



Feidhmeannacht na Seirbhíse Sláinte  
Health Service Executive



A Strategy for the Control of  
**Antimicrobial Resistance in Ireland**



**National Surveillance of  
Meticillin-Resistant *Staphylococcus aureus* (MRSA)  
in General Intensive Care Units (ICUs)**

**Protocol for ICU Staff and  
Infection Prevention and Control Teams**

Version 9, March 2010

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## **1. Introduction**

Since April 2008, data on the burden of MRSA in the intensive care setting has been collected from 32 ICUs in Ireland. This data has been collected voluntarily and without the provision of additional surveillance resources. A point prevalence approach has been adopted to keep the workload burden low which takes a snapshot of the ICU once a week and averages it over a quarterly period. This project provides important information on the prevalence and transmission of MRSA in Irish ICUs as well as national figures on bed occupancy and the ability of ICUs to isolate MRSA patients.

Several issues were raised by the Intensive Care Society of Ireland regarding the surveillance project which include: (i) a requirement for more accurate stratification of ICUs other than ICU type (i.e. level 2/3; level 3 grouping), (ii) a need to study the impact of ICU staffing on the risk of MRSA transmission and (iii) a need to investigate further the role of different infection prevention and control (IPC) practices on the risk of MRSA transmission in the ICU. In response to this requirement, the MRSA in ICU surveillance steering committee (Appendix 1.0) has developed a new protocol (version 9.0). This protocol addresses these issues without placing too much of an extra burden on ICU staff. An additional two questions have been added to the weekly census form to address the staffing issue. In addition, a new annual baseline form has been developed to capture information on ICU acuity (through collection of mean APACHE II scores) and additional information on ICU demographics and infection control practices. These changes to the protocol will be implemented from April 2010 onwards.

We welcome your participation in this new improved surveillance system. However, please be aware that data collected as part of this surveillance may be released into the public domain and you may therefore wish to discuss this with your Chief Executive Officer and with other relevant individuals and groups in your hospital.

## **2. Data Collection**

### **2.1 Population Under Surveillance**

This surveillance project focuses on all patients within the General ICU. All participating ICUs must cater for ICU category patients. General ICUs that cater for mixed categories of patients (ie ICU/HDU/CCU patients) should include all patients in the study. These ICU's will be classified as Level 2/3 units. General ICUs that cater only for ICU patients should include all ICU patients but not include patients from other HDU or CCU units. These ICU's will be classified as Level 3 units.

### **2.2 Weekly Census Form**

This survey is intended to be a **weekly point prevalence survey**. This means that you fill out the census form once a week on the census day and only report on cases within the ICU that occur on that particular day. You **DO NOT** report on all cases that have occurred during the week. It is intended that the infection control and prevention team/microbiology team, in association with ICU staff, will complete this form. The chosen census day should preferably be during the middle of the week, (either a Tuesday, Wednesday, or Thursday) at a time of mutual convenience for all. **However, whichever day is chosen for your hospital should be the same each week.** If during one particular week the data collector is absent on the chosen day, try to collect the data on one of the other mid-week days (i.e. Tuesday, Wednesday, or Thursday). The intention is that this form can be completed fairly quickly according to the information that is available at the time the form is being filled out. In particular, it is not expected that you will have to look for information or await laboratory results before completing the form.

#### **Changes From Previous Form:**

The current weekly census form has been reorganised into five main sections (ICU details, Bed Occupancy, MRSA Prevalence/Transmission, Isolation and Staffing). Questions 8, 12 and 13 are new. Question 8 captures weekly information on the number of isolation rooms available in your ICU. This was previously collected annually but frequent changes in isolation room availability in some ICUs led this question to move to the weekly census form. Questions 12 and 13 relate to questions on staffing. Below is a description of the questions within each section:

## 1. ICU DETAILS

### Q1. ICU Code

This will be allocated to you by the HPSC surveillance scientist (Fiona Roche) following registration of your ICU as a participant in the project. Hospitals with more than one participating ICU will be allocated a separate code for each participating unit.

### Q2. Census Date

Enter today's date (i.e. the date the weekly Census Return form is completed) in the format (DD/MM/YYYY).

## 2. BED OCCUPANCY

### Q3. Number of available beds in the ICU

Record the number of beds in your intensive care unit that are available for use at the time the Census Return is being filled in. This may not always equal the number of physical beds in the unit as staffing levels may affect bed availability. Therefore record the number of beds you could practically use that day, taking into account staff availability. Also if your ICU is a mixed ICU (i.e. caters for ICU, HDU and/or CCU beds), ensure that all beds are included in the survey even when not all of these are ICU beds. Note that this surveillance is taking a snapshot of the situation in the ICU, a form of census, and therefore it is essential to record the bed numbers at the time the survey is being carried out. Please do not take account of any changes that may occur later in the day.

#### Scenario 1:

If you have 4 physical beds in your intensive care unit and on the day you carry out the survey you only have enough staff for 3 of these ICU beds then the number of available beds = 3.

#### Scenario 2:

If you have 5 physical beds in your intensive care unit and 2 of these beds are designated for HDU patients and 3 of the beds are designated for ICU patients then you have 5 beds available for use (if staffing available for these). Even if some of these beds are occupied with patients, you still have 5 beds available for use. 'Available for use' does not mean 'unoccupied'. It represents your complement of beds that day.

### Q4. Number of occupied beds in the ICU

Please record the number of beds in your ICU that are occupied by patients at the time the Census Return is being filled in.

#### Scenario 1:

If you have 3 available beds in your ICU and all beds are occupied then 'Number of beds occupied' = 3.

#### Scenario 2:

If you have a 5 bed ICU unit and 3 of the beds are filled with HDU patients and the other 2 beds are filled with ICU patients then the 'Number of beds occupied in your ICU' = 5.

### 3. MRSA PREVALENCE / TRANSMISSION

#### Q5. Number of patients with MRSA

This field records the total burden of MRSA in the intensive care unit. Please include the total number of patients in the ICU known to have MRSA (colonisation or infection) at the time the Census Return is being filled in. Count patients known to have an MRSA infection at the time the survey is being filled in OR who tested positive either from (i) MRSA screening within the ICU, (ii) MRSA screening from another ward within the hospital or (iii) MRSA screening from another hospital. Patients remain positive unless they had three consecutive negative screens. For example, if a patient tested positive for MRSA carriage a month previous and had no negative screens recorded, this patient should be counted. **Record all patients known to have MRSA, even if they were counted in the previous weekly census.** Do not include patients who have not been confirmed with MRSA, i.e. when laboratory results are pending and results are preliminary.

#### Q6. Number of new patients this week with MRSA

Please record the number of patients in the ICU known to have MRSA this week (colonisation or infection). Do not include patients that were counted in the census form last week. For example, if Patient X was MRSA positive and in the ICU last week, he would have been captured on the census form last week under Q.5 and Q6. This week if Patient X is still in the ICU, he should be recorded in Q5 but should not be recorded in this question since he is not a new case anymore. **This field is capturing the number of new cases of MRSA on the unit (present on the census day only) that were not reported last week.** It is not capturing all new cases of MRSA throughout the week since the last weekly survey. Only new cases present on the census day.

#### Q7. Number of new patients this week with MRSA acquired in your ICU?

ICU-acquired MRSA is defined as either:

- A. **Positive MRSA screen** in a patient whose MRSA ICU admission screen was negative.
- OR**
- B. **Positive MRSA diagnostic sample** taken 48 hours or more after admission to the ICU in a patient when there is no evidence that the infection was present or incubating at the time of admission and ICU admission screen was negative

Please indicate the number of ICU patients with MRSA, **who acquired the MRSA in your ICU only, but were not counted in the census form last week.** Please do not include: (i) patients who acquired MRSA in the unit, but are now discharged, or (ii) patients who acquired MRSA in other areas of your hospital, or in an ICU in another hospital prior to the transfer of the patient.

*For example, Patient X was known to have acquired MRSA within the ICU this week and was present in the unit when the census was taken so he should be recorded. If Patient X is still in the ICU next week, he should NOT be recorded again. This field is capturing the number of new cases of ICU-acquired MRSA on the unit that were not reported last week.*

When screening, it is important to note that if a patient has a positive culture taken from any screening site (e.g. nose, groin, any skin lesion or medical device site), they are deemed positive. If a subsequent screen shows a different screening site showing a positive result, the patient remains MRSA positive. This is not an example of an ICU-acquired MRSA. *For example, Patient X was screened in the nose and groin upon admission to the ICU. He was positive in the nose but negative in the groin. The following week Patient X was rescreened in the nose, groin and urine (as he had a catheter in). His nose was now negative but he showed a positive culture in his urine. Although a different site is showing a positive result, Patient X would not be recorded as an ICU-acquired case.*

#### 4. ISOLATION

##### Q8. Number of available single rooms in the ICU?

Please record the number of single rooms that are available for use in your ICU (including those that are occupied) for isolating patients, irrespective of the reasons as to why the patient needs to be isolated.

##### Q9. Number of patients in a single room (does not have to be for infection control reasons)?

Indicate the number of patients who are present in a single room, irrespective of the reasons as to why they are there, which may not always be for isolation purposes. This field is capturing the occupancy of the single rooms (whether a patient has an infection or not). An example of this might be when a new patient (without an infection) might be placed in a single room as the ICU unit is full.

##### Q10. Number of MRSA patients in a single room?

Please record the number of MRSA positive patients who are present in a single room.

##### Q11. Number of patients requiring isolation for infection control reasons, but not in a single room?

Please indicate the number of patients who are not isolated in a single room but who require isolation for infection control reasons. An example of this might be where there are two isolation rooms in an intensive care unit, both occupied by patients with MRSA, but there is a patient in an open area of the ICU with diarrhoea and *Clostridium difficile*. In such a case, '1' should be filled in.

#### 5. STAFFING

##### Q12. How many nurses are rostered for direct patient care now?

Please indicate the number of nursing staff on duty for direct patient care in the ICU at the time the survey is taken on the census day. Include nurses that are counted in the unit roster. This includes agency staff and staff working over time. Direct patient care activities include: (i) continuous total patient care; (ii) assessment, planning, implementation and evaluation (includes medication management). Include staff on duty for direct patient care but on breaks or meetings at the time of the survey. Include staff development nurses if involved in direct patient care. Please exclude nurses involved in indirect patient care such as audit nurses, and practice and development nurses.

### Q13. How many of these nurses are agency nurses?

Please record the number of agency staff on duty in the ICU for direct patient care at the time the survey is taken on the census day. See Q12 above for definition of direct patient care. Agency staff are nursing staff that are either: (i) paid by an external agency or (ii) paid by the hospital but are not normally allocated to the ICU roster. Include staff on duty for direct patient care but on breaks or meetings at the time of the survey. Do not include regular ICU staff that are working an extra shift or working overtime as agency nurses.

## 2.3 Annual Baseline Demographic Form

The annual baseline form has to be filled in **once per year** and sent onto the surveillance scientist, Fiona Roche, at HPSC. See contact details below. There are three main sections to the baseline form. **Section A** is to be filled in by ICU nursing manager and the ICU Director. **Section B** is to be filled in by the ICU nursing manager and ICU Director in liaison with the infection prevention and control team. **Section C** is to be filled in by the microbiology laboratory. Below is a description of the questions within each section. The majority of the answers to the questions can be selected from a drop down menu.

### SECTION A

#### 1. ICU DETAILS

##### Hospital Name

Please select from the drop down list the name of your hospital. If you will be collecting data from an ICU in two or more hospitals, please fill in a form for each separate ICU. Please note that this surveillance system is confined to general ICUs (adults and children) but excludes specialist ICUs, i.e. cardiac, neurosurgical and neonatal. These may be included later.

##### Hospital Category

Please select your hospital category from the drop down list. "Regional/tertiary" hospital refers to a large hospital, which accepts transfers from other hospitals such as county hospitals. A "General" hospital refers to a smaller hospital such as a county hospital. Most hospitals should fall into one or other of these two groups, but if not, please use "Other."

##### Number of acute beds

Please select the drop down box that best reflects the number of acute beds in your hospital currently available for use. This number should exclude long-stay geriatric or rehabilitation beds.



### Type of ICU

Select the drop down box which best describes the categories of patients found in your ICU. A level 3 ICU contains only patients classified as ICU patients. A level 2/3 unit contains a combination of ICU (level 3 patients) and CCU or HDU patients (level 2 patients) or a variable combination of these groups.

### How many ICU patients were admitted to your ICU in 2009?

Please indicate the total number of patients admitted to your ICU during 2009. This should include repeat admissions, i.e. a patient who is admitted more than once.

### 2009 Mean APACHE II score for all patients

Please report the mean APACHE II score for all patients in your ICU in 2009. This information will provide an indication of the acuity of the ICU based on the severity score of the patients that were catered over an annual period. If this information is only available for a subset of patients or not at all, please indicate by writing N/A (not available).

### 2009 Mean 1<sup>st</sup> day SOFA score for all patients

Please report the mean 1st day SOFA score for all patients in your ICU in 2009. If this information is only available for a subset of patients or not at all, please indicate by writing N/A (not available).

### 2009 Mean SOFA score for all patients

In many ICUs, a patient's SOFA score is taken multiple times over the course of their ICU stay. Please calculate the mean SOFA score for each patient and from this calculate the overall mean SOFA score for all patients in the ICU in 2009. If this information is only available for a subset of patients or not at all, please indicate by writing N/A (not available).

## 2. MRSA SCREENING

### Do you routinely screen all patients for MRSA on admission to ICU?

Indicate whether or not you routinely screen all patients for MRSA upon admission to the ICU.

### If yes, (i) Which sites do you routinely screen? (tick more than one box if appropriate)

Please tick which sites you routinely screen in all patients.

### (ii) How frequently do you screen all patients after admission screen?

Please select what your routine policy for screening all patients after admission is i.e. screened weekly thereafter.

## 3. ISOLATION

### How many single rooms are available for isolating patients in your ICU?

An isolation room is a single room that is used to care for patients who may require protective or source isolation. Include such rooms even if they do not have artificial ventilation or specific facilities such as an anteroom for putting on protective equipment.

**Select whether each single room in your ICU has a clinical handwash sink or anteroom. Record location of clinical handwash sink.**

It is important to get an overview of the types of single rooms provided within acute public hospitals used for isolation. For each single room, please tick whether a clinical hand wash sink or anteroom exist. An **anteroom** is a lobby area for putting on protective equipment and storing patient files. A **clinical hand wash sink** is independent of a patient sink. It has mixer taps that don't flow directly down drain, no stopper or overflow, and is hands free (i.e. knee, elbow, foot, or sensor operated). Please mark as 'No' if neither feature are found. If a clinical hand wash sink is present, please also record its location (i.e. within the isolation room, in the anteroom, or both).

**Do you have a dedicated cohort area for infection control purposes in your ICU?**

Select whether you have an area in your ICU (two or more beds) separated from the rest of the ICU dedicated for isolating patients for infection prevention and control purposes and cared for by designated staff.

#### 4. STAFFING

**Is your ICU overseen by a Consultant in Intensive Care Medicine? If so, how many?**

We wish to collect information as to whether or not the ICU is clinically managed by a Consultant in Intensive Care Medicine. Please indicate if your ICU has an approved post for a Consultant in Intensive Care Medicine.

**Is your ICU overseen by a Consultant Anaesthetist with a designated special interest in intensive care medicine? If so, how many?**

Please indicate if your ICU is overseen by a Consultant Anaesthetist with speciality training in intensive care medicine.

#### 2.5 SURVEILLANCE

**Does your ICU carry out surveillance of MRSA infections? If so, what type of infections and which protocol is used?**

Please indicate if your ICU currently carries out surveillance of MRSA infections. If so, select the type of infections being studied (i.e. UTI, urinary tract infection; SSI, surgical site infection; BSI, bloodstream infection; VAP, ventilator associated pneumonia; Other, other type of MRSA infection) and also what type of protocol is being used.

## **SECTION B**

### **6. INFECTION CONTROL GUIDELINES AND EDUCATION**

#### **Does your hospital have an infection prevention & control strategic service plan?**

Please select 'yes' or 'no' from the drop down menu.

#### **Does your hospital have an annual infection control plan?**

Please select 'yes' or 'no' from the drop down menu.

#### **Are there local guidelines for prevention and control of MRSA in your hospital?**

Please select 'yes' or 'no' from the drop down menu.

#### **Is there a structure in place for communication between IPC teams and ICU staff? If so, how?**

This field is trying to capture if and how communication operates between IPC teams and ICU staff. Please indicate how these groups communicate. Examples are provided.

#### **Do you have microbiology rounds in your ICU? If so, how frequent are these rounds?**

A microbiology round must be led by a Consultant Microbiologist or led jointly by a Consultant Microbiologist and Intensivist. Please indicate the frequency the Microbiologist reviews ICU patients (i.e. daily, once a week, twice a week, other).

### **7. HAND HYGIENE**

#### **What is the ratio of clinical hand wash sink to ICU beds in your ICU?**

A clinical hand wash sink is independent of a patient sink. It has mixer taps that don't flow directly down drain, no stopper or overflow, and is hands free (i.e. knee, elbow, foot, or sensor operated). Please select from the drop down box the ratio of clinical hand wash sink to beds in your ICU (i.e. 1:3, 1:4, 1:5, >1:5)

#### **Are hand free waste bins provided at each clinical hand wash sink?**

Recommended in the SARI 2005 MRSA Guidelines. Please select 'yes' or 'no'.

#### **Is alcohol hand rub available for staff at the bedside of each patient in your ICU? (i.e. portable bottle or bedside dispenser)**

Recommended in the SARI 2005 MRSA Guidelines. Please select 'yes' or 'no'.

#### **Is there a hand hygiene education programme in your hospital?**

Recommended in the SARI 2005 MRSA Guidelines. Please select 'yes' or 'no'.

#### **Are hand hygiene audits carried out in your ICU? If yes, how frequently?**

Please indicate if your ICU carries out regular hand hygiene audits and the frequency of these audits.

#### **Are you using the HPSC hand hygiene audit tool?**

The HPSC developed a hand hygiene audit tool that was circulated to all infection prevention and control teams in Oct 2009. Please indicate if this tool is being used in your ICU.

**What date was your last hand hygiene audit?**

Please record the date of your last hand hygiene audit, irrespective of the type of tool that was used.

## 8. ENVIRONMENTAL CLEANING

**What is the ICU environment routinely cleaned with?**

Please indicate if the ICU environment is routinely cleaned with detergent only OR detergent and disinfectant.

**What is the environment in MRSA patient bed space routinely cleaned with?**

Please indicate if the environment surrounding MRSA patient bed space is routinely cleaned with detergent only OR detergent and disinfectant.

**Do you routinely change the beds of MRSA patients that are in the ICU for > one week?**

Please indicate if this is the policy in your ICU.

**Do you have waterproof computer keyboards that can be easily disinfected?**

Please indicate how many of your keyboards are waterproof and can be wiped down using hospital disinfecting sprays or germicidal wipes.

## 9. CONTACT PRECAUTIONS

**Are gloves and aprons recommended for use when in contact with the MRSA patient and their environment in your local guidelines?**

Please select 'yes' or 'no' from drop down menu.

**Do you always change bed curtains after discharge of an MRSA patient?**

Please select 'yes' or 'no' from drop down menu.

**Has an audit on compliance with contact precautions been carried out in the last 6 months?**

Please select 'yes' or 'no' from drop down menu.

## 2.10 DECOLONISATION PRACTICES

**What anti-bacterial product do you use for nasal decontamination?**

Please select from drop down menu (i.e. mupirocin for all patients, mupirocin only for patients colonised with mupirocin susceptible strains, neomycin nasal cream, other).

**Do you routinely use an antiseptic scrub as part of your decolonising protocol? If so, which product do you use?**

Please select from drop down menu.

## **SECTION C**

### **2.11 MRSA DIAGNOSIS**

#### **Which method do you routinely use for diagnosis of MRSA in the lab?**

Please select from the drop down menu if you use selective culture, molecular methods or both for the diagnosis of MRSA in the lab.

#### **If culture methods are used, do you use broth enrichment or plate directly from swab?**

Please indicate if you plate the patient swab/sample directly onto an agar plate or firstly use broth enrichment before plating onto agar.

#### **Do you routinely test all MRSA isolates from ICU for mupirocin resistance?**

Please indicate if it is routine practice in your laboratory to test all MRSA isolates for mupirocin resistance.

### **2.4 Instructions for Data Reporting to HPSC**

- Primary contact at HPSC for this project is Fiona Roche (see contact details below).
- Fill in the baseline demographic Excel form once annually. Forms can be emailed to Fiona Roche.
- Collect census data each week using a print out of the weekly census form. **Report data to HPSC quarterly**, preferably within two weeks following the end of the quarter.
- Data is reported back to HPSC using the Excel database provided. The Excel document covers the current year in monthly periods. Some months are longer than others. Each week spans from a Sunday - Saturday.
- For each reporting quarter please remember to also report your ICU code along with your data.
- At the end of each quarter, each participant will receive a quarterly report providing an overview of each hospital's data and to allow comparison with data gathered from the national set.

### **2.5 HPSC Contact Details:**

Fiona Roche, PhD  
Surveillance scientist,  
HSE - Health Protection Surveillance Centre,  
25-27 Middle Gardiner Street,  
Dublin 1,  
Ireland.  
[www.hpsc.ie](http://www.hpsc.ie)  
[fionamary.roche@hse.ie](mailto:fionamary.roche@hse.ie)

Tel: +353-1-8765378

Fax: +353-1-8561299

## 3.0 APPENDIX

### Appendix 1.0 Steering Group

A steering group was established from the members of the SARI Infection control subcommittee in 2007 to oversee the survey and provide guidance in its development and implementation. In March 2009, members of the Irish Association of Critical Care Nurses and the Intensive Care Society of Ireland joined the steering group.

Members of the steering group include:

- Dr. Fidelma Fitzpatrick, Consultant Microbiologist, Health Protection Surveillance Centre (HPSC) & Beaumont Hospital, Dublin (Chair)
- Prof. Hilary Humphreys, Consultant Microbiologist, Royal College of Surgeons in Ireland & Beaumont Hospital, Dublin
- Dr Maria Donnelly, Director of ICU, The Adelaide and Meath Hospital, Dublin Incorporating the National Children's Hospital (representative of the Intensive Care Society of Ireland). **Joined January 2010**
- Dr Brian Marsh, Director of ICU, Mater Misericordiae Univeristy Hospital. **Joined January 2010**
- Ms. Fiona Roche, Surveillance Scientist, HPSC
- Ms. Teresa Farrell, Infection Control, Sligo General Hospital
- Ms. Mairead Twohig, Infection Control, Our Lady of Lourdes Hospital Drogheda. (representing the Infection Prevention Society (IPS), formally ICNA)
- Ms. Katie Wedgeworth , Lecturer , School of Nursing Midwifery & Health Systems and Programme leader of the Graduate Diploma in Nursing Studies (Critical Care), University College Dublin (representing the Irish Association of Critical Care Nurses). **Joined March 2009**
- Ms Martha Hanlon, CNM3 ICU & HDU, Mater Misericordiae Univeristy Hospital. **Joined later in 2009**