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Data Standardization: Workgroup Proposal for Standardized Case Counting Date

Proposed Calculated Case Counting Date for NNDSS Case Counting

Molly Crockett, Laura Erhart, and the CSTE Data Standardization Workgroup

Best Practice Guidelines
Program Area: Surveillance and Informatics

Contents

Introduction

This document is a part of a series of documents that were developed by the Data Standardization Workgroup (DSWG) of the Council of State and Territorial Epidemiologists (CSTE) Surveillance Practice and Implementation Subcommittee and will be published and maintained in a repository on the CSTE website.

The objective of the DSWG for this report was to develop a standardized approach for jurisdictions to use to assign a case counting date for use across public health agencies (PHAs) and program areas. **The DSWG recommends creation of a new date element for this purpose, hereafter referred to as the *Calculated Case Counting Date (CCCD),*** which should be assigned according to a consistent algorithm across PHAs and conditions and is intended to be the most epidemiologically relevant date representing when disease occurred, based on the available information, for most cases.

Data Standardization Workgroup Overview

The objective of the CSTE Data Standardization Workgroup (DSWG) is to improve data quality through the development and application of consensus definitions for core data elements that are used for Nationally Notifiable Conditions surveillance. The DSWG combines the expert knowledge of its members to achieve agreement across program areas and jurisdictions to facilitate and support standardization for data elements, whether they are referenced as part of notification to the Centers for Disease Control and Prevention (CDC), in communication between jurisdictions, or in analysis.

This effort directly aligns with key portions of CSTE's mission, including developing standards for practice and promoting the collection and effective use of epidemiologic data to guide public health practice and improve health.

The DSWG recognizes that other entities are simultaneously working to standardize data elements and their usage across systems using healthcare information. Membership in the DSWG includes not only public health agency (PHA) staff but also CDC representatives. The DSWG has worked with CDC and CSTE to identify other workgroups within these organizations that are interested in similar work. Another key entity external to the DSWG is the Office of the National Coordinator (ONC) for Health Information Technology, which publishes the United States Core Data for Interoperability (USCDI). The USCDI is a standardized set of health data classes and constituent data elements for nationwide, interoperable health information exchange. At the time of publication of these guidelines, USCDI v4 was the current version (published July 2023), and v5 is being compiled (anticipated to be published July 2024). USCDI+, an extension to the existing USCDI that supports the identification and establishment of domain- or program-specific data elements and value sets, including an initial set for two public health use cases, was released in early 2024. The DSWG seeks to align our recommendations with the work of these other key partners.

As the work of the DSWG has progressed, some underlying principles for recommendations have evolved:

1. The DSWG has tried to find the balance between very prescriptive versus more flexible recommendations. Very prescriptive recommendations might, in theory, lead to better standardization across programs and jurisdictions, but may also create large barriers for implementation. State, local, and territorial jurisdictions have a wide variety of surveillance systems and infrastructure currently in place, have different needs, and have different regulations. Given these factors, the DSWG has purposefully included flexibility for the individual jurisdictions within some recommendations.
2. The recommendations in this set of documents focus on data elements communicated between jurisdictions and CDC, which may also facilitate interjurisdictional data sharing and analysis. Data collection and surveillance practices at the state or local level directly affect the information available for transmission. These recommendations therefore include guidance for collection of data within state, local, or territorial surveillance systems. Many jurisdictions may capture and

maintain additional fields or data elements related to the concepts discussed in these documents that go beyond the scope of these recommendations.

Rationale for these Guidelines

Case notifications for nationally notifiable conditions are sent from state, local, and territorial jurisdictions to CDC when a person meets the criteria to be classified as a case, typically defined by criteria established in case definitions developed and ratified by CSTE membership. The partially deidentified data contained in the case notifications are used to monitor disease occurrence, detect shifts in trends, and assist in the recognition of interstate disease outbreaks.

Case definitions are determined through an established process, but they do not always address the timeframes that apply to a case. As a result, variations exist across jurisdictions in the assignment of a particular date, week, or year to a given case for counting purposes. These variations make data analyzed and aggregated at the national level more difficult to interpret. When methods and processes vary, the result may be that comparing or aggregating data across jurisdictions is inappropriate or inaccurate.

The objective of the DSWG for this report was to develop a standardized approach for jurisdictions to use to assign a case counting date for use across jurisdictions and program areas.

Stipulations for Implementation

This document presents a recommendation for a standardized approach to calculating a case counting date for the purposes of disease surveillance. The DSWG considers the guidelines below as best practices for PHAs and CDC to work towards to support standardization of national surveillance data and provide a unified national picture on issues of public health importance. We acknowledge that implementation of the following recommendations will likely involve modifications to surveillance systems or jurisdictional practices and protocols for many PHAs, which will require time and resources in the face of competing priorities. There will be further coordination among stakeholders at the national and jurisdictional levels to provide specific details and practical approaches for implementation of these guidelines.

Background on the Date for Counting Cases

Public health agencies (PHAs) are responsible for collecting and maintaining records on the occurrence of reportable disease among residents within their jurisdictions. The definitions for what constitutes a case and what represents the appropriate time frame during which that case should be counted should be precise and consistent across jurisdictions. However, it is known that variations exist between jurisdictions, and even between disease/program areas within the same jurisdiction, in the date that is used to count cases. For instance, consider a state that reported 150 cases of pertussis in March 2022. Of the many dates that are associated with a case, such as the date on which symptoms began or the date of the first positive lab test, which date(s) were used to determine when these cases should be counted within March 2022?

Data elements such as EVENTDATE and MMWR Week and MMWR Year[1] have been defined and historically used for this purpose. However, they have been implemented in many disparate ways across PHAs and program areas. As part of the legacy NNDSS[1] National Electronic Telecommunications System for Surveillance (NETSS) message structure, a single EVENTDATE should be assigned to each case according to this hierarchy of dates, from the first date considered (i.e., illness onset date, considered the most important) to the last date considered:

- Illness (Symptom) Onset Date
- Clinical Diagnosis Date
- Laboratory-Related Date
- Date of First Report to Public Health System
- Report Date

The NETSS message implementation plan instructs that if the date of diagnosis or laboratory result are not readily available, the laboratory specimen collection date could be used as a proxy. The EVENTDATE is reported along with a corresponding data element called DATETYPE, which identifies the type of date that is represented. The hierarchy above differs slightly in the recommendations for jurisdictions using the National Electronic Disease Surveillance System (NEDSS) Base System (NBS). While the EVENTDATE is a key component of the legacy NETSS message, the Generic Message Mapping Guide (MMG) versions 1 and 2 do not include the EVENTDATE concept but do include MMWR Week and MMWR Year.

The CDC Office of Public Health Data, Surveillance, and Technology (OPHDST) uses the MMWR Week and Year submitted by the PHAs as the counting date in data shared by OPHDST. PHAs assign values to these variables and send the data to CDC in HL7 case notification messages based on MMGs or through the legacy NETSS message format. While the MMWR Week/Year provide a common pair of fields for CDC to use across jurisdictions and conditions, the guidance for populating these fields allows for substantial variation, which is also reflected in practice. For instance, in many systems, the MMWR Week and MMWR Year are calculated from the EVENTDATE and thus represent the week and year corresponding to that concept. Other health departments assign the MMWR Week based on the date a case was reported to the PHA. Also, jurisdictions may assign the MMWR Week using different rules by condition. This flexibility that the MMWR Week and Year were designed to allow limits its suitability as a standardized case counting date.

CDC guidance further notes that because 1) the MMWR Week may be based on a variety of dates and 2) assignment may vary by jurisdiction or condition, it may be more appropriate to conduct analyses of temporal incidence patterns according to another epidemiologically relevant date. The methodology by which the EVENTDATE is assigned is somewhat more precise in that there is a specific hierarchy that should be applied consistently across conditions. However, absence of EVENTDATE within the Generic

[1] MMWR = Morbidity and Mortality Weekly Report; MMWR Week and MMWR Year are the epidemiologic week and year for which the National Notifiable Diseases Surveillance System (NNDSS) disease report is assigned by public health agencies for the purposes of disease incidence reporting and publishing in the MMWR.

v2.0 MMG has represented a minor obstacle to standardizing the implementation and use of EVENTDATE.

The DSWG has outlined a standardized approach for PHAs to assign a case counting date. Note that because there is so much current variation across methodologies for assigning EVENTDATE and MMWR Week and Year, **the DSWG recommends creation of a new date element for this purpose, hereafter referred to as the *Calculated Case Counting Date***, rather than a repurposing or realignment of any of the existing calculated date fields. This Calculated Case Counting Date (CCCD) should be assigned according to a consistent algorithm across PHAs and conditions and is intended to be the most epidemiologically relevant date representing when disease occurred, based on the available information, for most cases.

Note that this document aims to define and describe the creation and use of an entirely *new* data element. Future usage and applications of currently existing data elements EVENTDATE and MMWR Week/Year remain to be determined, and any recommendations regarding those data elements are outside the scope of this document.

In addition, at the time of writing, the Generic version 3 MMG was planned and is therefore referenced throughout this document. If an alternative method or template for submission of generic, core, case data is established in lieu of a Generic version 3 MMG, the recommendations put forth in this document would still apply to the new method for the communication of case data between jurisdictions and CDC.

Components of the Calculated Case Counting Date

The six data elements below were selected by the Workgroup as the component dates that contribute to the Calculated Case Counting Date:

- Symptom Onset Date
- Clinical Diagnosis Date
- Earliest Specimen Collection Date Associated with a Positive Lab Result
- Earliest Result Date of a Positive Lab Result
- Date First Received by Public Health Agency
- Date Entered/Record Initiated

The Calculated Case Counting Date may be established for all cases and all conditions using the above set of component dates. All six data elements may not be available, collected, or even relevant for all cases or all conditions. The CCCD should therefore be calculated by supplying the algorithm to the selection of component dates that *are* available for any given case. This guidance does not constitute a recommendation to collect any additional date fields for conditions for which the data element is not relevant.

Further details for these six component dates are described later in this document. Additionally, several of these component dates were reviewed and addressed in more detail in the DSWG brief (23-IB-SI-01), *Data Standardization: Dates of Importance to Public Health Surveillance*.

Rationale for Selection of Component Dates

The symptom onset date will in many cases be the earliest marker representing the occurrence of a condition. In some scenarios – for instance, if the person is asymptomatic – the symptom onset date may not be applicable to the case. In other scenarios, the diagnosis date may not be available because a public health investigation could not be conducted or was unable to uncover some of the clinical information pertaining to the case. These scenarios highlight the need for a laboratory-related date, often available through automated, electronic laboratory reporting feeds, to be included as a component of the CCCD.

The laboratory-related date could take the form of a specimen collection date or a laboratory result date, but in either case, to best reflect when to count the case, the date should be the earliest laboratory date indicative of the infection or condition. On the other hand, not all conditions have relevant laboratory tests; symptom onset or clinical diagnosis dates may be the most applicable and available for those conditions.

In the rare circumstances when public health is notified of a case but is unable to acquire any relevant clinical or laboratory information, the date on which the notification is received by the PHA can serve as the CCCD. Finally, a system-generated date indicating when the case is entered into the surveillance system or when a record is initiated can be used to populate the CCCD. From an epidemiologic perspective, these last two dates may not be as relevant to the case as the clinical or laboratory-related dates. However, in the context of CCCD calculation, all six date concepts should be considered equally acceptable. Since the date first received by the public health agency and the system-generated date entered will most likely be available for all cases, their inclusion as component dates will help to ensure that the CCCD can be populated with a value for all cases.

Component Date Details

Each of the component dates is addressed in further detail below.

Symptom Onset Date

Background and Overview

Symptom Onset Date is a renaming of the data element known as “Date of Illness Onset” in the Generic v2.0 MMG. The renaming was recommended in the DSWG brief (23-IB-SI-01), *Data Standardization: Dates of Importance to Public Health Surveillance*, to encourage a more accurate capture of the start of the illness period.

This data element is included in the Generic v2.0 MMG with a CDC Priority of *1*, indicating that although the Date of Illness Onset is not *Required* in the message for HL7 compliance, it is considered high priority by CDC programs, and MMG onboarding is typically not complete without inclusion of this data element.

Recommended Definition and Implementation

> **Symptom Onset Date**: This data element should be interpreted as the **earliest date** of the **onset of signs or symptoms** relevant to the reported condition.

Refer to the *Data Standardization: Dates of Importance to Public Health Surveillance Brief* for detailed guidance on the interpretation and implementation of the symptom onset date and the recommended data sources from which to populate this data element.

Clinical Diagnosis Date

Background and Overview

Clinical Diagnosis Date is a renaming of the data element known as “Diagnosis Date” in the Generic v2.0 MMG, as recommended in the DSWG brief (23-IB-SI-01), *Data Standardization: Dates of Importance to Public Health Surveillance*.

This data element is included in the Generic v2.0 MMG with a CDC Priority of *1*, indicating that although the Date of Illness Onset is not *Required* in the message for HL7 compliance, it is considered high priority by CDC programs, and MMG onboarding is typically not complete without inclusion of this data element.

Recommended Definition and Implementation

Diagnosis Date: This data element should represent **clinical diagnosis** only and is defined as the earliest date that the condition being reported to public health system was identified by a clinician as the final, suspected, or most likely diagnosis. Other dates relevant to diagnosis, such as laboratory dates, should be captured in separate, discrete data elements.

The use of the word "clinical" as a qualifier in the data element name emphasizes the importance of identification of the condition by a clinician. Therefore, laboratory dates should not be used as a proxy for diagnosis and should instead be captured in separate data elements within the surveillance system and implemented as distinct concepts within the MMGs.

Refer to the DSWG brief (23-IB-SI-01), *Data Standardization: Dates of Importance to Public Health Surveillance,* for additional guidance on the interpretation and implementation of the clinical diagnosis date and the recommended data sources from which to populate this data element.

Note that the workgroup considered whether an additional component date should be included to capture another type of clinical observation, such as the date of an abnormal chest x-ray. We suggest that jurisdictions consider clinical observations as a factor in the symptom onset or clinical diagnosis dates, as appropriate, but we do not recommend a separate data element for such information.

Earliest Specimen Collection Date Associated with a Positive Lab Result

Background and Overview

Earliest Specimen Collection Date Associated with a Positive Lab Result may be one of several potential values for the Specimen Collection Date/Time data element, depending on how many lab results are available for the case.

As defined in the DSWG brief (23-IB-SI-01), *Data Standardization: Dates of Importance to Public Health Surveillance*, the Specimen Collection Date/Time is the date a clinical specimen was collected from the patient for testing for the condition of concern. The specific date to be considered as a component of the CCCD should be the earliest date on which a clinical specimen was collected that produced a lab result that was positive or indicative of the condition.

Recommended Definition and Implementation

Earliest Specimen Collection Date of a Positive Lab Result: This data element should be interpreted as the **earliest date** (with optional time component) a **clinical specimen was collected** from the patient that produced a laboratory result that was **positive or indicative of the disease** or condition being reported to a public health agency.

To identify the earliest specimen collection date, **only the laboratory tests that are relevant and specific to the condition should be considered**. Some additional guidelines are as follows:

- Any tests that are listed in the case definition as confirmatory, presumptive, or supportive laboratory evidence should be included for consideration.
- Any tests that are relevant to the condition but may not yet be listed in the case definition (e.g., a newly developed test) should be included for consideration.

- If a test interpretation requires a pair of acute and convalescent results or a pair of screening and confirmatory tests, then the collection date for the earliest specimen in the test sequence should be used.

Based on the guidelines outlined above for identifying the earliest specimen collection date associated with a case, some surveillance systems may be unable to automatically identify the earliest specimen collection date associated with a positive lab result. Under those circumstances, if non-positive or non-relevant lab results are included in cases, jurisdictions may want to reconsider how lab results are being associated with cases within their systems. Alternatively, jurisdictions might consider building a discrete data element into their systems to be manually populated by public health investigators that would capture **Earliest Specimen Collection Date Associated with a Positive Lab Result**.

Refer to the DSWG brief (23-IB-SI-01), *Data Standardization: Dates of Importance to Public Health Surveillance,* for additional guidance on the interpretation and implementation of the specimen collection date in general and how it should be populated.

Earliest Result Date of a Positive Lab Result

Background and Overview

Result Date of First Positive Lab Result may be one of several potential values for the Date/Time of Lab Result data element, depending on how many lab results are available for the case.
Two "result dates," the *Date/Time of Lab Result* and *Specimen Analyzed Date/Time*, are commonly captured and utilized within surveillance systems, and may provide information on when finalized test results are available, confirmation of diagnosis, or timeliness of reporting to public health. While the Date/Time of Lab Result represents when a result was reported out by the laboratory, the Specimen Analyzed Date/Time is intended to represent the date testing was performed or when the result was generated.

Although the two data elements are distinct in most HL7 electronic laboratory reporting (ELR) messages, they may not be stored separately in some surveillance systems. Non-ELR reports frequently do not include both the *date a result was reported* and the *date a result was generated* and may not clearly specify which date is reflected on the lab result report. Some surveillance systems capture a single 'result date' data element that could represent either or both dates, while other systems keep these elements distinct.

The specific date to be considered as a component of the CCCD should be the first result date that is available for the case, that is, the date on which the first lab result that was positive or indicative of the condition was either generated or reported by the laboratory.

Recommended Definition and Implementation

> **Result Date of First Positive Lab Result**: This data element should reflect the date on which the **first result** that was **positive or indicative of the disease** or condition was either **generated or reported** by the laboratory.

If the surveillance system captures and stores the Date/Time of Lab Result separately from Specimen/Analyzed Date/Time, both data elements should be maintained and reported accordingly. If the surveillance system does not differentiate between these two concepts, jurisdictions should use the

available date to populate at least the Date/Time of Lab Result, if not both, ensuring that this data element is available for consideration as a component of the CCCD.

The previous section on **Earliest Specimen Collection Date Associated with a Positive Lab Result** contains guidelines on which tests to include when identifying the first positive result. In addition, refer to the DSWG brief (23-IB-SI-01), *Data Standardization: Dates of Importance to Public Health Surveillance*, for additional considerations regarding interpretation and implementation of the *Date/Time of Lab Result* and *Specimen/Analyzed Date/Time*.

Note that the Earliest Result Date of a Positive Lab Result may or may not come from the same lab test as the Earliest Specimen Collection Date Associated with a Positive Lab Result. For example, if two specimens are collected on different dates, it is possible for the first specimen collected to have a test result date that is after the test result date of the second specimen.

Date First Received by Public Health Agency

Background and Overview

Dates representing when a public health agency is first notified about a case are commonly collected across jurisdictions and programs. In the DSWG brief (23-IB-SI-01), *Data Standardization: Dates of Importance to Public Health Surveillance*, we recommend the Date First Received by Public Health Agency as the highest priority of the "report date" fields. This data element is a renaming of the data element known as "Date First Reported to PHD" in the Generic v2.0 MMG. We recommend this new field be incorporated as a component of the CCCD. Refer to the DSWG brief (23-IB-SI-01), *Data Standardization: Dates of Importance to Public Health Surveillance,* for detailed guidance on the interpretation and implementation of this report date.

Recommended Definition and Implementation

Date First Received by Public Health Agency: This data element should be defined as the **earliest date** a report for the case was **received** by any public health agency, whether a state/territory or county/local agency, within the jurisdiction in which the case will be counted. Reports may include phone calls and any other mechanisms accepted by the agency.

While reports may be received from multiple sources for a given case, the value for **Date First Received by Public Health Agency** should only represent the "first" or "earliest" of the applicable reports. Furthermore, the date should reflect the first report of the case as at least a suspect, probable, or confirmed case. It should not represent the date that the public health agency was notified of a potential contact or a negative test result, even if the contact subsequently becomes a case, or if a positive test result is subsequently reported for the same person.

Date Entered or Record Initiated

Background and Overview

Surveillance systems often have an automatically generated date that represents the date when the case was entered into the system or when the case record was initiated. In the rare scenario when there is no information available to populate any of the previous component dates for a case, the DSWG proposes that this value be available for calculation into the CCCD.

Recommended Definition and Implementation

Date Entered/Record Initiated: This often automatically generated date represents when the case was entered into a surveillance system or when the case record was initiated and should be available to be submitted as the Calculated Case Counting Date.

This data element may have varying names in each surveillance system and will likely be automatically generated. It is not necessary that a separate data element be created to capture this information or that the system's existing element be renamed.

The **Date Entered/Record Initiated** should reflect the first entry of the case/record into the surveillance system as at least a suspect, probable, or confirmed case. It should not represent the date that the public health agency was notified of a potential contact or a negative test result, even if the contact subsequently becomes a case, or if a positive test result is subsequently reported for the same person.

Unlike the other component dates for the CCCD, we do not recommend that this field be included in the Generic version 3 MMG, as it has little inherent value to national surveillance. Therefore, no updates to any MMGs or to the majority of jurisdiction surveillance systems would be required to support the inclusion of this component date. However, if a surveillance system does not have existing functionality to automatically generate this date for cases, the jurisdiction might consider building a field or data element within the system to manually capture this information in order that it can be available to populate the CCCD if necessary.

Recommendations for Implementation

The Calculated Case Counting Date should be assigned the value of the earliest of the available component dates, subject to the considerations described in the component date details of this document. As described above, not all the component dates will be available or populated for every case, and one or more of the dates may not be applicable to or collected for certain conditions.

Although the component dates align very closely with the dates that constitute the hierarchy associated with the EVENTDATE, assignment of the CCCD should be based solely on the earliest date value, as long as the component dates are defined as in the sections above. Since the objective is to capture when disease first occurred, using the earliest date associated with the case is preferred over relying on a predefined hierarchy.

The following example scenarios show how the CCCD would be selected. In each scenario, the available component dates are given, and the CCCD is assigned the value of the earliest of the available dates.

Data Element	Scenario 1	Scenario 2	Scenario 3
Symptom Onset Date	1/5/2022	Unknown	Asymptomatic
Clinical Diagnosis Date	1/10/2022	n/a	3/1/2022
Earliest Specimen Collection Date Associated with a Positive Lab Result	1/9/2022	2/19/2022	n/a
Earliest Result Date of a Positive Lab Result	1/10/2022	2/21/2022	n/a
Date First Received by Public Health Agency	1/11/2022	2/21/2022	3/4/2022
Date Entered/Record Initiated	1/12/2022	2/25/2022	3/4/2022
Calculated Case Counting Date	***1/5/2022***	***2/19/2022***	***3/1/2022***

Other Implementation Considerations

Submission of component dates in MMGs: The current versions of Symptom Onset Date, Clinical Diagnosis Date, and Date First Received by Public Health Agency are high-priority data elements included in the Generic v2.0 MMG and should already be present within a jurisdiction's surveillance system. We recommend that Earliest Specimen Collection Date Associated with a Positive Lab Result and Earliest Result Date of a Positive Lab Result be added to the Generic version 3 MMG so that all component dates of the CCCD are also transmitted to CDC, with the exception of Date Entered or Record Initiated (discussed previously).

The DSWG recommends that the Calculated Case Counting Date be included as a high-priority data element in the Generic version 3 MMG. The mechanism for adding the CCCD to a surveillance system may vary across jurisdictions. Some jurisdictions may opt to build out a separate field/variable for CCCD that is visible within the surveillance system, while others may instead use a calculation that assigns the CCCD in an HL7 case notification message. Any method is acceptable, provided that the concept and interpretation of the CCCD is standardized so that the data can be appropriately interpreted and aggregated across jurisdictions.

CCCD override: The DSWG suggests that jurisdictions may want to include functionality within their surveillance system to override an automated CCCD calculation for specific cases, if necessary. While an automated calculation of CCCD will be most efficient and most accurate overall, there may be data anomalies or other sporadic situations where the ability to manually enter a CCCD to override the calculation provides the best solution. This override may also be helpful at times when the system usage of a field does not align completely with the definition in this guidance. For example, A CCCD override could be used when the automated CCCD calculation selects a recorded symptom onset date that is

inconsistent with the etiology of the condition, or a date first received by the PHA that is actually when the person was identified as a contact rather than as a case.

Changes in a case's CCCD over time: Typically, as a case investigation progresses, additional information becomes available that may result in corrections to existing component date values or the availability of previously unknown component dates. In the event that a new date value becomes the earliest of the component dates known at any given time, the CCCD algorithm indicates that its value should be updated to reflect the earliest of the available dates, and the updated CCCD value should be subsequently transmitted to CDC for that case. For example, consider a symptom onset date that was not initially reported but later becomes known. If the symptom onset date has the earliest value of the component dates known for the case, which is likely, the CCCD should be updated to the value of the symptom onset date.

No creation of condition-specific algorithms: The DSWG recommends that the CCCD be calculated consistently across conditions, with the understanding that it will only include the fields and values available for each case and relevant to the condition. The workgroup considered an approach similar to the existing MMWR Week guidance, which suggests that "states may choose to assign MMWR week differently by notifiable condition", for implementation of the CCCD. However, it was argued that not all the component dates apply to all conditions. For example, many sexually transmitted infection cases are asymptomatic, and therefore the symptom onset date is not always relevant. An algorithm that applies the CCCD calculation consistently across jurisdictions and across conditions was valued as the best way to accurately compare temporal incidence. This final recommendation was reached following workgroup discussions, including input from members of CDC's NNDSS team.

Other date fields or algorithms may be used in analysis or visualizations: We recommend that the CCCD should be calculated consistently across conditions, but it is important to note that the CCCD is not intended to be the singular date field that should be applied to all analyses. Other single date fields, additional date concepts, or other algorithms may continue to best meet the needs for certain analyses and visualizations. These approaches should be carefully considered and defined based on programmatic considerations and interpretation of the data. However, programmatic analytical requirements should not supersede the CCCD logic and definition. The development of those separate algorithms and practices is outside the scope of these guidelines.

Cases may be identified after the annual reconciliation period: Because of the component dates selected, using this algorithm across conditions means that some cases may have a CCCD identified for a year that is already closed out and/or reconciled between the PHAs and CDC. This may occur in the event of exceptional reporting delays, but also for conditions with extended clinical presentations or long periods before diagnosis. PHAs have varying practices on how they treat these cases when publishing their own case counts (for example, whether to update previous years' counts or to continue to exclude the later-identified case). We request that CDC also consider how to receive/accept these cases so that the updated information may be included in the national surveillance picture. While this is a known limitation, it is outweighed by the value of having a standardized CCCD that overall reflects the earliest identified epidemiologically-relevant date.

Reinfections or other situations involving multiple cases for the same person: For some conditions, a person may have multiple occurrences of the condition. Defining what constitutes a new occurrence or "when to count a new case" is outside the scope of this guidance. However, each case should have its own CCCD.

No recommendation for a "date type" field: The DSWG considered whether to recommend adding a field to indicate which component date is used for the CCCD for each case, like the EVENTTYPE in the NETSS messages, but decided *against* including that recommendation. The rationale is that multiple component dates may match the CCCD, and since the component dates will be included as separate elements in the MMG, CDC programs can identify which component date matches the CCCD, if necessary.

Recommended Actions

Public Health Agencies

1. Ensure the six component date elements can be captured by the jurisdiction's surveillance system (if relevant to conditions included within the surveillance system), and that their usage aligns with the component date details described above.
    a. Symptom Onset Date
    b. Clinical Diagnosis Date
    c. Earliest Specimen Collection Date Associated with a Positive Lab Result
    d. Earliest Result Date of a Positive Lab Result
    e. Date First Received by Public Health Agency
    f. Date Entered or Record Initiated
2. Calculate the proposed Calculated Case Counting Date data element as the earliest of the available component dates for each case.
3. Consider incorporating functionality to enable PHAs to override the Calculated Case Counting Date calculation on a case-by-case basis.
4. Transmit the first five data elements AND the Calculated Case Counting Date to CDC as part of routine case notification.

This guidance is intended as best practice/ideal state, recognizing that implementation will take some time.

CSTE

1. Promote use of Calculated Case Counting Date among members and encourage inclusion of the six component dates in jurisdictions' surveillance systems.
2. Collaborate with CDC to develop a Calculated Case Counting Date implementation plan that encompasses both jurisdictional and CDC programs.

CDC

1. Incorporate the Calculated Case Counting Date and the first five associated component dates (into routine case notifications).
2. Ensure CDC can accept these six data elements and provision the data to programs.
3. Promote use of standardized Calculated Case Counting Date for case counting across CDC programs and public health agencies.
4. Collaborate with CSTE to develop a Calculated Case Counting Date implementation plan that encompasses both jurisdictional and CDC programs.
5. Support the PHAs as needed in the implementation of these guidelines, including incorporating any changes needed for the NEDSS Base System (NBS).

References and Resources

- Council of State and Territorial Epidemiologists. Data Standardization: Dates of Importance to Public Health Surveillance. CSTE Brief, 23-IB-SI-01
  https://cdn.ymaws.com/www.cste.org/resource/resmgr/briefs/DSWG_Dates_of_PH_Importance_.pdf
- Centers for Disease Control and Prevention (CDC) NNDSS Modernization Initiative (NMI):
  https://www.cdc.gov/surveillance/index.html
- Message Mapping Guides:
  https://ndc.services.cdc.gov/message-mapping-guides/
- MMG-Related Documentation:
  https://ndc.services.cdc.gov/supporting-documents-for-implementation/
- Lab Repeating Group Template:
  Laboratory Template (5/11/2018)
- CSTE Position Statements:
  https://www.cste.org/page/PositionStatements
  https://cdn.ymaws.com/www.cste.org/resource/resmgr/PS/09-SI-04.pdf
- Surveillance Case Definitions for Current and Historical Positions:
  https://ndc.services.cdc.gov/
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