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सत्यमेव जयते
Ministry of Health & Family Welfare
Government of India

NHSRC

Technical Guidelines for Surveillance and Reporting of Healthcare Associated Infections

District Level Health Facilities

2025

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Ministry of Health & Family Welfare,
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सत्यमेव जयते

आज़ादी का अमृत महोत्सव

भारत सरकार
स्वास्थ्य एवं परिवार कल्याण मंत्रालय
Government of India
Ministry of Health & Family Welfare

FOREWORD

Healthcare Associated Infections (HAI) are one of the most common adverse events in delivery of health care and a major public health problem with impact on morbidity, mortality and quality of life. However, a large percentage of HAIs are preventable through effective Infection Prevention and Control (IPC) measures. Prevention of HAIs can also rationalise the burden of use of antibiotics and prevent antimicrobial resistance (AMR).

In the above mentioned context, MoHFW has already released National Guidelines for Infection Prevention Control in Healthcare Facilities, as well as the National Action Plan on Antimicrobial Resistance (NAP-AMR). IPC measures are also integral part of National Quality Assurance Standards (NQAS) aimed at ensuring both quality of care and patient safety at our hospitals. The government is committed to ensuring that all public health hospitals under National Health Mission achieve NQAS certification by December 2026 .

Surveillance of HAI is important to assess the burden, monitor trends and develop evidence-based polices to improve patient safety and prevent AMR. These guidelines are intended to support public health facilities with practical tools to monitor the trends of HAI reduce its incidence. They constitute a logical extension of the NQAS and Kayakalp initiatives and intended to further strengthen their implementation process.

I hope that the technical officers at the state and district hospitals will enthusiastically embrace these guidelines, using them as a foundation for enhancing the quality of care and thus contributing to the overarching goal of a healthier, more resilient nation.

Dated: 21st August, 2025

(Aradhana Patnaik)

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MESSAGE

Healthcare-Associated Infections (HAIs) are among the most common and preventable adverse events related to healthcare delivery. They continue to pose a significant public health concern, contributing substantially to patient morbidity and mortality; and lead to poor healthcare outcomes.

As we strive toward achieving Universal Health Coverage, it is imperative that our health system remains resilient and responsive. Timely detection, reporting, and use of HAI data can strengthen patient safety and drive improvements in healthcare outcomes.

At the district hospital level, effective surveillance and reporting of HAIs play a crucial role in adherence to Infection Prevention and Control (IPC) protocols, early identification of infections and ensuring timely corrective actions. Robust HAI reporting can significantly reduce hospital stays, lower treatment costs, and improve patient outcomes. Additionally, it supports rational use of antimicrobials, thereby contributing to antimicrobial resistance (AMR) prevention.

IPC is already an integral part of the National Quality Assurance Standards (NQAS) and the Kayakalp initiatives. And, we are introducing these HAI Surveillance and Reporting guidelines to further strengthen ongoing efforts. These guidelines will make surveillance more outcome-oriented and lead to developing of state and national benchmarks through a centralized reporting system.

As a part of PM-ABHIM initiative, we are establishing Integrated Public Health Laboratories (IPHLs) at 702 districts across the country. These microbiology testing section of these laboratories will act as key partners to district hospitals for HAI surveillance and reporting; leading to improved evidence-based clinical decision-making.

I urge all stakeholders, state health departments, facility administrators, clinicians, microbiologists, and program managers to implement these guidelines and integrate HAI surveillance into routine hospital operations. By doing so, we can collectively make our health system safer, more transparent, and more responsive to the needs of our patients.

22/8/25
(Saurabh Jain)

#Stop Obesity
टीबी हारेगा देश जीतेगा / TB Harega Desh Jeetega

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राष्ट्रीय स्वास्थ्य प्रणाली संसाधन केंद्र
Ministry of Health and Family Welfare
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MESSAGE

Hospital-acquired infections (HAIs) are among the most serious and persistent challenges; compromising patient safety and placing immense pressure on already burdened health systems. This is especially true for low- and middle-income countries (LMICs) like India, where high patient volumes, constrained resources, and infrastructural limitations make infection control a complex task.

In India, we find ourselves at a critical intersection: the rising tide of HAIs is closely intertwined with the growing crisis of antimicrobial resistance (AMR). Recent data from ICMR AMRSN (Antimicrobial Resistance Surviellance and Researcn Network) Annual Report 2023 shows high levels of Carbapenems resistance among multiple pathogens. A 2024 published study, lead by Association of Microbiologists of India based on isolates from clinical specimens analaysed for one year period from selected hospiatls in Ahmedabad points to high rates of Multi Drug Resistance (MDR) among multiple pathogens like E.coli (57 %), K. pneumoniae (80%) and S.aureus (51%). These twin challenges of HAI and AMR feed into each other fuelling resistance resulting in longer hospital stays and increased treatment costs.

Breaking this cycle demands coordinated, data-driven action. Mapping resistance patterns through robust surveillance and using culture sensitivity reports and hospital antibiograms can help healthcare providers make more informed decisions about empirical treatment and design better interventions.

At the national level, we have strong platforms like the National Quality Assurance Standards (NQAS) and Kayakalp. These initiatives embed infection prevention and control (IPC) into the heart of healthcare quality. While NQAS evaluates adherence to infection control protocols—from hand hygiene to biomedical waste management—Kayakalp reinforces cleanliness, hygiene, and staff engagement at the facility level. Together, they create a culture of accountability and improvement.

Tools like prescription audits, guided by the National Action Plan on AMR, are helping us monitor and improve antibiotic use. They highlight where changes are needed, whether in clinician behaviour, policy design, or on-the-ground practices.

The National Health Systems Resource Centre (NHSRC) has played a pivotal role in this journey—supporting states and facilities through technical guidance, training, and quality improvement strategies. These guidelines are developed in technical partnership with ICMR and AIIMS, New Delhi tapping into their institutional expertise and experience in implementaing such guidelines at teritiary care level.This has allowed us to integrate global evidence with local wisdom, developing country specific definitions, surveillance protocols and reporting system applicable to the challenges of public health facilities at secondary care level.

These HAI guidelines represent not just a set of protocols, but a commitment—to safer care, to responsible antibiotic use, and to the thousands of healthcare workers striving every day to protect their patients. We hope this resource, empowers healthcare teams to take decisive action against HAIs, strengthen antimicrobial stewardship, and drives sustainable improvements in patient safety across India's health system.

Maj Gen (Prof) Atul Kotwal

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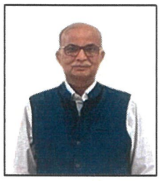

ACKNOWLEDGEMENT

These guidelines for surveillance and reporting of HAI are a natural progression of the Quality and Patient Safety Improvement journey of NQAS and Kayakalp. HAI Surveillance is an integral part of the extensive Infection Prevention & Control (IPC) standards in both NQAS and Kayakalp. However, there was a need to further standardize these processes through case definitions contextualized to the secondary care level, clear guidance on conducting surveillance and ensuring unform reporting using standardized case reports.

These guidelines are a result of unequivocal support for quality of care and patient safety improvements in public health facilities given by top leadership of the National Health Mission. We are grateful to Smt. Aradhana Patnaik, Additional Secretary & Mission Director (NHM), Mr. Saurabh Jain, Joint Secretary (Policy) and Mr. Harsh Mangla, Director (NHM I) for their support and inputs. The development of these guidelines had constant support and inputs from Maj. Gen. (Prof) Atul Kotwal, Executive Director who initiated the process through forging a technical collaboration with ICMR and AIIMS, New Delhi. I also acknowledge the gracious contribution of Prof. M. Srinivas, Director, AIIMS, New Delhi who whole heartedly guided this collaboration.

These guidelines are based on learnings and materials from "Healthcare Associated Infections Surveillance India" project, a collaboration between AIIMS, New Delhi, ICMR and NCDC with support from other academic and international institutions. Dr. Lata Kapoor, Additional Director & Head, CBDDR of NCDC and Dr. Kamini Walia, Scientist F, Division of Epidemiology and Communicable Diseases, ICMR guided us in conceptualization, development and reviewing this guideline. Dr. Purva Mathur, Professor Microbiology & Hospital Infection Control, JPN Advance Trauma Center, AIIMS, New Delhi and her team helped us in modifying and adapting these guidelines for working realities of public health system, mainly at secondary care level and in conducting training programs.

The work done by the members of expert review committee and stakeholder review committee in ensuring the robustness of these guidelines in terms of both scientific knowledge and their suitability for implementation at district hospitals is duly acknowledged. The contributions and support of NHM and NHSRC team in drafting these guidelines are also duly acknowledged.

I hope that the District Hospitals across the country will implement these guidelines as a part of NQAS and Kayakalp implementation. This along with development of a centralized online reporting system will strengthen our efforts to reduce the HAI to reduce patient morbidities and reduce cost of such infection. It will also contribute significantly to the country's effort in combating rising antimicrobial resistance.

(Dr. J.N. Srivastava)

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Section I – Introduction

Background:

Healthcare Associated Infections (HAIs), also reffered to as nosocomial or hospital-acquired infections, occur in patients during their care in healthcare facilities such as teaching hospitals, district hospitals, community health centers, or primary healthcare centers. While HAIs are not present or incubating at the time of admission to a healthcare facility, most become evident after two days of patient admission.

HAIs can occur due to a variety of micro-organisms, including bacteria, viruses, fungi, or parasites, either colonising or causing infections, depending on the physical condition of the host. The most common types of HAIs are:

- Bloodstream infection (BSI)
- Urinary tract infection (UTI)
- Pneumonia, including ventilator associated pneumonia (VAP)
- Surgical Site Infection (SSI)
- Gastrointestinal infection

HAIs are regarded as one of the most common adverse events related to healthcare delivery processes and a significant public health threat impacting morbidity, mortality, and quality of life. The World Health Organization's "Global Report on Infection Prevention and Control," published in 2022, estimates that among 100 patients in acute care hospitals, seven in high-income countries and 15 in low- and middle-income countries acquire at least one healthcare-associated infection. The report also estimates that 1 in every 10 affected patients dies from these infections. This results in a substantial economic burden on the affected societies and increases the burden on patients due to prolonged hospital stays, long-term disability, and the rising resistance of microorganisms to antimicrobials.

Emerging Threat of Antimicrobial Resistance (AMR):

Antimicrobial Resistance (AMR) is one of the key public health concerns that has taken center stage in the last decade or so. This issue is even more pressing in India, where relatively weak regulatory oversight in pharmaceutical retailing, rampant over-prescription of antimicrobials by doctors, and a lack of awareness among the general population lead to the purchase and over-the-counter use of antimicrobials. Although other factors, such as the indiscriminate use of antibiotics in poultry, animal husbandry, and fisheries, have also contributed to the emergence of antimicrobial resistance, healthcare services remain the most significant contributor.

The 2023 published survey, **"The First Multicentric Point Prevalence Survey of Antibiotic Use at 20 NAC-NET Sites India 2021-22," by the National Centre for Disease Control (NCDC)** under the Union health ministry, raised concerns about the rapidly growing threat of antimicrobial resistance in the country. This study, which covered 20 major hospitals across 15 states and 2 UTs, reported that 72% **of patients surveyed were prescribed antibiotics, and 4.6% of patients took four or more types of antibiotics.**

The Ministry of Health and Family Welfare, Government of India, has launched a national program for AMR containment, with the NCDC as the nodal institution. This initiative established the National Antimicrobial Surveillance Network (NARS-Net), which includes 35 network laboratories at national, regional, and state-level teaching institutions across the country. The National Action Plan for Antimicrobial Resistance Containment outlines multi-pronged strategies to raise awareness about the emerging threat of AMR and implement actions at national, state, and health facility levels to address this issue. A key component of the National Action Plan is the development and implementation of a coordinated system for HAI surveillance and reporting at the health facility level.

National Level Reporting of Healthcare Associated Infections - Current Scenario:

AIIMS, New Delhi, in collaboration with the ICMR, has developed a program for national surveillance of healthcare-associated infections, utilizing country-specific surveillance definitions created in consultation with several institutions and national experts. These surveillance definitions have been modified and adapted for the Indian context from those used by the European Centre for Disease Prevention and Control's (ECDC) HAI-Net and the United States Centres for Disease Control and Prevention's (CDC) National Healthcare Safety Network (NHSN). These HAI surveillance definitions are also included on India's NCDC website and are expected to fulfil the need for reliable HAI and AMR data to support effective patient care and public health initiatives aimed at measuring, tracking, and reporting the magnitude and types of AMR and HAI threats affecting India.

Efforts to enhance awareness and understanding of AMR through effective communication, as well as to strengthen the surveillance network by developing and enhancing laboratory capabilities, have been ongoing. However, specific efforts to engage healthcare providers regarding surveillance, effective infection prevention and control, and the optimised use of antimicrobial agents have been minimal. Most systematic engagement with hospitals and healthcare facilities has been limited to Central Government Institutions, academic institutions, and selected tertiary care private hospitals. The vast majority of public health institutions at the secondary care (DH, SDH, CHC/FRU) and primary care levels have yet to be engaged in advancing the objectives of the National Action Plan on Antimicrobial Resistance.

Preventing antimicrobial resistance related to health activities requires comprehensive engagement from healthcare providers at all care levels, from primary to tertiary care. Public hospitals, particularly secondary and primary care facilities, present an opportunity to establish a standardised national-level HAI surveillance system, thanks to the organised structure of state health departments and the widespread reach of the National Health Mission.

Scope and purpose:

This document provides evidence-based, country-specific definitions and formats for identifying and reporting HAIs in district-level healthcare facilities. These guidelines are aligned with international standards and have been modified for Indian context by the NCDC, ICMR, and AIIMS, New Delhi.

These guidelines align with the infection prevention and control activities outlined in Box 1 under the Kayakalp program and the National Quality Assurance Standards (NQAS) at

the health facility level. They will assist hospitals in conducting HAI surveillance activities, report them, and develop relevant key performance indicators as part of the Hospital Infection Prevention and Control program.

Box 1 – Healthcare Acquired Infections coverage in NQAS & Kayakalp

NATIONAL QUALITY ASSURANCE STANDARDS

Area of Concern – F: Infection Control
Standard F1: The facility has infection control programme and procedures in place for prevention and measurement of hospital associated infection
ME F1.2: The facility has provision for passive and active culture surveillance of critical & high-risk areas
ME F1.3: The facility measures hospital associated infection rates

KAYAKALP

Thematic Area D – Infection Control
Criteria D 9 – Hospital / Facility Acquired Infection Surveillance
D.9.1 Regular microbiological surveillance of critical areas
D.9.2 Facility measures Surgical Site Infection Rates
D.9.3 Facility measures Device Related HAI rates
D.9.4 Facility measures Blood Related and Respiratory Tract HAI
D.9.5 Facility takes corrective actions on occurrence of HAI

District Level Hospitals can implement these guidelines without requiring a separate specialised organisational structure or additional resources. They can utilise existing frameworks established through Kayakalp and NQAS, such as the Hospital Infection Control Committee and the Quality Team. These guidelines will be essential in developing training programs, modules, and IEC (information, education, and communication) materials related to Infection Prevention and Control for healthcare staff.

At the national and health system levels, these guidelines are expected to enhance the national effort to prevent the spread of antimicrobial resistance and develop a national repository and mapping of HAIs across the country. This would be essential for both hospitals and national bodies like the NHSRC, NCDC, and ICMR in creating a coordinated response and guidelines to combat the emerging patterns of antimicrobial resistance. Furthermore, this would be crucial for developing standard treatment guidelines and strengthening various national programs. Additionally, this would provide significant contributions to policy formation and reinforcing national action plans for IPC and AMR.

Applicability of various types of HAI surveillance across different district-level health facilities:

These guidelines outline the technical procedures for surveying and reporting different Healthcare Associated Infections at district-level health facilities. However, these facilities differ significantly in types and capabilities, from teaching hospitals (tertiary care) linked to medical colleges to dedicated women and child hospitals (WCH). Even within typical secondary-level district hospitals, the range of services and departments varies widely, along with essential infection control capabilities such as clinical laboratories that conduct microbiology tests.

The table below outlines the wide-ranging applicability of these individual guidelines across different types of district-level health facilities. It is well understood that not all district hospitals can carry out surveillance activities and reporting for every type of HAI. Instead, they will need to selectively adopt these practices according to their service scope and capabilities.

Table 1 – Applicability of Various Types of HAI Surveillance and Reporting Guidelines to District Level Health Facilities

HAI Guidelines	Suggested District Level Health Facilities for Implementation
Surgical Site Infections (SSI)	• District Hospitals attached to Medical Colleges • District Hospitals (Secondary Care Level) – with limited scope • Women and Child Hospitals – with limited scope
Caesarean Section - Surgical Site Infections (CS-SSI)	• District Hospitals attached to Medical Colleges • District Hospitals (Secondary Care Level) • Women and Child Hospitals
Blood Stream Infections (BSI)	• District Hospitals attached to Medical Colleges • District Hospitals – In cases Adult and SNCU/ NICUs without ventilation support are present • Women and Child Hospitals – In cases where SNCU/NICU are present
Urinary Tract Infections (UTI)	• District Hospitals attached to Medical Colleges • District Hospitals (Secondary Care Level) • Women and Child Hospitals
Ventilator Associated Pneumonia (VAP)	• District Hospitals attached to Medical Colleges • District Hospitals – In cases ICU and NICU providing ventilation support are present. • Women and Child Hospitals – In cases where NICU providing ventilation support are present.

Section II – Organisation for HAI Surveillance and Reporting at District Hospitals

Background:

The surveillance, identification, and measurement of HAIs are key components of the Infection Prevention and Control program at the health facility under the NQAS, along with related initiatives such as Kayakalp and SaQushal.

Compliance to Infection Prevention and Control practices among health facilities meeting Kayakalp and NQAS norms has improved. While the HAI surveillance needs are outlined in the Kayakalp implementation guidelines, the surveillance and reporting activities at these facilities do not adhere to a standardised methodology or pattern. Furthermore, identified HAIs are not reported at the state or national levels, resulting in a lack of benchmarks or analysis of trends in emerging infections, such as antibiograms, in the current scenario.

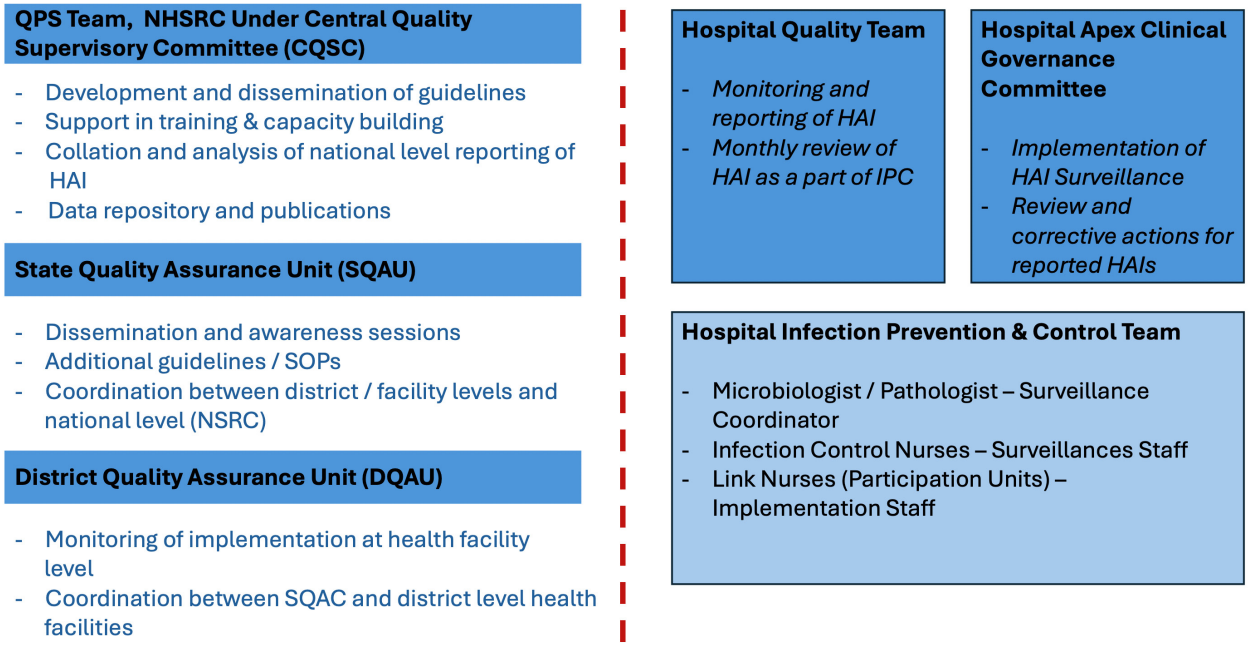
With the emerging crisis of AMR and a national priority to develop concerted efforts to prevent its impact, there is a need to standardise the process of surveillance and reporting of HAIs in health facilities. Therefore, the strengthening of HAI surveillance and reporting at the District Hospital levels is being undertaken as a first step in this direction by developing this guideline.

This guideline is expected to complement the implementation guidelines of Kayakalp and NQAS initiatives at the District Hospital level. It should further strengthen the Hospital Infection Prevention and control Program and align it with the priorities defined in state and national action plans for AMR prevention.

Organisation Structure for Implementation of HAI Surveillance & Reporting at District Hospitals:

The organizational arrangements for guiding and monitoring HAI surveillance at district-level health facilities will mirror the existing Organisational Structures aimed at improving quality in public healthcare facilities, as summarised in Figure 1.

Figure 1 – A Schematic Overview of Institutional and Facility Level Framework for Implementation of HAI Surveillance and Reporting at District Level Health Facilities



Quality & Patient Safety Division, NHSRC Under Central Quality Supervisory Committee

- Develop and publish guidelines based on nationally / internationally accepted guidelines for HAI surveillance and reporting guidelines.
- Coordination with national level stakeholders involved in AMR / IPC related activities like MOH&FW, ICMR, NCDC, AIIMS, and other academic and development partners.
- Support states in implementing guidelines through dissemination activities, developing training materials and providing training and continuous learning mechanisms.
- Coordination of national level reporting system for HAIs by district hospitals through an online platform developed by ICMR and AIIMS.
- Analysis, reporting and publication of national level data on HAI with support from ICMR and AIIMS.
- Create an Expert Advisory Group to provide guidance and oversee the implementation of IPC and HAI surveillance activities at the national level.
- Review the existing HAI surveillance mechanisms of the states / UTs and support them to channelise the efforts as per the national guidelines.
- Ensure mid-course corrections based on regular monitoring and evaluation of implementation at state / UT level implementation.
- Supporting funding for the activities under Quality Assurance budget of Program Implementation Plans (PIP) based on proposals from state / local levels.

State Quality Assurance Unit

- Organise dissemination and awareness session on the HAI Surveillance planning and

reporting for the District Level Quality Teams, Hospital Infection Control Committees and Staff of District Hospitals

- Develop and disseminate additional guidelines / standard operating procedures on HAI surveillance implementation as required at the state level.
- Review the findings and trends of HAI reported from the hospitals in the state and ensure that corrective and preventive actions are taken.
- Create an Expert Advisory Group to provide guidance and oversee the implementation of IPC and HAI surveillance activities at the state level.
- Coordinate with Quality & Patient Safety Division, NHSRC in implementing national level online reporting system for HAIs; including enrolling participating district hospitals in the system.

District Quality Assurance Unit

- Coordination and monitoring of implementation of HAI surveillance activities at district-level health facilities.
- Coordination with the SQAC to arrange training and capacity building sessions for the district level hospital teams.

District Hospital Quality Team

The person in charge of Laboratory Services, preferably a Microbiologist, Pathologist (if a Microbiologist is unavailable), General Medicine Physician, or General Surgeon, and infection control nurse suggested as a member of the District Hospital Quality Team, along with the infection prevention and control committee, will lead the implementation of HAI Surveillance and Reporting activities.

- Ensure that staff training on various aspects of HAI surveillance and reporting is conducted regularly as part of in-service training.
- Ensure that the participating units and hospital laboratory have adequate resources for conducting surveillance activities, including microbiology testing of samples.
- Monthly review of HAI surveillance and reporting activities as part of the Quality Team meeting, ensuring that HAI-related KPIs are maintained within the Kayakalp and NQAS outcomes monitoring framework.

HAI Surveillance - Roles & Responsibilities:

The District Hospital leadership will identify the staff members who will oversee the surveillance system, collect and enter surveillance data, and clearly lay out their expected roles and responsibilities. They should also provide the tools and resources needed to complete their assigned jobs. At minimum, a surveillance coordinator and a team of surveillance staff should be present.

The clinical staff in the ICUs / NICU / SNCU / Wards under surveillance also have roles in implementing HAI surveillance. Below are details on the roles and responsibilities of all aforementioned personnel.

Surveillance Coordinator

The Surveillance Coordinator is responsible for overseeing HAI surveillance within a hospital. Ideally, this role is filled by a microbiologist; however, if a microbiologist is unavailable, a pathologist associated with the hospital laboratory may take on this responsibility. In the absence of both a microbiologist and a pathologist, a general medicine specialist or general surgeon at the hospital may assume this role. They must ensure that the surveillance staff at their facility regularly report HAI events and denominator data from all units under surveillance. Additional responsibilities may include following up with the surveillance staff to reconcile any missing or conflicting data, disseminating HAI reports to relevant stakeholders at the hospital, and facilitating data-driven IPC activities.

Surveillance Staff

Surveillance staff should ideally be Infection Control Nurses. They carry out the day-to-day activities of HAI surveillance. The National Guidelines for Infection Prevention and Control in Healthcare Facilities of MH&FW recommend the appointment of a full-time dedicated infection control nurse (ICN). As per WHO recommendations for low-resource settings, one full-time dedicated ICN per 250 beds may be deputed from the regular nursing cadre, and these nurses should be exempted from other duties.

In general, the activities undertaken by surveillance staff include case finding, data collection, case determination, and recording surveillance data (e.g., on case report forms). To identify potential cases in the units under surveillance, these individuals evaluate various patient data sources on a daily basis. These sources typically include patient medical records (e.g., discharge checks, nursing notes, ICU/NICU/SBCU patient care records), laboratory results, and discussions with the clinical care team. They should monitor the timely and appropriate completion of case sheets by the clinical staff to ensure the availability of information relevant to HAI surveillance activities. Additionally, they will conduct environmental surveillance when required. All surveillance staff must be familiar with the HAI surveillance protocol, case finding flowcharts, and case definitions.

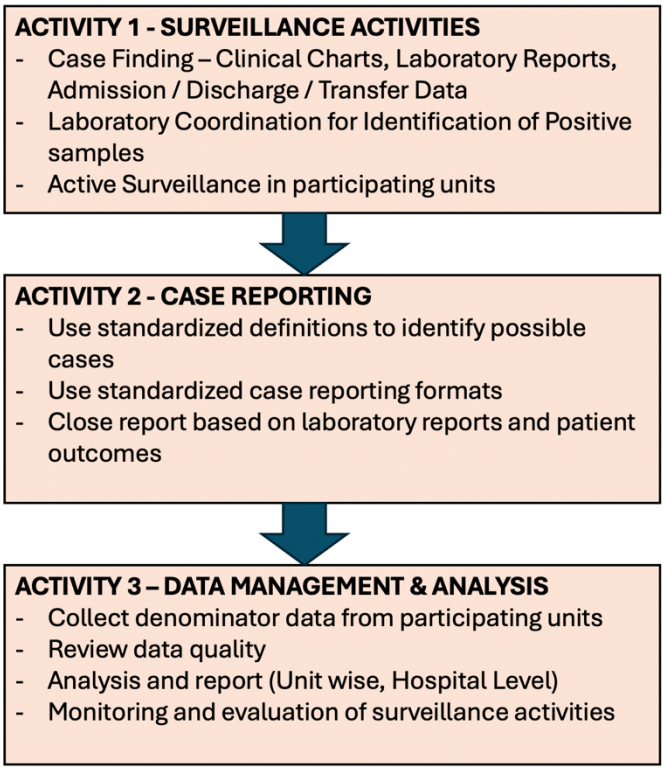
ICU / NICU / SNCU / In-Patient Wards Clinical Staff

Nurses and physicians staffing the ICU / SNCU / NICU / Post-Surgical Wards / In-patient Wards should be aware of the ongoing surveillance. These staff members should be familiar with the case definitions of the HAIs under surveillance to assist in identifying patients who may meet the case definition and in notifying surveillance staff for further assessment and confirmation. They should promote participation and teamwork among all unit members proactively and foster the development of a blame-free, transparent reporting culture. Clinical staff may be tasked with collecting denominator data, especially on weekends or holidays when surveillance staff might not be present in the hospital.

Surveillance Activities – An Overview

The workflow illustrated in Figure 2 below outlines the flow of surveillance activities within the District Hospitals. It highlights the key activities of Surveillance, Case Reporting, and Data Management within a key subset of activities. The details of these sub-activities are elaborated on further below.

Figure 2 – Overview of workflow of HAI Surveillance Activities



Surveillance Settings:

Surveillance will occur in the following locations within a District Hospital

- In-Patient Care Wards
- Adult and Neonatal ICU
- Special Neonatal Care Unit (SNCU)
- Maternity and Post–Natal Care Units
- Post Surgical Wards

Surveillance Events:

This guideline includes modules for the following types of HAI events:

- Surgical Site Infections (SSI)
- C-Section Surgical Site Infections (CS-SSI)
- Bloodstream Infections (BSI) - includes central-line associated BSI (CLABSI)
- Urinary Tract Infections (UTI) - includes catheter-associated UTI (CAUTI)
- Ventilator Associated Pneumonia (VAP)

The case definitions used for the above events are provided in specific chapters of this guideline. They are to be used for surveillance only and are not meant to serve as clinical definitions for use in diagnosis and treatment.

Surveillance Methods:

The surveillance process requires active, patient-based, prospective identification of cases and collection of denominator data by staff trained in this HAI surveillance protocol. Each HAI event module includes corresponding case definitions and additional event-specific methods for case reporting and data analysis. Each surveillance unit can adapt these steps to reflect institutional realities and share with surveillance staff before the initiation of the process.

Essential Elements of Healthcare-associated Infections Surveillance:

Figure 3 below illustrates the key stages and steps of HAI surveillance activities that should be ensured at the hospital or health facility level.

Figure 3 – Overview of HAI Surveillance Activity at District Level Health Facilities

HAI Surveillance Planning
• Determine who is responsible for HAI surveillance
• Establish goals and objectives of HAI surveillance
• Follow surveillance methods provided by national guidelines
• Select applicable HAI as per hospital services (Refer Table 1)
• Use applicable national HAI surveillance case definitions
• Hospital Quality Team / Clinical Governance Committee to promote collaboration among HAI Surveillance team and staff through meetings, trainings etc
Data Collection for HAI surveillance
• Follow standardized HAI surveillance data collection protocols
• Identify who is responsible for HAI surveillance data collection at facility and clinical unit level
• Identify sources of HAI surveillance data
• Provide and share HAI surveillance data in consistency with national guideline data structure
• Check and improve quality of HAI surveillance data
• Develop and maintain a facility level HAI surveillance data base
• Ensure HAI surveillance team training on HAI surveillance data collection
Analysis of HAI Surveillance Data
• Analyse HAI surveillance data on a regular basis (monthly, quarterly and yearly)
• Focus on KPI relevant to facility
• Health facility level data analysis should be based on simple tools and calculations

Interpretation of HAI Surveillance Data
• Contextualize HAI surveillance data as per hospital activities and engage staff in interpretation
• Monitor infection trends over time for the health facility to detect changes in HAI rates and to assess the impact of events
• Explore aetiology of high infection rates when applicable
• Benchmark facility level HAI surveillance data against other facilities or published national data where available
• Interpret HAI surveillance data for continual improvement of facility level IPC policies and adjust IPC strategies
• Translate HAI surveillance data to action points for IPC related improvements
Communication / feedback of HAI Surveillance Data
• Identify the facility level stakeholders to communicate with and share surveillance results
• Develop facility level HAI surveillance reports to summarize facility level HAI surveillance data
• Engage with facility stakeholders through meetings, quality circles etc to discuss HAI surveillance data
• Share HAI surveillance report with DQAU / SQAU for further data consolidation at district / state levels
• Distribute the HAI surveillance report to facility stakeholders in a timely manner
• Provide tailored feedback and support to specific stakeholders / clinical units for improvement
• Incorporate HAI surveillance findings in training and education programmes for health care workers
Monitoring and evaluation of HAI Surveillance
• Implement periodic reviews of HAI surveillance system elements on a regular basis (Quarterly by Clinical Governance Committee internally and annually by DQAC)
• Assess adherence of the facility to all HAI surveillance elements
• Evaluate the impact of HAI surveillance on reduction of HAI
• Share results of evaluations with facility level stakeholder and external stakeholder (DQAU / SQAU)
• Utilize evaluation finding to guide continuous improvement efforts and inform future planning

Reference: Surveillance of healthcare-associated infections at national and facility levels – Practical handbook, World Health Organization 2024

Establishing Linkages with Clinical Laboratories for Microbiology Testing:

The microbiology laboratory will play an essential role in surveillance. However, this presents challenges at the District Hospitals, where clinical laboratories lack their own microbiological testing capabilities. As a result, these hospitals will rely on establishing a close cooperation with other public health sector clinical laboratories, such as the newly created Integrated Public Health Laboratories (IPHL) or the clinical laboratories of the local Medical College hospitals.

The following scenarios may be considered to ensure connections for HAI surveillance and a clinical laboratory with microbiology testing capabilities.

Hospital's Own Clinical Laboratory: Hospital laboratory with capabilities for microbiology testing. Much of the case finding will be conducted by reviewing microbiology records. Therefore, ongoing communication and collaboration with the laboratory is essential.

Integrated Public Health Laboratory (IPHL): IPHLs, which provide comprehensive lab services, including infectious disease diagnostics and other diagnostic services such as Haematology, Clinical Biochemistry, Microbiology, Virology, and Pathology, are being established at the district level across the states. They are funded through the Ayushman Bharat Health Infrastructure Mission.

Referral Laboratory at Medical Colleges: Many districts have government teaching hospitals attached to Medical Colleges, which have comprehensive clinical laboratory facilities and act as referral laboratories for the district hospitals.

Outsourced Clinical Laboratories: Many states have outsourced clinical laboratory services to private sector companies, which operate on a hub-and-spoke model. Samples are collected regularly from district hospitals and other health facilities, and reports are provided online within an agreed-upon turnaround time.

Hospital management is expected to support the surveillance team in ensuring that appropriate clinical laboratory linkages are established for the HAI surveillance program. Where applicable, financial resources may be provided for laboratory testing support from the RKS funds or funds available for quality improvement activities through incentives received under NQAS or Kayakalp.

Section III – Surgical Site Infections

Overview:

This section outlines the methodology for conducting SSI surveillance and reporting in healthcare facilities (HCFs). Hospitals must adhere to the surveillance case definitions along with the data collection and reporting procedures detailed here to ensure data consistency and comparability.

Surveillance Settings:

Identify the surgical care units where surveillance for SSIs will occur, such as the General Operation Theatre and Maternity Operation Theatre, as well as the inpatient wards providing post-surgical care in the district hospital.

Surveillance Event:

This section adopts the surveillance definition from the ECDC HAI-Net and the US-CDC's National Healthcare Safety Network (NHSN). The case definitions serve only for surveillance purposes and are not intended as clinical definitions for diagnosis and treatment.

The SSI surveillance will occur in the identified unit for all operative procedures. The following criteria will be utilised for including a case:

i. At least one incision, which may involve a laparoscopic approach or cranial burr holes, is made through the skin or mucous membrane, or it may involve reoperation through an incision that was left open during a previous surgical procedure.

And

ii. Takes place in an operating room (OR). This may include the following
    a. an operating room
    b. C-section room
    c. Procedure Areas

Exclusions:

Procedures that are otherwise eligible but assigned an ASA score of 6 will be considered ineligible for SSI surveillance.

Monitoring of SSI:

This will require active, patient-centred prospective surveillance. SSIs should be identified using both in-hospital and post-discharge surveillance methods.

Review methods may include one or more of the following:

- Review of medical records / surgical / OT notes / Physician's notes / Admission, readmission, and ED notes.
- Patient charts for signs and symptoms of SSI
- Laboratory/ X-ray, other diagnostic test reports
- Visit the ICU and wards (by surveillance staff / ICNs)
- Follow up with the primary care staff at the CHC / PHC level (downward referral)
- Surveys by mail or telephone

Data Collection:

- Collect SSI (numerator) and type of surgery (denominator) data for all procedures in the selected procedure categories for at least one month.
- A procedure must fulfil the definition of an operative procedure to be included in the surveillance.
- All procedures must be followed for superficial, deep, and organ/space SSIs.

Definitions:

1. **Date of Event (DOE):** For an SSI, the DOE is **the date when the first element used to meet the SSI infection criterion occurs for the first time during the SSI surveillance period.** The date of event must fall within the SSI surveillance period to meet SSI criteria. The type of SSI (superficial incisional, deep incisional, or organ/space) reported should reflect the deepest tissue layer involved in the infection during the surveillance period. The date of the event should be the date that the patient met criteria for the deepest level of infection.
    - All symptoms required to meet SSI criteria usually occur within a 7–10-day timeframe with no more than 2-3 days between elements.
    - The elements must be relational to each other (thus, the surveillance team/ project staff should ensure the elements all associate to the SSI.
2. **Wound class:** An assessment of the degree of contamination of a surgical wound at the time of the operation. This is usually done by surgeon or circulating nurse. All procedures except the ones given in the box below can be recorded as clean procedures.

The following group of procedures can never be recorded as clean:

- **Appendix Surgery,**
- **Bile duct, Liver or Pancreatic surgery**
- **Gall bladder Surgery**
- **Rectal Surgery**
- **Small Bowel Surgery**
- **Vaginal Hysterectomy**

Therefore, for these procedures in the record clean should never be used.

Classification of Wounds:

Wounds are divided into four classes.

a. **Clean:** An uninfected operative wound in which no inflammation is encountered and the respiratory, alimentary, genital, or uninfected urinary tracts are not entered. In addition, clean wounds are primarily closed and, if necessary, drained with closed drainage. Operative incisional wounds that follow nonpenetrating (blunt) trauma should be included in this category if they meet the criteria.

b. **Clean-Contaminated:** Operative wounds in which the respiratory, alimentary, genital, or urinary tracts are entered under controlled conditions and without unusual contamination. Specifically, operations involving the biliary tract, appendix, vagina, and oropharynx are included in this category, provided no evidence of infection or major break in technique is encountered.

c. **Contaminated:** Open, fresh, accidental wounds. In addition, operations with major breaks in sterile technique (for example, open cardiac massage) or gross spillage from the gastrointestinal tract, and incisions in which acute, non-purulent inflammation is encountered, including necrotic tissue without evidence of purulent drainage (for example, dry gangrene), are included in this category.

d. **Dirty or Infected:** Includes old traumatic wounds with retained devitalized tissue and those that involve existing clinical infection or perforated viscera. This definition suggests that the organisms causing postoperative infection were present in the operative field before the operation.

Surgical Site Infection Criteria:

Criterion	Surgical Site Infection (SSI)
	Superficial incisional SSI Must meet the following criteria: Date of event for infection occurs within 30 days after any operative procedure (where day 1 = the procedure date) AND Involves only skin and subcutaneous tissue of the incision AND Patient has at least one of the following: a. Purulent drainage from the superficial incision. b. Organisms identified from an aseptically obtained specimen from the superficial incision or subcutaneous tissue by a culture based microbiologic testing method.

	c. Superficial incision that is deliberately opened by a surgeon or physician and culture or non-culture-based testing is not performed. AND Patient has at least one of the following signs or symptoms: pain or tenderness; localized swelling; erythema; or heat. d. Diagnosis of a superficial incisional SSI by the surgeon or physician.
	Deep incisional SSI Must meet the following criteria: The date of event for infection occurs within 30 or 90 days after the operative procedure (where day 1 = the procedure date) AND involves deep soft tissues of the incision (for example, fascial and muscle layers) AND patient has at least one of the following: 1. purulent drainage from the deep incision. 2. a deep incision that spontaneously dehisces, or is deliberately opened or aspirated by a surgeon or physician AND organism is identified by a culture or non-culture based microbiologic testing AND patient has at least one of the following signs or symptoms: fever (>38°C); localized pain or tenderness. A culture or non-culture-based test that has a negative finding does not meet this criterion. 3. an abscess or other evidence of infection involving the deep incision that is detected on gross anatomical or histopathologic exam, or imaging test.
	Organ/Space SSI Must meet the following criteria: Date of event for infection occurs within 30 or 90 days after the operative procedure (where day 1 = the procedure date) AND infection involves any part of the body deeper than the fascial/ muscle layers, that is opened or manipulated during the operative procedure AND patient has at least one of the following: a. purulent drainage from a drain that is placed into the organ/ space (for example, closed suction drainage system, open drain, T-tube drain, CT guided drainage)

	b. organisms are identified from fluid or tissue in the organ/space by a culture or non-culture based microbiologic testing method. c. an abscess or other evidence of infection involving the organ/ space that is detected on gross anatomical or histopathologic exam, or imaging test evidence suggestive of infection. AND meets at least one criterion for a specific organ/space infection site.

Surveillance Periods for SSIs:

Day 1 = the date of the procedure.

Note: Superficial incisional SSIs are only followed for a 30-day period for all procedure types.

Secondary incisional SSIs are only followed for a 30-day period regardless of the surveillance period for the primary site.

30-day Surveillance

Numerator Data: All patients undergoing any procedures within the operative procedure categories will be monitored for SSI. The SSI form must be completed for each case of SSI. This form includes patient demographic information as well as details about the operative procedure, such as the date and type of procedure. Information related to SSI includes the date of SSI, specific criteria used to identify the SSI, when/how the SSI was detected, whether the patient experienced a secondary bloodstream infection, whether the patient died, the organism(s) identified, and their antimicrobial susceptibilities.

Denominator Data: Fill out the Denominator for Procedure form (refer Annexure I) for all patients who undergo any of the procedures listed in the Operative Procedure category for which SSI surveillance is conducted during the month. Data is collected individually for each operative procedure performed during the month.

More than one operative procedure through the same incision within 24 hours: If a patient undergoes multiple surgeries during the same admission, and another procedure is performed through the same incision, report only one Denominator for Procedure form for the original procedure if the start time of the second procedure is within 24 hours of the finish time of the original procedure.

Note: ***If a patient expires in the operating room, do not complete a Denominator for Procedure form. This operative procedure is excluded from the denominator.***

Data Analysis:

SSI rates will be calculated as a percentage according to the formula below:

(No. of SSIs reported for a particular operation category for a month/ total number of surgeries of that category performed in the month) X 100.

Appendix 1

SSI Surveillance - Case Report Form

Patient Name:		
Gender: □ Female □ Male □ Other	**Date of Birth:**	
Event Type: SSI	**Date of Event:**	
Date of Procedure:	**Outpatient Procedure**: □ Yes □ No	
Date Admitted to Facility:	**Location:**	
Event Details		
Specific Event:		
□ Superficial Incisional	□ Deep Incisional	
□ Organ/Space (specify site): _____		
Specify Criteria Used (check all that apply):		
Signs & Symptoms		**Laboratory**
□ Drainage or material†	□ Sinus tract	□ Organism(s) identified
□ Pain or tenderness	□ Hypothermia	□ Culture or non-culture-based testing not performed
□ Swelling or inflammation	□ Apnoea	□ Organism(s) identified from blood specimen
□ Erythema or redness	□ Bradycardia	□ Organism(s) identified from ≥ 2 periprosthetic specimens
□ Heat	□ Lethargy	
□ Fever	□ Cough	□
□ Incision deliberately opened/drained	□ Nausea	□ Imaging test evidence of infection
□ Wound spontaneously dehisces	□ Vomiting	
□ Abscess	□ Dysuria	Clinical Diagnosis
□ Other evidence of infection found on invasive procedure, gross anatomic exam, or histopathologic exam†		□ Physician diagnosis of this event type □ Physician institutes appropriate antimicrobial therapy† □ Relevant Investigation (USG, X-ray, HMG)
Detected:	□ A (During admission)	□ P (Post-discharge surveillance)
	□ RF (Readmission to facility where procedure performed)	
	□ RO (Readmission to facility other than where procedure was performed)	
Secondary Bloodstream Infection: □ Yes □ No	**Died**: □ Yes □ No	**SSI Contributed to Death**: □ Yes □ No
Discharge Date:	**Pathogens Identified:** □ Yes /□ No	

Surgical Site Infection (SSI):

Organisms and Antibiotic Susceptibility					
Date of sample collection	**Organism**	**Drugs**			
_____	*Staphylococcus epidermidis*	**OX** S I R N	**CEFOX** S I R N	**METH** S I R N	**CLIND** S I R N	**DAPTO** S I R N
		VANC	**OTHER DRUG 1**	**OTHER DRUG 2**	**OTHER DRUG 3**	**OTHER DRUG 4**
		S I R N **OTHER DRUG 5** S I R N	S I R N	S I R N	S I R N	S I R N
_____	*Staphylococcus haemolyticus*	**OX** S I R N	**CEFOX** S I R N	**METH** S I R N	**CLIND** S I R N	**DAPTO** S I R N
		VANC S I R N **OTHER DRUG 5** S I R N	**OTHER DRUG 1** S I R N	**OTHER DRUG 2** S I R N	**OTHER DRUG 3** S I R N	**OTHER DRUG 4** S I R N
_____	*Staphylococcus hominis*	**OX** S I R N	**CEFOX** S I R N	**METH** S I R N	**CLIND** S I R N	**DAPTO** S I R N
		VANC S I R N **OTHER DRUG 5** S I R N	**OTHER DRUG 1** S I R N	**OTHER DRUG 2** S I R N	**OTHER DRUG 3** S I R N	**OTHER DRUG 4** S I R N
_____	*Staphylococcus, other* coagulase-	**OX** S I R N	**CEFOX** S I R N	**METH** S I R N	**CLIND** S I R N	**DAPTO** S I R N
		VANC S I R N **OTHER DRUG 5** S I R N	**OTHER DRUG 1** S I R N	**OTHER DRUG 2** S I R N	**OTHER DRUG 3** S I R N	**OTHER DRUG 4** S I R N
_____	*Enterococcus Faecium*	**AMP** S I R N	**DAPTO** S I R N	**GENTHL§** S I R N	**CIPRO** S I R N	**LNZ** S I R N
		TEICO S I R N	**VANC** S I R N	**OTHER DRUG 1** S I R N	**OTHER DRUG 2** S I R N	**OTHER DRUG 3** S I R N
_____	*Enterococcus faecalis*	**AMP** S I R N	**DAPTO** S I R N	**GENTHL§** S I R N	**CIPRO** S I R N	**LNZ** S I R N
		TEICO S I R N	**VANC** S I R N	**OTHER DRUG 1** S I R N	**OTHER DRUG 2** S I R N	**OTHER DRUG 3** S I R N
		OTHER DRUG 4 S I R N	**OTHER DRUG 5** S I R N			

_____	*Enterococcus Sp.* Please Specify Species: ____	**AMP** S I R N	**DAPTO** S I R N	**GENTHL§** S I R N	**CIPRO** S I R N	**LNZ** S I R N
		TEICO S I R N	**VANC** S I R N	**OTHER DRUG 1** S I R N	**OTHER DRUG 2** S I R N	**OTHER DRUG 3** S I R N
		OTHER DRUG 4 S I R N	**OTHER DRUG 5** S I R N			
_____	*Staphylococcus* *aureus*	**LEVO** S I R N	**MOXI** S I R N	**CLIND** S I R N	**DAPTO** S I R N	**DOXY** S I R N
		MINO S I R N	**ERYTH** S I R N	**GENT** S I R N	**LNZ** S I R N	**OTHER DRUG 1** S I R N
		OTHER DRUG 2 S I R N	**OTHER DRUG 3** S I R N	**OTHER DRUG 4** S I R N	**OTHER DRUG 5** S I R N	
_____	*Acinetobacter* *baumannii*	**AMK** S I R N	**AMPSUL** S I R N	**CEFTAZ** S I R N	**CEFOT** S I R N	**CIPRO** S I R N
		LEVO S I R N	**COL** S I R N	**PB** S I R N	**GENT** S I R N	**IMI** S I R N
		TICLAV S I R N	**MERO** S I R N	**DORI** S I R N	**NET** S I R N	**PIP** S I R N
		PIPTAZ S I R N	**TETRA** S I R N	**DOXY** S I R N	**MINO** S I R N	**TMZ** S I R N
		TOBRA S I R N	**OTHER DRUG 1** S I R N	**OTHER DRUG 2** S I R N	**OTHER DRUG 3** S I R N	**OTHER DRUG 4** S I R N
		OTHER DRUG 5 S I R N				
_____	*Acinetobacter* *baumannii complex*	**AMK** S I R N	**AMPSUL** S I R N	**CEFTAZ** S I R N	**CEFOT** S I R N	**CIPRO** S I R N
		LEVO S I R N	**COL** S I R N	**PB** S I R N	**GENT** S I R N	**IMI** S I R N
		TICLAV S I R N	**MERO** S I R N	**DORI** S I R N	**NET** S I R N	**PIP** S I R N
		PIPTAZ S I R N	**TETRA** S I R N	**DOXY** S I R N	**MINO** S I R N	**TMZ** S I R N
		TOBRA S I R N	**OTHER DRUG 1** S I R N	**OTHER DRUG 2** S I R N	**OTHER DRUG 3** S I R N	**OTHER DRUG 4** S I R N
		OTHER DRUG 5 S I R N				
_____	*Acinetobacter lwoffii*	**AMK** S I R N	**AMPSUL** S I R N	**CEFTAZ** S I R N	**CEFOT** S I R N	**CIPRO** S I R N
		LEVO S I R N	**COL** S I R N	**PB** S I R N	**GENT** S I R N	**IMI** S I R N
		TICLAV S I R N	**MERO** S I R N	**DORI** S I R N	**NET** S I R N	**PIP** S I R N
		PIPTAZ S I R N	**TETRA** S I R N	**DOXY** S I R N	**MINO** S I R N	**TMZ** S I R N

		TOBRA S I R N	**OTHER DRUG 1** S I R N	**OTHER DRUG 2** S I R N	**OTHER DRUG 3** S I R N	**OTHER DRUG 4** S I R N
		OTHER DRUG 5 S I R N				
_____	*Acinetobacter sp.* Please Specify Species: ___	**AMK** S I R N	**AMPSUL** S I R N	**CEFTAZ** S I R N	**CEFOT** S I R N	**CIPRO** S I R N
		LEVO S I R N	**COL** S I R N	**PB** S I R N	**GENT** S I R N	**IMI** S I R N
		TICLAV S I R N	**MERO** S I R N	**DORI** S I R N	**NET** S I R N	**PIP** S I R N
		PIPTAZ S I R N	**TETRA** S I R N	**DOXY** S I R N	**MINO** S I R N	**TMZ** S I R N
		TOBRA S I R N	**OTHER DRUG 1** S I R N	**OTHER DRUG 2** S I R N	**OTHER DRUG 3** S I R N	**OTHER DRUG 4** S I R N
		OTHER DRUG 5 S I R N				
_____	*Escherichia coli*	**AMK** S I R N	**CEFAZ** S I R N	**CEFEP** S I R N	**CEFOT** S I R N	**CEFTRX** S I R N
		CEFTAZ S I R N	**CEFUR** S I R N	**CEFOX** S I R N	**CTET** S I R N	**CIPRO** S I R N
		EVO S I R N	**MOXI** S I R N	**COL** S I R N	**PB** S I R N	**ERTA** S I R N
		GENT S I R N	**IMI** S I R N	**MERO** S I R N	**DORI** S I R N	**PIPTAZ** S I R N
		TETRA S I R N	**DOXY** S I R N	**MINO** S I R N	**TIG** S I R N	**OTHER DRUG 1** S I R N
		OTHER DRUG 2 S I R N	**OTHER DRUG 3** S I R N	**OTHER DRUG 4** S I R N	**OTHER DRUG 5** S I R N	
_____	*Enterobacter* *aerogenes*	**AMK** S I R N	**CEFAZ** S I R N	**CEFEP** S I R N	**CEFOT** S I R N	**CEFTRX** S I R N
		CEFTAZ S I R N	**CEFUR** S I R N	**CEFOX** S I R N	**CTET** S I R N	**CIPRO** S I R N
		LEVO S I R N	**MOXI** S I R N	**COL** S I R N	**PB** S I R N	**ERTA** S I R N
		GENT S I R N	**IMI** S I R N	**MERO** S I R N	**DORI** S I R N	**PIPTAZ** S I R N
		TETRA S I R N	**DOXY** S I R N	**MINO** S I R N	**TIG** S I R N	**OTHER DRUG 1** S I R N
		OTHER DRUG 2 S I R N	**OTHER DRUG 3** S I R N	**OTHER DRUG 4** S I R N	**OTHER DRUG 5** S I R N	
_____	*Enterobacter cloacae*	**AMK** S I R N	**CEFAZ** S I R N	**CEFEP** S I R N	**CEFOT** S I R N	**CEFTRX** S I R N
		CEFTAZ S I R N	**CEFUR** S I R N	**CEFOX** S I R N	**CTET** S I R N	**CIPRO** S I R N

		LEVO S I R N	**MOXI** S I R N	**COL** S I R N	**PB** S I R N	**ERTA** S I R N
		GENT S I R N	**IMI** S I R N	**MERO** S I R N	**DORI** S I R N	**PIPTAZ** S I R N
		TETRA S I R N	**DOXY** S I R N	**MINO** S I R N	**TIG** S I R N	**OTHER DRUG 1** S I R N
		OTHER DRUG 2 S I R N	**OTHER DRUG 3** S I R N	**OTHER DRUG 4** S I R N	**OTHER DRUG 5** S I R N	
_____	*Klebsiella oxytoca*	**AMK** S I R N	**CEFAZ** S I R N	**CEFEP** S I R N	**CEFOT** S I R N	**CEFTRX** S I R N
		CEFTAZ S I R N	**CEFUR** S I R N	**CEFOX** S I R N	**CTET** S I R N	**CIPRO** S I R N
		LEVO S I R N	**MOXI** S I R N	**COL** S I R N	**PB** S I R N	**ERTA** S I R N
		GENT S I R N	**IMI** S I R N	**MERO** S I R N	**DORI** S I R N	**PIPTAZ** S I R N
		TETRA S I R N	**DOXY** S I R N	**MINO** S I R N	**TIG** S I R N	**OTHER DRUG 1** S I R N
		OTHER DRUG 2 S I R N	**OTHER DRUG 3** S I R N	**OTHER DRUG 4** S I R N	**OTHER DRUG 5** S I R N	
_____	*Klebsiella pneumoniae*	**AMK** S I R N	**CEFAZ** S I R N	**CEFEP** S I R N	**CEFOT** S I R N	**CEFTRX** S I R N
		CEFTAZ S I R N	**CEFUR** S I R N	**CEFOX** S I R N	**CTET** S I R N	**CIPRO** S I R N
		LEVO S I R N	**MOXI** S I R N	**COL** S I R N	**PB** S I R N	**ERTA** S I R N
		GENT S I R N	**IMI** S I R N	**MERO** S I R N	**DORI** S I R N	**PIPTAZ** S I R N
		TETRA S I R N	**DOXY** S I R N	**MINO** S I R N	**TIG** S I R N	**OTHER DRUG 1** S I R N
		OTHER DRUG 2 S I R N	**OTHER DRUG 3** S I R N	**OTHER DRUG 4** S I R N	**OTHER DRUG 5** S I R N	
_____	*Klebsiella spp.* Please Specify Species: ___	**AMK** S I R N	**CEFAZ** S I R N	**CEFEP** S I R N	**CEFOT** S I R N	**CEFTRX** S I R N
		CEFTAZ S I R N	**CEFUR** S I R N	**CEFOX** S I R N	**CTET** S I R N	**CIPRO** S I R N
		LEVO S I R N	**MOXI** S I R N	**COL** S I R N	**PB** S I R N	**ERTA** S I R N
		GENT S I R N	**IMI** S I R N	**MERO** S I R N	**DORI** S I R N	**PIPTAZ** S I R N
		TETRA S I R N	**DOXY** S I R N	**MINO** S I R N	**TIG** S I R N	**OTHER DRUG 1** S I R N
		OTHER DRUG 2 S I R N	**OTHER DRUG 3** S I R N	**OTHER DRUG 4** S I R N	**OTHER DRUG 5** S I R N	

_____	*Pseudomonas aeruginosa*	**AMK** S I R N	**AZT** S I R N	**CEFEP** S I R N	**CEFTAZ** S I R N	**CIPRO** S I R N
		LEVO S I R N	**COL** S I R N	**PB** S I R N	**GENT** S I R N	**IMI** S I R N
		MERO S I R N	**DORI** S I R N	**NET** S I R N	**PIPTAZ** S I R N	**TOBRA** S I R N
		OTHER DRUG 1 S I R N	**OTHER DRUG 2** S I R N	**OTHER DRUG 3** S I R N	**OTHER DRUG 4** S I R N	**OTHER DRUG 5** S I R N
_____	*Pseudomonas putida*	**AMK** S I R N	**AZT** S I R N	**CEFEP** S I R N	**CEFTAZ** S I R N	**CIPRO** S I R N
		LEVO S I R N	**COL** S I R N	**PB** S I R N	**GENT** S I R N	**IMI** S I R N
		MERO S I R N	**DORI** S I R N	**NET** S I R N	**PIPTAZ** S I R N	**TOBRA** S I R N
		OTHER DRUG 1 S I R N	**OTHER DRUG 2** S I R N	**OTHER DRUG 3** S I R N	**OTHER DRUG 4** S I R N	**OTHER DRUG 5** S I R N
_____	*Pseudomonas sp.* Please Specify Species: ___	**AMK** S I R N	**AZT** S I R N	**CEFEP** S I R N	**CEFTAZ** S I R N	**CIPRO** S I R N
		LEVO S I R N	**COL** S I R N	**PB** S I R N	**GENT** S I R N	**IMI** S I R N
		MERO S I R N	**DORI** S I R N	**NET** S I R N	**PIPTAZ** S I R N	**TOBRA** S I R N
		OTHER DRUG 1 S I R N	**OTHER DRUG 2** S I R N	**OTHER DRUG 3** S I R N	**OTHER DRUG 4** S I R N	**OTHER DRUG 5** S I R N
_____	*Candida albicans*	**ANID** S I R N	**CASPO** S I R N	**FLUCO** S I R N	**FLUCY** S I R N	**ITRA** S I R N
		MICA S I R N	**VORI** S I R N	**OTHER DRUG 1** S I R N	**OTHER DRUG 2** S I R N	**OTHER DRUG 3** S I R N
		OTHER DRUG 4 S I R N	**OTHER DRUG 5** S I R N			
_____	*Candida glabrate*	**ANID** S I R N	**CASPO** S I R N	**FLUCO** S I R N	**FLUCY** S I R N	**ITRA** S I R N
		MICA S I R N	**VORI** S I R N	**OTHER DRUG 1** S I R N	**OTHER DRUG 2** S I R N	**OTHER DRUG 3** S I R N
		OTHER DRUG 4 S I R N	**OTHER DRUG 5** S I R N			
_____	*Candida tropicalis*	**ANID** S I R N	**CASPO** S I R N	**FLUCO** S I R N	**FLUCY** S I R N	**ITRA** S I R N
		MICA S I R N	**VORI** S I R N	**OTHER DRUG 1** S I R N	**OTHER DRUG 2** S I R N	**OTHER DRUG 3** S I R N
		OTHER DRUG 4 S I R N	**OTHER DRUG 5** S I R N			

_____	*Candida spp.* Please Specify Species: ___	**ANID** S I R N	**CASPO** S I R N	**FLUCO** S I R N	**FLUCY** S I R N	**ITRA** S I R N
		MICA S I R N	**VORI** S I R N	**OTHER DRUG 1** S I R N	**OTHER DRUG 2** S I R N	**OTHER DRUG 3** S I R N
		OTHER DRUG 4 S I R N	**OTHER DRUG 5** S I R N			
Date of sample collection	**Other Organisms**	**Drugs**				
_____	Organism 1 _____ Specify:	**Drug 1** S I R N	**Drug 2** S I R N	**Drug 3** S I R N	**Drug 4** S I R N	**Drug 5** S I R N
		Drug 6 S I R N	**Drug 7** S I R N	**Drug 8** S I R N	**Drug 9** S I R N	**Drug 10** S I R N
_____	Organism 2 _____ Specify:	**Drug 1** S I R N	**Drug 2** S I R N	**Drug 3** S I R N	**Drug 4** S I R N	**Drug 5** S I R N
		Drug 6 S I R N	**Drug 7** S I R N	**Drug 8** S I R N	**Drug 9** S I R N	**Drug 10** S I R N
_____	Organism 3 _____ Specify:	**Drug 1** S I R N	**Drug 2** S I R N	**Drug 3** S I R N	**Drug 4** S I R N	**Drug 5** S I R N
		Drug 6 S I R N	**Drug 7** S I R N	**Drug 8** S I R N	**Drug 9** S I R N	**Drug 10** S I R N

Comments

Result Codes

S = Susceptible I = Intermediate R = Resistant NS = Non-susceptible S-DD = Susceptible-dose dependent N = Not tested

§ GENTHL results: S = Susceptible/Synergistic and R = Resistant/Not Synergistic

† Clinical breakpoints have not been set. S/R designations should be based upon epidemiological cutoffs of S = MIC ≤ 2 and R = MIC ≥ 4.

AKF	Amikacin - Fosfomycin	**AMC**	Amoxicillin - cClavulanate	**AMK**	Amikacin
AMOX	Amoxicillin	**AMP**	Ampicillin	**AMPSUL**	Ampicillin Sulbactam
AMXCLV	Amoxicillin cClavulanic Acid	**ANID**	Anidulafungin	**AZA**	Aztreonam - Avibactam
AZL	Azlocillin	**AZM**	Azithromycin	**AZT**	Aztreonam
BES	Besifloxacin	**BPM**	Biapenem	**BPR**	Ceftobiprole
C/T	Ceftolozane - Tazobactam	**CASPO**	Caspofungin	**CAT**	Cefetamet
CB	Carbenicillin	**CDN**	Cefditoren	**CDR**	Cefdinir
CDZ	Cadazolid	**CEFAZ**	Cefazolin	**CEFEP**	Cefepime
CEFOT	Cefotaxime	**CEFOX**	Cefoxitin	**CEFTAZ**	Ceftazidime
CEFTRX	Ceftriaxone	**CEFUR**	Cefuroxime	**CEP**	Cephalothin
Cfm	Cefamandole	**Cfr**	Cefaclor	**CHL**	Chloramphenicol
CID	Cefonicid	**CIN**	Cinoxacin	**CIPRO**	Ciprofloxacin
CLA	Clarithromycin	**CLIND**	Clindamycin	**CLX**	Clinafloxacin
CMZ	Cefmetazole	**COL**	Colistin	**CPA**	Ceftaroline - Avibactam
CPR	Cefpirome	**CPT**	Ceftaroline	**CPZ**	Cefoperazone
CTB	Ceftibuten	**CTET**	Cefotetan	**CTZ**	Ceftizoxime
CZA	Ceftazidime - Avibactam	**DAL**	Dalbavancin	**DAPTO**	Daptomycin
DFX	Delafloxacin	**DIC**	Dicloxacillin	**DORI**	Doripenem
DOXY	Doxycycline	**DTM**	Dirithromycin	**ERTA**	Ertapenem
ERV	Eravacycline	**ERYTH**	Erythromycin	**FARO**	Faropenem
FC	Fusidic acid	**FDX**	Fidaxomicin	**FIN**	Finafloxacin
FLUCO	Fluconazole	**FLUCY**	Flucytosine	**FLX**	Fleroxacin
FOS	Fosfomycin	**FP**	Cefprozil	**FPZ**	Cefepime - Tazobactam
GAT	Gatifloxacin	**GEM**	Gemifloxacin	**GENT**	Gentamicin

GENTHL	Gentamicin - high level test	**GEP**	Gepotidacin	**GRN**	Garenoxacin
GRX	Grepafloxacin	**HAP**	Cephapirin	**HLS**	Streptomycin Synergy
ICL	Iclaprim	**IMI**	Imipenem	**ITRA**	Itraconazole
KAN	Kanamycin	**LEVO**	Levofloxacin	**LMU**	Lefamulin
LND	Levonadifloxacin	**LNZ**	Linezolid	**LOM**	Lomefloxacin
LOR	Loracarbef	**MEC**	Mecillinam	**MERO**	Meropenem
METH	Methicillin	**MEV**	Meropenem - Vaborabactam	**MEZ**	Mezlocillin
MICA	Micafungin	**MINO**	Minocycline	**MOX**	Moxalactam
MOXI	Moxifloxacin	**MTZ**	Metronidazole	**MUP**	Mupirocin
NAF	Nafcillin	**NAL**	Nalidixic acid	**NET**	Netilmicin
NIT	Nitazoxanide	**NITRO**	Nitrofurantoin	**NOR**	Norfloxacin
OFL	Ofloxacin	**OMC**	Omadacyline	**ORI**	Oritavancin
OX	Oxacillin	**PB**	Polymyxin B	**PEF**	Pefloxacin
PEN	Penicillin	**PEX**	Pexiganan	**PIP**	Piperacillin
PIPTAZ	Piperacillin / Tazobactam	**PLZ**	Plazomicin	**POD**	Cefpodoxime
PRU	Ulifloxacin	**QDA**	Quinupristin - Dalfopristin	**RAD**	Cephradine
RAM	Ramoplanin	**RIF**	Rifampin	**RZM**	Razupenem
SEC	Secnidazole	**SOL**	Solithromycin	**SPT**	Spectinomycin
SPX	Sparfloxacin	**SSS**	Sulfonamides	**STR**	Streptomycin
SULO	Sulopenem	**SUR**	Surotomycin	**TBR**	Trospectomycin
TEICO	Teicoplanin	**TEL**	Telithromycin	**TETRA**	Tetracycline
TIC	Ticarcillin	**TICLAV**	Ticarcillin / Clavulnate	**TIG**	Tigecycline
TOBRA	Tobramycin	**TVA**	Trovafloxacin	**TZD**	Tedizolid
VANC	Vancomycin	**VORI**	Voriconazole	**ZWK**	Nafithromycin
TIN	Tinoxanide	**TLV**	Telavancin	**TMP**	Trimethoprim
TMZ	Trimethoprim / Sulfamethoxazole	**TNZ**	Tinidazole		

Appendix 2

Denominator for Procedure

Patient ID:	Ward/Bed:	Date of Admission:
Patient Name, Last:	First:	Middle:
Gender: F M Other	Date of Birth:	
Date of Procedure:		

Procedure Details

Outpatient: Yes No

Duration: _____Hours _____Minutes

Wound Class: C CC CO D

Emergency: Yes No

Scope: Yes No

Height: _____feet _____inches

Surgeon: _____

□ Consultant □ Resident

Circle one: HPRO KPRO

ICD-10-PCS Supplemental Procedure Code for HPRO/KPRO: _____

Check one: □Total □Hemi □Resurfacing (HPRO only)

If Total: □Total Primary □Total Revision

If Hemi: □Partial Primary □Partial Revision

If Resurfacing (HPRO only) : □Total Primary □Partial Primary

*If total or partial revision, was the revision associated with prior infection at index joint? □Yes □No

Name of the Procedure, Site and Date

Comments

Denominator Form (General)

First Day of Surveillance Period	Last Day of Surveillance Period	Number of ALL Procedures* performed	Number of Elective Procedures* performed	Number of Emergent Procedures* Performed
DD/MM/YYYY	DD/MM/YYYY			
DD/MM/YYYY	DD/MM/YYYY			
DD/MM/YYYY	DD/MM/YYYY			
DD/MM/YYYY	DD/MM/YYYY			
DD/MM/YYYY	DD/MM/YYYY			
DD/MM/YYYY	DD/MM/YYYY			
DD/MM/YYYY	DD/MM/YYYY			
DD/MM/YYYY	DD/MM/YYYY			
DD/MM/YYYY	DD/MM/YYYY			
DD/MM/YYYY	DD/MM/YYYY			

**Procedures = C-Section Surgical Procedures included in SSI surveillance*

Notes:

Section IV – Caesarean Section - Surgical Site Infections

Overview:

This section outlines sustainable and feasible post-C-section SSI surveillance to guide the implementation and continuous evaluation of SSI prevention strategies. It is designed for use by facilities performing lower-segment ***caesarean sections*** (LSCS). The protocol provides comprehensive information for establishing SSI surveillance and guidelines that a surveillance officer or other individuals responsible for the surveillance system should adhere to.

Surveillance Settings:

Surveillance of surgical patients will occur in all District Hospitals where C-sections are performed. The primary objective of this protocol is to establish a feasible, cost-effective SSI surveillance initiative that can be implemented with a modest amount of resources. Effective surveillance will provide valuable information on improving patient outcomes and ensuring patient safety in the long run. Each facility should assess the resources available for surveillance to implement evidence-based IPC activities. It is recommended to designate a dedicated staff nurse, ideally an Infection Control Nurse (ICN), to lead the SSI surveillance in the healthcare facility.

In the future, this surveillance protocol may be extended to Sub-Divisional Hospitals and Community Health Centres (FRU Level) where C-sections are performed.

Key Terms:

Surveillance Period: The number of days over which surveillance data is collected, and results presented (Example: 1-month surveillance period)

Surveillance Inpatient Period: The period from the C-section procedure (Day 0) to discharge from the facility

Post-discharge Period: The period from discharge from the facility to the end of the follow-up period (Day 30)

Follow-up Period: The 30-day period in which symptoms meeting the case definition will be attributed to the surgical procedure.

Elective Procedure: A scheduled surgical procedure, usually performed with standard pre-procedure activities (also called a 'routine procedure')

Emergent Procedure: An unscheduled surgical procedure, often performed without standard pre-procedure activities

Wound Class: Grouping surgical wounds by risk of infection based on contamination and where the wound is located on the body.

Diagnosed Wound Infection: A wound determined to be infected after being assessed by a physician, surgeon or other qualified healthcare provider

SSI Case Definition:

The recommended surveillance case definition for SSI represents a balance between simplicity and data value/usability and relies only on observable patient symptoms for case determination

- **SSI Case Definition**

A patient within 30 days of the surgical procedure with the following observed or reported:

- A purulent (pus) discharge in, or coming from, the wound (including evidence of an abscess)

OR

- Any reopening of the surgical wound

OR

- Evidence of fever with painful, spreading erythema surrounding the surgical site

**Sites, based on laboratory capacity, may also collect bacteriology culture and sensitivity results to aid with the clinical diagnosis of SSI, but this information will not be included as part of this surveillance protocol.*

The case definition is for the purpose of surveillance and is not meant to serve as a dinical definition for use in dlagnosis and treatment

Surveillance Methods:

Infection Control Assessment

A baseline assessment of focused infection control practices (hand hygiene, pre-surgical prophylaxis, sterilisation, disinfection and aseptic practices, and environmental cleaning) in labour rooms, operating theatres and post-surgical wards should be performed before initiating surveillance to identify gaps in infection control policies and practices.

The information from the baseline assessment should be used to prioritise SSI prevention and activities to improve safe surgical practice. Surgical-focused infection control practices should be reassessed at least annually to assess progress.

Surveillance Population

SSI surveillance will be limited to C-sections to reduce the resources needed for SSI surveillance and increase the comparability of findings. The surveillance population shall include all patients undergoing the surgical procedures of interest. The surveillance population is established when the surveillance staff starts the Surgical Safety Checklist and

Surveillance Form (Appendix) as part of good surgical safety practice and documentation during the procedure. This form will be maintained throughout the follow-up period and will be used to document case findings and establish denominators. An example of a Surgical Safety Checklist and Surveillance Form can be found in Appendix.

Case Finding:

On or around post-operative day three, trained surgical staff and/or surveillance staff will record findings from their surgical wound assessment to determine if the surveillance case definition has been met. Assessment findings should be documented on the patient's Surgical Safety Checklist and Surveillance Form (provided in Appendix).

Ideally, the first wound assessment should occur on the day the dressing is changed, that is, post-op Day 3 (or according to the hospital's policy), to minimise patient discomfort and avoid unnecessary dressing changes. While a surgeon's or physician's diagnosis of infection is not sufficient to meet the surveillance case definition, assessing the wound and considering any symptoms of infection are valuable and should be taken into account for clinical care.

A second wound assessment: will be completed and documented at the time of patient discharge. If post-discharge case finding is not conducted or the patient is lost to follow-up (e.g., the patient's phone number is unreachable or the patient has moved to a different state), this discharge assessment will be the final wound assessment and will serve as the final determination of the patient's case status.

Third Wound assessment: Because a substantial portion of SSI may occur after discharge from the healthcare facility where the patient had undergone the procedure, post-discharge case finding is important to consider for SSI surveillance. Methods for post-discharge case finding may include:

- Telephone interviews with patients
- Capture assessment data from follow-up clinic visits
- Suture removal or wound assessment if the patient returns to the facility for care or follow-up

If a surgical site infection is observed during suture removal or during the follow-up visit within 30 days, the case forms will be categorised as a case of SSI.

Post-discharge Case Finding: Patient Interview

This protocol focuses on interviews conducted by the surveillance staff.

For post-discharge case finding, all patients should be contacted at least once (on or around day 30 post-procedure) and interviewed to determine whether the case definition has been met. The timing and method of patient contact and interviews should remain as consistent as possible. An example script for post-discharge case-finding interviews is provided in Appendix 2.

For patients who cannot be reached by phone, it is recommended that three attempts be made on different days to contact either the patient or the birth companion. After the third attempt, the patient should be recorded as 'lost to follow-up' by clearly marking

through the 'Final Check' section of the Surgical Safety Checklist and Surveillance Form (Appendix). While every effort should be made to contact all patients for post-discharge case finding, some 'lost to follow-up' cases are anticipated. Patients who refuse contact or lack a telephone number should be considered 'lost to follow-up'. There may be instances where mothers or providers self-refer mothers for routine follow-up. This surveillance case-finding method does not detract from the usual efforts already in place for ANMs and ASHA workers to refer mothers for care, self-referral of mothers, or providers seeing mothers as part of routine follow-up. Any cases of infection referred to the ICN leading the surveillance program do not require further contact.

Collection of Denominator Data

To calculate C-section SSI rates, data on the number of C-sections performed should be collected. The total number of C-sections performed each month at the health facility will serve as the denominator for calculating that month's SSI rate.

Denominator data will be calculated based on the Surgical Safety Checklist and Surveillance Forms (Appendix) completed during the surveillance period. **Therefore, it is important that every surgical patient undergoing a procedure under surveillance has a Surgical Safety Checklist and Surveillance Form initiated and available for review.** A Denominator Form for recording denominator data is provided in Appendix.

Case Reporting:

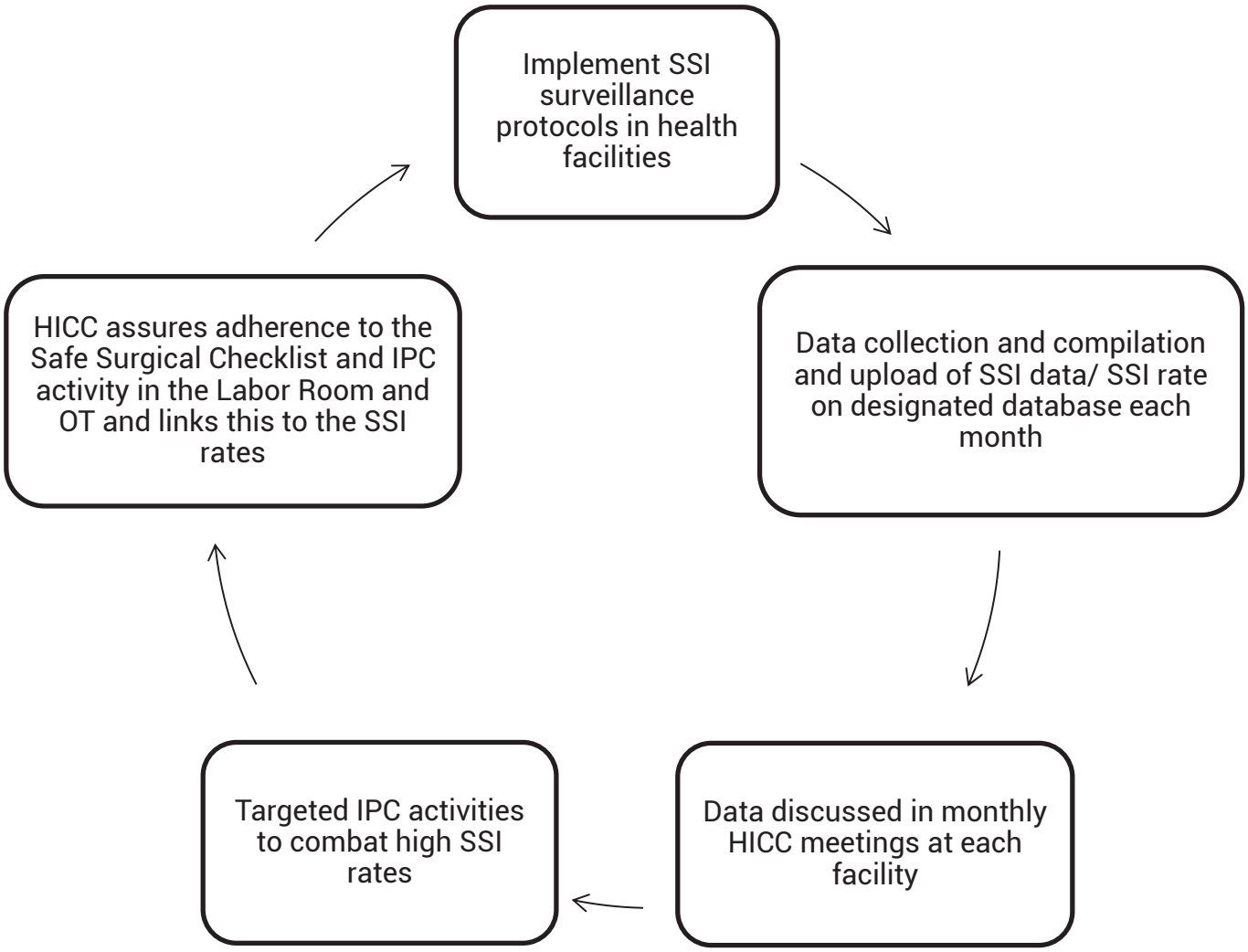
Case reporting will be conducted by completing the Surgical Safety Checklist and Surveillance Form. No additional documentation is required. All forms should be located near the patient care area, readily available to staff recording wound assessments, yet secured against loss or destruction.

Analysis Plan:

C-section SSI rates will be categorised based on elective or emergent procedures. Using numerator and denominator data, the incidence of total SSI and stratified SSI will be calculated as outlined below:

- **Total SSI rate:** SSI per 100 procedures. Divide the total number of recorded SSIs by the number of procedures performed, then multiply by 100.
- **Elective SSI rate:** SSI per 100 elective procedures. To calculate, divide the number of SSIs recorded for elective procedures by the total number of elective procedures performed, then multiply by 100.
- **Emergent SSI rate:** SSI per 100 emergent procedures. To calculate, divide the number of SSIs recorded for emergent procedures by the total number of elective procedures performed, then multiply by 100.

Figure 1. SSI Surveillance Data Use Cycle



Appendix 1

Surgical Safety Checklist and Surveillance Form

Instructions for completing this form: The surveillance staff at the healthcare facility should start using this form immediately before the start of each surgical procedure intended for surveillance. While serving as the primary data collection form for SSI surveillance, this form also functions as a surgical safety checklist. The checklist is not meant to be exhaustive. Additions and modifications to align with facility practices are encouraged; however, SSI surveillance elements should remain intact.

For detailed guidance on using a surgical safety checklist, refer to the Implementation Manual: WHO Surgical Safety Checklist (First Edition), available at https://www.who.int/patientsafety/safesurgery/ss_checklist/en/.

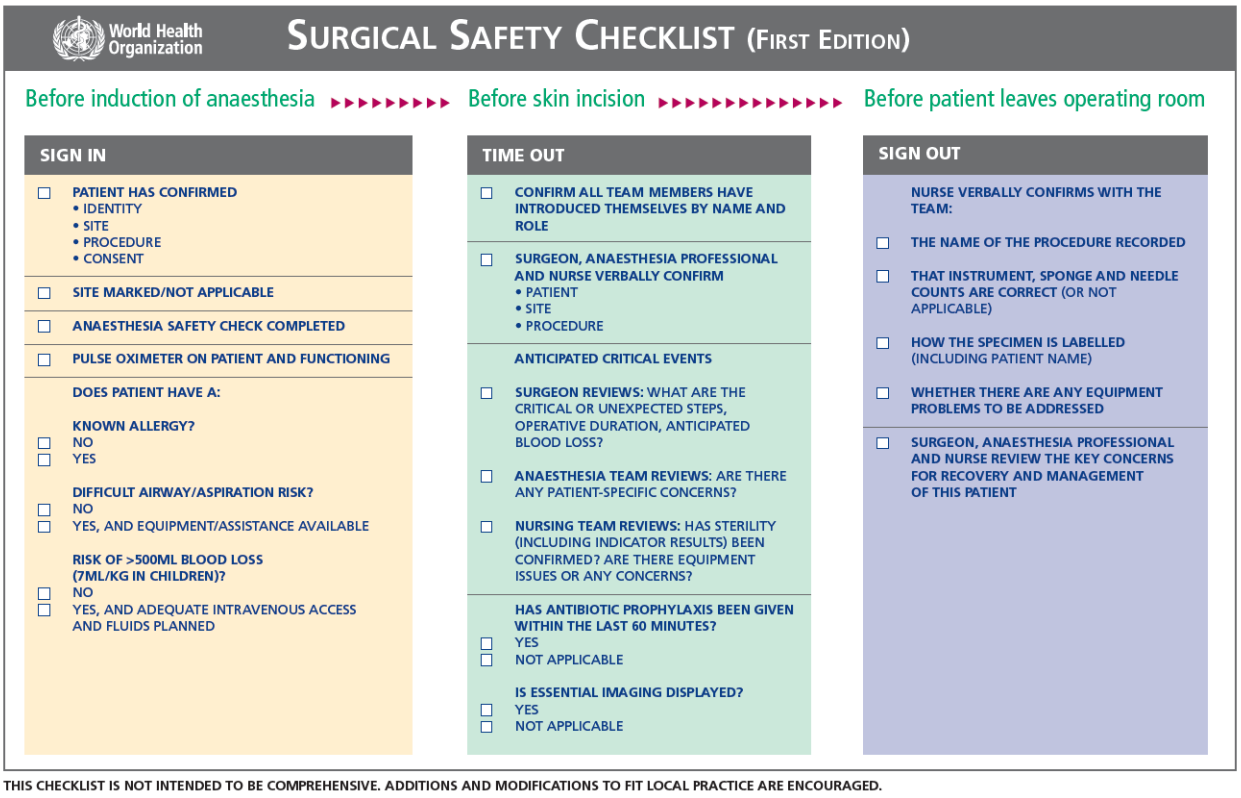
In brief, a single individual must be responsible for checking the boxes on the list. This designated Checklist coordinator is typically a circulating nurse, but it can be any clinician or healthcare professional involved in the procedure. The Checklist divides the operation into three phases, each corresponding to a specific period in the normal flow of a procedure:

1. Before Anaesthesia
2. Before Incision
3. After Wound Closure

During each phase, the Checklist coordinator must confirm that the team has completed its tasks before proceeding.

Having a single person lead the completion of the Surgical Safety and Surveillance form is essential for its success. In the complex environment of an operating room, steps may be overlooked. Designating one individual to confirm the completion of each safety step in the Checklist can ensure that none are omitted in the rush to proceed with the next phase of the operation.

The Infection Surveillance Section will take place at predetermined intervals during the patient's recovery (i.e., Day 3, Discharge, and Day 30) through wound assessments and patient interviews/self-reports.



World Health Organization

SURGICAL SAFETY CHECKLIST (FIRST EDITION)

Before induction of anaesthesia ▸▸▸▸▸▸▸▸▸ Before skin incision ▸▸▸▸▸▸▸▸▸▸▸▸▸ Before patient leaves operating room

SIGN IN

- ☐ PATIENT HAS CONFIRMED
  - IDENTITY
  - SITE
  - PROCEDURE
  - CONSENT
- ☐ SITE MARKED/NOT APPLICABLE
- ☐ ANAESTHESIA SAFETY CHECK COMPLETED
- ☐ PULSE OXIMETER ON PATIENT AND FUNCTIONING
- DOES PATIENT HAVE A:

KNOWN ALLERGY?
- ☐ NO
- ☐ YES

DIFFICULT AIRWAY/ASPIRATION RISK?
- ☐ NO
- ☐ YES, AND EQUIPMENT/ASSISTANCE AVAILABLE

RISK OF >500ML BLOOD LOSS (7ML/KG IN CHILDREN)?
- ☐ NO
- ☐ YES, AND ADEQUATE INTRAVENOUS ACCESS AND FLUIDS PLANNED

TIME OUT

- ☐ CONFIRM ALL TEAM MEMBERS HAVE INTRODUCED THEMSELVES BY NAME AND ROLE
- ☐ SURGEON, ANAESTHESIA PROFESSIONAL AND NURSE VERBALLY CONFIRM
  - PATIENT
  - SITE
  - PROCEDURE

ANTICIPATED CRITICAL EVENTS

- ☐ SURGEON REVIEWS: WHAT ARE THE CRITICAL OR UNEXPECTED STEPS, OPERATIVE DURATION, ANTICIPATED BLOOD LOSS?
- ☐ ANAESTHESIA TEAM REVIEWS: ARE THERE ANY PATIENT-SPECIFIC CONCERNS?
- ☐ NURSING TEAM REVIEWS: HAS STERILITY (INCLUDING INDICATOR RESULTS) BEEN CONFIRMED? ARE THERE EQUIPMENT ISSUES OR ANY CONCERNS?

HAS ANTIBIOTIC PROPHYLAXIS BEEN GIVEN WITHIN THE LAST 60 MINUTES?
- ☐ YES
- ☐ NOT APPLICABLE

IS ESSENTIAL IMAGING DISPLAYED?
- ☐ YES
- ☐ NOT APPLICABLE

SIGN OUT

NURSE VERBALLY CONFIRMS WITH THE TEAM:

- ☐ THE NAME OF THE PROCEDURE RECORDED
- ☐ THAT INSTRUMENT, SPONGE AND NEEDLE COUNTS ARE CORRECT (OR NOT APPLICABLE)
- ☐ HOW THE SPECIMEN IS LABELLED (INCLUDING PATIENT NAME)
- ☐ WHETHER THERE ARE ANY EQUIPMENT PROBLEMS TO BE ADDRESSED
- ☐ SURGEON, ANAESTHESIA PROFESSIONAL AND NURSE REVIEW THE KEY CONCERNS FOR RECOVERY AND MANAGEMENT OF THIS PATIENT

THIS CHECKLIST IS NOT INTENDED TO BE COMPREHENSIVE. ADDITIONS AND MODIFICATIONS TO FIT LOCAL PRACTICE ARE ENCOURAGED.

Appendix 2:

Post-Discharge Case Finding Script and Data Collection Form

Instructions for completing this form: This form should be used as both interview script and data collection form for post-discharge case finding. Steps for form use:

1. Complete Patient contact information –based on the Surgical Safety Checklist and Surveillance Form:
   - "Name of Patient"
   - "Procedure"
   - "Contact" [usually a mobile number]
   - "Date of Procedure"
   - "Follow-up Date" [30-days after the "Date of Procedure"]
2. On or within 5 days of the "Follow-up Date" the first attempt to contact the patient for follow-up should be made. Three attempts should be made on separate days. Record the date of each attempt in the space provided.
3. When the individual has been contacted, record the "Name of Interviewer" and complete the interview by reading each question as written. Record answers on the form.
4. Complete the "Final Check" section of the Surgical Safety Checklist and Surveillance

Form based on interview responses:

- Purulent Drainage = Yes: Question 1 (Yes) + a (Cloudy or Yellow or Green)
- Fever & Wound Redness = Yes: Question 8 (Yes) + Question 5 (Yes)
- Fever & Wound Swelling = Yes: Question 8 (Yes) + Question 6 (Yes)
- Fever & Increased Wound Pain = Yes: Question 8 (Yes) + Question 7 (Yes)

5. Store completed post-discharge form with the Surgical Safety Checklist and Surveillance Form for data entry

Post-Discharge Patient Interview Script

Hello, this is [**YOUR NAME**] from [**HEALTH FACILITY**]. My records show that you had a [**NAME OF PROCEDURE**] on [**DATE OF OPERATION**]. Is this correct?

[ ] Yes **Corrected information:**

[ ] No (specify)

[ ] Report that patient has died (date of death: _____/ _____/ _____)

Thanks for that, I am calling today to check that you are doing well and that your wound has healed as it should. Do you have 5 to 10 minutes to answer a few questions?

If not a good time, note a better time to call: _____

Your answers are very important to us and combined with hundreds of others will help to improve the quality care at [HEALTH FACILITY]. I want to assure you that all your responses will be kept confidential.

I would like to start with asking about fluid that may have come from your wound. A small amount of clear or bloody fluid from a healing wound is normal. I am interested in fluid we call pus that is a sign of an infection in your wound. Pus is usually thick and cloudy or milky and can sometimes have an unpleasant smell.

1. At any point did you see pus coming from your surgical wound? [[symptom_pus]]
   - ☐ Yes*
   - ☐ No [**SKIP TO QUESTION 5**]
2. What color was the pus?
   - ☐ Clear [clarify: puss is typically not clear]
   - ☐ Cloudy
   - ☐ Yellow
   - ☐ Green
   - ☐ Red/bloody [clarify: pus is not usually described as mainly bloody
3. Did the pus have a bad smell?
   - ☐ Yes
   - ☐ No
4. What was the date when you noticed the pus coming from the surgical wound? [[ssi_date]]
   - ☐ (dd/mm/yyyy) ___/ ____/ _____

I am now going to ask you about redness, swelling, and pain around your wound.

5. Did you notice redness around your wound that got worse instead of better? [[symptom_erythema]]
   - ☐ Yes*
   - ☐ No

6. Did the area around your wound ever become swollen? By swollen I mean an enlargement of the wound area or the affected part of the body causing pain or limited your movement. [[symptom_erythema]]

   ☐ Yes*

   ☐ No [clarify, if #5 = yes, confirm there was **NO swelling noted**]

7. While there was redness and/or swelling around the wound, did you have pain at the site that was worse than you expected? [[symptom_erythema]]

   ☐ Yes*

   ☐ No [clarify, if #5 and #6 = YES, confirm there was **NO pain noted**] [**SKIP TO QUESTION 9**]

8. While there was redness and/or swelling around the wound, did you have fever? By fever I mean a measured temperature above 38^0 C (oral), 37.5^0 C (axillary) or symptoms of a fever including periods of unusual sweating, shivering, headache, muscle aches, loss of appetite, or general weakness. [[symptoms_fever]]

   ☐ Yes*

   ☐ No [clarify, if #5, #6, and #7 are YES, confirm there was **NO fever or symptoms of fever**] [SKIP TO QUSTION 11]

9. What was the date when you measured or noticed your fever?

   ☐ (dd/mm/yyyy) ___/ ____/ _____

10. At any point did you seek health care for treatment of your surgical wound? [[ssi_care]

    ☐ Yes

    ☐ No

11. Did the health care provider tell you that your wound was infected? [[ssi_dx]]

    ☐ Yes

    ☐ No

    ☐ Unknown

12. Did you take antibiotics to treat the infection? [[ssi_abx]]

    ☐ Yes

    ☐ No

    ☐ Unknown

Thank you for taking the time to answer these questions. Do you have any questions for me? If you think of any questions later you can reach our team at: _____

Appendix 3:

Denominator Form

Instructions for completing this form: This form should be completed for each surveillance period (usually at least monthly) by counting all the Surgical Safety Checklist and Surveillance Forms completed during the period. It is assumed that every patient has a Surgical Safety Checklist and Surveillance Form started during his or her procedure and that every form will be available for counting.

If there is any question about forms being completed and available for surveillance, the Surveillance coordinator should be contacted.

Denominator Form (C-Section) to be collected by data manager – training to be provided

First Day of Surveillance Period	Last Day of Surveillance Period	Number of ALL C-sections performed	Number of Elective C- sections performed	Number of Emergent C-sections Performed
DD/MM/YYYY	DD/MM/YYYY			
DD/MM/YYYY	DD/MM/YYYY			
DD/MM/YYYY	DD/MM/YYYY			
DD/MM/YYYY	DD/MM/YYYY			
DD/MM/YYYY	DD/MM/YYYY			
DD/MM/YYYY	DD/MM/YYYY			
DD/MM/YYYY	DD/MM/YYYY			
DD/MM/YYYY	DD/MM/YYYY			
DD/MM/YYYY	DD/MM/YYYY			
DD/MM/YYYY	DD/MM/YYYY			

Notes:

Section V – Blood Stream Infections

Overview:

This section outlines the methods for conducting surveillance of healthcare-associated bloodstream infections (BSI) in intensive care unit (ICU) settings to ensure a standardized application of case definitions, data collection, and reporting procedures.

Surveillance Settings:

Surveillance will take place for District Hospitals in the following possible locations.

- Intensive care locations, which may include Intensive Care Units (Adult) and the Sick Newborn Care Unit (SNCU),
- Currently, it is proposed to limit surveillance to these units only due to the relative ease of case finding and collection of denominator data, as well as the high rates of device utilization.

Key Terms:

Recognized Pathogen: An organism is identified as a cause of BSIs. Please refer to Appendix 4 for an abbreviated list of recognized pathogens.

Common Commensal: An organism that can commonly exist on body surfaces without causing disease. It is often referred to as a "contaminant" when isolated in blood culture, but can also be associated with true BSIs, especially when isolated from patients with significant healthcare exposure or found in repeated blood cultures. See Appendix 5 for an abbreviated list of common commensal organisms.

Blood Stream Infections (BSI) Surveillance Definitions:

The case definition of BSI is limited to healthcare-associated, laboratory-confirmed bloodstream infections (BSI).

Bloodstream Infection (BSI)

BSI for Recognised Pathogens:

A patient with one or more positive blood cultures for a recognized pathogen that is known to cause BSIs

BSI for Common Commensals:

Patients > 12 months of age

- A patient with ≥ 2 matching positive blood cultures for a common commensal

AND

- At least one of the following signs or symptoms:
  - fever (>38oC)
  - hypotension

Patients ≤ 12 months of age

- A patient with ≥ 2 matching positive blood cultures for a common commensal

AND

- At least one of the following signs or symptoms:
  - fever (>38oC)
  - hypotension
  - hypothermia (<36oC)
  - apnoea
  - bradycardia

Rules for two matching blood cultures:

- Samples taken at the same time:
  - Should be from different sites (e.g., one from right arm and other from left arm) using a separate sterile needle and syringe for each blood draw

  OR

  - If samples taken from the same site, there must be:
    - Two separate blood draws, each using a separate sterile needle and syringe
    - Site disinfection between draws
- Samples taken at different times:
  - Second sample collection must be on the same day or next day (consecutive days)

***Note:** One or both blood samples may be drawn from a central line simultaneously or at different times. If both samples are taken from a central line with multiple lumens at the same time, they can be obtained from the same lumen or different lumens. Lumens must be disinfected between draws.*

Additional Definitions:

BSIs may be considered a primary infection (originating in the bloodstream) or a result of dissemination from an infection occurring at another body site. Thus, BSI events can be classified as either primary or secondary. Primary BSIs can be further classified by device association, either as central line-associated BSI (CLABSI) or non-central line-associated primary BSI. Secondary BSIs cannot be classified as central line-associated, as an infection at another body site argues against a primary BSI due to the catheter's presence. In this surveillance, identified BSIs will be classified using the following definitions: primary BSI, central line-associated BSI (CLABSI), and secondary BSI.

Primary BSI: a BSI without a matching positive culture obtained from another body site (e.g., sputum, pus, urine, etc.) within the Secondary BSI Attribution Period. The **Secondary BSI Attribution Period** is defined as a timeframe that includes the 14 calendar days before the event date and the 7 days after the event date (where the event date = Day 1).

Central line-associated BSI (CLABSI): a Primary BSI that meets the following criteria:

- A temporary central line in place for **>2** calendar days on the date of event, with day of device placement being Day 1,

  OR

- A temporary central line in place for **>2** calendar days that had been removed on the date of event or the day before the date of event

Note: *If a central line is removed and reinserted on the same or following day, in the same or different site, it is considered as one continuous central line.*

A **central line** is an intravascular catheter that terminates at or close to the heart or in one of the great vessels used for infusion, withdrawal of blood, or hemodynamic monitoring. Central lines can be:

- **Temporary central line:** A non-tunnelled, non-implanted catheter (e.g., short-term lines put in commonly in ICUs for acute management, peripherally inserted central catheters [PICC lines]).
- **Permanent central line:** Includes:
  - Tunnelled catheters (including certain long-term dialysis catheters)
  - Implanted catheters (including ports such as port-a-cath)

Note: Neither the insertion site nor the type of device may be used to determine if a line qualifies as a central line. The device must terminate in one of the great vessels or in or near the heart.

The following are considered great vessels for the purpose of reporting central line association and counting central-line (device) days:

- Aorta
- Pulmonary artery
- Superior or inferior vena cava
- Brachiocephalic vein
- Internal jugular vein
- Subclavian vein
- External and common iliac vein
- Femoral vein
- Umbilical artery/vein (in neonates)

The following devices are not considered central lines:

- Extracorporeal membrane oxygenation (ECMO) catheters
- Femoral arterial catheters
- Intra-aortic balloon pump (IABP) devices
- Haemodialysis reliable outflow (HeRO) dialysis catheters
- Impella heart devices

Secondary BSI: a BSI with a matching positive culture taken from another body site (e.g., sputum, urine, pus, etc.) within the Secondary BSI Attribution Period. The **Secondary BSI Attribution Period** is defined as a timeframe that includes the 14 calendar days before the date of event and the 7 days after the date of event (where the date of event = Day 1).

Note: ***an Event Timeframe is only created for primary BSIs. An Event Timeframe is not created for secondary BSIs since they are associated with primary HAIs at other body sites.***

Example 1: Applying the Recognized Pathogen BSI Case Definition

Surveillance Unit Day	Clinical / Laboratory Criteria	Window Period	Event Timeframe	Secondary BSI Attribution Period
1				
2				14 days before DOE
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15	(+) blood culture S. aureus	1st (+) blood culture	Date of Event	

16				
17				
18				
19				
20				
21				7 days after DOE
22			(runs through Day 28)	

Explanation:

- The window period is constructed around Day 15. The first positive diagnostic test, the positive blood culture with S. aureus, occurred on Day 15.
- Because S. aureus is a recognized pathogen, only a single culture is required to meet the BSI case definition. The Date of Event is Day 15, since that is the day the positive blood culture was collected.
- Case reporting rules for minimum time in the hospital and the surveillance unit (>2 calendar days) are met, since the Date of Event is Day 15 of surveillance unit admission. A case report form should be started for this patient.
- This BSI is classified as a primary BSI since no matching cultures from another site were identified during the Secondary BSI Attribution Period, defined as the 14 days before the Date of Event and the 7 days after the Date of Event (where Date of Event = Day 1).
- This BSI will be further classified as central line-associated or not central line-associated based on presence or absence of a central line as described in the protocol.
- Since this is a primary BSI, an Event Timeframe is created as the 14-day period following the Date of Event (where Date of Event = Day 1). The Event Timeframe runs from Day 15 to Day 28. No other BSIs can be reported for this patient during the Event Timeframe.

Example 2: Applying the Common Commensal BSI Case Definition

Surveillance Unit Day	Clinical / Laboratory Criteria	Window Period	Event Timeframe	Secondary BSI Attribution Period
5				
6				14 days before DOE
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19	Fever 39.2°C		First case def. criteria: Date of Event	
20	(+) blood culture Streptococcus viridans	First (+) diagnostic test		
21	(+) blood culture Streptococcus viridans			
22				
23				
24				
25				7 days after DOE
26			(runs through Day 32)	

Explanation:

- The window period is constructed around Day 20. The first positive diagnostic test, the initial positive blood culture with S. viridans, occurred on Day 20.
- All of the elements of the common commensal BSI case definition were met during the window period. The patient had a fever on Day 19. A second positive blood culture with S. viridans was collected on Day 21.
- Day 19 is the Date of Event, since the patient's fever was the first element of the case definition that appeared during the window period.
- Case reporting rules for minimum time in the hospital and the surveillance unit (>2 calendar days) are met, since the Date of Event is Day 19 of surveillance unit admission. A case report form should be started.
- This BSI is classified as a primary BSI since no matching cultures from another site were identified during the Secondary BSI Attribution Period.
- This BSI will be further classified as central line-associated or not central line-associated based on presence or absence of a central line as described in the protocol.
- Since this is a primary BSI, an Event Timeframe is created as the 14-day period following the Date of Event (where Date of Event = Day 1). The Event Timeframe runs from Day 19 to Day 32. No other BSIs can be reported for this patient during the Event Timeframe.

Example 3: Applying the Recognized Pathogen BSI Case Definition with Multiple Pathogens

Surveillance Unit Day	Clinical / Laboratory Criteria	Window Period	Event Timeframe	Secondary BSI Attribution Period
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				

15	(+) blood culture E. coli	1st (+) blood culture	Date of Event	
16				
17				
18				
19	(+) blood culture S. aureus		In Event Timeframe – Add to E. coli CRF	
20				
21				
22			Runs through Day 28	

Explanation:

- The window period is constructed around Day 15. The first positive diagnostic test, the positive blood culture with E. coli, occurred on Day 15.
- Because E. coli is a recognized pathogen, only a single culture is required to meet the BSI case definition. The Date of Event is Day 15, since that is the day the positive blood culture was collected.
- Case reporting rules for minimum time in the hospital and the surveillance unit (>2 calendar days) are met, since the Date of Event is Day 15 of surveillance unit admission. A case report form should be started.
- This BSI is classified as a primary BSI since no matching cultures from another site were identified during the Secondary BSI Attribution Period.
- This BSI will be further classified as central line-associated or not central line-associated based on presence or absence of a central line as described in the protocol.
- Since this is a primary BSI, an Event Timeframe is created as the 14-day period following the Date of Event (where Date of Event = Day 1). The Event Timeframe runs from Day 15 to Day 28.
- The positive blood culture with S. aureus is added to the case report form for the BSI event. It would not be reported as a new BSI event since the culture was collected during the Event Timeframe

Example 4: Applying the Secondary BSI Attribution Period

Surveillance Unit Day	Clinical / Laboratory Criteria	Window Period	Event Timeframe	Secondary BSI Attribution Period
3				
4				
5				
6				
7	(+) BAL culture Klebsiella pneumoniae			Matching (+) culture from other body site
8				
9				
10				
11				
12				
13				
14				
15				
16				
17	(+) blood culture Klebsiella pneumoniae	1st (+) blood culture	Secondary BSI.Event Timeframe is not created.	
18				
19				
20				
21				
22				
23				
24				
25				
26	(+) blood culture S. aureus			

Explanation:

- The window period is constructed around Day 17. The first positive diagnostic test, the positive blood culture with K. pneumoniae, occurred on Day 17.
- Day 17 is the Date of Event since the positive blood culture was collected on Day 17.
- Case reporting rules for minimum time in the hospital and the surveillance unit (>2

calendar days) are met, since the Date of Event is Day 17 of surveillance unit admission. A case report form should be started for this patient.

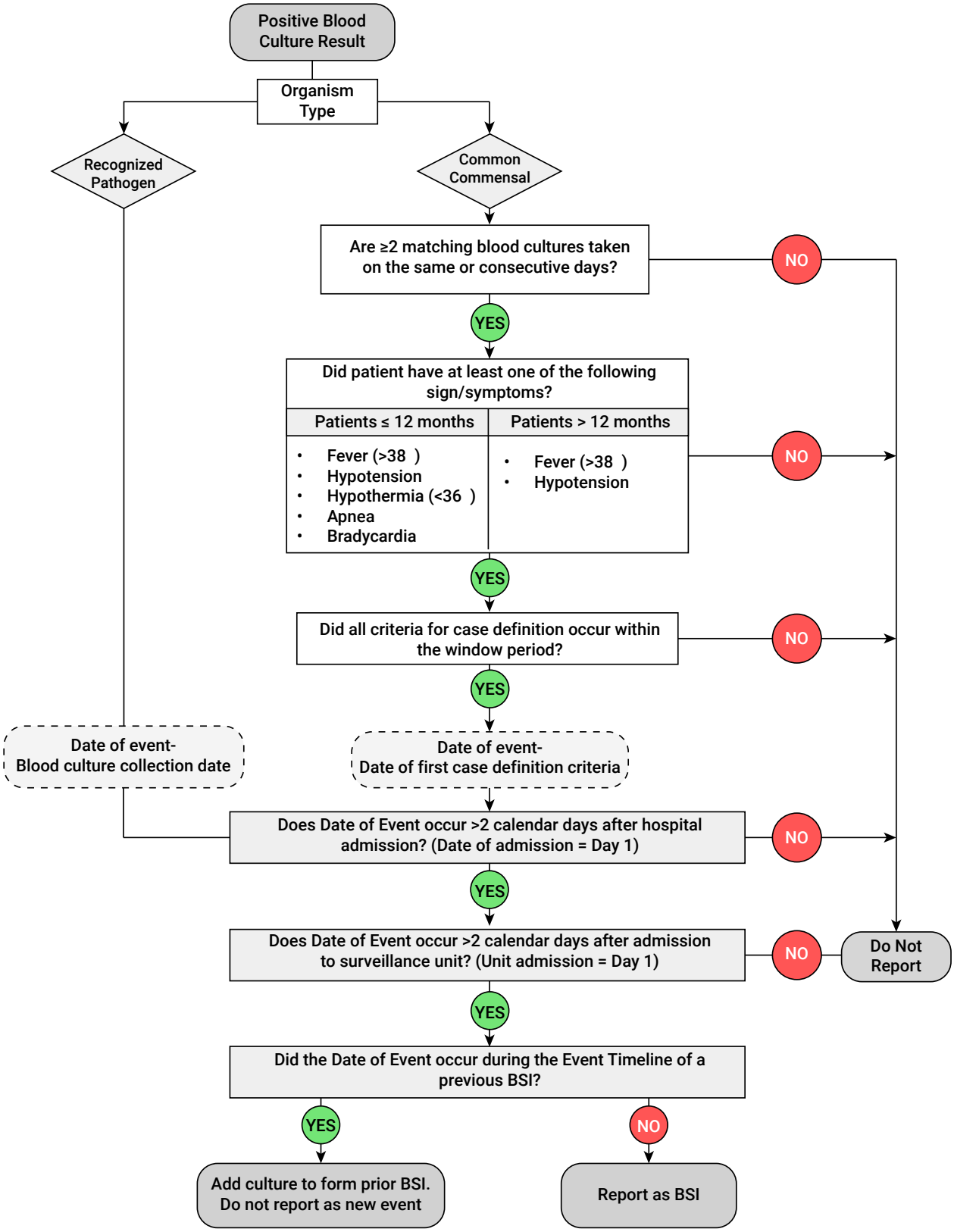
- The BAL culture collected on Day 7 grew K. pneumoniae – the same organism that grew from the positive blood culture on Day 17. Since the BAL culture with the matching organism was collected within the Secondary BSI Attribution Period, this BSI episode is classified as a secondary BSI.
- Because this BSI event is classified as a secondary BSI, no Event Timeframe is created around the BSI. The positive blood culture collected on Day 26 that grew S. aureus should be investigated as a possible new BSI event.

Surveillance Methods:

Conducting BSI surveillance in this protocol requires active, patient-based, prospective case identification and denominator data collection by staff trained in HAI surveillance.

Case Finding:

Bloodstream Infection (BSI) : Case Finding Flowchart



Case Reporting for BSI:

Once surveillance staff have evaluated all patients in the ICUs under surveillance and identified cases meeting the BSI case definition, they will complete the BSI case report form (Appendix 4) for each case. The case report form includes basic information about the patient's BSI episode and lists the isolated organism(s) along with antimicrobial susceptibility testing results. Instructions for completing the BSI case report form can be found in Appendix 6.

Section 5.2 (case Reporting) of the Surveillance for Healthcare-Associated Infections in Intensive Care Units protocol outlines additional case reporting rules, including details on interpreting and reporting laboratory results.

Additional Reporting Rules Specific to BSI:

- Matching common commensals represents a single criterion. If the matching common commensals came from blood cultures collected on consecutive days (See: Rules for two matching blood cultures), then the collection date of the first culture is the date assigned to the criteria.
- If only one blood sample is positive for culture from a common commensal (a second blood sample being negative or never collected), this sample should not be used for BSI surveillance purposes.
- Cultures of catheter tips should not be used to determine if a patient meets the BSI case definition.

Denominators (for calculation of incidence rates)

Central line days and patient days are the denominators used to calculate BSI and CLABSI incidence rates. Denominator data should be collected consistently every day for each participating unit or ward under surveillance, including weekends and holidays. The denominator forms for collecting patient days and central line days can be found in Appendix 7 of the Surveillance for Healthcare-Associated Infections (HAI) in Intensive Care Units protocol.

- **Central line day** denominator data is calculated as the number of patients with one or more temporary central lines on each unit under surveillance each day. Surveillance staff should record the number of patients in the surveillance unit who have at least one central line in place. If a patient has more than one central line in place, it still only counts as one central line day.
- **Patient day** denominator data is calculated as the total number of patients per day in the unit under surveillance. Patient days should be collected at the same time as central line days.
- **NICU patient days:** If feasible, participating hospitals conducting surveillance in NICUs may choose to collect the denominator data stratified by birth weight categories using the NICU denominator data collection form, or they may choose to use the regular/non-stratified denominator data collection form. NICUs collecting the denominator data by birth weight category will be able to stratify HAI rates by five birth weight categories.

Analysis Plan:

Data will be analysed for all BSIs combined and stratified by BSI type (primary non-central line-associated, CLABSI, or secondary). Incidence rates will be calculated for total BSI, total CLABSI, and the primary subsets of each, as described below.

Calculation of Incidence

- **Total BSI rate:** BSI per 1,000 patient days. Divide the total number of reported BSI by the number of patient days and then multiply by 1,000.
- **Primary BSI rate:** Primary BSI per 1,000 patient days. Divide the number of primary BSI by the number of patient days and then multiply by 1,000.
- **CLABSI rate:** CLABSI per 1,000 central line days. Divide the total number of reported CLABSI by the number of central line days and then multiply by 1,000.

Device Utilisation Ratio (DUR)

The device utilisation ratio (DUR) is used during reporting to contextualise the BSI incidence. This is important because facilities with high rates of central line usage (the most significant risk factor for BSI in ICUs) are likely to have increased BSI and CLABSI rates. The DUR can be calculated by dividing the number of central line days by the number of patient days, as shown in the formula below.

$$\text{DUR} = \frac{\text{\# of central line days}}{\text{\# of patient days for the days where central line days are also collected}}$$

Appendix 1

Abbreviated Organism Lists

Abbreviated List of Recognised Pathogens

Acinetobacter baumanii	Escherichia coli	Staphylococcus aureus
Burkholderia cepacia	Klebsiella oxytoca	Candida albicans
Citrobacter freundii	Klebsiella pneumoniae	Candida spp.
Citrobacter koseri	Moraxella catarrhalis	
Enterobacter aerogenes	Proteus spp.	
Enterobacter cloacae	Pseudomonas aeruginosa	
Enterococcus faecalis	Serratia marcescens	
Enterococcus faecium	Streptococcus agalactiae	

Abbreviated List of Common Commensals

Actinomyces species	Propionibacterium species	Streptococcus salivarius
Aerococcus species	Staphylococcus species, not S. aureus	Streptococcus sanguis
Bacillus species, not B. anthracis	Streptococcus anginosis	Streptococcus viridians
Corynebactrium species, not C. diphtheriae	Streptococcus constellatus	
Diphtheriods species	Streptococcus milleri	
Micrococcus species	Streptococcus mitis	
Pediococcus urinaeequi	Streptococcus mutans	
Peptococcus saccharolyticus	Streptococcus oralis	

A complete list of common commensals available at: http://www.cdc.gov/nhsn/XLS/master-organism-Com-Commensals-Lists.xlsx. If an organism is not included on the complete list of common commensals, it must be treated as a recognized pathogen.

Appendix 2

BSI Case Report Form

Case Type _____ Patient Name _____ Medical record Number: _____		
Sex: □ Male □ Female	Date of Birth (DD/MM/YYYY): __ /__ /__ Age (Years): ____ □ Age/DOB (Unknown)	Birth weight: _____grams (NICU only)
Date of hospital admission: ____ /_____ /_____	Date of admission to surveillance unit: ____ /_____ /_____	
Location prior to hospital admission:	□ Home / Community □ Another hospital □ Unknown	
Linked Case ID **(autogenerated)** do not fill on Hard copy. **Only to be filled on software**		
1. BSI Details		
Type of laboratory-confirmed BSI	□ Recognized Pathogen □ Common Commensal (from ≥ 2 blood cultures)	
Date of event *(dd/mm/yyyy)*:	____ /_____ /_____	
Fill out culture results in Section 5, Organisms and Antibiotic Susceptibility		
2. Invasive Devices: Central Lines		
Did the patient have a central line in place at any time on • The date of event **or** • The day before the date of event?	□ Yes □ No *(skip to 3, Infections at Other Body Sites)*	
If **YES,** was the central line in place for >2 calendar days?	□ Yes □ No *(skip to 3, Infections at Other Body Sites)*	
If **YES,** type(s) of central line(s) in place *(check all that apply)*	□ Non-tunneled short-term catheter (e.g., double or triple lumen) □ Peripherally inserted central catheter (PICC) □ Port-a-cath □ Hemodialysis catheter □ Tunneled catheter □ Umbilical catheter □ Other, specify: _____	
Location(s) of central line(s) in place *(check all that apply)*	□ Jugular □ Brachial □ Subclavian □ Umbilical □ Femoral □ Other, specify: _____	

3. Infections at Other Body Sites			
Was a positive, matching culture obtained from another body site(s) during the Secondary BSI Attribution Period?	□ Yes □ No *(skip to 4, Outcome)* □ Unknown		
If **YES**, specify specimen(s) collected, date(s) of culture, and organism(s).	Specimen Collected	Date of Collection	Organism
	1.		
	2.		
	3.		
	4.		
	5.		

4. Outcome	
Patient status at end of 14 days after DOE (Where DOE = Day 1)	□ Still in surveillance unit □ Transferred to other hospital □ Transferred to other ward/unit within the hospital □ Discharged □ LAMA □ Died □ Unknown Date of discharge, transfer, or death: ____ /_____ /_____
Patient outcome at end of hospitalization	□ Discharged □ Transferred to other hospital □ LAMA □ Died □ Unknown Date of discharge, transfer, or death: ____ /_____ /_____

5. Organisms and Antibiotic Susceptibility						
Date of sample collection	**Organism**	**Drugs**				
_____	*Staphylococcus epidermidis*	**OX** S I R N	**CEFOX** S I R N	**METH** S I R N	**CLIND** S I R N	**DAPTO** S I R N
		VANC S I R N	**OTHER DRUG** S I R N	**OTHER DRU** S I R N	**OTHER DRUG** S I R N	**OTHER DRU** S I R N
		OTHER DRUG S I R N				
_____	*Staphylococcus haemolyticus*	**OX** S I R N	**CEFOX** S I R N	**METH** S I R N	**CLIND** S I R N	**DAPTO** S I R N
		VANC S I R N	**OTHER DRUG** S I R N	**OTHER DRU** S I R N	**OTHER DRUG** S I R N	**OTHER DRU** S I R N

		OTHER DRUG S I R N				
_____	*Staphylococcus hominis*	**OX** S I R N	**CEFOX** S I R N	**METH** S I R N	**CLIND** S I R N	**DAPTO** S I R N
		VANC S I R N	**OTHER DRUG** S I R N	**OTHER DRU** S I R N	**OTHER DRUG** S I R N	**OTHER DRU** S I R N
		OTHER DRUG S I R N				
_____	*Staphylococcus, other* coagulase-	**OX** S I R N	**CEFOX** S I R N	**METH** S I R N	**CLIND** S I R N	**DAPTO** S I R N
		VANC S I R N	**OTHER DRUG** S I R N	**OTHER DRU** S I R N	**OTHER DRUG** S I R N	**OTHER DRU** S I R N
		OTHER DRUG S I R N				
_____	*Enterococcus Faecium*	**AMP** S I R N	**DAPTO** S I R N	**GENTHL§** S I R N	**CIPRO** S I R N	**LNZ** S I R N
		TEICO S I R N	**VANC** S I R N	**OTHER DRU** S I R N	**OTHER DRUG** S I R N	**OTHER DRU** S I R N
		OTHER DRUG S I R N	**OTHER DRUG 5** S I R N			
_____	*Enterococcus faecalis*	**AMP** S I R N	**DAPTO** S I R N	**GENTHL§** S I R N	**CIPRO** S I R N	**LNZ** S I R N
		TEICO S I R N	**VANC** S I R N	**OTHER DRU** S I R N	**OTHER DRUG** S I R N	**OTHER DRU** S I R N
		OTHER DRUG S I R N	**OTHER DRUG 5** S I R N			
_____	*Enterococcus Sp.* Please Specify Species: ____	**AMP** S I R N	**DAPTO** S I R N	**GENTHL§** S I R N	**CIPRO** S I R N	**LNZ** S I R N
		TEICO S I R N	**VANC** S I R N	**OTHER DRU** S I R N	**OTHER DRUG** S I R N	**OTHER DRU** S I R N
		OTHER DRUG S I R N	**OTHER DRUG 5** S I R N			

_____	*Staphylococcus aureus*	**LEVO** S I R N	**MOXI** S I R N	**CLIND** S I R N	**DAPTO** S I R N	**DOXY** S I R N
		MINO S I R N	**ERYTH** S I R N	**GENT** S I R N	**LNZ** S I R N	**OTHER DRUG** S I R N
		OTHER DRUG S I R N	**OTHER DRUG** S I R N	**OTHER DRUG** S I R N	**OTHER DRUG** S I R N	
_____	*Acinetobacter baumannii*	**AMK** S I R N	**AMPSUL** S I R N	**CEFTAZ** S I R N	**CEFOT** S I R N	**CIPRO** S I R N
		LEVO S I R N	**COL** S I R N	**PB** S I R N	**GENT** S I R N	**IMI** S I R N
		TICLAV S I R N	**MERO** S I R N	**DORI** S I R N	**NET** S I R N	**PIP** S I R N
		PIPTAZ S I R N	**TETRA** S I R N	**DOXY** S I R N	**MINO** S I R N	**TMZ** S I R N
		TOBRA S I R N	**OTHER DRUG** S I R N	**OTHER DRUG** S I R N	**OTHER DRUG** S I R N	**OTHER DRUG** S I R N
		OTHER DRUG S I R N				
_____	*Acinetobacter baumannii complex*	**AMK** S I R N	**AMPSUL** S I R N	**CEFTAZ** S I R N	**CEFOT** S I R N	**CIPRO** S I R N
		LEVO S I R N	**COL** S I R N	**PB** S I R N	**GENT** S I R N	**IMI** S I R N
		TICLAV S I R N	**MERO** S I R N	**DORI** S I R N	**NET** S I R N	**PIP** S I R N
		PIPTAZ S I R N	**TETRA** S I R N	**DOXY** S I R N	**MINO** S I R N	**TMZ** S I R N
		TOBRA S I R N	**OTHER DRUG** S I R N	**OTHER DRUG** S I R N	**OTHER DRUG** S I R N	**OTHER DRUG** S I R N
		OTHER DRUG S I R N				
_____	*Acinetobacter lwoffii*	**AMK** S I R N	**AMPSUL** S I R N	**CEFTAZ** S I R N	**CEFOT** S I R N	**CIPRO** S I R N
		LEVO S I R N	**COL** S I R N	**PB** S I R N	**GENT** S I R N	**IMI** S I R N

		TICLAV S I R N	**MERO** S I R N	**DORI** S I R N	**NET** S I R N	**PIP** S I R N
		PIPTAZ S I R N	**TETRA** S I R N	**DOXY** S I R N	**MINO** S I R N	**TMZ** S I R N
		TOBRA S I R N	**OTHER DRUG** S I R N	**OTHER DRU** S I R N	**OTHER DRUG** S I R N	**OTHER DRU** S I R N
		OTHER DRUG S I R N				
_____	*Acinetobacter sp.* Please Specify Species: ____	**AMK** S I R N	**AMPSUL** S I R N	**CEFTAZ** S I R N	**CEFOT** S I R N	**CIPRO** S I R N
		LEVO S I R N	**COL** S I R N	**PB** S I R N	**GENT** S I R N	**IMI** S I R N
		TICLAV S I R N	**MERO** S I R N	**DORI** S I R N	**NET** S I R N	**PIP** S I R N
		PIPTAZ S I R N	**TETRA** S I R N	**DOXY** S I R N	**MINO** S I R N	**TMZ** S I R N
		TOBRA S I R N	**OTHER DRUG** S I R N	**OTHER DRU** S I R N	**OTHER DRUG** S I R N	**OTHER DRU** S I R N
		OTHER DRUG S I R N				
_____	*Escherichia coli*	**AMK** S I R N	**CEFAZ** S I R N	**CEFEP** S I R N	**CEFOT** S I R N	**CEFTRX** S I R N
		CEFTAZ S I R N	**CEFUR** S I R N	**CEFOX** S I R N	**CTET** S I R N	**CIPRO** S I R N
		EVO S I R N	**MOXI** S I R N	**COL** S I R N	**PB** S I R N	**ERTA** S I R N
		GENT	**IMI**	**MERO**	**DORI**	**PIPTAZ**
		S I R N	S I R N	S I R N	S I R N	S I R N
		TETRA S I R N	**DOXY** S I R N	**MINO** S I R N	**TIG** S I R N	**OTHER DRU** S I R N
		OTHER DRUG S I R N	**OTHER DRUG** S I R N	**OTHER DRU** S I R N	**OTHER DRUG 5** S I R N	

_____	*Enterobacter aerogenes*	**AMK** S I R N	**CEFAZ** S I R N	**CEFEP** S I R N	**CEFOT** S I R N	**CEFTRX** S I R N
		CEFTAZ S I R N	**CEFUR** S I R N	**CEFOX** S I R N	**CTET** S I R N	**CIPRO** S I R N
		LEVO S I R N	**MOXI** S I R N	**COL** S I R N	**PB** S I R N	**ERTA** S I R N
		GENT S I R N	**IMI** S I R N	**MERO** S I R N	**DORI** S I R N	**PIPTAZ** S I R N
		TETRA S I R N	**DOXY** S I R N	**MINO** S I R N	**TIG** S I R N	**OTHER DRUG** S I R N
		OTHER DRUG S I R N	**OTHER DRUG** S I R N	**OTHER DRUG** S I R N	**OTHER DRUG** S I R N	
_____	*Enterobacter cloacae*	**AMK** S I R N	**CEFAZ** S I R N	**CEFEP** S I R N	**CEFOT** S I R N	**CEFTRX** S I R N
		CEFTAZ S I R N	**CEFUR** S I R N	**CEFOX** S I R N	**CTET** S I R N	**CIPRO** S I R N
		LEVO S I R N	**MOXI** S I R N	**COL** S I R N	**PB** S I R N	**ERTA** S I R N
		GENT S I R N	**IMI** S I R N	**MERO** S I R N	**DORI** S I R N	**PIPTAZ** S I R N
		TETRA S I R N	**DOXY** S I R N	**MINO** S I R N	**TIG** S I R N	**OTHER DRUG** S I R N
		OTHER DRUG S I R N	**OTHER DRUG** S I R N	**OTHER DRUG** S I R N	**OTHER DRUG** S I R N	
_____	*Klebsiella oxytoca*	**AMK** S I R N	**CEFAZ** S I R N	**CEFEP** S I R N	**CEFOT** S I R N	**CEFTRX** S I R N
		CEFTAZ S I R N	**CEFUR** S I R N	**CEFOX** S I R N	**CTET** S I R N	**CIPRO** S I R N
		LEVO S I R N	**MOXI** S I R N	**COL** S I R N	**PB** S I R N	**ERTA** S I R N
		GENT S I R N	**IMI** S I R N	**MERO** S I R N	**DORI** S I R N	**PIPTAZ** S I R N
		TETRA S I R N	**DOXY** S I R N	**MINO** S I R N	**TIG** S I R N	**OTHER DRUG** S I R N
		OTHER DRUG S I R N	**OTHER DRUG** S I R N	**OTHER DRUG** S I R N	**OTHER DRUG** S I R N	

_____	*Klebsiella pneumoniae*	**AMK** S I R N	**CEFAZ** S I R N	**CEFEP** S I R N	**CEFOT** S I R N	**CEFTRX** S I R N
		CEFTAZ S I R N	**CEFUR** S I R N	**CEFOX** S I R N	**CTET** S I R N	**CIPRO** S I R N
		LEVO S I R N	**MOXI** S I R N	**COL** S I R N	**PB** S I R N	**ERTA** S I R N
		GENT S I R N	**IMI** S I R N	**MERO** S I R N	**DORI** S I R N	**PIPTAZ** S I R N
		TETRA S I R N	**DOXY** S I R N	**MINO** S I R N	**TIG** S I R N	**OTHER DRUG** S I R N
		OTHER DRUG S I R N	**OTHER DRUG** S I R N	**OTHER DRUG** S I R N	**OTHER DRUG** S I R N	
_____	*Klebsiella spp.* Please Specify Species: ____	**AMK** S I R N	**CEFAZ** S I R N	**CEFEP** S I R N	**CEFOT** S I R N	**CEFTRX** S I R N
		CEFTAZ S I R N	**CEFUR** S I R N	**CEFOX** S I R N	**CTET** S I R N	**CIPRO** S I R N
		LEVO S I R N	**MOXI** S I R N	**COL** S I R N	**PB** S I R N	**ERTA** S I R N
		GENT S I R N	**IMI** S I R N	**MERO** S I R N	**DORI** S I R N	**PIPTAZ** S I R N
		TETRA S I R N	**DOXY** S I R N	**MINO** S I R N	**TIG** S I R N	**OTHER DRUG** S I R N
		OTHER DRUG S I R N	**OTHER DRUG** S I R N	**OTHER DRUG** S I R N	**OTHER DRUG** S I R N	
_____	*Pseudomonas aeruginosa*	**AMK** S I R N	**AZT** S I R N	**CEFEP** S I R N	**CEFTAZ** S I R N	**CIPRO** S I R N
		LEVO S I R N	**COL** S I R N	**PB** S I R N	**GENT** S I R N	**IMI** S I R N
		MERO S I R N	**DORI** S I R N	**NET** S I R N	**PIPTAZ** S I R N	**TOBRA** S I R N
		OTHER DRUG S I R N	**OTHER DRUG** S I R N	**OTHER DRUG** S I R N	**OTHER DRUG** S I R N	**OTHER DRUG** S I R N

_____	*Pseudomonas putida*	**AMK** S I R N	**AZT** S I R N	**CEFEP** S I R N	**CEFTAZ** S I R N	**CIPRO** S I R N
		LEVO S I R N	**COL** S I R N	**PB** S I R N	**GENT** S I R N	**IMI** S I R N
		MERO S I R N	**DORI** S I R N	**NET** S I R N	**PIPTAZ** S I R N	**TOBRA** S I R N
		OTHER DRUG S I R N	**OTHER DRUG** S I R N	**OTHER DRU** S I R N	**OTHER DRUG** S I R N	**OTHER DRU** S I R N
_____	*Pseudomonas sp.* Please Specify Species: ____	**AMK** S I R N	**AZT** S I R N	**CEFEP** S I R N	**CEFTAZ** S I R N	**CIPRO** S I R N
		LEVO S I R N	**COL** S I R N	**PB** S I R N	**GENT** S I R N	**IMI** S I R N
		MERO S I R N	**DORI** S I R N	**NET** S I R N	**PIPTAZ** S I R N	**TOBRA** S I R N
		OTHER DRUG S I R N	**OTHER DRUG** S I R N	**OTHER DRU** S I R N	**OTHER DRUG** S I R N	**OTHER DRU** S I R N
_____	*Candida albicans*	**ANID** S I R N	**CASPO** S I R N	**FLUCO** S I R N	**FLUCY** S I R N	**ITRA** S I R N
		MICA S I R N	**VORI** S I R N	**OTHER DRU** S I R N	**OTHER DRUG** S I R N	**OTHER DRU** S I R N
		OTHER DRUG S I R N	**OTHER DRUG** S I R N			
_____	*Candida glabrate*	**ANID** S I R N	**CASPO** S I R N	**FLUCO** S I R N	**FLUCY** S I R N	**ITRA** S I R N
		MICA S I R N	**VORI** S I R N	**OTHER DRU** S I R N	**OTHER DRUG** S I R N	**OTHER DRU** S I R N
		OTHER DRUG S I R N	**OTHER DRUG** S I R N			
_____	*Candida tropicalis*	**ANID** S I R N	**CASPO** S I R N	**FLUCO** S I R N	**FLUCY** S I R N	**ITRA** S I R N
		MICA S I R N	**VORI** S I R N	**OTHER DRU** S I R N	**OTHER DRUG** S I R N	**OTHER DRU** S I R N
		OTHER DRUG S I R N	**OTHER DRUG** S I R N			

_____	*Candida spp*. Please Specify Species: ____	**ANID** S I R N	**CASPO** S I R N	**FLUCO** S I R N	**FLUCY** S I R N	**ITRA** S I R N
		MICA S I R N	**VORI** S I R N	**OTHER DRU** S I R N	**OTHER DRUG** S I R N	**OTHER DRU** S I R N
		OTHER DRUG S I R N	**OTHER DRUG** S I R N			
Date of sample collection	**Other Organisms**	**Drugs**				
_____	Organism 1 _____ Specify:	**Drug 1** S I R N	**Drug 2** S I R N	**Drug 3** S I R N	**Drug 4** S I R N	**Drug 5** S I R N
		Drug 6 S I R N	**Drug 7** S I R N	**Drug 8** S I R N	**Drug 9** S I R N	**Drug 10** S I R N
_____	Organism 2 _____ Specify:	**Drug 1** S I R N	**Drug 2** S I R N	**Drug 3** S I R N	**Drug 4** S I R N	**Drug 5** S I R N
		Drug 6 S I R N	**Drug 7** S I R N	**Drug 8** S I R N	**Drug 9** S I R N	**Drug 10** S I R N
_____	Organism 3 _____ Specify:	**Drug 1** S I R N	**Drug 2** S I R N	**Drug 3** S I R N	**Drug 4** S I R N	**Drug 5** S I R N
		Drug 6 S I R N	**Drug 7** S I R N	**Drug 8** S I R N	**Drug 9** S I R N	**Drug 10** S I R N

Comments

Result Codes

S = Susceptible I = Intermediate R = Resistant NS = Non-susceptible S-DD = Susceptible-dose dependent N = Not tested

§ GENTHL results: S = Susceptible/Synergistic and R = Resistant/Not Synergistic

† Clinical breakpoints have not been set. S/R designations should be based upon epidemiological cutoffs of S = MIC ≤ 2 and R = MIC ≥ 4

AKF	Amikacin-fosfomycin	**AMC**	Amoxicillin-clavulanate	**AMK**	Amikacin
AMOX	Amoxicillin	**AMP**	ampicillin	**AMPSUL**	ampicillin sulbactam
AMXCLV	amoxicillin clavulanic acid	**ANID**	anidulafungin	**AZA**	Aztreonam-avibactam
AZL	Azlocillin	**AZM**	Azithromycin	**AZT**	aztreonam
BES	Besifloxacin	**BPM**	Biapenem	**BPR**	Ceftobiprole
C/T	Ceftolozane-tazobactam	**CASPO**	caspofungin	**CAT**	Cefetamet
CB	Carbenicillin	**CDN**	Cefditoren	**CDR**	Cefdinir
CDZ	Cadazolid	**CEFAZ**	cefazolin	**CEFEP**	cefepime
CEFOT	cefotaxime	**CEFOX**	cefoxitin	**CEFTAZ**	ceftazidime
CEFTRX	ceftriaxone	**CEFUR**	cefuroxime	**CEP**	Cephalothin
Cfm	Cefamandole	**Cfr**	Cefaclor	**CHL**	Chloramphenicol
CID	Cefonicid	**CIN**	Cinoxacin	**CIPRO**	ciprofloxacin
CLA	Clarithromycin	**CLIND**	clindamycin	**CLX**	Clinafloxacin
CMZ	Cefmetazole	**COL**	Colistin	**CPA**	Ceftaroline-avibactam
CPR	Cefpirome	**CPT**	Ceftaroline	**CPZ**	Cefoperazone
CTB	Ceftibuten	**CTET**	cefotetan	**CTZ**	Ceftizoxime
CZA	ceftazidime-avibactam	**DAL**	Dalbavancin	**DAPTO**	daptomycin
DFX	Delafloxacin	**DIC**	Dicloxacillin	**DORI**	doripenem
DOXY	doxycycline	**DTM**	Dirithromycin	**ERTA**	ertapenem
ERV	Eravacycline	**ERYTH**	erythromycin	**FARO**	Faropenem
FC	Fusidic acid	**FDX**	Fidaxomicin	**FIN**	Finafloxacin
FLUCO	fluconazole	**FLUCY**	flucytosine	**FLX**	Fleroxacin
FOS	Fosfomycin	**FP**	Cefprozil	**FPZ**	Cefepime-tazobactam
GAT	Gatifloxacin	**GEM**	Gemifloxacin	**GENT**	gentamicin

GENTHL	gentamicin - high level test	**GEP**	Gepotidacin	**GRN**	Garenoxacin
GRX	Grepafloxacin	**HAP**	Cephapirin	**HLS**	Streptomycin synergy
ICL	Iclaprim	**IMI**	imipenem	**ITRA**	itraconazole
KAN	Kanamycin	**LEVO**	levofloxacin	**LMU**	Lefamulin
LND	Levonadifloxacin	**LNZ**	linezolid	**LOM**	Lomefloxacin
LOR	Loracarbef	**MEC**	Mecillinam	**MERO**	meropenem
METH	methicillin	**MEV**	Meropenem-vaborabactam	**MEZ**	Mezlocillin
MICA	micafungin	**MINO**	minocycline	**MOX**	Moxalactam
MOXI	moxifloxacin	**MTZ**	Metronidazole	**MUP**	Mupirocin
NAF	Nafcillin	**NAL**	Nalidixic acid	**NET**	netilmicin
NIT	Nitazoxanide	**NITRO**	nitrofurantoin	**NOR**	norfloxacin
OFL	Ofloxacin	**OMC**	Omadacyline	**ORI**	Oritavancin
OX	oxacillin	**PB**	polymyxin B	**PEF**	Pefloxacin
PEN	Penicillin	**PEX**	Pexiganan	**PIP**	piperacillin
PIPTAZ	piperacillin/ tazobactam	**PLZ**	Plazomicin	**POD**	Cefpodoxime
PRU	Ulifloxacin	**QDA**	Quinupristin-dalfopristin	**RAD**	Cephradine
RAM	Ramoplanin	**RIF**	rifampin	**RZM**	Razupenem
SEC	Secnidazole	**SOL**	Solithromycin	**SPT**	Spectinomycin
SPX	Sparfloxacin	**SSS**	Sulfonamides	**STR**	Streptomycin
SULO	Sulopenem	**SUR**	Surotomycin	**TBR**	Trospectomycin
TEICO	teicoplanin	**TEL**	Telithromycin	**TETRA**	tetracycline
TIC	Ticarcillin	**TICLAV**	ticarcillin/ clavulnate	**TIG**	Tigecycline
TOBRA	tobramycin	**TVA**	Trovafloxacin	**TZD**	Tedizolid
VANC	vancomycin	**VORI**	voriconazole	**ZWK**	Nafithromycin
TIN	Tinoxanide	**TLV**	Telavancin	**TMP**	Trimethoprim
TMZ	trimethoprim/ sulfamethoxazole	**TNZ**	Tinidazole		

Bloodstream Infection (BSI) – Case Investigation Worksheet and Table

For all positive blood cultures:

1. Record collection date of blood culture:_____/_____/_____Continue to Question 2.

2. Select type of organism in positive blood culture:
   ☐ Recognized Pathogen. If selected, then date of event = collection date of positive culture. Skip to Question 4.
   ☐Common Commensal. If selected, continue to Question 3.

3. For common commensals <u>only</u>,
   3a. Did the common commensal have a matching blood culture collected on the same or consecutive day?
   ☐Yes. If selected, record the result on the case investigation table and continue to Question 3b.
   ☐No. If selected, the case definition is not met. **Do not report this episode**.
   3b. Did the patient have at least one of the following signs or symptoms during the window period?

   ☐Yes. If selected, record the signs/symptoms on the case investigation table and continue to Question 3c.
   ☐No. If selected, the case definition is not met. **Do not report this episode.**

Patients> 12 months	Patients ≤ 12 months
▪ Fever (>38°C) ▪ Hypotension	▪ Fever (>38°C) ▪ Hypotension ▪ Hypothermia (<36°C) ▪ Apnea ▪ Bradycardia

   3c.Determine the date of event(the date the first case definition criteria – blood culture collection or sign/symptom – occurred in the window period).Indicate on case investigation table and continue to Question 4.

4. Are <u>all</u> of the following inclusion criteria true?
   ☐Yes. **<u>This episode should be reported</u>**. Start a BSI case report form for the patient. Continue to Question 5.
   ☐No. Inclusion criteria are not met. **Do not report this episode.**

Inclusion Criteria
▪ The Date of Event does not occur during the Event Timeframe of a previous primary BSI ▪ The Date of Event occurs >2 days after hospital admission (where Date of Hospital admission=Day 1) ▪ The Date of Event occurs >2 days after ICU admission (where Date of ICU admission=Day 1)

5. Perform follow up activities on all case report forms. Use the case investigation table to organize relevant data.
    - Report information on presence of central line(s) in Section 2 – Invasive Devices
    - Report all matching positive cultures that occur during the Secondary BSI Attribution Period in Section 3 – Infections at Other Body Sites
        - Secondary BSI Attribution Period = 14 days before date of event to 7 days after date of event (where date of event = day 1) – section 3
    - Report the first positive blood culture and all positive blood cultures that occur during the Event Timeframe for primary BSIs in Section 5 – Organisms and Antibiotic Susceptibility
        - Event Timeframe = 14 days after date of event (where date of event = day 1)
        - For secondary BSIs, no Event Timeframe is created
    - At the end of the patient's hospitalization, specify the patient's outcome in Section 4.

6. Submit the case report form after all information is completed.

BSI Case Investigation Table Hospital Admission Date: ___/___/____ ICU Admission Date: ____/___/____						
Date	**First Positive Culture** Record information for first positive blood culture on the line with the X	**Window Period** Record matching commensal culture and symptoms	**Date of Event (DOE)** Indicate DOE with an X	**Secondary BSI Attribution Period** Record positive cultures from other body sites collected during the 14 days before DOE and the 7 days after DOE. DOE = Day 1	**Event Timeframe** Record positive cultures from blood cultures collected during the 14 days after the DOE. DOE = Day 1	**Central Line?** (Y/N)
	X					

BSI Case Report Form Instructions

Data Field	Instructions for Data Collection
Surveillance unit Number	Add the ICU Code in this row
Case Type	Add whether the case if BSI/ VAP or UTI
Patient Name	Add the name of the patient. This will remain with the Surveillance unit and will not be seen by the AIIMS team
Medical record Number	Add the Medical record number here. This will remain with the Surveillance unit and will not be seen by the AIIMS team
ICU Name	
Sex	
Date of Birth	Record the date of the patient birth using this format: DD/MM/YYYY. If DOB is unknown, age in years may be mentioned. DOB is mandatory for neonates.
Birth Weight	Required only for neonates housed in neonatal intensive care unit.
Date of Hospital Admission	Record the date of the hospital admission using this format: DD/MM/YYYY.
Location prior to hospital admission	Check one. Indicate the location the patient was in immediately prior to admission to the hospital.

Date of admission to Surveillance Unit	Record the date as DD/MM/YYYY.
Date of event	Record the date as DD/MM/YYYY. Enter the date when the first criteria used to meet the case definition occurred. Note: If the first criteria to meet the case definition is a laboratory diagnostic test, the laboratory specimen collection date should be reported as the date of event.
Laboratory Result	Fill out Section 5 on Organism and Antibiotic Susceptibility Testing.
Did the patient have a central line in place at any time on the date of event or day before the date of event?	Check one. If “No,” skip to Section 3, Infections at Other Body Sites.
Was the central line in place for >2 calendar days?	Required if central line in place at any time on date of event or day before. Check one. If “No,” skip to Section 3, Infections at Other Body Sites. Note: If a central line is removed and reinserted on the same or following day, in the same or different site, it is considered as one continuous central line.
Type(s) of central line(s) in place	Required if patient had central line in place for >2 calendar days. Search the medical record for central lines that were in place for > 2 days and in place at any time on the date of event or the day before the date of event. Check the type(s) of the central lines that apply. If “Other,” specify on the line provided. Do not document ‘brand names’ in ‘other’.

Location(s) of central line(s) in place	Required if patient had central line in place for >2 calendar days. Search the medical record for central lines that were in place for > 2 days and in place at any time on the date of event or the day before the date of event. Check the locations(s) of the central lines that apply. If "Other," specify on the line provided.
Was a positive, matching culture obtained from another body site(s) during the Secondary BSI Attribution Period?	Check one. If "Yes," list Specimen Collected, Date of Culture, and Organisms Isolated in the table provided. If "No," skip to Section 4, Outcome.
Specimen Collected, Date of culture, and Organism	Required if there was a positive culture from another body site that matches any of the blood cultures obtained within the secondary BSI Attribution Period. Fill out table for each positive culture obtained from another body site Record the date as DD/MM/YYYY.
Patient Status at end of 14 Days after DOE	Required. Check one. Report the status of the patient at the end of 14 days after the date of event (for primary BSIs, this is the end of the Event Timeframe).
Patient outcome at end of hospitalization	Keep the case report form(s) for a patient on hand and consider them incomplete until the end of the patient's hospital stay. Record the patient's outcome as of the end of their hospital stay by selecting one of the options.

Date of discharge, transfer, or death	Record date as DD/MMM/YYYY. Record the date that the patient was discharged, transferred to a different hospital, or died during the admission when the HAI occurred.
Organism ID and Antibiotic Susceptibility Testing	Record date of specimen collection as DD/MM/YYYY Specify species if known, otherwise report as spp. For pathogens not listed in the case report form, specify in the row for “Other Organisms” and provide antibiotic susceptibility results. Circle the pathogen’s susceptibility result using the codes defined on the case report forms. Report every organism isolated from blood cultures collected during the Secondary BSI Attribution Period and Event Timeframe
Comments	Enter any comments, questions, or doubts about this event in the space provided.

Section VI – Urinary Tract Infections

Overview:

This section outlines the methods for surveillance of healthcare-associated urinary tract infections (UTI) in intensive care unit (ICU) settings to ensure standardized application of case definitions, data collection, and reporting procedures.

Surveillance Settings:

Surveillance will be conducted in District Hospitals in intensive care locations, which may include Intensive Care Units (Adult) and Sick Newborn Care Units (SNCU), due to the relative ease of case finding, the collection of denominator data, and the high rates of device utilization.

UTI Surveillance Definitions:

The surveillance case definition includes microbiologically confirmed, healthcare-associated UTIs (e.g., UTIs with positive urine cultures). Non-culture-confirmed UTIs are excluded from this surveillance.

Culture-Confirmed UTI

- A patient with all of the following:
  - a positive urine culture of no more than two species of organisms
  - at least one organism with ≥105 colony forming units (CFU)/ml

AND

- At least one of following with no other recognized cause:
  - fever (>38°C)
  - suprapubic tenderness
  - urgency
  - frequency
  - dysuria

Additional Definitions:

Indwelling Urinary Catheter: a drainage tube that is inserted into the urinary bladder through the urethra, is left in place, and connected to a drainage bag. This is also called a Foley catheter. Condom or straight in-and-out catheters are not included nor are nephrostomy tubes or suprapubic catheters unless a Foley catheter is also present.

Catheter-associated UTI (CAUTI): A patient who meets the UTI case definition and

additionally meets one of the following criteria:

- An indwelling urinary catheter in place for **>2** calendar days on the date of event, with day of device placement being Day 1,

OR

- An indwelling urinary catheter in place for **>2** calendar days that had been removed on the date of event or the day before the date of event

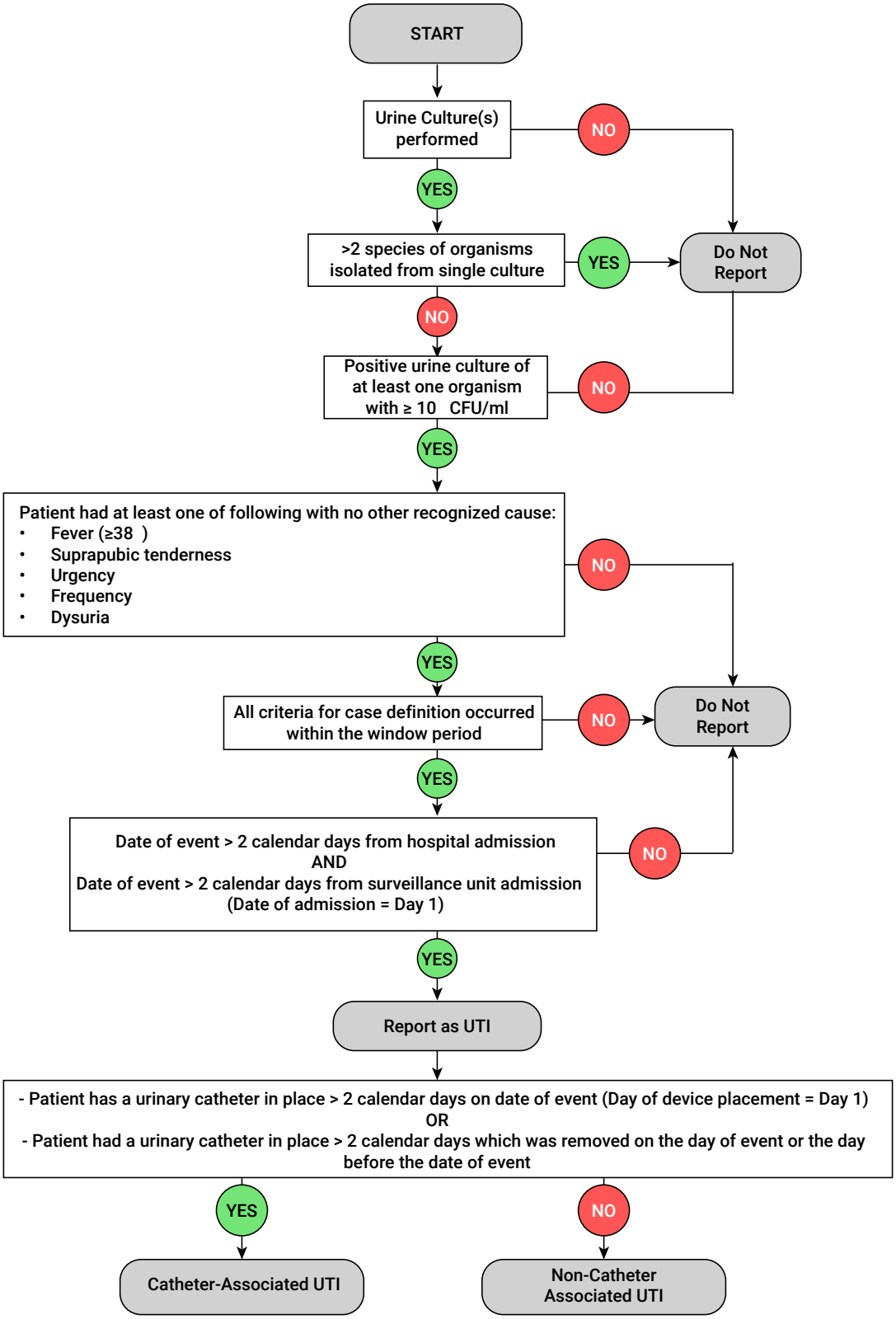
Note: If a catheter is removed and reinserted on the same or following day, it is considered as one continuous usage.

Surveillance Methods:

The process of conducting UTI surveillance in this protocol requires active, patient-based, prospective identification of cases and collection of denominator data by staff trained in HAI surveillance.

Case finding:

A flow chart that summarises the steps in finding UTI cases is given below:



Note: *If a urinary catheter is removed and reinserted on the same or following day, it is considered as one continuous usage*

Case Reporting for UTI:

Once surveillance staff have evaluated all patients in the ICUs under surveillance and identified cases meeting the UTI case definition, they will complete the UTI case report form (Appendix 8) for each case. The case report form includes basic information about the patient's UTI episode and lists the isolated organism(s) and antimicrobial susceptibility testing results. Instructions for completing the UTI case report form can be found in Appendix 9.

Additional case reporting rules, including details on interpretation and reporting of laboratory results, are described below:

Additional Reporting Rules Specific to UTI:

- Single urine cultures with > 2 organisms are routinely regarded as contaminated cultures and should not be used for UTI surveillance.

  Example: Klebsiella pneumoniae, E. coli, and Citrobacter freundii are isolated from a urine culture on March 1. This culture should be regarded as contaminated and not used in surveillance.

- If > 2 organisms are isolated over multiple urine cultures, urine cultures may be used to meet the case definition.

  Example: Klebsiella pneumoniae and Citrobacter freundii are isolated from a urine culture on March 1, and E. coli is isolated from a urine culture from the same patient on March 3. All three organisms would be reported on the UTI case report form.

- All organisms that are seen on gram stain or isolated by urine culture should be reported, including organisms such as Candida species.

Denominators (for calculation of incidence rates)

Urinary catheter days and patient days serve as the denominators for determining UTI and CAUTI incidence rates. Denominator data should be collected consistently, simultaneously, each day for every participating unit or ward under surveillance, including weekends and holidays. Appendix 10 of the Surveillance for Healthcare-Associated Infections (HAI) in Intensive Care Units protocol contains the denominator forms for collecting patient days and urinary catheter days.

- **Urinary Catheter Day:** denominator data is calculated as the number of patients with an indwelling urinary catheter in each unit under surveillance, each day. Surveillance staff should monitor and document the number of patients in the surveillance unit who have an indwelling urinary catheter in place.
- **Patient day:** denominator data is calculated as the total number of patients per day in the unit under surveillance. Patient days should be collected at the same with urinary catheter days.
- **NICU patient days:** If feasible, participating hospitals conducting surveillance in NICUs may choose to collect the denominator data stratified by birth weight categories using the NICU denominator data collection form, or they may choose to use the regular/ non-stratified denominator data collection form. NICUs collecting the denominator

data by birth weight category will be able to stratify HAI rates across five birth weight categories.

Analysis Plan:

Data will be analysed for all UTIs combined and stratified by device association (e.g., CAUTI vs. non-CAUTI). Incidence rates will be calculated for both total UTI and CAUTI, as described below.

Calculation of Incidence

- **UTI-incidence rate:** UTI per 1000 patient days. Divide the number of reported UTI by the number of patient days and then multiply by 1000.
- **CAUTI rate:** CAUTI per 1000 urinary catheter-days. Divide the number of reported CAUTI by the number of urinary catheter days and then multiply by 1000.

Device Utilization Ratio (DUR)

The device utilization ratio (DUR) is used during reporting to contextualize the UTI incidence. This is important because facilities that have high rates of indwelling urinary catheter usage will likely have higher UTI and CAUTI rates. The DUR can be calculated by dividing the number of urinary catheter days by the number of patient days as shown in the formula below.

$$\text{DUR} = \frac{\text{\# of indwelling urinary catheter days}}{\text{\# of patient days for the days where urinary catheter days are also collected}}$$

Appendix 1

UTI Case Report Form

Surveillance unit Name _____ Case Type _____ Patient Name _____ Medical record Number: _____		
Sex: □ Male □ Female	Date of Birth (DD/MM/YYYY): __ /__ /__ Age(Years): ____ □ Age/DOB (Unknown)	Birth weight: _____grams (NICU only)
Date of hospital admission: ____ /_____ /_____	Date of admission to surveillance unit: ____ /_____ /_____	
Location prior to hospital admission:	□ Home / Community □ Another hospital □ Unknown	
Linked Case ID **(autogenerated)** do not fill on Hard copy. **Only to be filled on software**		

1. UTI Details	
Date of event *(dd/mm/yyyy)*:	____ /_____ /_____
Type of UTI	□ Culture Confirmed UTI
Fill out culture results in Section 4, Organisms and Antibiotic Susceptibility	
2. Invasive Devices: Urinary Catheters	
Did the patient have a Foley catheter in place at any time on: • The date of event **or** • The day before the date of event?	□ Yes □ No *(skip to 3, Outcome)*
If **YES,** was the Foley catheter in place for >2 calendar days?	□ Yes □ No
3. Outcome	
Patient status at end of Event Timeframe (14 days after DOE, where DOE = day 1)	□ Still in surveillance unit □ Transferred to other hospital □ Transferred to other ward/unit within the hospital □ Discharged □ LAMA □ Died Date of discharge, transfer, or death ____ /_____ /_____
	□ Unknown
Patient outcome at end of hospitalization	□ Discharged Date of discharge, transfer, or death: □ Transferred to other hospital □ LAMA □ Died ____ /_____ /_____ □ Unknown

4. Organisms and Antibiotic Susceptibility						
Date of sample collection	**Organism**	**Drugs**				
_____	*Staphylococcus epidermidis*	**OX** S I R N	**CEFOX** S I R N	**METH** S I R N	**CLIND** S I R N	**DAPTO** S I R N
		VANC S I R N	**OTHER DRUG** S I R N	**OTHER DRU** S I R N	**OTHER DRUG** S I R N	**OTHER DRU** S I R N
		OTHER DRUG S I R N				
_____	*Staphylococcus haemolyticus*	**OX** S I R N	**CEFOX** S I R N	**METH** S I R N	**CLIND** S I R N	**DAPTO** S I R N
		VANC S I R N	**OTHER DRUG** S I R N	**OTHER DRU** S I R N	**OTHER DRUG** S I R N	**OTHER DRU** S I R N
		OTHER DRUG S I R N				
_____	*Staphylococcus hominis*	**OX** S I R N	**CEFOX** S I R N	**METH** S I R N	**CLIND** S I R N	**DAPTO** S I R N
		VANC S I R N	**OTHER DRUG** S I R N	**OTHER DRU** S I R N	**OTHER DRUG** S I R N	**OTHER DRU** S I R N
		OTHER DRUG S I R N				
_____		**OX** S I R N	**CEFOX** S I R N	**METH** S I R N	**CLIND** S I R N	**DAPTO** S I R N
	Staphylococcus, other coagulase-negative					
		VANC S I R N	**OTHER DRUG** S I R N	**OTHER DRU** S I R N	**OTHER DRUG** S I R N	**OTHER DRU** S I R N
		OTHER DRUG S I R N				
_____	*Enterococcus Faecium*	**AMP** S I R N	**DAPTO** S I R N	**GENTHL§** S I R N	**CIPRO** S I R N	**LNZ** S I R N
		TEICO S I R N	**VANC** S I R N	**OTHER DRU** S I R N	**OTHER DRUG** S I R N	**OTHER DRU** S I R N
		OTHER DRUG S I R N	**OTHER DRUG 5** S I R N			
_____	*Enterococcus faecalis*	**AMP** S I R N	**DAPTO** S I R N	**GENTHL§** S I R N	**CIPRO** S I R N	**LNZ** S I R N

		TEICO S I R N	**VANC** S I R N	**OTHER DRU** S I R N	**OTHER DRUG** S I R N	**OTHER DRU** S I R N
		OTHER DRUG S I R N	**OTHER DRUG 5** S I R N			
_____	*Enterococcus Sp.* Please Specify Species: ____	**AMP** S I R N	**DAPTO** S I R N	**GENTHL§** S I R N	**CIPRO** S I R N	**LNZ** S I R N
		TEICO S I R N	**VANC** S I R N	**OTHER DRU** S I R N	**OTHER DRUG** S I R N	**OTHER DRU** S I R N
		OTHER DRUG S I R N	**OTHER DRUG 5** S I R N			
_____	*Staphylococcus aureus*	**LEVO** S I R N	**MOXI** S I R N	**CLIND** S I R N	**DAPTO** S I R N	**DOXY** S I R N
		MINO S I R N	**ERYTH** S I R N	**GENT** S I R N	**LNZ** S I R N	**OTHER DRU** S I R N
		OTHER DRUG S I R N	**OTHER DRUG** S I R N	**OTHER DRU** S I R N	**OTHER DRUG** S I R N	
_____	*Acinetobacter baumannii*	**AMK** S I R N	**AMPSUL** S I R N	**CEFTAZ** S I R N	**CEFOT** S I R N	**CIPRO** S I R N
		LEVO S I R N	**COL** S I R N	**PB** S I R N	**GENT** S I R N	**IMI** S I R N
		TICLAV S I R N	**MERO** S I R N	**DORI** S I R N	**NET** S I R N	**PIP** S I R N
		PIPTAZ S I R N	**TETRA** S I R N	**DOXY** S I R N	**MINO** S I R N	**TMZ** S I R N
		TOBRA S I R N	**OTHER DRUG** S I R N	**OTHER DRU** S I R N	**OTHER DRUG** S I R N	**OTHER DRU** S I R N
		OTHER DRUG S I R N				
_____	*Acinetobacter baumannii complex*	**AMK** S I R N	**AMPSUL** S I R N	**CEFTAZ** S I R N	**CEFOT** S I R N	**CIPRO** S I R N
		LEVO S I R N	**COL** S I R N	**PB** S I R N	**GENT** S I R N	**IMI** S I R N
		TICLAV S I R N	**MERO** S I R N	**DORI** S I R N	**NET** S I R N	**PIP** S I R N

		PIPTAZ S I R N	**TETRA** S I R N	**DOXY** S I R N	**MINO** S I R N	**TMZ** S I R N
		TOBRA S I R N	**OTHER DRUG** S I R N	**OTHER DRU** S I R N	**OTHER DRUG** S I R N	**OTHER DRU** S I R N
		OTHER DRUG S I R N				
_____	*Acinetobacter lwoffii*	**AMK** S I R N	**AMPSUL** S I R N	**CEFTAZ** S I R N	**CEFOT** S I R N	**CIPRO** S I R N
		LEVO S I R N	**COL** S I R N	**PB** S I R N	**GENT** S I R N	**IMI** S I R N
		TICLAV S I R N	**MERO** S I R N	**DORI** S I R N	**NET** S I R N	**PIP** S I R N
		PIPTAZ S I R N	**TETRA** S I R N	**DOXY** S I R N	**MINO** S I R N	**TMZ** S I R N
		TOBRA S I R N	**OTHER DRUG** S I R N	**OTHER DRU** S I R N	**OTHER DRUG** S I R N	**OTHER DRU** S I R N
		OTHER DRUG S I R N				
_____	*Acinetobacter sp.* Please Specify Species: ____	**AMK** S I R N	**AMPSUL** S I R N	**CEFTAZ** S I R N	**CEFOT** S I R N	**CIPRO** S I R N
		LEVO S I R N	**COL** S I R N	**PB** S I R N	**GENT** S I R N	**IMI** S I R N
		TICLAV S I R N	**MERO** S I R N	**DORI** S I R N	**NET** S I R N	**PIP** S I R N
		PIPTAZ S I R N	**TETRA** S I R N	**DOXY** S I R N	**MINO** S I R N	**TMZ** S I R N
		TOBRA S I R N	**OTHER DRUG** S I R N	**OTHER DRU** S I R N	**OTHER DRUG** S I R N	**OTHER DRU** S I R N
		OTHER DRUG S I R N				
_____	*Escherichia coli*	**AMK** S I R N	**CEFAZ** S I R N	**CEFEP** S I R N	**CEFOT** S I R N	**CEFTRX** S I R N
		CEFTAZ S I R N	**CEFUR** S I R N	**CEFOX** S I R N	**CTET** S I R N	**CIPRO** S I R N
		EVO	**MOXI**	**COL**	**PB**	**ERTA**

		S I R N	S I R N	S I R N	S I R N	S I R N
		GENT S I R N	**IMI** S I R N	**MERO** S I R N	**DORI** S I R N	**PIPTAZ** S I R N
		TETRA S I R N	**DOXY** S I R N	**MINO** S I R N	**TIG** S I R N	**OTHER DRUG** S I R N
		OTHER DRUG S I R N	**OTHER DRUG** S I R N	**OTHER DRUG** S I R N	**OTHER DRUG 5** S I R N	
_____	*Klebsiella oxytoca*	**AMK** S I R N	**CEFAZ** S I R N	**CEFEP** S I R N	**CEFOT** S I R N	**CEFTRX** S I R N
		CEFTAZ S I R N	**CEFUR** S I R N	**CEFOX** S I R N	**CTET** S I R N	**CIPRO** S I R N
		LEVO S I R N	**MOXI** S I R N	**COL** S I R N	**PB** S I R N	**ERTA** S I R N
		GENT S I R N	**IMI** S I R N	**MERO** S I R N	**DORI** S I R N	**PIPTAZ** S I R N
		TETRA S I R N	**DOXY** S I R N	**MINO** S I R N	**TIG** S I R N	**OTHER DRUG** S I R N
		OTHER DRUG S I R N	**OTHER DRUG** S I R N	**OTHER DRUG** S I R N	**OTHER DRUG** S I R N	
_____	*Klebsiella pneumoniae*	**AMK** S I R N	**CEFAZ** S I R N	**CEFEP** S I R N	**CEFOT** S I R N	**CEFTRX** S I R N
		CEFTAZ S I R N	**CEFUR** S I R N	**CEFOX** S I R N	**CTET** S I R N	**CIPRO** S I R N
		LEVO S I R N	**MOXI** S I R N	**COL** S I R N	**PB** S I R N	**ERTA** S I R N
		GENT S I R N	**IMI** S I R N	**MERO** S I R N	**DORI** S I R N	**PIPTAZ** S I R N
		TETRA S I R N	**DOXY** S I R N	**MINO** S I R N	**TIG** S I R N	**OTHER DRUG** S I R N
		OTHER DRUG S I R N	**OTHER DRUG** S I R N	**OTHER DRUG** S I R N	**OTHER DRUG** S I R N	

_____	*Klebsiella spp.* Please Specify Species: ____	**AMK** S I R N	**CEFAZ** S I R N	**CEFEP** S I R N	**CEFOT** S I R N	**CEFTRX** S I R N
		CEFTAZ S I R N	**CEFUR** S I R N	**CEFOX** S I R N	**CTET** S I R N	**CIPRO** S I R N
		LEVO S I R N	**MOXI** S I R N	**COL** S I R N	**PB** S I R N	**ERTA** S I R N
		GENT S I R N	**IMI** S I R N	**MERO** S I R N	**DORI** S I R N	**PIPTAZ** S I R N
		TETRA S I R N	**DOXY** S I R N	**MINO** S I R N	**TIG** S I R N	**OTHER DRUG** S I R N
		OTHER DRUG S I R N	**OTHER DRUG** S I R N	**OTHER DRUG** S I R N	**OTHER DRUG** S I R N	
_____	*Pseudomonas aeruginosa*	**AMK** S I R N	**AZT** S I R N	**CEFEP** S I R N	**CEFTAZ** S I R N	**CIPRO** S I R N
		LEVO S I R N	**COL** S I R N	**PB** S I R N	**GENT** S I R N	**IMI** S I R N
		MERO S I R N	**DORI** S I R N	**NET** S I R N	**PIPTAZ** S I R N	**TOBRA** S I R N
		OTHER DRUG S I R N	**OTHER DRUG** S I R N	**OTHER DRUG** S I R N	**OTHER DRUG** S I R N	**OTHER DRUG** S I R N
_____	*Pseudomonas putida*	**AMK** S I R N	**AZT** S I R N	**CEFEP** S I R N	**CEFTAZ** S I R N	**CIPRO** S I R N
		LEVO S I R N	**COL** S I R N	**PB** S I R N	**GENT** S I R N	**IMI** S I R N
		MERO S I R N	**DORI** S I R N	**NET** S I R N	**PIPTAZ** S I R N	**TOBRA** S I R N
		OTHER DRUG S I R N	**OTHER DRUG** S I R N	**OTHER DRUG** S I R N	**OTHER DRUG** S I R N	**OTHER DRUG** S I R N
_____	*Pseudomonas sp.* Please Specify Species: ____	**AMK** S I R N	**AZT** S I R N	**CEFEP** S I R N	**CEFTAZ** S I R N	**CIPRO** S I R N
		LEVO S I R N	**COL** S I R N	**PB** S I R N	**GENT** S I R N	**IMI** S I R N
		MERO S I R N	**DORI** S I R N	**NET** S I R N	**PIPTAZ** S I R N	**TOBRA** S I R N
		OTHER DRUG S I R N	**OTHER DRUG** S I R N	**OTHER DRUG** S I R N	**OTHER DRUG** S I R N	**OTHER DRUG** S I R N

_____	*Candida albicans*	**ANID** S I R N	**CASPO** S I R N	**FLUCO** S I R N	**FLUCY** S I R N	**ITRA** S I R N
		MICA S I R N	**VORI** S I R N	**OTHER DRUG** S I R N	**OTHER DRUG** S I R N	**OTHER DRUG** S I R N
		OTHER DRUG S I R N	**OTHER DRUG** S I R N			
_____	*Candida glabrate*	**ANID** S I R N	**CASPO** S I R N	**FLUCO** S I R N	**FLUCY** S I R N	**ITRA** S I R N
		MICA S I R N	**VORI** S I R N	**OTHER DRUG** S I R N	**OTHER DRUG** S I R N	**OTHER DRUG** S I R N
		OTHER DRUG S I R N	**OTHER DRUG** S I R N			
_____	*Candida tropicalis*	**ANID** S I R N	**CASPO** S I R N	**FLUCO** S I R N	**FLUCY** S I R N	**ITRA** S I R N
		MICA S I R N	**VORI** S I R N	**OTHER DRUG** S I R N	**OTHER DRUG** S I R N	**OTHER DRUG** S I R N
		OTHER DRUG S I R N	**OTHER DRUG** S I R N			
_____	*Candida spp.* Please Specify Species: ____	**ANID** S I R N	**CASPO** S I R N	**FLUCO** S I R N	**FLUCY** S I R N	**ITRA** S I R N
		MICA S I R N	**VORI** S I R N	**OTHER DRUG** S I R N	**OTHER DRUG** S I R N	**OTHER DRUG** S I R N
		OTHER DRUG S I R N	**OTHER DRUG** S I R N			
Date of sample collection	**Other Organisms**	**Drugs**				
_____	Organism 1 _____ Specify:	**Drug 1** S I R N	**Drug 2** S I R N	**Drug 3** S I R N	**Drug 4** S I R N	**Drug 5** S I R N
		Drug 6 S I R N	**Drug 7** S I R N	**Drug 8** S I R N	**Drug 9** S I R N	**Drug 10** S I R N
_____	Organism 2 _____ Specify:	**Drug 1** S I R N	**Drug 2** S I R N	**Drug 3** S I R N	**Drug 4** S I R N	**Drug 5** S I R N
		Drug 6 S I R N	**Drug 7** S I R N	**Drug 8** S I R N	**Drug 9** S I R N	**Drug 10** S I R N
_____	Organism 3 _____ Specify:	**Drug 1** S I R N	**Drug 2** S I R N	**Drug 3** S I R N	**Drug 4** S I R N	**Drug 5** S I R N
		Drug 6 S I R N	**Drug 7** S I R N	**Drug 8** S I R N	**Drug 9** S I R N	**Drug 10** S I R N

Comments

Result Codes

S = Susceptible I = Intermediate R = Resistant NS = Non-susceptible S-DD = Susceptible-dose dependent N = Not tested

§ GENTHL results: S = Susceptible/Synergistic and R = Resistant/Not Synergistic

† Clinical breakpoints have not been set. S/R designations should be based upon epidemiological cutoffs of S = MIC ≤ 2 and R = MIC ≥ 4

AKF	Amikacin-fosfomycin	**AMC**	Amoxicillin-clavulanate	**AMK**	Amikacin
AMOX	Amoxicillin	**AMP**	ampicillin	**AMPSUL**	ampicillin sulbactam
AMXCLV	amoxicillin clavulanic acid	**ANID**	anidulafungin	**AZA**	Aztreonam-avibactam
AZL	Azlocillin	**AZM**	Azithromycin	**AZT**	aztreonam
BES	Besifloxacin	**BPM**	Biapenem	**BPR**	Ceftobiprole
C/T	Ceftolozane-tazobactam	**CASPO**	caspofungin	**CAT**	Cefetamet
CB	Carbenicillin	**CDN**	Cefditoren	**CDR**	Cefdinir
CDZ	Cadazolid	**CEFAZ**	cefazolin	**CEFEP**	cefepime
CEFOT	cefotaxime	**CEFOX**	cefoxitin	**CEFTAZ**	ceftazidime
CEFTRX	ceftriaxone	**CEFUR**	cefuroxime	**CEP**	Cephalothin
Cfm	Cefamandole	**Cfr**	Cefaclor	**CHL**	Chloramphenicol
CID	Cefonicid	**CIN**	Cinoxacin	**CIPRO**	ciprofloxacin
CLA	Clarithromycin	**CLIND**	clindamycin	**CLX**	Clinafloxacin
CMZ	Cefmetazole	**COL**	Colistin	**CPA**	Ceftaroline-avibactam
CPR	Cefpirome	**CPT**	Ceftaroline	**CPZ**	Cefoperazone
CTB	Ceftibuten	**CTET**	cefotetan	**CTZ**	Ceftizoxime
CZA	ceftazidime-avibactam	**DAL**	Dalbavancin	**DAPTO**	daptomycin
DFX	Delafloxacin	**DIC**	Dicloxacillin	**DORI**	doripenem
DOXY	doxycycline	**DTM**	Dirithromycin	**ERTA**	ertapenem
ERV	Eravacycline	**ERYTH**	erythromycin	**FARO**	Faropenem
FC	Fusidic acid	**FDX**	Fidaxomicin	**FIN**	Finafloxacin
FLUCO	fluconazole	**FLUCY**	flucytosine	**FLX**	Fleroxacin
FOS	Fosfomycin	**FP**	Cefprozil	**FPZ**	Cefepime-tazobactam
GAT	Gatifloxacin	**GEM**	Gemifloxacin	**GENT**	gentamicin

GENTHL	gentamicin - high level test	**GEP**	Gepotidacin	**GRN**	Garenoxacin
GRX	Grepafloxacin	**HAP**	Cephapirin	**HLS**	Streptomycin synergy
ICL	Iclaprim	**IMI**	imipenem	**ITRA**	itraconazole
KAN	Kanamycin	**LEVO**	levofloxacin	**LMU**	Lefamulin
LND	Levonadifloxacin	**LNZ**	linezolid	**LOM**	Lomefloxacin
LOR	Loracarbef	**MEC**	Mecillinam	**MERO**	meropenem
METH	methicillin	**MEV**	Meropenem-vaborabactam	**MEZ**	Mezlocillin
MICA	micafungin	**MINO**	minocycline	**MOX**	Moxalactam
MOXI	moxifloxacin	**MTZ**	Metronidazole	**MUP**	Mupirocin
NAF	Nafcillin	**NAL**	Nalidixic acid	**NET**	netilmicin
NIT	Nitazoxanide	**NITRO**	nitrofurantoin	**NOR**	norfloxacin
OFL	Ofloxacin	**OMC**	Omadacyline	**ORI**	Oritavancin
OX	oxacillin	**PB**	polymyxin B	**PEF**	Pefloxacin
PEN	Penicillin	**PEX**	Pexiganan	**PIP**	piperacillin
PIPTAZ	piperacillin/ tazobactam	**PLZ**	Plazomicin	**POD**	Cefpodoxime
PRU	Ulifloxacin	**QDA**	Quinupristin-dalfopristin	**RAD**	Cephradine
RAM	Ramoplanin	**RIF**	rifampin	**RZM**	Razupenem
SEC	Secnidazole	**SOL**	Solithromycin	**SPT**	Spectinomycin
SPX	Sparfloxacin	**SSS**	Sulfonamides	**STR**	Streptomycin
SULO	Sulopenem	**SUR**	Surotomycin	**TBR**	Trospectomycin
TEICO	teicoplanin	**TEL**	Telithromycin	**TETRA**	tetracycline
TIC	Ticarcillin	**TICLAV**	ticarcillin/ clavulnate	**TIG**	Tigecycline
TOBRA	tobramycin	**TVA**	Trovafloxacin	**TZD**	Tedizolid
VANC	vancomycin	**VORI**	voriconazole	**ZWK**	Nafithromycin
TIN	Tinoxanide	**TLV**	Telavancin	**TMP**	Trimethoprim
TMZ	trimethoprim/ sulfamethoxazole	**TNZ**	Tinidazole		

Urinary Tract Infection (UTI) – Case Investigation Worksheet and Table

For all positive urine cultures:

1. Record collection date of urine culture: ____/____/_____ Continue to Question 2.

2. Does the urine culture have at least one organism with ≥10^5 CFU/mL?
   - ☐ Yes. If selected, continue to Question 3.
   - ☐ No. If selected, the case definition is not met. **Do not report this episode.**

3. Does the urine culture have more than 2 species isolated from it?
   - ☐ Yes. If selected, the case definition is not met. **Do not report this episode.**
   - ☐ No. If selected, continue to Question 4.

4. Did the patient have at least one of the following signs or symptoms during the window period?
   - ☐ Yes. If selected, record the signs/symptoms on the case investigation table and continue to Question 5.
   - ☐ No. If selected, the case definition is not met. **Do not report this episode.**

UTI Signs & Symptoms
• Fever (>38°C) • Suprapubic tenderness • Urinary urgency • Urinary frequency • Dysuria

5. Determine the date of event (the date the first case definition criteria – urine culture collection or sign/symptom – occurred in the window period). Indicate on case investigation table and continue to Question 6.

6. Are ALL of the following inclusion criteria are true?
   - ☐ Yes. **<u>This episode should be reported</u>.** Start a UTI case report form for the patient. Continue to Question 7.
   - ☐ No. Inclusion criteria are not met. **Do not report this episode.**

Inclusion Criteria
▪ The Date of Event does not occur during the Event Timeline of a previous UTI ▪ The Date of Event occurs >2 days after hospital admission (where Date of Hospital admission=Day 1) ▪ The Date of Event occurs >2 days after ICU admission (where Date of ICU admission=Day 1)

7. Perform follow up activities on all case report forms. Use the case investigation table to organize relevant data.
    - Report information on presence of urinary catheter in Section 2 – Invasive Devices
    - Report the first positive urine culture and all positive urine cultures that occur during the Event Timeframe in Section 4 – Organisms and Antibiotic Susceptibility
        - Event Timeframe = 14 days after date of event (where date of event = day 1)
    - At the end of the patient's hospitalization, specify the patient's outcome in Section 3.

Submit the case report form after all information is completed.

UTI Case Investigation Table Hospital Admission Date: ___/___/____ ICU Admission Date: ____/___/____					
Date	**First Positive Culture** Record information for first positive urine culture on the line with the X	**Window Period** Record additional cultures and symptoms	**Date of Event (DOE)** Indicate DOE with an X	**Event Timeframe Record positive cultures from urine cultures collected during the 14 days after the DOE.** DOE = Day 1	**Urinary Catheter?** (Y/N)
	X				

UTI Case Report Form Instructions

Data Field	Instructions for Data Collection
Surveillance unit Number	Add the ICU Code in this row
Case Type	Add whether the case if BSI or UTI
Patient Name	Add the name of the patient. This will remain with the Surveillance unit and will not be seen by the AIIMS team
Medical record Number	Add the Medical record number here. This will remain with the Surveillance unit and will not be seen by the AIIMS team
ICU Name	
Sex	
Date of Birth	Record the date of the patient birth using this format: DD/MM/YYYY. If DOB is unknown, age in years may be mentioned. DOB is mandatory for neonates
Birth Weight	Required only for neonates housed in neonatal intensive care unit.
Date of Hospital Admission	Record the date of the hospital admission using this format: DD/MM/YYYY.
Location prior to hospital admission	Check one. Indicate the location the patient was in immediately prior to admission to the hospital.
Date of admission to Surveillance Unit	Record the date as DD/MM/YYYY.
Date of event	Record the date as DD/MM/YYYY. Enter the date when the first criteria used to meet the case definition occurred. Note: If the first criteria to meet the case definition is a laboratory diagnostic test, the laboratory specimen collection date should be reported as the date of event.
Laboratory Result	If the patient has a culture with organism identified that is used to meet the UTI case definition then fill out Section 4 on Organism and Antibiotic Susceptibility Testing. Instructions below.

Did the patient have a Foley catheter in place at any time on the date of event or day before the date of event?	Check one. If "No," skip to Section 3, Outcome. Note: A Foley catheter is an indwelling urinary catheter inserted into the urinary bladder through the urethra. Condom, nephrostomy, and suprapubic catheters are not included unless a Foley catheter is also present.
Was the urinary catheter in place for >2 calendar days?	Required if urinary catheter in place at any time on date of event or day before. Check one. If "No" skip to Section 3, Outcome. Note: If a Foley catheter is removed and reinserted on the same or following day, it is considered as one continuous usage.
Patient Status at end of Event Timeframe	Required. Check one. Report the status of the patient at the end of the Event Timeframe.
Patient outcome at end of hospitalization	Keep the case report form(s) for a patient on hand and consider them incomplete until the end of the patient's hospital stay. Record the patient's outcome as of the end of their hospital stay by selecting one of the options.
Date of discharge, transfer, or death	Record date as DD/MMM/YYYY. Record the date that the patient was discharged, transferred to a different hospital, or died during the admission when the HAI occurred
Organism ID and Antibiotic Susceptibility Testing	Record date of specimen collection as DD/MM/YYYY Specify species if known, otherwise report as spp. For organsims not listed in the case report form, specify in the row for "Other Organisms" and provide antibiotic susceptibility results. Circle the organsims's susceptibility result using the codes defined on the case report forms. Report every organism isolated from urine cultures collected during the Event Timeframe (14 calendar days, date of event = Day 1)
Comments	Enter any comments, questions, or doubts about this event in the space provided.

Section VII – Ventilator-Associated Pneumonia (VAP)

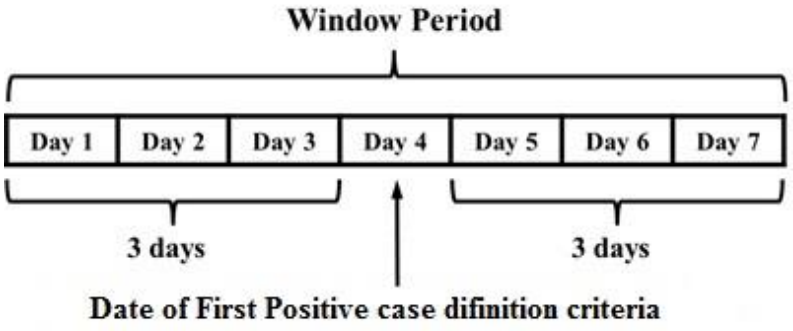
Overview:

This section describes the methods used for conducting VAP surveillance in adult intensive care units. Surveillance units must adhere to the surveillance case definitions, as well as the data collection and reporting procedures outlined here, to ensure that the data is comparable across sites. Infection control practitioners and surveillance staff should follow this protocol to establish and conduct VAP surveillance in their ICUs.

- Surveillance will be undertaken in the Adult ICU
- Only ventilated patients will be included for this surveillance

Key Terms:

Window Period: the 7-day timeframe in which all case definition criteria must be met. It includes the date of the first positive case definition criteria, the three calendar days before, and the three calendar days after.



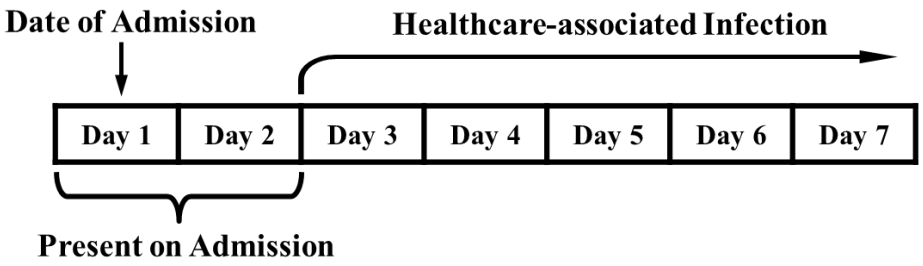
Date of Event: The date when the first criteria used to meet the case definition occurs for the first time within the window period.

Note: ***If the first element used to meet the case definition is a microbiology laboratory diagnostic test, the date of the test (defined as the laboratory specimen collection date) should be reported as the date of the event. The date when the test results were obtained should not be reported.***

Healthcare-associated Infection (HAI): An infection with a Date of Event > 2 calendar days after the hospital admission date (where the date of hospital admission is Day 1) is classified as an HAI.

Present on Admission: an infection with a date of event ≤ 2 calendar days after the hospital admission date (where the date of hospital admission is Day 1) is classified as present on admission.

Note: ***Infections that are classified as present on admission should not be reported as part of this surveillance system.***



A physician's diagnosis of pneumonia alone is not an acceptable criterion for POA

Event Timeframe: a 14-calendar-day period (where the date of the event is Day 1) during which a primary HAI event is deemed ongoing and no new infections of the same primary HAI type are reported. Additional organisms isolated during this period from the same body site are considered part of the same infection for surveillance purposes and are added to the original event.

Examples of Applying the Event Timeframe for VAP:

- A patient has a new infiltrate on chest X-ray as of July 3rd, along with fever and dyspnoea that developed on July 1st. A BAL (bronchoalveolar lavage) aspirate taken on July 4th grows Klebsiella pneumoniae at a count of 10^5/ml. The patient is treated for VAP by the clinicians. A BAL on July 8th grows Acinetobacter baumannii in significant counts. Based on the VAP protocol, this episode is classified as VAP, with the event date being July 1st. The Event Timeframe for this episode of VAP runs from July 1 to July 14. No new VAP can be reported for this patient during this period. The positive BAL culture with Acinetobacter baumannii would be considered part of the initial VAP event and added to the event's case report form.
- A blood culture was collected from the patient in the example above, and Klebsiella pneumoniae grew on July 20. Since this is after the end of the Event Timeframe of the patient's previous VAP (July 1-14), it should be investigated as a potential new BSI/ VAP and reported as a new event if all criteria are met.

Example of Window period, date of event and event timeframe for VAP

Surveillance Unit Day	Clinical / Laboratory Criteria	Window Period	Event Timeframe
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13		Fever, Dyspnoea	Date of Event
14			
15	(+) BAL culture K. pneumoniae	Chest X Ray: New Infiltrates	
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			

Ventilator: Any device used to support, assist or control respiration (inclusive of the weaning period) by applying positive pressure to the airway when delivered via an artificial airway, specifically an oral/nasal endotracheal or tracheostomy tube.

Note: *Ventilation and lung expansion devices that deliver positive pressure to the airway (for example, CPAP, BiPAP, bi-level, IPPB, and PEEP) via non-invasive means (for example, nasal prongs, nasal masks, full face masks, total masks, etc.) are not considered ventilators unless positive pressure is delivered through an artificial airway (oral/nasal endotracheal or tracheostomy tube).*

Ventilator-associated pneumonia (VAP) refers to pneumonia occurring in patients who have been on mechanical ventilation for more than 2 calendar days at the time of the event, with the day of ventilator placement considered Day 1.

AND

The ventilator was in place on the event date or the day before.

(If the patients came with a ventilator to your hospital setting, the ventilator day count begins with the admission date to the first inpatient location).

To report multiple episodes of VAP, follow the Repeat Infection Timeframe (RIT) guidance from the BSI/UTI Module.

Surveillance Methods:

The surveillance process requires active, patient-based, prospective identification of cases and collection of denominator data by staff trained in this VAP surveillance protocol. The module includes case definitions and additional event-specific methods for case reporting and data analysis.

Case Finding:

Surveillance staff will evaluate all patients and identify potential cases in the ICUs under surveillance by screening a variety of patient data sources, including admission, discharge, or transfer records, X-rays, laboratory records, and patient charts. These charts encompass history and physical exam notes, nurses' and physicians' notes, temperature charts, and microbiology culture reports, among others.

Laboratory:

Surveillance staff will engage with the clinical laboratory serving their facility to review microbiology records to identify positive cultures relevant to the HAI under surveillance (e.g., BAL/ ETA cultures). For each positive culture, staff will gather additional clinical data to determine whether the case definitions are met.

ICU clinical staff should be familiar with the case definitions, assist in identifying patients who potentially meet the definitions, and notify surveillance personnel for further confirmation. Additionally, ICU staff may also be utilised to collect denominator data.

X-rays: The clinicians/radiologists will confirm the interpretation of X-ray findings for VAP surveillance, as per the protocol of each participating ICU.

Case Reporting:

Once surveillance staff have evaluated all patients in the ICUs under surveillance and identified cases meeting the VAP case definition, a standardised case report form will be used to collect all required data. The VAP module includes case report forms and instructions for their completion. Case report forms should not be submitted until the end of the event timeframe to allow for the collection of required laboratory and patient outcome data. The VAP case reporting form and instructions are attached in Appendix 11 and Appendix 12.

Case Reporting Rules

All cases meeting all of the following must be reported:

- Date of event > 2 calendar days from hospital admission (where date of hospital admission is Day 1)
- Date of event >2 calendar days from date of surveillance unit admission (where date of surveillance unit admission is Day 1)
- Date of event does not occur within the Event Timeframe of a previously identified case of VAP

If the case does not meet all of the above, ***do not report.***

Denominator Data

Denominator data are collected to calculate the incidence rates of HAI events. These include patient days (a count of the total number of patients per day who were located in the surveillance unit) and ventilator days (a count of the total number of patients per day who had ventilators). Denominator data should be collected at the same time every day for each participating unit under surveillance.

Surveillance on multiple HAI Modules

If surveillance is conducted on VAP, BSI, and UTI, and all HAI event case definitions are met, the corresponding forms should be completed.

VAP Surveillance Definitions:

Diagnostic algorithm for VAP

A. One or more serial chest imaging test results with at least one of the following

New and persistent or Progressive and persistent

- Infiltrate
- Consolidation
- Cavitation

B. Signs and symptoms

B.1 At least one of the following:

- Fever (>38.0°C or >100.4°F)
- Leukopenia (≤4000 WBC/mm3) or leukocytosis (≥12,000 WBC/mm3)
- For adults ≥70 years old, altered mental status with no other recognized cause

And

B.2 At least one of the following:

- New onset of purulent sputum
- change in character of sputum
- Increased respiratory secretions
- Increased suctioning requirements
- New onset or worsening cough
- Dyspnea
- Tachypnea
- Rales or bronchial breath sounds
- Worsening gas exchange (for example: O_2 desaturations [for example: PaO_2/FiO_2

C. Lab findings

At least one of the following:

- **Organism identified from blood/ or pleural fluid**
- **Positive quantitative/ semi-quantitative culture from BAL/endotracheal aspirate**
- **≥5% BAL-obtained cells contain intracellular bacteria on direct microscopic Gram's stain**
- **Definitive diagnosis of fungal infection through histopathology/ cultures; definitive diagnosis of Bordetella/ Legionella/ Mycoplasma/ Chlamydia/ Viral pneumonia through Molecular/ serological tests**
- **For Immunocompromised patients, isolation of a matching Candida spp from blood and sputum/ endotracheal aspirate/ BAL will also be taken as positive laboratory confirmation (Appendix 4 defines immunocompromised patients)**

Isolation of any coagulase-negative S***taphylococcus species***, any ***Enterococcus species*** and any ***Candida species*** as well as a report of "yeast" that is not otherwise specified will not be considered a pathogen from the cultures obtained from above samples. The only exception is Candida spp. isolated in immunocompromised patients

For Diagnosis of VAP, the following algorithm will be used: At least one of each of the following components: A+B1+ B2+C= VAP

Data Entry:

- A Case report form will be filled for each case of VAP
- Ventilator and patient days are used for denominators (as for BSI/ UTI Module)

Denominators (For calculation of incidence rates)

Ventilator days and patient days are the denominators used to calculate VAP incidence rates. Denominator data should be collected at the same time every day for each participating ICUs under surveillance, including weekends and holidays. The denominator forms for collection of patient days and ventilator days are enclosed.

- **Ventilator day** denominator data is calculated as the number of patients on ventilator in each ICU under surveillance, each day. Surveillance staff should record the number of patients in the surveillance unit who have are on ventilator.
- **Patient day** denominator data is calculated as the total number of patients per day in the unit under surveillance. Patient days should be collected at the same time as central line-days.

Analysis Plan:

Data Analyses

VAP Rate

The VAP rate per 1000 ventilator days is calculated by dividing the number of VAPs by the number of ventilator days and multiplying the result by 1000 (ventilator days).

VAP Rate per 1000 ventilator days = ***No. of VAPs / No. of Ventilator Days X 1000.***

Device Utilization Ratio

The Ventilator Utilization Ratio is calculated by dividing the number of ventilator days by the number of patient days.

DUR = ***No. of Ventilator Days / No. of Patient Days.***

Appendix 1

VAP Case Report Form

Surveillance unit Name _____ Case Type _____ Patient Name _____ Medical record Number: _____	
Sex: □ Male □ Female	Date of Birth (DD/MM/YYYY): __ /__ /__ Age (Years): ____ □ Age/DOB (Unknown)
Date of hospital admission: ____ /_____ /_____ Date of admission to surveillance unit: ____ /_____ /_____	
Location prior to hospital admission:	□ Home / Community □ Another hospital □ Unknown
1. VAP Details	
Date of event *(dd/mm/yyyy)*:	____ /_____ /_____
Fill out culture results in Section 5, Organisms and Antibiotic Susceptibility	
2. Invasive Devices: Ventilator	
Did the patient have a Mechanical ventilator in place at any time on • The date of event **or** • The day before the date of event?	□ Yes □ No
If **YES,** was the ventilator in place for >2 calendar days?	□ Yes □ No
3. Please tick the following	
A. Did the patient have New and persistent **or** Progressive and persistent • Infiltrate • Consolidation • Cavitation	□ Yes (if yes) Date _____ □ No □ Yes (if yes) Date _____ □ No □ Yes (if yes) Date _____ □ No
B. Signs and symptoms B.1 • Fever (>38.0°C or >100.4°F) • Leukopenia (≤4000 WBC/mm3) or leukocytosis (≥12,000 WBC/mm3)	□ Yes (if yes) Date _____ □ No □ Yes (if yes) Date _____ □ No □ Yes (if yes) Date _____ □ No

• For adults ≥70 years old, altered mental status with no other recognized cause B.2 • New onset of purulent sputum • Change in character of sputum • Increased respiratory secretions • Increased suctioning requirements • New onset or worsening cough • Dyspnea • Tachypnea • Rales or bronchial breath sounds • Worsening gas exchange (for example: O2 desaturations [for example: PaO2/FiO2≤240], increased oxygen requirements, or increased ventilator demand)	□ Yes (if yes) Date _____ □ No □ Yes (if yes) Date _____ □ No □ Yes (if yes) Date _____ □ No □ Yes (if yes) Date _____ □ No □ Yes (if yes) Date _____ □ No □ Yes (if yes) Date _____ □ No □ Yes (if yes) Date _____ □ No □ Yes (if yes) Date _____ □ No □ Yes (if yes) Date _____ □ No □ Yes (if yes) Date _____ □ No
C. Lab Findings • Organism identified from blood/ or pleural fluid • Positive quantitative/ semi-quantitative culture from BAL/endotracheal aspirate • ≥5% BAL-obtained cells contain intracellular bacteria on direct microscopic Gram's stain • Definitive diagnosis of fungal infection through histopathology/ cultures; definitive diagnosis of Bordetella/ Legionella/	□ Yes (if yes) Date _____ □ No □ Yes (if yes) Date _____ □ No □ Yes (if yes) Date _____ □ No □ Yes (if yes) Date _____ □ No
D. Mycoplasma/ Chlamydia/ Viral pneumonia through Molecular/ serological testing methods • Patient is immunocompromised and a matching *Candida spp* from blood and sputum/ endotracheal aspirate/ BAL is obtained	□ Yes (if yes) Date _____ □ No

4. Outcome	
Patient status at end of 14 days after DOE (Where DOE = Day 1)	□ Still in surveillance unit □ Transferred to other hospital □ Transferred to other ward/unit within the hospital □ Discharged □ LAMA Date of discharge, transfer, or death: □ Died ____ /_____ /_____ □ Unknown
Patient outcome at end of hospitalization	□ Discharged Date of discharge, transfer, or death: □ Transferred to other hospital □ LAMA □ Died ____ /_____ /_____ □ Unknown

5. Organisms and Antibiotic Susceptibility						
Date of sample collection	**Organism**	**Drugs**				
_____	*Staphylococcus aureus*	**LEVO** S I R N	**MOXI** S I R N	**CLIND** S I R N	**DAPTO** S I R N	**DOXY** S I R N
		MINO S I R N	**ERYTH** S I R N	**GENT** S I R N	**LNZ** S I R N	**OTHER D** S I R N
		OTHER DR S I R N	**OTHER DR** S I R N	**OTHER DR** S I R N	**OTHER DR** S I R N	
_____	*Acinetobacter baumannii*	**AMK** S I R N	**AMPSUL** S I R N	**CEFTAZ** S I R N	**CEFOT** S I R N	**CIPRO** S I R N
		LEVO S I R N	**COL** S I R N	**PB** S I R N	**GENT** S I R N	**IMI** S I R N
		TICLAV S I R N	**MERO** S I R N	**DORI** S I R N	**NET** S I R N	**PIP** S I R N
		PIPTAZ S I R N	**TETRA** S I R N	**DOXY** S I R N	**MINO** S I R N	**TMZ** S I R N
		TOBRA S I R N	**OTHER DR** S I R N	**OTHER DR** S I R N	**OTHER DR** S I R N	**OTHER D** S I R N
		OTHER DR S I R N				

_____	*Acinetobacter baumannii complex*	**AMK** S I R N	**AMPSUL** S I R N	**CEFTAZ** S I R N	**CEFOT** S I R N	**CIPRO** S I R N
		LEVO S I R N	**COL** S I R N	**PB** S I R N	**GENT** S I R N	**IMI** S I R N
		TICLAV S I R N	**MERO** S I R N	**DORI** S I R N	**NET** S I R N	**PIP** S I R N
		PIPTAZ S I R N	**TETRA** S I R N	**DOXY** S I R N	**MINO** S I R N	**TMZ** S I R N
		TOBRA S I R N	**OTHER DRU** S I R N	**OTHER DR** S I R N	**OTHER DR** S I R N	**OTHER D** S I R N
		OTHER DR S I R N				
_____	*Acinetobacter lwoffii*	**AMK** S I R N	**AMPSUL** S I R N	**CEFTAZ** S I R N	**CEFOT** S I R N	**CIPRO** S I R N
		LEVO S I R N	**COL** S I R N	**PB** S I R N	**GENT** S I R N	**IMI** S I R N
		TICLAV S I R N	**MERO** S I R N	**DORI** S I R N	**NET** S I R N	**PIP** S I R N
		PIPTAZ S I R N	**TETRA** S I R N	**DOXY** S I R N	**MINO** S I R N	**TMZ** S I R N
		TOBRA S I R N	**OTHER DRU** S I R N	**OTHER DR** S I R N	**OTHER DR** S I R N	**OTHER D** S I R N
		OTHER DR S I R N				
_____	*Acinetobacter sp.* Please Specify Species: ____	**AMK** S I R N	**AMPSUL** S I R N	**CEFTAZ** S I R N	**CEFOT** S I R N	**CIPRO** S I R N
		LEVO S I R N	**COL** S I R N	**PB** S I R N	**GENT** S I R N	**IMI** S I R N
		TICLAV S I R N	**MERO** S I R N	**DORI** S I R N	**NET** S I R N	**PIP** S I R N

		PIPTAZ S I R N	**TETRA** S I R N	**DOXY** S I R N	**MINO** S I R N	**TMZ** S I R N
		TOBRA S I R N	**OTHER DRU** S I R N	**OTHER DR** S I R N	**OTHER DR** S I R N	**OTHER D** S I R N
		OTHER DR S I R N				
_____	*Escherichia coli*	**AMK** S I R N	**CEFAZ** S I R N	**CEFEP** S I R N	**CEFOT** S I R N	**CEFTRX** S I R N
		CEFTAZ S I R N	**CEFUR** S I R N	**CEFOX** S I R N	**CTET** S I R N	**CIPRO** S I R N
		EVO S I R N	**MOXI** S I R N	**COL** S I R N	**PB** S I R N	**ERTA** S I R N
		GENT S I R N	**IMI** S I R N	**MERO** S I R N	**DORI** S I R N	**PIPTAZ** S I R N
		TETRA S I R N	**DOXY** S I R N	**MINO** S I R N	**TIG** S I R N	**OTHER D** S I R N
		OTHER DR S I R N	**OTHER DRU** S I R N	**OTHER DR** S I R N	**OTHER DRUG 5** S I R N	
_____	*Enterobacter aerogenes*	**AMK** S I R N	**CEFAZ** S I R N	**CEFEP** S I R N	**CEFOT** S I R N	**CEFTRX** S I R N
		CEFTAZ S I R N	**CEFUR** S I R N	**CEFOX** S I R N	**CTET** S I R N	**CIPRO** S I R N
		LEVO S I R N	**MOXI** S I R N	**COL** S I R N	**PB** S I R N	**ERTA** S I R N
		GENT S I R N	**IMI** S I R N	**MERO** S I R N	**DORI** S I R N	**PIPTAZ** S I R N
		TETRA S I R N	**DOXY** S I R N	**MINO** S I R N	**TIG** S I R N	**OTHER D** S I R N

		OTHER DR S I R N	**OTHER DR** S I R N	**OTHER DR** S I R N	**OTHER DR** S I R N	
_____	*Enterobacter cloacae*	**AMK** S I R N	**CEFAZ** S I R N	**CEFEP** S I R N	**CEFOT** S I R N	**CEFTRX** S I R N
		CEFTAZ S I R N	**CEFUR** S I R N	**CEFOX** S I R N	**CTET** S I R N	**CIPRO** S I R N
		LEVO S I R N	**MOXI** S I R N	**COL** S I R N	**PB** S I R N	**ERTA** S I R N
		GENT S I R N	**IMI** S I R N	**MERO** S I R N	**DORI** S I R N	**PIPTAZ** S I R N
		TETRA S I R N	**DOXY** S I R N	**MINO** S I R N	**TIG** S I R N	**OTHER D** S I R N
		OTHER DR S I R N	**OTHER DR** S I R N	**OTHER DR** S I R N	**OTHER DR** S I R N	
_____	*Klebsiella oxytoca*	**AMK** S I R N	**CEFAZ** S I R N	**CEFEP** S I R N	**CEFOT** S I R N	**CEFTRX** S I R N
		CEFTAZ S I R N	**CEFUR** S I R N	**CEFOX** S I R N	**CTET** S I R N	**CIPRO** S I R N
		LEVO S I R N	**MOXI** S I R N	**COL** S I R N	**PB** S I R N	**ERTA** S I R N
		GENT S I R N	**IMI** S I R N	**MERO** S I R N	**DORI** S I R N	**PIPTAZ** S I R N
		TETRA S I R N	**DOXY** S I R N	**MINO** S I R N	**TIG** S I R N	**OTHER D** S I R N
		OTHER DR S I R N	**OTHER DR** S I R N	**OTHER DR** S I R N	**OTHER DR** S I R N	
_____	*Klebsiella pneumoniae*	**AMK** S I R N	**CEFAZ** S I R N	**CEFEP** S I R N	**CEFOT** S I R N	**CEFTRX** S I R N
		CEFTAZ S I R N	**CEFUR** S I R N	**CEFOX** S I R N	**CTET** S I R N	**CIPRO** S I R N

		LEVO S I R N	**MOXI** S I R N	**COL** S I R N	**PB** S I R N	**ERTA** S I R N
		GENT S I R N	**IMI** S I R N	**MERO** S I R N	**DORI** S I R N	**PIPTAZ** S I R N
		TETRA S I R N	**DOXY** S I R N	**MINO** S I R N	**TIG** S I R N	**OTHER D** S I R N
		OTHER DR S I R N	**OTHER DRU** S I R N	**OTHER DR** S I R N	**OTHER DR** S I R N	
_____	*Klebsiella spp.*	**AMK** S I R N	**CEFAZ** S I R N	**CEFEP** S I R N	**CEFOT** S I R N	**CEFTRX** S I R N
	Please Specify Species: ____					
		CEFTAZ S I R N	**CEFUR** S I R N	**CEFOX** S I R N	**CTET** S I R N	**CIPRO** S I R N
		LEVO S I R N	**MOXI** S I R N	**COL** S I R N	**PB** S I R N	**ERTA** S I R N
		GENT S I R N	**IMI** S I R N	**MERO** S I R N	**DORI** S I R N	**PIPTAZ** S I R N
		TETRA S I R N	**DOXY** S I R N	**MINO** S I R N	**TIG** S I R N	**OTHER D** S I R N
		OTHER DR S I R N	**OTHER DRU** S I R N	**OTHER DR** S I R N	**OTHER DR** S I R N	
_____	*Pseudomonas aeruginosa*	**AMK** S I R N	**AZT** S I R N	**CEFEP** S I R N	**CEFTAZ** S I R N	**CIPRO** S I R N
		LEVO S I R N	**COL** S I R N	**PB** S I R N	**GENT** S I R N	**IMI** S I R N
		MERO S I R N	**DORI** S I R N	**NET** S I R N	**PIPTAZ** S I R N	**TOBRA** S I R N
		OTHER DR S I R N	**OTHER DRU** S I R N	**OTHER DR** S I R N	**OTHER DR** S I R N	**OTHER D** S I R N

_____	*Pseudomonas putida*	**AMK** S I R N	**AZT** S I R N	**CEFEP** S I R N	**CEFTAZ** S I R N	**CIPRO** S I R N
		LEVO S I R N	**COL** S I R N	**PB** S I R N	**GENT** S I R N	**IMI** S I R N
		MERO S I R N	**DORI** S I R N	**NET** S I R N	**PIPTAZ** S I R N	**TOBRA** S I R N
		OTHER DR S I R N	**OTHER DR** S I R N	**OTHER DR** S I R N	**OTHER DR** S I R N	**OTHER D** S I R N
		AMK	**AZT**	**CEFEP**	**CEFTAZ**	**CIPRO**
_____	*Pseudomonas sp.* Please Specify Species: ____	S I R N	S I R N	S I R N	S I R N	S I R N
		LEVO S I R N	**COL** S I R N	**PB** S I R N	**GENT** S I R N	**IMI** S I R N
		MERO S I R N	**DORI** S I R N	**NET** S I R N	**PIPTAZ** S I R N	**TOBRA** S I R N
		OTHER DR S I R N	**OTHER DR** S I R N	**OTHER DR** S I R N	**OTHER DR** S I R N	**OTHER D** S I R N
		MICA S I R N	**VORI** S I R N	**OTHER DR** S I R N	**OTHER DR** S I R N	**OTHER D** S I R N
		OTHER DR S I R N	**OTHER DR** S I R N			
_____	*Candida spp.* Please Specify Species: ____ **(Only for ICP)**	**ANID** S I R N	**CASPO** S I R N	**FLUCO** S I R N	**FLUCY** S I R N	**ITRA** S I R N
		MICA S I R N	**VORI** S I R N	**OTHER DR** S I R N	**OTHER DR** S I R N	**OTHER D** S I R N
		OTHER DR S I R N	**OTHER DR** S I R N			
Date of sample collection	**Other Organisms**	**Drugs**				
_____	Organism 1 _____ Specify:	**Drug 1** S I R N	**Drug 2** S I R N	**Drug 3** S I R N	**Drug 4** S I R N	**Drug 5** S I R N

		Drug 6 S I R N	**Drug 7** S I R N	**Drug 8** S I R N	**Drug 9** S I R N	**Drug 10** S I R N
_____	Organism 2 _____ Specify:	**Drug 1** S I R N	**Drug 2** S I R N	**Drug 3** S I R N	**Drug 4** S I R N	**Drug 5** S I R N
		Drug 6 S I R N	**Drug 7** S I R N	**Drug 8** S I R N	**Drug 9** S I R N	**Drug 10** S I R N
	Organism 3	**Drug 1**	**Drug 2**	**Drug 3**	**Drug 4**	**Drug 5**
	Specify:					
		Drug 6 S I R N	**Drug 7** S I R N	**Drug 8** S I R N	**Drug 9** S I R N	**Drug 10** S I R N

Comments

Result Codes

S = Susceptible I = Intermediate R = Resistant NS = Non-susceptible S-DD = Susceptible-dose dependent N = Not tested

§ GENTHL results: S = Susceptible/Synergistic and R = Resistant/Not Synergistic

† Clinical breakpoints have not been set. S/R designations should be based upon epidemiological cutoffs of S = MIC ≤ 2 and R = MIC ≥ 4

AKF	Amikacin-fosfomycin	**AMC**	Amoxicillin-clavulanate	**AMK**	Amikacin
AMOX	Amoxicillin	**AMP**	ampicillin	**AMPSUL**	ampicillin sulbactam
AMXCLV	amoxicillin clavulanic acid	**ANID**	anidulafungin	**AZA**	Aztreonam-avibactam
AZL	Azlocillin	**AZM**	Azithromycin	**AZT**	aztreonam
BES	Besifloxacin	**BPM**	Biapenem	**BPR**	Ceftobiprole
C/T	Ceftolozane-tazobactam	**CASPO**	caspofungin	**CAT**	Cefetamet
CB	Carbenicillin	**CDN**	Cefditoren	**CDR**	Cefdinir
CDZ	Cadazolid	**CEFAZ**	cefazolin	**CEFEP**	cefepime
CEFOT	cefotaxime	**CEFOX**	cefoxitin	**CEFTAZ**	ceftazidime
CEFTRX	ceftriaxone	**CEFUR**	cefuroxime	**CEP**	Cephalothin
Cfm	Cefamandole	**Cfr**	Cefaclor	**CHL**	Chloramphenicol
CID	Cefonicid	**CIN**	Cinoxacin	**CIPRO**	ciprofloxacin
CLA	Clarithromycin	**CLIND**	clindamycin	**CLX**	Clinafloxacin
CMZ	Cefmetazole	**COL**	Colistin	**CPA**	Ceftaroline-avibactam
CPR	Cefpirome	**CPT**	Ceftaroline	**CPZ**	Cefoperazone
CTB	Ceftibuten	**CTET**	cefotetan	**CTZ**	Ceftizoxime
CZA	ceftazidime-avibactam	**DAL**	Dalbavancin	**DAPTO**	daptomycin
DFX	Delafloxacin	**DIC**	Dicloxacillin	**DORI**	doripenem
DOXY	doxycycline	**DTM**	Dirithromycin	**ERTA**	ertapenem
ERV	Eravacycline	**ERYTH**	erythromycin	**FARO**	Faropenem
FC	Fusidic acid	**FDX**	Fidaxomicin	**FIN**	Finafloxacin
FLUCO	fluconazole	**FLUCY**	flucytosine	**FLX**	Fleroxacin
FOS	Fosfomycin	**FP**	Cefprozil	**FPZ**	Cefepime-tazobactam
GAT	Gatifloxacin	**GEM**	Gemifloxacin	**GENT**	gentamicin

GENTHL	gentamicin - high level test	**GEP**	Gepotidacin	**GRN**	Garenoxacin
GRX	Grepafloxacin	**HAP**	Cephapirin	**HLS**	Streptomycin synergy
ICL	Iclaprim	**IMI**	imipenem	**ITRA**	itraconazole
KAN	Kanamycin	**LEVO**	levofloxacin	**LMU**	Lefamulin
LND	Levonadifloxacin	**LNZ**	linezolid	**LOM**	Lomefloxacin
LOR	Loracarbef	**MEC**	Mecillinam	**MERO**	meropenem
METH	methicillin	**MEV**	Meropenem-vaborabactam	**MEZ**	Mezlocillin
MICA	micafungin	**MINO**	minocycline	**MOX**	Moxalactam
MOXI	moxifloxacin	**MTZ**	Metronidazole	**MUP**	Mupirocin
NAF	Nafcillin	**NAL**	Nalidixic acid	**NET**	netilmicin
NIT	Nitazoxanide	**NITRO**	nitrofurantoin	**NOR**	norfloxacin
OFL	Ofloxacin	**OMC**	Omadacyline	**ORI**	Oritavancin
OX	oxacillin	**PB**	polymyxin B	**PEF**	Pefloxacin
PEN	Penicillin	**PEX**	Pexiganan	**PIP**	piperacillin
PIPTAZ	piperacillin/ tazobactam	**PLZ**	Plazomicin	**POD**	Cefpodoxime
PRU	Ulifloxacin	**QDA**	Quinupristin-dalfopristin	**RAD**	Cephradine
RAM	Ramoplanin	**RIF**	rifampin	**RZM**	Razupenem
SEC	Secnidazole	**SOL**	Solithromycin	**SPT**	Spectinomycin
SPX	Sparfloxacin	**SSS**	Sulfonamides	**STR**	Streptomycin
SULO	Sulopenem	**SUR**	Surotomycin	**TBR**	Trospectomycin
TEICO	teicoplanin	**TEL**	Telithromycin	**TETRA**	tetracycline
TIC	Ticarcillin	**TICLAV**	ticarcillin/ clavulnate	**TIG**	Tigecycline
TOBRA	tobramycin	**TVA**	Trovafloxacin	**TZD**	Tedizolid
VANC	vancomycin	**VORI**	voriconazole	**ZWK**	Nafithromycin
TIN	Tinoxanide	**TLV**	Telavancin	**TMP**	Trimethoprim
TMZ	trimethoprim/ sulfamethoxazole	**TNZ**	Tinidazole		

Appendix 2

VAP Case Report Form Instructions

Data Field	Instructions for Data Collection
Case ID	Add patient to patient register and use information to assign a new Case ID ending in "BSI." Write the Case ID in the space provided. There should be one Case ID per event.
ICU Name	
Sex	
Date of Birth	Record the date of the patient birth using this format: DD/MM/YYYY.
Date of Hospital Admission	Record the date of the hospital admission using this format: DD/MM/YYYY.
Location prior to hospital admission	Check one. Indicate the location the patient was in immediately prior to admission to the hospital.
Date of admission to Surveillance Unit	Record the date as DD/MM/YYYY.
Laboratory Result	Fill out Section 5 on Organism and Antibiotic Susceptibility Testing.
Locations where patient was housed on the date of event	In the provided, list all the locations in the hospital where the patient was housed on the date of event in chronological order. If unknown, write "Unknown"
Locations where patient was housed on the day before the date of event	In the provided, list all the locations in the hospital where the patient was housed on the day before the date of event in chronological order. If unknown, write "Unknown"
Did the patient have a ventilator in place at any time on the date of event or day before the date of event?	Check one. If "No," skip to Section 3
Was the ventilator in place for >2 calendar days?	Required if ventilator was in place at any time on date of event or day before. Check one. If "No," skip to Section 3 Note: If ventilator is removed and reinserted on the same or following day, it is considered as one continuous ventilator.

Patient Outcome	Required. Check one. Keep the case report form(s) for a patient on hand and consider them incomplete until the end of the patient's hospital stay. Record the patient's outcome as of the end of their hospital stay by selecting one of the options.
Date of discharge, transfer, or death	Required if outcome is not unknown. Record date as DD/MMM/YYYY. Record the date that the patient was discharged, transferred to a different hospital, or died during the admission when the HAI occurred.
Organism ID and Antibiotic Susceptibility Testing	Record date of specimen collection as DD/MM/YYYY Specify species if known, otherwise report as spp. For pathogens not listed in the case report form, specify in the row for "Other Organisms" and provide antibiotic susceptibility results. Circle the pathogen's susceptibility result using the codes defined on the case report forms. Report every organism isolated from blood cultures collected during the Event Timeframe (14 calendar days, date of event = Day 1)

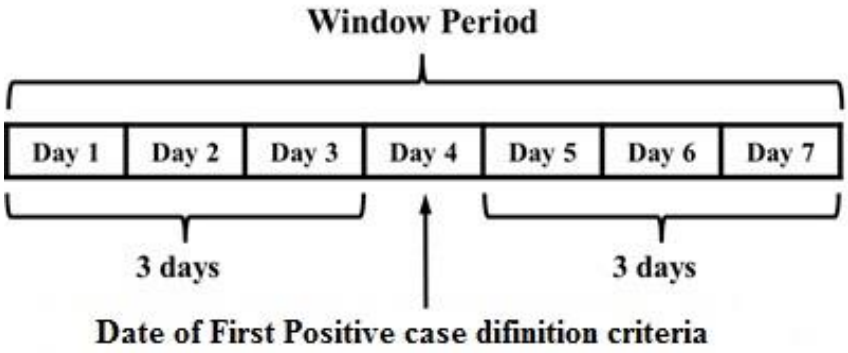
Appendix 3

Case Finding and Denominator Data Collection

Collection of case (numerator) data

Although the implementation of surveillance will likely differ from facility to facility, depending on clinical information systems, the level of staff support, and the type of HAI(s) under surveillance, the following general steps will be necessary to collect case (numerator) data:

1. Review the latest microbiology records daily to identify positive cultures or diagnostic test results of specimens relevant to VAP surveillance.
2. For each positive result, identify the corresponding patient and ensure they were residing in the surveillance unit at the time when the specimen was collected.
3. Review the clinical, X-ray and laboratory data of each identified patient to determine if the positive result is the first positive diagnostic test.
4. Once the first positive diagnostic criteria is identified, create the window period (3 calendar days before and the 3 calendar days after the first criteria).



5. Once the window period has been created, use the patient's X-ray, clinical information to identify the date of event (when the first criteria used to meet the case definition occurs for the first time within the window period). The first criteria used to meet the case definition may be a symptom or may be the positive laboratory result (X-ray finding).
6. Use the date of event to determine if the infection is healthcare-associated (date of event occurs > 2 calendar days after hospital admission, with date of hospital admission as Day 1). If the infection is not healthcare-associated, the infection should not be included in surveillance, do not continue.
7. If the infection is healthcare-associated, determine if the date of event falls within the event timeframe of a previous event of the same type. If it does, the infection should not be included in the surveillance, do not continue.
8. Confirm the date that the patient was admitted to the surveillance unit. A patient's date of event must occur >2 calendar days from their admission to the surveillance

unit (where date of surveillance unit admission = Day 1) in order to be included in the surveillance. If a patient's date of event occurs ≤ 2 calendar days from their admission to the surveillance unit, do not continue.

9. Review the patient's clinical data to verify that all criteria of the surveillance definition are met within the window period. If all criteria of the surveillance definition are not met within the window period, the infection should not be included in surveillance, do not continue.
10. If all criteria of the surveillance definition are met within the window period, assign the infection a Case ID, add the infection to the Case ID, and begin a case report form.
11. Construct an event timeframe for each case (a 14 day calendar day timeframe, with date of event as Day 1). During this time the VAP event for which the case definition was met is considered to be occurring and no new infections of that same type can be reported.
12. Follow up on each patient meeting the case definition. During this time:
    a. Identify additional organisms isolated from the same source that was used to meet the case definition during the Event Timeframe for VAP and add these to the case report form.
    b. At the end of the patient's hospital stay, record the patient's outcome on the case report form. Is the outcome is unknown, select "Unknown".
13. Once patient outcome is recorded and the case report form is complete, submit the completed case report form to the appropriate personnel for data entry and safekeeping.

Appendix 4

Definition of Immunosuppressed Patients

- All patients currently being treated for malignant disease with immunosuppressive chemotherapy or radiotherapy, and for at least six months after terminating such treatment
- All patients who have received a solid organ transplant and are currently on immunosuppressive treatment
- Patients who have received a bone marrow transplant until at least 12 months after finishing all immunosuppressive treatment, or longer where the patient has developed graft-versus-host disease. The decision to vaccinate should depend upon the type of transplant and immune status of the patient. Further advice can be found in current guidance produced by the European Group for Blood and Marrow Transplantation (www.ebmt.org) and the Royal College of Paediatrics and Child Health (www.rcpch.ac.uk)
- All patients receiving systemic high-dose steroids until at least three months after treatment has stopped. This would include children who receive prednisolone, orally or rectally, at a daily dose (or its equivalent) of 2mg/kg/day for at least one week, or 1mg/kg/day for one month. For adults, an equivalent dose is harder to define but immunosuppression should be considered in those who receive 40mg of prednisolone per day for more than one week. Occasionally, there may be individuals on lower doses of steroids who may be immunosuppressed, and are at increased risk from infections. Therefore, live vaccines should be considered with caution in discussion with a relevant specialist physician
- Patients receiving other types of immunosuppressive drugs (e.g. azathioprine, ciclosporin, methotrexate, cyclophosphamide, leflunomide and the newer cytokine inhibitors) alone or in combination with lower doses of steroids. The advice of the physician or immunologist in charge should be sought for at least six months after treatment
- Patients with evidence of severe primary immunodeficiency, for example, severe combined immunodeficiency (SCID), Wiskott-Aldrich syndrome and other combined immunodeficiency syndromes
- Patients with immunosuppression due to HIV infection (see section below).
- https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/456562/Green_Book_Chapter_34_v3_0.pdf
- https://www.gov.uk/government/publications/varicella-the-green-book-chapter-34

Abbreviations

BSI	Bloodstream infection
CLABSI	Central-line associated bloodstream infection
CAUTI	Catheter-associated urinary tract infection
DUR	Device utilization ratio
HAI	Healthcare-associated infection
ICU	Intensive care unit
MDRO	Multi-drug resistant organism
NHSN	National Healthcare Safety Network
NICU	Neonatal intensive care unit
PICU	Pediatric intensive care unit
SNCU	Specialised Newborn Care Unit
SSI	Surgical site infection
UTI	Urinary tract infection
VAP	Ventilator Associated Pneumonia

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