



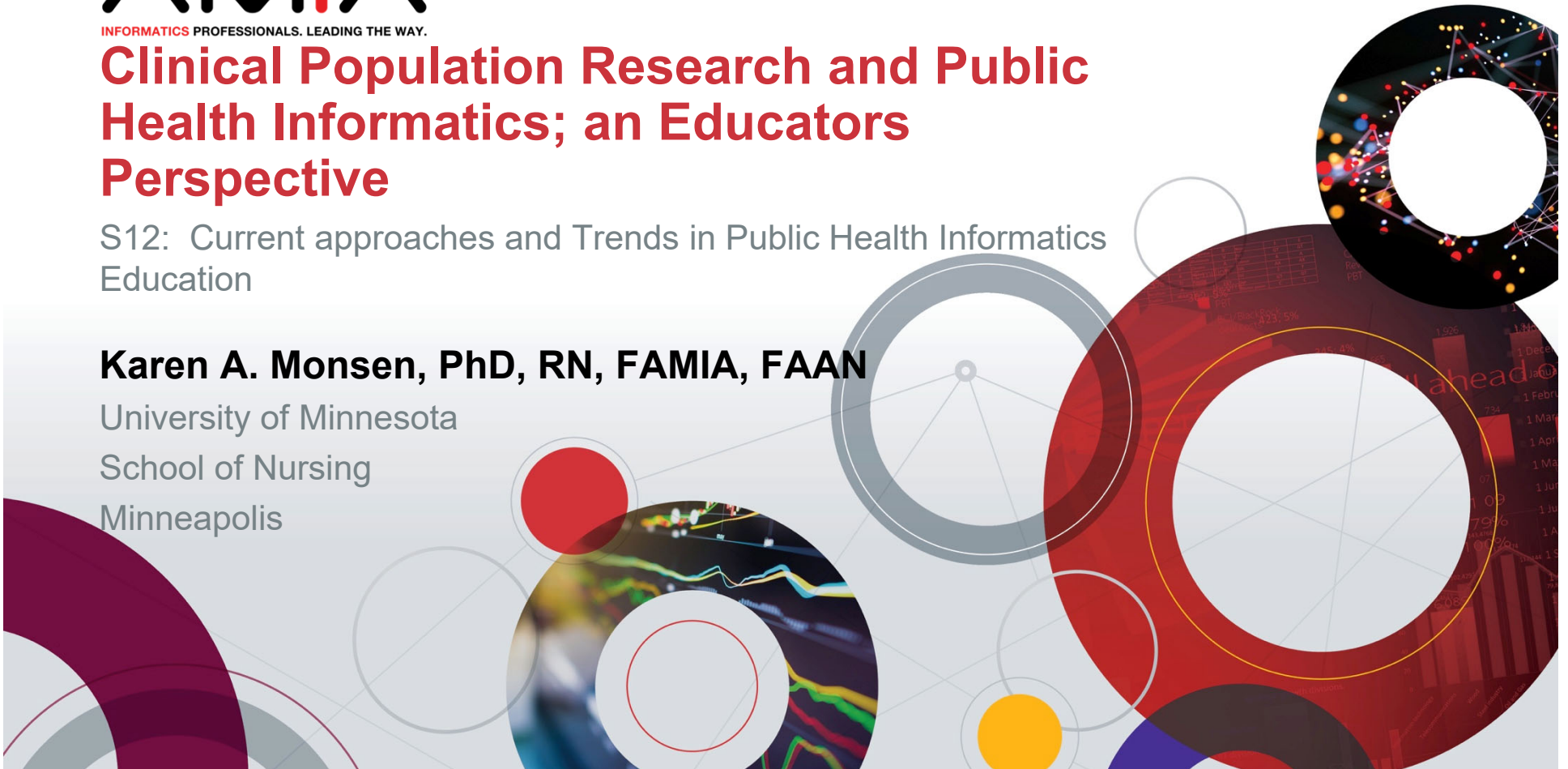
INFORMATICS PROFESSIONALS. LEADING THE WAY.

Clinical Population Research and Public Health Informatics; an Educators Perspective

S12: Current approaches and Trends in Public Health Informatics Education

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University of Minnesota
School of Nursing
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- Professor, University of Minnesota School of Nursing
- Director, Center for Nursing Informatics
- Coordinator, Nursing Informatics DNP Specialty
- Affiliate Faculty, Institute for Health Informatics
- Faculty, Center for Spirituality and Healing
- Faculty, Data Science Program, Computer Science and Engineering
- Developed and teach online informatics courses for the UMN DNP Nursing Informatics Specialty, Leadership in Health Informatics Certificate, and Coursera



Karen A. Monsen, PhD, RN, FAMIA, FAAN
University of Minnesota School of Nursing

Learning Objectives

After participating in this panel the learner should be better able to:

- Describe the variety of curricula that exist across the spectrum of public and population health informatics
- Construct dynamic PH informatics courses from undergraduate to the doctoral level, which align with CEPH competency requirements
- Discuss challenges facing the development and implementation of curriculum enhancements
- Discuss the use of simulation in public health informatics education

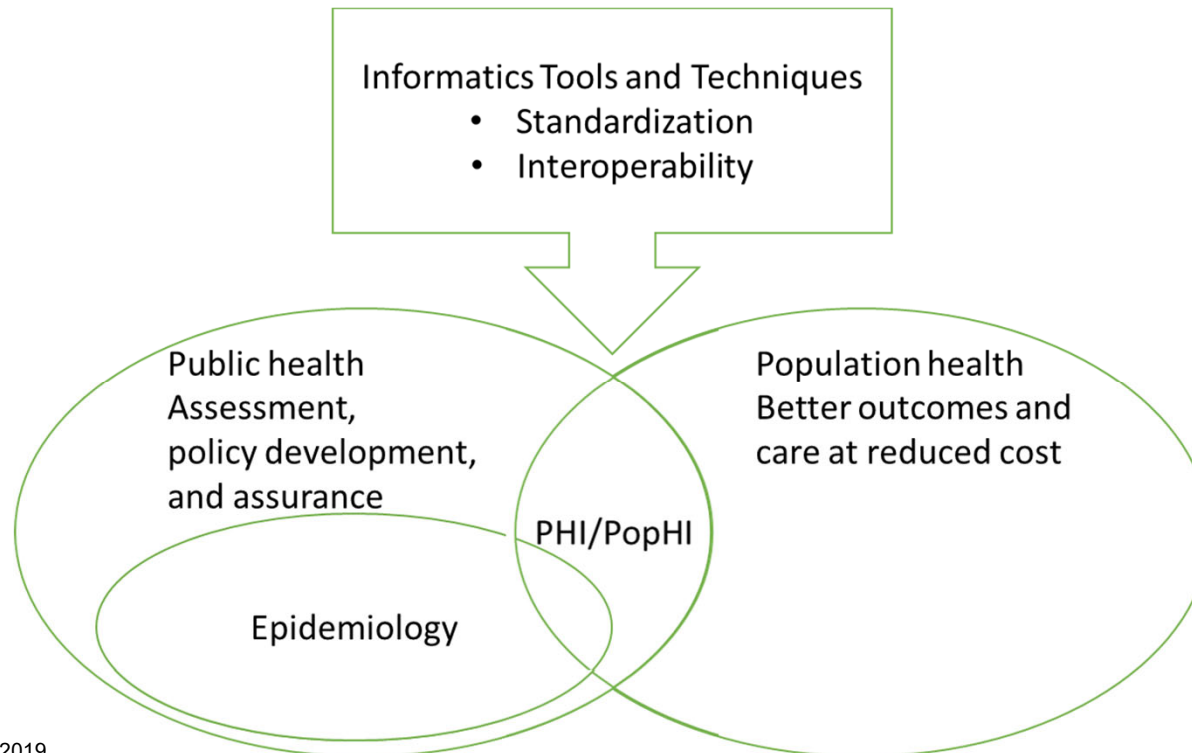
Public Health/Population Health and PHI/PopHI

Health systems and public health agencies increasingly rely on informatics and artificial intelligence tools to create and share digital information for public health purposes (public health informatics - PHI) and health management (population health informatics - PopHI)

- **Population health informatics:** Population health informatics addresses the IT and analytic needs of groups and organizations responsible for the health management of defined populations.^{1,p.200}
- **Public health informatics:** the systematic application of information, computer science, and technology to public health practice, research, and learning including surveillance, reporting, and health promotion.^{2,3}

1. Gamache R, Kharrazi H, Weiner JP. Public and Population Health Informatics: The Bridging of Big Data to Benefit Communities. Yearbook of medical informatics. 2018 Aug;27(01):199-206.
2. Yasnoff WA, O'Carroll PW, Koo D, Linkins RW, Kilbourne EM. Public health informatics: improving and transforming public health in the information age. J Public Health Manag Pract 2000;6(6):67-75.
3. AMIA Definition Public Health Informatics: <https://www.amia.org/applications-informatics/public-health-informatics>

Framework for Public/Population Health Informatics Education



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UMN SON – AACN Accreditation for DNP Programs Requires 1,000 Practicum Hours

DNP Specialty in Nursing Informatics

Population Health Informatics (on-line didactic – 2 cr)

Population Health Informatics Practicum (2 cr – 240 hours)

Population Health Informatics

Graduate-level

- Doctor of Nursing Practice
- Masters of Health Informatics
- Included in the 16 cr. UMN LHIT-HP Certificate program

Multi-disciplinary

2 Credits

Completely on-line with optional webinars throughout the semester

Includes virtual PopHR simulation experience

What is a PopHR?

The ideal PopHR automates extraction, harmonization, linking, and integration of all available data for individuals and populations to support population health measurement and monitoring to improve decision making.^{4,5}

PopHR learning opportunities:

- Interprofessional collaboration across sectors
- Security
- Governance
- Standards and interoperability
- Ethics

4. Friedman DJ, Parrish RG. The population health record: concepts, definition, design, and implementation. *Journal of the American Medical Informatics Association*. 2010 Jul 1;17(4):359-66.

5. Shaban-Nejad A, Lavigne M, Okhmatovskaia A, Buckeridge DL. PopHR: a knowledge-based platform to support integration, analysis, and visualization of population health data. *Annals of the New York Academy of Sciences*. 2017 Jan 1;1387(1):44-53.

Working PopHR and Informatics Tools/Techniques

PopHR: Champ Nightingale Notes

Simulation: Simulated ACO with diverse organizations

Standardization: Data dictionaries for documentation by org (Omaha System⁶)

Documentation: Data entry for at least 10 cases/student

Interoperability: Data extraction and aggregation

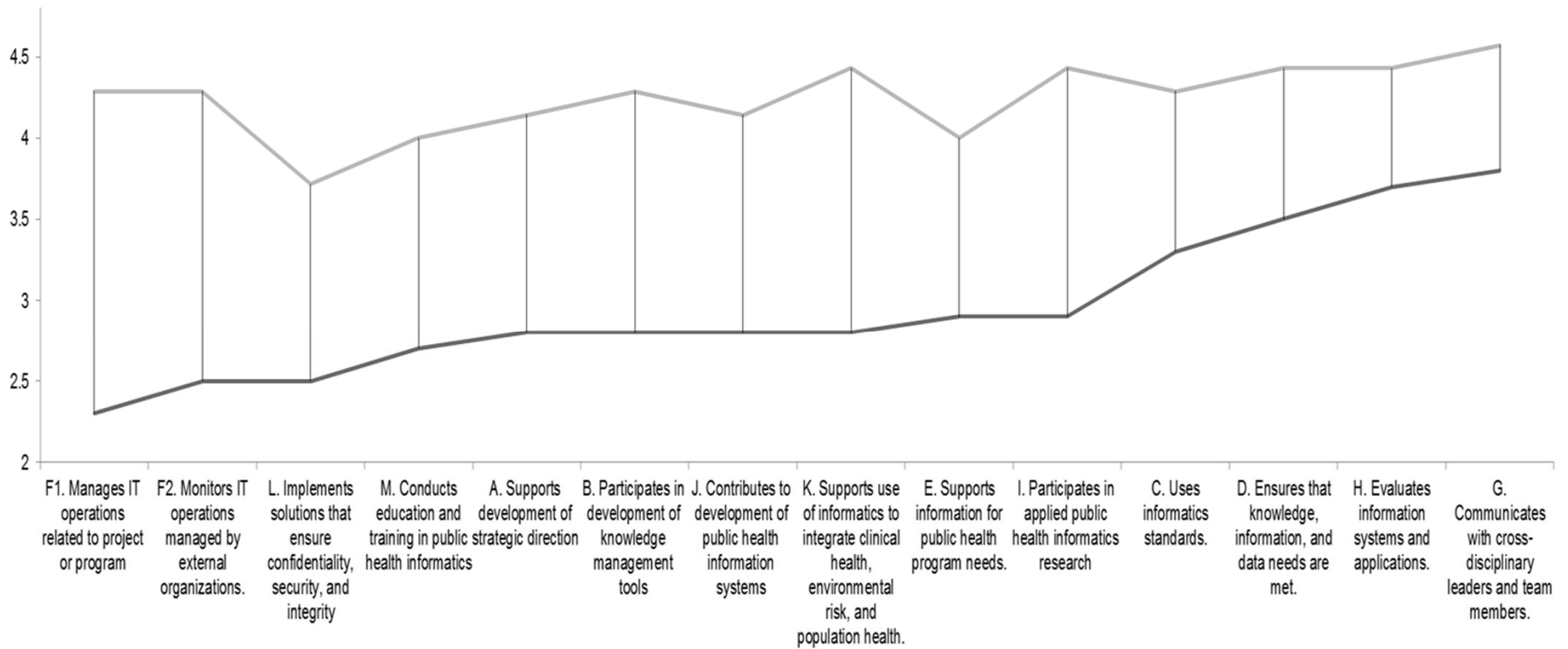
Evaluation: Analysis

Application: Reporting to stakeholders

6. Martin KS. (2005). *The Omaha System: A key to practice, documentation, and information management* (Reprinted 2nd ed.). Omaha, NE: Health Connections Press.

Pre-Post Competencies

U.S. Department of Health and Human Services. Centers for Disease Prevention and Control. Competencies for Public Health Informaticians; 2009.



Population Health Informatics Practicum – UMN SON

Hands-on practical experience in PHI/PopHI

Addressing a real problem identified by a public health department or health services organization, to identify informatics interventions/solutions

- Maternal morbidity/mortality disparities
- Vaccination
- Social determinants of health
- Opioids
- Syndromic surveillance

Practicum Learning Opportunities

Literature review


Framework development

Key informant interviews

Analysis

Presentation of findings

Poster presented at the Minnesota eHealth summit, 2018



Informatics Frameworks for Social Determinants of Health and the Prevention and Control of Misuse of Opioids

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Background

- The misuse or overdose of opioids is a serious national crisis that affects public health and socioeconomic welfare.
- In 2015, the Minnesota Department of Health (MDH) e-Health Initiative Workgroup proposed using the Institute of Medicine-recommended fourteen social determinants of health (SDH) related to health factors and affect on opioid misuse.
- Frameworks are needed to relate SDH with opioid misuse or overdose in order to collect, use and share critical information.

Purpose

- To recommend a framework to relate key SDH data elements to opioid misuse and overdose

Methods

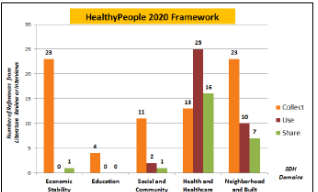
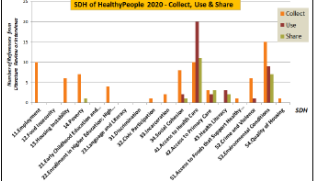
- Literature Review: Keyword search of SDH, opioid misuse, overdose, addiction, opioid monitoring and prevention in electronic databases (Medline, PsycINFO, PubMed)
- Interviews with 17 Subject Matter Experts (SME) using standardized script, in-person or telephone
 - Medical: Medical Director, Methadone Clinic; Psychiatrist; Providers in Primary Care, Pain Clinic, Spine Clinic
 - Nursing: Registered Nurse in Pain Clinic
 - Pharmacy: Director Inpatient Pharmacy, Inpatient Pharmacist,
 - National-Level Directors: Centers for Disease Control and Prevention (CDC) Medication Safety Program, Division of Healthcare Quality Promotion; Epidemiology and Data Systems, Consumer Product Safety Commission (CPCS); National Institute on Drug Abuse, National Institutes of Health
 - Academic: Associate Professor, Co-Director-Center for Nursing Informatics; Professor, Co-Director Center for Drug Use and HIV Research; University of Minnesota
 - Other: Licensed Social Worker; Compliance & Privacy Officer; Paramedic; Director, Primary Care Clinic

Results

- Applicable Frameworks Identified
 - Collect, Use, Share (Patnoe et al, Informatics Framework to Support Surveillance System Interoperability in Minnesota, 2017)
 - HealthyPeople 2020 (US Centers for Disease Control and Prevention)

Results

- 64 diverse data elements were relevant to opioid overdose and SDH
- Analyzed literature-identified SDH data elements using HealthyPeople 2020 SDH domains relative to interview data
 - Collect: What information are they actually collecting? What is coming out in practice that people are using the most? What are the parameters of the data?
 - Use: What does the literature/interview show how people use SDH?
 - Share: Who is sharing, who are they sharing it with and how?

Discussion

- HealthyPeople 2020 framework aids in understanding opioid-related SDH data elements across settings relative to how data are collected, used, and shared
- In practice, few SDH data elements are used or shared
- There was a significant gap understanding the importance of data collection, usage and exchange between federal/state agencies and frontline patient care professionals
- Medical diagnosis was the most important factor used to recognize people at risk for misuse of opioids
- Regarding the sharing of SDH, staff in primary care practice identified concerns regarding the patients approval of using PHI

Recommendations

- It is important to educate clinicians on the importance of SDH related to opioid misuse/ overdose.
- The following barriers using SDH of opioid misuse or overdose should be addressed.
 - Lack of standardization & interoperability of SDH data elements
 - Lack of knowledge of professionals who collect and submit SDH data
 - Limited data exchange

Conclusion

- SDH information is important for optimal opioid diagnosis and treatment
- Use of frameworks enables analysis of SDH data elements across sources and identifies opportunities to improve understanding of information management regarding SDH relative to opioid misuse and overdose

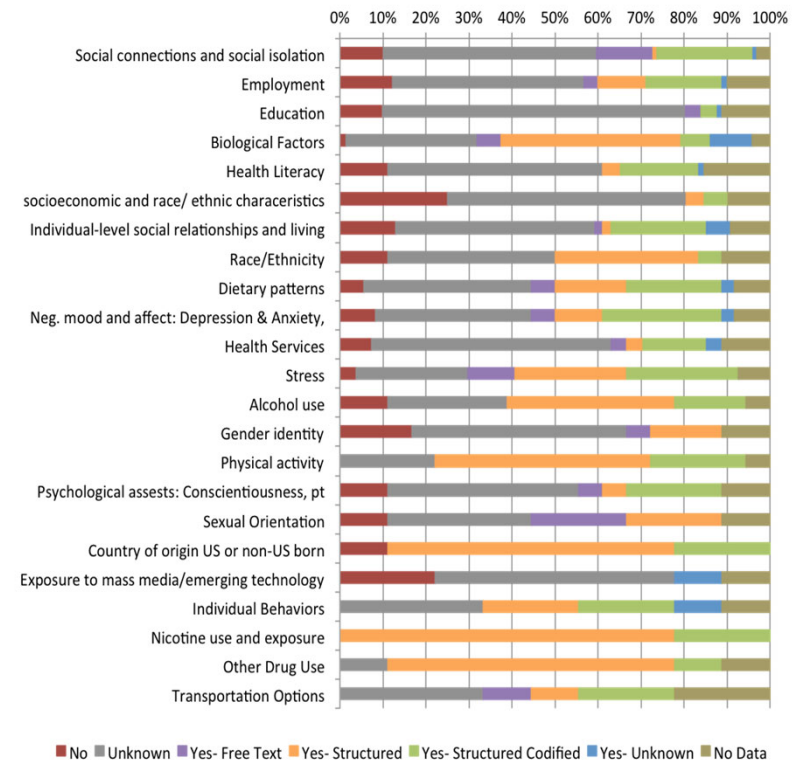
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Social Determinants of Health - Key Informant Survey

How 23 SDH were reported in 9 EHRs

- Affinity (SDH = 4)
- CareFacts (SDH=76)
- Centricity GE (SDH=27)
- Epic (SDH=59)
- McKesson Paragon (SDH=27)
- Meditech (SDH=23)
- Nightingale Notes (SDH=20)
- PH-Doc (SDH=75)
- QCPR (QuadraMed) (SDH=23)



Monsen, K. A., Rudenick, J., Kapos, N., Warmbold, K., McMahon, S., Schorr, E. (2018). Documentation of social determinants in electronic health records with and without standardized terminologies: a comparative study. Proceedings of Singapore Healthcare, p. 1-7 <https://doi.org/10.1177/2010105818785641>

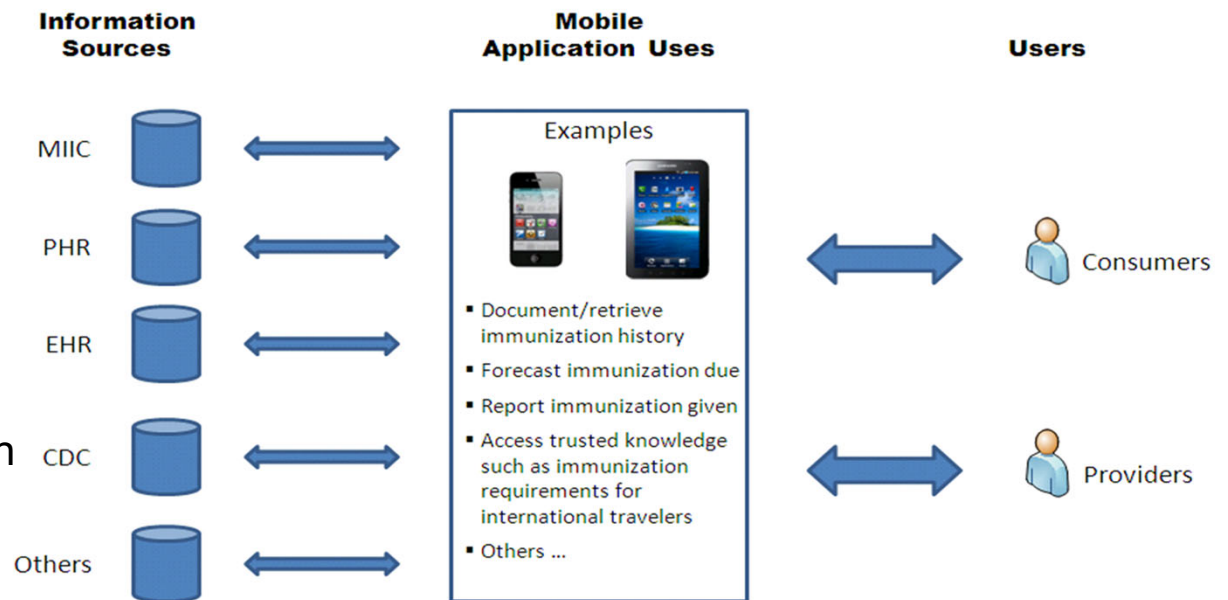
Developing an mHealth evaluation framework for consumer-based immunization applications

Students:

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 Anne Fishman LaFlamme
 Mary Jane Rivard
 Sara Yaron

Practicum site:

Minnesota Department of Health
 Pat Kururuchitham
 Priya Rajamani
 Marty LaVenture



MIIC = Minnesota Immunization Information Connection, PHR = Personal Health Record, EHR = Electronic Health Record, CDC = Centers for Disease Control and Prevention

Summary

Creative strategies in real and simulated population health informatics education have been shown to improve student self-reported public health informatics competencies across disciplines and settings.



Thank you!

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