Harnessing the Power of EHRs & HIT to Improve Population Health

The Johns Hopkins Center for Population Health Information Technology

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Disclosures:

I have no conflict of interest to disclose relevant to today’s presentation.
The opportunity: Health IT will bring about profound change

• Over the coming decade, electronic health records (EHRs), personal health records (PHRs), e-health applications and other health information technology (HIT) will transform health care in the US and globally.

• 21st Century HIT will have the potential to dramatically improve the health of populations. However to date, EHRs and HIT development has focused almost entirely on individual patients or limited episodes of care of patient groups within a single care setting.
In this presentation I will discuss:

• The potential for Health IT to improve the health of populations and to redefine public health and population oriented health care systems.

• The vision for the new Johns Hopkins Center for Population Health Information Technology (CPHIT).

• CPHIT’s proposed scope and structure and its research and development agenda.

• Opportunities for collaboration with CPHIT.
As part of health reform, the US is making the largest HIT investment in history

- President Obama is subsidizing doctors and hospital as part of stimulus package “HITECH” program:
  - $30 Billion pay for performance (P4P) program from Medicare/Medicaid termed linked to “Meaningful Use” (MU) measures.
  - It has been estimated that private spend is at least equal to this.
- Interoperability across settings via community “Health Information Exchanges” (HIEs)
- Standardization / certification of HIT systems

The three phases of “meaningful use”:

- Advanced clinical processes
- Data capture and sharing
- Improved outcomes
We are at the tipping point of EHR availability

Figure 1. Percentage of office-based physicians with electronic medical records/electronic health records (EMRs/EHRs): United States, 2001–2009 and preliminary 2010

NOTES: Any EMR/EHR is a medical or health record system that is either all or partially electronic (excluding systems solely for billing). The 2010 data are preliminary estimates (as shown by dashed lines), based only on the mail survey. Estimates through 2009 include additional physicians sampled from community health centers; prior 2008 combined estimates were revised to include those physicians (4). Estimates of basic and fully functional systems prior to 2006 could not be computed because some items were not collected in the survey. Fully functional systems are a subset of basic systems. Some of the increase in fully functional systems between 2009 and 2010 may be related to a change in survey instruments and definitions of fully functional systems between 2009 and 2010 (see Table for more details). Includes nonfederal, office-based physicians. Excludes radiologists, anesthesiologists, and pathologists.

SOURCE: CDC/NCHS, National Ambulatory Medical Care Survey.
The Electronic Health Record will become the core of a new HIT enabled health care system
Analytic Methods

PHR / eHealth
Personal Health Records and e-health apps

Knowledge Generation / Science

Evidence-Base

Analytic Methods

Population

Patient

Providers

Public Health / Agencies

Health Plans and Managed Care

CPOE
Computerized Physician Order Entry

EHRs
Electronic Health Records

Web Portal

CDS
Clinical Decision Support Systems

Society / Government / Employers

HIT Enabled Healthcare Delivery System

CPHIT TARGET AREAS
In the future the types of information linked to the EHR will increase exponentially.
“Interoperability” across the community will be key: A regional “exchange”

Interoperable EHR

Region 1

Doctors Offices
Hospital
Public Health Agencies
Pharmacy
Health Plan
Consumer PHR

Linking Geo Areas

Region 2
Region 3

Graphic Adapted from EU
A model for a Health Information Exchange (HIE)
A conceptual model of a public health grid as the integrator of a community-wide HIT system

Source: the CDC
Population HIT will be central to the transformation of medical care delivery towards population focused “accountable” care.

<table>
<thead>
<tr>
<th>CURRENT</th>
<th>TRANSFORMED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fragmented Care</td>
<td>Coordinated / Integrated / Accountable</td>
</tr>
<tr>
<td>Provider Centric</td>
<td>Patient / Population Focused</td>
</tr>
<tr>
<td>Payment for Volume / Units</td>
<td>Payment for Value / Outcome</td>
</tr>
<tr>
<td>Individual Facility Focused</td>
<td>Care System Focused</td>
</tr>
<tr>
<td>Solo Physician</td>
<td>Care Team</td>
</tr>
<tr>
<td>Opaque rules and systems</td>
<td>Transparency</td>
</tr>
<tr>
<td>Disease oriented / Acute Illness</td>
<td>Wellness / Chronic co-morbidities</td>
</tr>
<tr>
<td>Limited Basis for Clinical Action</td>
<td>Evidence-Based Care / Learning Organiz.</td>
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</tbody>
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Medicare’s Vision of an Advanced “2.0” “Medical Home”

- Integrate E-prescribing And COES
- Advance Chronic Disease Mgmt
- Patient Registry Databases
- EHR/HIE Connected
- Public Health Bio Surveillance Connected
- Two way Quality Reporting
- Electronic Eligibility System Interface
- E-Clinical Decision Support
- Electronic Patient Access and Communication

Source: CMS
• We at Johns Hopkins can and should become leaders in the application of HIT to population health & public health.

• The Center for Population Health Information Technology (CPHIT) will be an important vehicle for this.

• CPHIT will help coalesce and focus our numerous strengths and will add additional core resources.
The Johns Hopkins Center for Population Health IT -- Mission and Focus

The **mission** of CPHIT is to improve the health and wellbeing of populations by advancing the state-of-the-art of Health Information Technology and e-health tools used by public health agencies and private health care organizations.

CPHIT’s **focus** will be on the application of EHRs, PHRs and other digitally-supported health improvement interventions targeted at communities, special need populations and "denominator" groups of consumers. (E.g., those cared for by public and private health plans and accountable delivery systems.)
CPHIT’s activities

• Helping to set a national / global research agenda in the domain of population HIT.

• Establish a comprehensive core R&D infrastructure with access to EHR data and a large cadre of multi-disciplinary JHU faculty.

• Initiate and facilitate wide-ranging portfolio of breakthrough and translational R&D.

• Initiate and maintain an ongoing dialogue with public sector and industry stakeholders.

• Support JHU informatics educational mission.

• Facilitate pop. HIT translation and tech transfer.
Our initial R&D priorities - 1

• HIT based measures of community-wide health status, risk and need.

• Natural language processing (NLP) and pattern recognition advances that improve population based interventions.

• Development of innovative EHR-based e-measures to support the next generation of population / system based quality/safety improvement tools.

• EHR based tools to identify high risk populations for preventive and/or chronic care outreach.
Our initial R&D priorities - 2

• Approaches for integrating current functions of public health agencies into interoperable EHR networks.

• HIT / e-health decision support applications for disease prevention among special needs consumers.

• Legal / ethical and policy frameworks to help support the development of “secondary use” of EHRs for population health.

• Approaches for integrating health plan / agency administrative data with EHRs to enhance population interventions and evidence generating research.
CPHIT faculty and other resources

- We expect 50+ JHU affiliated faculty from the population, information, engineering, social, and clinical sciences.
- CPHIT will serve as a catalyst, convener and facilitator of collaboration across all components of JHU and health system.
- Based at Bloomberg School, will work very closely with School of Medicine, the Whiting School of Engineering, the School of Nursing; the Carey School of Business and several units within the Applied Physics Laboratory (APL).
- Will partner with JH’s own 300,000 person health plan, the 6 hospital JH Health System, and several government public health agencies and several other wired integrated delivery systems.
- CPHIT will focus on the US and other high/middle income nations and will collaborate with other e-health initiatives here at JHU targeting low income settings.
Methods / disciplines to be integrated within the CPHIT

- Informatics / knowledge management
- Computer science / IT / Systems engineering
- Health services/outcomes research / evaluation sciences
- Evidence based medicine / nursing / other clinical
- Quality / safety
- Prevention / public health sciences
- Health economics / management sciences
- Statistics / analytics
- Behavioral / social / communication sciences
- Ethics / policy / legal
- Other??
CPHIT’s Proposed Collaborations / Organizational Linkages

- **JH Health System**
- **JH Center for Population Health IT**
- **JH Population Health IT, LLC**
- **External PH / IDS Orgs.**
- **JHU Academic Depts. & other R&D centers**
- **Benefactors / Grant Agencies**
- **Business Partners**
Potential CPHIT External Collaborations

• Government agencies
  – Federal providers (VA / military / IHS)
  – CMS (Medicare / Medicaid / health reform)
  – Local & State health depts & CDC

• Private integrated delivery systems

• Private sector
  – Information companies
  – EHR / HIT vendors
  – Managed care / health insurance plans

• International (*high and middle income focus*)
  – Ministry of health in other nations
  – Integrated providers / health plans
  – NGOs
What CPHIT will offer Hopkins faculty

- Seed grant program to fund start up pilot projects
- Cadre of faculty resources and linkages between existing units
- Convening focused R&D development collaborative and grant submissions
- EHR database “learning laboratory” and access to HIPPA compliant data for grant submissions
- New HIT/ pop health informatics faculty hires
- Linkages to outside agencies / delivery systems
What CPHIT will offer collaborators / other parties

- Membership in “Industry Council”
- Tech transfer / dissemination of innovations
- White papers / consultations / technical assistance program
- Seminar / conferences
- Fellowships / practicums for JHU educational programs (both within CPHIT and with external partners)
- Industry sabbatical program
Will the application of HIT to pop health be easy?

“This is where the idea for the new EHR starts getting a little complicated.”
• Questions?
• Suggestions / Comments
• Interest in Participation?
• New Web page will be at: www.jhsph.edu/cphit
• Contacts:
   Center Director, Prof. Jonathan Weiner (jweiner@jhsph.edu)
   Center Coordinator, Elyse Lasser (elasser1@jhmi.edu)