillin-resistant Staphylococcus aureus Bacteremia</i>
CA MRSA	<i>Community Acquired Methicillin-resistant Staphylococcus aureus</i>
NDM-1	<i>New Delhi Metallo-β-Lactamase -1</i>
NHSN	<i>National Healthcare Safety Network</i>
PCR	<i>Polymerase Chain Reaction</i>
UTI	<i>Urinary Tract Infection</i>
VAP	<i>Ventilator Associated Pneumonia</i>

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1. INTRODUCTION

Surveillance is an essential component of prevention and control of infection in hospitals. It helps to identify risks of infection and reinforces the need for good practices. Preventing outbreak depends on prompt recognition of an infection and instituting control measures to reduce the spread of infection. Collection of accurate data allows comparison with other units or institutions and measurement of response to changes in practice. It consists of routine collection of data on infection among patients or staff, analysis and the dissemination of the result so that appropriate action can be implemented.

Multidrug-Resistant Organisms (MDRO) surveillance is the continuous active monitoring of the incidence of specified organisms of clinical interests. It is laboratory based surveillance. All laboratories shall use a standard definition for identification and reporting of these MDROs. This surveillance program measures both health care-associated infection and colonization attributed to the MDRO of interest.

Methicillin Resistant *Staphylococcus aureus* Bacteremia (MRSAB) has become significant and a growing concern. Common sources of MRSAB include intravenous catheters and other intravascular devices, soft-tissue infections, and pneumonia (usually associated with receipt of mechanical ventilation).

Surveillance for MRSAB cases is considered a component of an infection control program. By performing analysis on these surveillance data, we will be able to capture important information on the trends in MRSA bacteraemia in Malaysian hospitals. In addition to health care-associated MRSA there is a mounting concern regarding the emergence of community-associated MRSA in patients with no apparent risk factors.

2. OBJECTIVES

The objective of MDRO surveillance program is to determine the rate and trend of specified MDROs in all hospitals in Malaysia using standardized laboratory and clinical criteria. This is essential for prevention and early detection of outbreak and timely investigation and institution of control measures.

The objectives of MRSAB is to determine the incidence and trend of MRSA bacteremia in Malaysian hospitals and to identify the MRSA as health care acquired or Community acquired. This surveillance will also look into the outcome of the MRSA bacteremia.

3. METHODOLOGY

a) Population under surveillance

The population under surveillance is all inpatients.

Exclusion criteria;

- Cases from Emergency department, clinic or other outpatient services
- Cases previously identified at other acute care facilities/hospitals
- Cases re-admitted with same MDROs within one year¹
- Screening culture

b) The MDROs under surveillance are:

- Methicillin-resistant *S.aureus* (MRSA)
- Extended-spectrum beta-lactamases (ESBL) producing *Klebsiella pneumoniae*
- Extended- spectrum beta-lactamases (ESBL) producing *Escherichia coli*
- Multidrug-resistant *Acinetobacterbaumani*
- Carbapenem-resistant *Enterobacteriaceae* (CRE)
- Vancomycin-resistant *Enterococcus* (VRE)

c) Case definitions

MDRO case definition must fulfil all three criteria;

- Isolation of the MDRO from any sites of the body (including colonizer).
- The case must be an inpatient
- The case must be “*Newly identified*”.

“*Newly identified*” include:

- MDROs identified for the first time during current hospital admission. Cases that have been identified at your site but acquire ‘new infection’ with different MDROs.

NOTE:

- If more than one type of MDROs were isolated from the same patient, they should be counted separately.
- If a colonized case subsequently develops an infection, the case is counted as a new infection.

4. DATA COLLECTION

Infection Control Nurse (ICN) / Infection Control Personnel (ICP) shall collect data on MDRO and MRSA isolated from blood culture on a daily basis from the laboratory. The ICN / ICP will liaise with staff in the relevant clinical area to ensure that the infection control practices are implemented. Where appropriate, the Clinical Microbiologist will inform the relevant Clinician of the result.

Upon isolation of MDRO or MRSAB, the ICN / ICP should investigate and specify the type of infection based on the **CDC/NHSN Surveillance Definition of Health Care-Associated Infection and Criteria for Specific Types of Infections in the Acute Care Setting²**. Then classify the infection in relation to the health care facility as detailed in **Appendix 2**.

Complete the **MDRO-MRSAB Surveillance Form (MDRO-MRSAB/MOH/2018/1)** and **MDRO Surveillance Line-Listing (MDRO/MOH/2018/2)** as shown in **Appendix 3 & 4**. The **MRSAB Surveillance Line Listing (MRSAB/MOH/2018/3)** will be automatically generated once the data were encoded into the MDRO Surveillance Line-Listing (see **Appendix 5**).

All hospitals shall analyse the data on monthly basis by filling in the **Monthly MDRO-MRSAB Reporting Form (MDRO-MRSAB/MOH/2018/4-I)** as shown in **Appendix 6**.

For the purpose of Half Year and Annual Report, Jan-June and Jan-Dec data should be summarized and entered into respective forms [**Half Year MDRO-MRSAB Reporting Form (MDRO-MRSAB/MOH/2018/4-II)** and **Annual MDRO-MRSAB Reporting Form (MDRO-MRSAB/MOH/2018/4-III)**] as in **Appendix 7 and 8**.

Once the data were entered into the monthly reporting form, the data for January to June and July to December will be automatically generated and tranfered into the **Jan-June MDRO Surveillance Reporting Form (Jan-June MDRO/MOH/2018/5)**, **Jan-June MRSAB Surveillance Reporting Form (Jan-June MRSAB/MOH/2018/6)**, **July-Dec MDRO Surveillance Reporting Form (July-Dec MDRO/MOH/2018/7)** and **July-Dec MRSAB Surveillance Reporting Form (July-Dec MRSAB/MOH/2018/8)** as shown in **Appendix 9, 10, 11 and 12**.

The Annual MDRO Surveillance Reporting Form (**MDRO/MOH/2018/9**) as shown in **Appendix 13** will be automatically generated once all the reporting forms are completed.

5. DATA ANALYSIS AND REPORTING

The inpatient data will be used as **denominators** to calculate the incidence rate of MDRO and MRSAB in each hospital. Following data will be collected:

- a) Total number of hospital admissions.
- b) Total number of patient days (to collect a 12-midnight statistics from the Record Office).

All hospitals shall analyse data on monthly basis and submit the report to Hospital Infection and Antibiotic Control Committee (HIACC) Coordinator for verification. After verification by the HIACC Coordinator, all the line listing and reporting forms shall be send to **Infection Control State Coordinator** for compilation by 10th of August for **Half Year Report** and **10th February for Annual Report**. The Infection Control State Coordinator shall then send the compiled data to the **Infection Control Unit, Quality in Medical Care Section, MOH by 20th of August for the Half Year Report and 20th of February for Annual Report**.

The data will be analysed and result will be disseminated every 6-monthly. A yearly report will be published which will include;

- a) Incidence of each health care-associated MDRO per 100 admissions.
- b) Incidence of each health care-associated MDRO per 1,000 patient-days.
- c) Incidence of each health care-associated MRSAB per 100 admissions.
- d) Incidence of each health care-associated MRSAB per 1,000 patient-days.

The flow chart of MDRO & MRSAB Surveillance is shown in **Appendix 14**.

KEY TERMS**Multidrug-resistant Organisms (MDRO)**

MDRO are identified in microbiology laboratory and include organisms such as MRSA and other antibiotic resistant organisms.

- i. MRSA - *Staphylococcus aureus* that tests oxacillin - or ceftazidime-resistant by standard susceptibility testing methods; or by a positive result for penicillin binding protein 2a (PBP2a) latex agglutination test or molecular testing for *mecA* gene. May also include positive results of specimens tested by other validated polymerase chain reaction (PCR) tests for MRSA.
- ii. ESBL - are enzymes that mediate resistance to extended-spectrum (third generation) cephalosporins (e.g., ceftazidime, cefotaxime, and ceftriaxone) and monobactams (e.g., aztreonam). CLSI recommends confirmation of potential ESBL-producing isolates of *K. pneumoniae* or and *E. coli* by performing phenotypic testing using both cefotaxime and ceftazidime, alone and in combination with clavulanic acid.
- iii. MDR-Acinetobacter: *Acinetobacter baumannii* (resistant or intermediate) to three or more antimicrobial classes

Class	Antimicrobial
Cephalosporins	Cefepime, Ceftazidime
Carbapenems	Imipenem, Meropenem, Doripenem, Ertapenem
β -lactams / β -lactamase inhibitor combination	Ampicillin / sulbactam, Piperacillin / tazobactam
Aminoglycosides	Amikacin, Gentamicin, Tobramycin
Fluoroquinolones	Ciprofloxacin, Levofloxacin

- iv. Carbapenem resistant Enterobacteriaceae - Enterobacteriaceae that meet the following criteria; Intermediate or resistant to imipenem, meropenemertapenem and doripenem by using MIC method, and confirmed by molecular method.
- v. Vancomycin-resistant Enterococci (VRE) – the resistance of an Enterococcus species to vancomycin according to the susceptibility breakpoints given by CLSI. If using disc diffusion method, plates should be held for full 24 hours for accurate detection of resistance. Organisms with intermediate zones should be tested by an MIC method.

Attributable Death

The difference in all-cause deaths between 2 compared groups

Colonization

The presence of microorganisms on skin, mucous membranes, open wounds or excretions or secretions but is not causing adverse clinical signs or symptoms.

Contamination

Presence of microorganisms that do not multiply or cause clinical problems

Implant

A non-human-derive implantable foreign body (e.g., prosthetic heart valve, nonhuman vascular graft, mechanical heart, or hip prosthesis that is permanently placed in a patient during operative procedure and is not routinely manipulated for diagnostic or therapeutic purposes, screw, wires, and mesh that are left permanently are considered implants).

Infection	A positive culture of MDRO from a sterile site (blood, CSF, pleural fluid, peritoneal fluid) unless determined to be a contaminant. OR A positive culture of MDRO from a non-sterile site AND the presence of clinical signs and symptoms OR as determined by attending clinicians.
Inpatient	A patient whose date of admission to the healthcare facility and the date of discharge are 2 different calendar days.
Patient Days	Patient days are the total number of days that patients are in the location during the selected time period. Example: ten patients in the ward on the 1st day of the month; 12 on day 2; 11 on day 3; 13 on day 4; 10 on day 5; 6 on day 6; and 10 on day 7; and so on. If we counted the patients in the ward from day 1 through 7, we would add 10+12+11+13+10+6+10 for a total of 72 patient days for the 1st week of the for the entire month, the number of patient days for the month is simply the sum of the daily counts.
Surveillance	Surveillance is defined as the systematic active collecting, consolidating, and analysing data concerning the distribution and determinants of a given organisms, disease or event, followed by dissemination of that information to those who can change the result.

CLASSIFICATION OF INFECTION IN RELATIONS TO HEALTH CARE FACILITY

1. Healthcare Associated, Own Hospital	• A Multi-drug Resistant Organisms case identified 48 hours after the patient was admitted to your hospital. OR • A Multi-drug Resistant Organism case identified within one month for surgical procedure without implant or one year with implant. OR • A Multi-drug Resistant Organisms case identified less than 48 hours after admission to your hospital AND • The patient has history of encounter with any procedures at your acute care/ outpatient care facility.
2. Healthcare Associated, Another Health Care Facility [Other MOH facility or Non MOH facility]	• A Multi-drug Resistant Organisms case identified 48 hours or less after admission to your hospital AND • The case had an encounter with another healthcare facility, either as an inpatient or as an outpatient (including emergency care, ambulatory care, and outpatient clinics), within the last 12 months for MRSA and 3 months for gram negative bacteria^{3,4}

3. Not Healthcare Associated	• A Multi-drug Resistant Organisms case identified less than 48 hours after admission to your acute care facility AND • There was no exposure to any health care facility, either as an inpatient or an outpatient
4. Not Healthcare Associated (Community- associated MRSA)	Community-associated MRSA cases are defined as meeting the following criteria • No previous history of MRSA • MRSA identified ≤ 48 hours after hospital admission • No hospitalization in the previous 12 months • No surgery or dialysis in the previous 12 months • No residence in a long-term care facility in the previous 12 months • No indwelling catheter or medical device (e.g. foley catheter, IV line, tracheostomy, feeding tube)

MDRO-MRSAB SURVEILLANCE FORM
MINISTRY OF HEALTH MALAYSIA
(MDRO-MRSAB/MOH/2018/1)

HOSPITAL: DATE:

--	--	--	--	--	--

A. DEMOGRAPHIC DETAILS:1. Name:

2. MRN:		3. IC/ Passport No:	
---------	--	---------------------------	--

4. Date of Admission:		
--------------------------	--	--

5. Ward on Admission:	
--------------------------	--

6. Department:	
----------------	--

7. Diagnosis on Admission:	
-------------------------------	--

8. Previous Encounter to Health Facility/ long Term Nursing Care:		No
		Yes

If yes to (7), specify:	Name of Health Facility/ Long Term Nursing Care:	
	Date of Discharge:	

B. POSITIVE CULTURE:

1. Diagnosis on Specimen Taken:		2. Date of Positive Report:	
---------------------------------------	--	-----------------------------------	--

3. Date of Specimen Taken:		4. Specimen Type:	
----------------------------------	--	----------------------	--

5. Location (Ward) During Specimen Collection:	
---	--

C. ISOLATE ORGANISMS:

1. Methicillin-resistant *Staphylococcus aureus* (MRSA)

2. MDR *Acinetobacter baumannii*

3. ESBL *K pneumoniae*

4. Carbapenem-resistant Enterobacteriaceae (CRE)

5. ESBL *Escherichia coli*

6. Vancomycin-resistant Enterococcus (VRE)

7. OTHERS, specify:

D. ISOLATE STATUS:

1. Infection

2. Colonizer
(Proceed to F)

3. Contaminant
(Omit subsequent questions)

E. TYPE OF INFECTION:

1. Blood stream infection (BSI)
(Proceed to F, G & H if MRSAB)

2. Surgical site infection (SSI)

3. Urinary tract infection (UTI)

4. Hospital acquired pneumonia (VAP)

5. Hospital acquired pneumonia
(Non-VAP)

6. Skin & Soft Tissue Infection (SSTI)

7. Intra-abdominal Infection

8. OTHERS, specify:

F. CULTURE POSITIVE STATUS

1. Health Care-Associated, Own Facility

2. Health Care-Associated, other MOH Facility

3. Health Care-Associated, non MOH Facility

4. Not Health Care-Associated

G. ANTIBIOTIC (s) EXPOSURE WITHIN LAST 3 MONTHS

No.	Name of Antibiotic	Group of Antibiotic	Date Started	Duration (days)

H. MRSA BACTEREMIA (MRSAB)

1. HA MRSAB
2. CA MRSAB ** (Alive & Died)

I. OUTCOME DATA – AT ONE MONTH OF DIAGNOSIS

1. Alive
2. Died

J. MRSAB ATTRIBUTABLE DEATH

1. Yes
2. No

Prepared by:

Name:

Designation:

Date:

Verified by:

Name:

Designation:

Date:

APPENDIX 4

MDRO Surveillance Line Listing (MDRO/MOH/2018/2)

HOSPITAL _____ : JAN-JUNE _____
 SURVEY PERIOD

PATIENT DETAILS									
NO	NAME	RN	DATE OF ADMISSION	DATE OF MDRO DIAGNOSIS (DATE OF SPECIMEN TAKEN)	MONTH	WARD ON ADMISSION	DEPARTMENT	PREVIOUS ENCOUNTER TO HEALTHCARE FACILITY	DATE OF DISCHARGE FROM PREVIOUS HEALTHCARE
									H/O SURGICAL INTERVENTION WITHIN 1 MONTH
									H/O SURGICAL IMPLANT WITHIN 1 YEAR
									DIAGNOSIS ON SPECIMEN TAKEN
1									
2									
3									

POSITIVE CULTURE						ANTIBIOTIC EXPOSURE WITHIN LAST 3 MONTHS			OUTCOME OF MRSAB	RECHECK DATE	HOSPITAL INFORMATION		
DATE OF MDRO REPORT	WARD (SPECIMEN TAKEN)	TYPE OF SPECIMEN	ISOLATED ORGANISM	ISOLATE STATUS	TYPE OF INFECTION	HCAI STATUS	ANTIBIOTIC 1	ANTIBIOTIC 2	OUTCOME AT 1 MONTH OF MRSAB	MRSAB ATTRIBUTABLE DEATH (AT 1 MONTH)	WRONG DATE	NAME	CATEGORY

MRSAB Surveillance Line Listing (MRSAB/MOH/2018/3)

HOSPITAL : _____
 SURVEY PERIOD : JAN-JUNE

PATIENT DETAILS									
NO	NAME	RN	DATE OF ADMISSION	DATE OF MDRO DIAGNOSIS (DATE OF POSITIVE REPORT)	MONTH	WARD ON ADMISSION	DEPARTMENT	PREVIOUS ENCOUNTER TO HEALTHCARE FACILITY	DATE OF DISCHARGE FROM PREVIOUS HEALTHCARE
1									
2									
3									

Do not fill up anything in this worksheet.
 All the contents will be automatically
 transcribed from Jan - June Line Listing

POSITIVE CULTURE							ANTIBIOTIC EXPOSURE WITHIN LAST 3 MONTHS			OUTCOME		HOSPITAL INFORMATION		
DIAGNOSIS ON SPECIMEN TAKEN	DATE OF SPECIMEN TAKEN	WARD (SPECIMEN TAKEN)	TYPE OF SPECIMEN	ISOLATED ORGANISM	ISOLATE STATUS	TYPE OF INFECTION	HCAI STATUS	ANTIBIOTIC 1	ANTIBIOTIC 2	OUTCOME AT 1 MONTH OF MRSAB (AT 1 MONTH)	MRSAB ATTRIBUTABLE DEATH OF MRSAB (AT 1 MONTH)	NAME	CATEGORY	ZONE



MINISTRY OF HEALTH MALAYSIA
MONTHLY MDRO-MRSAB REPORTING FORM
MINISTRY OF HEALTH MALAYSIA
MDRO-MRSAB/MOH/2018/4-I

A. Healthcare Associated MDRO

STATE :

HOSPITAL:

MONTH/YEAR :

-----/

TOTAL ADMISSION

TOTAL PATIENT DAYS

Days

ORGANISM	NO. OF INFECTION	RATE OF INFECTION		NO. OF COLONISER	TOTAL NO. OF ISOLATE	TOTAL RATE (INFECTION + COLONISER)	
		per 100 admission	per 1000 pt days			per 100 admission	per 1000 pt days
<i>A. baumannii</i>							
CRE							
ESBL : <i>E. coli</i>							
ESBL : <i>Kleb Pneumo</i>							
MRSA							
VRE							
Others							
** only report data from own facility							

B. Community Acquired MDRO

STATE :

HOSPITAL:

MONTH/YEAR :/

TOTAL ADMISSION

TOTAL PATIENT DAYS

ORGANISM	NO. OF INFECTION	NO. OF COLONISER	TOTAL NO. OF ISOLATE
<i>A. baumannii</i>			
CRE			
ESBL : <i>E. coli</i>			
ESBL : <i>Kleb Pneumo</i>			
MRSA			
VRE			
Others			

PREPARED BY :

VERIFIED BY HIACC
COORDINATOR :

NAME :
DESIGNATION :
DATE :

NAME :
DESIGNATION :
DATE :



MINISTRY OF HEALTH MALAYSIA

HALF YEAR MDRO-MRSAB REPORTING FORM

MINISTRY OF HEALTH MALAYSIA

MDRO-MRSAB/MOH/2018/4-II

A. Healthcare Associated MDRO

STATE :

HOSPITAL:

MONTH/YEAR : Jan-June / TOTAL ADMISSION TOTAL PATIENT DAYS Days

ORGANISM	NO. OF INFECTION	RATE OF INFECTION		NO. OF COLONISER	TOTAL NO. OF ISOLATE	TOTAL RATE (INFECTION + COLONISER)	
		per 100 admission	per 1000 pt days			per 100 admission	per 1000 pt days
<i>A. baumannii</i>							
CRE							
ESBL : <i>E. coli</i>							
ESBL : <i>Kleb Pneumo</i>							
MRSA							
VRE							
Others							
** only report data from own facility							

B. Community Acquired MDRO

STATE :

HOSPITAL:

MONTH/YEAR :/

TOTAL ADMISSION

TOTAL PATIENT DAYS

ORGANISM	NO. OF INFECTION	NO. OF COLONISER	TOTAL NO. OF ISOLATE
<i>A. baumannii</i>			
CRE			
ESBL : <i>E. coli</i>			
ESBL : <i>Kleb Pneumo</i>			
MRSA			
VRE			
Others			

PREPARED BY :

VERIFIED BY HIACC
COORDINATOR :

NAME :
DESIGNATION :
DATE :

NAME :
DESIGNATION :
DATE :



MINISTRY OF HEALTH MALAYSIA

ANNUAL MDRO-MRSAB REPORTING FORM

MINISTRY OF HEALTH MALAYSIA

MDRO-MRSAB/MOH/2018/4-III

A. Healthcare Associated MDRO

STATE :

HOSPITAL:

MONTH/YEAR : Jan-Dec /

TOTAL ADMISSION

TOTAL PATIENT DAYS Days

ORGANISM	NO. OF INFECTION	RATE OF INFECTION		NO. OF COLONISER	TOTAL NO. OF ISOLATE	TOTAL RATE (INFECTION + COLONISER)	
		per 100 admission	per 1000 pt days			per 100 admission	per 1000 pt days
<i>A. baumannii</i>							
CRE							
ESBL : <i>E. coli</i>							
ESBL : <i>Kleb Pneumo</i>							
MRSA							
VRE							
Others							
** only report data from own facility							

B. Community Acquired MDRO

STATE :

HOSPITAL:

MONTH/YEAR : -----/

TOTAL ADMISSION -----

TOTAL PATIENT DAYS -----

ORGANISM	NO. OF INFECTION	NO. OF COLONISER	TOTAL NO. OF ISOLATE
<i>A. baumannii</i>			
CRE			
ESBL : <i>E. coli</i>			
ESBL : <i>Kleb Pneumo</i>			
MRSA			
VRE			
Others			

PREPARED BY :

VERIFIED BY HIACC

COORDINATOR :

NAME :

NAME :

DESIGNATION :

DESIGNATION :

DATE :

DATE :



MINISTRY OF HEALTH MALAYSIA

JAN-JUNE MDRO SURVEILLANCE REPORTING FORM
JAN-JUNE MDRO / MOH / 2018 / 5

OWN FACILITY HEALTH CARE-ASSOCIATED MDRO

Month	No. of Admission	MRSA Infection	MRSA Coloniser	Total No. of MRSA Isolate	Rate per 100 Admissions	ESBL-Kleb Pneumo Infection	ESBL-Kleb Pneumo Coloniser	Total No. of ESBL-Kleb Pneumo Isolate	Rate per 100 Admissions	ESBL-E.Coli Infection	ESBL-E.Coli Coloniser	Total No. of ESBL-E.Coli Isolate	Rate per 100 Admissions
Jan	0	0	0	0	#DIV/0!	0	0	0	#DIV/0!	0	0	0	#DIV/0!
Feb	0	0	0	0	#DIV/0!	0	0	0	#DIV/0!	0	0	0	#DIV/0!
Mar	0	0	0	0	#DIV/0!	0	0	0	#DIV/0!	0	0	0	#DIV/0!
Apr	0	0	0	0	#DIV/0!	0	0	0	#DIV/0!	0	0	0	#DIV/0!
May	0	0	0	0	#DIV/0!	0	0	0	#DIV/0!	0	0	0	#DIV/0!
Jun	0	0	0	0	#DIV/0!	0	0	0	#DIV/0!	0	0	0	#DIV/0!
TOTAL AVERAGE	0	0	0	0	#DIV/0!	0	0	0	#DIV/0!	0	0	0	#DIV/0!

* No. of Cases = Infection + Coloniser

			Rate per 100 Admissions			Rate per 100 Admissions			Rate per 100 Admissions			Rate per 100 Admissions		
A. Baumannii Infection	A. Baumannii Coloniser	Total No. of A. Baumannii Isolate	MRO A. Baumannii	CRE Infection	CRE Coloniser	Total No. of CRE Isolate	CRE	VRE Infection	VRE Coloniser	Total No. of VRE Isolate	VRE	OTHER MDROs Infection	OTHER MDROs Coloniser	Total No. of Other MDROs Isolate
0	0	0	#DIV/0!	0	0	0	#DIV/0!	0	0	0	#DIV/0!	0	0	0
0	0	0	#DIV/0!	0	0	0	#DIV/0!	0	0	0	#DIV/0!	0	0	0
0	0	0	#DIV/0!	0	0	0	#DIV/0!	0	0	0	#DIV/0!	0	0	0
0	0	0	#DIV/0!	0	0	0	#DIV/0!	0	0	0	#DIV/0!	0	0	0
0	0	0	#DIV/0!	0	0	0	#DIV/0!	0	0	0	#DIV/0!	0	0	0
0	0	0	#DIV/0!	0	0	0	#DIV/0!	0	0	0	#DIV/0!	0	0	0
0	0	0	#DIV/0!	0	0	0	#DIV/0!	0	0	0	#DIV/0!	0	0	0
0	0	0	#DIV/0!	0	0	0	#DIV/0!	0	0	0	#DIV/0!	0	0	0
0	0	0	#DIV/0!	0	0	0	#DIV/0!	0	0	0	#DIV/0!	0	0	0

Discipline	Total No. of Admission in the Department	No. of A. BAUMANNII Cases	No. of CRE Cases	No. of ESBL-E. COLI Cases	No. of ESBL-KLEB PNEUMO Cases	No. of MRSA Cases	No. of VRE Cases	TOTAL MDROs
Anaest		0	0	0	0	0	0	0
Medical		0	0	0	0	0	0	0
Nephro		0	0	0	0	0	0	0
Oncology		0	0	0	0	0	0	0
O&G		0	0	0	0	0	0	0
Ortho		0	0	0	0	0	0	0
Paed		0	0	0	0	0	0	0
Surgical		0	0	0	0	0	0	0
Urology		0	0	0	0	0	0	0
Others		0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	0	0

Isolated Organisms	Rate Per 100 Admissions
A.BAUMANNII	#DIV/0!
CRE	#DIV/0!
ESBL-E.COLI	#DIV/0!
ESBL-KLEB PNEUMO	#DIV/0!
MRSA	#DIV/0!
VRE	#DIV/0!
OTHERS	#DIV/0!
TOTAL	#DIV/0!

Discipline	No. of Patient with MDRO	Percentage	Total Admission (by department)	Incidence
Anaest	0	#DIV/0!	0	#DIV/0!
Medical	0	#DIV/0!	0	#DIV/0!
Nephro	0	#DIV/0!	0	#DIV/0!
Oncology	0	#DIV/0!	0	#DIV/0!
O&G	0	#DIV/0!	0	#DIV/0!
Ortho	0	#DIV/0!	0	#DIV/0!
Paed	0	#DIV/0!	0	#DIV/0!
Surgical	0	#DIV/0!	0	#DIV/0!
Urology	0	#DIV/0!	0	#DIV/0!
Others	0	#DIV/0!	0	#DIV/0!
TOTAL	0	#DIV/0!	0	#DIV/0!

Type of Specimen	No. of Patient with MDRO	Percentage
Blood	0	#DIV/0!
BAL	0	#DIV/0!
CSF	0	#DIV/0!
PD fluid	0	#DIV/0!
Rectal sw	0	#DIV/0!
Sputum	0	#DIV/0!
Tissue	0	#DIV/0!
Tr.asp	0	#DIV/0!
Urine	0	#DIV/0!
Wound sw	0	#DIV/0!
Others	0	#DIV/0!
TOTAL	0	#DIV/0!

Organisms	No. of Infection	No. of Coloniser	No. of Total Isolates	Percentage
A.BAUMANNII	0	0	0	#DIV/0!
CRE	0	0	0	#DIV/0!
ESBL-E.COLI	0	0	0	#DIV/0!
ESBL-KLEB PNEUMO	0	0	0	#DIV/0!
MRSA	0	0	0	#DIV/0!
VRE	0	0	0	#DIV/0!
Others	0	0	0	#DIV/0!
TOTAL	0	0	0	#DIV/0!

Type of Infection	No. of Patient with MDRO	Percentage
BSI	0	#DIV/0!
HAP (non-VAP)	0	#DIV/0!
HAP (VAP)	0	#DIV/0!
Intra-abd	0	#DIV/0!
SSI	0	#DIV/0!
SSTI	0	#DIV/0!
UTI	0	#DIV/0!
Others	0	#DIV/0!
TOTAL	0	#DIV/0!

Antibiotic Exposure within Last 3 Months	Frequency	Percentage
Aminoglycosides	0	#DIV/0!
B-lactamase	0	#DIV/0!
Carbapenems	0	#DIV/0!
Cephalosporins	0	#DIV/0!
Colistin	0	#DIV/0!
Fluoroquinolones	0	#DIV/0!
Glycopeptides	0	#DIV/0!
Penicillins	0	#DIV/0!
Others	0	#DIV/0!
TOTAL	0	#DIV/0!

COMMUNITY ACQUIRED MDRO

Month	MRSA Infection	MRSA Coloniser	Total No. of MRSA Isolate	ESBL-Kleb Pneumo Infection	ESBL-Kleb Pneumo Coloniser	Total No. of ESBL-Kleb Pneumo Isolate	ESBL-E.Coli Infection	ESBL-E.Coli Coloniser	Total No. of ESBL-E.Coli Isolate
Jan	0	0	0	0	0	0	0	0	0
Feb	0	0	0	0	0	0	0	0	0
Mar	0	0	0	0	0	0	0	0	0
Apr	0	0	0	0	0	0	0	0	0
May	0	0	0	0	0	0	0	0	0
Jun	0	0	0	0	0	0	0	0	0
TOTAL/AVERAGE	0	0	0	0	0	0	0	0	0

A. Baumannii Infection	A. Baumannii Coloniser	Total No. of A. Baumannii Isolate	CRE Infection	CRE Coloniser	Total No. of CRE Isolate	VRE Infection	VRE Coloniser	Total No. of VRE Isolate	OTHER MDROs Infection	OTHER MDROs Coloniser	Total No. of Other MDROs Isolate
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0



MINISTRY OF HEALTH MALAYSIA
JAN-JUNE MRSAB SURVEILLANCE REPORTING FORM
JAN-JUNE MRSAB / MOH / 2018 / 6

SURVEILLANCE PERIOD	JAN - JUNE
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NO.	STATE	HOSPITALS	CLASSIFICATION OF HOSPITAL	NO. OF HOSPITAL BEDS	AVERAGE LENGTH OF STAY (ALOS)	NO. OF PATIENT DAYS OVER STUDY PERIOD	NO. OF ADMISSIONS OVER STUDY PERIOD	NO. OF MRSAB CASES	TOTAL MRSAB RATE PER 100 PATIENT DAYS	TOTAL MRSAB RATE PER 100 HOSPITAL ADMISSIONS
						0	0	0	#DIV/0!	#DIV/0!

OUTCOME AT 1 MONTH			NO. OF DEATH RELATED TO MRSAB	ALL CAUSE MORTALITY (RATE)	DEATH ATTRIBUTABLE TO MRSAB (RATE)
NO. OF MRSAB CASES ALIVE	NO. OF MRSAB CASES DIED	TOTAL OF MRSAB CASES	0	#DIV/0!	#DIV/0!
0	0	0	0	#DIV/0!	#DIV/0!

TOTAL MRSAB RATE PER 1000 PATIENT DAYS	#DIV/0!	%
TOTAL MRSAB RATE PER 100 HOSPITAL ADMISSIONS	#DIV/0!	%
DEATH ATTRIBUTABLE TO MRSAB (RATE)	#DIV/0!	%

Reported by:
 Signature: _____
 Name and Designation: _____
 Date: _____

Verified by:
 Signature: _____
 Name and Designation: _____
 Date: _____



MINISTRY OF HEALTH MALAYSIA
JULY-DEC MDRO SURVEILLANCE REPORTING FORM
JULY-DEC MDRO / MOH / 2018 / 7

OWN FACILITY HEALTHCARE ASSOCIATED MDRO

Month	No. of Admission	MRSA Infection	MRSA Coloniser	Total No. of MRSA Isolate	Rate per 100 Admissions				Rate per 100 Admissions			
					ESBL-Kleb Pseudo Infection	ESBL-Kleb Pseudo Coloniser	Total No. of ESBL-Kleb Pseudo Isolate	ESBL-Kleb Pseudo	ESBL-E. Coli Infection	ESBL-E. Coli Coloniser	Total No. of ESBL-E. Coli Isolate	Rate per 100 Admissions
Jul	0	0	0	0	0	0	0	#DIV/0!	0	0	0	#DIV/0!
Aug	0	0	0	0	0	0	0	#DIV/0!	0	0	0	#DIV/0!
Sep	0	0	0	0	0	0	0	#DIV/0!	0	0	0	#DIV/0!
Oct	0	0	0	0	0	0	0	#DIV/0!	0	0	0	#DIV/0!
Nov	0	0	0	0	0	0	0	#DIV/0!	0	0	0	#DIV/0!
Dec	0	0	0	0	0	0	0	#DIV/0!	0	0	0	#DIV/0!
TOTAL/AVERAGE	0	0	0	0	0	0	0	#DIV/0!	0	0	0	#DIV/0!

* No. of Cases = Infection + Coloniser

			Rate per 100 Admissions		Rate per 100 Admissions				Rate per 100 Admissions		Rate per 100 Admissions		Rate per 100 Admissions		
A. Baumannii Infection	A. Baumannii Coloniser	Total No. of A. Baumannii Isolate	MRO A. Baumannii	CRE Infection	CRE Coloniser	Total No. of CRE Isolate	CRE	VRE Infection	VRE Coloniser	Total No. of VRE Isolate	VRE	OTHER MDROs Infection	OTHER MDROs Coloniser	Total No. of Other MDROs Isolate	OTHER MDROs
			#DIV/Q	0	0	0	#DIV/Q								
0	0	0	#DIV/Q	0	0	0	#DIV/Q	0	0	0	#DIV/Q	0	0	0	#DIV/Q
0	0	0	#DIV/Q	0	0	0	#DIV/Q	0	0	0	#DIV/Q	0	0	0	#DIV/Q
0	0	0	#DIV/Q	0	0	0	#DIV/Q	0	0	0	#DIV/Q	0	0	0	#DIV/Q
0	0	0	#DIV/Q	0	0	0	#DIV/Q	0	0	0	#DIV/Q	0	0	0	#DIV/Q
0	0	0	#DIV/Q	0	0	0	#DIV/Q	0	0	0	#DIV/Q	0	0	0	#DIV/Q
0	0	0	#DIV/Q	0	0	0	#DIV/Q	0	0	0	#DIV/Q	0	0	0	#DIV/Q
0	0	0	#DIV/Q	0	0	0	#DIV/Q	0	0	0	#DIV/Q	0	0	0	#DIV/Q
0	0	0	#DIV/Q	0	0	0	#DIV/Q	0	0	0	#DIV/Q	0	0	0	#DIV/Q

Discipline	Total No. of Admission in the Department	No. of A. BAUMANNII Cases	No. of CRE Cases	No. of ESBL- E. COLI Cases	No. ESBL-KLEB PNEUMO Cases	No. of MRSA Cases	No. of VRE Cases	TOTAL MDROs
Anaest		0	0	0	0	0	0	0
Medical		0	0	0	0	0	0	0
Nephro		0	0	0	0	0	0	0
Oncology		0	0	0	0	0	0	0
O&G		0	0	0	0	0	0	0
Ortho		0	0	0	0	0	0	0
Paed		0	0	0	0	0	0	0
Surgical		0	0	0	0	0	0	0
Urology		0	0	0	0	0	0	0
Others		0	0	0	0	0	0	0
TOTAL		0	0	0	0	0	0	0

Isolated Organisms	Rate Per 100 Admissions
A.BAUMANNII	#DIV/0!
CRE	#DIV/0!
ESBL-E.COLI	#DIV/0!
ESBL-KLEB PNEUMO	#DIV/0!
MRSA	#DIV/0!
VRE	#DIV/0!
OTHERS	#DIV/0!
TOTAL	#DIV/0!

Discipline	No. of Patient with MDRO	Percentage	Total Admission (by department)	Incidence
Anaest	0	#DIV/0!	550	0.0
Medical	0	#DIV/0!	450	0.0
Nephro	0	#DIV/0!	400	0.0
Oncology	0	#DIV/0!	600	0.0
O&G	0	#DIV/0!	300	0.0
Ortho	0	#DIV/0!	700	0.0
Paed	0	#DIV/0!	500	0.0
Surgical	0	#DIV/0!	500	0.0
Urology	0	#DIV/0!	250	0.0
Others	0	#DIV/0!	500	0.0
TOTAL	0	#DIV/0!	CHECK BACK THE TOTAL ADMISSION	#VALUE!

Type of Specimen	No. of Patient with MDRO	Percentage
Blood	0	#DIV/0!
BAL	0	#DIV/0!
CSF	0	#DIV/0!
PD fluid	0	#DIV/0!
Rectal sw	0	#DIV/0!
Sputum	0	#DIV/0!
Tissue	0	#DIV/0!
Tr.asp	0	#DIV/0!
Urine	0	#DIV/0!
Wound sw	0	#DIV/0!
Others	0	#DIV/0!
TOTAL	0	#DIV/0!

Organisms	No. of Infection	No. of Coloniser	No. of Total Isolates	Percentage
A.BAUMANNII	0	0	0	#DIV/0!
CRE	0	0	0	#DIV/0!
ESBL-E.COLI	0	0	0	#DIV/0!
ESBL-KLEB PNEUMO	0	0	0	#DIV/0!
MRSA	0	0	0	#DIV/0!
VRE	0	0	0	#DIV/0!
Others	0	0	0	#DIV/0!
TOTAL	0	0	0	#DIV/0!

Type of Infection	No. of Patient with MDRO	Percentage
BSI	0	#DIV/0!
HAP (non-VAP)	0	#DIV/0!
HAP (VAP)	0	#DIV/0!
Intra-abd	0	#DIV/0!
SSI	0	#DIV/0!
SSTI	0	#DIV/0!
UTI	0	#DIV/0!
Others	0	#DIV/0!
TOTAL	0	#DIV/0!

Antibiotic Exposure within Last 3 Months	Frequency	Percentage
Aminoglycosides	0	#DIV/0!
B-lactamase	0	#DIV/0!
Carbapenems	0	#DIV/0!
Cephalosporins	0	#DIV/0!
Colistin	0	#DIV/0!
Fluoroquinolones	0	#DIV/0!
Glycopeptides	0	#DIV/0!
Penicillins	0	#DIV/0!
Others	0	#DIV/0!
TOTAL	0	#DIV/0!

COMMUNITY ACQUIRED MDRO

Month	MRSA Infection	MRSA Coloniser	Total No. of MRSA Isolate	ESBL-Kleb Pneumo Infection	ESBL-Kleb Pneumo Coloniser	Total No. of ESBL-Kleb Pneumo Isolate	ESBL-E.Coli Infection	ESBL-E.Coli Coloniser	Total No. of ESBL-E.Coli Isolate
Jul	0	0	0	0	0	0	0	0	0
Aug	0	0	0	0	0	0	0	0	0
Sep	0	0	0	0	0	0	0	0	0
Oct	0	0	0	0	0	0	0	0	0
Nov	0	0	0	0	0	0	0	0	0
Dec	0	0	0	0	0	0	0	0	0
TOTAL/AVERAGE	0	0	0	0	0	0	0	0	0

A. Baumannii Infection	A. Baumannii Coloniser	Total No. of A. Baumannii Isolate	CRE Infection	CRE Coloniser	Total No. of CRE Isolate	VRE Infection	VRE Coloniser	Total No. of VRE Isolate	OTHER MDROs Infection	OTHER MDROs Coloniser	Total No. of Other MDROs Isolate
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0

APPENDIX 12



MINISTRY OF HEALTH MALAYSIA JULY-DEC MRSAB SURVEILLANCE REPORTING FORM JULY-DEC MRSAB / MOH / 2018 / 8

SURVEILLANCE PERIOD		JULY - DEC								
NO.	STATE	HOSPITALS	CLASSIFICATION OF HOSPITAL	NO. OF HOSPITAL BEDS	AVERAGE LENGTH OF STAY (ALOS)	NO. OF PATIENT DAYS OVER STUDY PERIOD	NO. OF ADMISSIONS OVER STUDY PERIOD	NO. OF MRSAB CASES	TOTAL MRSAB RATE PER 1000 PATIENT DAYS	TOTAL MRSAB RATE PER 100 HOSPITAL ADMISSIONS
						0	0	0	#DIV/0!	#DIV/0!
OUTCOME AT 1 MONTH		NO. OF DEATH RELATED TO MRSAB		ALL CAUSE MORTALITY (RATE)		DEATH ATTRIBUTABLE TO MRSAB (RATE)				
NO. OF MRSAB CASES ALIVE	NO. OF MRSAB CASES DIED	TOTAL OF MRSAB CASES								
0	0	0	0	#DIV/0!	#DIV/0!					
TOTAL MRSAB RATE PER 1000 PATIENT DAYS				TOTAL MRSAB RATE PER 100 HOSPITAL ADMISSIONS				DEATH ATTRIBUTABLE TO MRSAB (RATE)		
#DIV/0!				#DIV/0!				#DIV/0!		
#DIV/0!				#DIV/0!				#DIV/0!		
#DIV/0!				#DIV/0!				#DIV/0!		

Reported by:
Signature: _____

Name and Designation: _____

Date: _____

Verified by:
Signature: _____

Name and Designation: _____

Date: _____



MINISTRY OF HEALTH MALAYSIA
ANNUAL MDRO SURVEILLANCE REPORTING FORM
MDRO / MOH / 2018 / 9

Month	No. of Admission	MRSA Infection	MRSA Coloniser	Total No. of MRSA Isolate	Rate per 100 Admissions			Total No. of ESBL-Kleb Pneumo Isolate	Rate per 100 Admissions			Total No. of ESBL-E Coli Isolate	Rate per 100 Admissions		
					MRSA	ESBL-Kleb Pneumo Infection	ESBL-Kleb Pneumo Coloniser		ESBL-Kleb Pneumo	ESBL-E Coli Infection	ESBL-E Coli Coloniser		ESBL-E Coli	ESBL-E Coli	ESBL-E Coli
Jan	0	0	0	0	#DIV/0!	0	0	0	#DIV/0!	0	0	0	#DIV/0!	0	#DIV/0!
Feb	0	0	0	0	#DIV/0!	0	0	0	#DIV/0!	0	0	0	#DIV/0!	0	#DIV/0!
Mar	0	0	0	0	#DIV/0!	0	0	0	#DIV/0!	0	0	0	#DIV/0!	0	#DIV/0!
Apr	0	0	0	0	#DIV/0!	0	0	0	#DIV/0!	0	0	0	#DIV/0!	0	#DIV/0!
May	0	0	0	0	#DIV/0!	0	0	0	#DIV/0!	0	0	0	#DIV/0!	0	#DIV/0!
Jun	0	0	0	0	#DIV/0!	0	0	0	#DIV/0!	0	0	0	#DIV/0!	0	#DIV/0!
Jul	0	0	0	0	#DIV/0!	0	0	0	#DIV/0!	0	0	0	#DIV/0!	0	#DIV/0!
Aug	0	0	0	0	#DIV/0!	0	0	0	#DIV/0!	0	0	0	#DIV/0!	0	#DIV/0!
Sep	0	0	0	0	#DIV/0!	0	0	0	#DIV/0!	0	0	0	#DIV/0!	0	#DIV/0!
Oct	0	0	0	0	#DIV/0!	0	0	0	#DIV/0!	0	0	0	#DIV/0!	0	#DIV/0!
Nov	0	0	0	0	#DIV/0!	0	0	0	#DIV/0!	0	0	0	#DIV/0!	0	#DIV/0!
Dec	0	0	0	0	#DIV/0!	0	0	0	#DIV/0!	0	0	0	#DIV/0!	0	#DIV/0!
TOTAL/AVERAGE	0	0	0	0	#DIV/0!	0	0	0	#DIV/0!	0	0	0	#DIV/0!	0	#DIV/0!

* No. of Cases = Infection + Coloniser

Isolated Organisms	Rate Per 100 Admissions
A.BAUMANNII	#DIV/0!
CRE	#DIV/0!
ESBL-E.COLI	#DIV/0!
ESBL-KLEB PNEUMO	#DIV/0!
MRSA	#DIV/0!
VRE	#DIV/0!
Others	#DIV/0!
TOTAL	#DIV/0!

Discipline	No. of Patient with MDRO	Percentage	Total Admission	Incidence
Anaest	0	#DIV/0!	550	0.0
Medical	0	#DIV/0!	450	0.0
Nephro	0	#DIV/0!	400	0.0
Oncology	0	#DIV/0!	600	0.0
O&G	0	#DIV/0!	300	0.0
Ortho	0	#DIV/0!	700	0.0
Paed	0	#DIV/0!	500	0.0
Surgical	0	#DIV/0!	500	0.0
Urology	0	#DIV/0!	250	0.0
Others	0	#DIV/0!	500	0.0
TOTAL	0	#DIV/0!	CHECK BACK THE TOTAL	#VALUE!

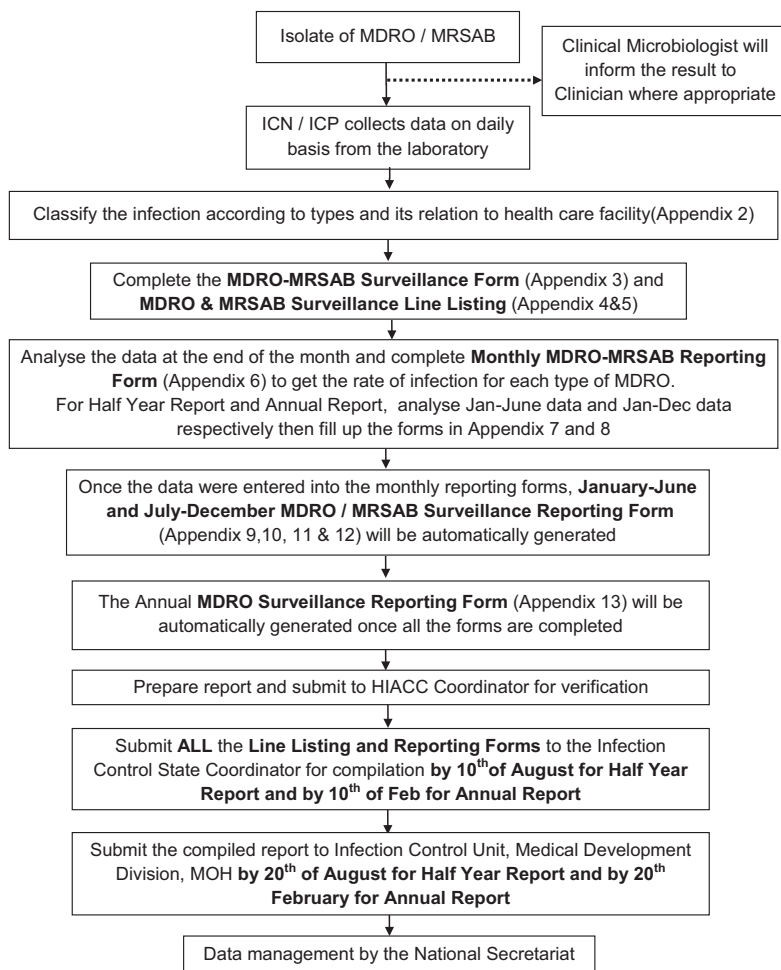
Type of Specimen	No. of Patient with MDRO	Percentage
Blood	0	#DIV/0!
BAL	0	#DIV/0!
CSF	0	#DIV/0!
PD fluid	0	#DIV/0!
Rectal sw	0	#DIV/0!
Sputum	0	#DIV/0!
Tissue	0	#DIV/0!
Tr.asp	0	#DIV/0!
Urine	0	#DIV/0!
Wound sw	0	#DIV/0!
Others	0	#DIV/0!
TOTAL	0	#DIV/0!

Organisms	No. of Infection	No. of Coloniser	No. of Total Isolates	Percentage
A.BAUMANNII	0	0	0	#DIV/0!
CRE	0	0	0	#DIV/0!
ESBL-E.COLI	0	0	0	#DIV/0!
ESBL-KLEB PNEUMO	0	0	0	#DIV/0!
MRSA	0	0	0	#DIV/0!
VRE	0	0	0	#DIV/0!
Others	0	0	0	#DIV/0!
TOTAL	0	0	0	#DIV/0!

Type of Infection	No. of Patient with MDRO	Percentage
BSI	0	#DIV/0!
HAP (non-VAP)	0	#DIV/0!
HAP (VAP)	0	#DIV/0!
Intra-abd	0	#DIV/0!
SSI	0	#DIV/0!
SSTI	0	#DIV/0!
UTI	0	#DIV/0!
Others	0	#DIV/0!
TOTAL	0	#DIV/0!

Antibiotic Exposure within Last 3 Months	Frequency	Percentage
Aminoglycosides	0	#DIV/0!
B-lactamase	0	#DIV/0!
Carbapenems	0	#DIV/0!
Cephalosporins	0	#DIV/0!
Colistin	0	#DIV/0!
Fluoroquinolones	0	#DIV/0!
Glycopeptides	0	#DIV/0!
Penicillins	0	#DIV/0!
Others	0	#DIV/0!
TOTAL	0	#DIV/0!

MDRO & MRSAB SURVEILLANCE FLOW CHART



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3. *2010 -MRSA Surveillance Protocol. Surveillance for Methicillin-resistant Staphylococcus aureus (MRSA) In CNISP health care facilities ,Revised November 24, 2009* <http://www.phac-aspc.gc.ca/>
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