Case Study of the Cost to Develop and Maintain Components of a State Biosurveillance System

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Purpose of Study

To provide planners and funders of surveillance with an example of costs involved in building and maintaining public health surveillance systems.
Challenges to estimating “typical” costs

- Variable design features of each system developed
- Functional differences specific to each jurisdiction (e.g., work flow, legal authority)
- Different technology environments in which systems are built
- Incremental development over time
Four Surveillance Systems Considered

• Epidemiology
  – Electronic Laboratory Reporting
  – Communicable Disease Reporting
  – Emergency Department Syndromic Surveillance

• Public Health Laboratory
  – Reporting to Epidemiology and counties
New York State’s Public Health Information Infrastructure

• NYSDOH Health Commerce System (HCS)
• Clinical Laboratory Information Management System (CLIMS).
Electronic Clinical Lab Reporting System (ECLRS)

• Transmission of lab results to NY State, City, and 57 local health departments
• State-funded vendor hired under a 5-year contract in 2000
• By 2001, first phase of ECLRS was built
Communicable Disease Electronic Surveillance System (CDESS)

• Developed in 2005 to integrate with ECLRS
• Secure system for the state and local HDs and hospital infection control programs to collect, manage, and report cases of infectious disease
• Patient-centric
• Tracking, contact tracing, case management
Electronic Syndromic Surveillance System (ESSS)

• Developed in 2005, on ECLRS infrastructure

• Monitors two data sources daily:
  – ED chief complaints, from most of the 144 hospitals
  – Medicaid over-the-counter and prescription drug sales
Public Health Laboratory Electronic Reporting

• Submits test results to the Division of Epidemiology and counties
• Requires no software changes when tests, results, or coding terms are added
• LOINC and SNOMED mapping tables
• HL7 format
Total Estimated Costs to Develop Surveillance Systems, New York, 2000-2005 (in $1000s)

Epidemiology: Electronic lab reporting, syndromic surveillance, and case reporting systems

PH Lab: Reporting to Epidemiology and counties
Costs to Develop ECLRS, CDESS, and ESSS

$6.8 million over five years (2000-2005) under state contract

– $200,000 for hardware and software
– $6.6 million for 11 staff
  • 7 Developers
  • 3 Business Analysts
  • 1 Project Manager
Costs to Develop Public Health Laboratory Reporting

$1.95 million over two years (2001-2003)
—Four FTEs
Annual Estimated Costs to Maintain/Enhance Surveillance Systems, New York, 2006-2013 (in $1000s)

Epidemiology: Electronic lab reporting, syndromic surveillance, and case reporting systems

PH Lab: Reporting to Epidemiology and counties
Maintaining/Enhancing ECLRS, CDESS, and ESSS

- Maintenance, monitoring and correcting problems during production
- Help desk training and technical support for users
- Migrating from Sybase to Oracle (2012)
Developing CDESS modules:
- Syphilis serology registry (2007)
- Data extraction/transmission to Foodnet Program (2007)
- Perinatal hepatitis B case management (2008)
- TB case management to replace former TIMS system (2009)
- Vaccine preventable disease contact tracing (2010)
- Hepatitis tracking (2011)
- Animal rabies exposure tracking (2011)
- Rabies prophylaxis financial reimbursement (2012)
- Sexually transmitted disease case management to replace former STDMIS (2012-2013)
- Refugee health assessment (2013-2014)
- Problem alert system for state and local health departments (2013-2014).
Maintaining/Enhancing Public Health Laboratory Electronic Reporting

- New vocabulary terms/mappings
- Configuring messaging of new tests
- Networking/messaging infrastructure changes
- Database upgrades
- Software (e.g., changes for HL7 code generation)
- Updating algorithms to identify tests to report
- Help desk training/technical support for users
- Troubleshooting problems during production
Annual Costs to Maintain/Enhance ECLRS, CDESS, and ESSS

$1.8 million/year

- 4 Developers
- 2 Business Analysts
- 4.5 Programmers
- 1 Program Manager
Annual Costs to Maintain/Enhance Public Health Laboratory Electronic Reporting

$487,000/year

—Two FTEs
Limitations to Cost Analysis

- One state’s experience
- Varying technology environments
- No cost vs. benefit
- Cost in yesterday’s dollars and with yesterday’s technology
- IT platform costs not included
- Disease/lab program staff costs not included
Cost Conclusions

- Considerable costs to develop surveillance systems
- Long-term financial commitment needed
- Funding both from state and from CDC grants
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