

LOINC and SNOMED CT Code Use in Electronic Laboratory Reporting—US, 2011

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Objective

To examine the use of LOINC and SNOMED CT codes for coding laboratory orders and results in laboratory reports sent from 63 non-federal hospitals to the BioSense Program in calendar year 2011.

Introduction

Monitoring laboratory test reports could aid disease surveillance by adding diagnostic specificity to early warning signals and thus improving the efficiency of public health investigation of detected signals. Laboratory data could also be employed to direct and evaluate interventions and countermeasures, while monitoring outbreak trends and progress; this would ultimately result in better outbreak response and management, and enhanced situation awareness. Since Electronic Laboratory Reporting (ELR) has the potential to be more accurate, timely, and cost-effective than reporting by other means of communication (e.g., mail, fax, etc.), ELR adoption has been systematically promoted as a public health priority. However, the continuing use of non-standard, local codes or text to represent laboratory test type and results complicates the use of ELR data in public health practice. Use of structured, unique, and widely available coding system(s) to support the concepts represented by locally assigned laboratory test order and result information improves the computational characteristics of ELR data. Out of several coding strategies available, the Office of the U.S. National Coordinator for Health Information Technology has recently suggested incorporating Logical Observation Identifiers Names and Codes (LOINC) for laboratory orders and Systemized Nomenclature of Medicine- Clinical Terms (SNOMED CT) codes for laboratory results to standardize ELR.

Methods

We assessed the use of LOINC and SNOMED CT codes in laboratory data reported to BioSense, a near real-time national-level, electronic syndromic surveillance system, managed by the Centers for Disease Control and Prevention. ELR data reported by 63 non-federal hospitals to BioSense in 2011 were analyzed to examine LOINC and SNOMED CT use in coding laboratory orders and results. We used Relma software, developed and distributed by Regenstrief Institute Inc for identifying LOINC codes.

Results

In 2011, a total of 14,028,774 laboratory test order or result reports from 821,108 individual patients were reported from the 63 hospi-

tals in 14 states. Since, by design the BioSense Program monitors a select set of syndromes mainly representing infectious conditions, 94% of the total reports were microbiology test orders or results. Seventy-seven percent of all test orders (n = 10,776,494) used LOINC codes. Of all test results with at least one value either in observation identifier (OBX3) or observation value (OBX5) segments of their Health Level 7 (HL7) ELR message (n = 12,313,952), 81% had only LOINC codes, 0.1% had only SNOMED codes, 7% had both LOINC and SNOMED codes, and 12% used no codes. In total, 1,428 unique LOINC and 608 unique SNOMED codes were used to describe the results, and 805 unique LOINC codes were used to describe the orders. Of the 608 unique SNOMED codes, 111 (18.3%) did not have corresponding LOINC codes. Fifty-one (46%) of these 111 SNOMED codes could have been matched to corresponding LOINC codes based on the concept. However, our search for matching LOINC codes in Relma for certain SNOMED concepts indicated that LOINC does not have codes for select types of laboratory test results, particularly qualifier (such as reactive, negative, and resistant) or structural (labia, urethra, and vagina) concepts.

Conclusions

Our analysis showed that the use of SNOMED CT codes for laboratory test results by non-federal hospitals reporting laboratory data to BioSense was extremely limited. These hospitals more frequently used LOINC codes than SNOMED CT in reporting test results. We found that a large percentage of test results with SNOMED CT codes could be represented by LOINC codes that exactly or closely match SNOMED CT codes. Using LOINC codes to report both test order and results in these databases could increase the availability and use of laboratory data in public health and surveillance activities. However, to increase the sensitivity of the coding further, a small number of tests could benefit by using LOINC along with SNOMED CT codes. Evaluation of use of syndromic surveillance case definitions that incorporate laboratory result information is required to determine if it improves syndromic surveillance performance for enhanced outbreak detection or improved situation awareness.

Keywords

LOINC; SNOMED; Laboratory reporting; ELR

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