NATIONAL ASSOCIATION OF Community Health Centers®

# 1,001 Reasons Why You Should Invest in Your Informatics Team

Monday, Oct 31 | 10:30 – 11:45 AM

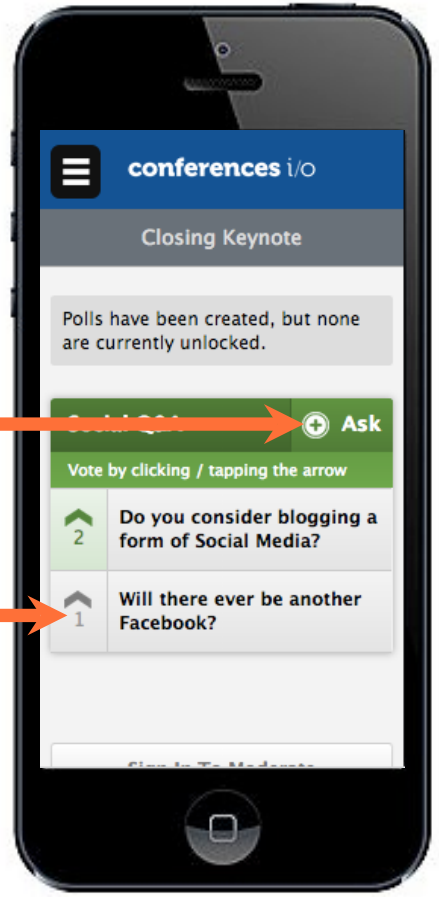
Augustus 1-2, Caesars Palace

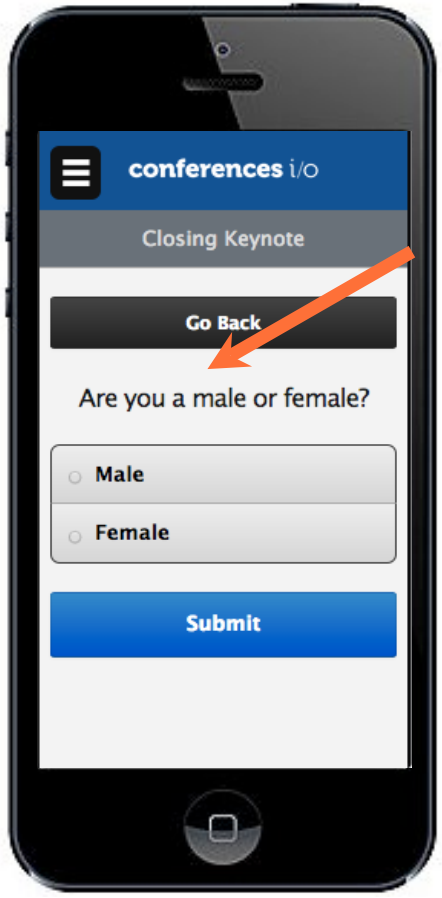
Las Vegas, NV

# In-Person Participants

Give us Feedback

Up-Vote a Comment




Click on question and then Respond to Polls when they appear

# Vote / Give Feedback/ Respond to Polls

# Virtual Participants

**Chat**
(use to talk with peers)

**Polling/Q&A**
(participate in polls, ask questions to faculty)

# NACHC's STRATEGIC PILLARS

## 1

### Equity and Social Justice

Center everything we do in a renewed commitment to equity and social justice

## 2

### Empowered Infrastructure

Strengthen and reinforce the infrastructure for leading and coordinating the Community Health Center movement, notably consumer boards and NACHC itself

## 3

### Skilled and Mission-driven Workforce

Develop a highly skilled, adaptive, and mission-driven workforce reflecting the communities served

## 4

### Reliable and Sustainable Funding

Secure reliable and sustainable funding to meet increasing demands for Community Health Center services

## 5

### Improved Care Models

Update and improve care models to meet the evolving needs of the communities served

## 6

### Supportive Partnerships

Cultivate new and strengthen existing mutually beneficial partnerships to advance the shared mission of improving community health

**To learn more about NACHC's Strategic Pillars visit https://www.nachc.org/about/about-nachc/**

# THE NACHC MISSION

## America's Voice for Community Health Care

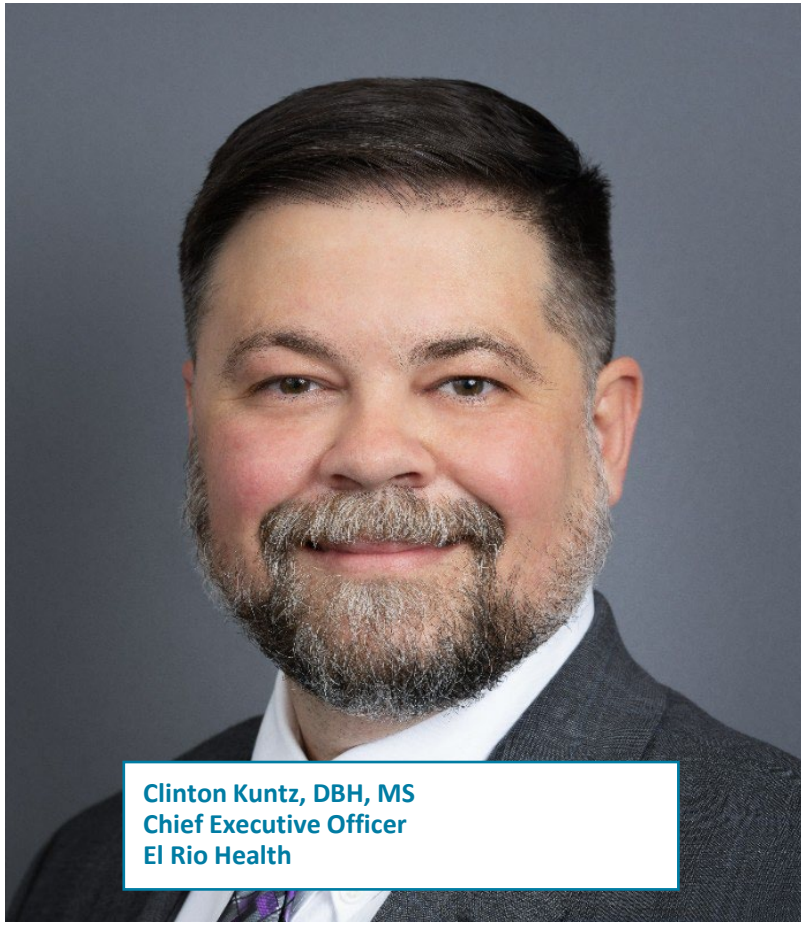
The National Association of Community Health Centers (NACHC) was founded in 1971 to promote efficient, high quality, comprehensive health care that is accessible, culturally and linguistically competent, community directed, and patient centered for all.


NATIONAL ASSOCIATION OF Community Health Centers®

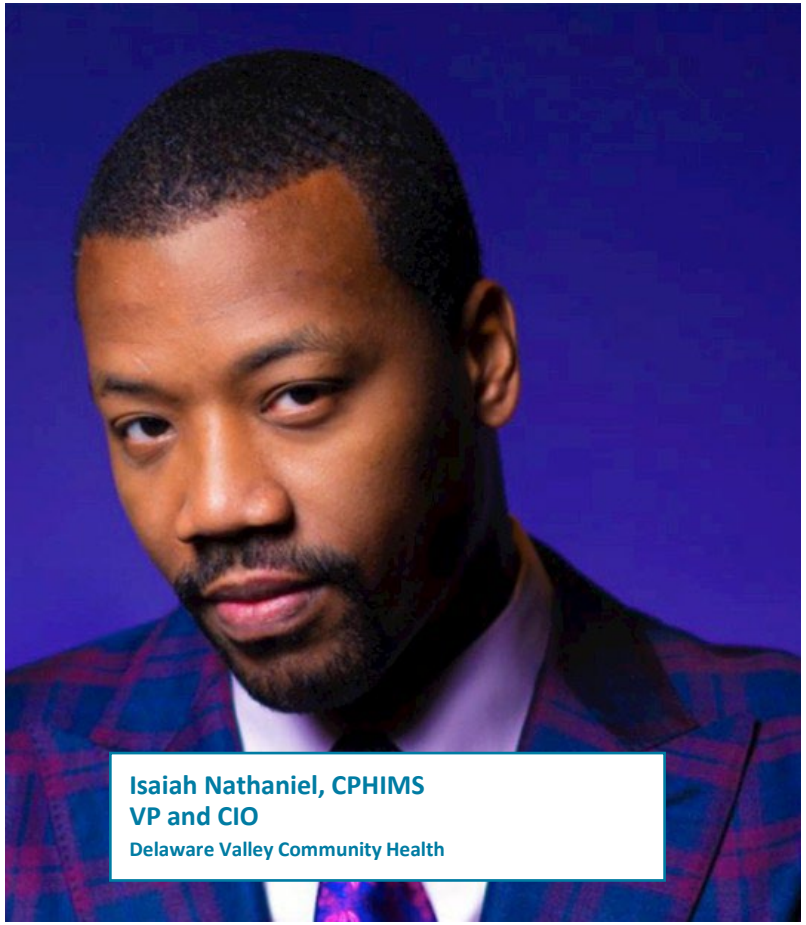
# AGENDA

1. Welcome
2. Speaker Introductions
3. What is Informatics?
4. Questions and Answers
5. Discussion and Reactions
6. Closing, Resources and Follow-up

# Meet our Reactors



# Meet our Reactors



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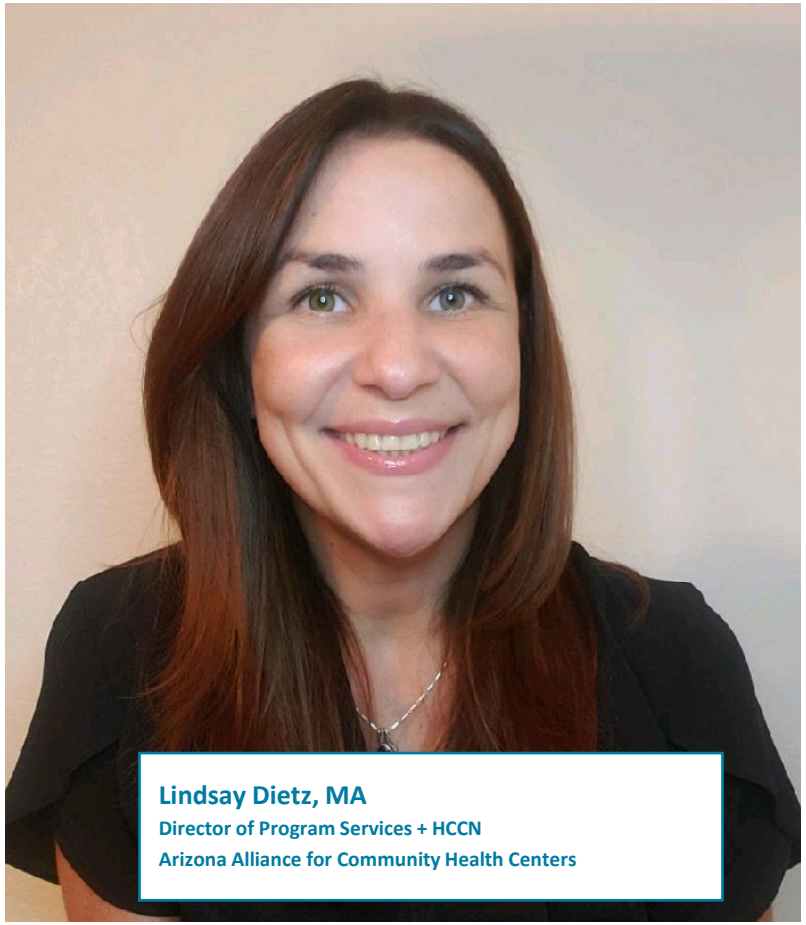


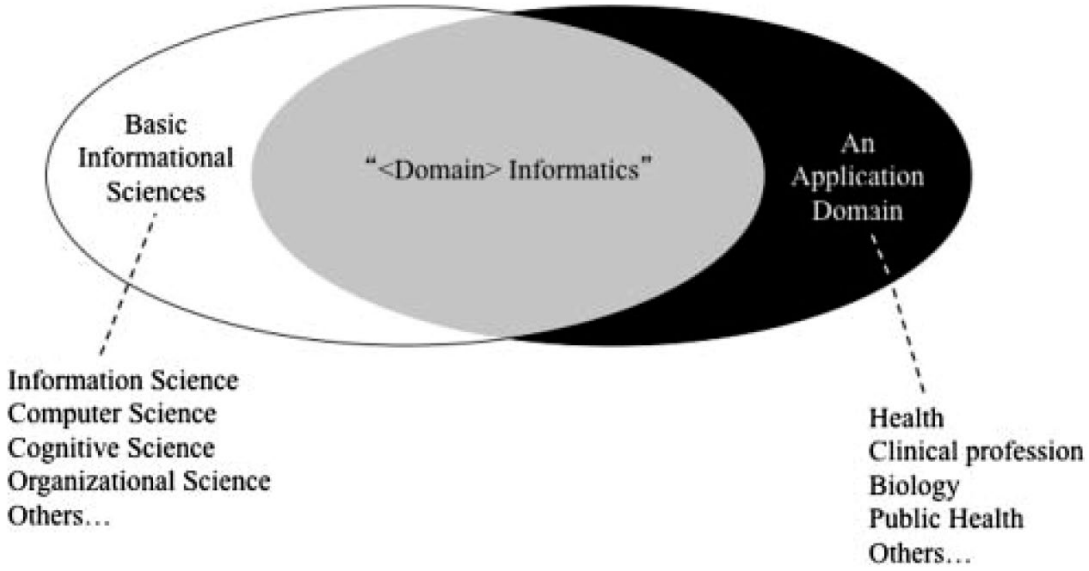
# What is Informatics?

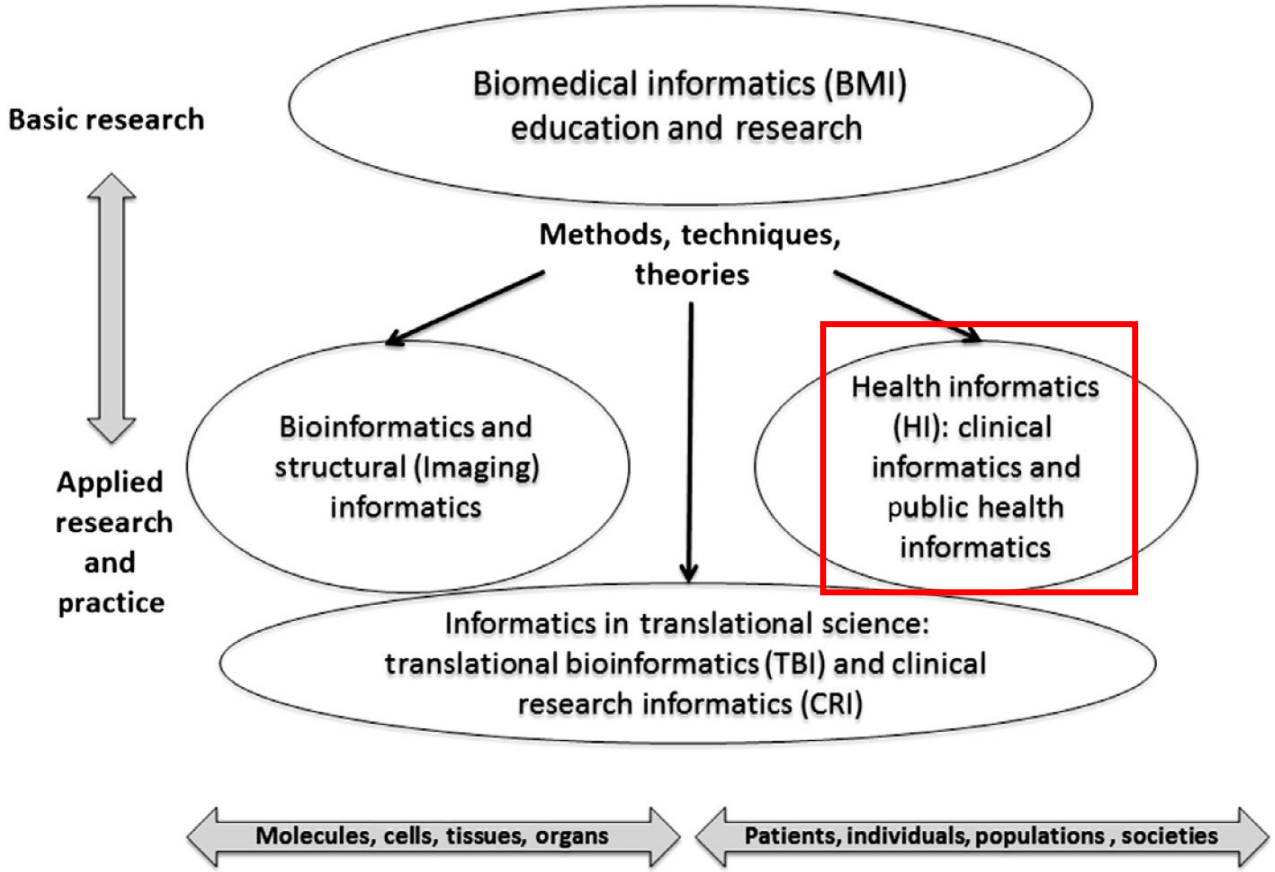
**Raymonde Uy, MD, MBA, ACHIP**

Physician Informaticist

National Association of Community Health Centers (NACHC)

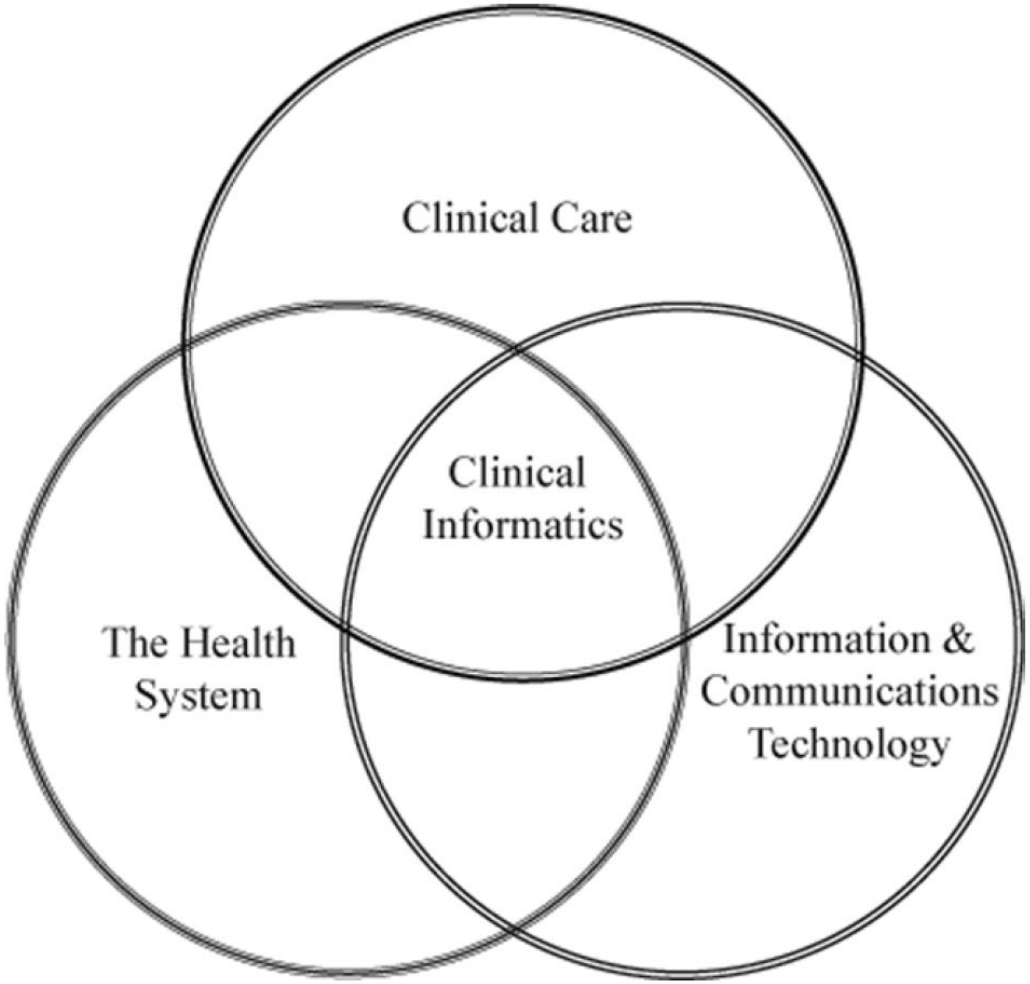
# Informatics as cross-training




J Am Med Inform Assoc 2013;20:224–226. doi:10.1136/amiajnl-2012-001206

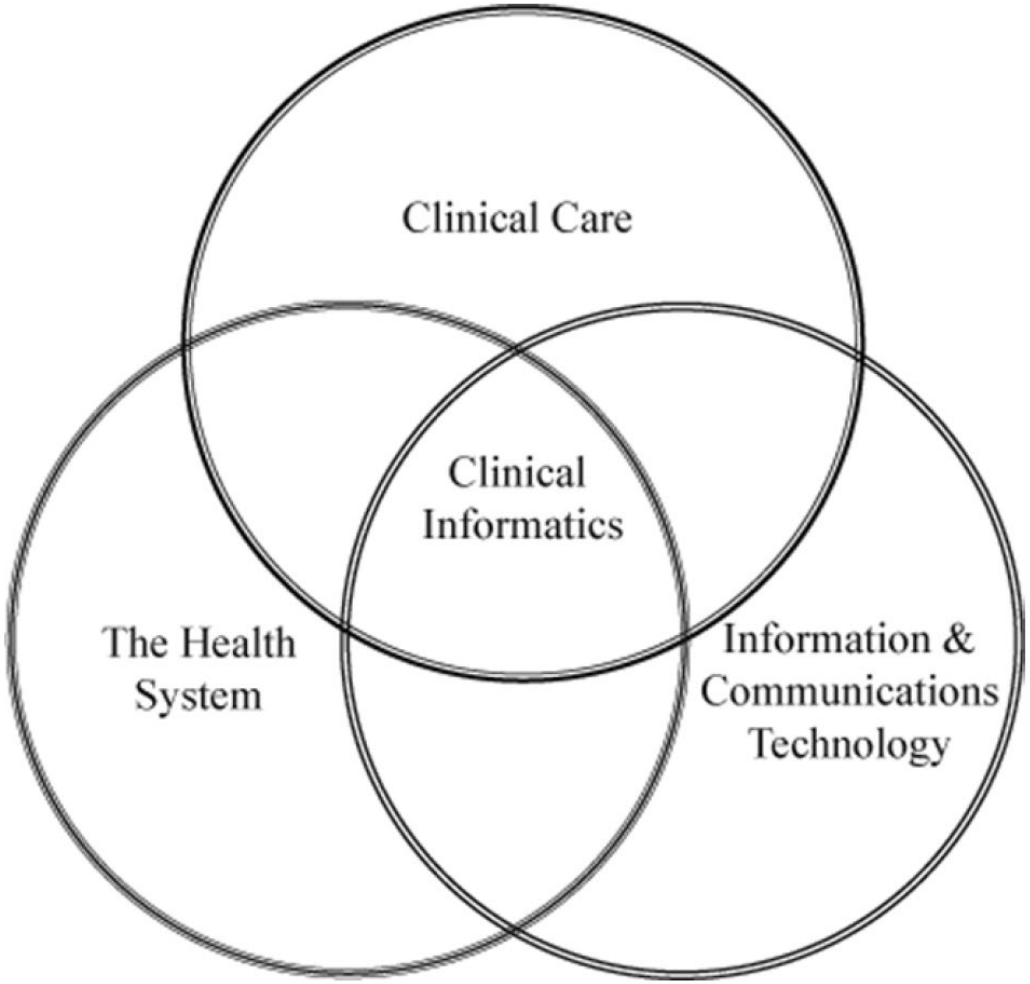
# Domains of Clinical Informatics




- Medical and informatics knowledge
- Health care environment, business processes influence health care delivery and the flow of data among
- Information systems and processes enhance or compromise the decision making and actions of health care team members
- Information system concepts, life cycle, evolving capabilities of information technology and health care, and the technical and nontechnical issues surrounding system implementation

J Am Med Inform Assoc 2013;20:224–226. doi:10.1136/amiajnl-2012-001206

# Domains of Clinical Informatics




- Clinical information systems impact users and patients, how to support clinician users, and how to promote clinician adoption of systems
- Evaluation of information systems to provide feedback for system improvement
- Leadership in organizational change, fostering collaboration, communicating effectively, and managing large scale projects related to clinical information systems.

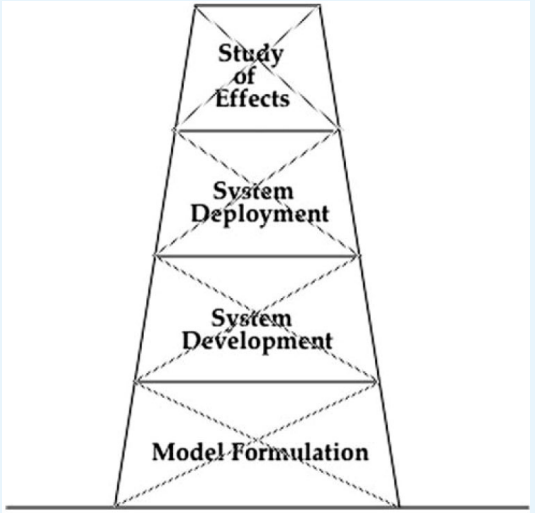
J Am Med Inform Assoc 2013;20:224–226. doi:10.1136/amiajnl-2012-001206

# What informatics “is and isn’t”

## Is

Cross-training where basic informational science meets a biomedical application domain

Tower of achievement




## Isn’t

Scientists or clinicians tinkering with computers

Analysis of large data sets per se

Circumscribed roles related to deployment of electronic health records (*point of disagreement)

Profession of health information management

Anything done using a computer

# It takes a village: roles, competencies and careers

## Traditional groupings of information professionals in health care

1. Information technology (IT) – usually with computer science or information systems background
2. Health information management (HIM) – historical focus on medical records
3. Clinical informatics (CI) – often from healthcare backgrounds, performing analysis, training, etc.
4. Others – librarians, managers, etc.

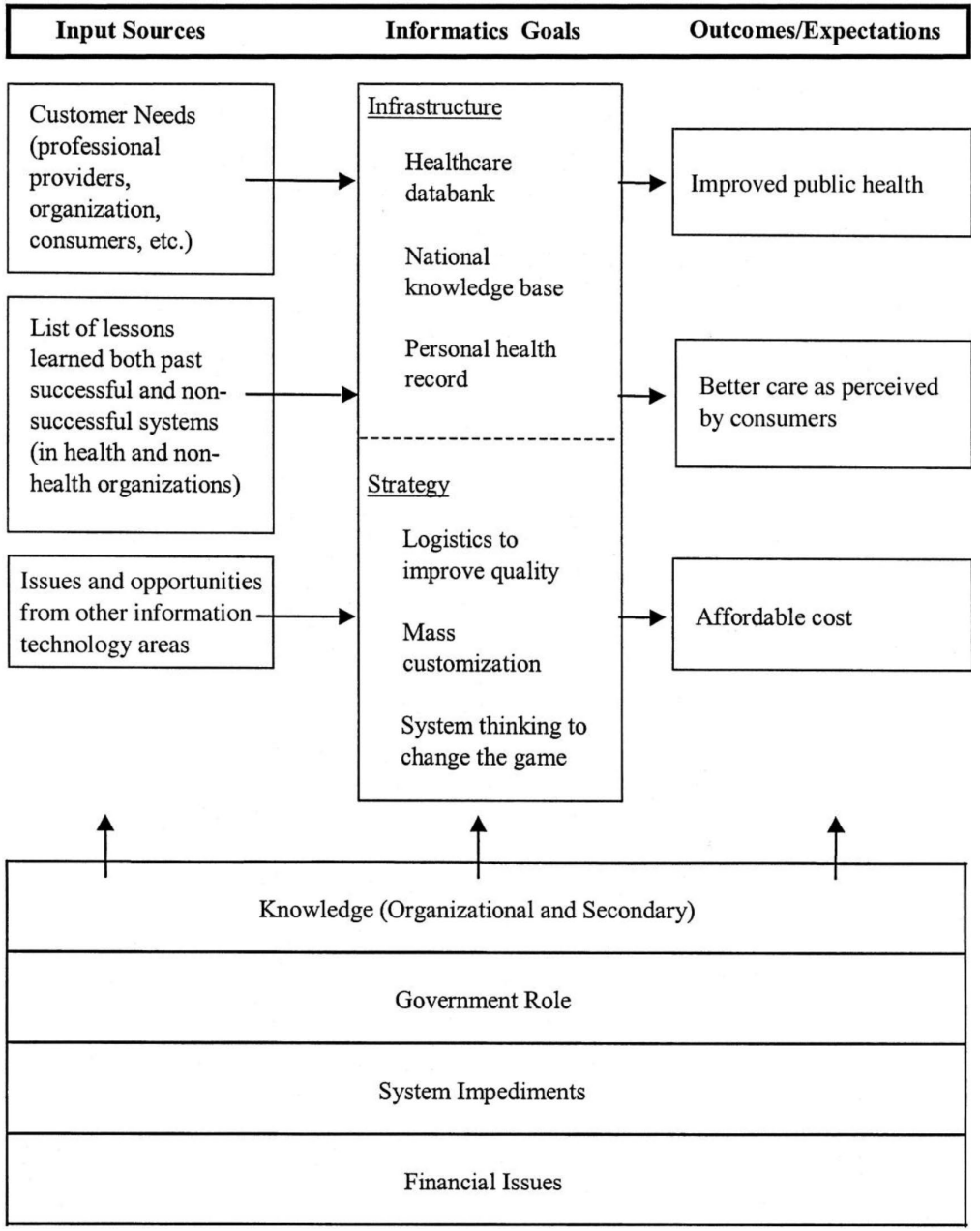
## Careers of informatics leaders

– Chief Information Officer (CIO)
– Chief Medical Informatics Officer (CMIO)
– Chief Nursing Informatics Officer (CNIO)
– Chief Technology Officer (CTO)
** Many other titles, no standards

Hospitals and healthcare organizations increasingly creating operational "clinical informatics" departments
– Often separate from IT (and CIO)
– Usually with clinical leadership, often CMIO
– Increasingly incorporate HIM


J Am Med Inform Assoc 2013;20:224–226. doi:10.1136/amiajnl-2012-001206

# Context for setting the agenda for an informatics team



# Assessing the Potential Economic Value of Health Information Technology Interventions in a Community-Based Health Network

Eric L. Eisenstein, D.B.A.[1], Kevin J. Anstrom, Ph.D.[1], Jennifer M. Macri, M.S.[2], David R. Crosslin, M.S. [1], Frederick S. Johnson, M.B.A.[2], Kensaku Kawamoto [2], and David F. Lobach, M.D., Ph.D., M.S[2].
[1]Duke Clinical Research Institute, Duke University Medical Center, Durham, NC
[2]Department of Community & Family Medicine, Duke University Medical Center, Durham, NC

**Table 1: Total Medicaid Costs**

| COST TYPE | INDIVIDUAL CLAIMS N | Costs / Claim |
|---|---|---|
| Emergency Room Encounter | 5179 | $346 |
| Provider Encounter | 108,853 | $80 |
| Inpatient | 405 | $7973 |
| Durable Medical Equipment | 1261 | $152 |
| Pharmaceuticals | 31,531 | $65 |
| Total | 147,229 | $109 |
| | TOTAL CLAIM COSTS | |
| Emergency Room Encounter | | $1,791,038 |
| Provider Encounter | | $8,739,608 |
| Inpatient | | $3,229,011 |
| Durable Medical Equipment | | $191,174 |
| Pharmaceuticals | | $2,049,588 |
| Total | | $16,000,419 |

**Table 2: Medicaid Claims By Type**

| COST TYPE | CLAIMS N | Costs / Claim |
|---|---|---|
| Asthma | | |
| Emergency Room Encounter | 179 | $431 |
| Provider Encounter | 984 | $107 |
| Inpatient | 12 | $2908 |
| Durable Medical Equipment | 102 | $67 |
| Total | 1277 | $176 |
| Diabetes | | |
| Emergency Room Encounter | 56 | $337 |
| Provider Encounter | 1020 | $129 |
| Inpatient | 11 | $6879 |
| Durable Medical Equipment | 460 | $70 |
| Total | 1547 | $167 |
| Low-Severity Emergency Room | | |
| Emergency Room Encounter | 1907 | $277 |
| | TOTAL CLAIM COSTS | |
| Asthma | | |
| Emergency Room Encounter | | $77,059 |
| Provider Encounter | | $105,326 |
| Inpatient | | $34,897 |
| Durable Medical Equipment | | $6820 |
| Total | | $224,101 |
| Diabetes | | |
| Emergency Room Encounter | | $18,897 |
| Provider Encounter | | $131,155 |
| Inpatient | | $75,670 |
| Durable Medical Equipment | | $32,052 |
| Total | | $257,774 |
| Low-Severity Emergency Room | | |
| Emergency Room Encounter | | $529,088 |

**Table 3: Estimated Monthly Cost Savings**

| Patient Type | Emergency Room Encounters / Month | Estimated Savings / Encounter |
|---|---|---|
| Asthma | 60 | $324 |
| Diabetes | 19 | $208 |
| Low-Severity | 636 | $197 |

| | Savings From Encounter Conversion 10% | 20% |
|---|---|---|
| Asthma | $1933 | $3866 |
| Diabetes | $388 | $777 |
| Low-Severity | $12,523 | $25,045 |

| | Savings From Encounter Conversion 30% | 100% |
|---|---|---|
| Asthma | $5800 | $19,332 |
| Diabetes | $1165 | $3883 |
| Low-Severity | $37,568 | $125,226 |

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1560778/pdf/amia2005_0221.pdf

# Health information technology interventions and engagement in HIV care and achievement of viral suppression in publicly funded settings in the US: A cost-effectiveness analysis

**Starley B. Shade[1,2]*, Elliot Marseille[1], Valerie Kirby[2], Deepalika Chakravarty[2], Wayne T. Steward[2], Kimberly K. Koester[2], Adan Cajina[3], Janet J. Myers[2]**

**1** Institute for Global Health Sciences, Department of Epidemiology and Biostatistics, University of California, San Francisco, California, United States of America, **2** Center for AIDS Prevention Studies, University of California, San Francisco, California, United States of America, **3** Demonstration and Evaluation Branch, HIV/AIDS Bureau, Health Resources and Services Administration, Rockville, Maryland, United States of America

## Why was this study done?

- The Health Resources and Services Administration's Special Projects of National Significance Program (HRSA/SPNS) funded a 4-year initiative (2007 to 2011) in 6 demonstration sites to enhance and evaluate existing health information electronic network systems for people living with HIV (PLHIV) in underserved communities.
- Each of the 6 demonstration sites implemented one or more health information technology (HIT) interventions to facilitate comprehensive care and enhance engagement in HIV medical services. These interventions included: (1) use of HIV surveillance data to identify out-of-care individuals; (2) extension of access to electronic health records to support service providers; (3) use of electronic laboratory ordering and prescribing; and (4) development of a patient portal.
- This study estimates the total costs, cost-effectiveness, and potential cost-savings of these 6 interventions.

Four of the interventions were associated with lower healthcare costs and better health outcomes (QALYs gained) for PLHIV in each setting.

These interventions saved between $6.87 and $14.91 per dollar invested.

Two interventions that provided access to medical record information to support service providers were not associated with improved health outcomes for PLHIV in these settings. These interventions were not effective or cost-effective

HIT interventions that facilitate changes in patient or provider behavior have the potential to improve the health status of PLHIV and reduce healthcare costs.

HIT interventions that only provided additional information to support service providers were less successful.

**Table 1. Costs of HIT interventions by resources category and site.**

| Cost category | Site 1 | Site 2 | Site 3 | Site 4 | Site 5 | Site 6 | Total |
|---|---|---|---|---|---|---|---|
| **Direct Costs** | | | | | | | |
| Personnel | $765,603 (92%) | $147,664 (66%) | $500,093 (83%) | $610,774 (69%) | $675,570 (91%) | $293,314 (81%) | $2,993,018 (82%) |
| Recurring Costs | $36,820 (4%) | $63,633 (28%) | $84,818 (14%) | $246,168 (28%) | $54,570 (7%) | $47,850 (13%) | $533,859 (15%) |
| Capital Costs* | $25,582 (3%) | $13,671 (6%) | $17,456 (3%) | $32,467 (4%) | $10,298 (1%) | $22,161 (6%) | $121,635 (3%) |
| Total | **$828,005** | **$224,968** | **$602,367** | **$889,409** | **$740,438** | **$363,325** | **$3,648,512** |
| **In-kind Costs** | | | | | | | |
| Personnel | $13,139 (54%) | $62,714 (100%) | $45,813 (100%) | $124,992 (63%) | $11,011 (69%) | $33,856 (53%) | $291,525 (71%) |
| Recurring Costs | $11,008 (46%) | $0 (0%) | $0 (0%) | $73,338 (37%) | $4,965 (31%) | $30,245 (47%) | $119,636 (29%) |
| Capital Costs* | $0 (0%) | $0 (0%) | $0 (0%) | $1,056 (1%) | $72 (0%) | $0 (0%) | $1,128 (0%) |
| Total | **$24,227** | **$62,714** | **$45,813** | **$199,386** | **$16,048** | **$64,101** | **$412,289** |
| **Total Costs** | | | | | | | |
| Personnel | $778,742 (91%) | $210,378 (73%) | $545,906 (84%) | $735,766 (74%) | $686,581 (91%) | $327,170 (77%) | $3,237,649 (83%) |
| Recurring Costs | $47,908 (6%) | $63,633 (22%) | $84,818 (13%) | $218,912 (22%) | $59,535 (8%) | $78,095 (18%) | $552,901 (14%) |
| Capital Costs* | $25,582 (3%) | $13,671 (5%) | $17,456 (3%) | $33,523 (3%) | $10,370 (1%) | $22,161 (5%) | $122,763 (3%) |
| Total | **$852,232** | **$287,6828** | **$648,180** | **$988,201** | **$756,486** | **$427,426** | **$3,913,313** |

*Costs amortized over the life of the equipment.

https://doi.org/10.1371/journal.pmed.1003389.t001

**Table 4. Cost-effectiveness and return on investment for HIT interventions.**

| | Site 1 | Site 2 | Site 3 | Site 4 | Site 5 | Site 6 |
|---|---|---|---|---|---|---|
| **Exposed** | | | | | | |
| | 350 | 649 | 258 | 409 | 263 | 1,181 |
| **Costs before intervention implementation (costs in thousands)** | | | | | | |
| Health care costs (5 years) | $162,754 | $289,621 | $129,087 | $186,690 | $122,785 | $515,211 |
| QALYs | 1443.29 | 2625.31 | 958.20 | 1598.89 | 1053.02 | 4863.91 |
| $/QALY | $113 | $110 | $135 | $117 | $117 | $106 |
| **Cost after intervention implementation (costs in thousands)** | | | | | | |
| Health care costs (5 years) | $177,333 | $297,869 | $122,017 | $172,549 | $111,505 | $507,164 |
| Intervention costs (3 years) | $852 | $288 | $648 | $1,089 | $756 | $427 |
| Total costs | $178,185 | $298,157 | $122,655 | $173,637 | $112,261 | $507,592 |
| QALYs | 1288.01 | 2618.10 | 959.64 | 1709.97 | 1073.22 | 4932.77 |
| $/QALY | $138 | $114 | $128 | $101 | $105 | $103 |
| **Cost-effectiveness (costs in thousands)** | | | | | | |
| Additional costs | $15,432 | $8,536 | $(4,458) | $(14,141) | $(10,524) | $(7,620) |
| Additional cost per person | $44 | $13 | $(17) | $(35) | $(40) | $(6) |
| Additional QALYs | −155.28 | −7.22 | 1.44 | 13.99 | 20.20 | 18.83 |
| $/QALY | Dominated | Dominated | Cost Saving | Cost Saving | Cost Saving | Cost Saving |
| **Cost savings (per $1 invested)** | | | | | | |
| | None | None | $6.87 | $13.99 | $14.91 | $12.97 |

HIT, health information technology; QALY, quality-adjusted life-year.

https://doi.org/10.1371/journal.pmed.1003389.t004

## Priorities and Strategies for the Implementation of Integrated Informatics and Communications Technology to Improve Evidence-Based Practice

*Bradley N. Doebbeling, MD, MSc,*[1,2,3] *Ann F. Chou, PhD, MPH,*[1,4] *William M. Tierney, MD*[1,2,3]

[1]Health Services Research & Development Center of Excellence on Implementing Evidence-Based Practice, Roudebush Veterans Affairs Medical Center, Indianapolis, IN, USA; [2]Indiana University Center for Health Services and Outcomes Research, Regenstrief Institute, Inc., Indiana University School of Medicine, Indianapolis, IN, USA; [3]Department of Internal Medicine, Indiana University School of Medicine, Indianapolis, IN, USA; [4]School of Public and Environmental Affairs, Indiana University Purdue University Indianapolis (IUPUI), Indianapolis, IN, USA.

**Table 1. Priorities, Barriers, and Strategies to Effective Implementation of Information Technology (IT) Applications Supporting Evidence-Based Practice and Management**

| Priority | Barriers | Strategies |
|---|---|---|
| *Priority 1*: | | |
| Support knowledge-based decisions | Information and provider overload | Research on prioritization<br>Research to include data on added value in terms of mortality and morbidity |
| | Lack of integration | National patient data record<br>Patient ownership of patient data, guidelines, and reminders<br>Common patient identifier<br>Common provider identifier<br>Integration across systems |
| | Operationalizing evidence | Research on what information users need<br>Basic research in managing information complexity<br>Alignment of research priorities with clinical management<br>Performance measures focused on how much evidence informs practice<br>Regular presentation of significant translation research findings to senior leadership |
| *Priority 2*: | | |
| Reporting/ evaluation functions | Threats to provider autonomy | Flexibility in decision support with required feedback about reasons for non-compliance and barriers to compliance<br>Local review of compliance with local solutions (tailored training)<br>Add autonomy in other areas: e.g., guideline input, self-review, link to reference materials |
| | Data issues | More data automation (e.g., link diagnosis to test)<br>Review and monitoring of data quality<br>Linkages to other information in electronic health record to eliminate duplicate entry |
| | Reporting complexity | Move reports off system—put analytical tools on a system separate from patient care system |
| | System resources | Simplify user generation of report |
| *Priority 3*: | | |
| Information system needs to evolve with health care system | Emphasis on provider-level activities and provider-entered data | Develop patient-centered data collection methods, core data elements, and system capacity for patient-based health data sets<br>Encourage basic research on capturing home care data for all stakeholders |
| | Emphasis on workload rather than care received by patient | Focus on outcomes (maintaining/improving functional status of the patient), not workload<br>Encourage "just in time" rather than "just in case" visits, collect interim data remotely |

*Adapted from discussion of the white paper by attendees at the Department of Veterans Affairs State-of-the-Art Conference in August 2004.*



https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2557136/pdf/jgi0021-0S50.pdf

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**Table 3. Information Technology (IT) Applications Supporting Evidence-based Practice and Management**

| Application | Utility | Support for EBPs |
|---|---|---|
| Population-based health care systems | These systems support creation of large, integrated databases of patient-specific information that allow real-time management of populations of similar patients | These databases may facilitate evaluation of new implementation strategies and provide insights into new associations between management approaches and health states |
| Computer-based decision support | Clinical decision support (CDS) may help health care providers utilize state-of-the-art medical knowledge in treatment decisions | CDS provides information management tools for the acquisition, manipulation, application, distribution, and display of appropriate patient- and task-specific clinical data to providers and patients that is conducive to correct, timely, and evidence-based clinical decision-making |
| Computerized provider order entry | Computerized provider order entry (CPOE) can help the tracking and analysis of health care processes | CPOE for tests, medicine, and procedures has the potential to decrease medical error, improve quality. It can help provider coordinate and collect patient-specific information |
| Electronic health records | Electronic health records (EHRs) would equip patients with personal health data, reliable patient-specific tools and resources | EHRs provide every patient and their caregivers with the necessary information required for optimal care. They can help patients to better understand the complexity of medical care and more readily participate in clinical decision-making and preventive health behaviors |
| Electronic health information exchange | This exchange ensures security, privacy, and system compatibility | The exchange between organizations would facilitate sharing patient information at the point of the care delivery to eliminate unnecessary testing, improve safety, and facilitate efforts to improve quality |

*Adapted from the Kaiser Permanente's Agenda for Clinical Information System Research.*[30]



https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2557136/pdf/jgi0021-0S50.pdf

# Developing an Informatics Team

made up of staff who understand the technical functioning of the clinical information systems— is one of the keys to successful implementation, adoption and ongoing use of a clinical information system, and seems to be frequently overlooked/undervalued.

**RESULTING VALUE/ROI AMBULATORY AREAS**

1. Depression screening
   We implemented the 9-question Patient Health Questionnaire (standardized depression screening tool) in all primary care sites to screen for depression and, with it, increased depression screening by 15-fold and diagnoses of depression by 23% (Palcisco et al., 2013).
2. Immunizations
   Immunization decision support was implemented for all pediatric immunizations as well as developed an automated messaging system to notify parents/guardians of adolescents due for immunizations, resulting in a 25% increase in adolescent immunizations (Hanson et al., 2007).
3. Pediatric hypertension
   Used EHR data to extrapolate isolated findings of under-diagnosed pediatric hypertension to expose system-wide under-diagnosis of hypertension in children and adolescents (designed as one of the top ten breakthroughs in stroke and cardiovascular medicine by the American Heart Association in 2007) Implemented clinical decision support to increase the diagnosis of pediatric hypertension by 50% (Bar-Shain et al., 2013).
4. Referral completion
   Developed Epic electronic health record-based processes to increase the 30-day referral completion rate from 48% to 63% throughout The MetroHealth System on all referrals. Resulted in
   - 6,700 additional visits and
   - $1 million in increased net revenue per month throughout The MetroHealth System
5. Hospital acinetobacter outbreak support
   By using a suite of electronic health record-based tools in support of an Acinetobacter (pathogenic bacteria) outbreak, the incidence of Acinetobacter in hospitalized patients was decreased by more than 60%.
6. Code status reconciliation
   The code status reconciliation in our EHR is used at discharge. This tool led to a 50% increase in the use of Do Not Resuscitate—Comfort Care and a 100% increase in the use of Do Not Resuscitate—Comfort Care Arrest—Do Not Intubate status in the transition from the inpatient to the outpatient setting.
7. Duplicate labs
   Implemented several duplicate lab clinical decision support tools that resulted in a 50% decrease in duplicate lab testing and saving of thousands of dollars in expenses annually (Noto et al., 2011).
8. Heparin errors
   After a sentinel event related to a heparin overdose, implemented a suite of electronic health record-based tools and redesigned a number of EHR processes related to heparin. In the three years since implementing these tools and changes, no heparin errors with patient harm have been identified.
9. System-wide health information exchange
   The MetroHealth System has conducted health information exchange more than 250,000 times and currently exchanges information thousands of times per day with other systems that have the same EHR, i.e. the Veteran's Administration, and the Social Security Administration.

   We have shown that when robust health information exchange occurs, about 80% of the time a test is not ordered that otherwise would have been ordered, and approximately 15% of the time, an inpatient admission does not occur that otherwise would have occurred (Kaelber et al., 2013).

1. Increase research grant funding.
2. Attract and retain trainees and attending physicians.

# Some questions Informatics teams ask

1. What is the current workflow?
2. What is the expected workflow?
3. How well does the EMR configuration support that workflow?


Not like this (*with gaps between the workflow and configuration*)...


... or this (*where the configuration is overbuilt*):

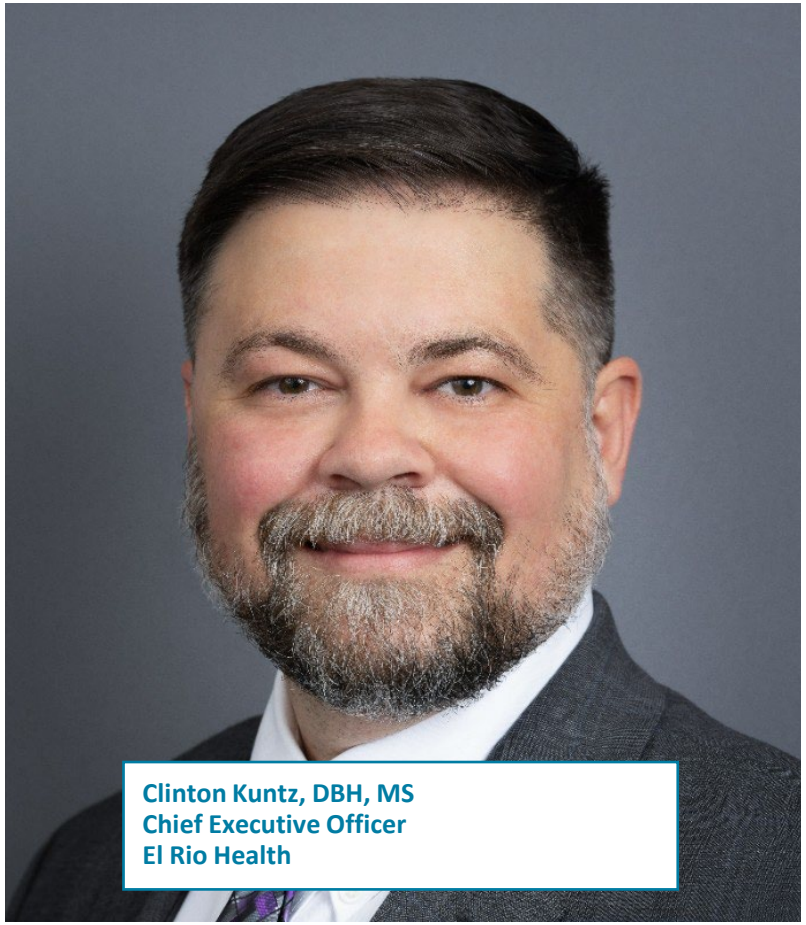

... or this (*where the configuration is confusing or vague*):

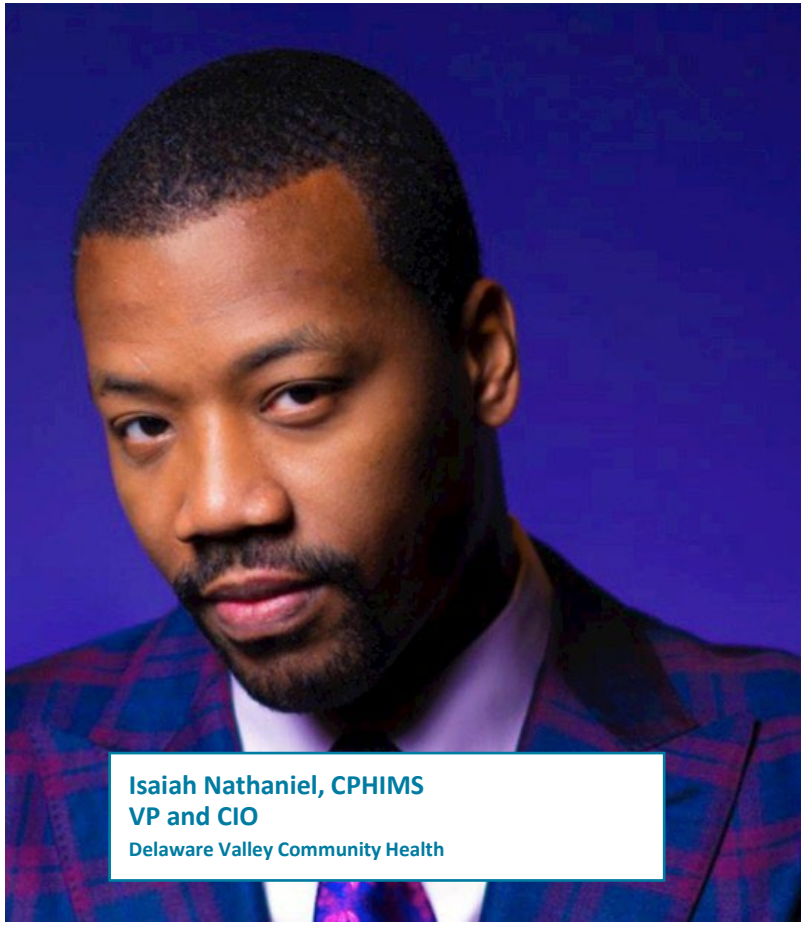

... or this (*where the workflow is confusing or vague*):

# The Learning Health System

## connecting health and care for the nation: a vision to achieve an interoperable health IT infrastructure

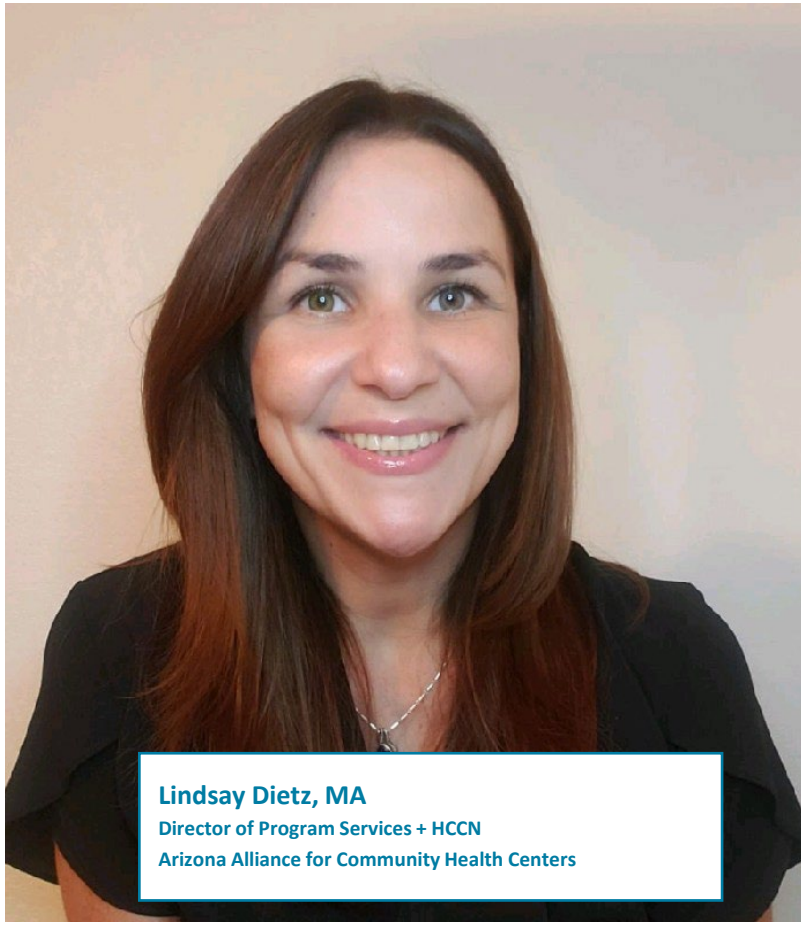
# Meet our Reactors



# Meet our Reactors

**Jennifer Williams, MAEL**
**CEO / CFO (prev.)**
**FQHC Resource Alternative /**
**Hardin County Regional Health Center**



**Lindsay Dietz, MA**
**Director of Program Services + HCCN**
**Arizona Alliance for Community Health Centers**

# What is the importance of Informatics to your health center/s?

# How does an informatics team bridge gaps in your health center/s?

# How does an informatics team's activities help finance and clinical teams?

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# Thank You!

# 1,001 Reasons Why You Should Invest in Your Informatics Team

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