Recommendations for
Surveillance of Surgical Site Infection

SARI Healthcare-associated Infection Surveillance Sub-committee

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Executive Summary

Surveillance of healthcare-associated infection (HCAI) is a key requirement under the Strategy for the control of Antimicrobial Resistance in Ireland (SARI) and a requirement under European Commission decision 2119/98. Without national HCAI surveillance, the true burden of HCAI is unknown. Development of a high quality surveillance system is essential to monitor HCAI and identify areas for improvement. Such an initiative in the long run will save public monies and is an essential component under the ‘quality and safety of patient care’.

On the request of the HSE HCAI Governance Committee, the SARI national committee established a subcommittee to produce recommendations for national HCAI surveillance. A 2007 questionnaire indicated that while 91% of acute public hospitals were interested in participating in national HCAI surveillance initiatives, they would be unable to do so due to a lack of appropriate surveillance resources (both IT and personnel). This gap in surveillance infrastructure was previously highlighted during the 2006 prevalence study of HCAI, when HSE-funded data collectors enabled 44 hospitals to participate. Without HSE support, the majority of hospitals would have been unable to participate in the survey, which is the only source of national HCAI data that Ireland has to date.

The SARI HCAI subcommittee commenced with producing a draft national protocol for surveillance of surgical site infection (SSI) in general surgery and plans over time to produce similar protocols for other surgical specialities. In addition, the SARI HCAI subcommittee has produced this document which provides recommendations for the HSE on the development of a high quality national SSI surveillance system that is standardised and internationally comparable. These recommendations will also support other HCAI surveillance activities. Both documents have been modified after a consultation process, prior to presentation to the SARI National Committee.

Summary of Recommendations

1. SSI surveillance must start and end with the patient in order to improve patient care. A SSI surveillance programme should be introduced over a range of surgical specialities as dictated by the specialities and requirements of that institution.

2. In order to implement a SSI programme nationally, the HSE must assign ring-fenced funding to fill gaps in surveillance infrastructure (IT and personnel). This should include access to the government VPN network to ensure a secure information network for national surveillance. Without this support, establishment
of SSI programmes in most public hospitals will not happen as demonstrated by
the requirement for HSE funding during the 2006 HCAI prevalence study.

3. SSI protocols must be standardised and adhere to other European frameworks
   (e.g. Pan Celtic / HELICS) for comparative analysis of SSI incidence rates

4. SSI surveillance should focus initially on in-patient surveillance

5. Individual hospitals should be responsible for the collection of surveillance data

6. The HSE should support a regional-based infrastructure for data processing and
   analysis to reduce duplication of work and resources

7. National data should be compared with European and international networks
1. Introduction

1.1 The 2006 HIS Prevalence Survey – lessons learnt

Postoperative surgical site infections (SSIs) are a major source of morbidity and mortality in the surgical patient. The only source of national SSI data is from the 2006 Hospital Infection Society (HIS) prevalence survey of healthcare-associated infections (HCAI). In this survey, the Republic of Ireland had a national SSI rate of 4.6%, in comparison to rates of 4.65% (England), 3.69% (Northern Ireland) and 5.35% (Wales). The Republic of Ireland remains the only country out of this group without a national surveillance system and lacks many of the resources necessary to carry out such surveillance. Unlike similar hospitals in the UK, many Irish hospitals do not have consultant microbiologists on-site and in many, the infection prevention and control team (IPCT) consists of one person, which is usually an infection prevention and control nurse (ICN). Therefore, to enable as many hospitals as possible to participate in the survey, the Health Services Executive (HSE) provided funding for the temporary employment of administrative assistants and surveillance nurses, to assist local IPCTs complete survey data. As a result of this support, most eligible hospitals participated in the survey, and feedback from participating hospital IPCTs indicated that provision of additional surveillance personnel was crucial.

Participation in the prevalence survey was time consuming - excluding preparation time and cancellation of data collection due to hospital infection control matters (e.g. norovirus outbreaks), it took data collection teams 1897.25 hours to collect survey data per hospital, representing 237 working (9am – 5pm) days for a data collection team of at least three people. If the HSE funded data collectors were not available, the type of additional support that participants would have required included staff (ICNs / microbiologists (93%) and administrative staff (90%)), and additional IT support (54%). All participants indicated that they would in principle be willing to participate in future National HCAI surveillance initiatives; however 87% could only do so with additional surveillance support.

1.2 Establishment of the SARI HCAI Surveillance Sub-committee

On the request of the HSE HCAI Governance Committee, the SARI National Committee established a subcommittee in mid 2007 to examine the options and produce recommendations for the surveillance of healthcare-associated infection (HCAI) in Ireland, to commence with SSI surveillance. In addition this subcommittee was to oversee the development of national HCAI surveillance initiatives and provide guidance for the HSE in their development and implementation. Members of the SARI HCAI subcommittee include:

- Dr. Fidelma Fitzpatrick, Consultant Microbiologist, Health Protection Surveillance Centre (HPSC) & Beaumont Hospital, Dublin (Chair)
• Ms. Mary Kelleher, Surveillance Scientist, St. James’s Hospital, Dublin (representing the Surveillance Scientists Association)
• Mr. Ken Mealy, Consultant Surgeon, Wexford General Hospital, Wexford (lead surgeon driving the General Surgery surveillance initiative in Wexford Hospital)
• Dr. Olive Murphy, Consultant Microbiologist, Bon Secours Cork (representing the Irish Society of Clinical Microbiologists - ISCM)
• Dr. Brian O’Connell, Consultant Microbiologist, St. James’s Hospital, Dublin (representing ISCM)
• Mr. Ajay Oza, Surveillance Scientist, HPSC.
• Dr. Fiona Roche, Surveillance Scientist, HPSC.
• Dr. Edward Smyth, Director, Northern Ireland Healthcare-associated infection Surveillance Centre and Consultant Microbiologist, Royal Hospitals, Northern Ireland.
• Ms. Mairead Twohig, Infection Control, Our Lady of Lourdes Hospital Drogheda. (representing the Infection Prevention Society, formally known as the Infection Control Nurses Association)

1.3 Questionnaire on existing HCAI surveillance activities in Ireland
In August 2007, a questionnaire was sent to the IPCTs of 59 acute national hospitals to capture the type of HCAI surveillance activities being carried out across the country. 45 hospitals responded. The main findings included:

- A variety of HCAI surveillance activities are currently being carried out;
  - 13 (29%) hospitals were performing SSI surveillance
  - 17 (38%) hospitals - HCAI surveillance in the intensive care unit
  - 10 (22%) hospitals - catheter-related bloodstream infection surveillance
  - 5 (11%) hospitals - surveillance of pneumonia
  - 5 (11%) hospitals - surveillance of urinary tract infections
  - 15 (33%) hospitals - other surveillance activities

- SSI surveillance is being carried out in orthopaedic surgery (7 hospitals), colon surgery (6), cholecystectomy (6), cardiac surgery (4), caesarean section (2) and other surgical specialties (5). While all hospitals were using CDC definitions of SSI, only three hospitals had access to an automated data entry system (Teleform / Formic) and only 4 hospitals are using standardised international protocols (HELICS / Pan Celtic)

- 41 (91%) hospitals expressed an interest in participating in national HCAI surveillance initiatives, however additional resources (IT and personnel) would be required in many centres to participate
1.4 Rationale for Recommendations
Developing high quality health intelligence of HCAI in Ireland is essential for the development, implementation and evaluation of policy and practice to prevent and control HCAI at local and national levels. At present, there is no national HCAI surveillance system in Ireland; therefore the true burden is unknown. The SARI HCAI subcommittee has focused initially on SSI surveillance, however many of the recommendations below will support other HCAI surveillance activities. The SARI HCAI subcommittee therefore recommend:

- Establishing a national HCAI surveillance system is prioritised by the HSE
- This system should be standardised and internationally comparable
- In order to address the gaps in surveillance infrastructure (IT and personnel), dedicated ring-fenced funding must be invested in this area to ensure that every hospital can participate and to ensure that the recommendations outlined below are implemented.

2. Recommendations

2.1 Recommended Infrastructure
In the Republic of Ireland, acute public hospitals differ in the types of surveillance resources available to them as well as in their needs for surveillance of categories of HCAI. In order to develop a national HCAI surveillance system that is cost-effective, strengthens current surveillance systems and ensures effective reduction of HCAI through timely feedback, the SARI HCAI subcommittee recommends that surveillance activities be coordinated at local, regional and national levels (Figure 1). The recommended infrastructure will not only support an SSI programme, but also surveillance of other HCAI’s in that hospital. The SARI HCAI subcommittee recognises that different regions have differing pre-existing resources and that the additional surveillance infrastructure required to participate in national HCAI surveillance activities will vary from region to region.

- HCAI Surveillance must start and end with the patient in order to improve patient care. Local HCAI surveillance programmes must be relevant to the needs of their patients and local priorities, therefore individual hospitals should be responsible for coordinating the surveillance programme including collection of local surveillance data.

- Each hospital should be part of a hospital network or regional cluster to which a regional data analyst is designated to coordinate data scanning/validation and analyses (for those hospitals that do not have these resources). For hospitals that already scan and validate their own data, these should continue. The regional team will be responsible for providing...
feedback to the local teams so that surveillance data can be monitored and acted on locally. The SARI regional committee and local implementation team should have access to this data in order to guide infection prevention and control activities in that area.

- All core validated data should be subsequently forwarded to the national centre (Health Protection Surveillance Centre) for national analysis. The HPSC will be responsible for national reporting and feedback of analyses on core data to each of the regional teams. Local hospitals will therefore receive hospital-specific feedback on a timely basis from regional teams and national comparative analyses from the national team.

This regional-based approach will build upon the existing cooperation among hospitals at the regional level as well as promoting a national standardised approach to how the data is processed, analysed and feedback to participants. In this document, the SARI HCAI subcommittee outline the resources that are required at the local, regional and national levels for the implementation of a national SSI surveillance system (Figure 1).

**Figure 1.** Recommended infrastructure for national surveillance of SSIs and the resources required at local, regional and national levels. PH Dept – Public Health Department; ICN – infection prevention and control nurse
2.1.1 Resources for local surveillance team:
The SARI HCAI subcommittee recommend the following resources for each hospital (Figure 1):

- A dedicated surveillance coordinator. This has been demonstrated to be crucial to the success of the SSI surveillance system in Irish hospitals with pre-existing programmes. This would be a full-time position (CMN2 grade) with responsibilities in coordinating the process, training staff, following up on surveillance forms, liaising with the analysis team and feeding data back to the surgical units. For smaller hospitals this post might be combined with another role or shared between two smaller hospitals.
- Administrative support for surveillance coordinator
- A consultant microbiologist and a general surgeon to drive the surveillance process and encourage compliance
- A local multidisciplinary committee should be established with representatives from surgery, microbiology, infection prevention and control, and hospital management to help drive the surveillance project and advise hospital management based on the results of surveillance data

2.1.2 Resources for regional surveillance team:
It is recommended that surveillance data are collated, scanned, validated and analysed at the regional level (Figure 1). This will reduce duplication of work and resources (i.e. having multiple scanners in neighbouring hospitals). However, hospitals with scanning resources and dedicated personnel may prefer to carry out their own scanning in house. If there are existing IT systems within the hospital that could be employed for surveillance (e.g. use of surgical software systems for data entry such as CIS metavision), these could also be used for SSI surveillance rather than scanning, where feasible.

The setup of regional surveillance may differ within each regional hospital network. For example, in regions where there is a hospital that is currently carrying out SSI surveillance it may be sensible to provide this hospital with additional resources to act as the regional SSI surveillance unit. In networks where there is interest in carrying out SSI surveillance but no current programme in operation, it may be sensible for the regional data analyst to be located in the Public Health Department (similar to the setup at Wexford Hospital). The SARI regional committee should be involved to help set up regional infrastructure for surveillance and deal with any issues at the regional level.
In order to set up a SSI surveillance team at the regional-level, the following resources are recommended:

- A data analyst (i.e. surveillance scientist or audit & surveillance nurse) should be appointed at either the local hospital or regional office to liaise with local surveillance teams, manage the scanning and validation of forms, develop a database, carry out hospital specific analyses and forward core surveillance data to the national surveillance team for national analysis and reporting.
- Administrative support for the above
- IT support (e.g. automated optical reader for form scanning)

2.1.3 Resources for national surveillance team:
It is recommended that the national surveillance team should collate validated national core data from each region and have responsibility for the reporting of results nationally, and to international surveillance networks (e.g. the Pan Celtic network, HELICS). It is also recommended that this team in conjunction with the SARI HCAI subcommittee will have responsibility for the development of national guidelines, policies and strategies surrounding national surveillance of SSIs.

The SARI HCAI subcommittee recommend the following resources:
- A surveillance scientist with responsibilities in liaising with all surveillance sites to coordinate national data collation, analysis and quarterly/annual reporting
- A senior infection prevention and control nurse to manage the project, coordinate national education workshops and encourage participation and compliance

2.2 Recommendations for the surveillance of surgical site infections
2.2.1 Surgical procedures for surveillance
As with any HCAI surveillance programme, SSI surveillance must start and end with the patient in order to improve patient care. A SSI surveillance programme should be introduced over a range of surgical specialities as dictated by the specialities and requirements of that institution. The Committee has focused initially on SSI surveillance in general surgery as most public hospitals have general surgical departments. In addition, surveillance of SSI in general surgery is already running as a successful project in Wexford General Hospital and as part of the HISC surveillance initiatives in Northern Ireland where much experience has already been learned. However, commencing with general surgery may not be relevant or appropriate for some institutions. While the SARI HCAI subcommittee have initially produced a national protocol for surveillance in general surgery, over time it is planned to produce protocols in other surgical specialities such as
Orthopaedics and Caesarean section. Pending these protocols, the SARI HCAI subcommittee recommend that if hospitals wish to implement surveillance programmes in other surgical specialities that they employ protocols that adhere to other European frameworks (e.g. Pan Celtic / HELICS) for comparative analysis of SSI incidence rates.

It is recommended that if an institution wants to implement surveillance in general surgery, surveillance should be commenced with a small range of General surgical procedures and the type of procedure(s) chosen should be decided locally based on resources available and local specialities. It may be preferable to choose procedures with known or suspected high infection rates and with a sufficient volume (e.g. > 20 procedures per year) in order to determine reliable rates of infection.

2.2.2 The target population
The SARI HCAI subcommittee recommend that surveillance should focus initially on the in-patient population until the surveillance system is fully embedded into the hospital’s activities. At a later stage, when resources allow, post-discharge surveillance should be introduced. However, any surveillance system that does not incorporate both in-patient and post-discharge surveillance will provide incomplete data.

2.2.3 The development of a standardised national form and protocol
The SARI HCAI subcommittee recommends that a standardised national form and protocol should be developed that adheres to other European frameworks such as Pan Celtic and HELICS to allow comparative analysis of national SSI incidence rates with other neighbouring nations. A standardised national form and protocol for general surgery has already been developed by the HPSC. The form represents the core minimum data set for SSI surveillance for the Republic of Ireland. The form represents a template and can be used to guide hospitals in the design of their own forms. Each individual hospital should be free to include additional questions to the template form so that local needs can be met. It is strongly recommended that forms be designed using form-recognition software, such as Teleform or Formic, to ensure high quality data. Information about surgical procedures should be captured using the 3-digit OPCS coding system developed by the NHS to allow the analysis of infection rates within specific procedure categories for useful feedback reporting.

2.2.4 The provision of a secure information network for each hospital site
Each hospital should have access to the government VPN network so that all participants can have access to secure surveillance information which can be readily shared across hospitals, regional centres (e.g. Public Health Departments) and the national surveillance centre at the HPSC.