HITECH: Advancing the Adoption of Electronic Health Records in the United States

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1

Outline of talk

- Information-related problems and solutions in healthcare
- Why do we need more informatics?
- Why are we not there?
- Details of ARRA programs
- The workforce need for informatics
- Educational and career opportunities in informatics

2

## Many problems in healthcare have information-related solutions

- Quality – not as good as it could be (McGlynn, 2003; Schoen, 2009; NCQA, 2010)
- Safety – errors cause morbidity and mortality; many preventable (Kohn, 2000; Van Den Bos, 2011)
- Cost – rising costs not sustainable; US spends more but gets less (Angrisano, 2007)
- Inaccessible information – missing information frequent in primary care (Smith, 2005)

3

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Growing evidence shows information interventions are part of the solution

- Systematic reviews (Chaudhry, 2006; Goldzweig, 2009; Buntin, 2011) have identified benefits in a variety of areas
  - Although 18-25% of studies come from a small number of 'health IT leader" institutions
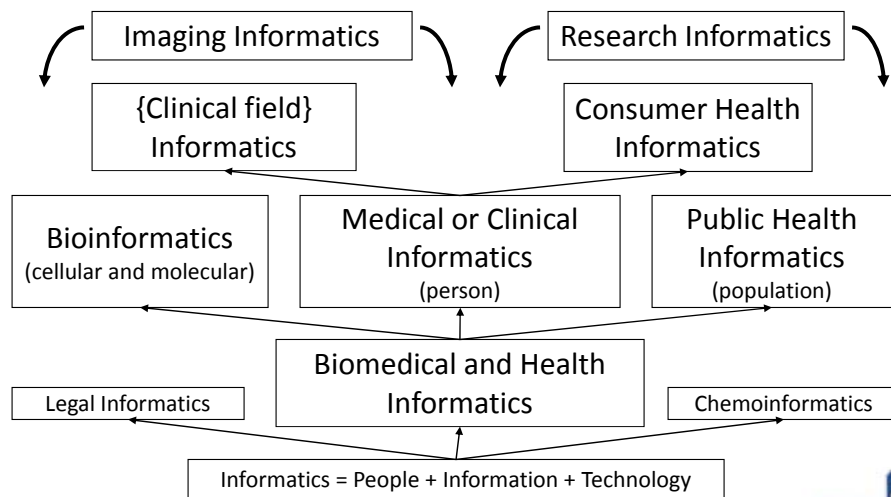

(Buntin, 2011)
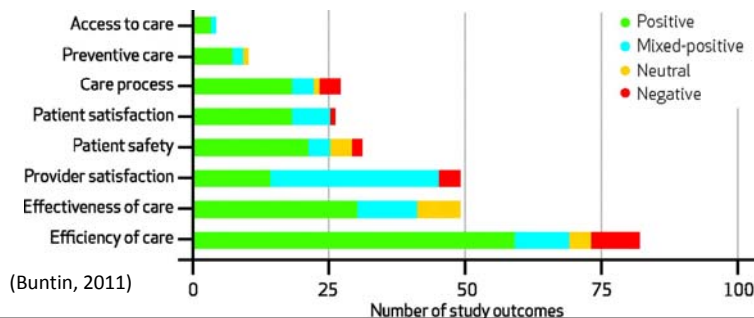
Biomedical and health informatics is the science underlying the solutions

- *Biomedical and health informatics* (BMHI) is the science of using data and information, often aided by technology, to improve individual health, health care, public health, and biomedical research (Hersh, 2009)
  - It is about information, not technology
- Practitioners are BMHI are usually called *informaticians* (sometimes *informaticists*)

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5

BMHI has many sub-areas

Imaging Informatics	Research Informatics

{Clinical field} Informatics	Consumer Health Informatics

Bioinformatics (cellular and molecular)	Medical or Clinical Informatics (person)	Public Health Informatics (population)

Legal Informatics	Biomedical and Health Informatics	Chemoinformatics

Informatics = People + Information + Technology

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6

3

Informatics BO (before Obama)

- Growing recognition of value in healthcare
  - Evidence for improved safety, quality, and cost of healthcare
  - Widespread usage worldwide (Schoen, 2009; Protti, 2010)
  - Research and demonstration funding by NLM, AHRQ, and others
  - Actions of Bush Administration – e.g., appointment of first National Coordinator for HIT, establishment of AHIC, HITSP, etc.
- Emerging importance in other areas
  - Clinical and translational research – prominent role in CTSA programs (Zerhouni, 2007; Bernstam, 2009)
  - Genomics – bioinformatics, personalized medicine (Hamburg, 2010)
  - Individual health – growth of personal health records (PHRs) (Detmer, 2008), including from companies, e.g., Microsoft HealthVault, Google Health, etc.

7

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But then a new US president came along…

CNN.com

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updated 7:42 a.m. EST, Mon January 12, 2009

Obama's big idea: Digital health records

President-elect Barack Obama, as part of his effort to revive the economy, is proposing a massive effort to modernize health care by making all health records standardized and electronic. The government estimates about 212,000 jobs could be created by this program, CNNMoney reports. full story

"To lower health care cost, cut medical errors, and improve care, ***we'll computerize the nation's health records in five years,*** *saving billions of dollars in health care costs and countless lives."*

First Weekly Address
Saturday, January 24, 2009

8

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4

…and the US entered a new "ARRA"

- Health Information Technology for Economic and Clinical Health (HITECH) Act of the American Recovery and Reinvestment Act (ARRA)
  - Incentives for electronic health record (EHR) adoption by physicians and hospitals (up to $27B)
  - Direct grants administered by federal agencies ($2B)
- Other provisions in other areas of ARRA, e.g.,
  - Comparative effectiveness research
  - NIH and other research funding
  - Broadband and other infrastructure funding

9

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Why has it been so difficult to get there? (Hersh, 2004)

Health Care Information Technology
Progress and Barriers

William Hersh, MD

IN THE 3 DECADES SINCE THE TERM "MEDICAL INFORMAT-ics" was first used, individuals working at the intersection of information technology (IT) and medicine have developed and evaluated computer applications aim-

in this issue of *JAMA*, Slack demonstrates the value that patient-physician e-mail can have in improving patient care, and also catalogs the incomplete but encouraging underlying evidence.[11] As with many applications of IT, the technology can improve the existing situation but also empower clinicians and patients to think more fundamentally about how innovation can lead to changes in the way medicine is practiced

- Cost
- Technical challenges
- Interoperability
- Privacy and confidentiality
- Workforce

care IT.[89] It is no exaggeration to declare that the years ahead portend the "decade of health information technology."[90] Informatics is poised to have a major impact in patient-clinician communication. In the Clinical Crossroads article

See also p 2255.

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ment. The rest goes to those who typically do not pay for

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(Reprinted) JAMA, November 10, 2004—Vol 292, No. 18 **2273**

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US has low rates of adoption in inpatient and outpatient settings

- Adoption in the US is low for both outpatient (Hsiao, 2010) and inpatient settings (Jha, 2010)
- By most measures, US is a laggard and could learn from other countries (Schoen, 2009)
- Most other developed countries have undertaken ambitious efforts, e.g.,
  - England (Hayes, 2008)
  - Denmark (Protti, 2010)

(Hsiao, 2009)

(Schoen, 2009)
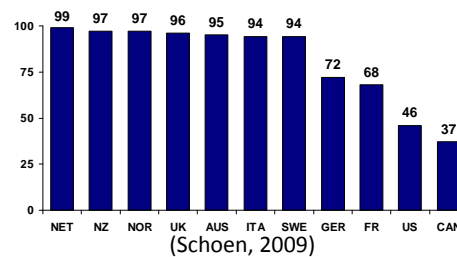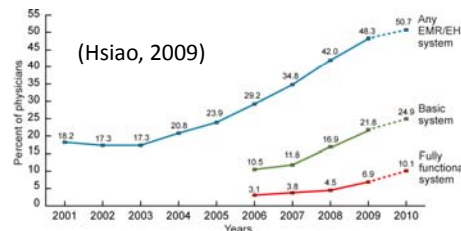
11

The new "ARRA" of health information technology (HIT) in the US

- HITECH provides financial incentives for "meaningful use" of HIT (Blumenthal, 2010; Blumenthal, 2010)
  - Incentives for EHR adoption by physicians and hospitals (up to $27B)
  - Direct grants administered by federal agencies ($2B)
  - All initiatives administered by the Office of the National Coordinator for Health IT (ONC, http://healthit.hhs.gov/)

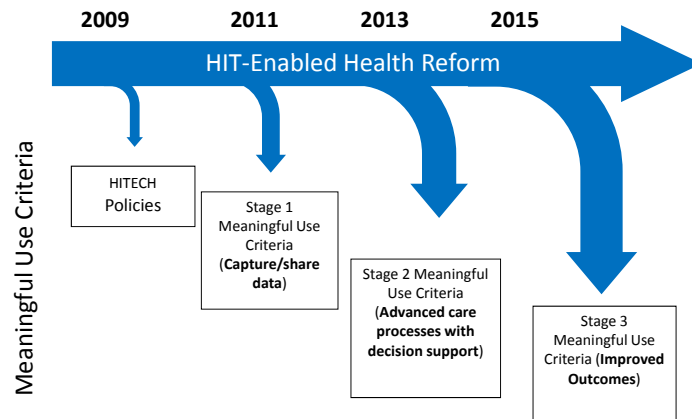12

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What is "meaningful use" of an EHR?

- Driven by five underlying goals for healthcare system
  - Improving quality, safety and efficiency
  - Engaging patients in their care
  - Increasing coordination of care
  - Improving the health status of the population
  - Ensuring privacy and security
- Consists of three requirements
  - Use of certified EHR technology in a meaningful manner
  - Utilize certified EHR technology connected for health information exchange (HIE)
  - Use of certified EHR technology to submit information on clinical quality measures

13

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Meaningful use is being implemented in three stages

2009　　**2011**　　**2013**　　**2015**

HIT-Enabled Health Reform

Meaningful Use Criteria

HITECH Policies

Stage 1 Meaningful Use Criteria (**Capture/share data**)

Stage 2 Meaningful Use Criteria (**Advanced care processes with decision support**)

Stage 3 Meaningful Use Criteria (**Improved Outcomes**)

14

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Implementation of meaningful use

- Implemented through Medicare or Medicaid reimbursement to
  - Eligible professionals (EPs) – up to $44K
  - Eligible hospitals (EHs) – $2-9M
- Differences in definitions of above as well as amounts for Medicare vs. Medicaid reimbursement
- Stage 1 elaborated in final rules released in July, 2010 by CMS (2010) and ONC (2010)
  - Must achieve 14-15 core and 5 of 10 menu criteria

15

Phase 1 meaningful use criteria

- Variety of criteria in areas of
  - Data collection – e.g., problem list, demographics, etc.
  - Functions – e.g., clinical decision support rule, computerized provider order entry (CPOE)
  - Health information exchange – test of capability
  - Security – various encryption and network standards
  - Quality reporting – various measures for EPs based on specialty and for EHs

16

Other funding initiatives for the HIT infrastructure

- HIT Regional Extension Centers (RECs)
  - $677 million to fund 62 RECs that will provide guidance, mainly to small primary care practices, in achieving meaningful use (Maxson, 2010)
- State-based health information exchange (HIE)
  - $547 million in grants to states to develop HIE programs (Vest, 2010)
- Beacon communities
  - $250 million to fund 17 communities that provide exemplary demonstration of the meaningful use of EHRs (McKethan, 2011)
- Strategic health information advanced research projects (SHARP)
  - $60 million for four collaborative research centers

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17

Other funding for the infrastructure: HIT workforce

- A competent workforce is essential to achieve meaningful use of HIT
- ONC estimates 51,000 workers needed to implement federal HIT agenda (Monegain, 2009)
- ONC is funding $118 million for
  - Community college consortia ($70M)
  - Curriculum Development Centers ($10M)
  - Competency testing ($6M)
  - University-based training grants ($32M)

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18

ONC workforce roles to implement the HITECH agenda

- Mobile Adoption Support Roles
  - Implementation support specialist*
  - Practice workflow and information management redesign specialist*
  - Clinician consultant*
  - Implementation manager*
- Permanent Staff of Health Care Delivery and Public Health Sites
  - Technical/software support staff*
  - Trainer*
  - Clinician/public health leader†
  - Health information management and exchange specialist†
  - Health information privacy and security specialist†
- Health Care and Public Health Informaticians
  - Research and development scientist†
  - Programmers and software engineer†
  - Health IT sub-specialist†

  (to be trained in *community colleges and † universities)

19

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ONC workforce development program

- Community College Consortia to Educate Health Information Technology Professionals Program ($70M)
  - Five regional consortia of 82 community colleges developing short-term programs to train 10,000 individuals per year in the six community college workforce roles
- Curriculum Development Centers Program ($10M)
  - Five universities collaboratively developing (with community college partners) HIT curricula for 20 components (topics)
  - One of the five (OHSU) additionally funded as National Training and Dissemination Center
- Competency Examination for Community College Programs ($6M)
  - Developing competency examinations based on the six community college workforce roles
- Program of Assistance for University-Based Training ($32M)
  - Funding education of individuals in workforce roles requiring university-level training at nine universities (including OHSU)
  - Emphasis on short-term certificate programs delivered via distance learning

20

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Who are the HIT workforce and what do know about them? (Hersh, 2010)

- Three historical groups of professionals in HIT
  - Information technology (IT) – usually with computer science or information systems background
  - Health information management (HIM) – historical focus on medical records
  - Clinical informatics (CI) – often from healthcare backgrounds
- Problematic HIT implementations often attributable to lack of understanding of clinical environment and use of IT within it (Leviss, 2010)

21

How many IT personnel does the US have and need?

- IT – to reach level of known benefit and meaningful use, may need 40,000 (Hersh, 2008)
- HIM – from US Bureau of Labor Statistics occupational employment projections 2008-2018 (BLS, 2009)
  - Medical Records and Health Information Technicians (RHITs and coders) – about 172,500 employed now, increasing to 207,600 by 2018 (20% growth)
- CI – estimates less clear for this emerging field
  - One physician and nurse in each US hospital (~10,000) (Safran, 2005)
  - About 13,000 in health care (Friedman, 2008) and 1,000 in public health (Friedman, 2007)
  - Growing role of CMIO and other CI leaders (Leviss, 2006; Shaffer, 2010)

22

## Informatics personnel needs and education are not limited to the US

- Many long-established programs in Europe, Asia, and Australia (Haux, 2010)
- Growing recognition of accomplishments in Argentina
  - Hospital Italiano (Quiros, 2009; Otero, 2010)
- Recognition of need to build capacity in developing countries as well (Detmer, 2008; Hersh, 2010)
- IMIA educational recommendations set baseline for world (Mantas, 2010)

23

Opportunities in BMHI are not limited to healthcare

- Bioinformatics – genomics and personalized medicine
- Clinical and translational research – building a "learning" healthcare system
- Public health – protecting the public and promoting health, e.g., H1N1 surveillance
- Consumer health – for all ages, especially aging Internet-savvy baby boomers
- Imaging informatics – use of images for biomedical research, clinical care, etc.
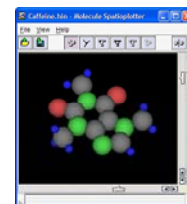
24

Conclusions

- BMHI is an important science and profession for improving health, healthcare, public health, and biomedical research with data and information
  - Most resources in clinical informatics but plenty of other opportunity in bioinformatics, public health informatics, consumer health informatics, clinical research informatics, imaging informatics, etc.
- The grand experiment of HITECH is going on in the US – results not yet in
- There are many opportunities for practitioners, researchers, and others in BMHI

25

For more information

- Bill Hersh
  - http://www.billhersh.info
- Informatics Professor blog
  - http://informaticsprofessor.blogspot.com
- OHSU Department of Medical Informatics & Clinical Epidemiology (DMICE)
  - http://www.ohsu.edu/dmice
  - http://oninformatics.com
- OHSU financial aid for informatics training
  - http://www.informatics-scholarship.info
- What is BMHI?
  - http://www.billhersh.info/whatis
- Office of the National Coordinator for Health IT (ONC)
  - http://healthit.hhs.gov
- American Medical Informatics Association (AMIA)
  - http://www.amia.org

26