National Center for Emerging and Zoonotic Infectious Diseases



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Success with NHSN Location Mapping



Objectives

- Apply mapping options from the NHSN Locations chapter 15
- Understand differences in location mapping
- Demonstrate basic concepts used in mapping locations

The material provided is based on NHSN Patient Safety Component protocols and do not necessarily represent the official position of the Centers for Disease Control and Prevention

MDRO Website

https://www.cdc.gov/nhsn/acute-care-hospital/index.html



CDC Location Labels and Descriptions

https://www.cdc.gov/nhsn/pdfs/pscmanual/15locationsdescriptions_current.pdf



Importance of Correct Location Mapping

NHSN location types are developed in order to identify "like populations" within different facilities. Like population are believed to have similar risks for healthcare associated infections (HAIs)

- Similar medical devices
- Similar invasive procedures
- Similar host factors affecting susceptibility
- Many NHSN surveillance modules utilize location type as a risk factor, for example CLABSI, CAUTI, VAP, MDRO/CDI, etc.

Importance of Correct Location Mapping

- NHSN pooled mean rates of infection are calculated for location types and utilized in data analysis, such as the Standardized Infection Ratio
- Incorrectly mapped locations affect the validity of:
 –NHSN database data
 - -Facility-based standardized infection ratios
- State validations
- Inter-facility comparisons

Location Mapping Recommendations

- NHSN recommends mapping all inpatient locations, Emergency Departments and 24- hour observation locations for use with reporting
- Location mapping should be reviewed each calendar year for accuracy and whenever the patient mix or service for the unit changes.
- Bottom line: Without correctly mapped locations, facilities cannot compare their data to the NHSN data and NHSN data validity is compromised for identifying trends in HAIs.

Access Location Table in NHSN



Decision Flow Chart

Step 1

• Define Acuity Level

Step 2

 Review Patient Mix Step 3

• Define Type of Service

Acuity Level

80% Rule

- If 80% of patients that comprise this patient care area are of the same acuity level, then move on to define patient mix
- There's common levels of acuity as determined by billing stratification such as:
 - Critical Care Level
 - Step Down Care Level
 - Ward Care Level

Patient Mix

Facilities should review the patient mix in the unit for the last full calendar year, if available. A shorter period of at least 3 months is acceptable when a full 12 months of data is unavailable.

To determine patient mix, facilities should use:

- Acuity billing data
- Admission/transfer diagnosis (if acuity billing not available)

Type of Service

- Specific Service Type, use 80% Rule
 - If 80% of patients that comprise this patient care area of the same specific service type (for example, burn, cardiac), then map to the most appropriate CDC Location Description
- General medical, surgical, medical-surgical, use **60/40 Rule**
 - If 60% of patients are either general medical or surgical, map to the majority type
- If the unit does not meet either rule there are other mapping options to consider:
 - Combined medical-surgical location
 - Virtual Locations

Virtual Locations

- Can be used when user would like to conduct separate surveillance for different patient types in the same unit
- Recommended only where there is a means to collect denominator data separately for the mixed -use unit. Commonly used when the unit is geographically split by patient service or units where beds are designated by service

Mixed Acuity Units

- Intended for locations comprised of patients with varying levels of acuity and don't meet the 80% rule (for example, CC and step down; CC and ward)
- Mapping a location in NHSN to the CDC "Mixed Acuity" designation may have implications on data that your facility reports for the CMS Hospital Inpatient Quality Reporting Program
- If facilities map a location using the mixed acuity designation, be aware that NHSN does not plan to publish national pooled mean rates for this location type

Instructions for Mapping Patient Care Locations in NHSN 15-2



Weheal Community Hospital offers a 5-bed Emergency Services department and a 15-bed adult medical unit.

What locations should be mapped within NHSN for reporting purposes?

- a) An Emergency Department CDC Location Code = OUT:ACUTE:ED
- b) An Inpatient Medical Unit CDC Location Code = IN:ACUTE:WARD:M
- c) Both A and B
- d) Neither A or B

Case Study #1 Rationale

Weheal Community Hospital offers a 5-bed Emergency Services department and a 15-bed adult medical unit.

What locations should be mapped within NHSN for reporting purposes? C. Both A and B

Rationale: All units included in NHSN reporting and/or identified as inpatient locations for the facility should be mapped within NHSN. Although the emergency department is an outpatient location for the acute care facility, it is included in LabID event reporting and must be mapped and included for this monitoring. The correct mapping for an Emergency Department is OUT:ACUTE:ED.

All inpatient units are to be mapped to NHSN for inclusion in NHSN surveillance and collection of denominator data. The correct mapping of the adult medical unit is IN:ACUTE:WARD:M.

As a result of the COVID-19 pandemic, Weheal Community Hospital dedicates 5 beds on the adult medical unit for children with COVID-19 or related respiratory issues.

Does this change the unit mapping?

- a) No this is a temporary situation based on COVID and related illness
- b) No the 5 beds represent only 1/3 of the unit, not 80%
- c) Yes Re-map the unit to CDC location code IN:ACUTE:WARD:M_PED
- d) Yes Leave the unit mapping for the 10 bed adult patients but add a virtual location for the 5 beds designated for pediatrics, IN:ACUTE:WARD:M_PED

Case Study #2 Rationale

Does this change the unit mapping?

D. Yes – Leave the unit mapping for the 10 bed adult patients but add a virtual location for the 5 beds designated for pediatrics, IN:ACUTE:WARD:M_PED

<u>Rationale</u>: Because 5 beds are dedicated to pediatric use, you can get age specific data by mapping these beds separately from the 10 beds used for adult services. Neither the adult beds nor the pediatric beds represent 80% of the overall total unit count therefore, using a 'virtual' location works best when the facility has a means to collect denominator data separately for the pediatric beds and adult beds. Although the 15 beds are physically located in the same space, NHSN recommends mapping each separately for reporting and denominator data collection. The 5 pediatric beds are mapped as IN:ACUTE:WARD:M_PED

• The 10 adult beds are adjusted under mapping as IN:ACUTE:WARD:M

• Virtual locations: Virtual locations are created in NHSN when a facility is unable to meet the 80% rule for location designation in a single physical unit but would like to report their NHSN surveillance data for each of the major, specific patient types in that unit. The use of virtual locations is recommended only for those physical units that are geographically split by patient service or those in which beds are designated by service.

As a result of the COVID-19 pandemic, Weheal Community Hospital dedicates 5 beds on the adult medical unit for children with COVID-19/non-critical respiratory illness. The IP has no way to know which beds will house adults or children and can't separate the denominator data.

Does this change the unit mapping?

- A. No this is a temporary situation based on COVID and related illness
- B. No the 5 beds represent only 1/3 of the unit, not 80%
- C. Yes Re-map the unit to CDC location code IN:ACUTE:WARD:M_PED
- D. Yes There is a mix of adults and children, neither 80%, also acuity level is varied. Map as a Mixed Age Mixed Acuity Unit IN: ACUTE:MIXED:ALL

Case Study #3 Rationale

Does this change the unit mapping?

D. Yes– There is a mix of adults and children, neither 80%, also acuity level is varied. Map as a Mixed Age Mixed Acuity Unit IN: ACUTE:MIXED:ALL

<u>Rationale</u>: Because 5 beds are designed for pediatric use, the patient mix of 10 beds for adults and 5 beds for children does not meet the NHSN 80% rule. Additionally, since denominator data will be captured by overall unit count, not specifically by adult or child, a 'mixed acuity' unit mapping should be considered. NHSN offers a mixed age , mixed acuity mapping defined as 'Hospital area for the evaluation and treatment of a mixture of adult and pediatric patients whose conditions are of varying levels of acuity (for example, critical care, ward-level care, step-down type care, etc.). Such a care area may be comprised of patients followed by different hospital services (for example, coronary, medical, surgical, etc.).'

• The unit is mapped as IN: ACUTE:MIXED:ALL

NOTE: Mapping a location in NHSN to the CDC "Mixed Acuity" designation may have implications on data that your facility reports for CMS Programs and/or your state's reporting mandate(s). Although a Mixed Acuity location may have ICU beds and ICU patients, it is not considered an ICU location type for the purposes of NHSN reporting and therefore, would not be included in any ICU-specific reporting requirements. Mixed Acuity units are also excluded from ward-specific reporting requirements.

I Care4U Hospital is a general acute care facility that offers general medical and surgical services; physically within the hospital are an emergency room, a dedicated observation unit, an operating room used primarily for low-risk surgical procedures, an intensive care unit, a medical step-down unit and a large general ward where 30% of patients come from the step-down unit, 20% of patients are post-ortho surgery patients and 50% are direct admit medical patients.

Q4: Should all the units noted be formally mapped within NHSN?

- A. Yes
- B. No
- C. Maybe I'm not sure

Case Study #4 Rationale

Should all the units noted be formally mapped within NHSN? A. Yes

<u>Rationale</u>: All inpatient units within the facility are formally mapped per NHSN guidance to ensure appropriate attribution of events and to ensure appropriate denominator data collection.

 The ED and dedicated observation unit is included for LabID event reporting and must be mapped for use. These locations are considered outpatient locations for the facility; denominator data from these areas are reported as 'encounters'.

I Care4u hospital is a general acute care facility that offers general medical and surgical services; physically within the hospital are an emergency room, a dedicated observation unit, an operating room used primarily for low-risk surgical procedures, an intensive care unit, an ICU step-down unit and a large general ward where 30% of patients come from the ICU step-down unit, 20% of patients are post-ortho surgery patients and 50% are direct admit medical patients.

Q2: Will mapping include the operating room?

- a) No it's not an inpatient area for the facility
- b) No the OR is a temporary transfer for surgery only
- c) No The OR only provides low-risk surgery
- d) Yes The OR is an inpatient location for NHSN purposes, eligible to be used for 'date admitted to facility'. Map as Operating Room/Suite IN:ACUTE:OR

Case Study #5 Rationale

Q5: Will mapping include the operating room?

D. Yes – The OR is an inpatient location for NHSN purposes, eligible to be used for 'date admitted to facility'. Map as Operating Room/Suite IN:ACUTE:OR

<u>Rationale</u>: All units included in NHSN reporting and/or identified as inpatient locations for the facility should be mapped within NHSN. Although the Operating Room is a nonbedded location [no denominator data is collected] and may be considered a temporary 'transfer' for the inpatient, it is an inpatient location per NHSN mapping guidance. Formally mapping the OR serves as a reminder the unit is an eligible inpatient location for use with identifying the date admitted to the facility [NHSN definition for date admitted to the facility is the earliest calendar date the patient is physically located to an inpatient location for the facility].

• All inpatient units are to be mapped to NHSN, NHSN offers 1 mapping for the acute facility Operating Room - IN:ACUTE:OR

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Q6: What is the most appropriate mapping for the ICU and ICU step down unit?

- a) Map ICU as Surgical Cardiothoracic Critical Care IN:ACUTE:CC:CT
- b) Map ICU as general medical ICU- Medical Critical Care IN:ACUTE:CC:M
- c) Map the step-down unit as Medical Cardiac Critical Care- IN:ACUTE:CC:C
- d) Map the step-down unit as an Adult Step- Down Unit IN:ACUTE:STEP
- e) B and D

Case Study #6 Rationale

Q6: What is the most appropriate mapping for the ICU and ICU step down unit? E is the correct response.

<u>Rationale</u>: All units included in NHSN reporting and/or identified as inpatient locations for the facility should be mapped within NHSN. An Intensive Care Unit would be acuity level 'Critical Care'; the details provided do not specify a service line. NHSN recommends mapping as a general Medical Critical Care location, IN:ACUTE:CC:M

- The ICU step-down unit appears to be 100% step-down level care without a specific service indicated. The appropriate mapping is IN:ACUTE:STEP.
- Only if the service line for ICU was 80% post- Cardiac Surgery patients would you map ICU as a Surgical Cardiothoracic ICU. Step-down units are not critical care level acuity and should not be mapped as such.

I Care4u hospital is a general acute care facility that offers general medical and surgical services; physically within the hospital are an emergency room, a dedicated observation unit, an operating room used primarily for low-risk surgical procedures, an intensive care unit, an ICU step-down unit and a large general ward where 30% of patients come from the ICU step-down unit, 20% of patients are post-ortho surgery patients and 50% are direct admit medical patients.

Q4: How is the general ward mapped in NHSN?

- a) Map as an adult medical ward IN:ACUTE:WARD:M
- b) Map as 3 virtual units Medical Cardiac Critical Care (IN:ACUTE:CC:C), Surgical Critical Care (IN:ACUTE:CC:S) and adult medical ward (IN:ACUTE:WARD:M)
- c) Map as a general surgical ward IN:ACUTE:WARD:S
- d) Forget mapping it's too complicated!

Case Study #7 Rationale

Q7: How is the general ward mapped in NHSN?

A. Map as an adult medical ward - IN:ACUTE:WARD:M

<u>Rationale</u>: The details of the case show 30% of patients admitted to the large general ward come from the step-down unit and 50% are direct medical admissions. The step-down patient mix is medical same as direct medical admits, combining these patients allows you to meet the NHSN 80% rule for mapping the unit as a general medical unit. Response B and C are not appropriate mappings.

• **Patient mix:** When determining the appropriate CDC Location mapping for a unit, facilities should review the patient mix in that unit for the last full calendar year. If a full year is not available, facilities should review patient mix based on the data they have available for that unit. When determining the acuity level, as well as the specific service type of a location, the acuity billing data (if available) should be used. Admission/transfer diagnosis can also be used to determine location mapping if billing data is not available. Facilities, when possible, should use 1 years' worth of data to make this determination. If that is not available, a shorter period of at least 3 months is acceptable.

Illside Hospital has been crushed with COVID patients for several months to the point that the ED is holding admitted patients for days awaiting bed placement. The facility converted a previously unused portion of the ED to an overflow area for admitted patients awaiting a bed. The area is also used for direct admits awaiting an official inpatient bed. The average length of stay for patients in this area is 4 days.

Q8: Should this 'new' overflow area be mapped within NHSN?

- a) Yes the unit would be considered an inpatient unit for the facility
- b) Yes the inpatients housed on this unit are eligible for denominator data capture
- c) Yes all patients on this unit are officially admitted to inpatient status for billing
- d) All of the above

Case Study #8 Rationale

Q8: Should this 'new' overflow area be mapped within NHSN?

D. All of the above

- a) Yes the unit would be considered an inpatient unit for the facility
- b) Yes the inpatients housed on this unit are eligible for denominator data capture
- c) Yes all patients on this unit are officially admitted to inpatient status for billing

<u>Rationale</u>: All units included in NHSN reporting and/or identified as inpatient locations for the facility should be mapped within NHSN. The area would be reviewed for patient mix/acuity levels then the NHSN 80% rule is applied. There is limited information provided about this 'new' unit but it's clear the unit intent is for inpatient care/services.

 From the Locations chapter, page 15-6: Surge and/or overflow units, whether newly opened or repurposed from a previously mapped location, should follow NHSN mapping guidance and be included in facility mapping. Examples of surge/overflow mapping can be found here: <u>https://www.cdc.gov/nhsn/pdfs/covid19/location-mapping-508.pdf</u>.

Illside Hospital has been crushed with COVID patients for several months to the point that the ED is holding admitted patients for days awaiting bed placement. The facility converted a previously unused area to an overflow area for admitted patients awaiting a bed. The area is also used for direct admits awaiting an official inpatient bed. The average length of stay for patients in this area is 4 days.

Q9: What is the correct mapping for this 'new' overflow area?

- a) Map as a general medical ward IN:ACUTE:M
- b) Map as a COVID respiratory unit IN:ACUTE:WARD:PULM
- c) Map as an Onsite Overflow Critical Care location IN:ACUTE:CC:OF_ONSITE
- d) Map as an Onsite Overflow Ward IN:ACUTE:WARD:OF_ONSITE

Case Study #9 Rationale

Q9: What is the correct mapping for this 'new' overflow area?

D. Map as an Onsite Overflow Ward - IN:ACUTE:WARD:OF_ONSITE

Rationale: All units included in NHSN reporting and/or identified as inpatient locations for the facility should be mapped within NHSN. The area would be reviewed for patient mix/acuity levels then the NHSN 80% rule is applied. There is limited information provided about this 'new' unit but it's clear the unit intent is to serve as an overflow inpatient location. NHSN recommends mapping as an Overflow location – an inpatient area eligible for denominator data collection and event attribution.

Based on the limited information provided, the patients appear to be ward level care. NHSN recommends the onsite overflow ward mapping for the unit: IN:ACUTE:WARD:OF _ONSITE as the best option.

Questions ???

contact the NHSN Helpdesk at nhsn@cdc.gov



For more information please contact Centers for Disease Control and Prevention 1600 Clifton Road NE, Atlanta, GA 30333 Telephone, 1-800-CDC-INFO (232-4636)/TTY: 1-888-232-6348 E-mail: cdcinfo@cdc.gov Web: www.cdc.gov

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

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