2004-2010 NATIONAL ASSESSMENTS OF ELECTRONIC LABORATORY REPORTING IN HEALTH DEPARTMENTS

Findings and Recommendations

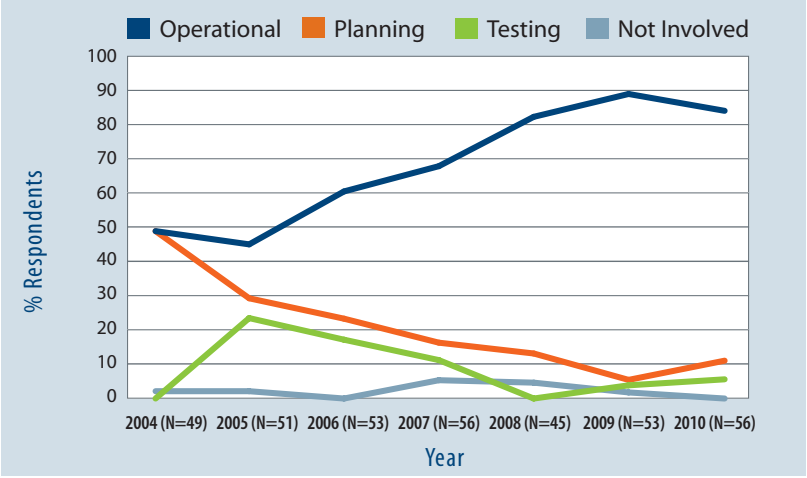
SUMMARY

Electronic laboratory reporting (ELR) is the electronic transmission of reportable condition results from laboratories to public health. ELR within local and state health departments requires periodic measurement and assessment. In 2000, the Electronic Laboratory Reporting (ELR) community first convened a working group among several states (1). The collaborative began to capture national ELR data in 2004 with development of an annual nationwide assessment, the main objective of which was to track the progress and remaining obstacles to ELR implementation in the United States. The results of the 2010 assessment showed substantial progress in nationwide ELR implementation over time (2). However, barriers to implementation—most notably resource and staffing constraints—remain. Future assessments of ELR implementation will offer insight on these issues and identify key areas for targeted resources and strategic planning.

METHODS

The 2010 ELR assessment was emailed to participants in a Microsoft Excel spreadsheet format. One ELR representative for each identified jurisdiction (state, metropolitan area, or associated county/territory) responded to the assessment. An editorial review board vetted assessment questions with representatives from states, laboratories, the Centers for Disease Control and Prevention (CDC), and academia. Core questions from previous assessments were preserved to provide longitudinal data. Fifty-six (97%) of 58 jurisdictions responded: 50 states, the Federated States of Micronesia, and four metropolitan areas (Chicago, Denver, Indianapolis, Los Angeles).

FIGURE 1. Percentage of responding health departments' electronic laboratory reporting implementation by year – 2004-2010 Electronic Laboratory Reporting Assessments



RESULTS

In 2010, of the 56 responding jurisdictions, 43% indicated receiving 50%–100% of notifiable condition reports electronically through ELR. From 2004 to 2010, the number of public health jurisdictions in production stages of ELR progressively increased as those in testing and planning stages decreased (Figure 1). In 2010, 84% of jurisdictions reported an ELR system in production receiving at least some electronic reportable condition laboratory reports. Five percent of jurisdictions reported ELR systems in the testing phase, and 11% reported ELR systems in the planning phase. No jurisdictions reported "no current involvement" with ELR.

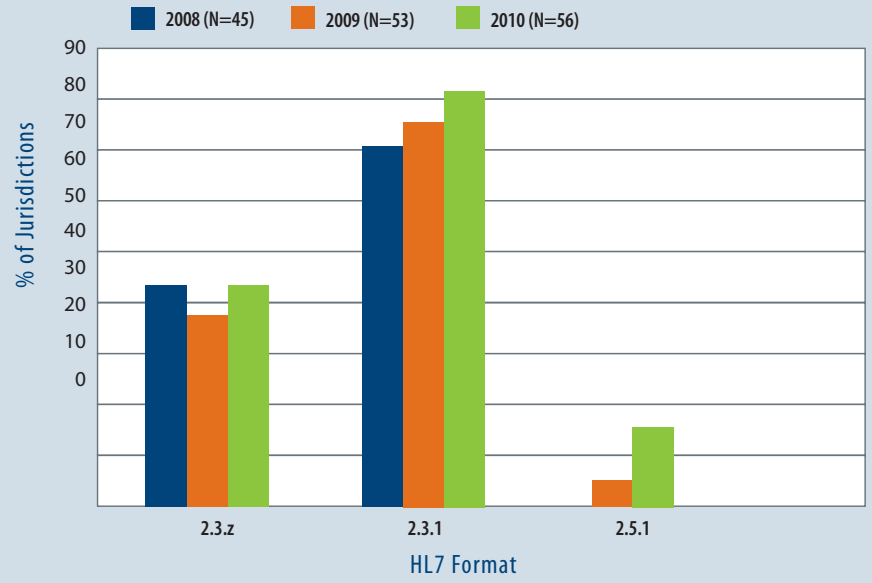
ELR SYSTEMS AND USES OF DATA

The main purpose of ELR is to provide reportable condition data to end users, the most common of which were state program areas (91%), CDC or other federal agencies (79%), county/local health departments (74%), and centralized integrated data stores (74%). Other uses for ELR data included contributing to data analysis and visualization (87%), integrating ELR with NEDSS Base System (3) or similar system (72%), assisting in patient care (e.g., test ordering and result posting) (26%), offering health-care decision support (e.g., adjusting treatment on the basis of receipt of antimicrobial susceptibility data from ELR) (21%), detecting antimicrobial susceptibility patterns (21%), and contributing to syndromic surveillance (e.g., laboratory test order patterns) (15%).

The development and implementation of ELR systems used in health departments varied by jurisdiction. Twenty-two percent of jurisdictions reported they had purchased their ELR system, 10% used a system built by in-house personnel, 50% used a hybrid system (both purchased and built), and 16% used a system built by contractors. Despite these differences, the interval from acquisition to full operation was similar regardless of system type. Twenty-four percent of in-house-developed systems/components were operational within 1 year, and 32% of jurisdictions that purchased systems/components were operational within 1 year.

Jurisdictions reported receiving ELR data in Health Level Seven (HL7) (4) format (a health data standard format); the most common versions received in production were 2.3.1 (82%) and 2.3.z (44%) (Figure 2). Sixteen percent of jurisdictions reported having received data in version 2.5.1, specified in the Stage 1 Meaningful Use Menu Set Objectives for Eligible Hospitals (5).

FIGURE 2. Percentage of jurisdictions by type of Health Level 7 (HL7) format accepted in production-level electronic laboratory reporting systems–2008-2010 Electronic Laboratory Reporting Assessments

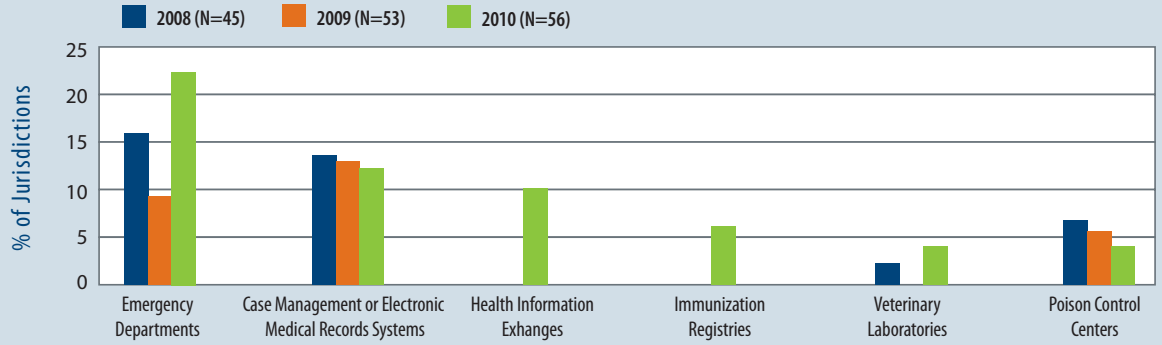


Acceptance of data through ELR systems from nontraditional ELR sources (e.g., veterinary laboratories, poison control centers, emergency departments) was not widespread. Only 22% of test or production sites processed data from emergency departments; 12%, from case management or electronic medical records systems; 10%, from Health Information Exchanges; 6%, from immunization registries; 4% from veterinary laboratories; and 4%, from poison control centers (Figure 3).

BARRIERS

All jurisdictions were asked to identify and rank the three most important barriers to full ELR implementation. In 2010, the highest priority barriers were lack of health department funding (21%), competing priorities of laboratories (20%), lack of health department staffing (16%), and the inability to offer incentives (14%).

FIGURE 3. Nontraditional uses of electronic laboratory reporting data – 2008 -2010 Electronic Laboratory Reporting Assessments



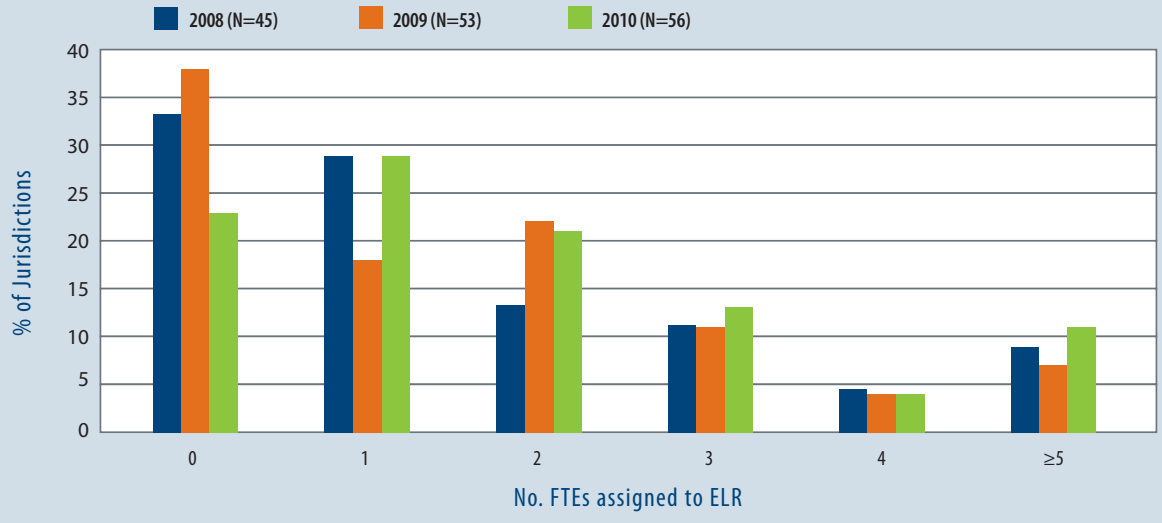
RESOURCES

Collective resources required to build and maintain functional ELR ranged from <$1 million to >$5 million. In 2009, 20% of jurisdictions reported investing >$5 million on ELR activities and, in 2010, 21%. The highest expenses were information technology staff (52% of jurisdictions) and software (23%).

PERSONNEL AND TRAINING

The number of full-time equivalent (FTE) personnel assigned to ELR activities in the health departments has varied over time. Twenty-three percent of jurisdictions in 2010 indicated zero ELR FTEs—a sharp decline from 38% in 2009 and 33% in 2008 (Figure 4). The 2010 ELR Assessment showed an increase in the percentage of jurisdictions reporting at least one FTE assigned to ELR (29%), an increase from the 2009 assessment (18%) and the same as the 2008 assessment (29%). Thirty-four percent of jurisdictions in 2010 reported two to three FTEs dedicated to ELR activities, and 15% have four or more ELR FTEs.

FIGURE 4. Number of electronic laboratory reporting assigned full time equivalents by responding jurisdictions – 2008-2010 Electronic Laboratory Reporting Assessments



In 2010, the training needs identified for existing ELR staff included training in LOINC® or SNOMED coding (75%), HL7 messaging (71%), and public health informatics (46%). Similarly, respondents indicated the need for additional staff already trained in these areas. Forty-three percent of jurisdictions indicated messaging experts with skills, such as HL7, LOINC®, and SNOMED, as the additional staff most useful for ELR implementation and support. Additional staff, such as information technology personnel (27%), informaticists (20%), epidemiologists (5%), and medical technologists (2%), also were indicated as useful to ELR implementation in local and state health departments.

CONCLUSION

Despite the tremendous progress reflected by the results of the 2010 assessment, the need for better resources critically limits ELR implementation. Funding and staffing shortages negatively affect most jurisdictions' ability to design, implement, and maintain ELR systems; recruit and support laboratories; and provide meaningful data to public health partners at local, state, and federal levels. Ongoing assessment, workforce training, strategic planning, and continued discussions at all levels of government in public health should continue to ensure nationwide implementation of ELR.

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