



## Health Level 7 (HL7) Generator for National Electronic Lab Reporting

### Introduction:

As a result of the COVID-19 pandemic, CDC and HHS have issued reporting guidance to all healthcare entities (public and private labs) that generate COVID-19 test results. Labs must report COVID-19 test results to the appropriate public health agencies in a specific data format, ideally following the Health Level 7 (HL7) version 2.5.1 Implementation Guide: Electronic Laboratory Reporting to Public Health Release 1 (ELR R1)<sup>1</sup>. Furthermore, CDC and HHS have provided guidance on specific constraints on values contained in the COVID-19 test result reports (for example, patient date of birth should be provided in date/time format of YYYYMMDD[HHMMSS])<sup>2</sup>. This data can be sent from labs to public health agencies through the APHL Informatics Messaging Service, or AIMS<sup>3</sup>, which will provide routing service based on the patient's residence address.

APHL has provided an HL7 validator that can assist labs sending COVID-19 results to Public Health to assess their data's compliance with CDC and HHS data format requirements at <https://hl7v2.gvt.nist.gov/gvt/#/cf> (tool scope = APHL, profile HHS ELR).

However, it is often difficult for labs to generate HL7 2.5.1 messages when they lack specific knowledge of that data standard. To that end, APHL has created a tool (based in Microsoft Excel) that can generate an HL7 V2.5.1 ELR R1 specification based data output file for COVID-19 test results that is compliant with all data format and value constraints imposed by CDC and HHS. This HL7 data output file can be generated by the tool from two different data sources as input:

1. Manual entry of data into the tool
2. Conversion of a comma separate value (CSV) file

APHL envisions that the HL7 Generator tool will assist 1) labs sending COVID-19 test data, and 2) public health agencies receiving COVID-19 test data. It will shorten the integration lifecycle of getting properly formatted and compliant data from labs to public health agencies. Should additional or revised guidance be issued from CDC or HHS regarding COVID-19 test data requirements, the HL7 Generator will be updated as needed.

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<sup>1</sup> [http://www.hl7.org/implement/standards/product\\_brief.cfm?product\\_id=413](http://www.hl7.org/implement/standards/product_brief.cfm?product_id=413)

<sup>2</sup> <https://www.hhs.gov/sites/default/files/hhs-guidance-implementation.pdf>

<sup>3</sup> [https://www.aphl.org/programs/informatics/Documents/APHL\\_AIMS\\_Hub.pdf](https://www.aphl.org/programs/informatics/Documents/APHL_AIMS_Hub.pdf)



### Guidance for Public Health Agencies Trying to Receive COVID-19 data

Prepare your state specific version of the HL7 Generator Tool, available for download at [https://preparedness.cste.org/?page\\_id=136](https://preparedness.cste.org/?page_id=136), by updating fields in the configuration tab with your specific requirements.

As new labs contact your agency to send COVID-19 data, make them aware of the HL7 HHS ELR profile validator tool here: <https://hl7v2.gvt.nist.gov/gvt/#/cf> (tool scope = APHL, profile HHS ELR). If the lab indicates it is not capable of generating HL7 V2.5.1 ELR R1 compliant messages, share your agency specific version of the HL7 Generator tool and point them to the detailed User Guide for that tool at are part of the download package. Since the lab will be producing csv files, point them to the flat file validator tool <https://validator.aimsplatform.org/> (select the Flatfile Validator), if they are using the import function for the tool.

Prior to starting, remind labs to check each download location for the newest versions of tools and user guides before beginning work, since guidance from the CDC and HHS may have been updated for COVID-19.

### Guidance for Labs Sending COVID-19 Test Data

When starting, APHL recommends that you establish contact with the appropriate public health agency where you will be sending COVID-19 data, to find out what their onboarding process is and what options you have to report to them. If you are unable to generate HL7 V2.5.1 ELR R1 compliant messages with the additional HHS elements, you may use the HL7 Generator tool and coordinate with them.

Please note that there are a significant number of fields on the Configuration Tab in the tool that you need provide content for, before using the tool - many fields are specific to your lab (e.g. CLIA number) that are needed in order to properly generate the output file. Please see the detailed tool user guide available as part of the package for instructions on configuration and use of the tool.

If you have providers that don't currently provide patient and order information electronically, this file may also be able to help you collect that directly from the providers, including the HHS requested Ask At Order (AOE) questions.

Video about the dataflow in the below diagram: <https://youtu.be/qoI0uKZrCUw>

## National ELR CSV to HL7 processing

1. Option 1- A CSV file is generated and placed into the CSV Input directory
- 1a. A scheduled task invokes a Macro, which picks up the file from the CSV input directory
2. Option 2-Users can manually enter values into the worksheet to be transformed. Input is validated via dropdowns and other restricted values
3. The prepared CSV is validated and copied to a worksheet to be transformed to HL7.
- 3a. If the file does not pass validation during CSV import, a list of errors are written to an error log file and the file is not imported
- 3b. The errored file is written to the Processed Failed CSV Directory
4. The CSV to HL7 macro processes the worksheet.
- 4a. If there are errors, HL7 is not output and a list of errors are written to an error log file
- 4b. If there are no errors and all required fields are populated, the transformed HL7 is output to the HL7 output directory
- 4c. Once processed, the raw CSV is output to the CSV processed directory
- 4d. If the file errors, the CSV is written to the Process Failed CSV Directory
5. A transport service is scheduled to send the file to the AIMS Hub using InterPartner routing
- 5a. There can be manual intervention to transmit the file to the AIMS Hub.
6. The HL7 messages are routed to the appropriate jurisdiction PHAs.

