

Successes and Challenges in Population-Based Electronic Pathology Reporting

Tamas S. Gal, MS

Eric B. Durbin, MS

Kentucky Cancer Registry

NAACCR 2010 Conference

Québec City, QC Canada



Overview

- Electronic pathology (E-Path) implementations in Kentucky
- Successes
- Challenges
- Future Directions
- Conclusions

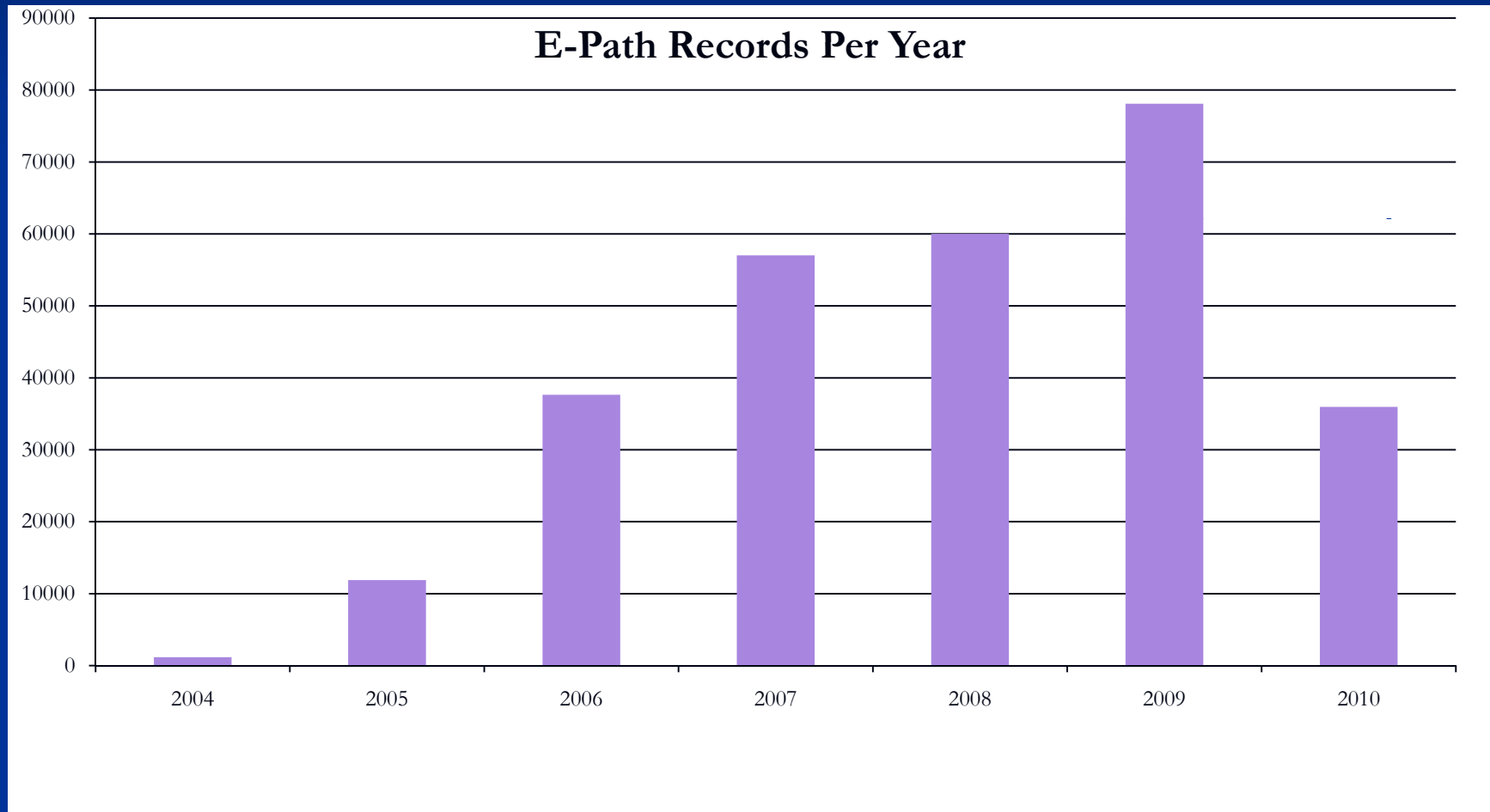
E-Path Reporting in Kentucky

- Began in **November, 2004**
- Consists primarily of lab installations using software from Artificial Intelligence in Medicine, Inc. (AIM)
 - ~98% of all reports at KCR
 - Sponsored by the NCI/SEER program
- In 2009, implemented interface through the CDC Public Health Information Network Messaging System (PHIN-MS)
 - For national based reporting
 - Labcorp

Nearing Population Based E-Path Reporting

- Includes hospital based and freestanding pathology labs
- 35 of 48 pathology labs are reporting electronically (73%)
- 79 of 100 hospitals are covered (79%)
 - 90% of cases seen at large hospitals
 - 72% of cases seen at small hospitals
- Receiving approximately **2000** reports/week
- About **282,000** reports received to date

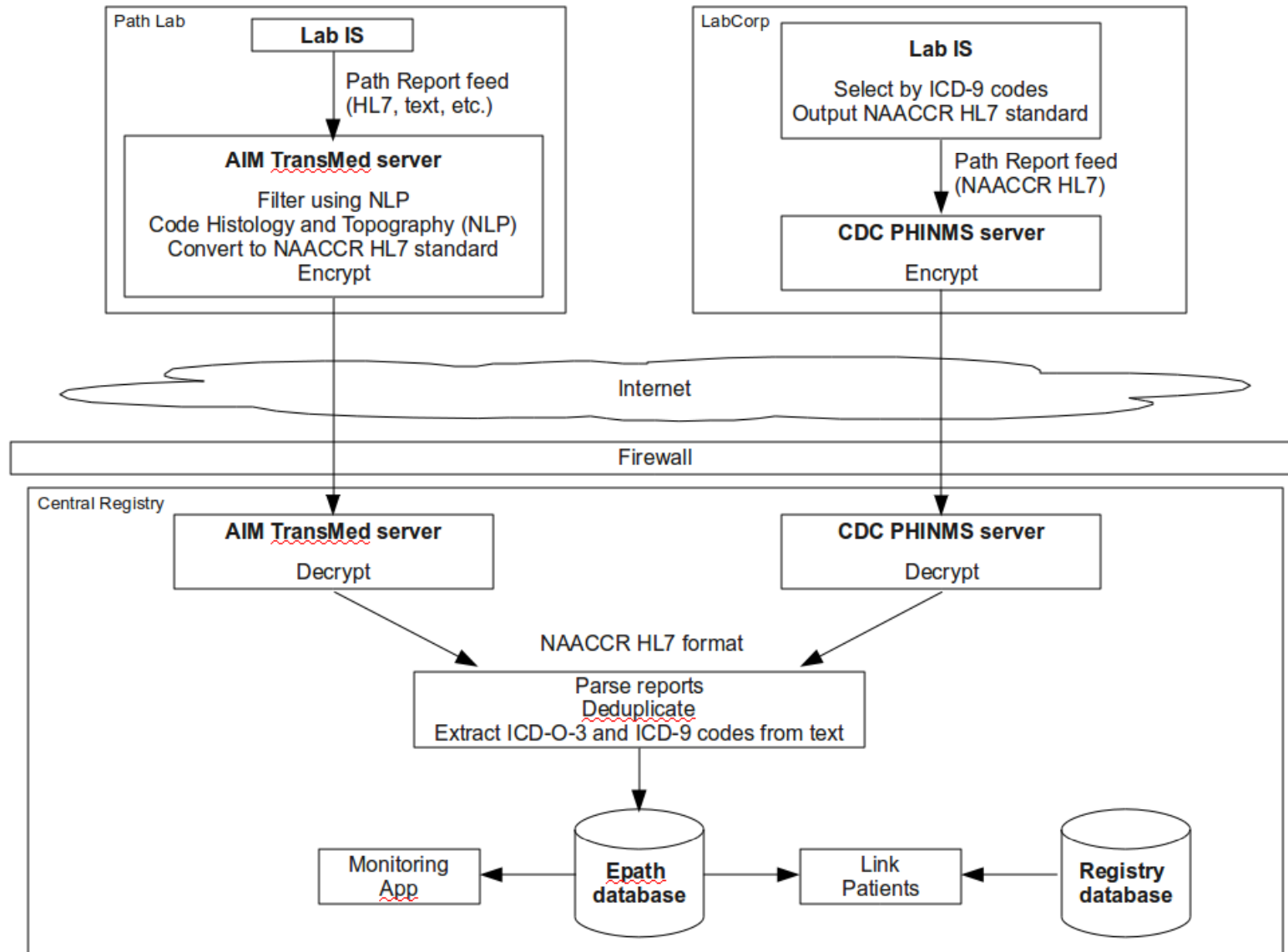
Increasing E-Path Volumes



KCR E-Path Record Management

- E-Path repository designed according to NAACCR Standard HL7 2.3.x message structure
 - MySQL database server
 - One table for each HL7 message segment
- Applications developed to parse and store E-Path records
- Other utilities developed to search and view E-Path reports

E-Path Architecture



Successes: Hospital Case-finding Audits

- E-Path used for six annual audits since 2005
- Over 60 missed cases identified
- KCR plans to use E-Path for audit purposes more frequently as the repository database and applications mature and more labs are installed

Successes: Additional Missed Cases Identified

- E-Path reports routinely matched against central database to search for missed cases
- Currently auditing 2008 E-Path reports
- 93 possible missed cases from 10 labs identified so far
 - Cases not reportable by hospitals

Challenges: Establishing New Feeds

- Business agreements must be vetted
- Technical specifications
 - Feed format (Custom interface for each format)
 - Hardware requirements
 - Personnel
 - Network specifications, etc.
- Testing
- Production
- AIM handles most logistic details
- Motivated facilities may take up to a year to bring online

Challenges: Complexity

- The transmission route is complex involving multiple systems from the path lab to KCR
- Most steps are automated but human intervention is frequently required
- Tends to be “Error prone”
 - Single bad messages can cause a facility’s feed to shutdown
- A central monitoring tool would be beneficial
- KCR implemented automated daily e-mails showing report volumes by sending facility

Sample Daily E-Mail Report

Number of Pathology Reports on Mon June 21, 2010

Baptist East: 17

Central Baptist: 5

DIANONCT: 12

Ephraim McDowell RMC: 5

Jewish Hospital: 14

Jewish Hospital - Shelbyville: 1

Kings Daughters MC: 19

KOSAIR: 1

LABCORP - Park Duvall Comm. Health Ctr.: 1

MCBG: 3

MCBG - BOWLING GREEN DROP-OFF: 4

Murray Calloway : 8

NORTON: 6

OMHS: 15

Pikeville Medical Center - Pikeville Medical Center: 4

RMC Trover - MADISONVILLE WOMEN'S CENTER: 1

RMC Trover - RMC TROVER: 3

ST. CLAIRE RMC: 1

University Of Kentucky: 56

Challenges: Message Filtering

- Reports are filtered at the pathology lab
 - AIM: natural language processing
 - PHIN-MS: Lab filtering by ICD-9 codes
 - Non-reportable skins not filtered
 - Numerous unwanted reports still transmitted to central registry
 - Some cases still missed
- Requires systematic audits

Other Challenges

- Missing data elements
- Update and addendum reports
 - Not distinguished from new reports
- Non-standard HL7 formatting

Challenge: NAACCR HL7 Standards NOT Being Followed

- Well defined HL7 standards published in NAACCR Volume V since 2005
- Standards not being followed in E-Path installations
 - Missing required segments (such as common order segment)
 - Data elements appear in wrong HL7 field
 - Required data elements missing
 - Labcorp: non-escaped field delimiters embedded in field
- Failure to follow standards negates benefits of NAACCR standards
 - Custom applications must be written to deal with “exceptions”

Future Directions

- KCR integrating hospital E-Path reports as an electronic case-finding source for the hospital abstracting system provided to all non-federal hospitals in Kentucky
- Integration will support automated abstraction of limited set of E-Path variables
- Challenges previously mentioned are slowing KCR's progress towards this goal

Conclusions

- E-Path installations and record volumes have dramatically increased over past five years
- Utility of E-Path reports increasing but not fully realized
- Challenges remain that should be solvable
- Adherence to NAACCR HL7 standards by software vendors would be beneficial

Acknowledgements

- KCR Operations Staff

- Marilyn Wooten
- Lisa Witt
- Mary Jane Byrne

- KCR Informatics Staff

- Isaac Hands
- David Rust

- Funding

- NCI/SEER N01-PC-54403

Questions?