

2021 NPCR NEBRASKA SUCCESS STORY

Nebraska Cancer Registry: Qianru Wu, Connie Ganz, Lifeng Li

Data Quality Control for Electronic Pathology Reporting

National Program of Cancer Registries SUCCESS STORY

SUMMARY

The Nebraska Cancer Registry resolved to automate data quality control activities for electronic cancer pathology reports in Health Level Seven (HL7) format from laboratories. To do so, it needed to summarize common types of errors in the HL7 messages and provide solutions.

CHALLENGE

The Nebraska Cancer Registry (NCR) started to receive consistent electronic pathology (ePath) reporting in HL7 format in March 2021. The ePath reports originated from four local and national laboratories comprising more than 95% of the pathology report volume in Nebraska. The volume of data prohibited the continued use of manual error detection and error correction methods for data quality control activities. Furthermore, new errors were encountered with the engagement of more reporting laboratories, making the data quality control activities even more difficult.

Below is a summary of the most common types of issues observed in the HL7 messages:

- Required data items were missing. Laboratories must frequently depend upon ordering facilities to gather data elements such as race and ethnicity.
- Laboratory sent excess segments or data items, causing errors or failure when eMaRC Plus attempted to import files. For example, a laboratory sent two sets of batch segments in one file and caused failure in importing the first batch to eMaRC Plus.
- Laboratory sent data items in the wrong segment or used the incorrect delimiter in the message, causing inaccuracy in the final abstract. For example, a laboratory used wrong delimiters in OBR-32 (Principal result interpreter) data field, which made eMaRC Plus fail to capture the interpreter's name.
- The health information system of a laboratory didn't have the technical capability to comply with the required North American Association of Central Cancer Registries (NAACCR) Pathology Laboratory Electronic Reporting Standards, Volume V. For example, one laboratory's health information system could send only one OBX segment, resulting in an extra-long text field in OBX-5. This text field might exceed the maximum character length allowance and face the risk of truncation during the auto-abstraction process in eMaRC Plus.

SOLUTION

Prior to onboarding, the new laboratory was required to send test HL7 messages for validation in both eMaRC Plus and the Rocky Mountain Cancer Data Systems. The Informatician reviewed the structure of the HL7 messages, and the Certified Tumor Registrars (CTRs) reviewed the converted abstract in NAACCR format. If the test messages required further improvement, feedback was provided to the sending laboratory on the modifications that must be made to their HL7 messages.

Due to the high volume of data, the team developed an automated Java program to detect and correct the errors in the HL7 messages. The program was run internally by the NCR before data transmission to eMaRC Plus. The program integrated a main program that handled the common errors across multiple laboratories and laboratory specific subprograms with each subprogram handling the unique errors that belonged to a certain laboratory. The main program read new messages from the sFTP receiving folder one by one, detected and modified the common errors, identified the reporting laboratory from the Message Header segment, and requested the corresponding laboratory specific subprogram to handle the laboratory unique errors. After the subprogram completed the modifications, the main program wrote the modified HL7 message to a new file, which was ready for importing into eMaRC Plus. Every modification the program performed was logged for later reference.

RESULTS

Most of the laboratory reporting errors were corrected using this solution. The pre-onboarding step largely standardized the HL7 message structure, and the automated program could detect and eliminate systematic and unexpected errors. If an error could not be solved by either the laboratory or the automated programs, such as missing race and ethnicity, it would be recorded, and a notification would be provided to the CTRs. The message modification service provided flexibility for laboratories to continue their current reporting while also providing automated message defect detection and correction within the data exchange process.

SUSTAINING SUCCESS

The solution provided an opportunity to learn the multiple variances in laboratory's HL7 messaging structures. Furthermore, as additional laboratories onboard to report electronically, knowledge of potential errors will become more thorough, which will help proactively prevent the same errors from occurring. In addition to the message modification service, planning is under way to further enhance these services, such as generation of additional data using the content already present in HL7 messages provided by laboratories.

REGISTRY CONTACT INFORMATION

402-326-3226

<http://dhhs.ne.gov/Pages/Cancer-Registry.aspx>



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