Leveraging Cloud Computing to Address Public Health Disparities

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• 495-bed hospital
• Outpatient Care Clinic
• Numerous Specialty Clinics
• Seven Health Science Colleges
University of Illinois Mission

• Deliver personalized health in pursuit of the elimination of racial and ethnic health disparities

• Train professionals in a wide range of public service disciplines serving Illinois as the principal educator of health-science professionals and as a major health-care provider to the underserved
UIC INITIATIVES TO ADDRESS HEALTH DISPARITIES

The University of Illinois at Chicago
Center for Population Health and Health Disparities

- One of seven National Institute of Health (NIH) sponsored sites evaluating health disparities

- Focused on developing research initiatives that address the unequal burden of cancers in segments of the population

http://cphhd.hrpc.uic.edu/about.htm
CHICAGO HEALTH DISPARITIES

Track Health Inequities

- Health departments and other agencies should monitor health inequities and make the data available to the public.

- Race/ethnicity/class/gender data should be collected to monitor health inequities

The Chicago Health Atlas is a Web site for displaying aggregate health-related information on a map.

Collaboration between Chicago Department of Public Health and Five Chicago Hospitals.

http://www.smartchicagocollaborative.org/projects/chicago-health-atlas/
New Mile Square Health Center

- Opens October 2013
- Five Story Health Center
- Urgent Care Clinic
- Onsite Medical Laboratory

http://www.uic.edu/htbin/cgiwrap/bin/uicnews/articledetail.cgi?id=16907
HOW IS THE SECURE TRANSFER OF HEALTH DATA FACILITATED?

A Simplified Representation of the Exchange of an XML Formatted Continuity of Care (CCD) Document using DIRECT

A Simplified Illustration of Public Key Encryption

- **Message Component**: Body, Digital Signature
- **Encrypted Using**: Receiver’s Public Key, Sender’s Private Key
- **Unencrypted With**: Receiver’s Private Key, Sender’s Public Key
- **Purpose**: Limit Access to Intended Receiver, Prove Authorship by Sender

Informatics for Integrating Biology & the Bedside (i2b2)

- The goal of i2b2 therefore is to develop the science and the engineering required to enable the clinical investigators of academic medical centers to conduct clinical research that is informed by state-of-the-art genomics and biomedical informatics.

https://www.i2b2.org/about/mission.html
I2b2 WORKFLOW FOR RESEARCHERS

http://www.cvrgrid.org/features/aiw
popHealth is an open source reference implementation software service that automates the reporting of Meaningful Use quality measures. popHealth integrates with a healthcare provider’s electronic health record (EHR) system using continuity of care records.

http://projectpophealth.org/about.html
Concept of Operations

http://projectpophealth.org/documents/pophealth_overview_04032012.pdf
## POPHEALTH DASHBOARD

**Provider:** Adam, Gino

**Reporting Period:** 07/31/2010 - 10/31/2010

**# of Patients:** 49

### Core Measures

**Preventive Care And Screening: Tobacco**
- Use: 69% (18/26)

**Adult Weight Screening And Follow-Up**
- 65+: 44% (4/9)
- 18-64: 8% (2/24)

**Hypertension: Blood Pressure Measurement**
- 50% (1/2)

### Alternate Measures

**Heart Conditions**

**Cancer**

**Miscellaneous**

**Women's Health**

**Diabetes**

**Childhood Immunization Status**
- DTAP: 100% (3/3)

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CONCEPTUAL REPRESENTATION OF A PUBLIC HEALTH GRID

SMarter Public Health Prevention System (SPHPS)

- SPHPS provides real-time reporting of potential public health threats to public health leaders
- SPHPS focuses on looking at population centric data and making it meaningful towards a patient-centric viewpoint

### SPHPS USE CASE SCENARIO

**Figure 3: Use Case Scenario: Smarter Public Health Prevention System (SPHPS)**

<table>
<thead>
<tr>
<th>Patient</th>
<th>Provider</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient presents to provider</td>
<td>Visit interaction converted to electronic data</td>
</tr>
<tr>
<td></td>
<td>Meaningful knowledge feedback to patient</td>
</tr>
<tr>
<td></td>
<td>EHR Data stored in data warehouse</td>
</tr>
<tr>
<td></td>
<td>Meaningful knowledge feedback to provider</td>
</tr>
</tbody>
</table>

**SPHPS**

EHR Data uploaded to the cloud

**Information Exchange**

HIE

REG

eHealth Exchange

Meaningful knowledge feedback to Public Health agencies

PUBLIC HEALTH SURVEILLANCE IN THE LARGER CONTEXT OF HEALTH KNOWLEDGE

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Questions?

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