National Surveillance Guideline of Healthcare Acquired Infections

Ministry of Health and Population

Central Unit of Infection Prevention and Control

First Edition (2021)

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Acronyms

BSI	Bloodstream Infection
CAUTI	Catheter Associated Urinary tract Infections
CDC-NHSN	Centers for Disease Control and Prevention – National Healthcare Safety Network
CLABSI	Central line associated Blood stream Infections
DAI	Device Associated Infections
HAI	Health care-associated infection
ICP(s)	Infection Prevention and Control Professional(s)
ICU	Intensive Care Unit
IPC	Infection prevention and control
MDRO	Multi-drug Resistance organisms
NAMRU-3	Naval Medical Research Unit No. 3
NESR	National Electronic Surveillance and Reporting
NICU	Neonatal Intensive care Unit
SSI	Surgical site infection
UTI	Urinary Tract Infection
VAP	Ventilator-associated Pneumonia
WHO	World Health Organization

Glossary of terms

Benchmark: A validated measure that may be used for comparison provided data are collected in the same way as that of the benchmark data. Benchmarks are used to compare HAI rates to data that use the same definitions for infection and are appropriately adjusted for patient risk factors so that meaningful comparisons can be made. Comparing HAI rates to a validated benchmark will indicate whether the rates are below or above the recognized average.

Central line: An intravascular catheter that terminates at or close to the heart or in one of the great vessels which is used for infusion, withdrawal of blood, or hemodynamic monitoring. The following are considered great vessels for the purpose of reporting central-line BSI: Aorta, Pulmonary artery, Superior vena cava, Inferior vena cava, Brachiocephalic veins, Internal jugular veins, Subclavian veins, External iliac veins, Common iliac veins, Femoral veins, and In neonates, the umbilical artery/vein. The following devices are not considered central lines:

- Arterial catheters
- Arteriovenous fistula
- Arteriovenous graft
- Extracorporeal membrane oxygenation (ECMO)
- Hemodialysis reliable outflow (HERO) dialysis catheters
- Intra-aortic balloon pump (IABP) devices
- Non-accessed central line (not accessed nor inserted during the hospitalization)
- Peripheral IV or Midlines
- Ventricular Assist Device (VAD)

Denominator: Represents the population at risk.

Health care-associated infection: also referred to as “nosocomial” or “hospital” infection, is an infection occurring in a patient during the process of care in a hospital or other health care facility, which was not present or incubating at the time of admission. Health care-associated infections can also appear after discharge. They represent the most frequent adverse event during care.

Indwelling catheter: A drainage tube that is inserted into the urinary bladder through the urethra, is left in place, and is connected to a drainage bag (including leg bags). These devices are also called Foley catheters. Indwelling urinary catheters that are used for intermittent or continuous irrigation are also included in CAUTI surveillance. Condom or straight in-and-out catheters are not

included nor are nephrostomy tubes, ileoconduits, or suprapubic catheters unless an indwelling urinary catheter (IUC) is also present.

Infection Prevention and Control (IPC): Evidence-based practices and procedures that, when applied consistently in health care settings, can prevent or reduce the risk of transmission of microorganisms to health care providers, other clients/patients/residents and visitors.

Infection Prevention and Control Professional(s) (ICPs): Trained individual(s) responsible for a health care setting's infection prevention and control activities.

Multi-Drug Resistant Organism (MDRO): A microorganism that has developed resistance to the action of several antimicrobial agents and that is of special clinical or epidemiological significance (e.g., MRSA, VRE, ESBL, and CPE).

NAMRU-3: The Naval Medical Research unit is a biomedical research laboratory of the US Navy located in Sigonella, Italy. Previously it was located in Cairo, Egypt.

National Healthcare Safety Network (NHSN): The Centers for Disease Control's (CDC) National Healthcare Safety Network is the most widely used healthcare-associated infection tracking system in the United States.

Numerator: Each event/infection that occurs during the surveillance period.

Surgical site infection: refers to an infection that occurs after surgery in the part of the body where the surgery took place. Surgical site infections can sometimes be superficial infections involving the skin only. Other surgical site infections are more serious and can involve tissues under the skin, organs, or implanted material.

Surveillance: is defined as the ongoing, systematic collection, analysis, interpretation and evaluation of health data closely integrated with the timely dissemination of these data to those who need it.

1. Introduction

BACKGROUND

Health care-associated infections (HAI) are one of the most common adverse events in care delivery and a major public health problem with an impact on morbidity, mortality and quality of life. These infections also present a significant economic burden at the societal level. However, a large percentage of HAI are preventable through effective infection prevention and control (IPC) measures.

In 2009, the World Health Organization (WHO) published Guidelines on Core Components of Infection Prevention and Control Programs to identify core components of national and healthcare facility-based programs for the prevention and control of healthcare-associated infections. These core components are: organization, technical guidelines, trained human resources, surveillance of healthcare-associated infections, assessment of compliance with international recommendations, support from microbiology laboratories, the environment, program evaluation, and collaboration with public health or other services.

With regard to surveillance, the WHO recommended that national health authorities should collect and document data available on healthcare-associated infections, define national objectives for surveillance efforts, establish priorities for surveillance of healthcare-associated infections and pathogens, determine what data should be provided to the health authority and in what form, and comply with reporting requirements of stakeholders regarding the national state of healthcare-associated infection. National health authorities would also be responsible for standardizing case definitions and surveillance methods, and promoting the assessment of infection prevention practices and other relevant processes.

In 2011, NAMRU-3 and USAID started the national electronic surveillance of HAIs in Egypt. The project started on several phases and included baseline assessment of selected hospitals, training and education of participating teams and follow-up for monitoring of implementation.

In 2016, the HAI National Electronic Surveillance and Reporting (HAI-NESR) system has started. The electronic surveillance of selected HAIs was conducted in certain Hospitals. 39 hospitals has joined the HAI-NESR system from 2017 until now.

SCOPE OF THIS MANUAL

This manual is designed to ensure standardized surveillance methodology of HAI for hospitals participating in the HAI National Electronic Surveillance and Reporting (HAI-NESR) system. The manual provides an approach to HAI surveillance that has been developed by the NAMRU-3 unit and

the Egyptian ministry of health. The case definitions of this manual is based on the widely accepted US Centers for Disease Control and Prevention – National Healthcare Safety Network (CDC-NHSN) definitions for Healthcare acquired infections.

The manual is intended for use by Infection control professionals, surveillance officers, healthcare professionals in charge of HAI surveillance, training and/or supervising.

The manual will be of interest also to surveillance officers in hospitals that are not included in the HAI-NESR system plan. The manual provides information about case definitions, data collection and data analysis to introduce and support the conduct of HAI surveillance in hospitals that are still adapting the paper-based surveillance system to help them undertake a sound surveillance program.

OBJECTIVES

- Identify benchmarks of hospital-acquired infections in Egypt through establishing national surveillance programs.
- Describe microbiological profile and resistance pattern of pathogens causing HAIs.
- Implement evidence-based prevention measures to reduce rates of HAIs.
- Capacity building in IPC and supporting hospital IPC programs.

2. HAIs Surveillance overview

The Healthcare Acquired infection (HAI) rate in patients in a facility is an indicator of quality and safety of care. The development of a surveillance process to monitor this rate is an essential first step to identify local problems and priorities, and evaluate the effectiveness of infection control activity. Surveillance, by itself, is an effective process to decrease the frequency of hospital-acquired infections. The ultimate aim of surveillance is the reduction of HAIs, and their costs. The specific objectives of a surveillance programme include:

- Determine baseline and endemic rates of occurrence of a disease or event.
- Detect and investigate clusters or outbreaks.
- Assess the effectiveness of prevention and control measures.
- Provide information that can be used by organization to target performance improvement activities.
- Observe practices such as hand hygiene and central line insertion to promote compliance with recommendations and standards.
- Identify organisms and diseases of epidemiological importance such as multidrug-resistance organisms (MDROs) to prevent their spread.

Types of Surveillance

Outcome surveillance

Outcome surveillance is the measurement of the rates and consequences of health care-associated infections (HAI), including but not limited to: HAI rates, mortality, and bacterial resistance. Outcome surveillance of device-associated infections (DAI) has become an integral feature of infection control and quality assurance in healthcare organizations.

Process surveillance

Process surveillance is the standardized collection of data regarding the infection control practices actually used in hospitals. This includes compliance with recommendations for hand hygiene, vascular catheter care, urinary catheter care, measures to prevent VAP and measures to prevent surgical site infections. Process surveillance is usually done by observation of actual practices, analysis of the data and performance feedback to the personnel who performed the care or are responsible for it.

Surveillance Methodology

Active surveillance and Passive Surveillance

- **Active surveillance:** In active surveillance, trained personnel, mainly ICPs, vigorously look for HAI. This may involve regular (e.g., daily) visits to patient wards/care units to assess

patients at risk of HAIs and/or review of their medical records.

- **Passive surveillance:** passive surveillance relies on others (e.g., physicians, nurses, or the microbiology laboratory) who are not primarily responsible for surveillance activities to report HAIs.

Patient-based and laboratory-based

- **Patient-based:** Count HAIs, assess risk factors, and monitor patient care procedures and practices for adherence to infection control principles. Patient based surveillance requires ward rounds and discussion with caregivers.
- **Laboratory-based:** Detection is based solely on the findings of laboratory studies of clinical specimens.

Prospective and Retrospective

- **Prospective surveillance:** Monitor patients during their hospitalization for HAIs, also monitor for SSI during the post-discharge period.

- **Retrospective surveillance:** Identify infections via file reviews after patient discharge.

Prevalence study and incidence study

- **Prevalence study (prevalence rate):** Infections in all patients hospitalized at a given point in time are identified (point prevalence) in the entire hospital, or on selected units.
- **Incidence study (Incidence rate):** a rate that represents the occurrence (number) of new cases of a disease (e.g., a specific HAI) occurring in a defined patient population during a defined period.

Total or Whole-House and Targeted

- **Total / Whole-House:** Continuous monitoring of all patients for all events and/or processes. Whole-house surveillance is extremely labour intensive.

- **Targeted:** In targeted surveillance, objectives for surveillance are defined. It focuses on specific events, medical devices, processes, organisms, and/or patient populations. Targeted surveillance generally include:

    - **Device-Associated Infections:** as most patients admitted for health care are exposed to invasive Devices in the course of their treatment (e.g. vascular and urinary catheters, and ventilators), the surveillance system enables hospitals to monitor infectious complications associated with the use of these devices specifically, surveillance of central line-associated bloodstream infection (CLABSI), catheter-

associated urinary tract infection (CAUTI), and ventilator-associated pneumonia (VAP).

- **Procedure-related HAI (Surgical Site Infections):** SSI is considered the most costly HAI type. In surgical care, Surveillance of SSI with feedback of appropriate data to surgeons has been shown to be an important component of strategies to reduce SSI risk.

- **Surveillance of Multidrug-resistant Organisms (MDROs):** MDRO Surveillance is a critically important component of any Multidrug-resistant Organism (MDRO) control program. MDRO surveillance strategies range from surveillance of clinical microbiology laboratory results obtained as part of routine clinical care, to use of active surveillance cultures to detect asymptomatic colonization.

The Egyptian HAIs surveillance system Methodology is:

- **Active, Prospective:** Actively search for cases of HAIs.
- **Targeted:** Targets Device associated HAI (VAP, CAUTI, CLABSI) and Procedure related HAI (Surgical Site Infection [SSIs])
- **Standardized:** based on the US Centers for Disease Control and Prevention – National Healthcare Safety Network (CDC-NHSN) definitions for Healthcare acquired infection

Steps for Implementing Surveillance Program

The following framework is useful in planning and implementing a sound surveillance program:

1. **Assess and define the populations to be studied**:
   Identify the population that have the greatest risk for infection or other adverse outcomes this should be done by assessing the types of patients (e.g, newborn, pediatric, adult, geriatric), healthcare services provided (e.g. medical, surgical) and invasive procedures performed.
2. **Choose the events to monitor**:
   Surveillance programs should measure outcomes or processes of healthcare. The program should focus on the high volume, high risk events in a specific population.
3. **Determine time period for observation**.
4. **Identify surveillance criteria (case definitions)**
5. **Collect Surveillance Data**
   Both numerator (number of infections during the surveillance period) and denominator (number of patients at risk of the infection during the surveillance period) data are required for most surveillance activities. A data collection tool should be developed for recording data on HAI

cases, this can be a hard copy (paper) form or, ideally, computer based. Elements that are needed to identify a case and determine whether the case criteria are met for the condition or event being studied include:

a. Demographic: name, date of birth, gender, hospital identification number, admission date.
b. Infection: onset date, site of infection, patient care location of HAI onset.
c. Risk factors**:** devices, procedures, other factors associated with HAI.
d. Laboratory: pathogens, antibiogram, serology, pathology.
e. Radiology/imaging: X-ray, CT scan, MRI, etc.

6. **Analyse the data:**

Surveillance data are analysed periodically to produce results. Analysis include calculation of Infection rates, Device utilization ratio, and benchmarking.

7. **Design an interpretive surveillance report:**

A written report should be developed at the end of every month or quarter to provide a mechanism to interpret the surveillance data. Tables, graphs, and charts are effective tools for organizing, summarizing, and visually displaying data and should be used as applicable.

8. **Communication of the surveillance data:**

Communication of surveillance data should target managers and healthcare providers in the organization who can use the findings to influence performance improvement activities.

9. **Evaluation of the surveillance Program:**

The Infection Control Team should perform a periodic evaluation of the surveillance program to review case definitions, Data collection methods and other surveillance procedures to ensure consistency in application

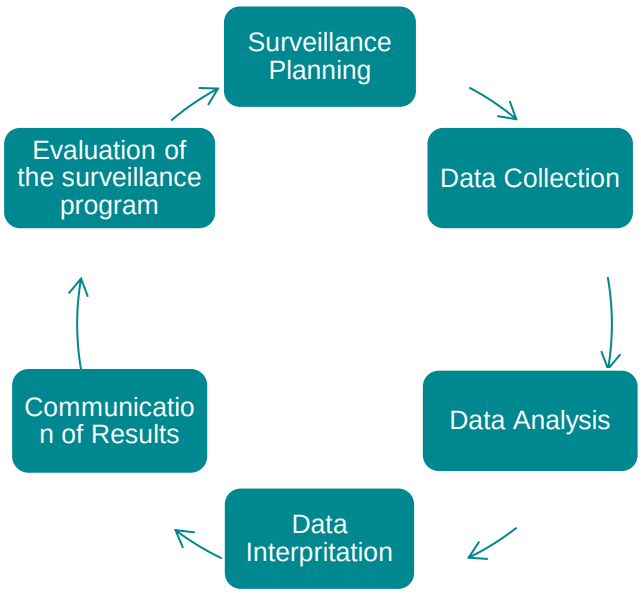


Figure 1 steps of surveillance process

3. HAIs National Electronic Surveillance & Reporting (HAI-NESR) System

Background of the HAI Electronic Surveillance in Egypt

To promote quality and safety of healthcare in Egypt, NAMRU-3 has launched the HAI electronic surveillance program in Egypt in 2011. A baseline assessment of MOHP and university hospitals was conducted to collect information on the capacity of the hospitals to participate in the surveillance program. After evaluation, a total of 13 hospitals were eligible to participate in phase I of the surveillance program to measure HAIs and AMR. NAMRU-3 microbiology laboratory provided technical support to all laboratories and acted as the reference laboratory for all hospital labs participating in the surveillance program. The pilot phase of the surveillance program took one month and Included 4 hospitals out of the 13. It helped identify challenges and problems in implementation of the system. Phase I of the project started in June 2011 for the period of 6 months and it included the 13 eligible hospitals to implement the electronic surveillance for all types of HAI using Personal Digital Assistant (PDA) for data entry. Phase II targeted the most common types of HAI including Device associated Infections (CAUTI, CLABSI, VAP) and SSI. It focused on working out logistical issues with the surveillance methodology and procedures to start phase III. During Phase III (Sep 2012) full-scale electronic surveillance system for targeted HAIs was initiated in all eligible MOHP and university hospitals.

The HAI-NESR system

In 2016, NAMRU-3 initiated The HAI National Electronic Surveillance and Reporting (HAI-NESR) website. The HAI-NESR system has evolved from the previous NAMRU-3 electronic surveillance project of 2011. In the current HAI-NESR system the PDA device used for data entry is replaced by smart phone application. Data are submitted electronically by trained ICP via smart phones application to the MOH surveillance Database. Surveillance reports are automatically generated and are directly accessed by participating hospitals using the (HAI-NESR) website. The number of participating hospitals in the HAI-NESR system increased from 15 in 2016 to 39 hospitals in 2020.

Hospitals participating in the HAI-NESR System

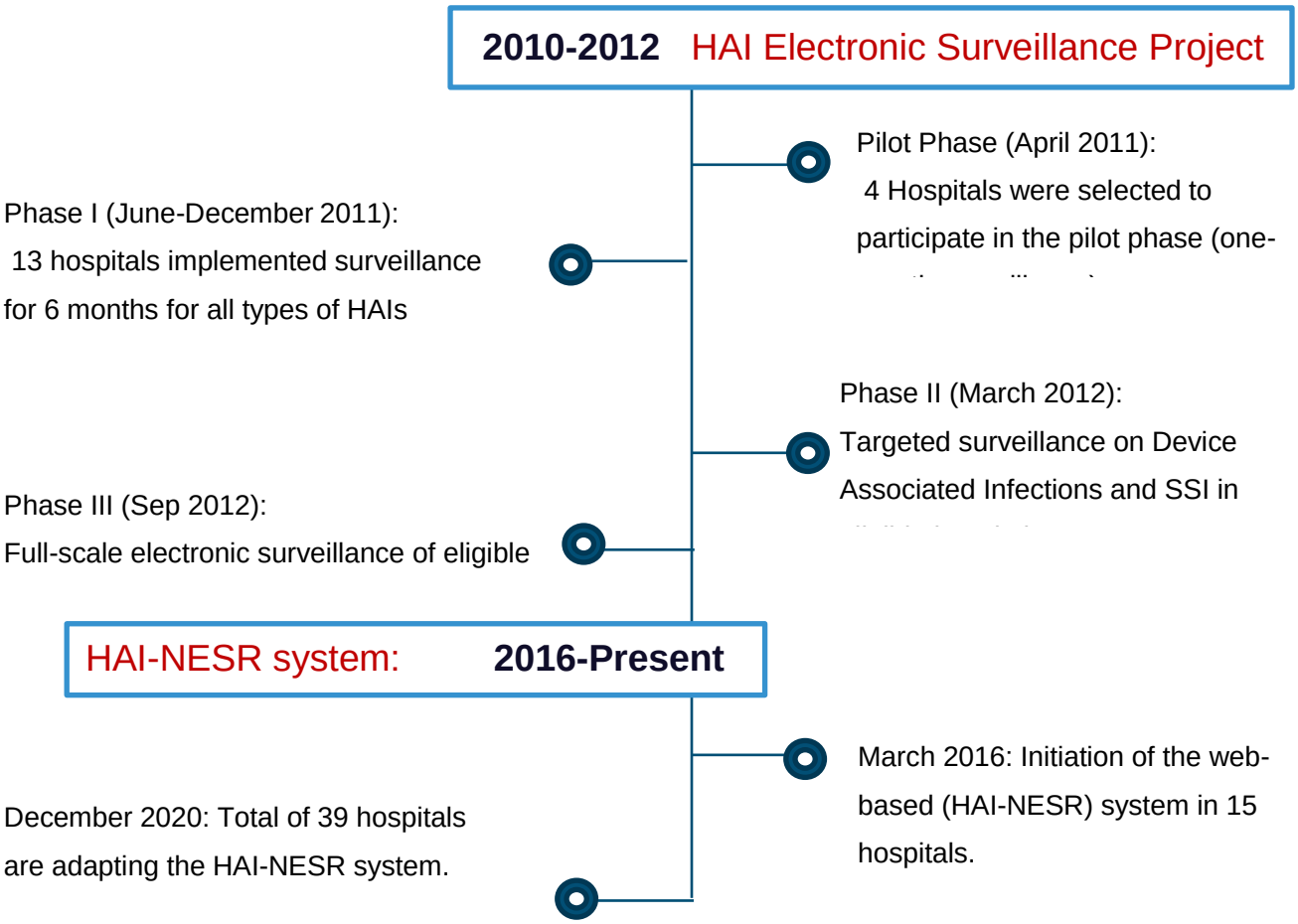
The following Criteria are used to identify hospitals that have the capacity to participate in the HAI-NESR system:

- Presence of IC Team (at least one FTE)
- Data Entry Capacity (computer, office and data entry person)

- Microbiology laboratory capacity (performing full bacterial identification, antimicrobial susceptibility testing, and culturing all types of specimens)
- Presence of ICUs.
- Presence of IC link nurses in ICUs.

All hospitals with the above criteria are encouraged to join the HAI-NESR system. The central unit of IPC will evaluate hospitals interested in joining the HAI-NESR system to ensure they are eligible to join the program. If the hospitals found to be meeting the selection criteria, the IPC team members and Link nurses of the proposed hospital will receive intensive training on surveillance methodology, case-definitions, and data entry using smart phone application. One-day training will be provided to ICU physicians for identification of targeted HAIs. The central unit of IPC will provide eligible hospital with the soft-wear application, user name and password for application and website access, and other needed IT support. The IPC central unit will plan monthly follow-up visits to the newly participated hospitals to provide technical support to the IPC teams and to ensure correct implementation of the surveillance program.

Phases of implementation of the Electronic Surveillance Program



Methodology of HAI-NESR system

Active patient-and laboratory-based prospective surveillance are implemented in intensive care units (ICUs) of selected hospitals. All types of HAIs are looked for vigorously. Identifying Device associated infections in ICUs will be done actively. The assigning ICU treating physician joined by the ward liaison (IP Link Nurse) will inspect all ICU admitted patients 3 times weekly during the clinical rounds and review the status of the patients to determine if the patients had any triggers of infections by using hospital records, patient files, nurse's notes, observation chart etc. They ensure requesting the proper laboratory investigations to support diagnosis of infection and case definitions.

The ICU physicians and IP link nurses also confirm and classify infections according to the NHSN CDC case definitions using smart phone application. In addition, a lab focal person is assigned from the microbiology lab to review the microbiology logbook and alert the IP ward liaison and medical staff of any results indicative of infection.

In addition, surgical site infection (SSI) surveillance is conducted actively for all surgical procedures within seven surgical discipline in participating hospitals: General surgery, Ob/Gyn, Cardiothoracic. Neurosurgery, Orthopedics, vascular surgery and urology. In SSI surveillance, patient is followed during his hospital stay, readmission, and outpatient visits. Although a small percentage of patients undergoing surgery return back to the same hospital for follow up, yet, a tracking system is developed to identify patients when presenting to the outpatient clinics of the same hospital. A trained IP link nurse will collect the corresponding denominator data from the operating theatres.

Data will be collected prospectively. Data collection Forms and Logbooks are used to provide a consistent data collection methodology including patient information and all clinical and laboratory criteria that would help the IP teams and the clinicians to diagnose the different types of infections

Smart phones applications are used for data entry by the surveillance coordinator *(See section 7: Rules and responsibilities).*

3.1. Case Definitions

Case definition is a set of criteria for identification of persons having a particular infection. It usually specifies clinical, laboratory and other diagnostic criteria. Criteria used to define a case for surveillance purposes may be different from criteria used clinically for diagnosis and treatment.

The definitions developed by the National Healthcare Surveillance Network (NHSN) within the Centers for Disease Control and Prevention (CDC) in the United States of America are the most comprehensive and widely used definitions for HAI surveillance and will be used in the Egyptian HAI surveillance program for identifying each type of HAIs.

An Egyptian task force was identified representing the different facilities participating in the national HAI surveillance program to revise and adapt case definitions. They agreed on using the NHNS 2012 case definitions with no change.

3.1.1. Urinary Tract Infections (UTI)

- Urinary tract infections (UTI) are defined using Symptomatic Urinary Tract Infection (SUTI) criteria, and Asymptomatic Bacteremic UTI (ABUTI).
- **Catheter-Associated UTI (CAUTI):** A UTI where an indwelling urinary catheter was in place for >2 calendar days on the date of event, with day of device placement being Day 1, AND an indwelling urinary catheter was in place on the date of event or the day before.

3.1.1.1. Symptomatic Urinary Tract Infection (SUTI)

I. CATHETER ASSOCIATED UTI (CAUTI):

- The Patient has an indwelling urinary catheter in place for > 2 days at the time of event.
- Symptomatic CAUTI must meet at least one of the following criteria:

Criterion 1:

a. At least one of the following signs or symptoms:
   - Fever (>38°C)
   - Suprapubic tenderness
   - Costovertebral angle pain or tenderness

b. A positive urine culture of ≥10^5 colony-forming units (CFU)/ml with no more than two species of microorganisms.

Criterion 2:

a. At least one of the following signs or symptoms:
   - Fever (>38°C)
   - Suprapubic tenderness
   - Costovertebral angle pain or tenderness

b. A positive urine culture of ≥10^3 and ≥10^5 CFU/ml with no more than 2 species of microorganisms.

c. At least one of the following findings:
   - Positive dipstick for leukocyte esterase and/or nitrite
   - Pyuria (urine specimen with ≥10 white blood cells [WBC]/mm3 of unspun urine or >3 WBC/high power field of spun urine)

II. Non-catheter Associated UTI (Non-CAUTI)

- The Patient has No indwelling urinary catheter in place at the time of event.
- Non-CAUTI must meet at least one of the following criteria:

Criterion 1:

a. At least **one of the following signs or symptoms**:
Fever (>38.0°C), Suprapubic tenderness, Costovertebral angle pain or tenderness, Urinary urgency, Urinary frequency, Dysuria

b. Patient has a urine culture with no more than two species of organisms identified, at least one of which is a bacterium of ≥10^5 CFU/m

Criterion 2:

a. At least one of the following signs or symptoms:
Fever (>38.0°C), Suprapubic tenderness, Costovertebral angle pain or tenderness, Urinary urgency, Urinary frequency, Dysuria.

b. A positive urine culture of ≥10^3 and ≥10^5 CFU/ml with no more than 2 species of microorganisms.

c. At least one of the following findings:
   i. Positive dipstick for leukocyte esterase and/or nitrite
   ii. Pyuria (urine specimen with ≥10 white blood cells [WBC]/mm^3 of unspun urine or >5 WBC/high power field of spun urine)
   iii. Microorganisms seen on Gram's stain of unspun urine

III. UTI IN PATIENTS ≤ 1 YEAR

- Patient is **with or without** indwelling urinary catheter.
- Must meet at least one of the following criteria:

Criterion 1

a. Patient had at least one of the following signs or symptoms:

Fever (>38°C core), hypothermia (<36°C core), apnea, bradycardia, dysuria, lethargy, vomiting

b. A positive urine culture of ≥105 CFU/ml with no more than 2 species of microorganisms

Criterion 2

a. Patient had at least one of the following signs or symptoms:

Fever (>38°C core), hypothermia (<36°C core), apnea, bradycardia, dysuria, lethargy, vomiting

b. A positive urine culture of ≥103 and ≥105 CFU/ml with no more than 2 species of microorganisms.

c. At least one of the following findings:

- Positive dipstick for leukocyte esterase and/or nitrite
- Pyuria (urine specimen with ≥10 white blood cells [WBC]/mm3 of unspun urine or >3 WBC/high power field of spun urine)
- Microorganisms seen on Gram's stain of unspun urine.

3.1.1.2. Asymptomatic Bacteremic UTI (ABUTI)

- Patient **with or without** an indwelling urinary catheter.
- Must meet the following criteria
    a. Has No signs or symptoms.
    b. A positive urine culture of ≥10^5 CFU/ml with no more than 2 species of uropathogen microorganisms.
    c. A positive blood culture with at least 1 matching uropathogen microorganism to the urine culture.

3.1.2. Ventilator Associated Pneumonia (VAP)

Pneumonia (PNEU) is identified by using a combination of imaging, clinical and laboratory criteria. Ventilator-associated pneumonia (VAP): A pneumonia where the patient is on mechanical ventilation for >2 calendar days on the date of event, with day of ventilator placement being Day 1, AND the ventilator was in place on the date of event or the day before.

Signs and Symptoms of Pneumonia:

Symptom	Definition
Fever	Temperature > 38° C
Hypothermia	Temperature < 36.5° C
Dyspnea	Shortness of breath
Tachypnea	▪ Respiration Rate: > 25 breaths per minute in adults ▪ Respiration Rate: > 75 breaths per minute in premature infants ▪ Respiration Rate: > 60 breaths per minute in infants 2 months old ▪ Respiration Rate: > 50 breaths per minute in infants 2 to 12 months old ▪ Respiration Rate: > 30 breaths per minute in children 1 year old
Worsening gas exchange	(e.g., O2 desaturations e.g., [PaO2/FIO2 ≤ 240], increased oxygen requirements, or increased ventilator demand)
Bradycardia	Heart rate < 100 beats/min in infants ≤1 year old
Tachycardia	Heart rate > 170 beats/min in infants ≤1 year old
Hemoptysis	Expectoration (coughing up) of blood or of blood-stained sputum from the bronchi, larynx, trachea, or lungs

Table 1Signs and Symptoms of Pneumonia

3.1.2.1. Clinically Defined Pneumonia (PNU1)

For Any Patient	a. 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. b. At least two of the following: ▪ New onset of purulent sputum or change in character of sputum, or increased respiratory secretions, or increased suctioning requirements ▪ New onset or worsening cough, or dyspnea, or tachypnea. ▪ Rales or bronchial breath sounds ▪ Worsening gas exchange

	c. Two or more serial chest imaging test results with New or Progressive: ▪ Infiltrate ▪ Consolidation ▪ Cavitation
Alternate criteria, for infants <1 year old	a. Worsening gas exchange b. At least three of the following: ▪ Temperature instability ▪ Leukopenia (≤4000 WBC/mm3) or leukocytosis (>15,000 WBC/mm3) and left shift (>10% band forms) ▪ New onset of purulent sputum or change in character of sputum , or increased respiratory secretions or increased suctioning requirements ▪ Apnea, tachypnea, nasal flaring with retraction of chest wall or nasal flaring with grunting ▪ Wheezing, rales, or rhonchi. ▪ Cough ▪ Bradycardia (<100 beats/min) or Tachycardia (170 beats/min) c. Two or more serial chest imaging test results with New or Progressive: ▪ Infiltrate ▪ Consolidation ▪ Cavitation ▪ Pneumatoceles, in infants ≤1 year old
Alternate criteria, for child >1 year old or ≤12 years	a. Fever (>38°C) or hypothermia (<36°C) b. Leukopenia (≤4000 WBC/mm3) or leukocytosis (≥15,000 WBC/mm3) c. New onset of purulent sputum or change in character of sputum, or increased respiratory secretions, or increased suctioning requirements d. New onset or worsening cough, or dyspnea, apnea, or tachypnea. e. Rales or bronchial breath sounds f. Worsening gas exchange

Table 2 clinically defined Pneumonia

3.1.2.2. Pneumonia with common bacterial pathogen (PNU2)

Signs/Symptoms	a. 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, altered mental status with no other recognized cause. b. At least one of the following: ▪ New onset of purulent sputum or change in character of sputum, or increased respiratory secretions, or increased suctioning requirements ▪ New onset or worsening cough, or dyspnea, or tachypnea ▪ Rales or bronchial breath sounds ▪ Worsening gas exchange
Laboratory	At least one of the following: ▪ Organism identified from blood ▪ Organism identified from pleural fluid ▪ Positive quantitative culture from minimally-contaminated LRT specimen (specifically, BAL, protected specimen brushing or endotracheal aspirate)
Imaging Test	Two or more serial chest imaging test results with New or Progressive: ▪ Infiltrate ▪ Consolidation ▪ Cavitation ▪ Pneumatoceles, in infants ≤1 year old

Table 3 Pneumonia with common bacterial pathogens

3.1.2.3. Pneumonia in Immunocompromised Patients (PNU3)

Signs/ Symptoms	Patient who is immunocompromised has at least one of the following: ▪ Fever (>38.0°C or >100.4°F) ▪ For adults >70 years old, altered mental status with no other recognized cause. ▪ New onset of purulent sputum or change in character of sputum, or increased respiratory secretions, or increased suctioning requirements ▪ New onset or worsening cough, or dyspnea, or tachypnea ▪ Rales or bronchial breath sounds ▪ Worsening gas exchange (for example O2 desaturations, increased oxygen requirements, or increased ventilator demand) ▪ Hemoptysis ▪ Pleuritic chest pain
Laboratory	a. At least one of the following: ▪ Identification of matching Candida spp. from blood and one of the following: sputum, endotracheal aspirate, BAL or protected specimen brushing ▪ Evidence of fungi (excluding Candida and yeast) from minimally-contaminated LRT specimen from one of the following: ○ Direct microscopic exam ○ Positive culture of fungi ○ Non-culture diagnostic laboratory test b. OR, any of the following ▪ Organism identified from blood ▪ Organism identified from pleural fluid ▪ Positive quantitative culture result from minimally-contaminated LRT specimen (BAL, protected specimen brushing or endotracheal aspirate)
Imaging Test	Two or more serial chest imaging test results with New or Progressive: ▪ Infiltrate ▪ Consolidation ▪ Cavitation ▪ Pneumatoceles, in infants ≤1 year old Blood Stream Infections

Table 4 Pneumonia in immunocompromised patients

3.1.3. Central Line Associated Blood Stream Infections (CLABSI)

Central line-associated BSI (CLABSI): A laboratory-confirmed bloodstream infection (LCBI) where central line or umbilical catheter was in place for >2 calendar days on the date of event, with day of device placement being Day 1, AND the line was also in place on the date of event or the day before.

3.1.3.1. Laboratory Confirmed Blood stream Infection

LCBI 1

a. Patient of any age has a recognized pathogen cultured from one or more blood cultures.
b. Organism cultured from blood is not related to an infection at another site.

LCBI 2

a. Patient of any age has at least one of the following signs or symptoms:
    - Fever (>38oC)
    - Chills
    - hypotension
b. Common commensal is identified from two or more blood cultures drawn on separate occasions.
c. Positive laboratory results are not related to an infection at another site.

LCBI 3

a. Patient ≤ 1 year of age has at least one of the following signs or symptoms:
    - Fever (>38oc)
    - Hypothermia (<36oc)
    - Apnea
    - Bradycardia
b. Positive laboratory results are not related to an infection at another site
c. Common skin commensal is cultured from two or more blood cultures drawn on separate occasions

Recognized Pathogen	Common Commensals
E. coli spp.	Coagulase Negative Staphylococci (CONS),
Pseudomonas spp.,	Diphtheroids (Corynebacterium spp.),
Klebsiella spp.,	Bacillus spp,
Acinetobacter spp.,	Strept. Viridans,
Enterococcus spp.,	Others.
Candida spp.,	
Others.	

Table 5 Recognized pathogens vs common commensals pathogens

3.1.4. Surgical Site Infections (SSI)

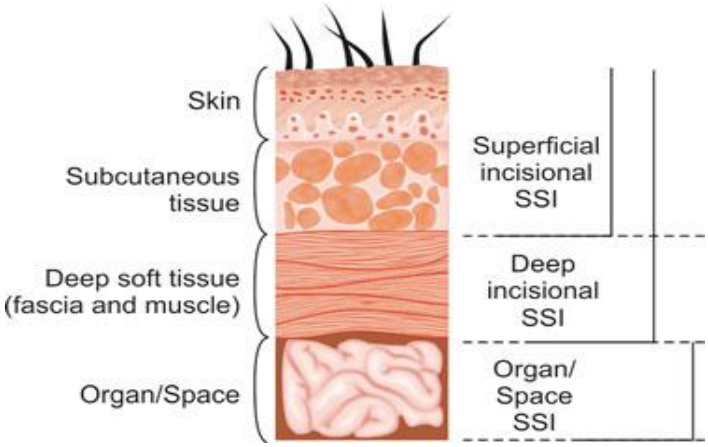


Figure 2 classification of SSI

3.1.4.1 Superficial Incisional

a. Infection occurs within 30 days after any operative procedure;
b. Involves only skin and subcutaneous tissue of the incision.
c. Patient has at least one of the following:
    i. Purulent drainage from the superficial incision.
    ii. Organisms isolated from an aseptically-obtained culture of fluid or tissue from the superficial incision.
    iii. Superficial incision that is deliberately opened by a surgeon and is culture-positive or not cultured and; Patient has at least one of the following signs or symptoms:
        - Pain or tenderness;
        - Localized swelling;
        - Redness; or heat.
    iv. Diagnosis of a superficial incisional SSI by the surgeon or attending physician.

3.1.4.2 Deep incisional SSI

a. Infection occurs within 30 or 90 days after the operative procedure
b. Involves deep soft tissues of the incision (e.g., fascial and muscle layers)
c. Patient has at least one of the following:
    i. Purulent drainage from the deep incision.

ii. A deep incision that spontaneously dehisces or is deliberately opened by a surgeon and is culture-positive or not cultured and Patient has at least one of the following signs or symptoms:
    - fever (>38°C);
    - localized pain or tenderness.
    - An abscess or other evidence of infection involving the deep incision that is found on direct examination, during invasive procedure, or by histopathologic examination or imaging test.
    - Diagnosis of a deep incisional SSI by a surgeon or attending physician.

3.1.4.3 Organ/Space SSI

a. Infection occurs within 30 or 90 days after the operative procedure;
b. infection involves any part of the body, excluding the skin incision, fascia, or muscle layers, that is opened or manipulated during the operative procedure;
c. patient has at least one of the following:
    i. Purulent drainage from a drain that is placed into the organ/space
    ii. Organisms isolated from an aseptically-obtained culture of fluid or tissue in the organ/space
    iii. An abscess or other evidence of infection involving the organ/space that is found on direct examination, during invasive procedure, or by histopathologic examination or imaging test.

Specific Sites of an Organ/Space SSI			
Spinal abscess/infection	Joint or bursa infection	Gastrointestinal (GI) tract infection	Ear, mastoid infection
Breast abscess or mastitis	Mediastinitis	Intra-abdominal infection	Disc space infection
Myocarditis or pericarditis	Oral cavity infection (mouth, tongue, or gums)	Upper respiratory tract, pharyngitis, laryngitis, epiglottitis	Deep pelvic tissue infection or other infection of the male or female reproductive system
Sinusitis	Meningitis or ventriculitis	Urinary System Infection	Periprosthetic joint infection
Endocarditis	Osteomyelitis	Intracranial infection	Other infection of the lower respiratory tract
Endometritis	Arterial or venous infection	Vaginal cuff infection	

Table 6 specific site of organ/space SSI

List of surgeries in the HAI-NESR system

Cardiothoracic surgery	Vascular surgery
▪ CBGC - Coronary bypass graft ▪ CBGC - Coronary bypass graft with valve replacement ▪ Ventricular septal defect (VSD) ▪ Arterial septal defect (ASD) ▪ Tetralogy of Fallot (TOF) ▪ Thoracic surgery ▪ Pacemaker surgery ▪ Coarctation of Aorta (COA) ▪ Patent ductus arteriosus (PDA)	▪ Shunt for dialysis ▪ Abdominal aortic aneurysm repair ▪ Carotid endarterectomy ▪ Peripheral vascular bypass surgery
Obstetrics/Gynecology surgery	Urology surgery
▪ Abdominal Hysterectomy ▪ Cesarean section ▪ Vaginal Hysterectomy ▪ Ovarian surgery	▪ Kidney transplant ▪ Kidney surgery ▪ Prostate surgery
Orthopedics surgery	**Neurosurgery**
▪ Refusion of spine ▪ Spinal fusion ▪ Laminectomy ▪ Open reduction of fracture ▪ Knee prosthesis ▪ Hip prosthesis	▪ Craniotomy ▪ Ventricular shun
General Surgery	
▪ Liver transplant ▪ Colon surgery ▪ Bile duct surgery ▪ Liver surgery ▪ Pancreatic head tumor ▪ Small bowel surgery ▪ Rectal surgery ▪ Gastric surgery ▪ Cholecystectomy	▪ Thyroid and parathyroid surgery ▪ Herniorrhaphy ▪ Limb amputation ▪ Neck surgery. ▪ Mastectomy ▪ Exploratory laparotomy ▪ Appendectomy ▪ Spleen surgery

Table 7 list of surgeries in the HAI-NESR system

Surveillance Periods for SSI Following Selected Operative Procedure

30-day Surveillance	
▪ Abdominal aortic aneurysm repair	▪ Laminectomy
▪ AMP Limb amputation	▪ Liver transplant
▪ APPY Appendix surgery	▪ Neck surgery
▪ AVSD Shunt for dialysis	▪ Kidney surgery
▪ BILI Bile duct, liver or pancreatic surgery	▪ Heart transplant
▪ Carotid endarterectomy	▪ Carotid endarterectomy
▪ Ovarian surgery	▪ Gastric surgery
▪ Prostate surgery	▪ Thoracic surgery
▪ Gallbladder surgery	▪ Rectal surgery
▪ Colon surgery	▪ Small bowel surgery
▪ Cesarean section	▪ Spleen surgery
90-day Surveillance	
▪ Breast surgery	
▪ Cardiac surgery	
▪ Coronary artery bypass graft with both chest and donor site incisions	
▪ Craniotomy	
▪ Spinal fusion	
▪ Open reduction of fracture	
▪ Herniorrhaphy	
▪ Hip prosthesis	
▪ Knee prosthesis	
▪ Pacemaker surgery	
▪ Peripheral vascular bypass surgery	
▪ Ventricular shun	

Table 8 surveillance periods of SSI

3.2. Data Collection / Data entry

3.2.1. Device Associated Infections

Numerator Data Collection

Two standardized data collection forms (Logbooks) will be used for data collection in the ICUs (Appendices 1 and 2). Appendix 1 is for patients' screening upon ICU admission and Appendix 2 is for patients with suspected HAIs. Each ICU will have one **screening logbook** contains the following data for all patients:

- Serial Number
- Full Patient Name (first, middle, last names)
- Hospital admission number
- Clinical Diagnosis
- Patient had surgery or not
- ICU admission date

The IPC link nurse will document the patient information in the screening logbook upon patient admission to the ICU. Patient data will be updated in the screening logbook 3 times per week until their discharge from the ICU (whether HAIs is suspected or not).

If the patient is suspected to have HAI, the date and type of suspected HAI should be documented in the Screening logbook. The patient entry in the logbook should be completed with the patient outcome (Died, Discharged, transferred)

Each episode of infection of a suspected case should be documented in the **suspect- case logbook**.

The Logbook will include the following data for any HAI suspected case:

Patient serial number: must be the same serial number as in the screening logbook

- Type of suspected infection
- Full patient Name (first, middle, last names)
- Hospital Number
- Date and Type of culture (Blood, Urine, BAL, wound)
- Type of isolated Pathogen and Isolate label number.
- Date and type of any laboratory and radiological investigations requested for the patient
- Date of starting Smart Device and date of completion of each Smart Device section.
- Type of HAI given by the Smart Device of the suspected case

Each line (entry) in the logbook represents new episode of infection, if a patient is suspected to have two episodes of infection (e.g. pneumonia and Blood stream infection), two entries should be made in the logbook. All information of the suspected episode should be completed even if the patient is discharged or died.

Denominator Data Collection

During the month of surveillance, the number of patients in the ICU (patient-days) and the number of patients with attached devices: central line, urinary catheter and ventilator (device days), is collected on a designated data collection form (Appendix 3 and 4).

Denominator data (patient days and device days) will be collected at the same time, every day, for each ICU performing surveillance to ensure that differing collection methods don't inadvertently result in device days being greater than patient days.

For daily collection of denominator data, the following should be recorded:

- The total number of patients on the unit.
- The number of patients on the ICU who have at least one central line.
- The number of patients on ICU who have an indwelling urinary catheter.
- The number of patients on the ICU who are on a mechanical ventilator.
- At the end of the month, these daily counts are summed and only the total for the month is entered into smart phone.

3.2.2. Surgical Site Infection

Numerator Data collection

Data will be collected prospectively. SSI Screening Logbook (Appendix 5) along with SSI Suspect case logbook (Appendix 6) are completed for every patient who undergoes surgery at the selected departments through the ward link nurse. Patients will be followed up during every dressing throughout the patient hospital admission to assess the presence of any symptom or sign suggestive of infection. Attending surgeon will be asked to report any diagnosed SSI. The process of inpatient follow up will end by the end of hospital stay (discharge, or death).

Infection control team will be responsible for follow up at the outpatient clinics. They will daily update the outpatient clinic logbook (Appendix 7), recording information of discharged patients such as operation type, and other patient criteria. On outpatient clinic days specific to the selected departments, Infection Control team members will attend the outpatient clinic to follow up for reporting. Follow up will be completed when the patient develop SSI (primary endpoint), or after 30 - 90 days post-operative without reporting of SSI (whether patient is seen on outpatient clinic or he is not attending the visit).

The surveillance coordinator will enter the procedure and surgical site infections SSI data into HAI-NESR smart phone application once all surveillance data are collected.

Denominator Data Collection

Appendix 8 is the denominator tool for collection of the number of surgical procedures performed at the month of surveillance.

3.2.3. Electronic Data Entry

Electronic data entry will be done using smart phones, which are programed to receive patient data electronically. Only suspected patient's data will be entered to the smart phone application. A new entry will be made for each suspected episode of infection, if a patient is suspected to have two episodes of infections (e.g. pneumonia and Blood stream infection) two entries should be made in the Smart Device.

All infections should be entered in the Smart Device whether the infection is CAI (Community Acquired Infection), or HAI from another hospital or HAI attributed to your hospital.

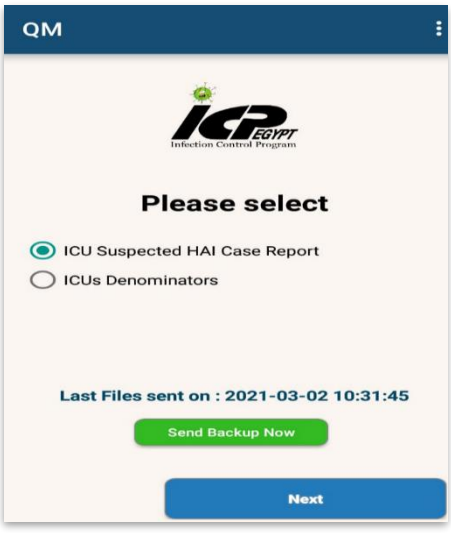
Infection Data should also be collected and entered in the Smart Device for the multiple episodes of the same infection (e.g. Patient has multiple episodes of BSI). For patients with multiple infection episodes, enter each episode in a separate record in the Smart Device.

To consider an infection as a new infection episode, the patient must be free of infection at least three days after the first episode, free from infection means: free from any signs or symptoms – also relevant investigations must be negative - related to the previous infection episode.

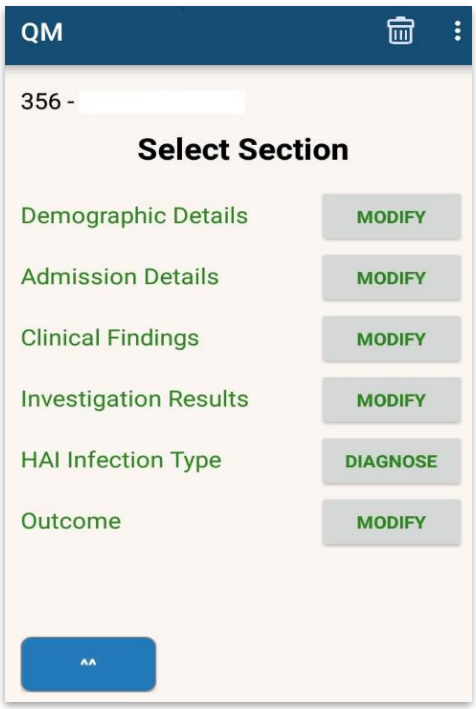
How to use smart phone application in data entry

For participating hospitals, IPC teams will be provided with two smart phones to be used in data entry, one phone for DAI data entry in the ICU and the other for SSI data entry.

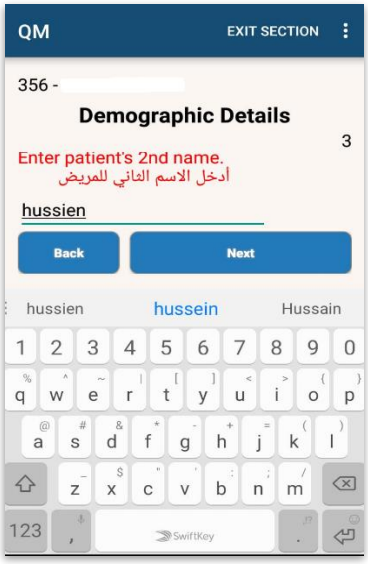
1. Using the ICU smart phone device, open the HAI-NESR application. On the main screen, select "ICU suspected HAI case report" to add or modify a new entry for ICU suspected HAI case. Select "ICU denominators" if you want to add the ICUs denominators for the month of surveillance. You will have to Login using your hospital Username and Password before making any data entry/modification.

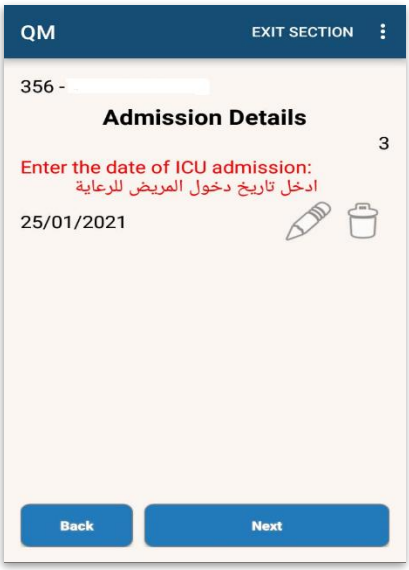


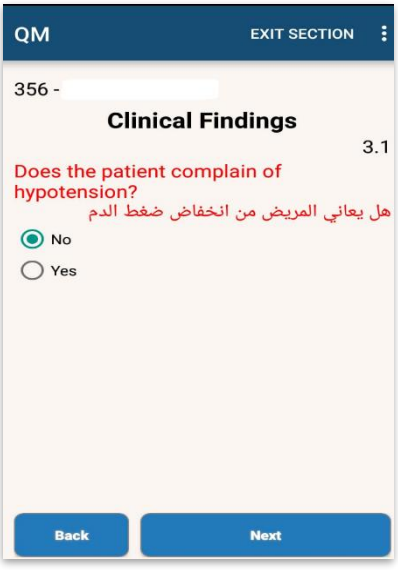
2. If you want to add or modify suspected HAI case, select “add new HAI suspect case” or “Modify existing HAI suspect case”. After clicking “Next”, you will be able to select the set of data that you need to add or modify.



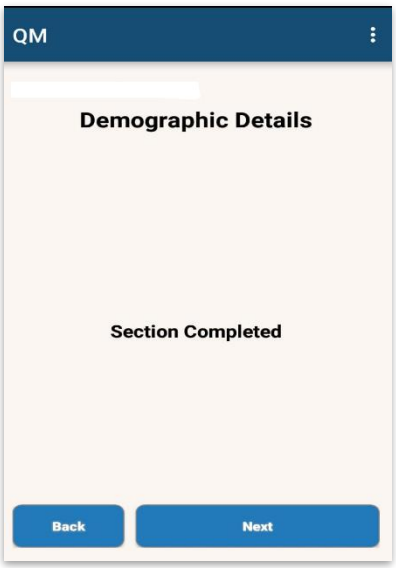
3. Select a section and follow the instructions that appear on the screen to add all collected data. you’ll be notified when a section is complete to go to the next section

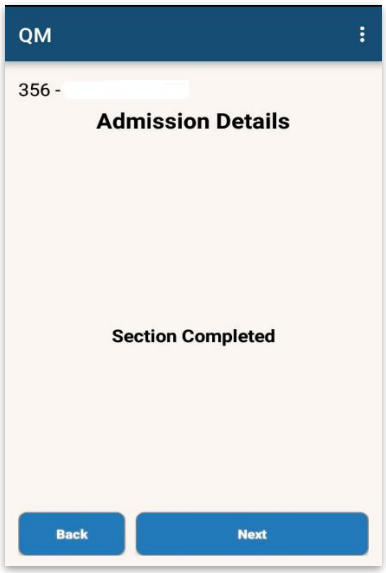


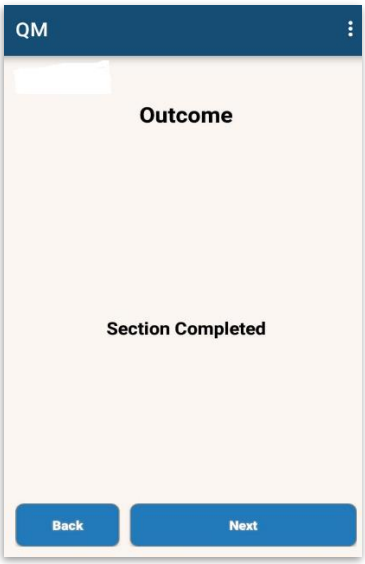




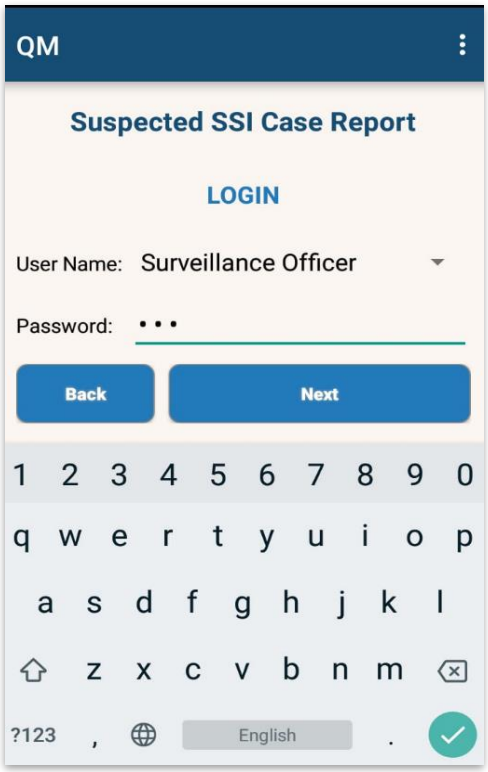
4. Continue until you finish data entry/modification of all sections of ICU suspected HAI case.



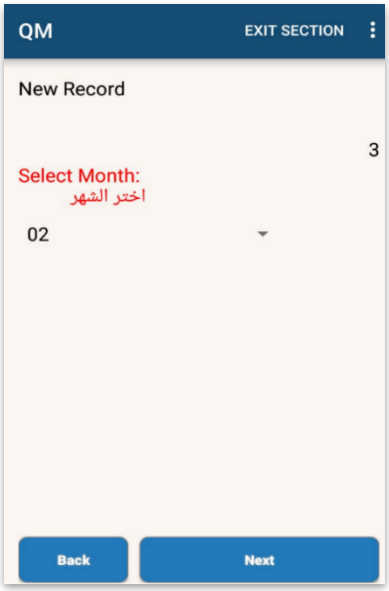


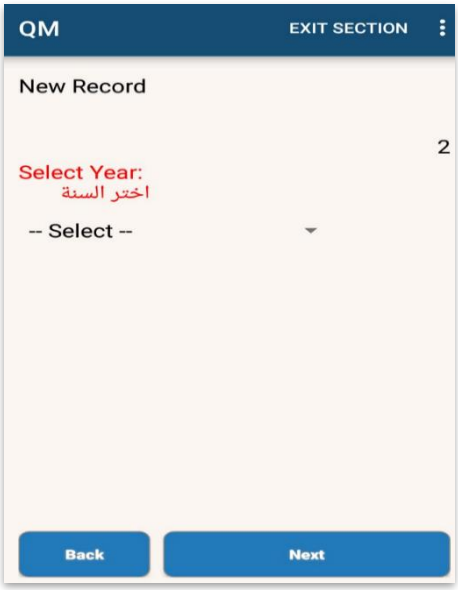


5. For SSI data entry, use the SSI mart phone device. Select whether you want to add Suspected SSI case, or to enter SSI denominators for the month of surveillance. Login using your hospital username and password to enable data entry.

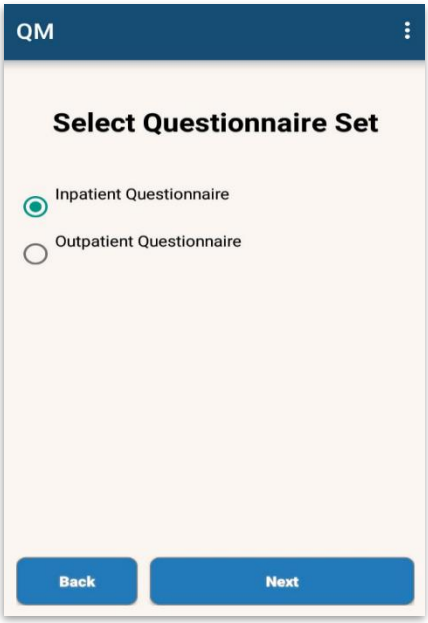


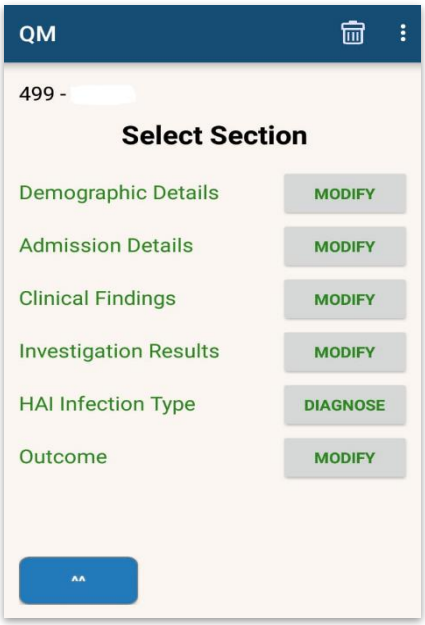
6. To enter the SSI denominator, select the month and year of the surveillance month, and then proceed with data entry.



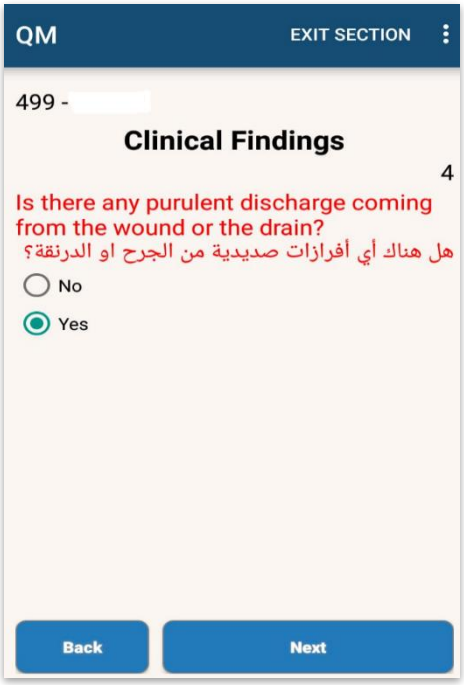


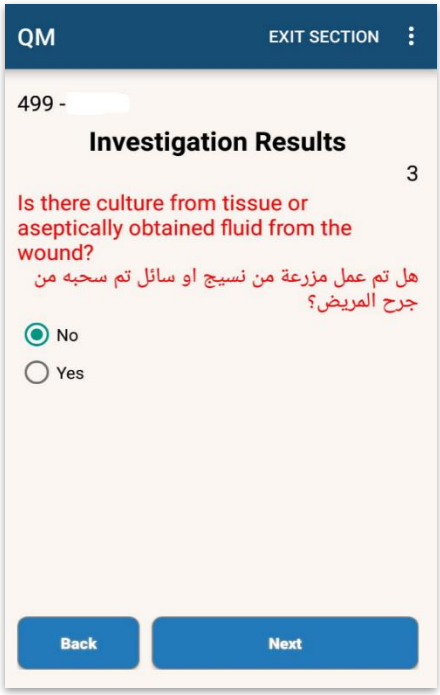
7. If you want to add/modify data for suspected SSI case, you have to select the questionnaire set to use either the inpatient questionnaire or the outpatient questionnaire. Select whether you want to add new suspect case or to modify existing case. Repeat the same steps as with the ICU data entry.

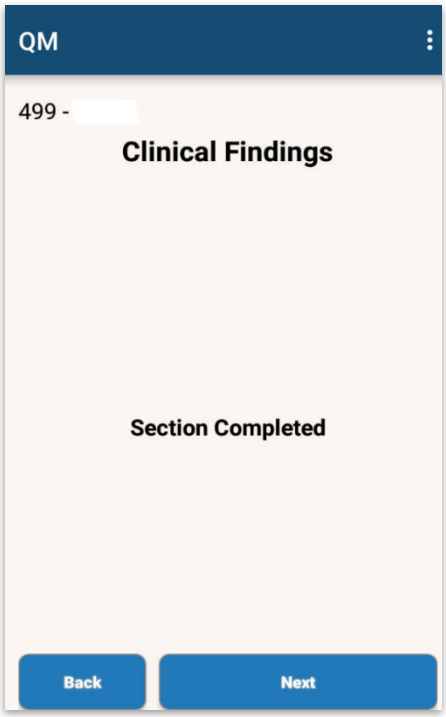


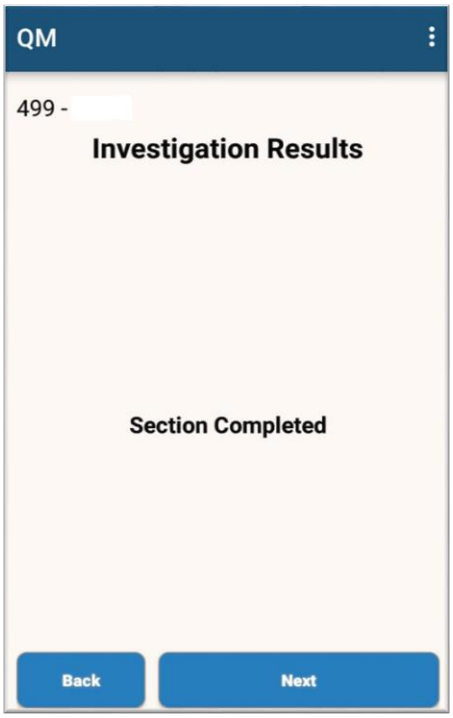


8. Enter or modify data until all sections of SSI suspect case are complete









3.3. Electronic Data Analysis

3.3.1. Surveillance Reports

Once the smart phone entries are completed and validated, the infection Control teams of enrolled hospitals will have the ability to see their data and share that information with their facility leadership. Infection Control Teams can directly access their hospital surveillance reports from the HAI-NESR website. Analysis tools within HAI-NESR website help facilitate internal benchmark activities.

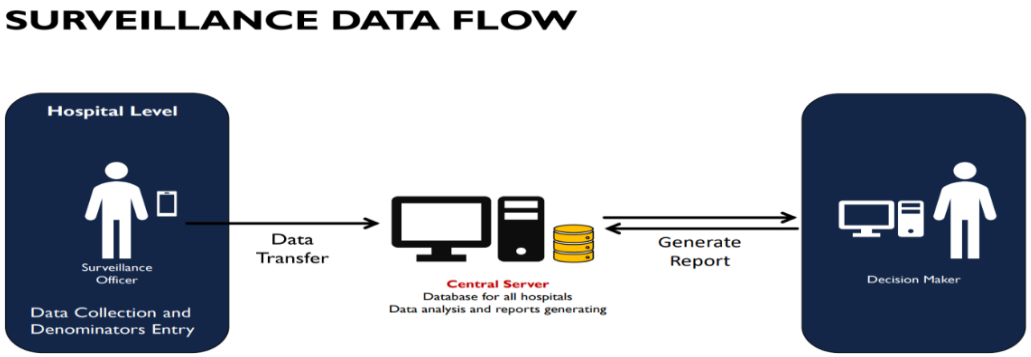
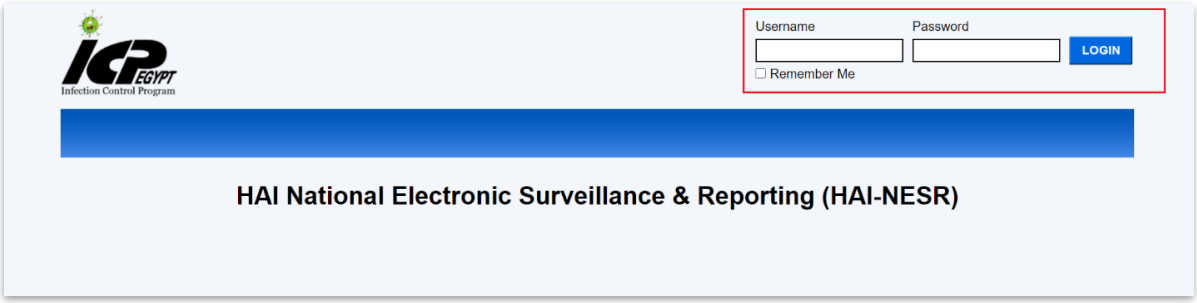


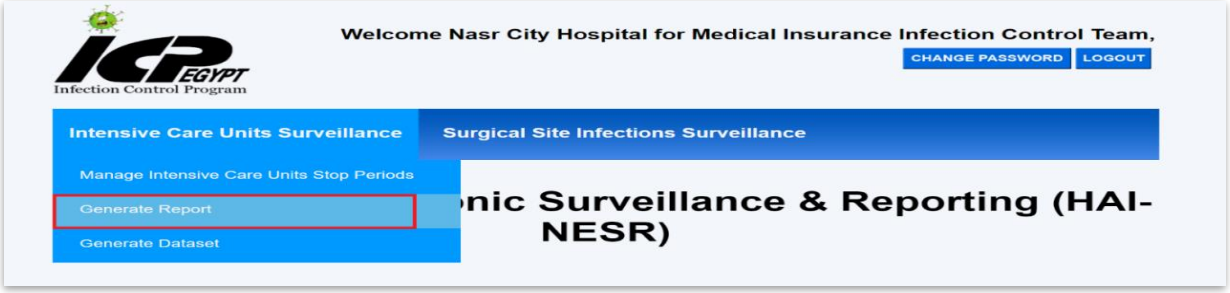
Figure 3 Surveillance data flow

How to Access your surveillance report from the HAI-NESR website

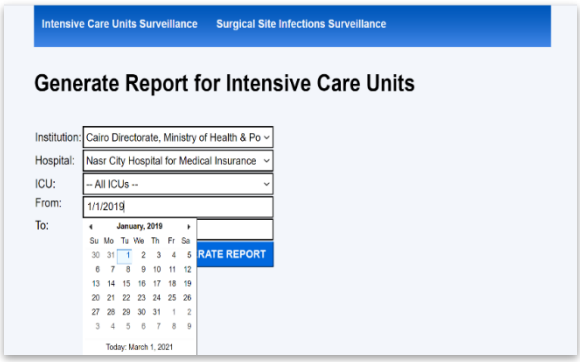
1. Go to website *http://www.icpegypt.com*
2. Enter your facility username and password provided to you by the central IPC unit



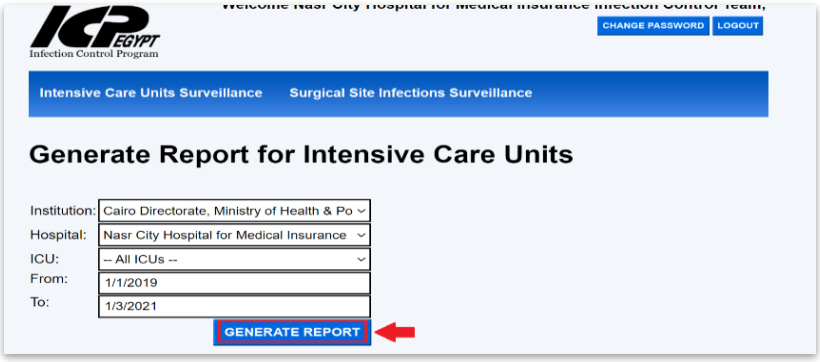
3. Within HAI-NESR site, navigate to Menu “Intensive care surveillance” and select “Generate Report”



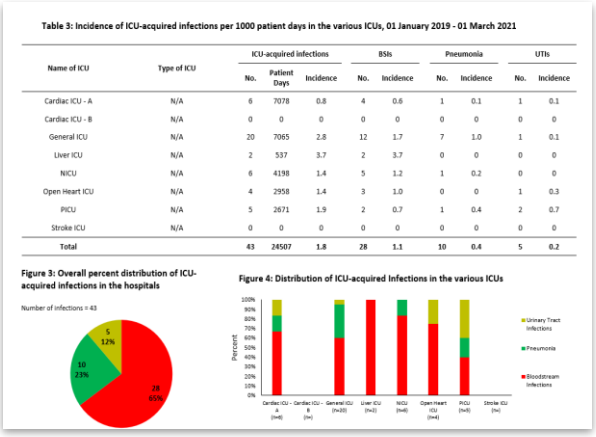
4. Select the type of ICU that you are interested in or select “ALL ICUs” for an aggregated report of all hospital ICUs. Specify a time period for your report.

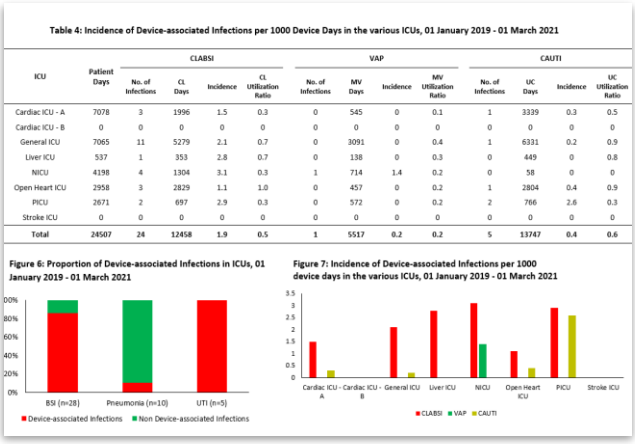


5. Click “Generate Report” to create your hospital’s ICU(s) DAI report.

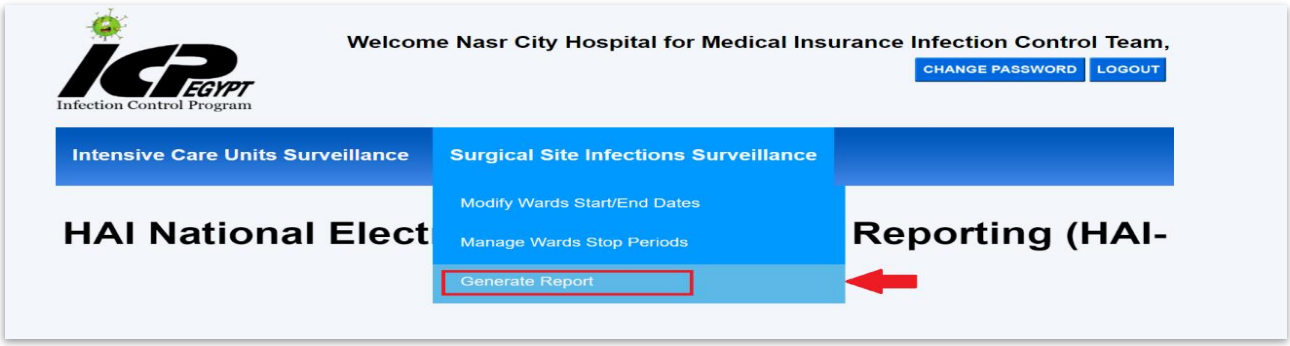


6. A word report will be automatically downloaded containing charts and graphs that represent the distribution of device-associated (DAI) in your hospital ICUs

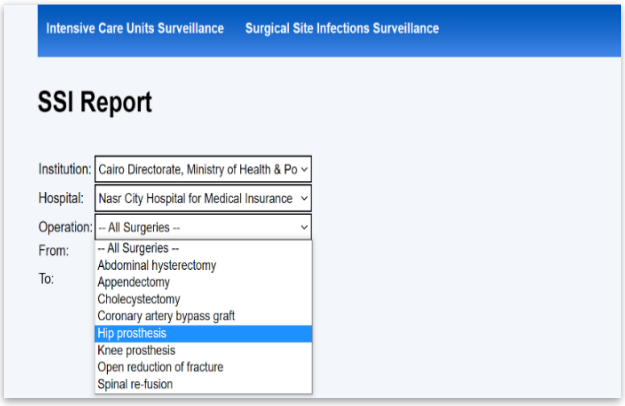


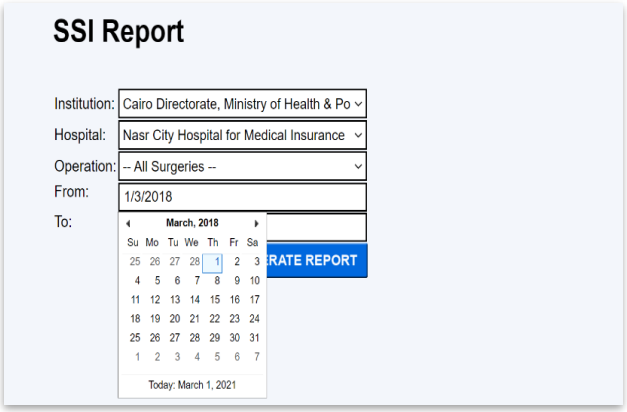


7. Select “Generate report” in the SSI menu to generate your hospital SSI report.

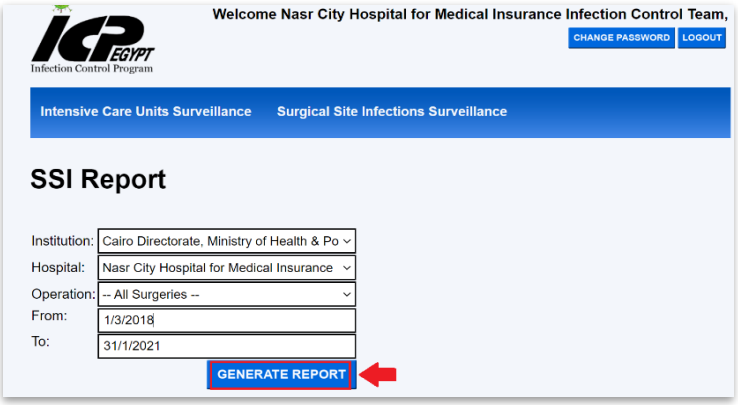


8. Select the type of surgical procedure that you are interested in or select “ALL Surgeries” for an aggregated report. Specify a time period for your report.





9. Click “Generate Report” to download your hospital’s SSI report.



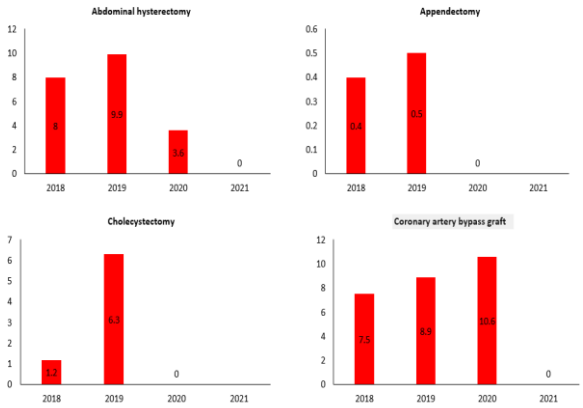
10. A word report will be automatically downloaded containing charts and graphs that represent the rates of SSI in your hospital, also a spreadsheet that contains your hospital SSI dataset will be available to allow for review of data.

Table 2: Incidence of Surgical Site Infections by Operation, 01 March 2018 - 01 March 2021

Operation	No. of Operations	No. of SSIs	SSI Incidence	Type of Surgical Site Infections					
				Superficial SSIs		Deep SSIs		Organ/Space SSIs	
				No.	Inc.	No.	Inc.	No.	Inc.
Abdominal hysterectomy	366	29	7.9	11	3.0	18	4.9	0	0
Appendectomy	483	2	0.4	0	0	2	0.4	0	0
Cholecystectomy	182	3	1.6	2	1.1	1	0.5	0	0
Coronary artery bypass graft	664	57	8.6	11	1.7	43	6.5	3	0.5
Hip prosthesis	339	18	5.3	4	1.2	12	3.5	2	0.6
Knee prosthesis	263	3	1.1	1	0.4	2	0.8	0	0
Open reduction of fracture	2503	29	1.2	3	0.1	26	1.0	0	0
Spinal re-fusion	629	11	1.7	6	1.0	5	0.8	0	0
Total	**5429**	**152**	**2.8**	**38**	**0.7**	**109**	**2.0**	**5**	**0.1**

Figure 1: Incidence of Surgical Site Infections by Operation

Figure 3: Annual incidence of Surgical Site Infections by Operation, 01 March 2018 - 01 March 2021



3.3.2. Benchmarking

Benchmarking involves comparing an infection rate with another point of reference which gives an indication of performance. Benchmarking should only be used as a guide and interpreted with caution due to potential variability in case mix, size of population and surveillance practice. Benchmarked data must be collected using standardized case definitions as well as similar data collection methods and in populations of adequate sizes over a sufficient duration of time.

HAI benchmarking can be divided into internal and external systems.

- **Internal benchmarking:** involves comparing current outcomes to baseline data or comparing different departments in the same healthcare facility.
- **External benchmarking:** involves comparing outcomes in one healthcare facility to other facilities performing similar activities with the same size of population and surveillance methodology.

4. Paper-based Surveillance System

This section is intended to assist PCI professionals in hospitals still adopting the paper-based surveillance system.

Surveillance Methodology

HAI surveillance will require active, patient-based, prospective surveillance of infections and their corresponding denominator data collected by a trained Infection control professionals (ICP). The ICP shall look for infections during a patient's stay by screening a variety of data sources, such as laboratory, pharmacy, admission/discharge/transfer records, radiology/imaging reports, as well as patient files, including history and physical exam notes, nurses/physicians notes, temperature charts, etc. Laboratory-based surveillance should not be used alone. Retrospective chart reviews should be used only when patients are discharged before all information can be gathered. Standardized forms should be used to collect all required data using the case definitions of HAIs as listed in section 3.1. Spreadsheet (Excel sheets) is preferred to be used to store data and calculate HAI rates, to maximize infection prevention and control resources and reduce the potential for errors associated with manual calculations.

4.1. Urinary Tract Infection (UTI)

Numerator Data

The Urinary Tract Infection (UTI) form (Appendix 9) is used to collect and report each UTI that is identified during the month of surveillance.

The UTI form includes patient demographic information and information on indwelling urinary catheter. Additional data include the specific criteria met for identifying the UTI, the organisms isolated from cultures and their antimicrobial susceptibilities.

Denominator Data:

During the month of surveillance, the daily number of patients in the ICU (patient-days) and the number of patients with urinary catheter should be collected on a designated data collection form (Appendix 3 and 4).

Data Analysis:

The CAUTI rate per 1000 urinary catheter days is calculated by dividing the number of CAUTIs by the number of urinary catheter days and multiplying the result by 1000.

$$\text{CAUTI Rate per 1000 urinary catheter days} = \frac{No.\ of\ CAUTIs}{No.\ of\ \text{Urinary}\ Catheter\ Days} * 1000$$

Device Utilization Ratio (DURs)

DUR are useful for the purposes of tracking device use over shorter periods of time and for internal trend analyses. The urinary catheter Utilization Ratio is calculated by dividing the number of urinary catheter days by the number of patient days.

4.2. Ventilator Associated Pneumonia (VAP)

Numerator Data:

The VAP Data collection form (Appendix 10) is used to collect and report each VAP that is identified during the month of surveillance. The VAP forms includes patient demographic information and information on the dates of mechanical ventilation connection. Additional data include the specific criteria met for identifying pneumonia and presence of clinical symptoms.

Denominator Data:

Device days and patient days are used for denominators. Ventilator days, which are the number of patients managed with a ventilator device, are collected daily, at the same time each day, according to the chosen location using the appropriate form (Appendix 3 and 4). These daily counts are summed and only the total for the month is used for rates calculations. Ventilator days and patient days are collected for each of the locations where VAP is monitored.

Data Analysis:

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.

$$\text{VAP Rate per 1000 ventilator days} = \frac{No.\ of\ VAPs}{No.of\ Ventilator\ Days} * 1000$$

Ventilator Utilization Ratio

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

4.3. Central Line Associated BSI (CLABSI)

Numerator Data:

The Primary Bloodstream Infection (BSI) form (Appendix 11) is used to collect and report each CLABSI that is identified during the month of surveillance. The Primary BSI form includes patient demographic information and whether a central line was present, Additional data include the specific criteria met for identifying the primary BSI, whether the patient died, and organisms identified from blood specimens, and the organisms' antimicrobial susceptibilities.

Denominator Data:

During the month of surveillance, the daily number of patients in the ICU (patient-days) and the number of patients with Central venous catheters should be collected on a designated data collection form (Appendix 3 and 4).

Data Analysis:

The CLABSI rate per 1000 central line days is calculated by dividing the number of CLABSIs by the number of central line days and multiplying the result by 1000

$$\text{CLABSI Rate per 1000 Central Line days} = \frac{No.\ of\ CLABSIs}{No.\ of\ \text{Central Line}\ Days} * 1000$$

Central Line Utilization Ratio

The Central line Utilization Ratio is calculated by dividing the number of central line days by the number of patient days

4.4. Surgical Site Infections (SSI)

Numerator Data collection

All patients having any of the procedures included in the selected operative procedure category(s) as listed in Table 7 will be monitored for SSI. Ward link nurse will complete the SSI data collection form (Appendix12) for each SSI case. The SSI Screening Logbook (Appendix 5) along with SSI Suspect case logbook (Appendix 6) and OR Logbook (Appendix 13) are completed by the ward link nurse for every patient who undergoes surgery at the selected departments. These Logbooks facilitate data collection so IPC teams can follow-up patients during their hospital admission to assess the presence of any signs or symptoms of infection. Attending surgeon will be asked to report if he thinks SSI is

diagnosed. The process of inpatient follow up will end by the end of hospital stay (discharge, or death). Infection control team will be responsible for follow up at the outpatient clinics. They will daily update the outpatient clinic logbook (Appendix 7), recording information of discharged patients such as operation type, and other patient criteria. On outpatient clinic days specific to the selected departments, Infection Control team members will attend the outpatient clinic to follow up for reporting. Follow up will be completed when the patient develop SSI (primary endpoint), or after 30/90 days post-operative without reporting of SSI (whether patient is seen on outpatient clinic or he is not attending the visit).

Denominator Data Collection

Appendix 8 is the denominator tool for collection of the number of surgical procedures performed at the month of surveillance.

Data Analysis:

SSI rates per 100 operative procedures are calculated by dividing the number of SSIs by the number of specific operative procedures and multiplying the results by 100. SSIs will be included in the numerator of a rate based on the date of procedure, not the date of event.

$$\text{SSI Rate per 100 Operative procedures} = \frac{No.\ of\ \text{SSIs}}{No.\ of\ \text{Specific operative procedures}} * 100$$

5. Roles and Responsibilities

Surveillance requires cooperation and communication between:

- Surveillance officers
- ICU physicians
- IC Teams
- Microbiology lab staff
- Data managers

I. Surveillance Officers

The Surveillance officer is responsible for collecting and documenting data of Health care associated infections by using the Smart Phone Device and logbooks. Surveillance Officers could be:

- High Nurses.
- Infection Control Team Members.
- ICU Doctors.

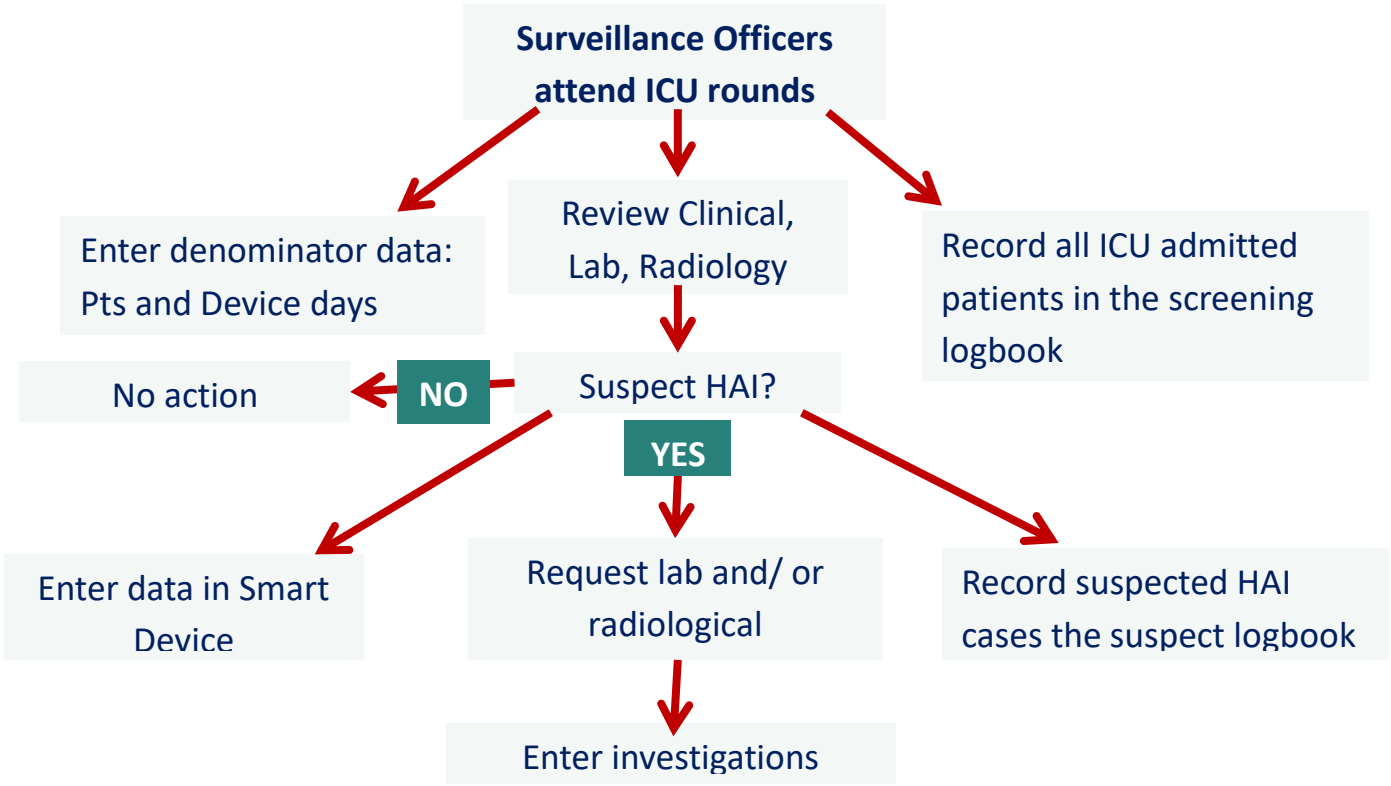


Figure 4 surveillance officers procedure

Responsibilities during Surveillance Rounds:

- Enter the denominator daily to the smart device.
- Conduct surveillance rounds 3 times / week at fixed time.
- Record all ICU patient names in the Screening Logbook.
- Check patient's files for signs and symptoms suggestive of infection.
- Participate in the clinical rounds inside the ICU at least 3 times per week.
- Mark the suspect cases in the screening logbook when you find out any signs and symptoms suggestive of infection, and write the date of suspicion.

Responsibilities after Suspecting HAI Cases

- Document any suspect cases of HAI in Suspect Cases Logbook.
- Collect data about each suspect case using patient file (physician progress notes, vital Signs, investigations, cultures results) and communicate with the assigned physician and nurse.

Communicate with the Lab personnel:

- Communicate with the lab focal person at least 3 per week for any pending results.
- Immediately notify the lab focal person with any isolate number generated by the Smart Devices.

Communicate with Data Managers

- Deliver the Smart Devices weekly to the Data mangers or the Infection control team/
- Deliver the denominator monthly to the Data mangers or the Infection control team.

How to Suspect HAIs?

- ✓ Attend medical rounds and ask the treating physician.
- ✓ Review patient charts and file.
- ✓ Talk to the assigned patient care nurses.
- ✓ Follow up investigations (Lab and Radiology)

II. ICU physicians

The ICU physician is considered the surveillance Champion among colleagues. He should have Knowledge of the adapted case definitions of HAIs, Identify signs and symptoms suggestive of infection and notify link nurses (Surveillance officers) during their rounds and request necessary Microbiological or radiology investigations to support diagnosis of infection.

III. Hospital IC Teams

- Supervise surveillance activities
- Continuous monitoring
- Conduct surveillance training for new surveillance officers (turn over)
- Data backup (sending)

IV. Lab Personnel

- Document in the lab logbook all the cultures sent from the ICUs (Appendix 13)
- Communicate with the surveillance officers in the ICUs for the culture results
- Document any isolate numbers generated by the Smart Devices in the lab logbook

V. Data Coordinator

Back up the data from each Smart Device and Send data to ICP website on Weekly basis

6. References

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3. Best Practices for Surveillance of Health Care-associated Infections In Patient and Resident Populations, 3rd edition, Provincial Infectious Diseases Advisory Committee (PIDAC)
4. National Healthcare Safety Network (NHSN) Patient Safety Component Manual, https://www.cdc.gov/nhsn/acute-care-hospital/index.html
5. Kathryn N. Suh and Terrie B. Lee. IFIC Basic Concepts of Infection Control, 3rd edition, 2016. Chapter 4 Surveillance for Healthcare Infections,
6. European Centre for Disease Prevention and Control. European surveillance of healthcare-associated infections in intensive care units – HAI-Net ICU protocol, version 1.02. Stockholm: ECDC; 2015. Available from http://ecdc.europa.eu/en/publications/Publications/healthcare-associated-infections-HAI-ICU-protocol.pdf
7. IMPROVING INFECTION PREVENTION AND CONTROL AT THE HEALTH FACILITY, Interim practical manual supporting implementation of the WHO Guidelines on Core Components of Infection Prevention and Control Programmes, World Health Organization.

7. Appendices

Appendix 1: screening logbook

سجل حالات المرور اليومي

ICU Screening logbook

Serial NO.	PATIENT FULL NAME	HOSPITAL NO.	Patient Had Surgery inside the hospital	Clinical Diagnosis	ICU Admission Date	Date: ___ / ___	Date: ___ / ___	Date: ___ / ___	Date: ___ / ___	Date: ___ / ___	Patient Outcome	DATE PATIENT Discharged from ICU
						Suspect infection	Suspect infection	Suspect infection	Suspect infection	Suspect infection		
			☐ Yes ☐ No Type of Surgery ------------								☐ Discharged ☐ Transferred to Ward ☐ Died	
			☐ Yes ☐ No Type of Surgery ------------								☐ Discharged ☐ Transferred to Ward ☐ Died	
			☐ Yes ☐ No Type of Surgery ------------								☐ Discharged ☐ Transferred to Ward ☐ Died	
			☐ Yes ☐ No Type of Surgery ------------								☐ Discharged ☐ Transferred to Ward ☐ Died	
			☐ Yes ☐ No Type of Surgery ------------								☐ Discharged ☐ Transferred to Ward ☐ Died	

Appendix 2 suspect case logbook

سجل الحالات المشتبه بها

Suspect case Logbook

Serial NO. (from Screening Logbook)	Type OF SUSPECTED INFECTION	PATIENT FULL NAME	Hospital No.	CULTURE RESULTS				
				TYPE OF CULTURE	DATE COLLECTED	ORGANISM NAME	ISOLATE LABEL NO.	Date of notification of Isolate No. to the lab
	○ BSI ○ PNEU ○ UTI ○ SS			1		1. 2.	1. _ _ _-_ _ _ _ _ _ 2. _ _ _-_ _ _ _ _ _	1. DATE: ___/ ___ 2. DATE: ___ / ___
				2		1. 2.	1. _ _ _-_ _ _ _ _ _ 2. _ _ _-_ _ _ _ _ _	1. DATE: ___/ ___ 2. DATE: ___ / ___
				3		1. 2.	1. _ _ _-_ _ _ _ _ _ 2. _ _ _-_ _ _ _ _ _	1. DATE: ___/ ___ 2. DATE: ___ / ___
				4		1. 2.	1. _ _ _-_ _ _ _ _ _ 2. _ _ _-_ _ _ _ _ _	1. DATE: ___/ ___ 2. DATE: ___ / ___
				5		1. 2.	1. _ _ _-_ _ _ _ _ _ 2. _ _ _-_ _ _ _ _ _	1. DATE: ___/ ___ 2. DATE: ___ / ___
				4		1. 2.	1. _ _ _-_ _ _ _ _ _ 2. _ _ _-_ _ _ _ _ _	1. DATE: ___/ ___ 2. DATE: ___ / ___
				5		1. 2.	1. _ _ _-_ _ _ _ _ _ 2. _ _ _-_ _ _ _ _ _	1. DATE: ___/ ___ 2. DATE: ___ / ___

سجل الحالات المشتبه بها

Suspect case Logbook

Serial NO. (from previous page)	INVESTIGATION DETAILS Other than Cultures		DATE SMART PHONE CASE REPORT OPENED	DATE SMART PHONE ICU SURVEY SECTIONS COMPETE					TYPE OF HAI
	TYPE OF INVESTI-GATION	DATE ORDERED		DEMO-GRAPHICS	ADMISSION DETAILS	CLINICAL DETAILS	INVESTI-GATION DETAILS	Outcome	
	1		Date:	Date:	Date:	Date:	Date:	Date:	
	2		.....	.....	.....	.....	.....	.....	
	3		Surveillance Officer Initials	O Yes	O Yes	O Yes	O Yes	O Yes	
	4		☐☐						
	5								
	6								

Appendix 3 Denominator for Intensive care units

Denominator for Adult and Pediatric Intensive care units (ICUs)

Hospital: **ICU Name:** **Month:**

DAY	Number of patients	Number of patients with one or more central lines	Number of patients with a urinary catheter	Number of patients on a ventilator
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				
31				
Total				

Appendix 4 Denominator for Neonatal Intensive care units

Denominator for Neonatal Intensive care unit (NICU)

Hospital: _____ **ICU Name:** _____ **Month:** _____

	≤750 gm				751-1000 gm				1001-1500gm				1501-2500gm				>2500gm			
Date	Pts	U/C	CL	MV	Pts	U/C	CL	MV	Pts	U/C	CL	MV	Pts	U/C	CL	MV	Pts	U/C	CL	MV
1																				
2																				
3																				
4																				
5																				
6																				
7																				
8																				
9																				
10																				
11																				
12																				
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21																				
22																				
23																				
24																				
25																				
26																				
27																				
28																				
29																				
30																				
31																				
TOTAL																				

N.B

- Pts (patients) / MV (mechanical ventilation).
- U/C (urinary catheter) / CL (central lines including umbilical catheter.

Appendix 5 SSI Screening Logbook

سجل المرور اليومي (عدوى الموضع الجراحي)
SCREENING LOGBOOK (SSI)

الرقم المسلسل	اسم المريض بالكامل	رقم المريض بالمستشفى	مكان إجراء المريض الجراحة		تاريخ العملية	نوع الجراحة	تاريخ دخول المريض للقسم الجراحي	تاريخ الدخول بالعدوى الموضع الجراحي	حالة المريض عند مغادرة القسم الجراحي			تاريخ مغادرة المريض القسم الجراحي
			خارج المستشفى	داخل المستشفى					نقل لقسم آخر	وفاة	تصريح بالخروج	
١												
٢												
٣												
٤												
٥												
٦												
٧												
٨												
٩												
١٠												
١١												
١٢												
١٣												
١٤												
١٥												
١٦												

APPENDIX 6 SSI SUSPECT CASE LOGBOOK

سجل الحالات المشتبه بها (عدوى الموضع الجراحي)

SUSPECT-CASE LOGBOOK (SSI)

تشخيص عدوى الموضع الجراحي	حالة المريض عند الخروج	تفاصيل الإختبارات	تفاصيل الأعراض الإكلنيكية	تفاصيل الدخول	التفاصيل الديموجرافية	اختبارات أو تحاليل أخرى		نتيجة المزرعة					رقم المريض بالمستشفى	اسم المريض بالكامل	الرقم المسلسل
						تاريخ إجراء الإختبار	نوع الإختبار	تاريخ ابلاغ المعمل برقم الميكروب	رقم الميكروب	اسم الميكروب	تاريخ سحب المزرعة	نوع المزرعة			

APPENDIX 7 OUTPATIENT CLINIC FOLLOW-UP FORM

استمارة المتابعة بالعيادة الخارجية (عدوى الموضع الجراحي)

OUTPATIENT CLINIC LOGBOOK (SSI)

اسم المريض	نوع العملية	تاريخ العملية	القسم الجراحي التابع له المريض	هل تم تشخيص عدوى الموضع الجراحي؟		تشخيص العدوى			تم تشخيص العدوى بواسطة		تاريخ التشخيص
				نعم	لا	عدوى الأعضاء	عدوى عميقة	عدوى سطحية	الطبيب	الممرضة	

1

Appendix 8 SSI denominator Form

Denominator of Surgical site infection (SSI)

Hospital: _____ **Surgical Ward:** _____ **Month:** _____

	Cardiothoracic Surgery	Vascular Surgery	Obs./Gynecology Surgery	Urology Surgery	Neurosurgery	Orthopedics Surgery	General Surgery
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
Total							

APPENDIX 9 UTI DATA COLLECTION FORM

استمارة ترصد عدوى مجرى البول

المحافظة		المستشفى			
شهر الترصد		العام الميلادى			
م	اسم المريض	رقم الملف	السن	النوع	القسم
				☐ ذكر ☐ أنثى	
تاريخ الدخول		تاريخ الخروج		تاريخ حدوث العدوى	
/ /		/ /		/ /	
وجود قسطرة بولية لمدة أكثر من يومان عند ظهور الأعراض		تاريخ التثبيت	سبب التثبيت	تاريخ الرفع	
☐ نعم ☐ لا		/ /		/ /	

تشخيص العدوى

☐ **عدوى مجرى البول بأعراض إكلينيكية**
☐ عدوى مجرى البول المرتبط بتثبيت قسطرة بولية ☐ عدوى مجرى البول غير مرتبط بتثبيت قسطرة بولية
☐ عدوى مجرى البول فى المرضى أقل من عام واحد

☐ **عدوى مجرى البول بدون أعراض إكلينيكية**

الأعراض الإكلينيكية: اختر واحد أو أكثر من الأعراض أو العلامات الآتية :			النتائج المعملية
لأى مريض:	لمريض عمره أقل من عام واحد:		
☐ ارتفاع فى درجة الحرارة أكثر من ٣٨ درجة مئوية.	☐ ارتفاع في درجة الحرارة أكثر من ٣٨ درجة مئوية		▫ مزرعة بول إيجابية أكثر من ١٠٠,٠٠٠ (CFU/ml) ليس لأكثر من نوعين من الميكروبات.
☐ إلحاح البول.	☐ انخفاض فى درجة الحرارة أقل من ٣٦ درجة مئوية		▫ مزرعة بول إيجابية أكثر من١٠٠٠ وأقل من ١٠٠,٠٠٠ (CFU/ml) ليس لأكثر من نوعين من الميكروبات.
☐ آلام عند التبول.	☐ التوقف الوقتي للتنفس		▫ مزرعة دم ايجابية تتوافق مع نوع الميكروب الموجود بمزرعة البول
☐ تكرار التبول	☐ بطء فى ضربات القلب		▫ عينة بول إيجابية لاستيريز كرات الدم البيضاء أو/ و النيتريت بواسطة شرائط اختبار مخصصة (Dipstick for Leukocyte Esterase and/or Nitrite)
☐ آلام جانبية أسفل الظهر أو آلام عند الضغط.	☐ آلام عند التبول.		▫ صديد فى البول (١٠ أو أكثر كرات دم بيضاء/ مم٣ من عينة بول لم يتم تدويرها أو أكثر من ٣ /HPF فى عينة بول تم تدويرها).
☐ آلام فوق منطقة العانة.	☐ حمول	☐ قيئ	▫ وجود ميكروبات باستخدام صبغة جرام في عينة بول لم يتم تدويرها.

نتيجة المزرعة

▫ نوع الميكروب (١) :..... حساس ل ..... مقاوم ل.....

▫ نوع الميكروب (٢) :..... حساس ل ..... مقاوم ل.....

وفاة المريض	هل عدوى مجرى الدم الأولية المرتبطة بتركيب قسطرة وريدية مركزية سبب الوفاة؟	
☐ نعم ☐ لا	☐ نعم ☐ لا	
ممرضة الاتصال	التوقيع	رئيس القسم	التوقيع

APPENDIX 10 VAP DATA COLLECTION FORM

استمارة ترصد عدوى الالتهاب الرئوي المرتبط بتثبيت جهاز التنفس الصناعي

المحافظة		المستشفى		
شهر الترصد		العام الميلادى		
م	اسم المريض	رقم الملف	السن	النوع	القسم
				☐ ذكر ☐ أنثى	

تاريخ الدخول	تاريخ الخروج	تاريخ حدوث العدوى
/ /	/ /	/ /

توصيل جهاز تنفس صناعى لاكثر من يومين	تاريخ توصيل جهاز التنفس الصناعى	تاريخ فصل الجهاز	هل المريض منقوص المناعة؟
☐ نعم ☐ لا	/ /	/ /	☐ نعم ☐ لا

تشخيص العدوى

☐ عدوى الالتهاب الرئوى الحالة الأولى PNEU 1	☐ عدوى الالتهاب الرئوى الحالة الثانية PNEU 2	☐ عدوى الالتهاب الرئوى الحالة الثالثة PNEU 3
☐ مريض أقل من ١٢ عام ☐ مريض أقل من عام واحد ☐ مريض أكثر من ١٢ عام		

نتيجة فحص الأشعة:	☐ Pnuematoceles لمريض عمره اقل من عام واحد	☐ Cavitation	☐ Consolidation	☐ Infiltration

الأعراض الإكلينيكية: اختر واحد أو أكثر من الأعراض أو العلامات الآتية :		النتائج المعملية
☐ ارتفاع فى درجة الحرارة أكثر من ٣٨ درجة م	☐ انخفاض فى درجة الحرارة أقل من ٣٦ درجة مئوية	☐ مزرعة دم إيجابية: ميكروب..... حساس ل...../ مقاوم ل.....
☐ عدد خلايا الدم البيضاء أكثر من أو يساوى ١٢٠٠٠ مم٣. ☐ عدد خلايا الدم البيضاء أقل من ٤٠٠٠/مم٣	☐ التوقف الوقتي للتنفس، تسارع التنفس، اتساع فتحتى الأنف عند الشهيق مع تراجع الصدر إلى الداخل أثناء التنفس أو اتساع فتحتى الأنف عند الشهيق مع الشخير(Grunting)، زيادة معدل التنفس	☐ نتيجة إيجابية لعينة سحب السائل البلورى (pleural fluid)
☐ سعال ☐ توقف التنفس ☐ تسارع التنفس ☐ ضيق فى التنفس		☐ نتيجة إيجابية لمزرعة كمية (quantitative culture) من عينة مأخوذة من الجهاز التنفسى السفلى (BAL أو Endotracheal aspirate)
☐ أصوات التنفس من الشعب الهوائية (Rales) الصفير ، أو الحشرجة.	☐ تغيير حالة الوعي لدى المرضى أكبر من ٧٠ عام.	
☐ بطء فى ضربات القلب.	☐ تحول افرازات الجهاز التنفسى إلى إفرازات صديدية (٢٥ أو أكثر خلايا دم بيضاء LPF/ Neutrophil)، زيادة الحاجة إلى التنشيط	☐ وجود الميكروب الفطرى (candida) فى مزرعة دم إيجابية بالإضافة الى وجود الميكروب الفطرى (candida) فى مزرعة بصاق أو Endotracheal aspirate أو BAL .
☐ تسارع فى ضربات القلب.		
☐ تغير خصائص افرازات الجهاز التنفسى (لون/ رائحة / كمية / قوام)	☐ القيئ الدموى	☐ دليل على وجود فطريات (باستثناء candida والحميرة) بأحد الطرق الآتية: فحص ميكروسكوبى مباشر، مزرعة فطريات إيجابية، أختبار معملى تشخيصى بخلاف المزرعة ، وذلك من عينة مأخوذة من الجهاز التنفسى السفلى.
☐ ندى معدلات تشبع الدم بالأكسجين (على سبيل المثال : PaO2/FiO2 ≤240)، زيادة الاحتياج إلى الأكسجين ، او زيادة الحاجة لجهاز التنفس الصناعى.	☐ آلام فى الصدر	
	☐ عدم استقرار فى درجة الحرارة	

هل توفى المريض ؟	هل عدوى الالتهاب الرئوى المكتسبة او المرتبطة بجهاز تنفس صناعى سبب فى الوفاة؟
☐ نعم ☐ لا	☐ نعم ☐ لا

ممرضة الاتصال	التوقيع	رئيس القسم	التوقيع

APPENDIX 11 CLABSI DATA COLLECTION FORM

استمارة ترصد عدوى مجرى الدم المرتبط بتثبيت قسطرة وريدية مركزية

المحافظة		المستشفى	
شهر الترصد		العام الميلادي	

م	اسم المريض	رقم الملف	السن	النوع	القسم
				☐ ذكر ☐ أنثى	

تاريخ الدخول	تاريخ الخروج	تاريخ حدوث العدوى
/ /	/ /	/ /

تثبيت قسطرة مركزية	تاريخ التثبيت	مكان التثبيت	تاريخ الرفع
☐ نعم ☐ لا	/ /		/ /

تشخيص العدوى

☐ عدوى مجرى الدم الأولية المعتمد على التشخيص المعملي (LCB1)	☐ عدوى مجرى الدم الاولية مع ظهور أعراض أكلينيكية (LCB 2)	☐ عدوى مجرى الدم الأولية لمريض عمره أقل من عام (LCB 3)

الأعراض الإكلينيكية: اختر مايتوافق مع تعريف حالة عدوى مجرى الدم الأولية		النتائج المعملية
لاى مريض عمره أكبر من عام واحد	لمريض عمره أقل من عام واحد	
☐ ارتفاع في درجة الحرارة أكثر من ٣٨ درجة مئوية. ☐ التاريخ: ...../...../.....	☐ ارتفاع في درجة الحرارة أكثر من ٣٨ درجة مئوية ☐ التاريخ: ...../...../.....	☐ عزل ميكروب ممرض من مزرعة واحدة أو أكثر من الدم. ☐ التاريخ: ...../...../.....
		☐ نوع الميكروب (١) :..... ☐ حساس لـ..... ☐ مقاوم لـ.....
		☐ نوع الميكروب (٢) :..... ☐ حساس لـ..... ☐ مقاوم لـ.....
☐ انخفاض في ضغط الدم. ☐ التاريخ: ...../...../.....	☐ انخفاض فى درجة الحرارة أقل من ٣٦ درجة مئوية ☐ التاريخ: ...../...../.....	☐ عزل ميكروب شائع على الجلد من مزرعة واحدة أو أكثر من الدم ☐ التاريخ: ...../...../.....
☐ رعشة ☐ التاريخ: ...../...../.....	☐ التوقف الوقتي للتنفس. ☐ التاريخ: ...../...../.....	☐ نوع الميكروب (١) :..... ☐ حساس لـ..... ☐ مقاوم لـ.....
	☐ بطء في ضربات القلب ☐ التاريخ: ...../...../.....	☐ نوع الميكروب (٢) :..... ☐ حساس لـ..... ☐ مقاوم لـ.....

وفاة المريض؟	هل عدوى مجرى الدم الأولية المرتبطة بتركيب قسطرة وريدية مركزية سبب الوفاة؟
☐ نعم ☐ لا	☐ نعم ☐ لا

ممرضة الاتصال	التوقيع	رئيس القسم	التوقيع

APPENDIX 12 SSI DATA COLLECTION FORM

استمارة ترصد عدوى الموضع الجراحي

المحافظة		المستشفى	
شهر الترصد		العام الميلادى	

م	اسم المريض	رقم الملف	السن	النوع	القسم
				☐ ذكر ☐ أنثى	

تاريخ الدخول	تاريخ الخروج	تاريخ حدوث عدوى الموضع الجراحي
/ /	/ /	/ /

هل يوجد عدوى لدى المريض موجودة وقت عملية الجراحة؟	نوع الجرح
☐ نعم ☐ لا	☐ نظيف ☐ نظيف/ ملوث ☐ ملوث ☐ غير نظيف/ به عدوى

تاريخ العملية الجراحية	اسم العملية الجراحية	اسم الجراح	اسم مساعد الجراح	اسم الممرضة

جداح العمليات	رقم عرفة العمليات	هل يوجد بالمستشفى سياسة لاستخدام المضادات الحيوية	هل تم اعطاء المريض جرعة مضاد حيوى خلال ٦٠ دقيقة قبل العملية
		☐ نعم ☐ لا	☐ نعم ☐ لا

اذا كان نعم، اسم المضاد الحيوى:		الجرعة:	

تشخيص العدوى

☐ عدوى الأعضاء الداخلية أو الحيز بموضع الجراحي ☐ عدوى القطع الجراحي العميق ☐ عدوى القطع الجراحي السطحي

الأعراض الإكلينيكية: لأى مريض: اختر مايتوافق مع تعريف حالة تشخيص عدوى الموضع الجراحي				النتائج المعملية
☐ وجود صديد من موضع الجرح	☐ وجود صديد من الدرقة	☐ ألم بموضع الجرح أو عند الضغط عليه	☐ تورم موضعي.	☐ عزل ميكروب من مزرعة (من سائل أو أنسجة) من القطع الجراحي أو العضو/الحيز
☐ فتح الجرح ذاتياً أو بشكل متعمد بواسطة الجراح .	☐ احمرار/ سخونة بموضع الجرح	☐ ارتفاع فى درجة الحرارة	☐ انخفاض فى درجة الحرارة .	☐ وجود مزرعة إيجابية أو عدم إجراء مزرعة.
☐ وجود خراج .	☐ تشخيص الجراح لوجود عدوى	☐ دليل على وجود عدوى تم تشخيصها أثناء الفحص المباشر أو أثناء اجراء اختراقى آخر او بواسطة تحليل أنسجة أو أشعة.		☐ هل يوجد عدوى تجرثم دموى ثانوى؟ ☐ نعم ☐ لا اسم الميكروب ..... حساس ل..... مقاوم ل.....

تمت متابعة عدوى الموضع الجراحي

☐ عند الدخول لقسم الجراحة ☐ فى عيادة المتابعة الخارجية بعد الخروج من القسم ☐ فى مستشفى آخر غير التى تمت بها العملية الجراحية للمريض

حدوث وفاة نتيجة عدوى الموضوع الجراحي	☐ نعم ☐ لا	
ممرضة الاتصال	التوقيع	رئيس القسم	التوقيع

Appendix 12 OR Logbook

سجل العمليات (عدوى الموضع الجراحي)

OR LOGBOOK (SSI)

The surgical ward the patient is admitted الدور الجراحي المنقول له المريض	Type of surgery نوع العملية	Date of surgery تاريخ العملية	Hospital no رقم المريض بالمستشفى	Patient name اسم المريض

Appendix 13 Lab Logbook

LAB LOG BOOK SURVEILLANCE FOR HAI IN ICUS

Serial No	PATIENT FULL NAME	HOSPITAL NO.	Name of the ICU	TYPE OF CULTURE	DATE COLLECTED	RESULT	OGANISM NAME	ISOLATE LABEL
						○ No Growth ○Growth No. of Pathogens ○ 1 ○ 2 ○Contamination Or Colonization	1	
							2	
						○ No Growth ○Growth No. of Pathogens ○ 1 ○ 2 ○Contamination Or Colonization	1	
							2	
						○ No Growth ○Growth No. of Pathogens ○ 1 ○ 2 ○Contamination Or Colonization	1	
							2	

For any inquiries, please contact us

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