



Harnessing EMRs / Health IT for Performance Measurement and Population Health: Some Challenges and Opportunities

Jonathan P. Weiner, DrPH

Professor of Health Policy & Management and
of Health Informatics,

Director, Center for Population Health IT (CPHIT)
The Johns Hopkins University, Baltimore Maryland, USA

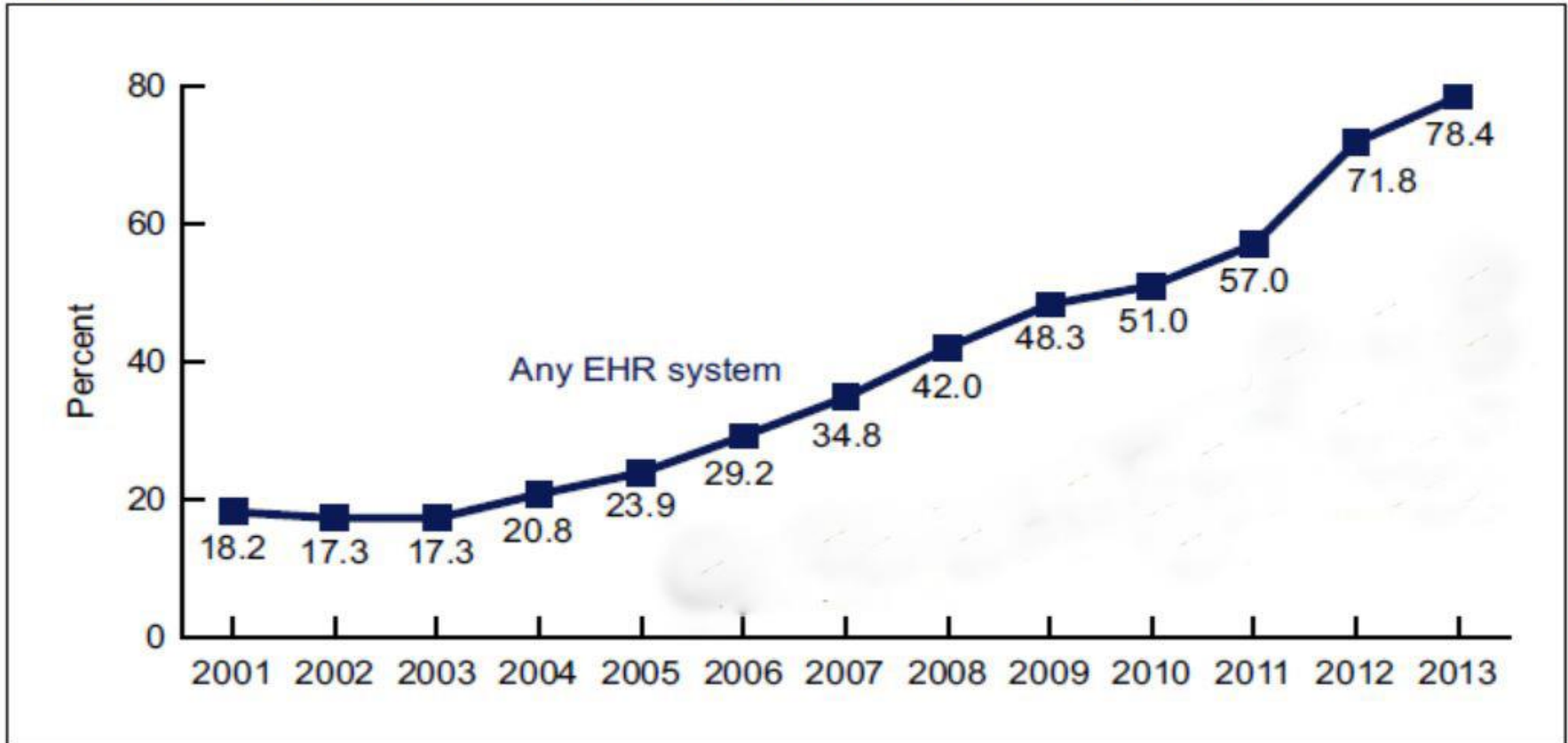
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Digitalization of medical care has reached a “tipping point”

The implications for measurement will be profound

Figure 1. Percentage of office-based physicians with EHR systems: United States, 2001–2013



Source: USDHHS, CDC-National Center for Health Statistics - 2014

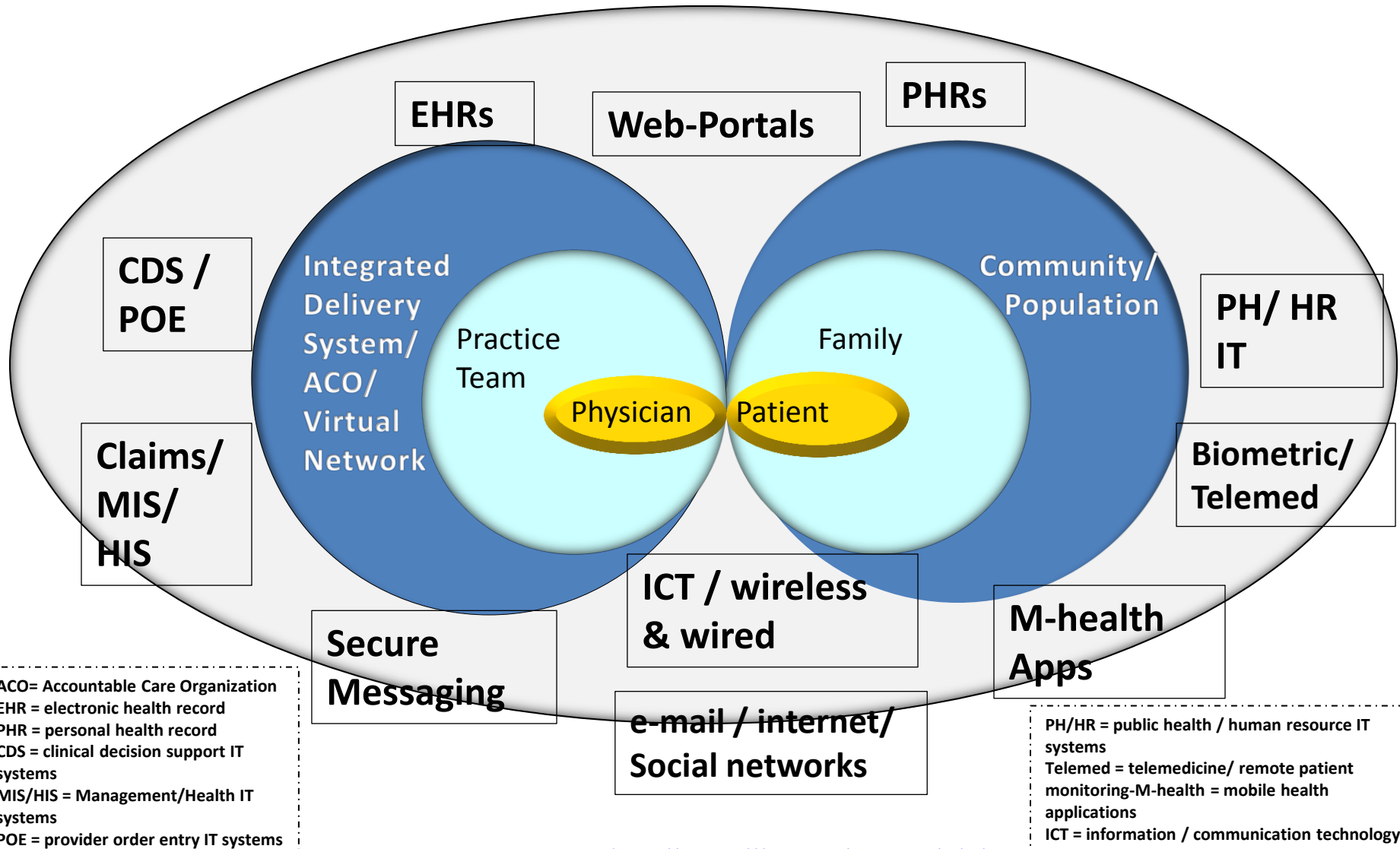


IN THIS PRESENTATION I WILL DISCUSS THE FOLLOWING AREAS

- The evolving *digital health milieu*
- *New paradigms* for EMR based performance measurement
- HIT as an enabler for *population health*
- Some preliminary thoughts about *HIT in support of measurement* for the All-Payer waiver



The new “digital health care milieu”



Source: Weiner, 2012 <http://www.ijhpr.org/content/1/1/33>

HIT is the core of the Accountable Care Organization (ACO)

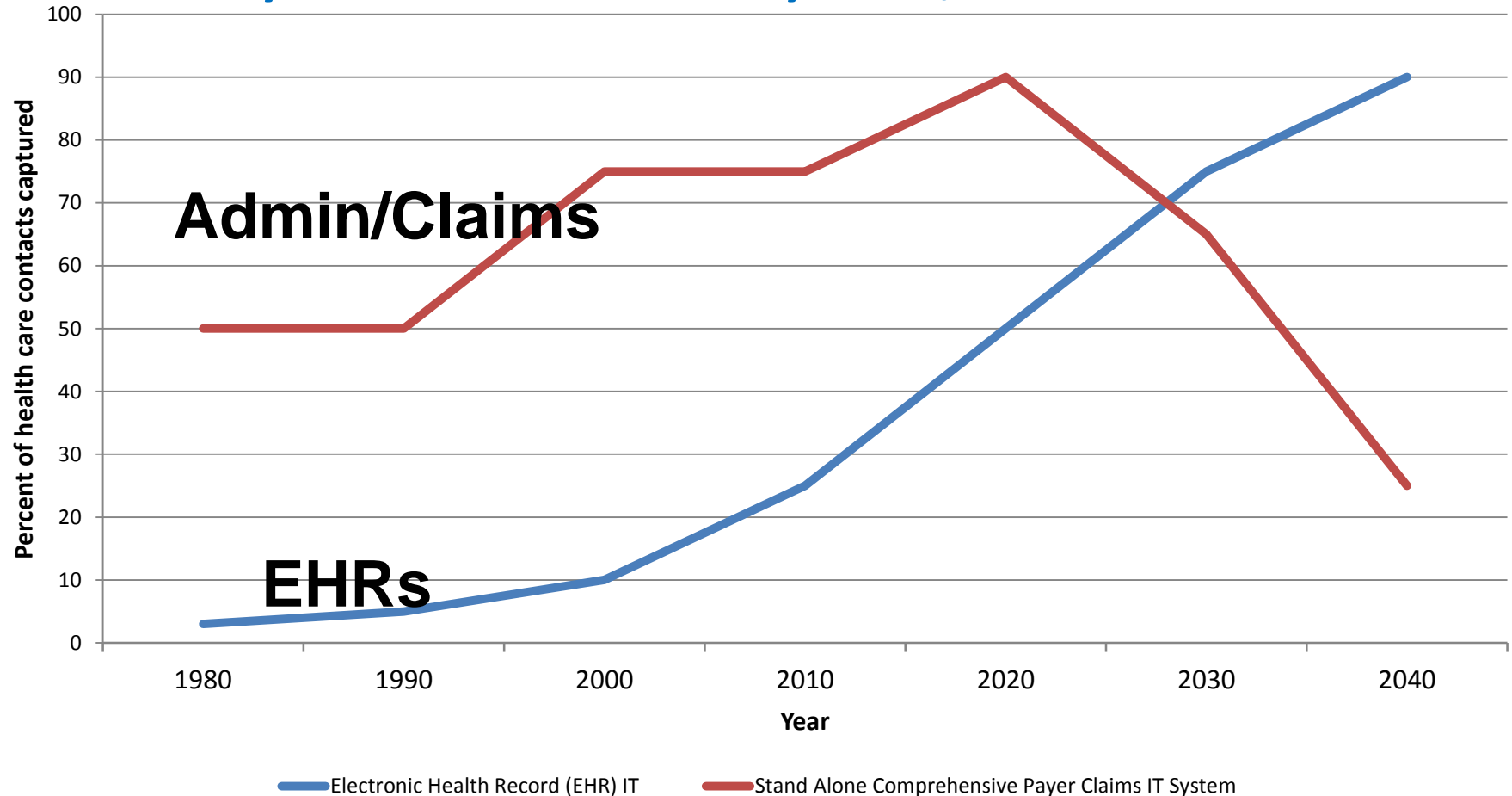


Source: Premier Healthcare Alliance



The shifting US “data economy” – the transition from admin/claims to EHR systems

Estimated % of health care contact information captured primarily by admin data vs. EHR systems, US 1980-2040



The Changing Axiom of the US Health Care “Data Economy”

	<u>CLAIMS/ ADMIN DATA</u>	<u>EHR/HIT/E-HEALTH</u>
<u>MOTIVATOR</u>	<ul style="list-style-type: none"> • REIMBURSEMENT • MANAGEMENT • P4P/QI/REPORTING 	<ul style="list-style-type: none"> • CARING FOR ONE PT • CARE WORKFLOW • P4P/QI/REPORTING
<u>ADVANTAGES</u>	<ul style="list-style-type: none"> • UBIQUITOUS • INTEROPERABLE • ACCURATE IF RELATED TO \$\$ • STANDARDIZED 	<ul style="list-style-type: none"> • CLINICALLY RICH • SELF DOCUMENTING • CONSUMER INFO
<u>DISADVANTAGES</u>	<ul style="list-style-type: none"> • LIMITED CLINICALLY • INACCURACY RELATED TO \$ • DATA HOLES EXIST 	<ul style="list-style-type: none"> • POOR INTEROPERABILITY • ACCURACY INCENTIVES ? • STANDARDS IN FLUX • DATA UNSTRUCTURED



There will be profound opportunities to use HIT to develop population-based performance measures for:

- Quality improvement for provider organizations
 - Real time (safety / care management)
 - Retrospective evaluation / QI
- Community / regional health monitoring and improvement
- Knowledge creation to improve effectiveness / outcomes (the “learning” health system)
- Improving efficiency through management / financing initiatives (e.g., P4P targets)



Review of data sources and types of quality / performance measures

Type of Measure

Data Source:

Denominator Process Outcome Pt-Cent. Cost

Electronic / HIT

PH records / registry	X				
Payer / provider HIS	X	X	X		X
EHR	X	X	X		X
CPOE (order entry)	X				
PHR /m-health /web-portal		X	X	X	
CDS (clinical support)		X	X		

Non-electronic

Paper medical record		X	X		
Surveys (mail/phone)			X	X	



A typology for HIT based electronic quality measures (“e-QMs”)

- 1) Translated:** Traditional (e.g., paper record and claims) measures translated for use on HIT platforms. (*Level-1*)
- 2) HIT-facilitated:** Measures that while not conceptually limited to HIT, would not otherwise be feasible. (*Level-2*)
- 3) HIT-enabled:** Measures that generally would not be possible outside of EHR context. (*Level -3*)
- 4) HIT system management / CQI:** Measures needed to implement, manage and evaluate HIT systems.
- 5) “e-iatrogenesis” / HIT safety:** Measures of patient harm caused at least in part by sub-optimal application of HIT.

See: *Weiner et al, April 2012 issue of International Journal for Quality in Health Care*
<http://intqhc.oxfordjournals.org/content/early/2012/04/05/intqhc.mzs011.abstract>



Examples of each type of e-QM

1) Translated: (Level-1)

- EHR version of existing NCQA/HEDIS/JCAHO measures (such as % with tests ordered)

2) HIT-facilitated: (Level -2)

- % of children > BMI of x receiving intervention
- % of entire population achieving BP below certain threshold

3) HIT-enabled: (Level -3)

- % of consumer generated web-based shared-care plans accessed by both generalist & specialists within 6 months
- % of in scope care that is routed through CDSS supported workflow algorithm
- % of PCPs who read key sections of specialists referral note



Examples of each type of e-QM - cont.

4) HIT system management:

- Attainment of EHR interoperability targets
- % of prescriptions via e-prescribing
- % of CDS alerts ignored by clinicians

5) e-iatrogenesis / safety:

- % of e-prescriptions that result in wrong drug



Applications of HIT for “*population health decision support*” within integrated delivery systems

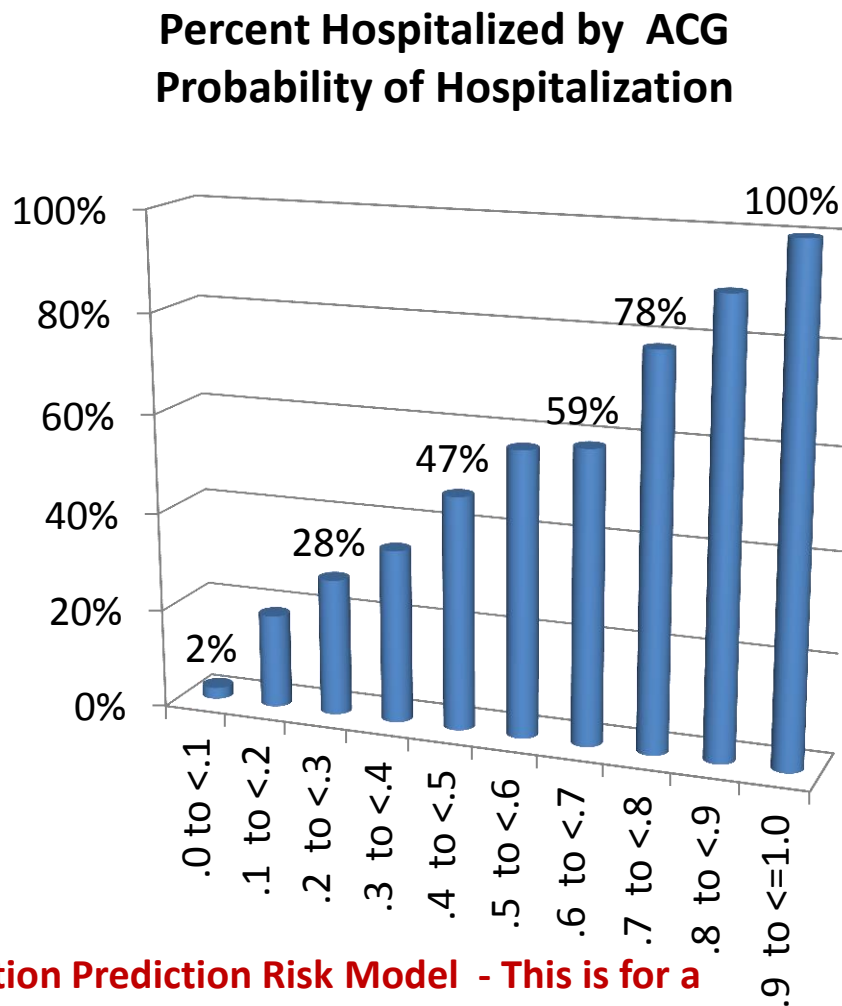
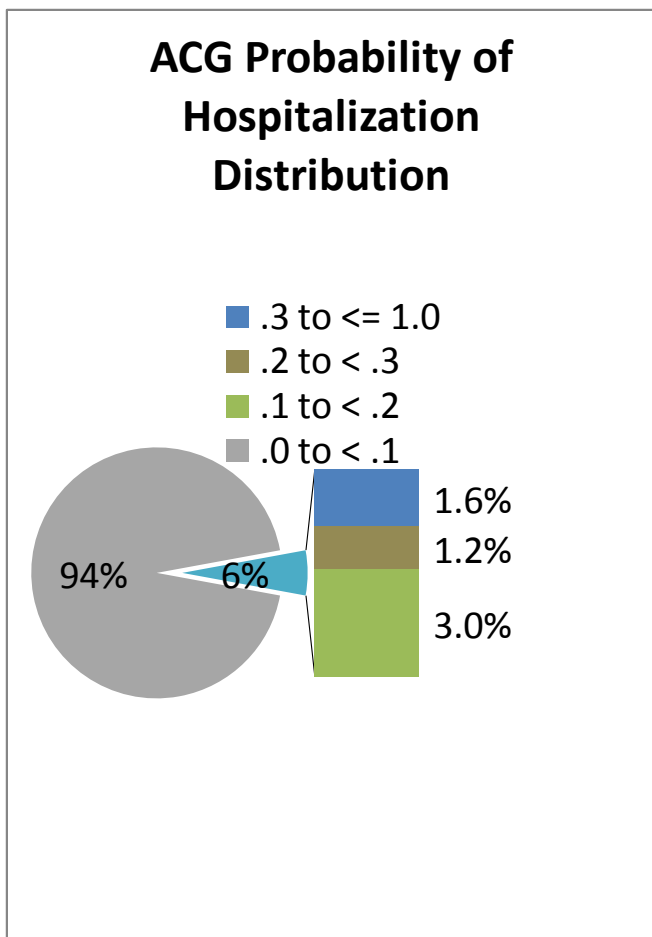
- Risk identification / stratification for targeting priority populations/patients
- Provider focused process improvement focusing on patient “denominator”
- Patient / consumer targeted care management using “e-health” / “m-health” tools.
- High level monitoring of outcomes/value of the entire population



Innovative uses of widely used Johns Hopkins ACGs population case-mix measure among the 300+ organizations in 16 nations that apply them (www.acg.jhsph.edu)



Using Predictive Models to Identify Patients at Risk for Future Hospitalization: Johns Hopkins ACG system



Scores Based on ACG Version 9.0 Hospitalization Prediction Risk Model - This is for a Medicaid Cohort enrolled in private health plans. (See www.acg.jhsph.edu)

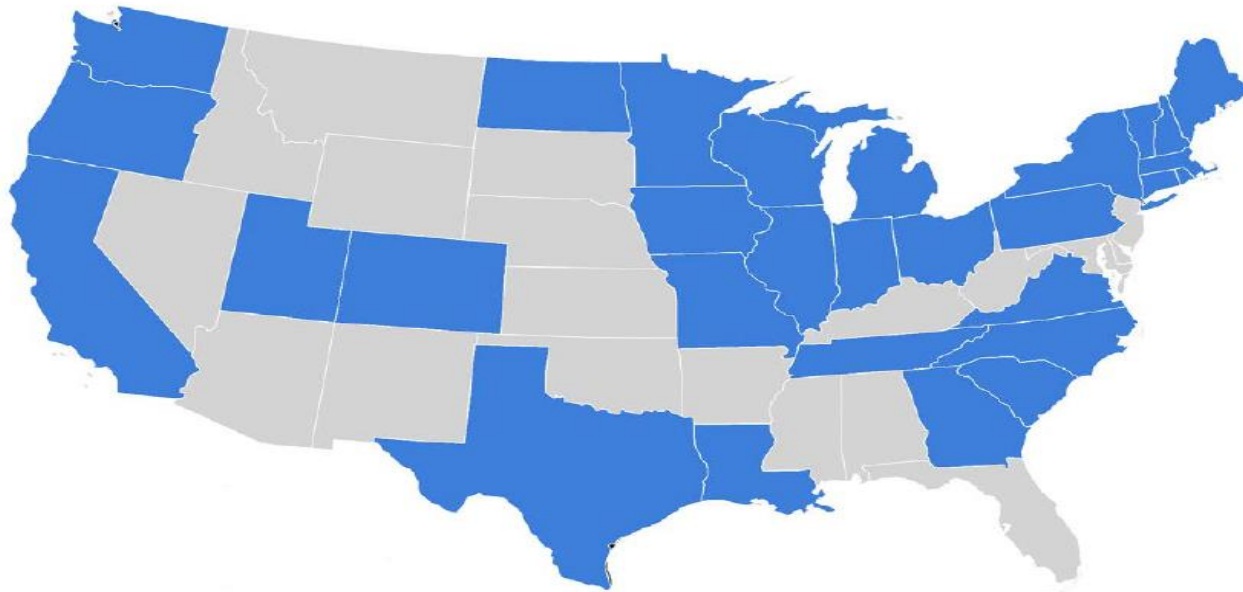


NQF certified “Total Cost of Care” (TCOC) Index developed by Health Partner (MN) using Johns Hopkins ACG case mix measure

TCOC Uptake Across the Country



HealthPartners



Since the NQF endorsement in 2012,

- 90+ licensees in 29 states (blue colored states).
- Plus several national and regional organizations.

www.healthpartners.com/tcoc

Updated: 4/25/2014

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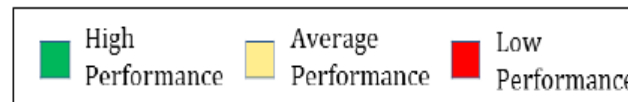


Use of “TCOC” on Performance Dashboard by Alliance of Community Health Plans (ACHP)

FIGURE 1: PRIORITY HEALTH TOTAL COST OF CARE DASHBOARD REPORT

Accountable Care Network	Risk Score	Total Cost of Care	Adm / 1000	Cost per Adm	Readm Rate	OP Fac Cost PMPM	OP Surg Cost PMPM	OP Lab Cost PMPM	ER Visit / 1000	Spec Cost PMPM	2011 Quality Index
Group J	1.25	0.89	0.92	0.98	1.02	0.73	0.82	0.9	0.74	0.94	
Group I	1.27	0.91	0.94	0.91	0.71	0.86	0.87	0.56	1.03	0.96	0.96
Group T	1.76	0.91	0.89	1.06	1.18	0.85	0.89	0.53	0.79	0.92	0.93
Group B	0.96	0.91	1.18	0.83	0.68	0.83	0.87	0.73	1.04	0.87	1
Group G	1.22	0.94	0.82	1	0.74	1.01	1.07	1.19	1.08	0.98	1.02
Group D	1.02	0.98	1.12	0.91	0.77	0.86	0.85	0.95	0.87	0.97	1.03
Group H	1.18	0.99	0.88	1.07	0.75	0.9	1.07	0.85	0.98	1.18	0.85
Group N	1.13	1.03	1.22	1	0.89	0.92	0.81	1.15	0.96	0.94	1
Group S	1.06	1.28	0.98	1.18	0.88	1.74	1.29	2.32	1.17	1.14	0.8
Group O	0.86	1.39	1.09	1.17	0.88	1.64	1.45	2.43	1.44	1.46	0.36

*Chart does not include full set of Priority Health network groups.



Scores that fall between measurements are shaded accordingly.



EHR and other HIT data offer new profound opportunities to measure risk beyond current claims based models (“e-ACGs”)

Clinical Domain

Symptoms/Physical Status
Diagnostics
Therapeutics
Medical History
Genomics

Consumer Domain

Socio-economic
Behavioral/Lifestyle
Family
Preferences
Insurance Status
Knowledge/Attitudes
Community Norms
Access to Care
Race/ethnicity

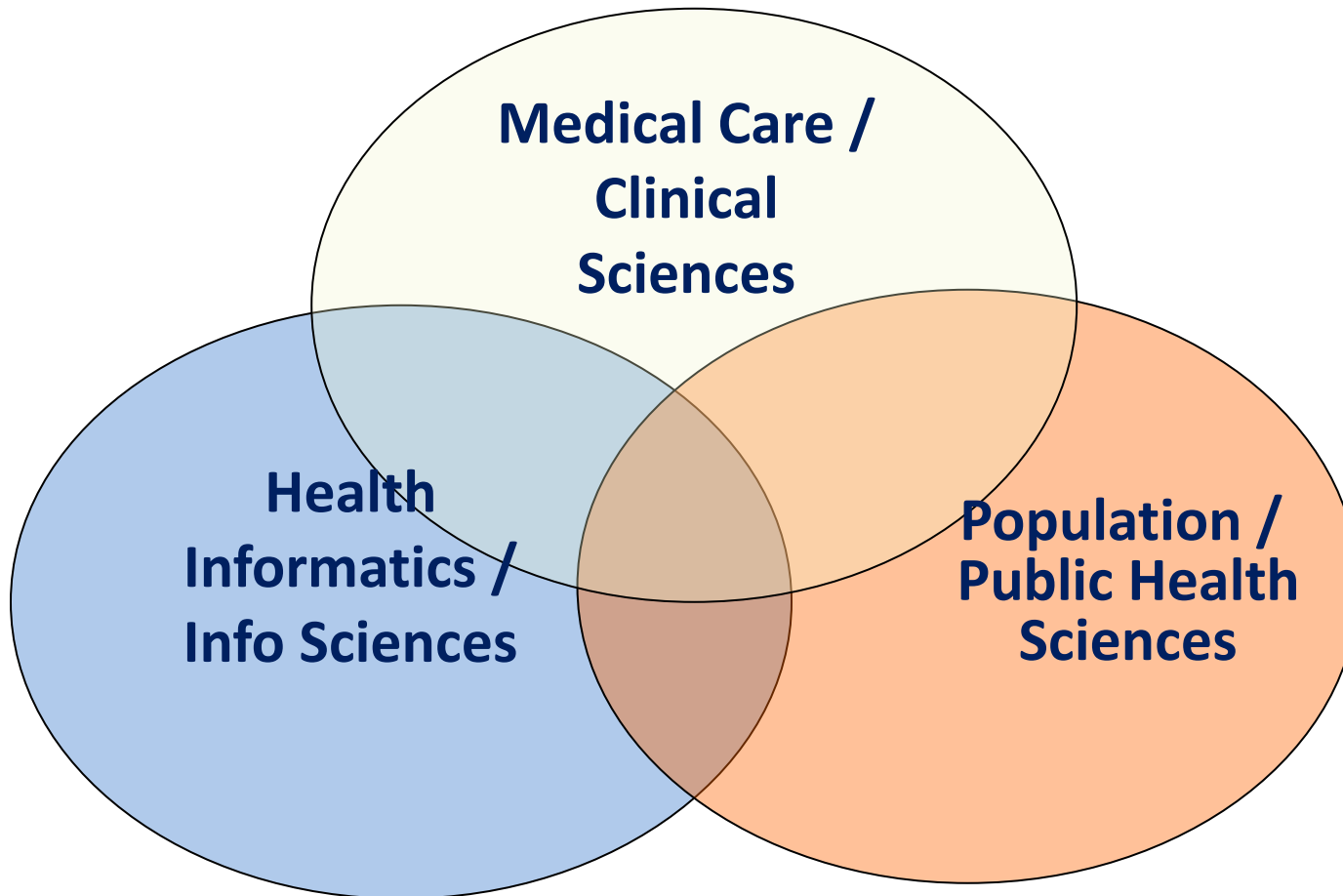


MAXIMIZING HEALTH (AND VALUE) FOR POPULATIONS

**HIT WILL MAKE IS FEASIBLE...
AND INEVITABLE**



Population Health Informatics: An Integration of Three Disciplines



Working Definitions

Population Health

“Population health comprises organized activities for assessing and improving the health and well-being of a defined population.”

Population Health Informatics (PHIT):

“Population health informatics is the systematic application of information technologies and electronic information to the improvement of the health and well-being of a defined community or other target population.”



A controversy: “Public Health” vs. “Population Health”

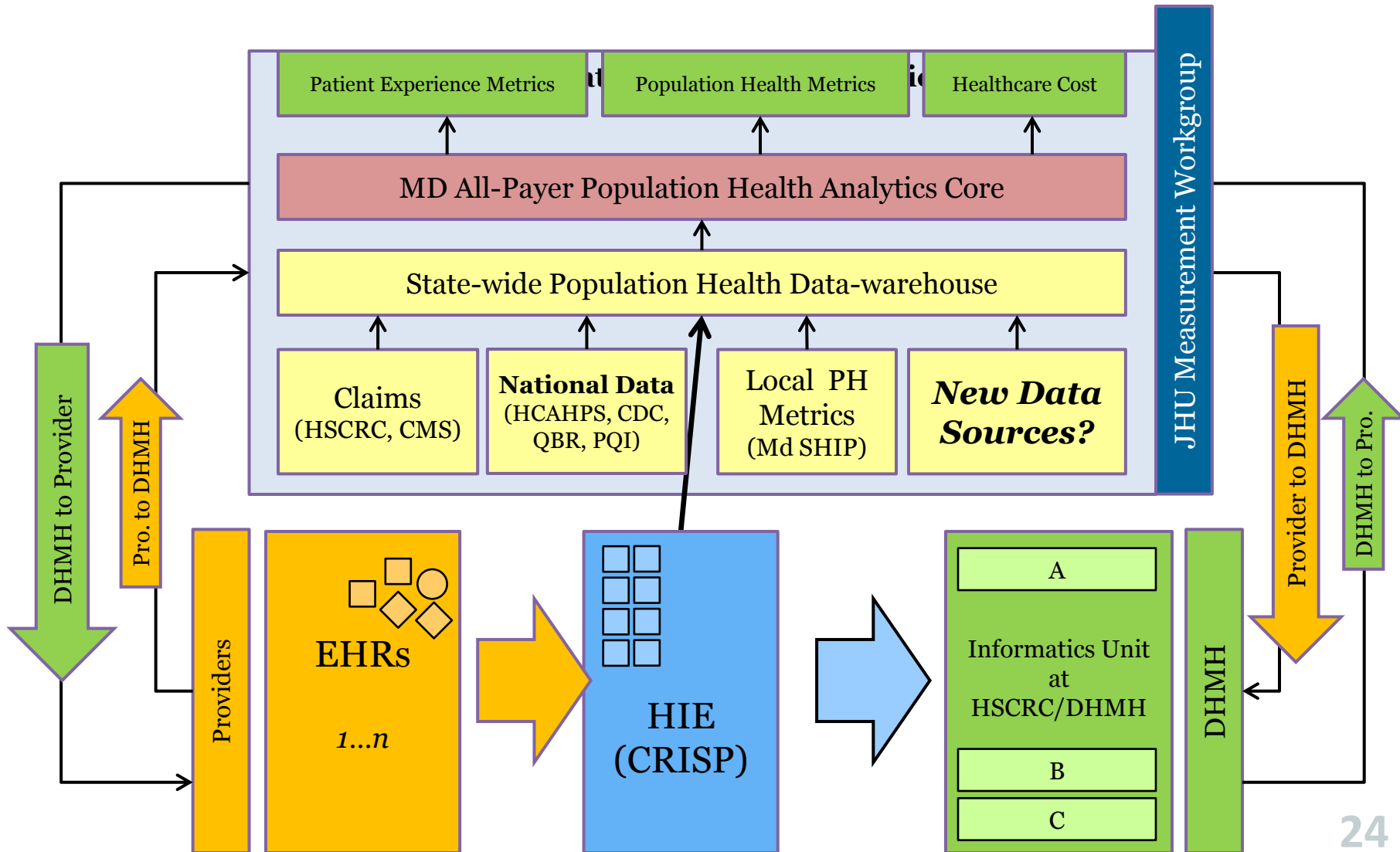


HIT WILL ALLOW GREAT ADVANCES IN POPULATION HEALTH

- Ways to integrate disparate “numerators” & “denominators” to define true populations and communities.
- Models and tools to help medical care systems move towards “population value” perspectives.
- Advanced tools for extracting and analyzing unstructured data from many sources.
- Standards and frameworks for integrating across EHR / IT vendors to achieve true community standards.



Conceptual model for the “Maryland Population Health Information Network” (M-PHIN) in Support of the new “All Payer” Population-Based Global Budget Hospital Payment System



New Measures JHU Team Could Potentially Help to Develop, Pilot and Evaluate

- State-of-the-art population health metrics that tap into a broader range clinical, public health, consumer and human service digital sources.
- New quality measures representing broader perspectives: Patient reported outcomes (PROs) / consumer wellbeing; Palliative care measures; Over utilization (aka “choosing wisely”).
- Innovative ways to integrate existing quality measures (QMs), EMR meaningful use (MU) metrics into the population framework. (We would work with CMS Innovations center re ACO, MU , PQRS and new “MIPS” - SGR replacement.)
- Expanding EHR sources to create: more timely measures (daily, weekly or real-time), more localized measures (integrating GIS data), more integrated measures (across providers)
- New predictive models for quality (and potentially care management) E.g., forecasting readmission, community residing consumer at high-risk.
- 50% of MD Patients will be captured within the Epic EMR system. Epic has indicated their willingness to work with us on this initiative to support cross-provider linked pop health metrics and management.



Goals of John Hopkins “Overuse” Measure Project

- To identify a set of potentially overused medical procedures (indicator procedures) that can be characterized with administrative claims
- To aggregate these indicators into a **single indicator of overuse**
- To test whether the index is associated with higher costs and worse clinical outcomes.

Source: J. Segal et al. See White paper at:

<http://www.hscrc.state.md.us/documents/md-mapsh/wp-sub/JHHS-PAU-White-Paper.pdf>

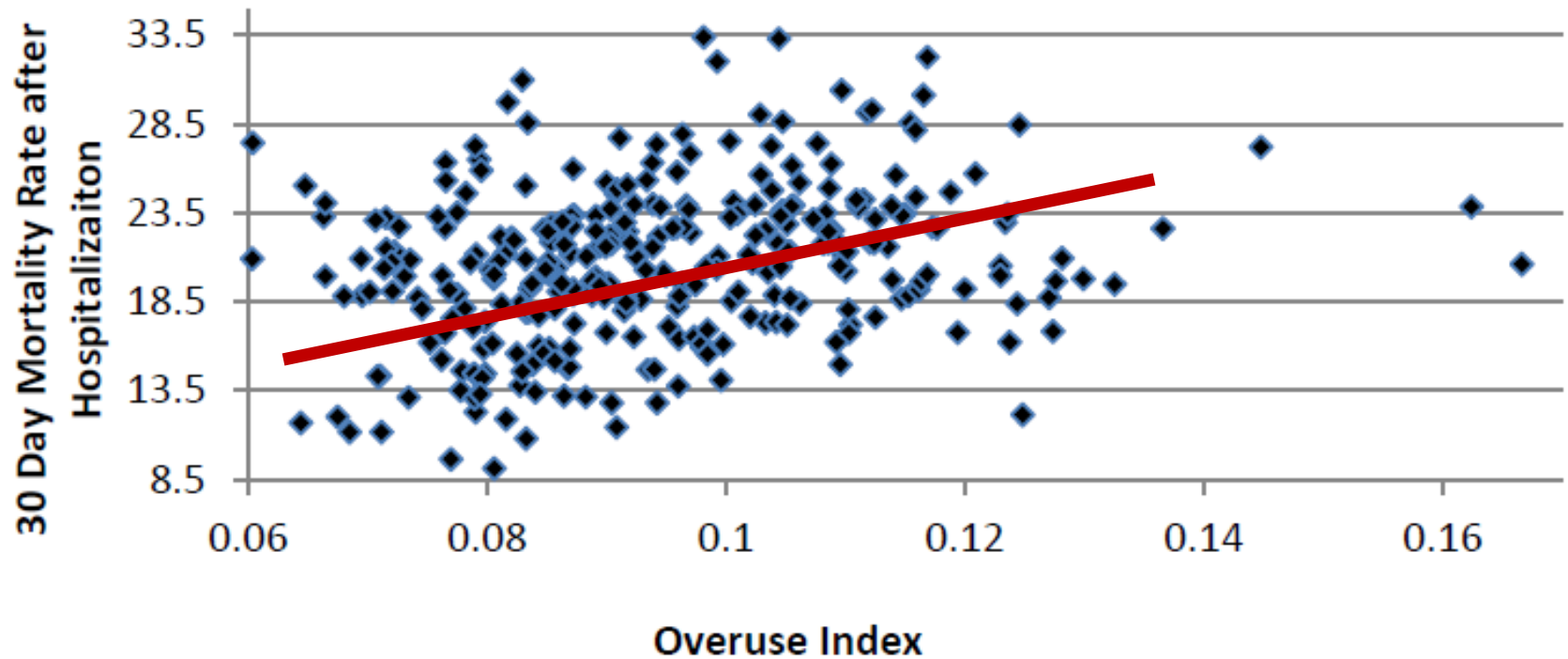


Example Potentially Overused Procedures (From JHU Overuse Index)

	Mean	Median	Interquartile Range	
	Per 1000			
Stress echocardiography in symptomatic or ischemic equivalent acute chest pain	33	22.7	2.7	45.5
Abdomen CT, use of contrast material	222	187	133	288
Thorax CT, use of Contrast Material	64.9	47.5	26.8	79.7
MRI Lumbar Spine for Low Back Pain	395	395	356	441
Sinus CT or antibiotics for uncomplicated acute rhinosinusitis	14	12.4	6.9	19.1
Diagnostic tests, like immunoglobulin testing, in evaluation of allergy	4.5	3.7	1.7	5.8



Figure 2. 30-Day Mortality Rate after Hospitalization vs. Overuse Index



Legend: Overuse Index generated using Medicare Parts A and B, 2008 for each of 306 Health Referral Regions

($r=0.27$, $p<0.0001$)



Some Challenges and Opportunities in the Measurement / Data Infrastructure Domain Facing the Maryland “All Payer Waiver Community”

- **Challenges:**

- There are many transformations that will be required to move from hospital/episode centric care to the population perspective.
- Balancing CMS requirement of traditional hospital/claims centric “legacy” metrics with future oriented innovative metrics and tools.
- Though most electronic data sources we propose to use are available, many technical and standardization challenges will be faced.

- **Opportunities**

- The “Stars are in Alignment” for what we propose. The all-payer, PCMH, and data systems are unique here in Maryland.
- Our new metrics can serve as a national (international?) model.
- The population centric “M-PHIN” Health IT system we propose is inevitable in the future. Maryland can be the first to build it.
- We have a unique set of partners at the table to really make this happen!



The new Johns Hopkins Center for Population Health IT (CPHIT) will be central to many of these advances

The **mission** of CPHIT (“see-fit”) is to improve the health and well-being of populations by advancing the state-of-the-art of Health Information Technology (HIT) and e-health tools used by private health care organizations and public health agencies.

CPHIT’s **focus** will be on the application of electronic health records (EHRs), e-health and other digitally-supported health improvement interventions targeted at communities, special need populations and groups of consumers cared for by integrated delivery systems (IDSs).

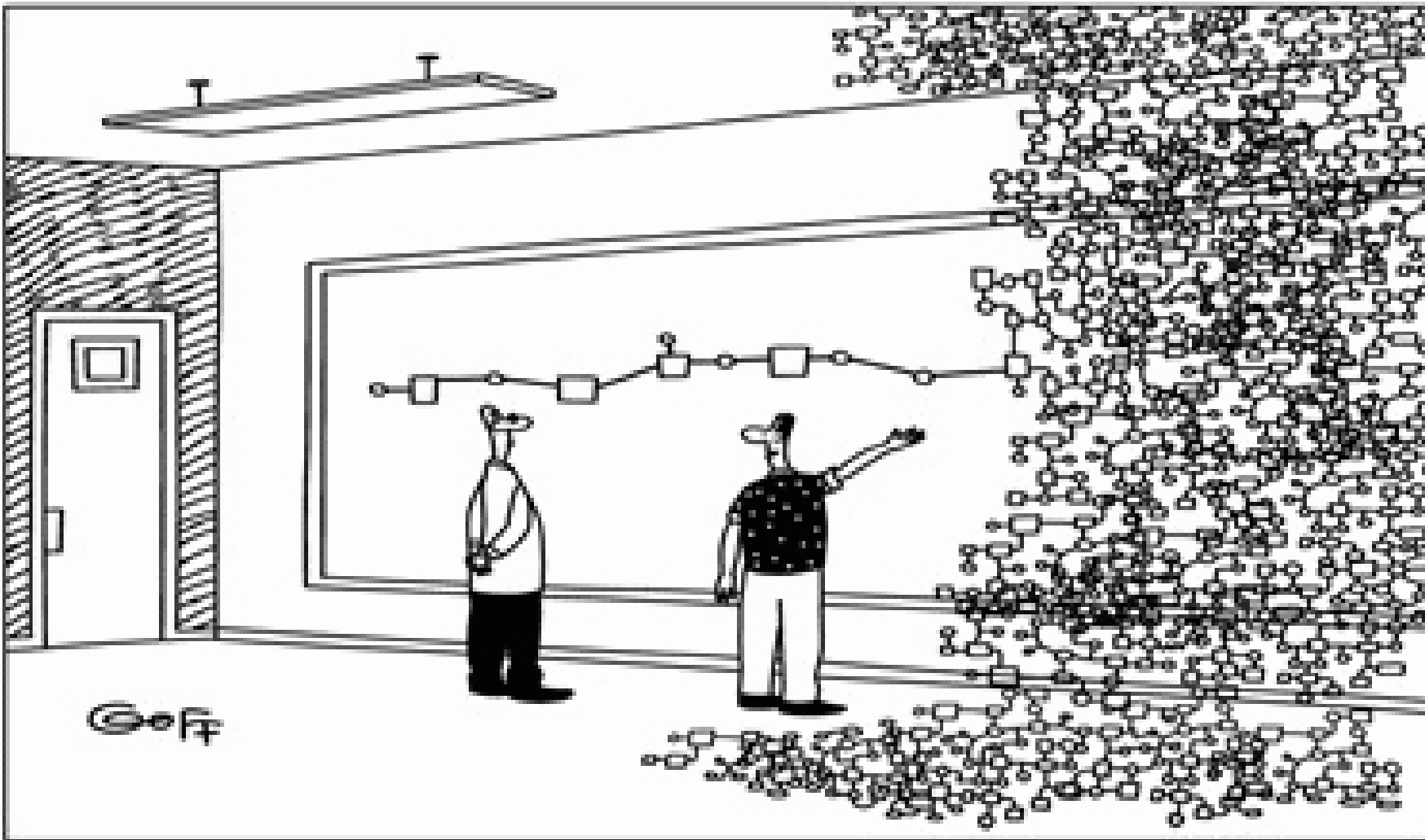


JHU - CPHIT Key R&D priorities

1. Health status and quality measures created from HIT systems.
2. Text mining (NLP) and pattern recognition tools.
3. Linking provider- and consumer-centric HIT systems.
4. e-Decision support to manage high risk populations.
5. Approaches for surmounting HIT interoperability.
6. Legal / ethical and policy frameworks for secondary use of HIT
7. EHR-based tools for IDS quality / safety improvement.
8. Integration of “community” data for pop-based interventions.
9. Standardized tools to support pop health IT/informatics R&D.



And while the “direction of travel” of key HIT trends is 100% clear, the journey may not be so simple



Further Information ??

Prof. Jonathan Weiner
jweiner@jhsph.edu, 410 955-5661

www.jhsph.edu/cphit

