

data quality management.

Figure 1: Pre-Validation Receipt and Storage of Communicable Disease ELRs



Methods

The DDP, in conjunction with the Virginia Department of Health's (VDH) ELR Messaging Team and general infectious disease program (Division of Surveillance and Investigation [DSI]), collaborates with laboratories to establish mechanisms for HL7 ELR transport. Once established, test message structural validation and issue resolution occurs using two ELR validators (Fig. 1). Messages are subsequently validated for content, comparing ELR to corresponding paper reports. Due to inaccurate ELR provisioning, a process was established to review daily LOINC/ SNOMED ELR accuracy for DDP and DSI (Fig. 2-3). A custom application is used to assign values to each ELR field for deterministic data matching. Content validation results are summarized via Facility ELR Assessment Reports (FEAR) for programmatic review/approval.



The VALIDATOR: a "must-see" prequel to electronic laboratory reporting

Jeff Stover, MPH^{1,2} John McNeice³ Jennifer Loney¹ Stephen Barber¹ Neehar Gollapudi¹ (1) STD Surveillance, Operations & Data Administration (SODA) - Division of Disease Prevention - Virginia Department of Health (2) Division of Epidemiology - Department of Family Medicine and Population Health - Virginia Commonwealth University (3) HIV Surveillance Program - Division of Disease Prevention - Virginia Department of Health



Acknowledgement: This project was supported by the Centers for Disease Control and Prevention cooperative agreements related to STD

Results

Between July 2012 - April 2014, structural and content validation from five laboratories was completed for >20,000 HIV and STD ELRs; 11,990 and 8,290, respectively (Table 1). DDP has also performed HL7 structure validation for >120 different messages from 14 private laboratories, and identified and resolved >500 unique message errors. Staff worked with laboratories to reduce data inaccuracies and incompleteness to <4%. To date, the average ELR record is received 48 hours faster than traditional mail or facsimile.



Validation of HIV/STD ELRs provides meaningful standards for programmatic data quality acceptance. Virginia's HIV/STD ELR validation framework has been incorporated as a core component for on-boarding all future ELR providers, including use by other VDH programs. Results illustrate that receipt of ELR data compared to traditional paper reporting is more accurate, complete and faster, and that validation is critical for all new provider ELR messaging. The use of FEAR reports allows HIV and STD programs to quantify and fix data quality issues prior to incorporation into surveillance systems (Fig 4). ELR data quality management, inclusive of structural and content validation, should be incorporated into the receipt of ELR messages to ensure accuracy and validity of electronic messages. Protocols should also be in place for routine ad hoc assessment to ensure ongoing continuity of existing messages.



Table 1: HIV/STD ELR Validation Activities, 7/25/2012—4/3/2014						
		Date	Date	Total		
Sending	Validation	Validation	Range	Validated	Subtotal	Subtotal
Facility	#	Completed	(Days)	ELR's	HIV	STD
Lab #1	1	12/2/2012	10	8	8	-
	2	10/16/2013	25	63	31	32
	3	4/3/2014	35	108	95	13
Lab #2	1	7/25/2012	15	4,545	693	3,852
	2	3/8/2013	15	7,072	5,527	1,545
	3	5/24/2013	1	378	255	123
Lab #3	1	5/17/2013	7	877	219	658
	2	5/24/2013	1	459	131	328
Lab #4	1	9/29/2012	12	3,371	2,538	796
	2	10/4/2013	12	3,078	2,308	770
Lab #5	1	11/6/2012	25	205	135	70
	2	5/23/2013	4	53	50	3
TOTAL	12			20,217	11,990	8,190

Figure 5: Routing of Validated Communicable Disease ELRs



Conclusions



Reporting (ELR) is the future for efficient and standardized receipt of communicable disease laboratory data. But, numerous challenges must be met, including staffing expertise and information technology infrastructure. Receipt and focus for STD/HIV programs; however, structural and content validation are critical, interdependent components that must be addressed to ensure adequate ELR data quality management.