Presentation Agenda

- Modernizing Vital Records with eVital Standards
- Minnesota e-Birth Records Project
- Interoperability between Vital Records and EHRs in Utah
- Challenges and Opportunities
- Q&A
Modernizing Vital Records with eVital Standards

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CDC Public Health Informatics Conference
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By computerizing health records, we can avoid dangerous medical mistakes, reduce costs, and improve care.”

Former President G. W. Bush in State of the Union Address on January 20, 2004

Established goal for most Americans to have access to an interoperable electronic health record (EHR) by 2014

Established the Office of the National Coordinator for Health Information Technology (ONC) through an Executive Order
U.S. Plans for Health Information Technology

“To lower healthcare cost, cut medical errors, and improve care, we’ll computerize the nation’s health record in five years, saving billions of dollars in health care costs and countless lives.”

President Barack Obama in First Weekly Address on January 24, 2009

Consistent with Bush’s 2014 goal for electronic health records
President Obama signed ARRA on Feb. 17, 2009

ARRA required the Department of Health and Human Services (DHHS) to create, vet and publish an initial set of HIT system standards, implementation specifications and testing criteria to promote adoption and “meaningful use” of EHRs

ARRA is serving to stimulate adoption of HIT
Standards for Population Health and Healthcare

- CDC/NCHS and its partner organizations have developed, implemented and maintained many of the critical standards used in population health and healthcare.

- These standards can contribute to and benefit from current deliberations on national standards.
National Vital Statistics System

Over 6 million vital events reported annually

National Vital Statistics System
National Vital Statistics System

Vital statistics data are widely used to monitor and improve the nation’s health.
Medical and Health Information Captured for the U.S. Standard Certificate of Live Birth

- **Prenatal Care**
  - Visit Information
  - Past pregnancies

- **Risk Factors**
  - Medical Conditions (DM, HTN)
  - Infertility Treatment
  - Previous C-Section

- **Labor & Delivery**
  - Onset of Labor
  - Method of Delivery
  - Maternal Morbidity

- **Newborn**
  - Birth weight
  - Abnormal Conditions
  - Congenital Anomalies
NCHS eVitals Standards Initiative

Develop national standards to facilitate the national exchange of birth, death and fetal death records between electronic health record systems and state vital statistics systems.
Standards to Support Capturing VR Data at the Point of Care or Contact

Mother's Worksheet

Birth Registration System (EBRS)

Birth Certificate

State Department of Health

Electronic Health Record

CDC/NCHS

Mother

Birth Information Specialist

Birth Event

Nurse

Obstetrician

Registrar
Why the eVitals Standards Initiative?

Hypothesis:
Interoperability with EHRs may improve the timeliness, accuracy and quality of the information collected for vital records purposes.
It is worthwhile to lay the foundation for standardizing the exchange of VR data as efforts towards developing and implementing EHRs continue.
eVital Standards Activities

- Stakeholder Collaboration
- Standards Development Activities
- Trial Implementations, Demonstrations and Pilot Testing
Stakeholder Collaboration

- Ongoing collaboration with the National Association for Public Health Statistics and Information Systems (NAPHSIS) and states/jurisdictions to support standards development activities

- Outreach and partnership with EHR, VR and public health system vendors to develop, test and implement the VR standards
Standards Development Activities

- Participating in standards development activities with the Standards Development Organizations (SDOs)

Health Level Seven International (HL7)

IHE: Integrating the Healthcare Enterprise
Health Level Seven International (HL7)

- Dedicated to developing standards for the exchange, integration, sharing, and retrieval of electronic health information
- Includes over 2,300 members representing more than 90% of the information systems vendors serving healthcare
- VR standards developed through support of the HL7 Public Health and Emergency Response Work Group (PHER WG)

Available at: http://www.hl7.org/about/index.cfm?ref=nav
- Promotes the coordinated use of established standards such as HL7 to address specific clinical needs in support of optimal patient care

- VR standards developed through support of the IHE Quality, Research and Public Health Committee (QRPH)

Available at: http://www.ihe.net/
IHE Vital Records Standards

IHE Content Profiles

- IHE Birth and Fetal Death Reporting (BFDR)
- IHE Vital Records Death Reporting (VRDR)

VR Form

EHR System

Vital Records System
State Department of Health
HL7 Vital Records Standards

Data Model
- HL7 V3 Domain Analysis Model: Vital Records, Release 1

Functional Profile
- HL7 EHR-S FM VR Functional Profile, Release 1.1

Messaging
- HL7 V2.5.1: Birth & Fetal Death Reporting, R1 Draft Standard for Trial Use (DSTU)
- HL7 V2.5.1: Vital Records Death Reporting, R1 DSTU

Document
- HL7 V3 CDA R2: Birth & Fetal Death Reporting, R1 DSTU
- HL7 V3 CDA R2: Vital Records Death Reporting, R1 DSTU

http://www.cdc.gov/phin/resources/standards/data_interchange.html
HL7 Vital Records Standards

VR Form → EHR System → HL7 CDA → Vital Records System

State Department of Health

HL7 V2.5.1
Trial Implementations, Demonstrations and Pilot Testing

IHE Connectathon

HIMSS Interoperability Showcase

NAPHSIS Conference Demo

CDC PHI Conference
Special thanks to those who have collaborated with us during the trial implementations and demonstrations to support development of the Vital Records standards
eVitals Standards Pilot Testing

- Minnesota Department of Health
  - Evaluating readiness for secure electronic exchange of birth registration information using the IHE and HL7 standards

- Utah Department of Health
  - Collaborating with Intermountain Healthcare to test sending death information using the HL7 V2.5.1 message
Minnesota e-Birth Records Project:
Assessing Readiness for e-Birth Records Standards

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Minnesota

- 5.3 million Minnesotans in 87 counties
- 60% live in “Twin Cities”
- Separate state health and human services agencies
- Minnesota Registration and Certification System
  - Electronic Birth Reporting System
  - ≈ 68,000 births
Minnesota e-Health Initiative

A public-private collaboration established in 2004

- Legislatively chartered
- Coordinates and recommends statewide policy on e-health
- Develops and acts on statewide e-health priorities
- Reflects the health community’s strong commitment to act in a coordinated, systematic and focused way

“Vision: ... accelerate the adoption and effective use of Health Information Technology to improve healthcare quality, increase patient safety, reduce healthcare costs, and enable individuals and communities to make the best possible health decisions.”
Minnesota e-Vital Records Initiative

- Collaborative effort to address opportunities and challenges of using electronic health record (EHR) systems and electronic health information exchange for collection and exchange of vital records information.

- Advisory Group provides guidance on projects including and interpretation of findings and recommendations
  - Local, state and federal experts in vital records, e-health and public health
Introduction

- The Minnesota e-Birth Records Project evaluated the readiness of the Minnesota Department of Health (MDH) and Minnesota hospitals for secure electronic exchange of birth registration information using
  - Integrating the Healthcare Enterprise (IHE) Birth and Fetal Death (BFDR) Profile and
  - Health Level 7 (HL7) standard message and document specifications.
- Duration: September 2012 – April 2014
Methods

- Collaborative Team Model
  - Office of Vital Records (MDH)
  - Office of Health Information Technology (MDH)
  - MN’s central IT (MN.IT) at MDH
  - MDH Leadership

- Community Engagement
  - MN e-Vital Records Initiative Advisory Group
  - Partner Hospitals & Health Systems
    - Unity Hospital, Allina Health, Essentia Health
  - Community of Interest
  - Meetings and Presentations
# Study Approach

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<th>Approach</th>
<th>Activity Summary</th>
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| **Analyze Information, Technology, Workflow and Organizational Components** | ▪ Compare data standards and collection tools  
▪ Test proof of concept between partners  
▪ Describe birth records process at MDH and partner hospital |
| **Develop and Validate Models (Current and Future)** | ▪ Develop models incorporating information, technology and workflow components  
▪ Leverage stakeholders to reaffirm and identify themes and variances in current and proposed models |
| **Discover Opportunities for Improvement** | ▪ Identify opportunities for improvement in the information, technology and workflow components in current and proposed models |
MN Birth Records Information Flow

Examples of External Use:
- School Districts
- Dept. of Human Services
- Social Security Administration
- Local Public Health
- Sudden Infant Death Syndrome Program
- Research

Examples of Internal Use:
- Infectious Disease Epidemiology, Prevention and Control (IDEP)
- Pregnancy Risk Assessment Monitoring Program (PRAMS)
- Maternal & Child Health
- Newborn Screening
- MN Immunization Information Connection (MIIC)
Current Hospital Birth Registration Process
Opportunities for Improvement

- Structured data capture (IHE BFDR Profile)
- Bi-directional exchange
  - Clinic, hospital, mom, MDH
- Interface fetal monitoring system
- Electronic capture of civil information (mother’s worksheet)
- Eliminate reliance on delivery logs
- Electronic source for paternity document
Proposed Hospital Birth Registration Process
Implications for Office of Vital Records

- Update policies on data collection and use
  - Harmonize national standards with Minnesota-specific questions and value sets
  - Understand and document data use and needs
- Recognize and assure staff/resources for HL7 and IHE BFDR Profile
- Acknowledge connection to fetal death and death reporting
- Incorporate e-Vital Records into planning and daily work
Key Findings

- MDH and hospitals support the adoption of e-birth records standards but lack the readiness to fully test and implement the e-birth records standards.

- Four key contributing factors contributing to the lack of readiness:
  - Policies are not in place to support using e-birth records standards for collection of civil and medical information.
  - Current incentives through meaningful use and health reform do not directly support the implementation of e-birth records standards.
  - All birth registration data is not in the EHR nor always available as structured.
  - The IHE BFDR Profile has been tested with only one EHR product.
Recommendations

- **Align policies to support using e-birth records standards.** Hospital, jurisdictional and NAPHSIS policies need to be aligned to support e-birth records standards. NAPHSIS should lead this work with technical assistance from NCHS.

- **Leverage activities of the Office of National Coordinator (ONC) and other federal activities.** Although current federal activities do not support e-birth records standards, activities and strategies of the ONC and other others should be leveraged to advance e-birth records standards through certification of EHRs and electronic birth reporting systems (EBRS).
Recommendations

- **Continue expansion and testing of e-birth records standards.** Continue expansion and testing of the e-birth records standards led by NCHS with stakeholder engagement including hospitals, jurisdictions’ Office of Vital Records, EHR, EBRS, and HIT vendors, the ONC and other providers, such as prenatal care clinics.

- **Provide resources and technical assistance for readiness and implementation.** The findings emphasized the need for resources and technical assistance for Offices of Vital Records and hospitals to prepare for the implementation of e-birth records standards. Create tools, templates, and training along with NCHS or NAPHSIS staff assistance.
Recommendations

• **Demonstrate the value of and build stakeholder support for e-birth records standards.** The project identified the need to communicate the value of e-birth records standards. Targeted communication about the value of e-birth records standards to hospitals, Offices of Vital Records, prenatal care providers and public health.

• **Build Offices of Vital Records’ e-birth records capacity.** In addition to participating in the above recommendations, all Offices of Vital Records should prepare for e-birth records by building e-birth records capacity such as employing an informatics-savvy workforce and engaging in agency discussion on health information exchange.
Recommendations

• **Implement opportunities for improvement.** In addition to assessing the readiness of the e-birth records standards, the project also identified opportunities for improvement for hospitals and MDH. These opportunities can be shared with other hospitals and Offices of Vital Records and implemented with ongoing feedback and continuous learning.
Conclusion

• This project revealed support for adoption and use of e-birth records standards.
• Addressing the factors contributing to the lack of readiness and implementing the recommendations will require the effort of the entire vital records community and its partners.
• The support of e-birth records standards will strengthen the vital records system to document the lives and improve the health of all people.
Acknowledgements

- MN e-Vital Records Initiative Advisory Group
- NCHS
- Essentia Health
- Unity Hospital
- Allina Health
- MDH Office of Vital Records
- MDH Office of Health Information Technology
INTEROPERABILITY BETWEEN VITAL RECORDS AND EHRS IN UTAH

Jeff Duncan, MS
Utah Department of Health
Timeline of events—UDOH-Intermountain Death Interface

**2009**
- CDC Pan Flu Grant
  - UDOH received funding to create a death reporting interface with Intermountain.

**2010**
- Pilot testing
  - Implemented at one Intermountain Clinic

**2011**
- HL7 Version 2.3 Interface Planning and Development
  - Interface development and testing

**2012**
- Upgrage to DSTU Project begins

**2013**
- Pilot test expanded to Salt Lake City Metro Area
- DSTU Implementation
Death Registration in the US

- Death certificate is...
  - A legal document
  - A public health report
- A cooperation between funeral directors, physicians, coroners and medical examiners, and public health departments

- Electronic death registration
  - 38 states now have some form of EDR
  - Utah’s Electronic Death Entry Network (EDEN) August 1, 2006
The Eden plateau

Percentage of all deaths signed in EDEN by physicians, 2006-2010
Reasons for low physician participation

- About 75% of physicians that certify a death do <1 death certificate per year.
- They account for about 35% of all DC’s
- Difficult to maintain EDEN skills
- Lack of incentive to complete death certificates
From Intermountain to EDEN

Intermountain EHR

Intermountain HL7 Message Server

EDEN Master Database

Matcher & Merger

EDEN Cause of Death Table

UDOH HL7 Message Server (Rhapsody)

HL7 Over VPN Tunnel
Intermountain’s EHR screen:
HL7 death message

- In 2009 UDOH and Intermountain created an HL7 v2.3.1 message using a lot of z-segments
- We used existing gateway for immunization records from Intermountain
- Began pilot testing in 2011 at a large family practice clinic
- In 2013, began work to implement a v2.5.1 draft standard death message
Death Certification Process

- Matching and merging
- Update / delete messages

Business Rules

Funeral Director -> EDEN
Local Registrar -> EDEN

Match and Merge

EDEN -> Cause of Death Table

Physician -> Cause of Death Table
The new and improved interface

System Architecture

1 – HL7 Over MLLP

IHC HELP2 EMR

Internet

2 – HL7 Over MLLP

External App Server HL7-Listener SubRoute

3 – DBOBJECTPAYLOAD

6 – Various message events

Internal App Server HL7-Forwarder SubRoute

4 – DBOBJECTPAYLOAD

5 – Various message events

Internal DB Server HL7-Inserter SubRoute

EDEN System

EDEN Loader

Cause of Death Table
Next Steps

- DSTU implementation
- Testing
- Provide feedback to HL7
- HL7 ballots and approves normative standard
- Industry implements standard.
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  - Stephen Clyde, PhD
  - Mike Jolley, Project Manager
Challenges are what make life interesting. Overcoming them is what makes it meaningful.

Challenges for eVital Records Initiative

• Limited funding to support states/jurisdictions pilot testing/adopting eVital Standards

• Limited EHR and VR system vendors adoption of eVital standards

• Vital Records not specifically recognized in Meaningful Use Regulations
Opportunities for eVital Records Initiative

- **Get Ready**
  - Develop an informatics-savvy workforce
  - Start an eVital Records Initiative
  - Conduct a readiness assessment of state and local partners

- **Be Aware**
  - Become familiar with the available VR standards
  - Contribute to national policy discussions, e-health and standards related activities

- **Get Involved**
  - Participate in SDO activities to review and provide feedback on the VR standards
  - Engage in trial implementation/pilot testing activities
THANK YOU

Any questions???