



HL7 Generator Tool Overview (Manual Entry)

Version 20210105

Version number	Changes made
20200921	<i>Added capability to customize the file name (Step 5 to Step 5A and 5B) Updated notes around replacement value handling</i>
20201016	<i>Updated instructions to explain how testing lab / reporting facility information is used. Updated instructions to clarify which element in the csv file is used as the look up in the Local Code column on the DropDownValues tab Updated instructions to indicate how to deal with assigning authority</i>
20201125	<i>Added note about use of only the first row per specimen for comments Added Mapping table for content in the COVID-19 LVD file to specific csv file columns</i>
20210105	<i>Added instructions what to do, when you need help</i>



This tool is built into Microsoft Excel and has various tabs, some of which are for data input and some of which are for configuration data.

Note: When you have to update to a new version of the tool it is recommended to copy over the entire tabs EXCEPT for the Admin tab - copy only your settings (values in Column B) over to it.

Description of Tabs in the HL7 Generator Tool

Instructions Tab: Contains overall instructions and buttons to execute the generation

Gap Analysis7-8 Tab: Contains the overall data guidance/constraints provided by CDC and HHS on 7/8/2020

Flatfile_Result_Use Tab: Data entry tab which allows the user to manually enter data into those fields whose values cannot be pre-configured. This tab supports drop down menus for several elements. The macro used ensures that all fields required to generate an HL7 v.2.5.1 compliant message are populated and follow the expected format, when important. Do NOT change the order of the columns on this tab, as that will affect the linking of the drop down values.

In order to help with population of some of the content use the following table to extract related information for the specific test you are performing using the COVID-19 LIVD file accessible here: <https://www.cdc.gov/csels/dls/sars-cov-2-livd-codes.html>

Column Header in Flatfile HL7 Generator	LIVD Column Name	LIVD Column ID	Comment
Ordered_test_code	LOINC Order Code	H	This is the preferred value to use in the Ordered_test_code column in the csv file and also populate column C in the DropDownValues tab, so that the lookup can properly work to include the version number
Ordered_test_description	LOINC Order Code Long Name	I	
Ordered_test_code_system	Not explicitly in the LIVD file, but can be assumed by the column header name - should be set to "LN"		



Column Header in Flatfile HL7 Generator	LIVD Column Name	LIVD Column ID	Comment
Specimen_type_code	Vendor Specimen Description the first element in the () - a numeric value in most cases.	D	This is the preferred value to use in the Specimen_type_code column in the csv file and also populate column C in the DropDownValues tab, so that the lookup can properly work to include the version number
Specimen_type_description	Vendor Specimen Description the second element in the () - text	D	
Specimen_type_code_system	Vendor Specimen Description the third element in the () - "SCT" in most cases	D	
Test_kit_EUA_ID	Testkit Name ID, when Testkit Name ID Type = "EUA"	M and N	Use the content of this column and append _<Testkit Name ID Type>, so in this case _EUA
Test_kit_model_ID	Testkit Name ID, when Testkit Name ID Type = "DIT"	M and N	Use the content of this column and append _<Testkit Name ID Type>, so in this case _DIT
Test_kit_model_name	Testkit Name ID, when Testkit Name ID Type = "MNT" or "MNM"	M and N	Use the content of this column and append _<Testkit Name ID Type>, so in this case _MNT
Instrument_model_ID	Equipment UID, when Equipment UID Type = "DII"	O and P	Use the content of this column and append _<Testkit Name ID Type>, so in this case _DII
Instrument_model_name	Equipment UID, when Equipment UID Type = "MNI"	O and P	Use the content of this column and append _<Testkit Name ID Type>, so in this case _MNI



Column Header in Flatfile HL7 Generator	LIVD Column Name	LIVD Column ID	Comment
Test_performed_code	LOINC Code	F	This is the preferred value to use in the Test_performed_code column in the csv file and also populate column C in the DropDownValues tab, so that the lookup can properly work to include the version number
Test_performed_description	LOINC Long Name	G	
Test_performed_code_system	Not explicitly in the LIVD file, but can be assumed by the column header name - should be set to "LN"		
Test_result_coded	Vendor Result Description the first element in the () - a numeric value in most cases.	E	This is the preferred value to use in the Test_result_coded column in the csv file and also populate column C in the DropDownValues tab, so that the lookup can properly work to include the version number
Test_result_description	Vendor Result Description the second element in the () - text	E	
Test_result_code_system	Vendor Result Description the third element in the () - "SCT" in most cases	E	

Configuration Tab: Contains two parts that determine data mapping for each message generated by the tool:

1. Static values to be included in specific data fields for all messages generated
 - a. If Column E – “Corresponding input column name (to replace if empty)” is populated, the tool will only populate this entry if the corresponding input column is empty. (e.g. for reporting_facility_id – if the csv file has values the tool will use those, if those cells are blank, the tool will use the value from the configuration tab in cell B11. This means:



If you are reporting only for one facility you can use the configuration tab values and don't need to populate the cells in the csv file, but if you are reporting for many different testing sites, you should only use the csv cell values and leave the configuration cells blank, so that you get an error, when csv file data is missing).

2. References that map valid values from the dropDownValues tab to the data input fields on Flatfile_Result_Use tab

dropDownValues Tab: Defines specific value sets that are valid for certain HL7 elements and fields. Referenced by Configuration Tab and Flatfile_Result_Use Tab and allows for mapping local codes used in the csv file coded columns (e.g. test_performed_code) that is being imported to the standard codes to be included in the HL7 messages. If the lookup of the local value fails, it will then check to see if the input is in column D (Standard code). If it matches the value in Column D, it will map the replacement value to the HL7 message for that field, if it does not match, the file will error.

Admin Tab: Defines overall flat file configuration (input/output directories for processing, flatfile naming parameters) as well as validations and lookups to be used for various fields.

For a video of this section see (The video uses the previous version of the tool, so if some screens look different don't despair – the screenshots in this document show the updated views): <https://youtu.be/3SdD0D4vPwQ>



Summary of Steps to Generate HL7 Output Files from Manual Entry

Step 1: Set up folder structures for files

Step 2: Open the HL7 Generator Tool

Step 3: In *Admin* tab, specify file directory paths

Step 4: In *Admin* tab, specify 'Test' or 'Prod'

Step 5A: For AIMS Routing Service: In *Admin* tab, select "InterPartner" in Cell B13 and specify the *Interpartner "From"* Value in Cell B16, which will be the ID assigned to your organization by the AIMS team.

Step 5B: For direct connections with jurisdictions: In *Admin* tab, select the desired file naming schema in Cell B13 and enter the specific requirements for the jurisdiction you are working with in Cell B14.

Step 6: In *Admin* tab, specify the delimiter character to note multiple values (repeats) in a single segment.

Step 7: In *Instructions* tab, click "Generate HL7 from Manual Entry" button to generate test output

Step 8: In *Gap Analysis7-8* tab, view minimum required fields and indicate fields that your lab supports

Step 9: In *Configuration* tab, populate static meta-data values.

Step 10: In *dropDownValues* tab, map local lab values to standard values for use in HL7; this includes demographic data, test related data and assigning authority identification

Step 11: In *Configuration* tab, ensure that all standard HL7 values from *dropDownValues* tab are represented in the bottom half of the tab

Step 12: In *Flatfile_Result_Use* tab, enter your data manually

Step 13: In *Instructions* tab, click "Generate HL7 from Manual Entry" button to generate output

For videos of the above steps see here (The video uses the previous version of the tool, so if some screens look different don't despair – the screenshots in this document show the updated views):

<https://youtu.be/5ZEK1JXRN5c>



https://youtu.be/6_6v4cCv7y0

https://youtu.be/zBggE_4DTeY

Instructions when you need help

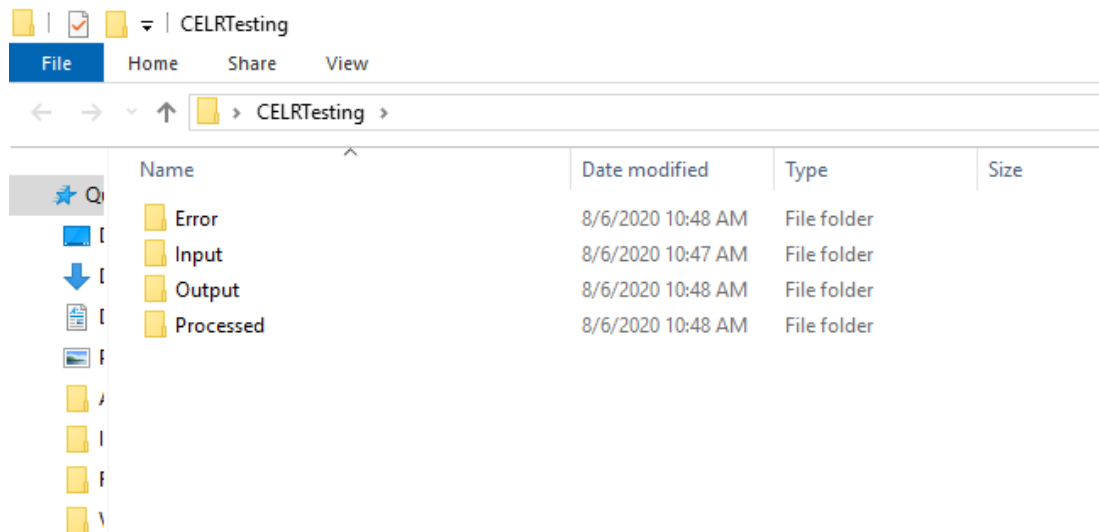
If you encounter issues, send an email to informatics.support@aphl.org

In the subject line include the name of your jurisdiction (if you are a PHA) or organization and “HL7 Generator Help”. Describe your problem in detail and be sure to also attach your version of the HL7 generator file – with the TEST DATA (no PHI) that you are working with.



Detailed Steps to Generate HL7 Output Files from Manual Entry

Step 1: Create a folder structure (suggested on Desktop of your Computer) with four folders: Input, Output, Processed, Error. Write down the full paths of each of the folders.



Step 2: Open the HL7 Generator tool Excel file (*NatELRFlatFile_GapAnalysis_HL7Generator.xlsm*). Enable all content and macros. Click on “Save As” and add your own unique filename to save your specific configurations separate from the base tool file (i.e. *NatELRFlatFile_GapAnalysis_HL7Generator_Testing.xlsm*).

Step 3. Go to the *Admin* tab of the tool. Enter the full directory paths for the Input, Output, Processed and Error Directories from Step 1. If the order of the columns is changed on the Flatfile_result_use tab, update the “Flatfile_Result_Use column to count rows” to a required field. It currently points to “Patient_ID.”



File Home Insert Page Layout Formulas Data Review View ACROBAT Tell me what you want to do...				
PROTECTED VIEW Be careful—files from the Internet can contain viruses. Unless you need to edit, it's safer to stay in Protected View. Enable Editing				
G34 REQUIRED_COMBO_4				
Config Item	value	Description	FlatFile_Col	
Input Directory	C:\runMacro\test1\Input		Abnormal flag	
Output Directory	C:\runMacro\test1\Output		Comments	
Processed Directory	C:\runMacro\test1\Processed		Date_result_rel	
Error Directory	C:\runMacro\test1>Error		Disease_sympt	
FlatFile_order_use column to count rows	A		Employed_in_h	
FlatFile_Result_Use final column	DP		Employed_in_h	
Timer on	FALSE		First test	
Number of Errors before exit	0		flatfile_version	
Include Batch header and footer	TRUE		Hospitalized	
File Naming option	ManualAndTimeStamp		ICU	
Manual file Name	ELR~		Illness_onset_d	
Current Usage (and MSH-11 mapping)	Prod		Instrument_ins	
InterPartner "From" value	eTrueNorth		Instrument_ma	
InterPartner "To" value	AIMSPlatform		Instrument_ma	
Test result exclude from normal processing	Test_kit_EUA_ID,Test_kit_model_ID,Test_kit_model_name,Test_result_code_system,Tes		Link_test_to_pa	
Multiple value separator	;		Link_test_to_pa	
Input file name	csvToConvert.csv		Order_result_st	
Debug mode	FALSE		Order_test_dat	
Time zone	ET		Ordered_test_c	
			Ordered_test_c	
			Ordered_test_c	

Step 4: On the *Admin* tab, select the appropriate value (Test or Prod) from the drop down for the field *Current Usage (and MSH-11 mapping)*.



File Home Insert Page Layout Formulas Data Review View ACROBAT Tell me what you want to do...			
PROTECTED VIEW Be careful—files from the Internet can contain viruses. Unless you need to edit, it's safer to stay in Protected View. Enable Editing			
G34 X ✓ fx REQUIRED_COMBO_4			
	A	B	C
1	Config Item	Value	Description
2	Input Directory	C:\runMacro\test1\Input	Abnormal_flag
3	Output Directory	C:\runMacro\test1\Output	Comments
4	Processed Directory	C:\runMacro\test1\Processed	Date_result_rel
5	Error Directory	C:\runMacro\test1\Error	Disease_symp
6	FlatFile_order_use column to count rows	A	Employed_in_h
7	FlatFile_Result_Use final column	DP	Employed_in_h
8			First_test
9	Timer on	FALSE	flatfile_version
10	Number of Errors before exit	0	Hospitalized
11	Include Batch header and footer	TRUE	ICU
12			Illness_onset_d
13	File Naming option	ManualAndTimeStamp	Instrument_ins
14	Manual file Name	FLR~	Instrument_mc
15	Current Usage (and MSH-11 mapping)	Prod	Instrument_mc
16	InterPartner "From" value	errueNorth	Link_test_to_pa
17	InterPartner "To" value	AIMSPlatform	Link_test_to_pa
18	Test result exclude from normal processing	Test_kit_EUA_ID,Test_kit_model_ID,Test_kit_model_name,Test_result_code_system,Tes	Order_result_s
19	Multiple value separator	;	Order_test_dat
20	Input file name	csvToConvert.csv	Ordered_test_c
21	Debug mode	FALSE	Ordered_test_c
22	Time zone	ET	Ordered_test_c
23			Ordering_facilit

Step 5A: Setting up for Use of InterPartner file naming convention: On the *Admin* tab, in Cell B13 select InterPartner.



NatELRFlatFile_GapAnalysis_HL7Generator_20200921 [Protected View] - Excel

File Home Insert Page Layout Formulas Data Review View ACROBAT Tell me what you want to do...

PROTECTED VIEW Be careful—files from the Internet can contain viruses. Unless you need to edit, it's safer to stay in Protected View. Enable Editing

B13 ManualAndTimeStamp

	A	B	C	D
1	Config Item	Value	Description	FlatFile_Colui
2	Input Directory	C:\runMacro\test1\input		Abnormal flag
3	Output Directory	C:\runMacro\test1\Output		Comments
4	Processed Directory	C:\runMacro\test1\Processed		Date_result_relea
5	Error Directory	C:\runMacro\test1\Error		Disease_symptom
6	FlatFile_order_use column to count rows	A		Employed in hea
7	FlatFile_Result_Use final column	DP		Employed in high
8				First test
9	Timer on	FALSE		flatfile_version_nc
10	Number of Errors before exit		0	Hospitalized
11	Include Batch header and footer	TRUE		ICU
12				Illness onset datu
13	File Naming option	ManualAndTimeStamp		Instrument instar
14	Manual file Name	InterPartner		Instrument mode
15	Current Usage (and MSH-11 mapping)	InputFileNameAndTimeStamp		Instrument mode
16	InterPartner "From" value	Manual		Link test to pare
17	InterPartner "To" value	ManualAndTimeStamp		Link test to pare
18	Test result exclude from normal processing	ManualAndInputFileName		Order_result_stat
19	Multiple value separator	ManualAndInputFileNameAndTimeStamp		Order test date
20	Input file name	csvToConvert.csv		Ordered test cod
21	Debug mode	FALSE		Ordered test cod
22	Time zone	ET		Ordered test des
23				Ordering facility

On the *Admin* tab, in Cell B16 *Interpartner "From" Value*, input the appropriate value for your organization (example below shows "eTrueNorth"). For more information about setting up the Interpartner filename follow instructions in ["AIMS - CentralizedELR InterPartner Messaging Guide"](#) This step is important when using AIMS routing services.



File Home Insert Page Layout Formulas Data Review View ACROBAT Tell me what you want to do...			
PROTECTED VIEW Be careful—files from the Internet can contain viruses. Unless you need to edit, it's safer to stay in Protected View. Enable Editing			
G34 REQUIRED_COMBO_4			
Config Item	Value	Description	FlatFile_Col
Input Directory	C:\runMacro\test1\input		Abnormal_flag
Output Directory	C:\runMacro\test1\Output		Comments
Processed Directory	C:\runMacro\test1\Processed		Date_result_rel
Error Directory	C:\runMacro\test1\Error		Disease_symp
FlatFile_order_use column to count rows	A		Employed_in_h
FlatFile_Result_Use final column	DP		Employed_in_h
			First test
Timer on	FALSE		flatfile_version
Number of Errors before exit		0	Hospitalized
Include Batch header and footer	TRUE		ICU
			Illness onset d
File Naming option	ManualAndTimeStamp		Instrument ins
Manual file Name	ELR~		Instrument mc
Current Usage (and MSH-11 mapping)	Prod		Instrument mc
InterPartner "From" value	eTrueNorth		Link test to pa
InterPartner "To" value	AIMSPatient		Link test to pa
Test result exclude from normal processing	Test_kit_EUA_ID,Test_kit_model_ID,Test_kit_model_name,Test_result_code_system,Tes		Order_result sl
Multiple value separator	;		Order_test dat
Input file name	csvToConvert.csv		Ordered_test c
Debug mode	FALSE		Ordered_test c
Time zone	ET		Ordered_test c
			Ordering facilit

Step 5B: Setting up for Use of other file naming conventions: When working directly with a jurisdiction they may have other requirements for file naming conventions, which can be configured using cell B14 in the Admin tab.



File Home Insert Page Layout Formulas Data Review View ACROBAT Tell me what you want to do...			
PROTECTED VIEW Be careful—files from the Internet can contain viruses. Unless you need to edit, it's safer to stay in Protected View. Enable Editing			
G34 X ✓ fx REQUIRED_COMBO_4			
	A	B	C
1	Config Item	Value	Description
2	Input Directory	C:\runMacro\test1\Input	Abnormal_flag
3	Output Directory	C:\runMacro\test1\Output	Comments
4	Processed Directory	C:\runMacro\test1\Processed	Date_result_rel
5	Error Directory	C:\runMacro\test1>Error	Disease_sympt
6	FlatFile_order_use column to count rows	A	Employed_in_h
7	FlatFile_Result_Use final column	DP	Employed_in_h
8			First test
9	Timer on	FALSE	flatfile_version
10	Number of Errors before exit	0	Hospitalized
11	Include Batch header and footer	TRUE	ICU
12			Illness_onset_d
13	File Naming option	ManualAndTimeStamp	Instrument_ins
14	Manual file Name	ELR~	Instrument_ma
15	Current Usage (and MSH-11 mapping)	Prod	Instrument_ma
16	InterPartner "From" value	eTrueNorth	Link_test_to_pe
17	InterPartner "To" value	AIMSPlatform	Link_test_to_pe
18	Test result exclude from normal processing	Test_kit_EUA_ID,Test_kit_model_ID,Test_kit_model_name,Test_result_code_system,Tes	Order_result_st
19	Multiple value separator	,	Order_test_dat
20	Input file name	csvToConvert.csv	Ordered_test_c
21	Debug mode	FALSE	Ordered_test_c
22	Time zone	ET	Ordered_test_c
23			Ordering_facilit

Cell B13 in the *Admin* tab allows selection of one of 4 basic file naming schemes:

- Manual – where the filename is defined in the *Admin* tab in cell B14
- Manual with timestamp – uses the value from cell B14 in *Admin* tab and appends with the file creation date and time
- Manual with the name of the input file – uses the value from cell B14 in *Admin* tab and appends with the file name defined in cell B20
- Manual with the name of the input file and timestamp– uses the value from cell B14 in *Admin* tab and appends with the file name defined in cell B20 and the file creation date and time



NatELRFlatFile_GapAnalysis_HL7Generator_20200921 [Protected View] - Excel

File Home Insert Page Layout Formulas Data Review View ACROBAT Tell me what you want to do...

PROTECTED VIEW Be careful—files from the Internet can contain viruses. Unless you need to edit, it's safer to stay in Protected View. Enable Editing

B13 ManualAndTimeStamp

Config Item	Value	Description	FlatFile_Column
Input Directory	C:\runMacro\test1\input		Abnormal flag
Output Directory	C:\runMacro\test1\Output		Comments
Processed Directory	C:\runMacro\test1\Processed		Date result relea
Error Directory	C:\runMacro\test1\Error		Disease_symptom
FlatFile_order_use column to count rows	A		Employed in hea
FlatFile_Result_Use final column	DP		Employed in high
Timer on	FALSE		First test
Number of Errors before exit	0		flatfile_version_nc
Include Batch header and footer	TRUE		Hospitalized
			ICU
			Illness_onset date
File Naming option	ManualAndTimeStamp		Instrument instar
Manual file Name	InterPartner		Instrument_mode
Current Usage (and MSH-11 mapping)	InputFileNameOnly		Instrument_mode
InterPartner "From" value	ManualAndTimeStamp		Link_test_to_pare
InterPartner "To" value	ManualAndTimeStamp		Link_test_to_pare
Test result exclude from normal processing	ManualAndInputFileName		Order result statu
Multiple value separator	ManualAndInputFileNameAndTimeStamp		Order test date
Input file name	csvToConvert.csv		Ordered_test_cod
Debug mode	FALSE		Ordered_test_cod
Time zone	ET		Ordered_test des
			Ordering facility

On the *Admin* tab, note that Columns D-K contain the logic by which the different data fields are read, transformed and output to the flat file. Please do not change these columns or the tool macros may break.

On the Admin tab, the fields “Timer on” , “Number of Errors before exit” and “Debug mode” should be used by developers or those trained with the macro to perform integration testing. This is documented in “Developer Instructions”. By default “Timer on” and “Debug Mode” should be set to “FALSE” and “Number of Errors before exit” should be set to 0.

If you notice any issues please contact AIMS Technical Assistance at informatics.support@aphl.org.

Step 6: In *Admin* tab, specify the delimiter character to note multiple values (repeats) in a single field. Note that the default character used is a semicolon (;). Use this delimiter to list multiple values in the Disease_symptoms column. In the output, each value will be mapped to a separate OBX segment.



File Home Insert Page Layout Formulas Data Review View ACROBAT Tell me what you want to do...				
PROTECTED VIEW Be careful—files from the Internet can contain viruses. Unless you need to edit, it's safer to stay in Protected View. Enable Editing				
G34 : X ✓ fx REQUIRED_COMBO_4				
	A	B	C	
1	Config Item	Value	Description	FlatFile_Col
2	Input Directory	C:\runMacro\test1\Input		Abnormal_flag
3	Output Directory	C:\runMacro\test1\Output		Comments
4	Processed Directory	C:\runMacro\test1\Processed		Date_result_rel
5	Error Directory	C:\runMacro\test1\Error		Disease_symptr
6	FlatFile_order_use column to count rows	A		Employed_in_h
7	FlatFile_Result_Use final column	DP		Employed_in_h
8				First_test
9	Timer on	FALSE		flatfile_version_
10	Number of Errors before exit	0		Hospitalized
11	Include Batch header and footer	TRUE		ICU
12				Illness_onset_d
13	File Naming option	ManualAndTimeStamp		Instrument_inst
14	Manual file Name	ELR~		Instrument_mo
15	Current Usage (and MSH-11 mapping)	Prod		Instrument_mo
16	InterPartner "From" value	eTrueNorth		Link_test_to_pa
17	InterPartner "To" value	AIMSPlatform		Link_test_to_pa
18	Test result exclude from normal processing	Test_kit_EUA_ID,Test_kit_model_ID,Test_kit_model_name,Test_result_code_system,Tes		Order_result_st
19	Multiple value separator	;		Order_test_dat
20	Input file name	csvToConvert.csv		Ordered_test_c
21	Debug mode	FALSE		Ordered_test_c
22	Time zone	ET		Ordered_test_d
23				Ordering_facilit

Step 7: Under the *Instructions* tab, click the “Generate HL7 from Manual Entry” button to generate a test output. If a runtime error pops up, go through Steps 1 to 6 (especially Step 3) to ensure that all setup steps are correct. If no runtime error is generated or no message appears, go to the Output directory set up in Step 3 to find output files generated from the sample data that were included through the *Flatfile_Result_Use* tab.



HL7 Generator Instructions, CSV Input, 20200802, DRAFT, r1.docx

NatlHL7FlatFile_GapAnalysis_HL7Generator_updatedInstructions.xlsx - Excel

File Home Insert Draw Page Layout Formulas Data Review View Deloitte Tools Help Acrobat Search

Normal Page Break Preview Layout Views Gridlines Headings Zoom 100% Zoom to Selection Zoom Window Arrange Freeze Panes Hide Synchronous Scrolling Switch Windows Macros

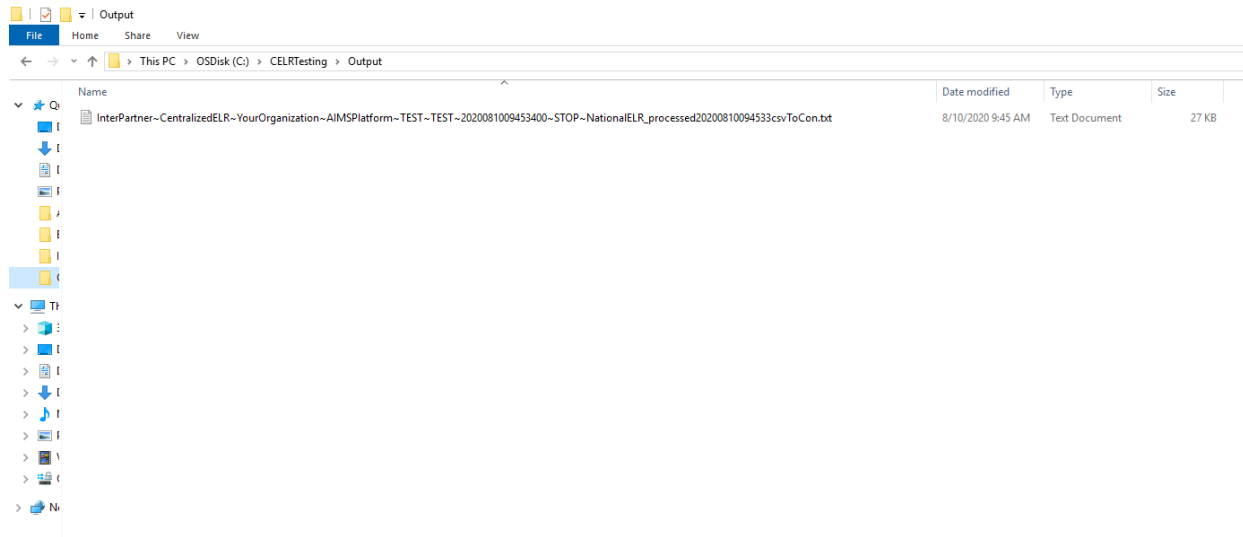
SECURITY WARNING: Macros have been disabled. Enable Content

	A	B	C	D
1	Gap Analysis document to support COVID-19 ELR flat file development efforts			
2	Tabs included in this file:			
3		Instructions		
4		Gap Analysis7-8		Generate HL7 from Manual Entry
5		Flatfile_Result_Use		
6		Configuration		
7		dropDownValues		Process CSV and generate HL7
8		Admin		
9				
10				
11				
12	Instructions tab			
13	Provides background and explanation of how this file is laid out, its usage and the purpose of each tab.			
14				
15	Gap Analysis7-8 tab			
16	This tab includes all the data elements that are desired (R, C, RE and O) for the flat file and how they will be mapped to HL7v2.5.1 ELR R1 message instance default view.			
	Only elements that have an entry in the Flatfileheader column are included in the FlatFile_Result_Use tab with example data tab, and are needed in the			

Instructions Gap Analysis7-8 Flatfile_Result_Use Configuration dropDownValues Admin

8:31 AM 8/12/2020

Output folder showing generated file:



Step 8: Go to the *Gap Analysis 7-8* tab. Filter on Column L, *MUST SUPPORT in flatfile* = Y. This displays the minimum data fields that must be included in the input and output files.



	I	J	K	L	M	N	O	P
	HHS guidance elements							
	HHS element name / description	HHS Guidance comment	HHS guidance 6/4/2020 verbiage	MUST SUPPORT in flatfile	Supported by Lab (Y/N)	GAP ANALYSIS NOTES	Sort for HL7 mapping	HL7 Field
2								
3	Performing facility name and/or CLIA number, if known		C(R/RE)	Y			121	OBX-23.1
4	Performing facility name and/or CLIA number, if known		RF	Y			123	OBX-23.1

Review each data element and mark in Column M, *Supported by Lab* whether your lab can support the particular required data field (Y/N). Enter any notes, other documentation that may help with understanding what you are using to populate the field or anything needed for follow up in Column N, *Gap Analysis Notes*, as necessary. Once you have validated that your lab can provide data for each of the minimum required fields, proceed to Step 9.

Step 9: Go to the *Configuration* tab. The top part of the tab specifies static values that will be sent with every HL7 message generated (i.e. your lab address and CLIA number) and which fields they are mapped to in the HL7 message. If a field is left empty on the “Flatfile_Result_Use” tab, the field will be automatically populated with the appropriate value from the “Configuration” tab if column E “Corresponding input column name (to replace if empty)” is configured. Populate all fields in Column B, *Answer (local value)* that are highlighted in yellow. The tool will reference these values to populate the appropriate field when generating the HL7 message. You will need to create 1 tool file for each submitting laboratory, if you are a data aggregator.

HL7 Generator Instructions, CSV Input, 20200102, BNA/1, 1/1/2020

HL7 Generator Instructions, CSV Input, 20200102, BNA/1, 1/1/2020

Cheng, Benson

Cheng, Benson

File Home Insert Draw Page Layout Formulas Data Review View Deloitte Tools Help Acrobat Search

Normal Page Break Preview Page Custom Views Sub Formula Bar Zoom 100% Zoom to Selection New Window All Pages Hide Switch Windows Macros

Worksheet Views Show

Do not move these columns. The macro code references specific cells.

Question	Answer (local value)	More information about the question	Mapping to HL7	Corresponding input column name (to replace if empty)	Additional mapping instructions	Related mapping value
1. Testing Laboratory Street	202 South Monroe From Static		OBX-24.1	Testing_lab_street		
2. Testing Laboratory Street 2	804 11th From Static		OBX-24.2	Testing_lab_street2		
3. Testing Laboratory City	Little Rock From Static		OBX-24.3	Testing_lab_city		
4. Testing Laboratory State	AR		OBX-24.4	Testing_lab_state		
5. Testing Laboratory County	55519		OBX-24.9	Testing_lab_county		
6. Testing Laboratory Zip	72205		OBX-24.5	Testing_lab_zip_code		
7. Name of the reporting facility	Public Health Laboratory, AR From Static		MSH-4.1	Reporting_facility_name	MSH-4.3	OID
8. Identifier of the reporting facility	AR Little Rock SPH From Static	This can be a CLIA number or an OID	MSH-4.2	Reporting_facility_id		
9. Name of the reporting system	AR Little Rock SPH From Static 2		MSH-3.1	Report_facility_data_source_app	MSH-3.3	OID
10. OID for the reporting system (if known)	dummyMSH3OID		MSH-3.2			
11. Testing Lab ID assigner	testingLabIDAssignerRequired	System id assigner for ORC-5, OBX-5, and SPM2 2				
12. Testing Lab ID assigner OID	testingLabIDAssignerOIDRequired					
13. Name of the testing laboratory	UAMC From Static		OBX-23.1	Testing_lab_name		
14. CLIA number of the testing laboratory	0401044189 From Static		OBX-23.10	Testing_lab_id		
15. Name of the organization that assigns the Patient identifier	dummyOID	Patient_ID_assigner	PID-3.4.1-1			
16. OID of organization that assigns the Patient identifier	Public Health Laboratory, AR From Static	Patient ID assigning OID	PID-3.4.2-1			
17. Name of the organization that assigns the Patient identifier	Public Health Laboratory, AR From Static	Patient_ID_assigner 2	PID-3.4.1-1			
18. OID of organization that assigns the second Patient identifier	dummyOID2	Patient ID assigning OID	PID-3.4.2-1			
19. Test instrument or kit		If more than one test is performed, copy this row as often as needed	OBX-17.1		populate if OBX-17.1 empty	
20. Test instrument or kit		If more than one test is performed, copy this row as often as needed	OBX-17.1		populate if OBX-17.1 empty	
21. Test instrument or kit		If more than one test is performed, copy this row as often as needed	OBX-17.1		populate if OBX-17.1 empty	
22. Default specimen type description	Specimen of unknown material	Default value if Specimen_type_description is not populated, enter this value	SPM-4.2	Specimen_type_description		
23. Default specimen type code	118924002	Default value if not populated	SPM-4.1	Specimen_type_code		
24. Software vendor	software vendor					
25. Software version or release number	v1.2					
26. Software Name	software name					
27. Binary ID	Binary ID unknown					
28. Install date	20181208	Date in HL7 format YYYYMMDD				
29. Receiving Application Name	US WHO Collab LabSys		MSH-5.1			
30. Receiving Application OID	2.16.840.1.114322.4.3.3.7		MSH-5.2			
31. Receiving Facility Name	CDC-EPH Surv Branch	This field can be left blank, if using the AIMS routing service	MSH-6.1			
32. Name of the health department receiving the data	2.16.840.1.114322.4.1.10418		MSH-6.2		Based on the name, look up the OID for use in MSH-6.2 and also the information	

Instructions Gap Analysis 7-8 Fullfile Result Live Configuration dropDownValues Admin

9:07 AM 8/12/2020

The bottom part of the *Configuration* tab refers to cells on the *dropDownValues* tab and indicates which range of dropdown values are mapped to particular HL7 fields. See next step for more details on the *dropDownValues* tab.



HL7 element / Field Name	Local Code	HL7 range is hard coded to replace "C" with "G" do not remove columns
Patient_ID_type	C2 C7	
Patient_gender	C29 C33	
YAU	C273 C275	
Patient_race	C15 C20	
Patient_ethnicity	C23 C25	
Patient_state	C28 C87	
Ordering_facility_state	C28 C87	
Ordering_provider_state	C28 C87	
Testing_lab_state	C28 C87	
Ordered_test_code_system	C89 C91	
Test_result_code_system	C93 C95	
Result_status_code	C97 C100	
Specimen_type_code_system	C102 C105	
Specimen_source_site_code_sys	C107 C109	
Patient_died	C111 C112	Must have more than one in range
Patient_location	C114 C121	
Symptomatic_for_disease	C273 C275	
Disease_symptoms	C351 C351	
Patient_age_units	C134 C137	
Pregnant	C139 C142	
Abnormal_flag	C144 C161	
Ordered_test_code	C167 C169	
Test_performed_description	C176 C203	
Test_result_code	C206 C219	
Test_result_description	C206 C219	
Test_result_free_text	C206 C219	
Specimen_type	C238 C238	
Specimen_type_free_text	C238 C238	
Specimen_source_site_code	C260 C262	
Specimen_source_site_desc	C260 C262	
Order_result_status	C97 C100	
Test_result_units	C224 C236	
First_test	C273 C275	
Employed_in_high_risk_setting	C277 C292	
Patient_occupation	C294 C313	
Patient_residency_type	C314 C317	
Result_units	C300 C307	
Patient_ID_assigner	C354 C358	
Patient_ID_2_assigner	C354 C358	
Patient_county	C1100 C4245	
Ordering_facility_county	C1100 C4245	
Ordering_provider_county	C1100 C4245	
Testing_lab_county	C1100 C4245	

Step 10: The *dropDownValues* tab maps input values from your lab for certain fields that may be plaintext or locally coded to be standard values to be included in the HL7 output. Note that any input values in the Column C of the *dropDownValues* tab will be replaced with corresponding values in Column G of the same row.

- On the *dropDownValues* tab, enter any transformation values for particular data fields as new rows at the bottom of the tab, if additional values are needed, else update to your local values in column C.
- Ensure that Column A, *HL7 element / Field Name* matches the name of the data column in Row 1 of the *Flatfile_Result_Use* tab.
- Also ensure that each row in Column C, *Local Code* represents all the local values that could be received from your system / are familiar to your users; those are the values that will populate the drop down menus.
 - Notes:
 - For all coded entries the following hierarchy applies:



- If the input value for the code (i.e. Ordered_test_code or Test+performed_code, or Test_result_coded or Specimen_type_code or Specimen_source_site_code) matches a value in the Local Code (Column C) or the Standard Code (Column D) then the entire replacement value will be used and entries in the respective *_code_system fields will be ignored; if the input value does not match the values from the respective fields in the input file will be used.
- If you need to map different local codes to the same standard codes (for example Detected and D both need to be mapped to detected, then you need to create a second version of the standard code entry in column D, or the tool will not process properly (the tool uses the replacement value from Column G, so that will not affect the HL7 file output values.
- For identification of assigning authorities (so that identifiers across organizations will be unique):
 - Ensure you have local values that will be in the csv file represented in column C for these elements:
 - Patient_ID_assigner
 - If used: Submitter_sample_ID_assigner
 - Seek help in creating the replacement value in column G as an OID will be required as well as the suffix of '&ISO'
- Transformation for county values starts on row 1100 (scroll way down!) – because many counties have the same name in different states, it is recommended that you include the state in the same field (we may update the tool in the future to use a combined search, but for now) to get the right county mapped.
- Column G *Replacement Value* is the standard value that will populate and replace your local code in the output file. Verify that that this replacement value is correct. In most instances you will want to use the standard code found in Column D. For example, in the screen below, a Local Code value of “Medical Record Number” in cell C2 (yellow) will be replaced with the value of “MR” as specified in cell G2 (orange), which is the standard code populated in cell D2.



NatELRFlatFile_GapAnalysis_HL7Generator - Excel

File Home Insert Page Layout Formulas Data Review View ACROBAT Tell me what you want to do... Riki Merrick

Clipboard Font Alignment Number Styles Cells Editing

G379

	A	B	C	D	E	F	G	H
	HL7 element / Field name	Local Description	Local Code	Standard Code	Standard Code Description	Standard Code System	Replacement Value	Comment
1	Patient_ID_Type		Medical Record Number	MR	Medical Record Number		MR	
2	Patient_ID_Type		Specimen Identifier	SID	Specimen Identifier		SID	
3	Patient_ID_Type		Patient Internal ID	PI	Patient Internal ID		PI	
4	Patient_ID_Type		Social Security Number	SS	Social Security Number		SS	
5	Patient_ID_Type		Patient External ID	PT	Patient External ID		PT	
6	Patient_ID_Type		Public Health Case ID	PHC	Public Health Case ID		PHC	
7								
8	Patient_gender		Male	M	M		M	
9	Patient_gender		Female	F	F		F	
10	Patient_gender		Other	O	O		O	
11	Patient_gender		Unknown	U	U		U	
12	Patient_gender		Ambiguous	A	A		A	
13								
14	Patient_race		American Indian or Alaska Native	1002-5	American Indian or Alaska Nat	HL70005	1002-5^American Indian or Alaska Native^HL70005	
15	Patient_race		Asian	2028-9	Asian	HL70005	2028-9^Asian^HL70005	
16	Patient_race		Black or African American	2054-5	Black or African American	HL70005	2054-5^Black or African American^HL70005	
17	Patient_race		Native Hawaiian or Other Pacific Islander	2076-8	Native Hawaiian or Other Paci	HL70005	2076-8^Native Hawaiian or Other Pacific Islander^HL70005	
18	Patient_race		White	2106-3	White	HL70005	2106-3^White^HL70005	
19	Patient_race		Other Race	2131-1	Other Race	HL70005	2131-1^Other Race^HL70005	
20	Patient_race		Asked but no answer / unknown	ASKU	Asked but unknown	NULLFL	ASKU^Asked but unknown^NULLFL	
21								
22	Patient_ethnicity		Hispanic or Latino	H	Hispanic or Latino	HL70189	H^Hispanic or Latino^HL70189	
23	Patient_ethnicity		Not-Hispanic or latino	N	Not-Hispanic or latino	HL70189	N^Not-Hispanic or latino^HL70189	
24	Patient_ethnicity		Unknown	U	Unknown	HL70189	U^Unknown^HL70189	
25	Patient_ethnicity		Asked but no answer / unknown	ASKU	Asked but unknown	NULLFL	ASKU^Asked but unknown^NULLFL	
26								

Step 11: Once you are done entering transformation values in the *dropDownValues* tab, go back to the *Configuration* tab and ensure that all values from the *dropDownValues* tab match those listed in the bottom half of the tab. For example, it specifies that rows C15 through C21 will be input values for the field Patient_Race. To update the dropdown values on the Flatfile_Result_Use tab, select the entire column (and control-left click the top item to prevent validation in the header) and select “Data Validation” and update the source per what was entered in the dropDownvalues tab. The “Source:” input can be clicked and then values can be selected in the dropDownValues tab to populate the range.

Data Validation ? X

Settings Input Message Error Alert

Validation criteria

Allow:
 List ☒ Ignore blank
 Data: ☒ In-cell dropdown
 between

Source:

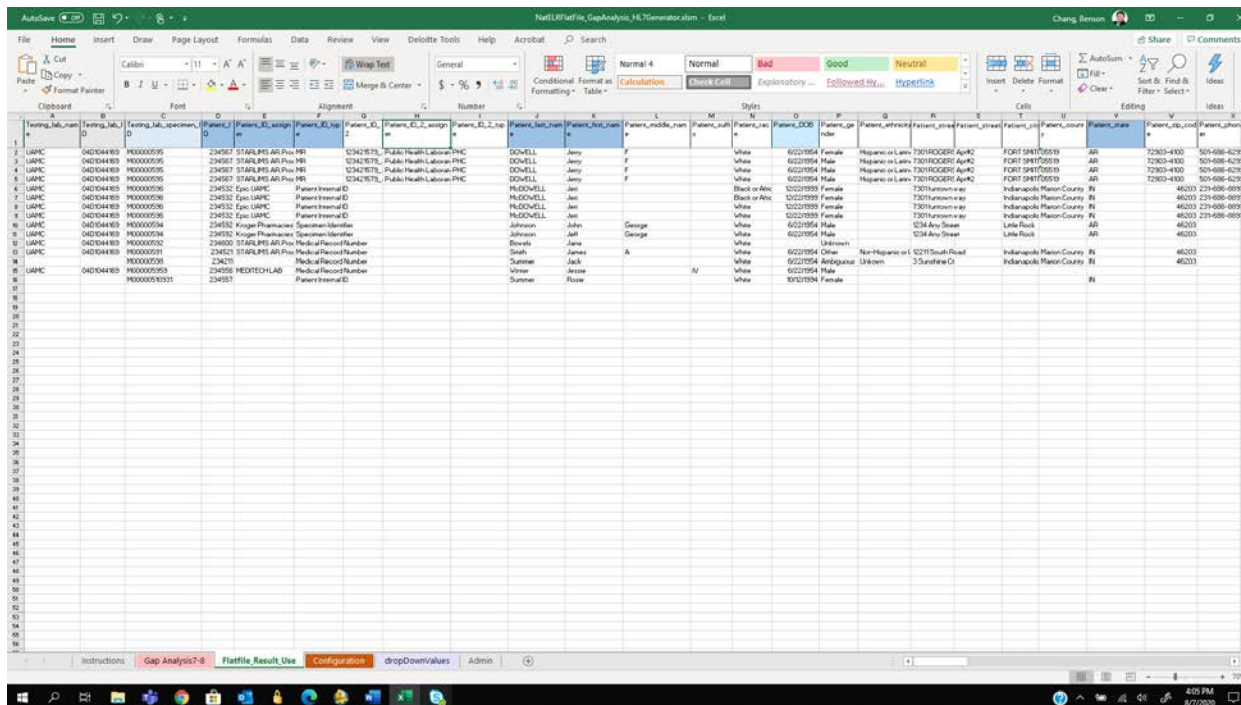
☐ Apply these changes to all other cells with the same settings

Make sure that “Show error alert after invalid data is entered” is unchecked. This allows the macro to also check for HL7 code values.

A screenshot of a 'Data Validation' dialog box. The dialog has three tabs: 'Settings', 'Input Message', and 'Error Alert'. The 'Error Alert' tab is selected. Inside this tab, there is a checkbox labeled 'Show error alert after invalid data is entered:' which is currently unchecked. Below this, there is a text field for 'When user enters invalid data, show this error alert:'. Underneath, there are three fields: 'Style:' with a dropdown menu showing 'Stop', 'Title:' with an empty text box, and 'Error message:' with a large empty text area. At the bottom of the dialog, there are three buttons: 'Clear All', 'OK', and 'Cancel'.

Step 12: Go to the *Flatfile_Result_Use* tab to enter your data manually. Note that there are sample data rows in the default tool file. Please delete those rows before or after you put in your actual data. Note that each row in the *Flatfile_Result_Use* tab represents one test result. If there are more than one test result for a specimen, you will need to copy all the other information into the next row and then add the second test result. Make sure ALL comments are entered in the FIRST ROW for each specimen – the tool currently ONLY uses the data from that first row!

The tool will create a separate HL7 message for each accession (*Testing_lab_accession_number*); all HL7 messages are batched within a single output file. Do NOT remove any columns from the *Flatfile_Result_Use* tab, or the HL7 output will not generate.



Trouble shooting other tool outputs etc.

1. It outputs the HL7 batch to the output directory only if there are no errors (although there could be warnings in the NationalELRLog file). The HL7 file will generate if there are warnings.



2. If there are errors, it will output the error file (and warnings if any) to the error directory describing what happened.
3. A file named "NationalELRLog<timestamp>.txt" with: "Not generating HL7 because of the following errors:" (with a list of the errors that prevented processing)
4. Use the error entries to fix the data being input into the "Flatfile_Result_Use" tab
5. If there are no errors, it will output a file named "NationalELRLog<timestamp>.txt" with: "HL7 batched produced with no errors" and may have warnings in the file.