Frequently Asked Questions and Answers for the Malaria Case Notification Message Mapping Guide

OVERVIEW

The malaria Health Level 7 (HL7) case notification message has two components, (i) the generic version 2 (GenV2) data elements, which are part of all case notification messages, and (ii) the data elements specific to the malaria case report. The malaria message mapping guide (MMG) describes the malaria-specific content (e.g., data elements and valid values) and message mapping specifications to report malaria cases to CDC via HL7 case notifications. This frequently asked questions (FAQ) document provides technical guidance and additional instructions for the reporting of confirmed malaria cases.

In preparation to onboard for malaria HL7 reporting, please review the guidance within the CDC NNDSS (National Notifiable Diseases Surveillance System) Technical Resource Center (https://www.cdc.gov/nndss/trc/index.html) on the implementation of MMGs and preparation for onboarding. Below are the high-level steps jurisdictions should take prior to initiating the onboarding process:

- ✓ Perform the gap analysis.
- ✓ Complete the implementation spreadsheet and test case scenario worksheet.
- ✓ Prepare the test case scenario messages.
- ✓ **Submit year-to-date (YTD) records in the legacy format (case report forms or excel file) to the CDC malaria program at the time of the onboarding kickoff call.**

Onboarding for malaria HL7 case notification implementation is a collaborative process among the jurisdiction, the CDC malaria program, and the NNDSS Onboarding team. If you have any onboarding or technical questions or would like to request technical assistance, please email edx@cdc.gov with the subject "Technical Assistance." The CDC malaria program (malariasurveillance@cdc.gov) can answer any programmatic and surveillance questions about the MMG.

FREQUENTLY ASKED QUESTIONS

Question 1: Which GenV2 data elements are especially important for malaria surveillance?

Answer 1: In addition to the core priority 1 data elements in GenV2, the data elements in the table below are of key importance to the national malaria surveillance. The CDC malaria program's prioritization of malaria elements can be found within the malaria MMG (https://ndc.services.cdc.gov/mmgpage/malaria-message-mapping-guide/).

GenV2 Data Elements Important to the CDC Malaria Program in Addition to Those with Priority 1			
PHIN Variable	**Data Element Identifier Sent in HL7 Message**	**Data Element Name**	**Notes and Justification**
DEM126	78746-5	Country of Birth	This data element will provide information about the risk factors for malaria.
INV501	77983-5	Country of Usual Residence	Approximately 25% of malaria cases diagnosed in the U.S. are among non-U.S. residents. The malaria program requests that all cases diagnosed in the U.S. be reported via NNDSS. The malaria program encourages jurisdictions to use INV501 Country of Usual Residence to report non-U.S. resident case reports. See also "Special Case Scenarios" Question 5, (pg. 6) for guidance.
INV128	52455-3	Hospitalization Admission Date	Please use the GenV2 data element for the most recent hospitalization admission date. See Question 2 for more information.
INV133	52525-3	Hospitalization Discharge Date	Please use the GenV2 data element for the most recent hospitalization discharge date. See Question 2 for more information, page 3.
INV134	78033-8	Hospitalization Duration in days.	Please use the GenV2 data element for the most recent hospitalization discharge date. See Question 2 for more information, page 3. If the hospital admission and discharge dates are known, then the hospital duration data element can be left blank. If one or both dates are unknown, then provide the hospital duration.
INV178	77996-7	Pregnancy Status	Because malaria can cause severe illness in pregnant women, reporting pregnancy status is important for surveillance in this risk group. While pregnancy status may not be reported for each case, it is important for jurisdictions to have built in the ability to send these data when available.
NOT113	77967-8	Reporting County	This data element is important to the malaria program for case follow-up.
INV886	77999-1	Comment	This data element is important to the malaria program as it allows for the documentation of additional pertinent information. (See examples in the "Special Case Scenarios" section [pg. 6]). This data element has been used in previous malaria case report forms, and, because it is included in GenV2, there is not an equivalent "Comments" field in the malaria-specific MMG. If using the "Comment"

			field is a challenge for a jurisdiction, please contact the malaria program. Additionally, include this information in the implementation spreadsheet.

Question 2: The following data elements are included in both the GenV2 MMG and malaria MMG: Hospitalized (GenV2: 77974-4; malaria MMG: 32485007), Admission Date (GenV2: 8656-1; malaria MMG: 52455-3), and Discharge Date (GenV2: 8649-6; malaria MMG: 52525-3). Which version of the data elements would the program prefer?

Answer 2: The GenV2 MMG does not allow for repeating hospitalization information. Please provide the details for the most recent hospitalization in the GenV2 hospital admission and discharge data elements (Hospitalized GenV2: 77974-4; Admission Date GenV2: 8656-1; Discharge Date GenV2: 8649-6; Hospitalization Duration: 78033-8). If the patient had multiple hospitalizations for this illness, please document earlier admissions in the malaria repeating block (Hospitalized malaria MMG: 32485007; Admission date malaria MMG: 52455-3; Discharge date malaria MMG: 52525-3; Hospital name: 58237-9; Hospital record number: 46106-1).

Question 3: Are there any new or updated data elements compared to the paper case reporting system? Also, are there any updated value sets?

Answer 3: Yes, compared to the paper case reporting system, several data elements have been updated. The tables below describe A) data elements that are organized into repeating blocks, B) updated value sets, and C) new data elements in the malaria MMG.

A. Repeating Blocks ***New data elements in the repeating blocks are bolded.***		
Block Name	Data Elements Included	Notes and Justification
Physician Name/Number	Physician Name (52526-1), Physician Phone Number (68340-9)	Repeating block to include information for more than one physician. Providing multiple physicians is useful when more than one physician provided care or when patients are transferred.
Hospitalization	Admission Date (52455-3), **Discharge Date (52525-3)**, Hospital Name (58237-9), Hospital Record Number (46106-1), Admitted as Inpatient (32485007)	Repeating block for information on multiple hospitalizations, or transfers, for the current illness. See above, Question 2, discussing the malaria hospitalization repeating block (page 3).
Previous Illness	Previous History of Malaria (12 Months Prior) (161413004), Date of Previous Illness (82758-4), Organism Associated with Previous Illness (INV914)	Repeating block for each prior illness in the last 12 months.

Treatment	Treatment Information (55753-8), **Date Treatment or Therapy Started (86948-7),** **Date Treatment or Therapy Stopped (63939-3),** **Treatment Duration (67453-1)**	Repeating block for each treatment medication. Please indicate the treatment start and stop dates for each medication. If the treatment dates are not available, then you may provide the duration of treatment, in days.
Travel History	International Destination(s) of Recent Travel (82764-2), Date of Return to the US from Travel (55209-1), Duration of Stay (82310-4), Duration of Stay - Units (OBX-6 for 82310-4), Reason(s) for Travel (66415-1)	Repeating block for each country of travel.
Occupation and Industry	Current Occupation (85658-3), Current Occupation Standardized (85659-1), Current Industry (85078-4), Current Industry Standardized (85657-5)	Standard Occupation and Industry data elements are new (and optional) for malaria case reporting.
Specimen Type	Specimen Type(s) Sent to CDC (66746-9), **CDC Specimen ID (CSID) (INV965)**	Repeating block for each specimen sent to CDC.
Laboratory Testing	Test Type (INV290), Test Result (INV291), **Specimen Collection Date/Time (68963-8),** **Date/Time of Lab Result (82773-3),** Organism Name (LAB278), Performing Laboratory Name (68994-3), Laboratory Phone Number (65651-2), Parasitemia Level Percentage (53556-7)	Repeating block for each lab test reported. See instructions for reporting the Laboratory Results in the MMG data element description or the annotated case report form.
Part II. Adverse Event	Adverse Event Description (42563-7), Adverse Event Related to Treatment (INV918), Adverse Event Time to Onset (82311-2), Adverse Event Time to Onset – Units (N/A: OBX-6 for 82311-2), Adverse Event Severity (64750-3)	Part II (4-week follow-up) repeating block for each adverse event experienced due to antimalarial treatment. This is an optional section to complete for patients who report an adverse event.
Part II. Medications	Medication Administered (29303-5), Medication Administered Relative to Treatment (INV1284), **Medication Start Date (91381-4),** **Medication Stop Date (91382-2),** **Medication Duration (91383-0)**	Part II (4-week follow-up) repeating block to report medications taken in the two weeks prior to antimalarial treatment and the four weeks after antimalarial treatment. This is an optional section to complete for patients who report an adverse event to antimalarial medications.

B. New Malaria Data Elements		
Section or Data Element name	Data Element Identifier	Notes and Justification
CSID	INV965	CDC specimen ID number from the 50.34 submission form. This new data element will facilitate record linkage across epidemiological and lab sources.
Hospitalization Discharge date	52525-3	Please provide the hospitalization discharge date, if available. This information is useful to understand the timeliness of care.
Specimen Collection Date/Time	68963-8	If known, please indicate the specimen collection date/time. This information is useful to understand the timeliness of diagnosis.
Date/Time of Lab Result	82773-3	If known, please indicate the lab result date/time. This information is useful to understand the timeliness of diagnosis.
Date Treatment or Therapy Started	86948-7	The treatment dates will provide information on the timeliness of malaria treatment. If the precise date is unknown, then leave blank and provide the treatment/therapy duration.
Date Treatment or Therapy Stopped	63939-3	The treatment dates will provide information on the timeliness of malaria treatment. If the precise date is unknown, then leave blank and provide the treatment/therapy duration.
Treatment Duration	67453-1	If the start and stop dates for treatment/therapy dates are known, then duration can be left blank. If one or both dates are unknown, then please provide the treatment duration (in days).
Part II (4-week follow-up). Medication Start Date	91381-4	The Part II (4-week follow-up) medication *start* date is a new data element in the optional part of the malaria paper case report form that assists in the evaluation of antimalarial adverse events. This section is to be completed only if the subject experienced an adverse event to an antimalarial. If the precise date is unknown, then provide the medication duration.
Part II (4-week follow-up). Medication Stop Date	91382-2	The Part II (4-week follow-up) medication *stop* date is a new data element in the optional part of the malaria paper case report form that assists in the evaluation of antimalarial adverse events. This section is to be completed only if the subject experienced an adverse event to an antimalarial. If the precise date is unknown, then provide the medication duration.
Part II (4-week follow-up). Medication Duration	91383-0	The Part II (4-week follow-up) medication *duration* is a new data element in the optional part of the malaria paper case report form that assists in the evaluation of antimalarial adverse events. This section is to be completed only if the subject experienced an adverse event to an antimalarial. If the start and stop dates for medication dates are known, then duration can be left blank. If one or both medication dates are unknown, then provide the medication duration.

C. Updated value sets, compared to the paper case report (2014) *Please check the PHIN VADS Malaria MMG Case View for the most recent collection of malaria value sets*		
Section	Data Element Name and Identifier	Notes and Justification
Travel history repeating block	Reason(s) for Travel (66415-1)	Added "Medical/Relief response." Value set updated to include this commonly reported reason for travel.
Specimen block elements	Specimen Type (66746-9)	Added "Images." Images are sent to CDC for telediagnosis assistance.
Chemoprophylaxis Questions	Chemoprophylaxis Medication(s) (INV931)	Added "Arakoda (tafenoquine)." This medication was FDA approved for malaria chemoprophylaxis in 2019.
Treatment questions	Treatment Information (55753-8)	Added "Krintafel (tafenoquine)" and "Arakoda (tafenoquine)." Krintafel was FDA approved for malaria treatment in 2019. It is possible that Arakoda (which has the same active ingredient with a different dosage) could be used for treatment.

Question 4: "State Case Identifier (77993-4)," "Local Subject ID (PID-3)," and "Local Record ID" (OBR-3) are included on the GenV2 MMG. Which data element takes priority?

Answer 4: The "Local Subject ID" (PID-3) and "Local Record ID" (OBR-3) are required data elements and must be submitted in the HL7 messages. Please be sure to identify in the implementation spreadsheet if the local subject ID is not at the patient level due to constraints of the surveillance system, i.e., event vs. person-based system. It is the jurisdiction's choice to send or not to send the "State Case Identifier" (77993-4) in the malaria message.

SPECIAL CASE SCENARIO FAQS

Question 5: How should jurisdictions report recent immigrants and refugees, considering the new GenV2 residence question ("Country of Usual Residence" [77983-5]) and the malaria residence question ("Country of Residence Prior To Most Recent Travel" [TRAVEL15])?

Answer 5: Because refugees and immigrants are establishing residence in the United States, please indicate that their "Country of Usual Residence" (77983-5) is the United States. However, the "Country of Residence Prior To Most Recent Travel" (TRAVEL15) should be answered to reflect the country from where they immigrated. Persons who are neither immigrants nor refugees have the same answer for both residence questions (e.g., "Country of Usual Residence" [77983-5] and "Country of Residence Prior To Most Recent Travel" [TRAVEL15]). Please complete the "Country of Birth (78746-5)" question for all subjects, regardless of their residence status. (Please see CDC guidance in the FAQs about implementing the "Country of Usual Residence" data element here: https://ndc.services.cdc.gov/supporting-documents-for-implementation/). See Census Guidance here: https://www.federalregister.gov/documents/2018/02/08/2018-02370/final-2020-census-residence-criteria-and-residence-situations?#)

Question 6: How should jurisdictions notify CDC of cases where no valid travel history is reported?

Answer 6: The CDC malaria program requests that the jurisdiction provide investigation findings and pertinent details using the GenV2 "Comment" (77999-1) data element. If necessary, extended travel history beyond 2 years can be included. "Country of Birth" (78746-5) information is requested as well. If your jurisdiction does not include the "Comment" (77999-1) data element in the HL7 message, provide this information via secure methods to the CDC malaria program. Please report any cases without a travel history to a malaria endemic country, or cryptic cases, to CDC as quickly as possible so that prompt follow-up can occur.

Question 7: How should jurisdictions notify CDC of possible blood transfusion-associated cases?

Answer 7: The CDC malaria program requests that the jurisdiction provide the following data elements: "Received Blood Transfusion/Organ Transplant" (82312-0), "Blood Transfusion/Organ Transplant Date" (80989-7), "Hospital Admission" (32485007), "Hospital Name" (58237-9), "Physician Name" (52526-1), and "Phone Number (68340-9)." Please use the "Comment" (77999-1) data element to indicate that this is a possible (or confirmed) case acquired from a blood transfusion or organ transplant. If your jurisdiction does not include these data elements in their HL7 message, provide this information via secure methods to the CDC malaria program. Please report any possible transfusion-transmitted malaria case to CDC as quickly as possible so that prompt follow-up can occur.

Question 8: How should jurisdictions notify CDC of a possible congenital case?

Answer 8: The CDC malaria program requests that the jurisdiction provide pertinent information regarding a potential congenital case (mother case ID, travel history of mother, and any relevant details) using the "Comment" (77999-1) data element. If your jurisdiction does not include the "Comment" (77999-1) data element in their HL7 message, then please provide this information via secure methods to the CDC malaria program. Please report any possible congenital case to CDC as quickly as possible so that prompt follow-up can occur.

Question 9: How should jurisdictions notify CDC of a fatal malaria case?

Answer 9: The CDC malaria program requests that the jurisdiction complete the "Subject Died" (INV145) and "Deceased Date" (INV146) data elements. Pertinent information can be added in the "Comment" (77999-1) data element, especially related to the diagnosis or circumstances of the death. The malaria program will follow up for more information. Please report any fatal case to CDC as quickly as possible so that prompt follow-up can occur.

For specific instructions on how to interpret or map the malaria data elements, please refer to the MMG date element descriptions and HL7 implementation notes, as well as the annotated case report form. All of these documents can be found at https://ndc.services.cdc.gov/mmgpage/malaria-message-mapping-guide.

REFERENCES

NNDSS Technical Resource Center - HL7 Message Mapping Guides & Standards: https://www.cdc.gov/nndss/trc/mmg/index.html

Malaria MMG and artifacts: https://ndc.services.cdc.gov/mmgpage/malaria-message-mapping-guide/

NNDSS eSHARE training webinars: https://www.cdc.gov/nmi/eshare.html

How to report a case of malaria prior to onboarding the Malaria MMG, including some malaria-specific instructions: https://www.cdc.gov/malaria/report.html

Country-specific information on malaria: https://www.cdc.gov/malaria/travelers/country_table/a.html