Open House

Biomedical Informatics Graduate Program
October 8, 2020

Department of Medical Informatics & Clinical Epidemiology
School of Medicine
Oregon Health & Science University
Portland, OR, USA

Rest of agenda

12:30 PM	Welcome and Opening Session Dr. William Hersh
1:00 PM	Program Sessions: Health & Clinical Informatics (Dr. William Hersh) Bioinformatics & Computational Biomedicine (Dr. Ted Laderas)
1:30PM	Plenary Session: Alliance for Visible Diversity in Science OHSU Center for Diversity and Inclusion Career Services
2:15 PM	Student Panel Sessions: Health & Clinical Informatics Bioinformatics & Computational Biomedicine
2:45 PM	Admissions Questions (Informal session)

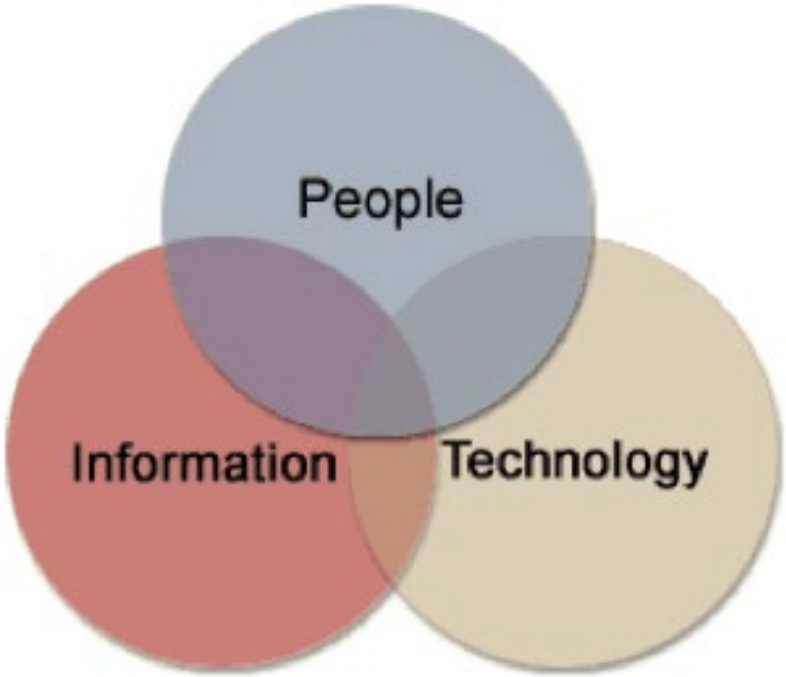
Biomedical Informatics

Overview of Program and Field

William Hersh, MD
Professor and Chair
Department of Medical Informatics & Clinical Epidemiology
School of Medicine
Oregon Health & Science University
Portland, OR, USA

What is biomedical informatics?

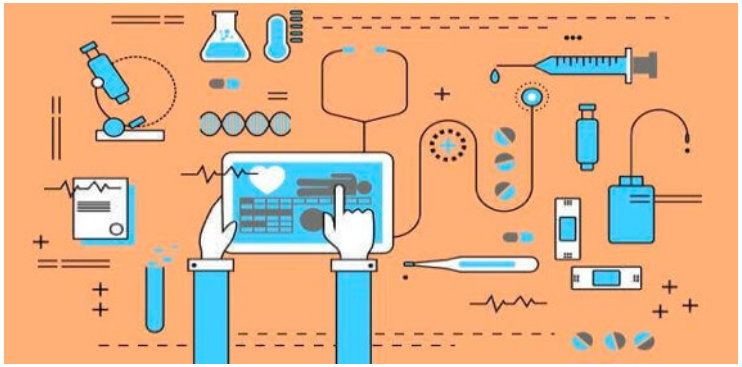
- The field concerned with the optimal use of information, often aided by technology, to improve individual health, healthcare, public health, and biomedical research
  - http://informatics.health/
- More about data and information than technology

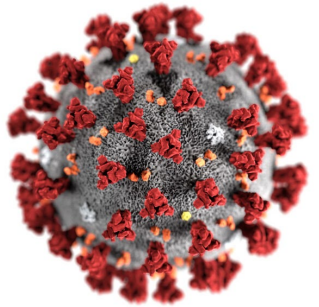


OHSU

Important roles for biomedical informatics in 2020 and beyond

- Value of electronic health record (EHR) for improving the quality and safety of healthcare
- Data science, machine learning, and artificial intelligence to maintain health and improve diagnosis and treatment of disease
- Precision medicine to bring “omics” to health and healthcare
- Use of personal health record (PHR), wearables, and other personal information for engaging people in their health and healthcare
- Critical tools in response to COVID-19 pandemic





OHSU

Many career opportunities

- Recent analysis of healthcare IT workforce shows estimated growth of 19,852-153,114 FTE as EHR adoption increases (Hersh, 2018)
  - https://doi.org/10.1093/jamiaopen/ooy029
- Largest amount of opportunity in healthcare but plenty of others in research, industry, government, etc.

Emerging and declining jobs in Global Health & Healthcare

Workforce in 2018 and 2022

EMERGING

8% in 2018 → 17% in 2022

Roles such as:

Data Analysts and Scientists
Biologists and Geneticists
AI and Machine Learning Specialists
Information Technology Services
Environmental and Occupational Health and Hygiene Professionals
Big Data Specialists
Administrative and Executive Secretaries
Supply Chain and Logistics Specialists
Specialist Medical Practitioners

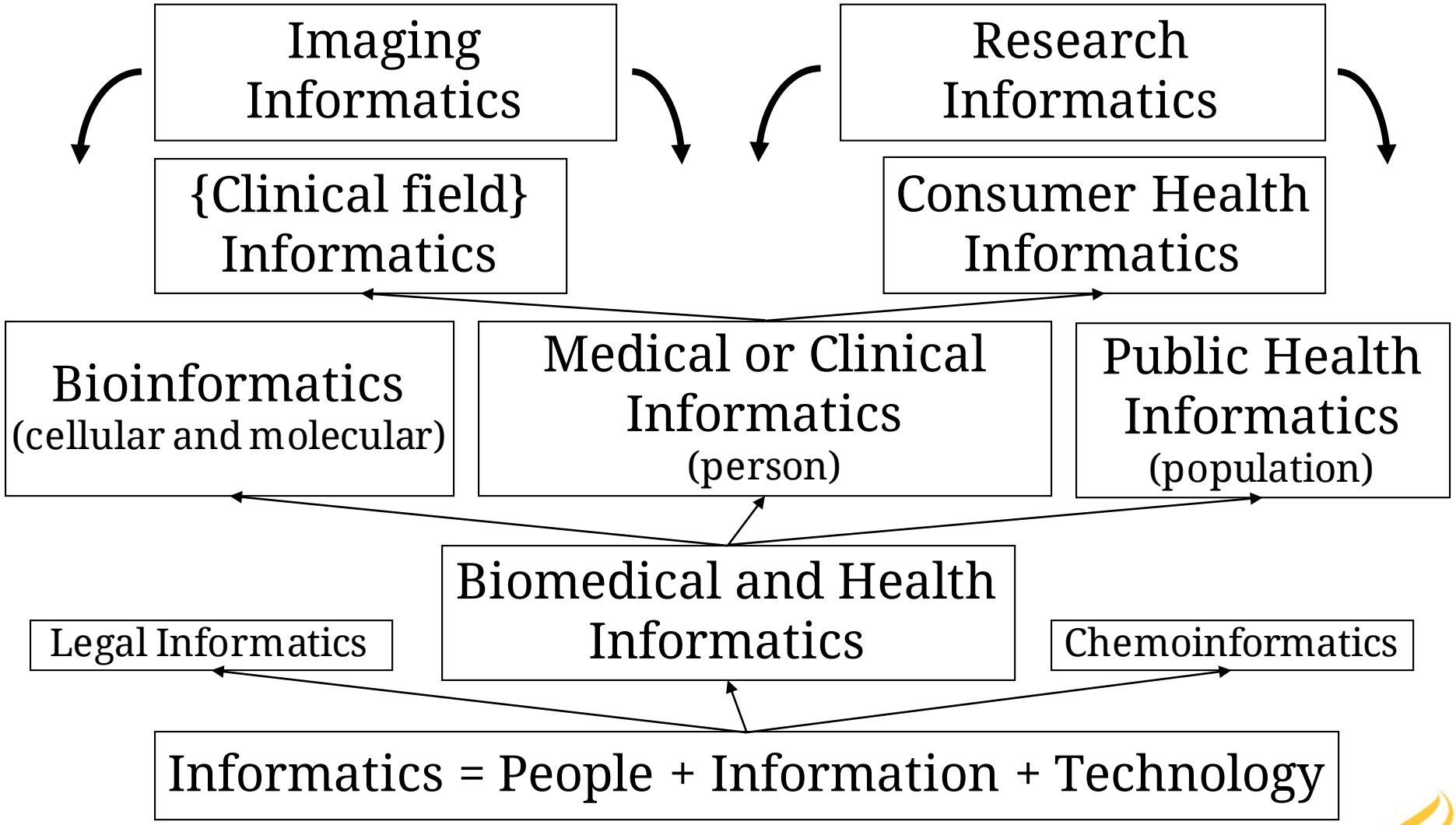
DECLINING

33% in 2018 → 21% in 2022

Roles such as:

Data Entry Clerks
Assembly and Factory Workers
Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products
Postal Service Clerks
Electronics and Telecommunications Installers and Repairers
Client Information and Customer Service Workers
Business Services and Administration Managers
Accounting, Bookkeeping and Payroll Clerks
Accountants and Auditors
Traditional and Complementary Medicine Professionals

Many areas of biomedical informatics



(Hersh, 2009; adapted from Shortliffe, 2006)

OHSU

Department of Medical Informatics & Clinical Epidemiology (DMICE)

- One of 26 departments in OHSU School of Medicine
- Mission is to provide leadership, discovery, and dissemination of knowledge in the areas of biomedical informatics and clinical epidemiology
  - Fulfilled through programs of research, education, and service
- Department leadership
  - William Hersh, MD - Chair
  - Shannon McWeeney, PhD, Head, Division of Bioinformatics & Computational Biology
  - David Dorr, MD, MS - Vice Chair for Clinical Informatics
  - Karen Eden, PhD - Vice Chair for Faculty Development
  - Cynthia Morris, PhD - Vice Chair for Education and Training

MEDICAL INFORMATICS
& CLINICAL EPIDEMIOLOGY

DMICE is a national leader

- No official rankings, but OHSU informatics program is
  - 1 of 16 programs to have a National Library of Medicine NIH Training Grant for PhD and postdoctoral students
  - 1 of 9 programs funded under the Office of the National Coordinator Health IT Workforce Development Program
  - 1 of 8 programs funded by the NIH Fogarty Center Informatics Training for Global Health Program in collaboration with Hospital Italiano de Buenos Aires
  - Consistent recipient of research funding, appointment to national leadership positions, publication in high-profile journals, etc.
  - Highly accomplished alumni being productive in many different settings
- Clinical epidemiology program similarly successful in areas of evidence-based medicine, systematic reviews, and meta-analysis

OHSU Biomedical Informatics Graduate Program

- http://www.ohsu.edu/informatics/
- Overall goal of program is to train future professionals, researchers, and leaders in area of biomedical and health informatics
  - Majors focus on different areas of larger field
  - All programs at graduate level, i.e., require a baccalaureate degree
- Diverse students who typically fall into one of two categories
  - "First-career" students more likely to be full-time, on-campus, and from variety of backgrounds
  - "Career-changing" students likely to be part-time, distance, mostly (though not exclusively) from healthcare professions

OHSU

Program majors (formerly tracks)

- Health & Clinical Informatics (HCIN)
  - Original track, focused on informatics and applied data analytics in health, healthcare, public health, and clinical research settings
- Bioinformatics & Computational Biomedicine (BCB)
  - Focused on methods and deep analytics applied across omics, imaging, clinical medicine, and public health

Program faculty and leadership

- Overall program director – William Hersh, MD
- Leadership
  - William Hersh, MD – HCIN
  - Shannon McWeeney, PhD – BCB
  - Karen Eden, PhD – PhD program
- Over 30 other faculty who teach, advise, mentor projects, etc.

One of oldest and largest programs in world – established 1996

Early adopter of online learning, with students across country and world

Have awarded 872 degrees and certificates to 782 people who work in healthcare systems, industry, and other settings

Degree	Total	BCB	HCIN
Cert	467	0	467
MS	374	54	320
PhD	31	11	20
Total	872	65	807

International graduates from: Singapore, Thailand, Argentina, Egypt, Israel, Saudi Arabia, Zimbabwe, China, and other countries

Despite "age," continual improvement and updating of curriculum and program

OHSU

Degrees and certificates

- Doctor of Philosophy (PhD)
  - For those who wish to pursue research, academia, or leadership careers
- Master of Science (MS) thesis
  - Research master's, including for those with doctoral degrees in other fields who wish to pursue research careers
- Master of Science (MS) non-thesis
  - Professional master's degree for practitioners and leaders
- Graduate Certificate
  - Subset of master's degree as an introduction or career specialization (HCIN major only)

Majors, degrees and certificates, and availability

Degree/Certificate Major	PhD	MS thesis	MS non-thesis	Grad Cert
HCIN	On-campus	On-campus	On-campus On-line	On-campus On-line
BCB	On-campus	On-campus	On-campus	

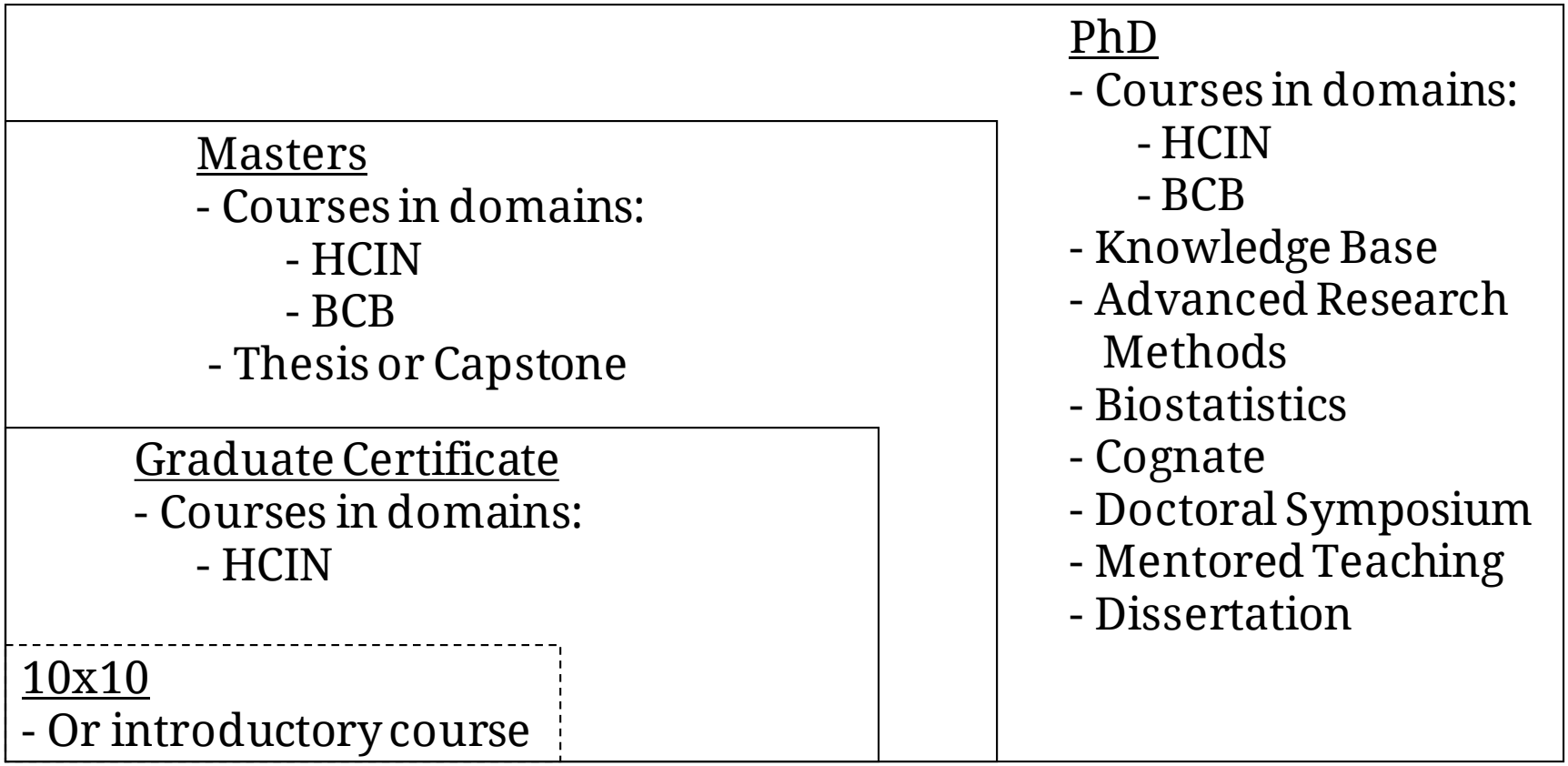
All “on-campus” programs currently on-line due to COVID-19

OHSU

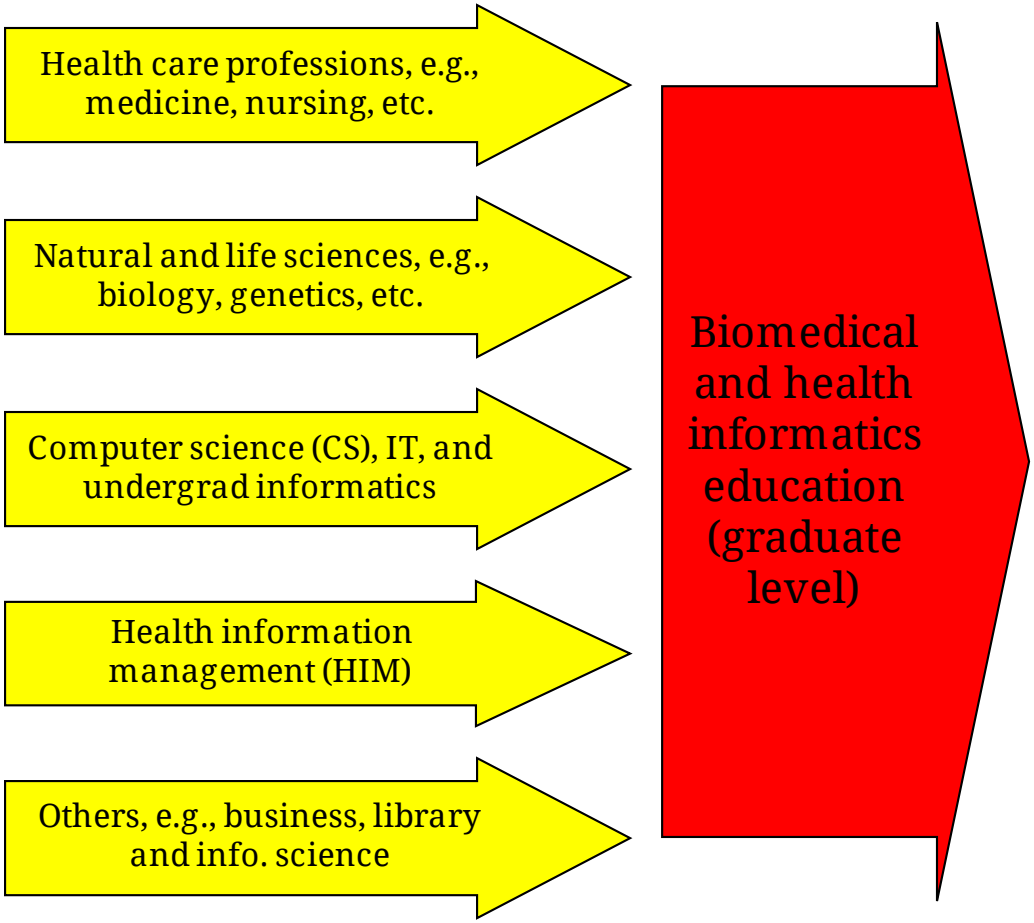
Curriculum

- Curriculum in each major for degree programs (master's and PhD) organized into domains, each of which may have courses that are
  - Required
  - Individual competency ("k of n")
  - Elective
- Core curriculum of degree programs is knowledge base plus additional courses
  - MS thesis = knowledge base + thesis
  - MS non-thesis = knowledge base + capstone (can be internship)
  - PhD = knowledge base + additional advanced work, including dissertation

Building block approach



Informatics career pathways have diverse inputs and outputs



There is no single career pathway, ladder, etc.

Jobs in:
- Healthcare systems
  - Clinical
  - IT
  - Leadership
- Biomedical research
- Industry
- Academia

OHSU

Other programs

- Fellowships
  - Predoctoral and postdoctoral funding from National Library of Medicine and National Institutes of Health institutes since 1992
  - Clinical informatics fellowship for physician board-certification started in 2015
- 10x10 (“ten by ten”)
  - Continuing education course in clinical informatics
  - Adaptation of on-line introductory course (BMI 510), with option to pursue further study at OHSU
  - Nearly 2700 have completed course since 2005, with about 10-15% going on to additional graduate study

AMIA 10x10 Health Informatics Online

OHSU

OHSU informatics program provides value

- For tuition and fees comparable to other programs, get
  - Cutting-edge curriculum based on solid foundation
  - Faculty who are international leaders in research and practice
  - Internship/practicum experience
  - Career development and advising
  - Connections to industry and others

DMICE online

- DMICE seminars
  - YouTube
    - https://www.youtube.com/channel/UCCekPERb6i3xXEDQxwlCeIA
- Web and blog
  - Web
    - http://www.ohsu.edu/informatics
  - Blog
    - http://www.ohsu.edu/blogs/health-data/
- Social media
  - Twitter
    - @OHSUInformatics
  - LinkedIn
    - https://www.linkedin.com/groups/962257/
  - Facebook
    - https://www.facebook.com/ohsu.informatics

OHSU

Thank You!

William Hersh, MD
Professor and Chair
Department of Medical Informatics & Clinical Epidemiology
School of Medicine
Oregon Health & Science University
Portland, OR, USA

Email: hersh@ohsu.edu
Web: www.billhersh.info
Blog: http://informaticsprofessor.blogspot.com
Twitter: @williamhersh