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

Perry F. Smith[1]

Hwa-Gan Chang[2]

Alok Mehta[2]

1 School of Public Health, SUNY Albany

2 New York State Department of Health

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

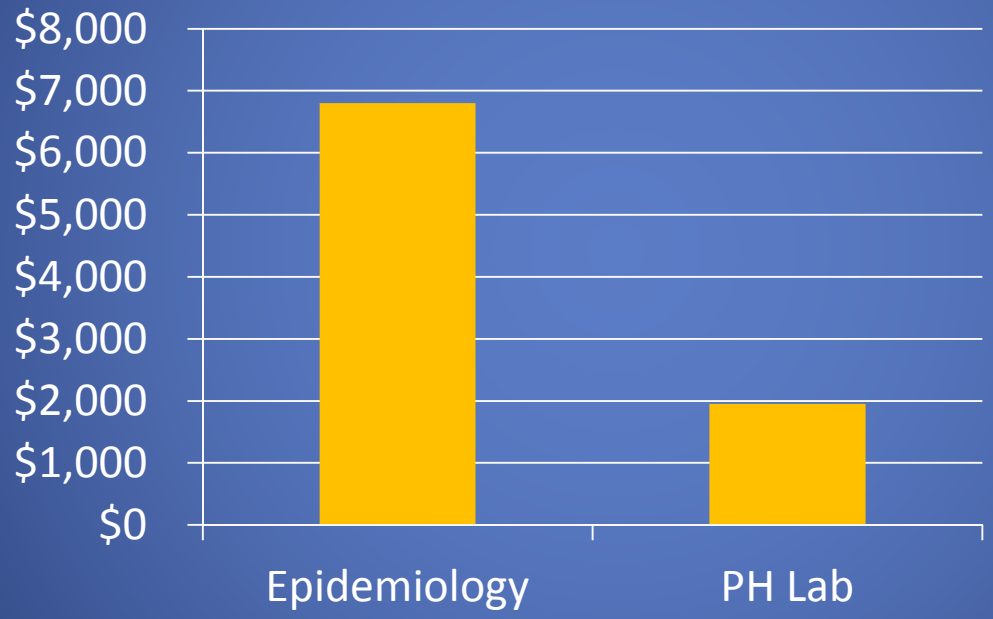
Electronic Syndromic Surveillance System (ESSS)

- 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

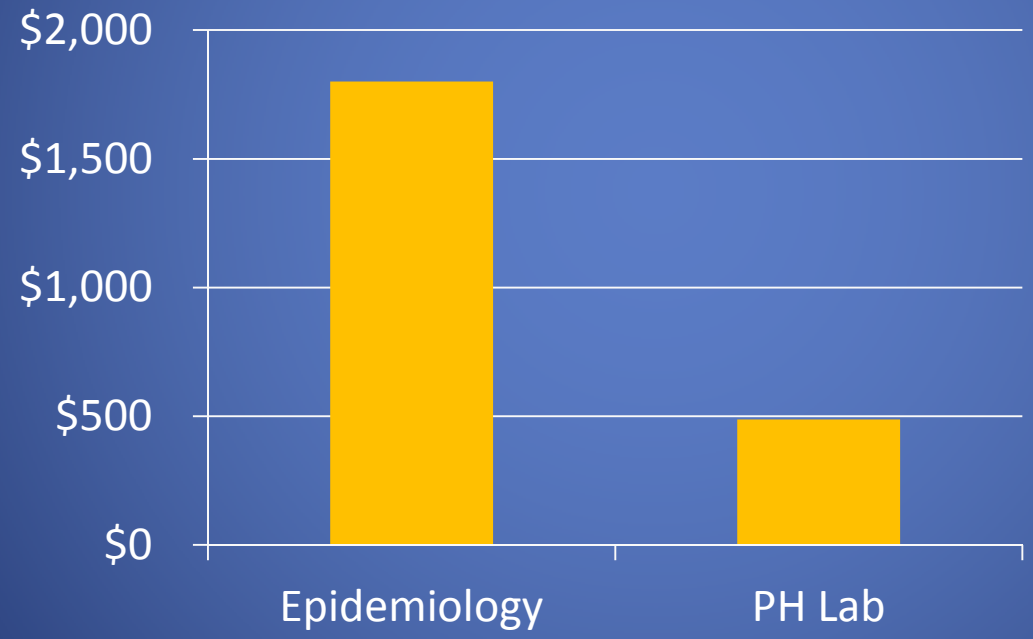
$6.8 million over five years (2000-2005) under state contract

- $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)

Maintaining/Enhancing ECLRS, CDESS, and ESSS (Cont'd)

- 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

Acknowledgements

Special thanks to the staff of the New York State Department of Health for supplying cost and staffing information.

Funding provided to the North Carolina Preparedness and Emergency Response Research Center at the University of NC at Chapel Hill's Gillings School of Global Public Health by CDC Grant 1PO1 TP 000296.