



HL7 Generator Tool Overview (Manual Entry)

Version 20220225

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>
20211026	<i>Added instructions for using the flat file generator tool for different programs (e.g., PHLIP)</i>
20220225	<i>Added instructions to explain how to generate individual messages rather than batch. Added the evaluation for "CLIP" in Testing_Lab_ID in addition to "CLIA".</i>

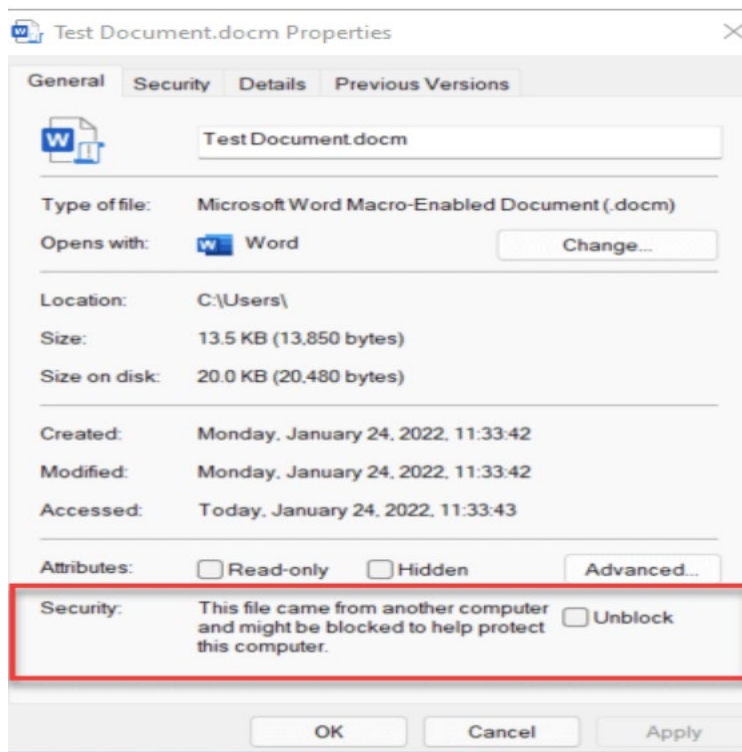


How to Enable Macros

Starting in April 2022 - Office Version 2203, macros in files obtained from the internet will be disabled by default.

Enable the macro by right clicking the file, open Properties, see Security, select Unblock checkbox, and select OK button. For more information, please see Microsoft additional information page below.

<https://docs.microsoft.com/en-us/DeployOffice/security/internet-macros-blocked#mark-of-the-web-motw-and-trusted-documents>





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 dropdown 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, reporting profile) 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 Centralized ELR partners using the AIMS Routing Service: In *Admin* tab, select "InterPartner" in Cell B13; specify the *InterPartner "From"* Value in Cell B16, which will be the ID assigned to your organization by the AIMS team; specify 'AIMSPlatform' as the *InterPartner "To"* value in Cell B17; specify 'CentralizedELR' as the *InterPartner use case* value in B25; and select 'CentralizedELR' as the *Reporting Profile* value in B26.

Step 5B: For PHLIP partners using the AIMS Routing Service: In *Admin* tab, select "InterPartner" in Cell B13; specify the *InterPartner "From"* value in Cell B16, which will be the ID assigned to your organization by the AIMS team; specify 'CDC' as the *InterPartner "To"* value in Cell B17; specify 'PHLIP_251' as the *InterPartner use case* value in B25; and select 'PHLIP' as the *Reporting Profile* value in B26.

Step 5C: 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 in Cell B19 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

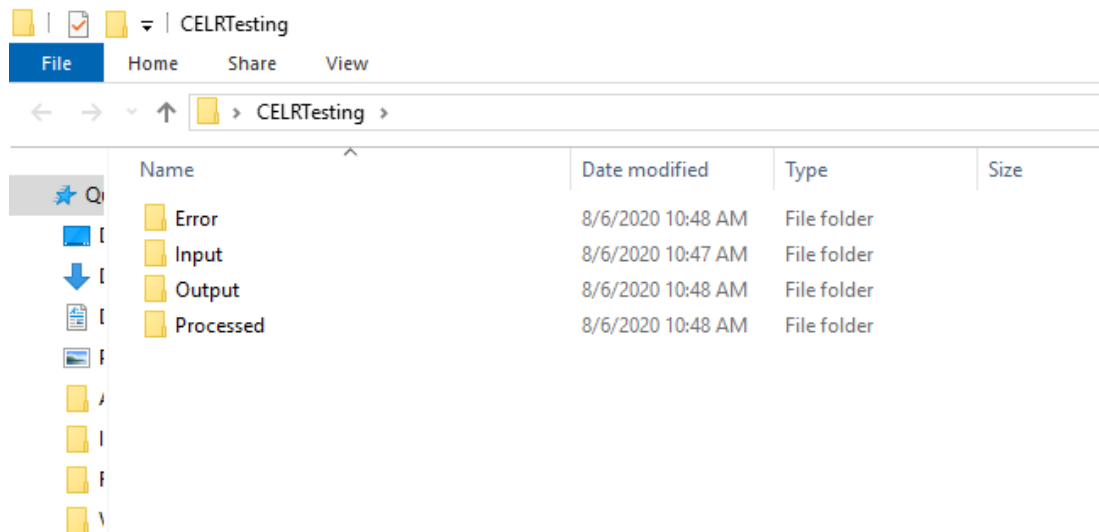
If you encounter issues, send an email to informatics.support@aphl.org

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 Help				
SECURITY WARNING Some active content has been disabled. Click for more details. Enable Content				
B29				
	A	B	C	
1	Config Item	Value	Description	FlatFile_C
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_re
5	Error Directory	C:\runMacro\test1\error		Disease_symp
6	FlatFile_order_use column to count rows	BB		Employed_in_I
7	FlatFile_Result_Use final column	DP		Employed_in_I
8				First_test
9	Timer on	FALSE		flatfile_versior
10	Number of Errors before exit	0		Hospitalized
11	Include Batch header and footer	TRUE		ICU
12				Illness_onset
13	File Naming option	InterPartner		Instrument_in
14	Manual file Name	ELR~		Instrument_m
15	Current Usage (and MSH-11 mapping)	Prod		Instrument_m
16	InterPartner "From" value	eTrueNorth		Link_test_to_p
17	InterPartner "To" value	AIMSPlatform		Link_test_to_p
18	Test result exclude from normal processing	Test_kit_EUA_ID,Test_kit_model_ID,Test_kit_model_name,Test_result_code_system,Test		Order_result :
19	Multiple value separator	;		Order_test_da
20	Input file name	csvTextOutput.csv		Ordered_test
21	Debug mode	FALSE		Ordered_test
22	Time zone	ET		Ordered_test
23	Column to count input CSV rows	Patient_ID		Ordering_facili
24	Default hour for timestamp when time not provi	08		Ordering_facili
25	InterPartner use case	CentralizedELR		Ordering_facili
26	Reporting Profile	CentralizedELR		Ordering_facili
27				Ordering_facili
28				Ordering_facili



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 Help			
SECURITY WARNING Some active content has been disabled. Click for more details. Enable Content			
B29			
	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_re
5	Error Directory	C:\runMacro\test1\error	Disease_symp
6	FlatFile_order_use column to count rows	BB	Employed_in_I
7	FlatFile_Result_Use final column	DP	Employed_in_I
8			First_test
9	Timer on	FALSE	flatfile_versior
10	Number of Errors before exit	0	Hospitalized
11	Include Batch header and footer	TRUE	ICU
12			Illness_onset
13	File Naming option	InterPartner	Instrument_in
14	Manual file Name	ELR	Instrument_m
15	Current Usage (and MSH-11 mapping)	Prod	Instrument_m
16	InterPartner "From" value	eTrueNorth	Link_test_to_p
17	InterPartner "To" value	AIMSPlatform	Link_test_to_p
18	Test result exclude from normal processing	Test_kit_EUA_ID,Test_kit_model_ID,Test_kit_model_name,Test_result_code_system,Test	Order_result_
19	Multiple value separator	;	Order_test_da
20	Input file name	csvTextOutput.csv	Ordered_test
21	Debug mode	FALSE	Ordered_test
22	Time zone	ET	Ordered_test
23	Column to count input CSV rows	Patient_ID	Ordering_facili
24	Default hour for timestamp when time not provi	08	Ordering_facili
25	InterPartner use case	CentralizedELR	Ordering_facili
26	Reporting Profile	CentralizedELR	Ordering_facili
27			Ordering_facili
28			Ordering_facili



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

File Home Insert Page Layout Formulas Data Review View Help			
SECURITY WARNING Some active content has been disabled. Click for more details. Enable Content			
B13	InterPartner		
	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_r
5	Error Directory	C:\runMacro\test1\error	Disease_symp
6	FlatFile_order_use column to count rows	BB	Employed_in_
7	FlatFile_Result_Use final column	DP	Employed_in_
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
13	File Naming option	InterPartner	Instrument_in
14	Manual file Name	InterPartner	Instrument_m
15	Current Usage (and MSH-11 mapping)	InputFileNameOnly	Instrument_m
16	InterPartner "From" value	InputFileNameAndTimeStamp	Link_test_to_r
17	InterPartner "To" value	Manual	Link_test_to_r
18	Test result exclude from normal processing	ManualAndTimeStamp	Link_test_to_r
19	Multiple value separator	ManualAndInputFileName	Order_result_
20	Input file name	ManualAndInputFileNameAndTimeStamp	Order_result_
21	Debug mode	;	Order_test_de
22	Time zone	csvTextOutput.csv	Ordered_test_
23	Column to count input CSV rows	FALSE	Ordered_test_
24	Default hour for timestamp when time not provided	ET	Ordered_test_
25	InterPartner use case	Patient_ID	Ordering_facil
26	Reporting Profile	08	Ordering_facil
27		CentralizedELR	Ordering_facil
28		CentralizedELR	Ordering_facil

On the *Admin* tab, in Cell B16 *InterPartner "From" value*, input the appropriate value for your organization (example below shows "eTrueNorth"), which will be the ID assigned to your organization by the AIMS team; in Cell B17 specify 'AIMSPlatform' as the *InterPartner "To" value*; in Cell B25 specify 'CentralizedELR' as the *InterPartner use case* value; and in Cell B26 select 'CentralizedELR' as the *Reporting Profile* value. 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 Help				
SECURITY WARNING Some active content has been disabled. Click for more details. Enable Content				
B26 CentralizedELR				
	A	B	C	
1	Config Item	Value	Description	FlatFile_C
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_re
5	Error Directory	C:\runMacro\test1\error		Disease_symp
6	FlatFile_order_use column to count rows	BB		Employed_in_I
7	FlatFile_Result_Use final column	DP		Employed_in_I
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_
13	File Naming option	InterPartner		Instrument_in:
14	Manual file Name	ELR~		Instrument_m
15	Current Usage (and MSH-11 mapping)	Prod		Instrument_m
16	InterPartner "From" value	eTrueNorth		Link_test_to_p
17	InterPartner "To" value	AIMSPlatform		Link_test_to_p
18	Test result exclude from normal processing	Test_kit_EUA_ID,Test_kit_model_ID,Test_kit_model_name,Test_result_code_system,Test		Order_result_s
19	Multiple value separator	;		Order_test_da
20	Input file name	csvTextOutput.csv		Ordered_test
21	Debug mode	FALSE		Ordered_test
22	Time zone	ET		Ordered_test
23	Column to count input CSV rows	Patient_ID		Ordering_facili
24	Default hour for timestamp when time not provi	08		Ordering_facili
25	InterPartner use case	CentralizedELR		Ordering_facili
26	Reporting Profile	CentralizedELR		Ordering_facili
27		CentralizedELR		Ordering_facili
28		PHLIP		Ordering_facili



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

File Home Insert Page Layout Formulas Data Review View Help				
SECURITY WARNING Some active content has been disabled. Click for more details. Enable Content				
B13	InterPartner			
	A	B	C	
1	Config Item	Value	Description	FlatFile_C
2	Input Directory	C:\runMacro\test1\input		Abnormal fla
3	Output Directory	C:\runMacro\test1\output		Comments
4	Processed Directory	C:\runMacro\test1\processed		Date_result_i
5	Error Directory	C:\runMacro\test1\error		Disease_sym
6	FlatFile_order_use column to count rows	BB		Employed_in
7	FlatFile_Result_Use final column	DP		Employed_in
8				First_test
9	Timer on	FALSE		flatfile_versio
10	Number of Errors before exit	0		Hospitalized
11	Include Batch header and footer	TRUE		ICU
12				Illness_onset
13	File Naming option	InterPartner		Instrument_i
14	Manual file Name	InterPartner		Instrument_r
15	Current Usage (and MSH-11 mapping)	InputFileNameOnly		Instrument_r
16	InterPartner "From" value	Manual		Link_test_to
17	InterPartner "To" value	ManualAndTimeStamp		Link_test_to
18	Test result exclude from normal processing	ManualAndInputFileName	name,Test_result_code_system,Test_	Order_result
19	Multiple value separator	;		Order_test_d
20	Input file name	csvTextOutput.csv		Ordered_test
21	Debug mode	FALSE		Ordered_test
22	Time zone	ET		Ordered_test
23	Column to count input CSV rows	Patient_ID		Ordering_fac
24	Default hour for timestamp when time not provi	08		Ordering_fac
25	InterPartner use case	PHLIP_251		Ordering_fac
26	Reporting Profile	PHLIP		Ordering_fac
27				Ordering_fac
28				Ordering_fac

On the *Admin* tab, in Cell B16 *InterPartner "From" value*, input the appropriate value for your organization (example below shows "USAFSAM EpiLab"), which will be the ID assigned to your organization by the AIMS team; in Cell B17 specify 'CDC' as the *InterPartner "To" value*; in Cell B25 specify 'PHLIP_251' as the *InterPartner use case* value; and in Cell B26 select 'PHLIP' as the *Reporting Profile* value. 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 Help			
SECURITY WARNING Some active content has been disabled. Click for more details. Enable Content			
B26	PHLIP		
	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_re
5	Error Directory	C:\runMacro\test1\error	Disease_symp
6	FlatFile_order_use column to count rows	BB	Employed_in_
7	FlatFile_Result_Use final column	DP	Employed_in_
8			First_test
9	Timer on	FALSE	flatfile_versior
10	Number of Errors before exit	0	Hospitalized
11	Include Batch header and footer	TRUE	ICU
12			Illness_onset
13	File Naming option	InterPartner	Instrument_in
14	Manual file Name	ELR~	Instrument_m
15	Current Usage (and MSH-11 mapping)	Prod	Instrument_m
16	InterPartner "From" value	USAFSAM EpiLab	Link_test_to_r
17	InterPartner "To" value	CDC	Link_test_to_r
18	Test result exclude from normal processing	Test_kit_EUA_ID,Test_kit_model_ID,Test_kit_model_name,Test_result_code_system,Test	Order_result_
19	Multiple value separator	;	Order_test_da
20	Input file name	csvTextOutput.csv	Ordered_test
21	Debug mode	FALSE	Ordered_test
22	Time zone	ET	Ordered_test
23	Column to count input CSV rows	Patient_ID	Ordering_facil
24	Default hour for timestamp when time not provided	08	Ordering_facil
25	InterPartner use case	PHLIP_251	Ordering_facil
26	Reporting Profile	PHLIP	Ordering_facil
27		PHLIP	Ordering_facil
28		PHLIP	Ordering_facil



Step 5C: 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 Help			
SECURITY WARNING Some active content has been disabled. Click for more details. Enable Content			
B29			
	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_re
5	Error Directory	C:\runMacro\test1\error	Disease_symp
6	FlatFile_order_use column to count rows	BB	Employed_in_l
7	FlatFile_Result_Use final column	DP	Employed_in_l
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
13	File Naming option	ManualAndTimeStamp	Instrument_in
14	Manual file Name	ELR~	Instrument_m
15	Current Usage (and MSH-11 mapping)	Prod	Instrument_m
16	InterPartner "From" value	eTrueNorth	Link_test_to_p
17	InterPartner "To" value	AIMSPlatform	Link_test_to_p
18	Test result exclude from normal processing	Test_kit_EUA_ID,Test_kit_model_ID,Test_kit_model_name,Test_result_code_system,Test_	Order_result :
19	Multiple value separator	;	Order_test_da
20	Input file name	csvTextOutput.csv	Ordered_test
21	Debug mode	FALSE	Ordered_test
22	Time zone	ET	Ordered_test
23	Column to count input CSV rows	Patient_ID	Ordering_facili
24	Default hour for timestamp when time not provi	08	Ordering_facili
25	InterPartner use case	CentralizedELR	Ordering_facili
26	Reporting Profile	CentralizedELR	Ordering_facili
27			Ordering_facili
28			Ordering_facili

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

File Home Insert Page Layout Formulas Data Review View Help

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B13 ManualAndTimeStamp

	A	B	C	
1	Config Item	Value	Description	FlatFile_C
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_r
5	Error Directory	C:\runMacro\test1\error		Disease_symp
6	FlatFile_order_use column to count rows	BB		Employed_in
7	FlatFile_Result_Use final column	DP		Employed_in
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
13	File Naming option	ManualAndTimeStamp		Instrument_in
14	Manual file Name	InterPartner		Instrument_n
15	Current Usage (and MSH-11 mapping)	InputFileNameOnly		Instrument_n
16	InterPartner "From" value	Manual		Link_test_to
17	InterPartner "To" value	ManualAndTimeStamp		Link_test_to
18	Test result exclude from normal processing	ManualAndInputFileName	name,Test_result_code_system,Test	Order_result
19	Multiple value separator	;		Order_test_d
20	Input file name	csvTextOutput.csv		Ordered_test
21	Debug mode	FALSE		Ordered_test
22	Time zone	ET		Ordered_test
23	Column to count input CSV rows	Patient_ID		Ordering_facil
24	Default hour for timestamp when time not provi	08		Ordering_facil
25	InterPartner use case	CentralizedELR		Ordering_facil
26	Reporting Profile	CentralizedELR		Ordering_facil
27				Ordering_facil
28				Ordering_facil

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.



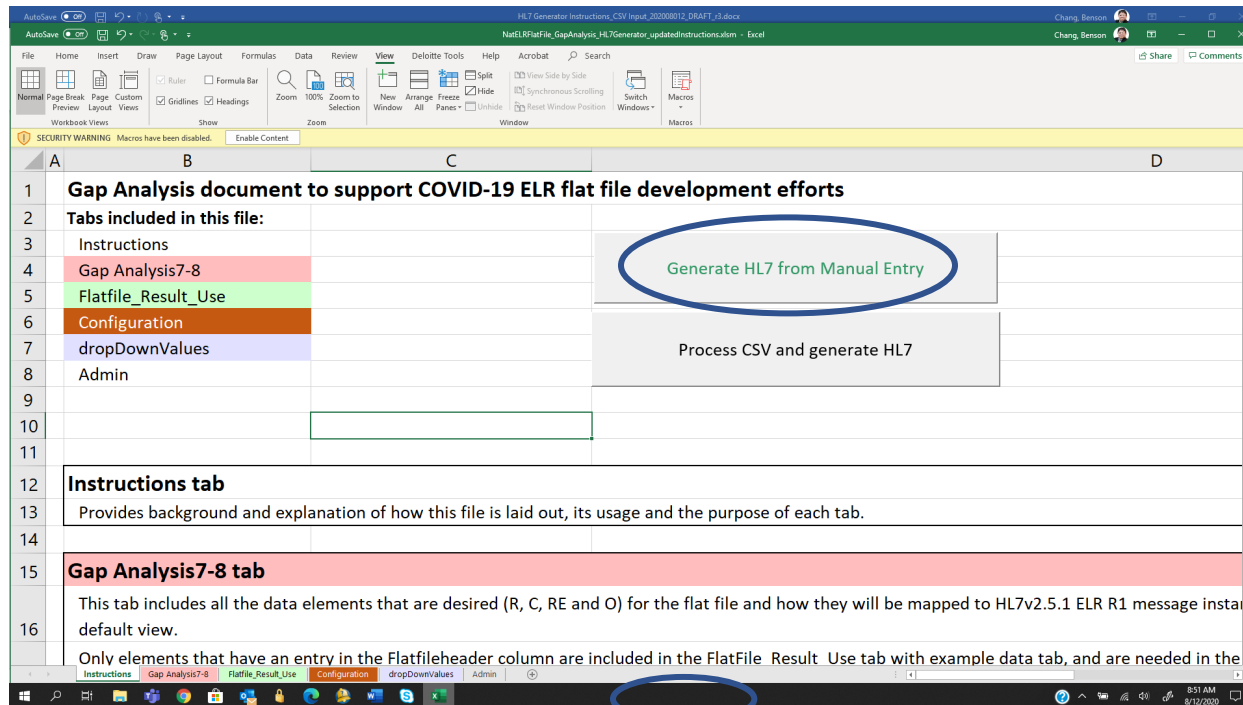
If you notice any issues, please contact AIMS Technical Assistance at informatics.support@aphl.org.

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 Help			
SECURITY WARNING Some active content has been disabled. Click for more details. Enable Content			
B13 : X ✓ fx InterPartner			
	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_r
5	Error Directory	C:\runMacro\test1\error	Disease_symp
6	FlatFile_order_use column to count rows	BB	Employed_in_
7	FlatFile_Result_Use final column	DP	Employed_in_
8			First_test
9	Timer on	FALSE	flatfile_versior
10	Number of Errors before exit	0	Hospitalized
11	Include Batch header and footer	TRUE	ICU
12			Illness_onset
13	File Naming option	InterPartner	Instrument_in
14	Manual file Name	ELR~	Instrument_m
15	Current Usage (and MSH-11 mapping)	Prod	Instrument_m
16	InterPartner "From" value	eTrueNorth	Link_test_to_r
17	InterPartner "To" value	AIMSPlatform	Link_test_to_r
18	Test result exclude from normal processing	Test_kit_EUA_ID,Test_kit_model_ID,Test_kit_model_name,Test_result_code_system,Test_r	Order_result_
19	Multiple value separator	;	Order_test_de
20	Input file name	CSVTextOutput.csv	Ordered_test_
21	Debug mode	FALSE	Ordered_test_
22	Time zone	ET	Ordered_test_
23	Column to count input CSV rows	Patient_ID	Ordering_facil
24	Default hour for timestamp when time not provi	08	Ordering_facil
25	InterPartner use case	CentralizedELR	Ordering_facil
26	Reporting Profile	CentralizedELR	Ordering_facil
27			Ordering_facil
28			Ordering_facil

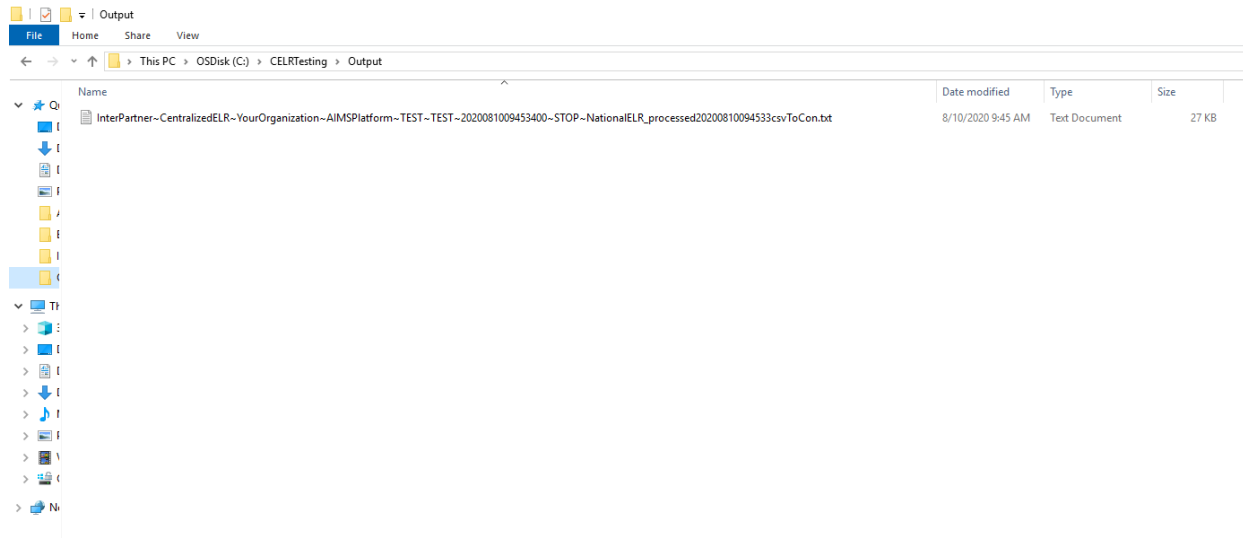


Step 8: Under the *Instructions* tab, click the “Generate HL7 from Manual Entry” button to generate a test output. If a runtime error pops up, go through Steps 1 to 6 (especially Step 3) to ensure that all setup steps are correct. If no runtime error is generated or no message appears, go to the Output directory set up in Step 3 to find output files generated from the sample data that were included through the *Flatfile_Result_Use* tab.





Output folder showing generated file:





Step 9: Go to the *Gap Analysis7-8* 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
1	HHS guidance elements							
2	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
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		RE	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 10.

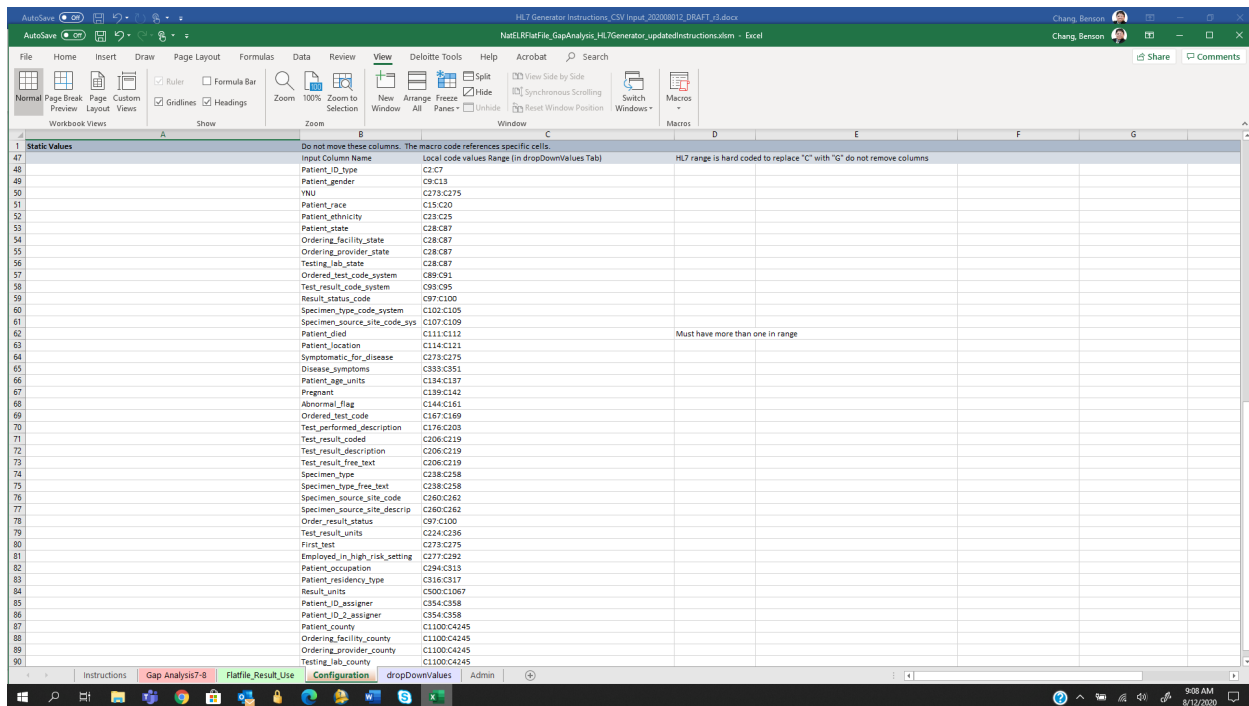


Step 10: Go to the *Configuration* tab. The top part of the tab specifies static values that will be sent with every HL7 message generated (i.e., your lab name, address, and CLIA number) and which fields they are mapped to in the HL7 message. If a field is left empty on the “Flatfile_Result_Use” tab, 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. For PHLIP partners, populate the LIMS Namespace ID and OID (Cells B36 and B37). Either a CLIA or CLIP number can be populated in OBX-23.10. Based on the value in OBX-23.10, the “CLIP” or “CLIA” assigning authority value in “Testing Lab Assigning authority-CLIP” (cell B38) or “Testing Lab Assigning authority-CLIA” (cell B39) will be populated in OBX-23.6.

File Home Insert Draw Page Layout Formulas Data Review View Help							Comments	Sha
PROTECTED VIEW Be careful—email attachments can contain viruses. Unless you need to edit, it's safer to stay in Protected View.							Enable Editing	
A40								
Static Values	Do not move these columns. The macro code references specific cells.							
1 Data on this tab is assumed to be the same for each site, where testing is performed, so could be pre-populated for manual user entry or populated automatically if entry is blank								
2 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		
3 Testing Laboratory Street	202 South Monroe		OBX-24.1	Testing_lab_street				
4 Testing Laboratory Street 2	816g12		OBX-24.2	Testing_lab_street2				
5 Testing Laboratory City	Little Rock		OBX-24.3	Testing_lab_city				
6 Testing Laboratory State	AR		OBX-24.4	Testing_lab_state				
7 Testing Laboratory County	27029		OBX-24.9	Testing_lab_county				
8 Testing Laboratory Zip	72205		OBX-24.5	Testing_lab_zip_code				
9 Name of the reporting facility	eTrueNorth	For this project this can be left blank - if populated, it MUST NOT exceed 20 characters	MSH-4.1	Reporting_facility_name	MSH-4.3	CLIA		
10 Identifier of the reporting facility	45D2134744	This MUST be a CLIA number	MSH-4.2	Reporting_facility_ID				
11 Name of the reporting system	UAMC		MSH-3.1	Report_facil_data_source_app	MSH-3.3	OID		
12 Name of the reporting system (if known)	2.16.840.1.113883.3.13.2.2.1		MSH-3.2					
13 Testing Lab ID assigner	EHR	This is no longer used. the testing lab assigner name is copied from the Testing_lab_name column which is required						
14 Testing Lab ID assigner OID	2.16.840.1.113883.3.2226	This is no longer used. The testing lab assigner id is copied from the Testing_lab_ID column which is required						
15 Name of the testing laboratory	UAMC-Sample		OBX-23.1	Testing_lab_name				
16 CLIA or CLIP number of the testing laboratory	04D1044169		OBX-23.10	Testing_lab_ID				
17 Name of the organization that assigns the Patient Identifier		Patient_ID_assigner -assigned from input column Patient_ID_assigner	PID-3.4.1-1					
18 Name of organization that assigns the Patient Identifier		Patient ID assigning OID-assigned from dropdown	PID-3.4.2-1					
19 Name of the organization that assigns the Patient Identifier		Patient_ID_assigner 2 -assigned from input column	PID-3.4.1-1					
20 Name of the organization that assigns the Patient Identifier		Patient_ID_2_assigner						
21 Name of the organization that assigns the Patient Identifier		Patient ID assigning OID-assigned from dropdown	PID-3.4.2-1					
22 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			
23 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			
24 Test instrument or kit			OBX-17.1		populate if OBX-17.1 empty			
25 Default Specimen_type_description	Specimen of unknown material	If Specimen_type_description is not populated, enter this value	SPM-4.2	Specimen_type_description				
26 Default specimen type code	119324002	Default value if not populated	SPM-4.1	Specimen_type_code				
27 Software vendor	software vendor		SFT-1					
28 Software version or release number	v12		SFT-2					
29 Software Name	software name	Cannot exceed 20 characters	SFT-3					
30 Binary ID	Binary ID unknown		SFT-4					
31 Install date	20181008	Date in HL7 format 'YYYYMMDD'	SFT-6					
32 Receiving Application Name	AR.NBS		MSH-5.1					
33 Receiving Application OID	2.16.840.1.114222.4.3.3.2.5.3		MSH-5.2					
34 Receiving Facility Name	AR DOH	This field can be left blank, if using the AIMS routing service	MSH-6.1		Based on the name, look up the OID for use in MSH-6.2 and also			
35 Name of the health department receiving the data	2.16.840.1.114222.4.1.141		MSH-6.2					
36 PHLIP LIMS namespace id	STARLIMS							
37 PHLIP LIMS OID	2.16.840.1.113883.3.2226							
38 Testing Lab Assigning authority-CLIP	0000 CLIA&2.16.840.1.113883.3.8	This is to map to OBX 23.6 based on the value in OBX 23.10 for CLIP	OBX-23.6					
39 Testing Lab Assigning authority-CLIA	CLIA&2.16.840.1.113883.4.78&ISO	This is to map to OBX 23.6 based on the value in OBX 23.10 for CLIA	OBX-23.6					



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.



Step 11: 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 1218 (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	Patient_ID_Type							
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	Patient_gender							
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 Pacific Islander	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	Patient_race							
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	Patient_ethnicity							

Step 12: 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.

The image shows a "Data Validation" dialog box with three tabs: "Settings", "Input Message", and "Error Alert". The "Settings" tab is active. Under "Validation criteria", the "Allow:" dropdown is set to "List", and the "Data:" dropdown is set to "between". There are two checked checkboxes: "Ignore blank" and "In-cell dropdown". The "Source:" field contains the formula "=dropDownValues!\$C\$15:\$C\$20". At the bottom, there is an unchecked checkbox labeled "Apply these changes to all other cells with the same settings". The dialog has three buttons at the bottom: "Clear All", "OK", and "Cancel".

Data Validation

Settings | Input Message | Error Alert

Validation criteria

Allow: List ☒ Ignore blank

Data: between ☒ In-cell dropdown

Source: =dropDownValues!\$C\$15:\$C\$20

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

Clear All OK Cancel

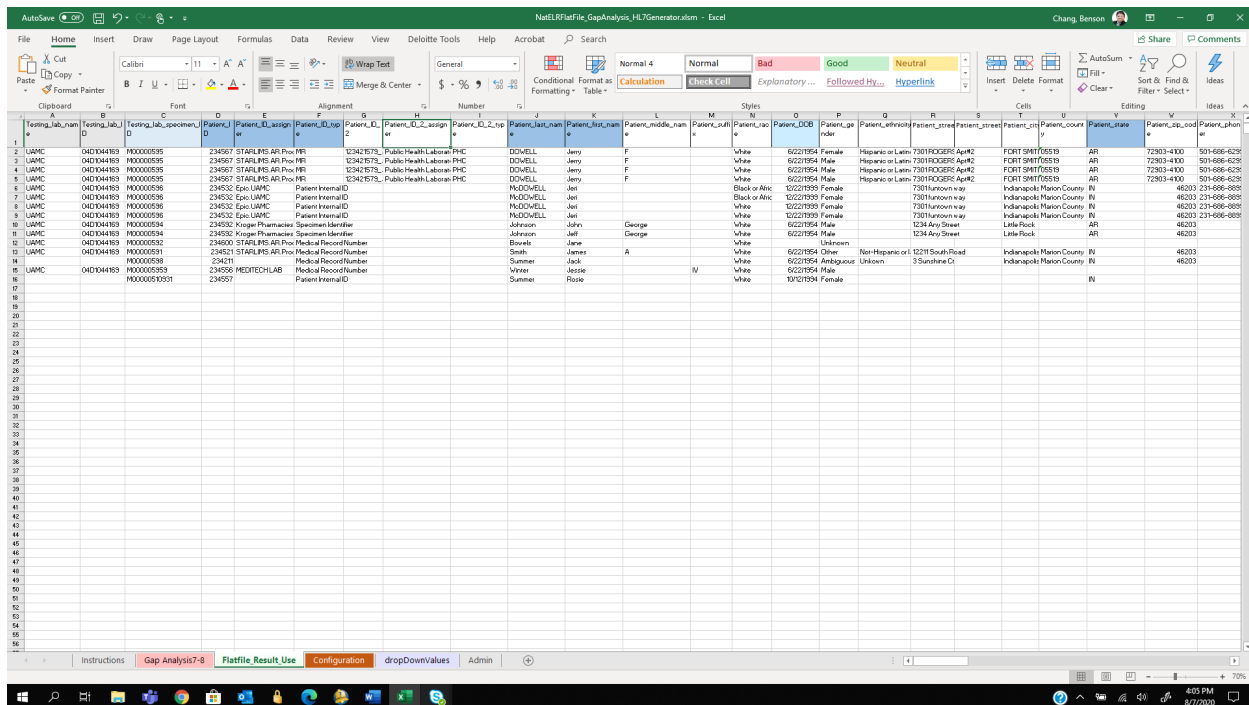


Make sure that “Show error alert after invalid data is entered” is unchecked. This allows the macro to also check for HL7 code values.

A screenshot of the "Data Validation" dialog box. The "Error Alert" tab is selected. The checkbox "Show error alert after invalid data is entered" is unchecked. Below it, the text "When user enters invalid data, show this error alert:" is followed by a line. Under "Style:", a dropdown menu shows "Stop". Under "Title:", there is an empty text box. Under "Error message:", there is a large empty text area with a vertical scrollbar. At the bottom are buttons for "Clear All", "OK", and "Cancel".

Step 13: 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.



Version 20220225



Trouble shooting other tool outputs etc.

When the “Generate HL7 from Manual Entry” is selected, the following happens:

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.