



Core Case Notification Data Element Recommendations: Hospitalization

This document was developed by the Data Standardization Work Group (DSWG) of the Council of State and Territorial Epidemiologists (CSTE) Surveillance Practice and Implementation Subcommittee (SPIS) as a part of a larger data harmonization effort. It will be published and maintained in a repository on the CSTE website.

The DSWG identified and standardized the data elements to utilize in the transmission of core surveillance case data to the Centers for Disease Control and Prevention (CDC). Core surveillance data classes and data elements are those that apply across many conditions and, in general, are not specific to any single condition or condition family. In each recommendation document, the DSWG provides common definitions, value sets/code sets, structure, and interpretation notes for each identified data element that is designated as core. The DSWG does not provide questions which would be used to populate the recommended data elements. More information about the DSWG and data harmonization can be found [here](#).

The structure of this document is as follows:

- [Background](#)
- [Core Surveillance Hospitalization Data Elements for Routine Case Notifications](#)
- [Appendix A. Input Data Standards and Data Sources for Hospitalization Data](#)

Background

Hospitalization was selected by the workgroup as the first element to discuss for standardization after ranking high in the attributes considered. In addition, workgroup members noted that although the collection of usable hospitalization data continues to be an area of difficulty for public health agencies, it is an element that is expected to be relatively easy to standardize across case surveillance for multiple conditions.

Public health objectives for hospitalization data collection differ from those of clinical care. Clinical data contain details related to a person's hospitalizations; however, public health is interested more specifically in whether the person has a hospitalization that is associated with the condition under public health surveillance and may use hospitalization as a proxy for the severity of that condition. For example, a tuberculosis (TB) case patient who is hospitalized for a traumatic injury soon after their TB diagnosis would generally not be considered as a TB hospitalization; categorizing the patient as such might lead to misinterpretation that the person has a more severe course of illness or a more virulent strain. Public health officials must therefore interpret the clinical information available to identify whether a case patient had a hospitalization associated with the condition of interest.

To ensure that all participants approached the discussion from the same public health perspective, assumptions regarding the aspects of the data element that were considered in scope versus out of scope were clearly defined. Condition-associated hospitalization data elements were approached as an indicator of severity of disease comparable to the way these are defined in the Generic V2 Message Mapping Guide (MMG) for the National Notifiable Disease Surveillance System (NNDSS). Condition-associated hospitalization may be an imperfect metric for severity, given that the decision to admit a patient may potentially involve many factors, including isolation, social support, etc. However, this use contrasts with hospitalization as a potential exposure or risk factor in a case investigation, such as in healthcare-associated infections, which was assumed to be a separate concept and considered out of scope for this data class. Furthermore, the workgroup did not attempt to define any hospitalization-related guidelines for specific conditions, such as a timeframe within which the hospitalization occurs or specific diagnosis codes that must be linked to the admission for it to qualify as a hospitalization for the condition.





Core Surveillance Hospitalization Data Elements for Routine Case Notifications

The following data elements were considered by the DSWG membership to be core surveillance data under the umbrella of the condition-associated hospitalization topic. Data elements marked with an asterisk (*) did not reach the 80% consensus mark within the group but were supported by more than half of the participants. These are included here as core data elements with weak support from the DSWG. For each of these data elements, there is no pre-defined default value for what should be transmitted when the data element has not been populated. Refer to Tables 1-4 below for definitions and additional information. Additional information on input data sources for hospitalization data can be found in Appendix A.

- [Hospitalized](#)
- [Admission date*](#)
- [Discharge date*](#)
- [Admitted to Intensive Care Unit \(ICU\)](#)

The following data elements were also discussed, but there was no consensus to include them in core surveillance data for routine case notifications to CDC.

- Duration of hospitalization
- Admission location name (free text)
- Admission location ID (coded value)
- ICU admission and discharge dates

The Generic V2 MMG currently allows for one block of hospitalization information and is unable to capture multiple or repeated sets of admission and discharge dates if a subject had multiple hospitalizations related to the condition. The workgroup consensus was that any and all admissions that meet the approved definition and criteria to qualify as a condition-associated hospitalization should be captured and collected as repeatable blocks as part of core surveillance data. Furthermore, the workgroup recommendation, though with weak support, was that these condition-associated hospitalizations all be included in routine case notifications to CDC, rather than selecting one visit or concatenating information across hospital stays.

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Table 1. Core Surveillance Data Element for Routine CDC Case Notification – Hospitalized

Hospitalized	
Definition	Indicator the person had one or more hospitalizations associated with the condition
Standard Code for Transmission to CDC	LOINC: 77974-4 – Whether the patient was hospitalized for condition of interest
Value set or coding system	Yes/No/Unknown
Abstracted/ Derived/ Created	Derived
Derived from (examples)	Facility type; Encounter status; Encounter reason; Encounter timing
Recommendations for Input Data Source(s)	• Case investigation • eCR
Notes	See Interpretation Notes section below.
Data Source Details	
eCR CDA	Derived from class of encounter and encounter diagnosis • Class of encounter: ClinicalDocument/componentOf/encompassingEncounter/code • Encounter diagnosis: Encounter Activity (V3) (encounter)/Encounter Diagnosis (act)/Problem Observation (V3) (observation)
eCR FHIR	Encounter resource with a classification for inpatient or related value that may indicate hospitalization. • Encounter.class
ELR	N/A
USCDI v6	Encounter Information data class: • Encounter Type: Category of health care service • Encounter Diagnosis: Coded diagnoses associated with an episode of care. • Encounter Location: Place where patient's care is delivered
USCDI+ Public Health: Case Reporting Use Case	Encounter Information data class: • Encounter Type: Category of health care service. • Encounter Diagnosis: Coded diagnoses associated with an episode of care. • Encounter Location: The physical location of the encounter.

Interpretation Notes

When determining if a hospitalization is associated with the condition, several components may contribute to the decision: the facility type, the encounter status, the encounter duration, the encounter reason, and the timing of the hospitalization in relation to the condition. In general, a response of “Hospitalized” = “Yes” should follow the guidelines below:

- Facility type = Acute care facility
 - Hospitalization should reflect a stay at an acute care facility. Stays at long-term care, assisted living, hospice, or other longer-term health care facilities should be captured elsewhere.
- Encounter status = Inpatient or Observation
 - **Emergency department visits that do not result in an inpatient or observation admission should *not* be considered hospitalizations.**
 - In general, the patient should be in the hospital for at least 24 hours to be considered hospitalized. This 24-hour duration is intended as a proxy for identifying whether the

patient was admitted; an emergency department visit lasting more than 24 hours should not be counted as a hospitalization.

- If there is insufficient information to identify whether the patient was admitted or was at the hospital for at least 24 hours, this should, in general, not be counted as a hospitalization. However, public health officials may need to evaluate their data sources and the information received; for example, reports from the very beginning of a hospitalization may not reflect that a case is later admitted for the condition.
- Encounter reason
 - The condition under public health surveillance should be associated with the reason for hospitalization. This may include an exacerbation of a comorbid condition that affects the duration or severity of the patient's illness.
 - The reason for hospitalization may be specified or may be inferred. Potential sources of information within the medical record may include clinical notes and diagnosis codes.
 - The condition under surveillance need not be explicitly stated in the medical record or report, if the clinical manifestations make sense for the condition in question. This may include the systemic effects of the condition or exacerbation of a comorbid condition, for example hospitalization for cardiopulmonary disease for an influenza case. This criterion may need to be applied differently depending on the condition, resource capacity, and sources of information, as it may be unrealistic to try to discern whether the condition affected the hospitalization or not in many situations.
- Encounter timing
 - The timing of the hospitalization should make sense in relation to the timing of the case (e.g., onset, diagnosis, laboratory results) and the disease process for the condition under surveillance.

The extent of hospitalization information available to a PHA for a given case may vary by jurisdiction or by condition for numerous reasons. "Hospitalized" = "Yes" might represent hospitalizations that are a direct outcome of the condition as well as those that are more indirectly associated. Additionally, a "No" response should be used to indicate that there is sufficient certainty that the person did not experience a hospitalization associated with the condition (e.g., the person was not hospitalized at all, *or* the hospitalization was unrelated to the condition under surveillance). "No" should *not* be used to indicate a lack of information about the hospitalization status or about whether the hospitalization was associated with the condition. Depending on the extent of a PHA's case investigation capacity and available data, "Hospitalized" may be frequently "Unknown" or blank due to insufficient information. Depending on investigation capacity, reporting volume, and how each PHA obtains hospitalization information for given conditions, PHAs might be able to more consistently confirm that a person *was* hospitalized than to confirm the person was *not* hospitalized.

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Table 2. Core Surveillance Data Element for Routine CDC Case Notification – Admission Date

Admission Date	
Definition	The date on which the person was admitted
Standard Code for Transmission to CDC	LOINC: 8656-1 – Hospital admission date
Value set or coding system	Date If the date is unknown, this data element may be left blank.
Abstracted/ Derived/ Created	Abstracted
Derived from (examples)	N/A
Recommendations for Input Data Source(s)	• Case investigation • eCR
Notes	The admission date and discharge date were always discussed and considered together but are listed separately since they are technically individual data elements. There was weak support for inclusion of this data element in the core data for routine case notification to CDC. “Hospitalized” should be determined to be = “Yes” in order for this data element to be populated. For example, data derived from encounter times should only be used for “Admission Date” and/or “Discharge Date” if the associated encounter meets the criteria for a hospitalization associated with the condition.
Data Source Details	
eCR CDA	Start time of the encounter • ClinicalDocument/encompassingEncounter/effectiveTime/low
eCR FHIR	Start time of the encounter • Encounter.period.start
ELR	N/A
USCDI v6	Encounter Information data class: • Encounter Time: Dates/times related to an encounter
USCDI+ Public Health: Case Reporting Use Case	Encounter Information data class: • Admission Date/Time: Date and time the patient was admitted to the treatment facility; e.g., hospital

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Table 3. Core Surveillance Data Element for Routine CDC Case Notification – Discharge Date

Discharge Date	
Definition	The date on which the person was discharged
Standard Code for Transmission to CDC	LOINC: 8649-6 – Hospital discharge date
Value set or coding system	Date If the date is unknown, this data element may be left blank.
Abstracted/ Derived/ Created	Abstracted
Derived from (examples)	N/A
Recommendations for Input Data Source(s)	• Case investigation • eCR
Notes	The admission date and discharge date were always discussed and considered together but are listed separately since they are technically individual data elements. Discharge date should refer to the discharge from acute care regardless of where the person was discharged to, for example, even if this is a rehabilitation center associated with the acute care facility. If the person dies while hospitalized, the date of death should be used as date of discharge. There was weak support for inclusion of this data element in the core data for routine case notification to CDC. “Hospitalized” should be determined to be = “Yes” in order for this data element to be populated. For example, data derived from encounter times should only be used for “Admission Date” and/or “Discharge Date” if the associated encounter meets the criteria for a hospitalization associated with the condition.
Data Source Details	
eCR CDA	End time of the encounter • ClinicalDocument/encompassingEncounter/effectiveTime/high
eCR FHIR	End time of the encounter • Encounter.period.end
ELR	N/A
USCDI v6	Encounter Information data class: • Encounter Time: Dates/times related to an encounter
USCDI+ Public Health: Case Reporting Use Case	N/A

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Table 4. Core Surveillance Data Element for Routine CDC Case Notification – Admitted to Intensive Care (ICU)

Admitted to Intensive Care Unit (ICU)	
Definition	Indicator that the person was admitted to an intensive care unit (ICU) or other specialty care unit for the condition
Standard Code for Transmission to CDC	LOINC: 95420-6 – Whether the patient was admitted to intensive care unit (ICU) for condition of interest
Value set or coding system	Yes/No/Unknown
Abstracted/ Derived/ Created	Abstracted
Derived from (examples)	N/A
Recommendations for Input Data Source(s)	• Case investigation
Notes	“Hospitalized” should be determined to be = “Yes” in order for this data element to be populated. The phrase “Intensive Care Unit” is inclusive of sub-categories including but not limited to Pediatric and Neonatal ICUs, also known as PICUs and NICUs.
Data Source Details	
eCR CDA	ICU data has no precise mapping in eCR, but could be derived from Encounter information • ClinicalDocument/componentOf/encompassingEncounter/code
eCR FHIR	N/A
ELR	N/A
USCDI v6	Encounter Information data class: • Encounter Location: Place where a patient’s care is delivered
USCDI+ Public Health: Case Reporting Use Case	Encounter Information data class: • Encounter Location: The physical location of the encounter

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Appendix A. Input Data Standards and Data Sources for Hospitalization Data

Electronic Case Reporting (eCR)

Electronic case reporting may provide a useful source of incoming hospitalization data to PHAs by offering the potential to automate data flow, as well as minimizing the need for review to identify hospitalizations associated with the condition. For hospitalization data, both CDA and FHIR standards use the same HL7 value set, ActEncounterCode, to represent the “class of encounter”. The value set contains 11 concepts, including codes for ambulatory, emergency, and home health encounters. Five of those codes, listed below, are considered a hospitalization by the clinical decision support within RCKMS.

Table 5. Hospitalization Codes in RCKMS

Code	Display	Definition
IMP	Inpatient encounter	A patient encounter where a patient is admitted by a hospital or equivalent facility, assigned to a location where patients generally stay at least overnight and provided with room, board, and continuous nursing service.
ACUTE	Inpatient acute	An acute inpatient encounter.
NONAC	Inpatient non-acute	Any category of inpatient encounter except 'acute'.
OBSENC	Observation encounter	An encounter where the patient usually will start in different encounter, such as one in the emergency department (EMER) but then transition to this type of encounter because they require a significant period of treatment and monitoring to determine whether or not their condition warrants an inpatient admission or discharge. In the majority of cases the decision about admission or discharge will occur within a time period determined by local, regional or national regulation, often between 24 and 48 hours.
SS	Short stay	An encounter where the patient is admitted to a health care facility for a predetermined length of time, usually less than 24 hours.

The use of one of these codes, in combination with review of the encounter diagnosis that was recorded, may result in the conclusion that the person was hospitalized in association with a specific condition or with one sufficiently relevant to the condition under surveillance. Note that a “short stay” encounter is triaged as a hospitalization by RCKMS but may not meet the definition of hospitalized used for case surveillance; cases with a “short stay” encounter should be marked as hospitalized only upon investigator confirmation.

Several conditions available for authoring in RCKMS include clinical criteria for hospitalization. When evaluating eICRs against these criteria to determine reportability to PHAs, three value sets specific to hospitalization codes are used. These codes would be found in the “Encounter Activity” section of the eICR and would indicate that an inpatient hospitalization is associated with the encounter.

Table 6. Hospitalization Value Sets in RCKMS

RCKMS Value Set Name	Description
Hospitalized [Inpatient] (EncounterTypeCode)	CPT codes for an encounter during which the patient was hospitalized or classified as an inpatient
Hospitalized [Inpatient] (ActEncounterCode)	HL7 codes derived from the ActCode code system for an encounter during which the patient was hospitalized or classified as an inpatient Note: Contains the five hospitalization encounter codes above identified from the HL7 ActEncountercode value set
Hospitalized [Inpatient] (SNOMED)	SNOMED codes for an encounter during which the patient was hospitalized or classified as an inpatient



As the derived data continue to improve, the automated nature of eCR in determining hospitalization will provide a significant reduction in the burden of manual case investigation and record review that is currently on public health staff.

Note that “Hospitalized” should be determined to be = “Yes” in order for any of the other data elements to be populated. For example, data derived from encounter times should only be used for “Admission Date” if the associated encounter meets the criteria for a hospitalization associated with the condition.

Electronic Laboratory Reporting (ELR)

ELR does not contain any hospitalization data elements.

USCDI and USCDI+

The current version of USCDI (version 6) does not have a specific data element that would map directly to a determination of hospitalization, limiting the feasibility of deriving whether a patient was hospitalized for the condition without further review. The relevant data elements that are available in both USCDI and USCDI+ (Table 7), such as the Encounter Type, Encounter Diagnosis, and Encounter Location, would need to be considered in order to determine whether the encounter represents a hospitalization as defined above, and perhaps whether the patient was admitted to an intensive care unit. Furthermore, if appropriate, additional data elements such as the Encounter Time or Admission Date/Time may be interpreted as the admission and discharge dates.

Table 7. Hospitalization-related data elements in USCDI or USCDI+ Public Health Domain

Data Element	Description	USCDI Level	USCDI+ Use Case
Encounter Type	Category of health care service. Examples include but are not limited to office visit, telephone assessment, and home visit.	v6	Case Reporting
Encounter Diagnosis	Coded diagnoses associated with an episode of care.	v6	Case Reporting
Encounter Location	Place where a patient's care is delivered.	v6	Case Reporting
Encounter Time	Date/times related to an encounter. Examples include but are not limited to scheduled appointment time, check in time, start and stop times.	v6	N/A
Admission Date/Time	Date and time the patient was admitted to a treatment facility; e.g., hospital	N/A	Case Reporting
Encounter Status	Current state of the encounter: Planned; Arrived; Triaged; In progress; On leave; Finished; Canceled; Entered in error; Unknown.	0	Case Reporting
Encounter Disposition	USCDI: Place or setting where the patient went after a hospital stay or encounter. USCDI+: Place or setting to which the patient left a hospital or encounter.	v6	Case Reporting
Reason for the Encounter	Reason the encounter takes place, expressed as a code.	0	Case Reporting
Encounter Identifier	Sequence of characters by which an encounter is known.	v6	Case Reporting