The Importance of Predictive Modeling and Analytics for Health Care Reform and System Transformation

Jonathan P. Weiner, DrPH

Professor of Health Policy & Management & Health Informatics

Director Johns Hopkins ACG R&D Team

Director Center for Population Health IT

The Johns Hopkins University

(jweiner@jhsph.edu)

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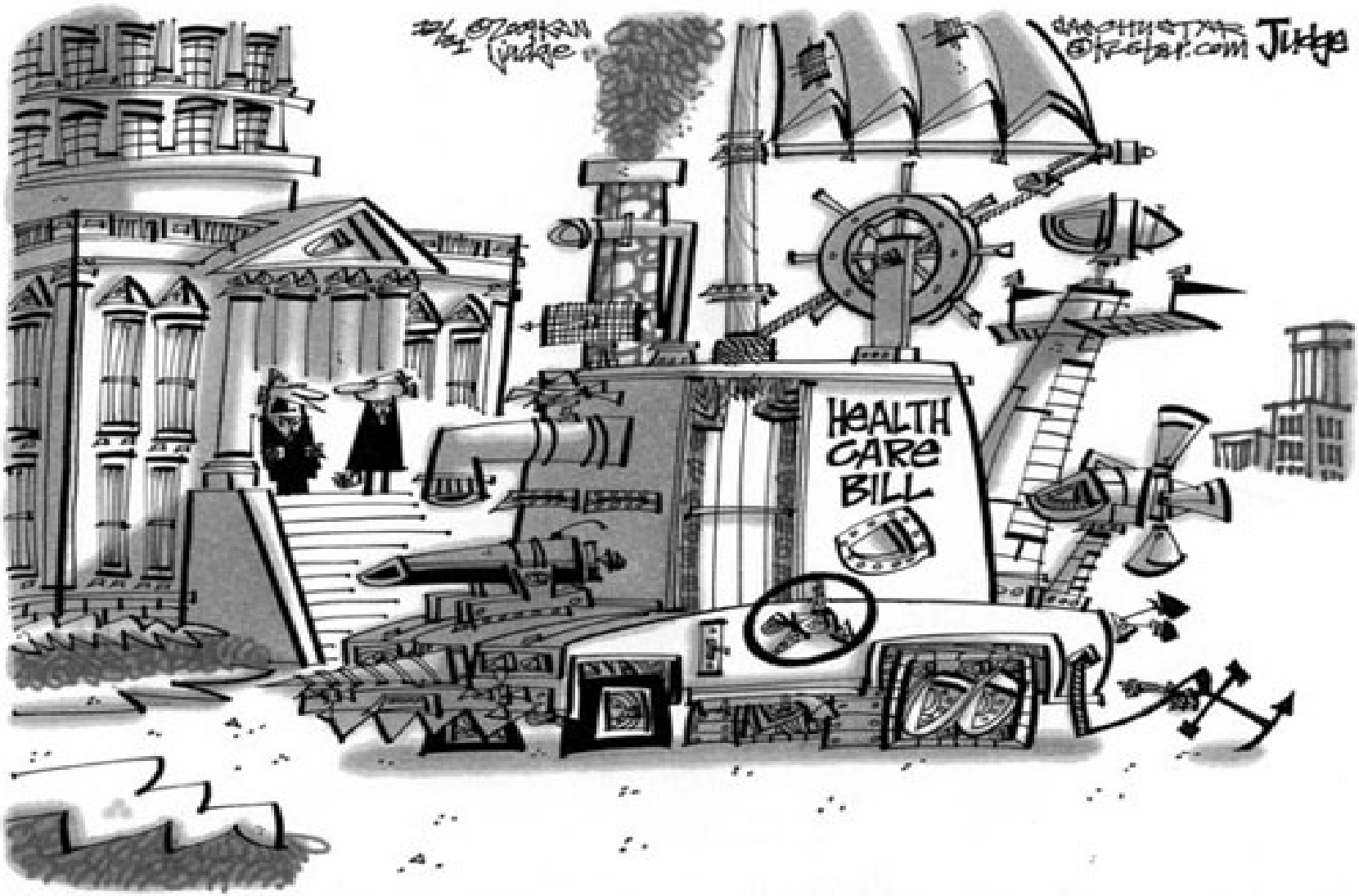
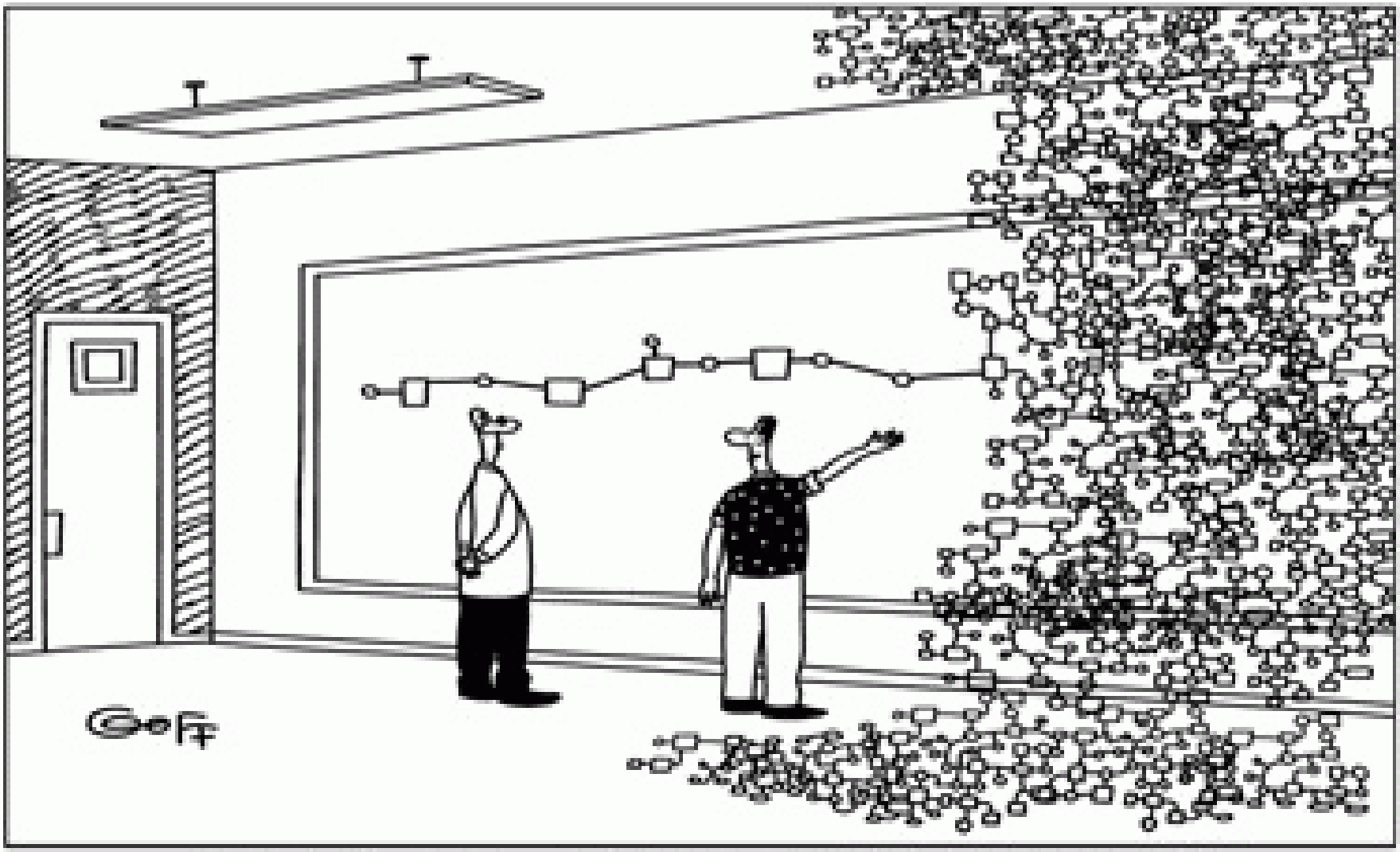
We're facing the greatest change in US health care in 45 years

Yes, the ACA legislation is a bit complex



Will Health IT and analytics solve our health care problems ?



"This is where the idea for the new EHR starts getting a little complicated."

During this session I will:

- Describe key facets of US healthcare reform and their potential intersections with the predictive modeling (PM) / risk adjustment (RA) domains.
- Discuss the impact of clinical analytics within Accountable Care Organizations (ACOs), Patient Centered Medical Homes (PCMHs) and other “transformed” delivery systems.
- Explore how RA/PM will interface with health IT and e-health.
- Suggest how PM / RA / clinical analytics could (and should) play key roles within the various streams of reform and transformation.
- Explore potential implications of health care reform for the PM / RA fields.
- Identify possible future issues and challenges facing the field.

Before We get Started: Some Working Definitions

Healthcare Information Technology (HIT)

The application of electronic health records (EHRs), IT and other "e-health" digital technologies to the delivery and management of health care.

Healthcare Analytics

The leveraging of electronically available health care data to enable actions that improve health system effectiveness, efficiency or equity.

Working Definitions – Cont.

Risk adjustment

Taking health status / risk into consideration for healthcare finance, payment, provider performance assessment and patient outcome monitoring.

Predictive modeling (PM)

Prospective (or concurrent) application of risk measures and statistical technique to identify “high risk” individuals who would likely benefit from care management interventions.

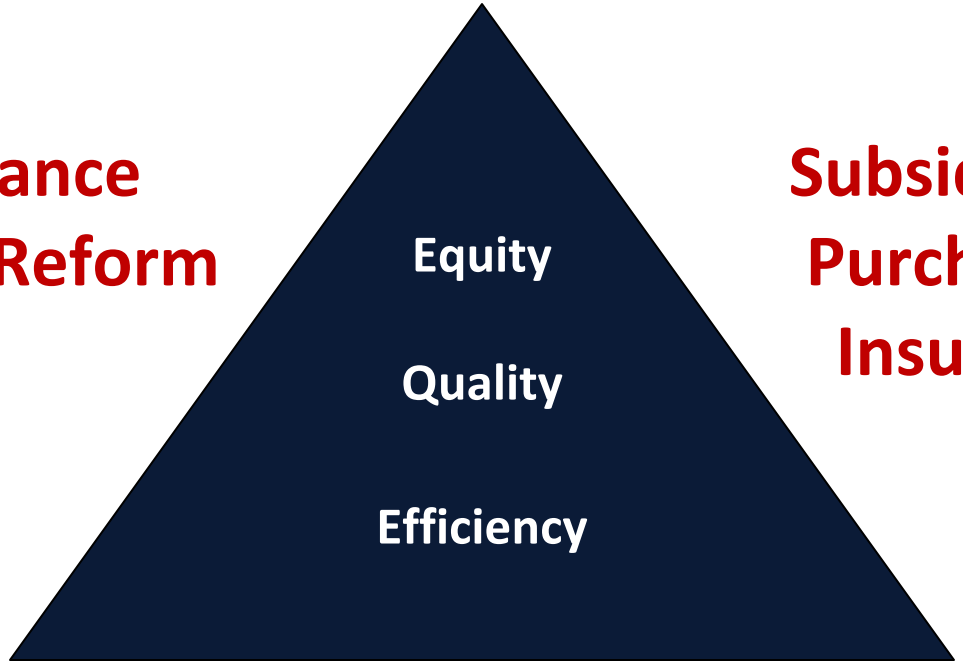
The Alphabet Soup of Health Reform

- ACA -- Affordable Care Act - formerly PPACA
- ACO – Accountable Care Organizations (aka Medicare shared savings program – MSSP)
- HIE (1) -- Health Insurance Exchange -- aka HIX
- HIE (2) -- Health Information Exchange -- aka regional health information organizations (RHIOs or HIOs)
- PCMH – patient centered medical home (aka primary care medical home)
- Meaningful Use (MU) – Office of the National Coordinator (ONC) for HIT / Center for Medicare/Medicaid Services (CMS) pay for performance (P4P) program to expand EHR use (aka HITECH)
- IDS – Integrated Delivery System (aka IDN)
- MCO- Managed Care Organization (aka private health plan)

Health Reform in a Nutshell

THE PATIENT PROTECTION AND AFFORDABLE CARE ACT

Insurance Market Reform



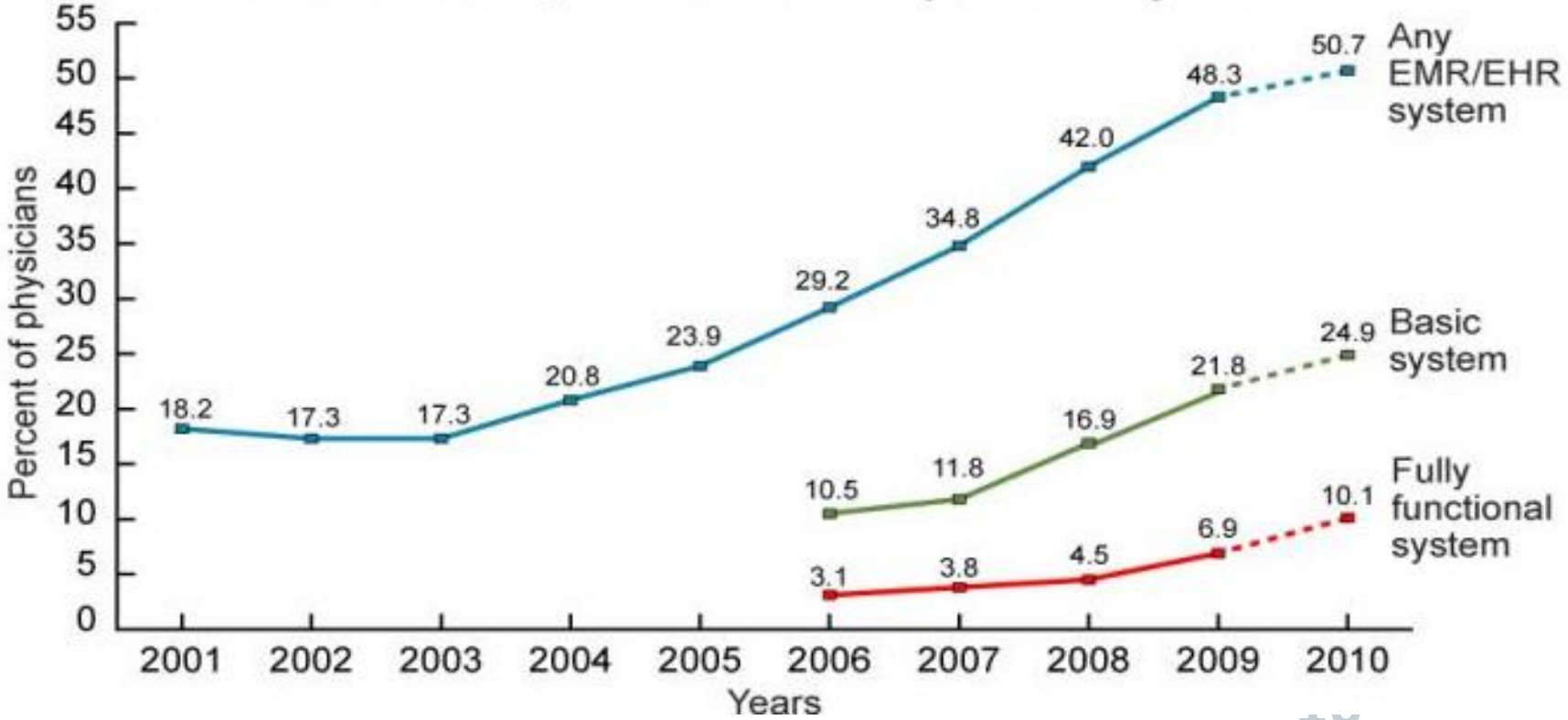
Subsidies for Purchase of Insurance

Delivery System Transformation

Connecting America for Better Health
eHR INCENTIVE PROGRAM

Reform (HITECH / MU) is leading to a rapid digitalization of health care

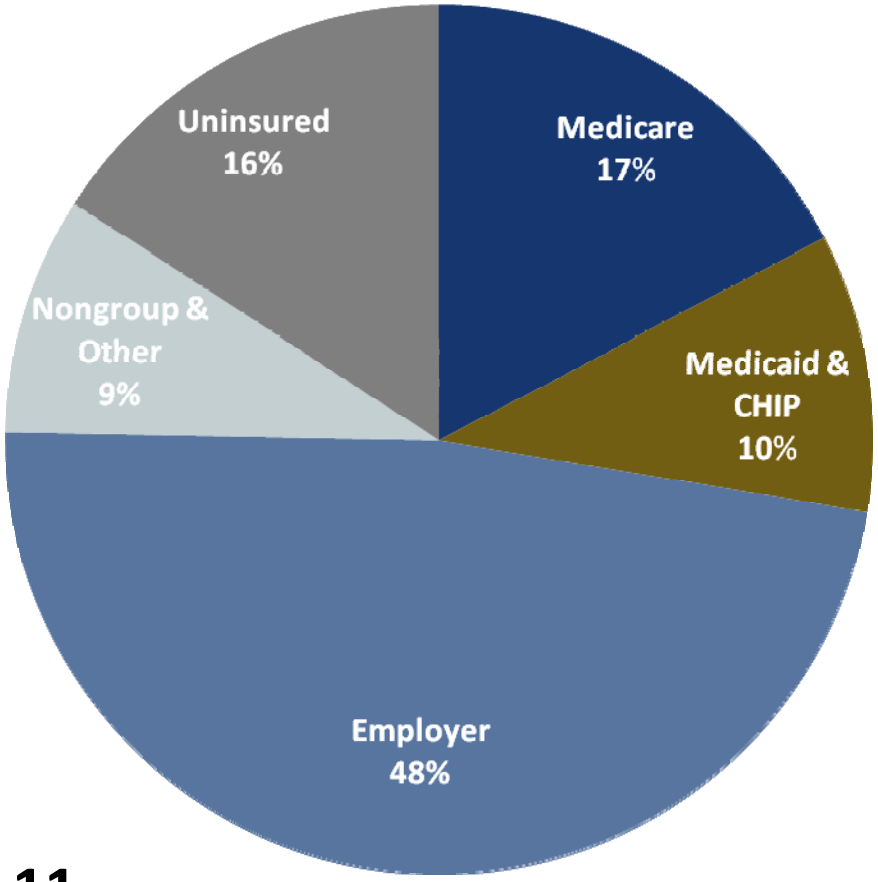
Figure 1. Percentage of office-based physicians with electronic medical records/electronic health records (EMRs/EHRs): United States, 2001–2009 and preliminary 2010



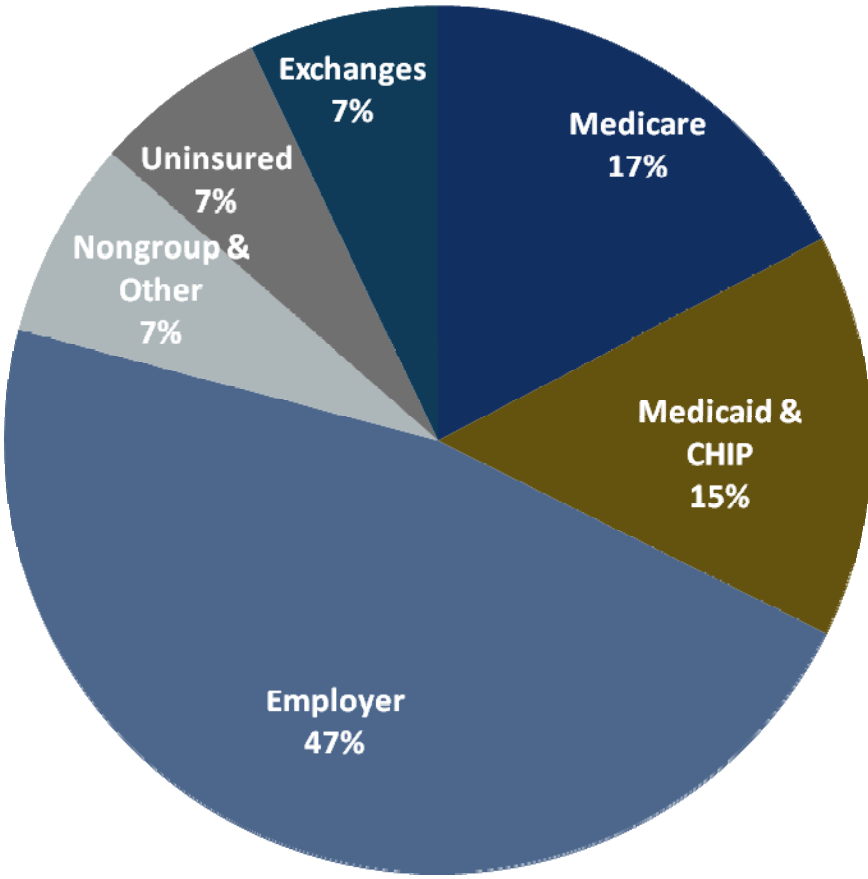
Source: NCHS/CDC 2011

The ACA's Expected Effects on US Insurance Coverage (Projected 2019)

Without Law



With Law



Source: Congressional Budget Office's 3/20/2010

How PM / RA will be applied to covering the uninsured

- Premium adjustments to account for varying risk within plans comprising health insurance exchanges (HIE).
- As part of Medicaid expansion (Most Medicaid states use risk adjusted capitation.)
- To help private plan actuaries better manage within the new rating environment.
- To regulate / monitor small group / individual market outside of exchange.

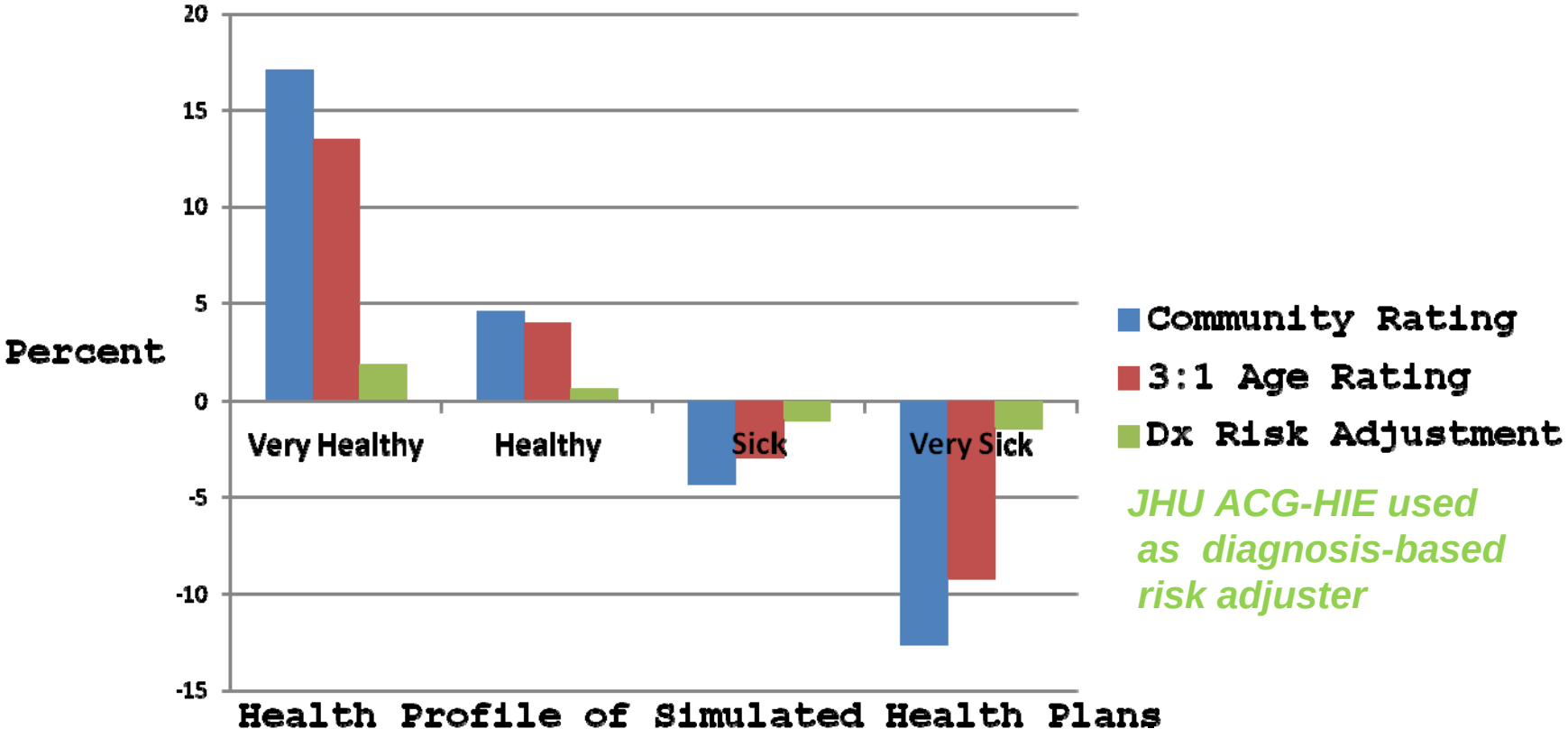
Why there will likely be adverse selection within the HIE and outside the exchange

- The ACA mandates that “risk” rating be based only on:
  - 3 to1 age rating “bands” (and not gender)
  - Family composition, geographic region, smoking status (1.5 to 1)

- Consumers with different levels of medical need and differing levels of federal subsidy will often have multiple choices between:
  - alternative plans within the exchange
  - alternative benefit packages (the “metallic” levels)
  - between plans inside and outside the exchange

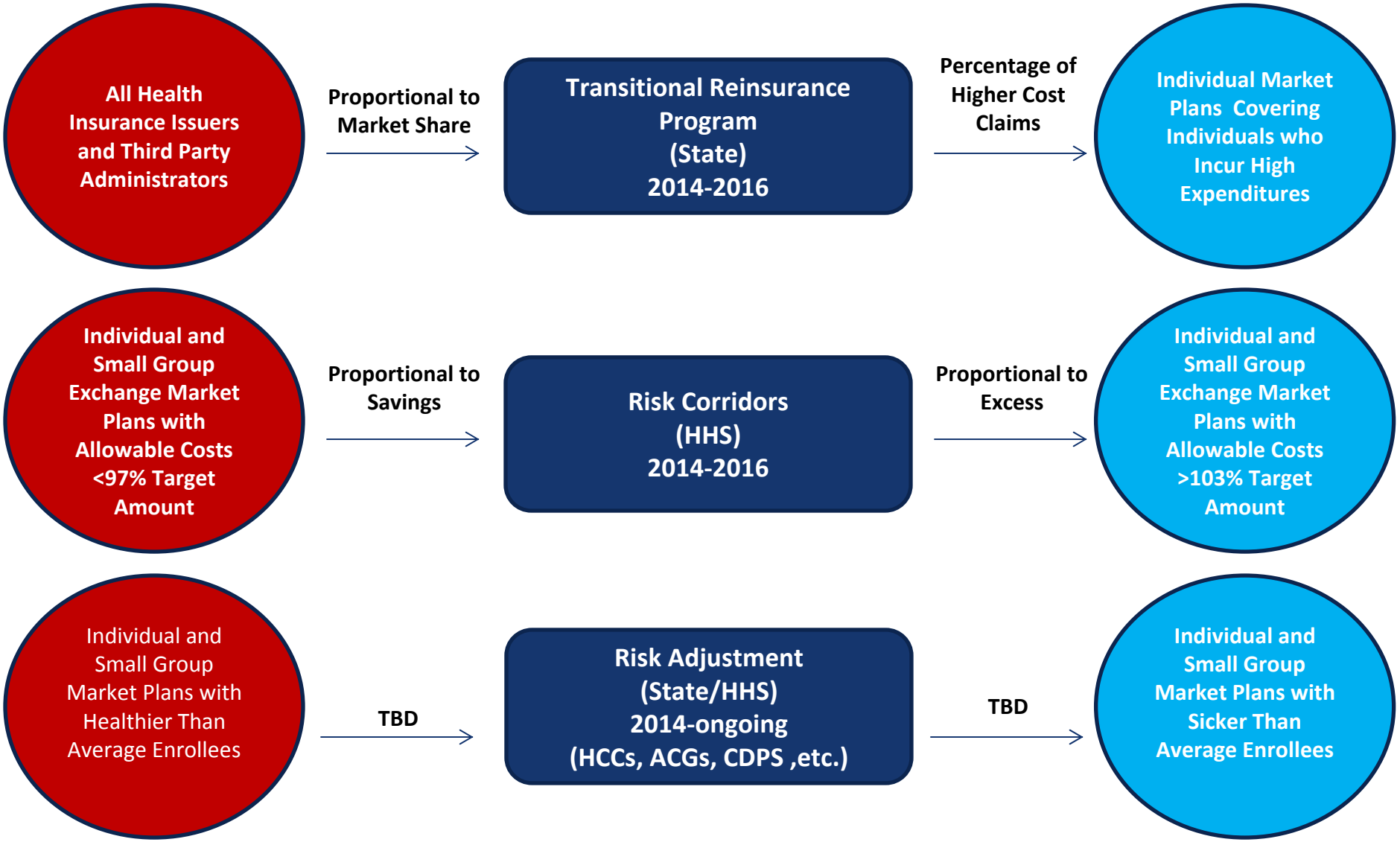
Risk adjustment will be essential for HIEs given impact of even modest selection bias across contracting health plans

Average % over and under-payment for 25 simulated health plans of 50,000 members each with varying levels of enrollee risk.



From papers in progress – Johns Hopkins University.

ACA Regulations for Using Risk Adjustment, Risk Corridors and Reinsurance Provisions within HIEs



Source: Authors' analysis of Sections 1341-3 of the Patient Protection and Affordable Care Act of 2010. From Weiner et al Paper in Final Revision Health Affairs.

The ACA's risk adjustment provisions for HIEs

- ACA calls for 3-phase approach to risk adjustment:
  - Temporary reinsurance
  - Temporary risk corridors
  - Ongoing diagnosis based risk adjustment (Feds will provide version of CMS HCCs, States can also use ACGs, CDPs or other well tested systems). Will also apply to non HIE small/individual market plans.

- Other regulations to limit product differentiation/selection:
  - Standardized benefit packages
  - Regulation of MLRs
  - Mandatory coverage of certain preventative health services

The Road to "Accountable Care" Transforming Health Care Organizations Will Require Several Paradigm Shifts

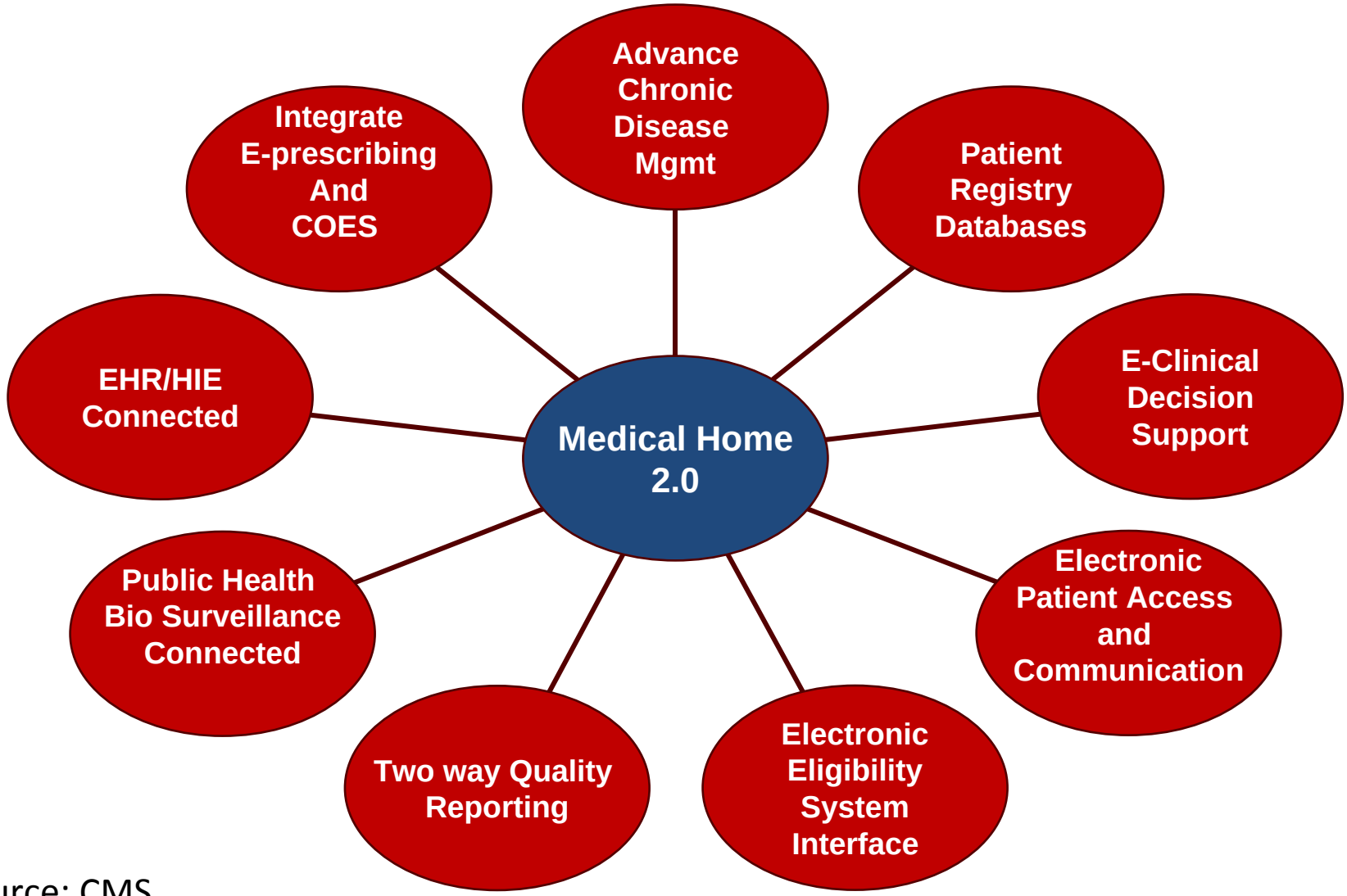
CURRENT	TRANSFORMED
Fragmented Care	Coordinated /Integrated Care
Provider Centric	Patient / Population Focused
Payment for Volume / Units	Payment for Value / Outcome
Individual Facility Focused	Care System Focused
Disease oriented / Acute Illness	Wellness / Chronic co-morbidities
Limited Basis for Clinical Action	Evidence-Based Care /Learning Organiz.

What is an Accountable Care Organization?

ACOs are a consortia of "accountable" providers with the legal /administrative structure to receive and distribute incentive payments to participating providers and to help integrate / coordinate care. ACOs are part of ACA and focus on patients insured by the Federal Medicare program. They also build on the PCMH model and make use of the decades of lessons from large "Integrated Delivery Systems."

Source: Premier Healthcare Alliance

CMS's Vision of an Advanced Medical Home



Source: CMS

Understanding and adjusting for co-morbidities will be key to managing outcomes and resources within ACOs and PCMHs

# Chronic Co-morbidities	% Pop.	Relative Cost (Per Pt.)	Est. % of Total Medicare Costs	Avg. # Unique MDs/Yr.	Avg. # Filled Rx / Yr.
5+	20%	3.2	66%	13.8	49
3-4	27%	.9	23%	7.3	26
0-2	53%	.1	11%	3.0	11

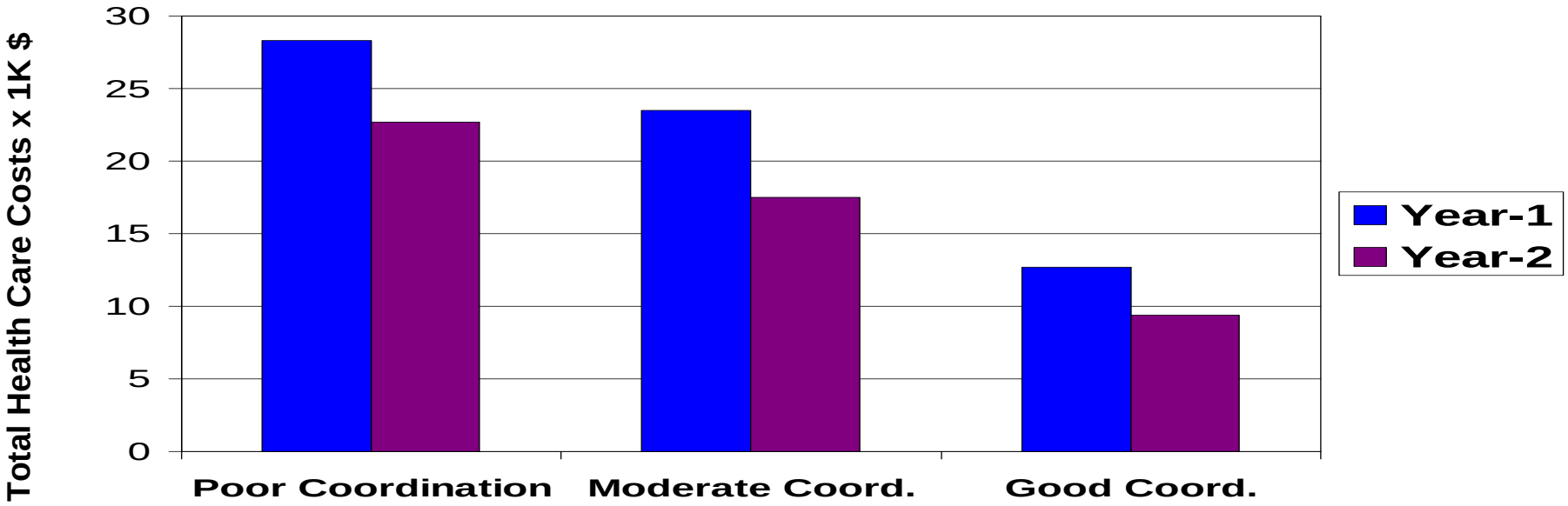
Data Source: G. Anderson et. al., Johns Hopkins Univ. (Derived from Medicare claims and beneficiary surveys.)

The applications of predictive modeling / risk adjustment within ACOs & PCMHs will include:

- **Financing, Payment, Planning**
  - Allocation of budgets
  - Service targets
- **Provider Performance Assessment**
  - Profiling / Reporting
  - Pay-for-Performance
- **Quality**
  - Quality improvement
  - Quality monitoring / "Dashboard"
- **Care Management**
  - Identification of high risk patients
    - Disease management
    - Case management
  - Population health monitoring
- **Research and Evaluation**
  - Effectiveness Research
  - Impact of interventions

Case Study: Using analytics to monitor achievement of "coordination" (and impact on $) within an ACO

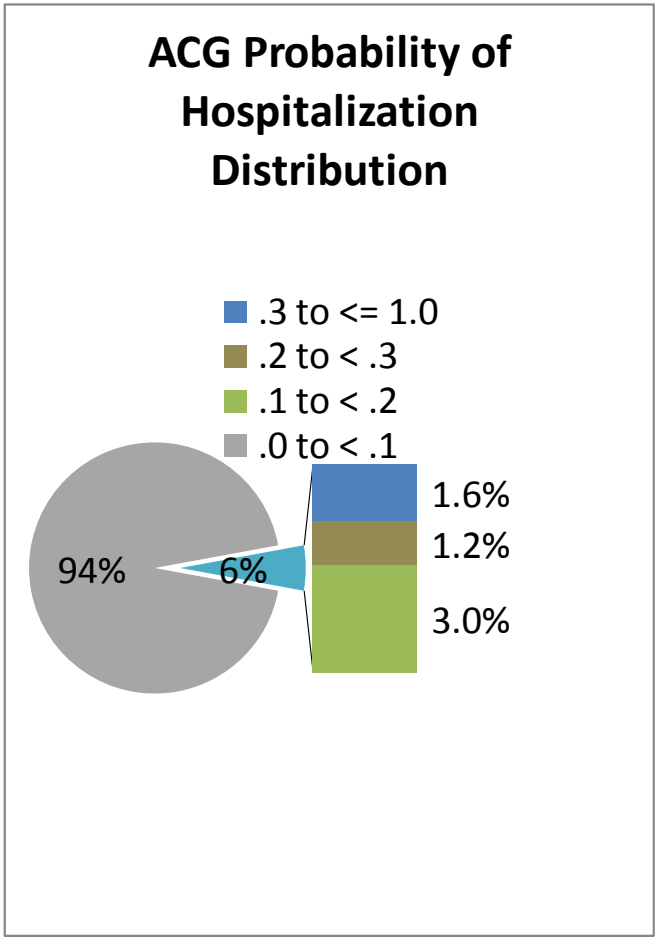
Cost of care (year 1 and 2) for high morbidity persons by achievement of "coordination" in year 1

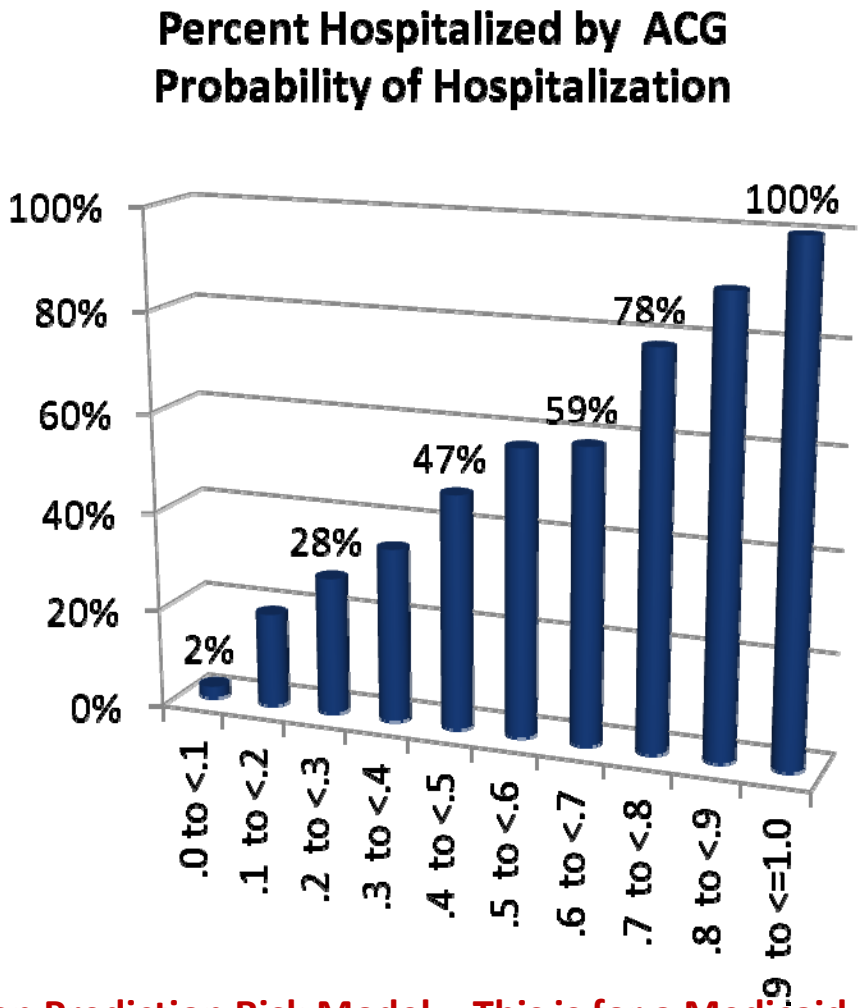


Coordination levels measured by Johns Hopkins ACG Version 9.0.

Year-1 coordination markers include: count of unique MDs, presence of PCP, presence of "majority source." Analysis based on 418,000 health plan enrollees in 2005/06. This analysis is case-mix adjusted and includes only persons identified in (Yr-1) as being "high morbidity" based on ACGs.

Case Study: Using Predictive Models to Identify Patients at Risk for Future Hospitalization





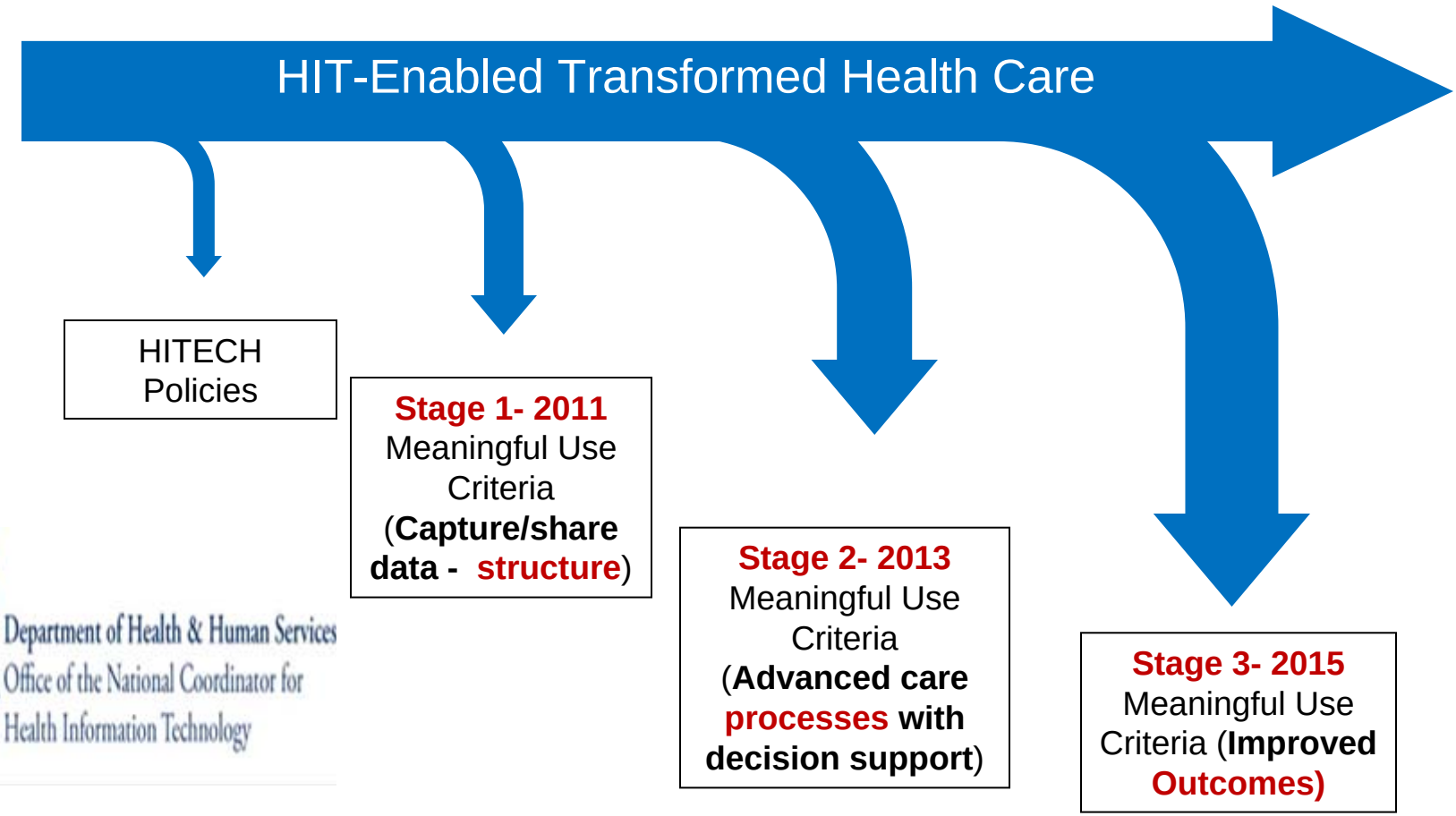
Scores Based on ACG Version 9.0 Hospitalization Prediction Risk Model - This is for a Medicaid Cohort enrolled in private health plans. See K.Lemke et al Medical Care in Press

Electronic Health Records, "Meaningful Use" and the move to EHR-based PM

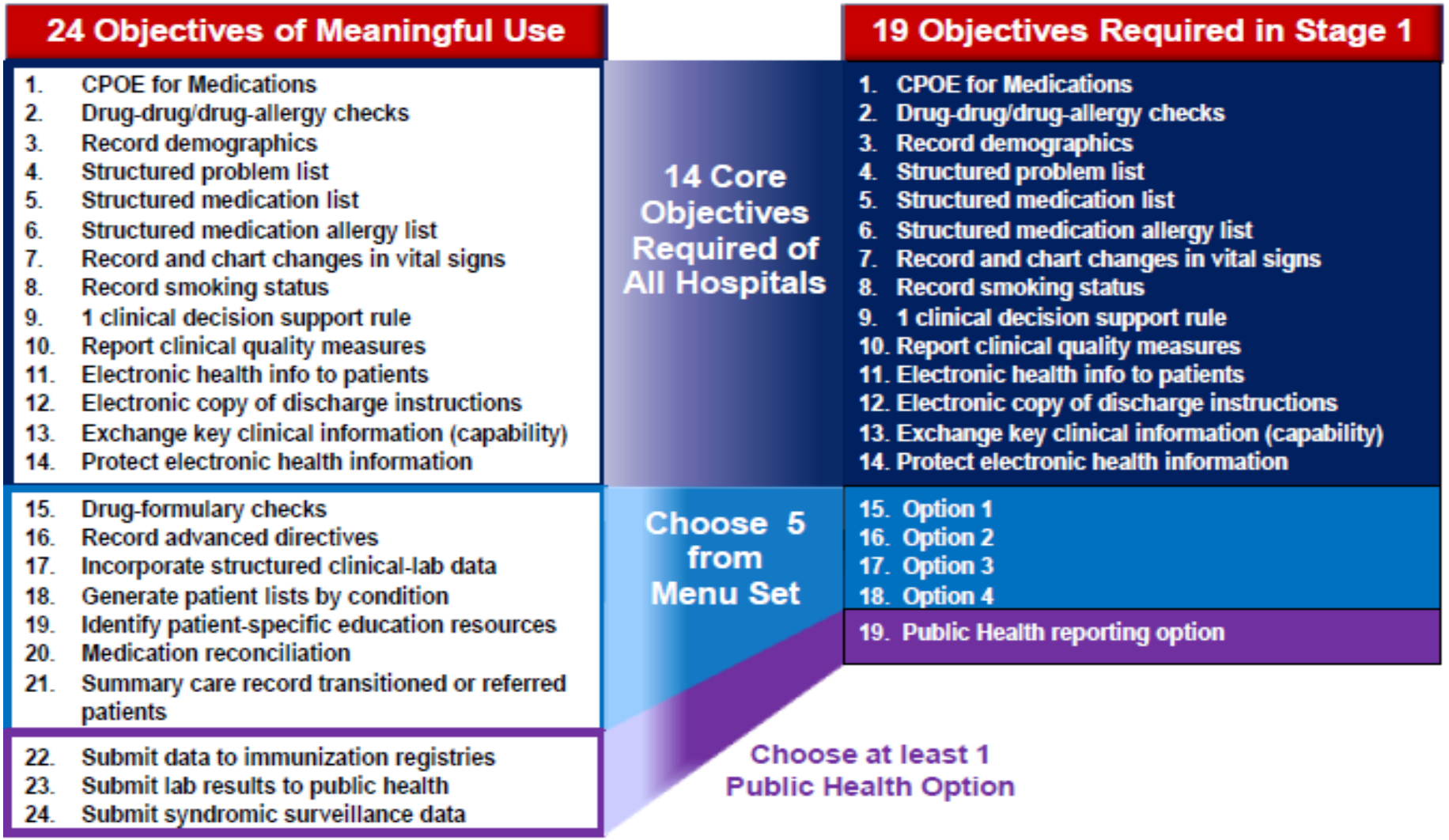
("e-PM")

The phases of "*Meaningful Use*"

Risk adjustment will be key for stage 2 and 3

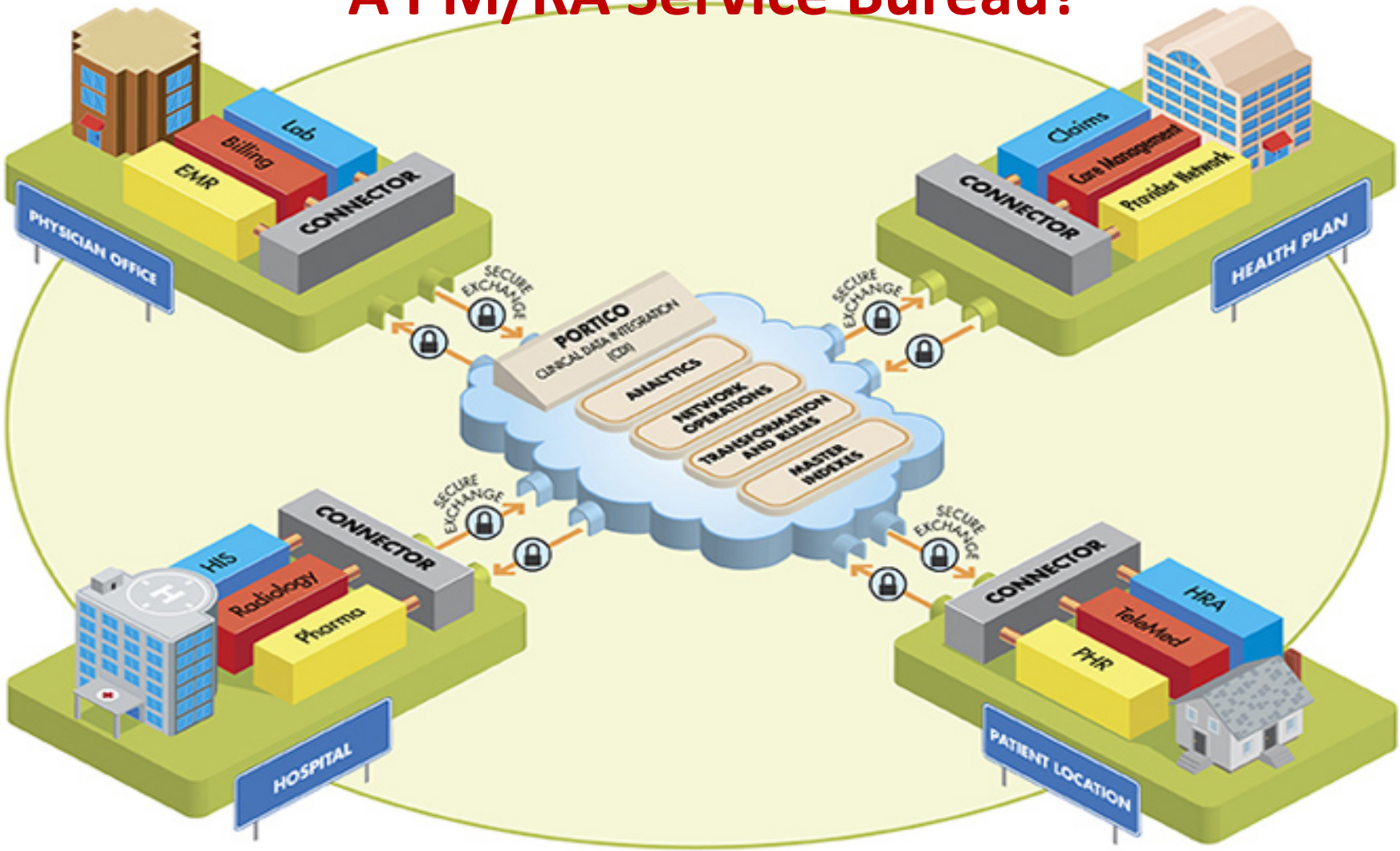


Stage 1 (2011) Meaningful Use Measure Highlights (for Hospitals)



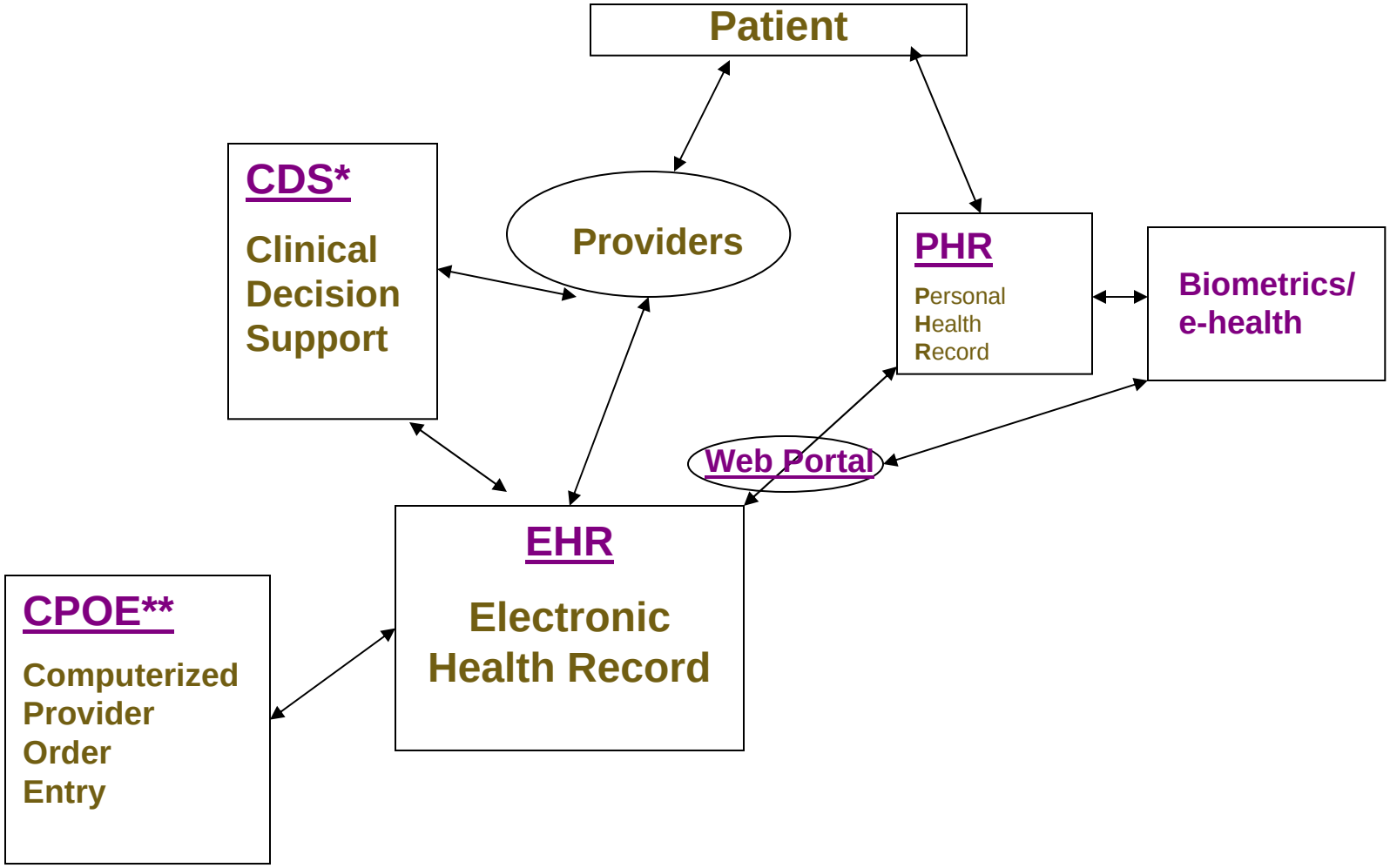
Source of Graphic Wisc. Hospital Association

A State Health Information Exchange (HIE/HIO) – A PM/RA Service Bureau?

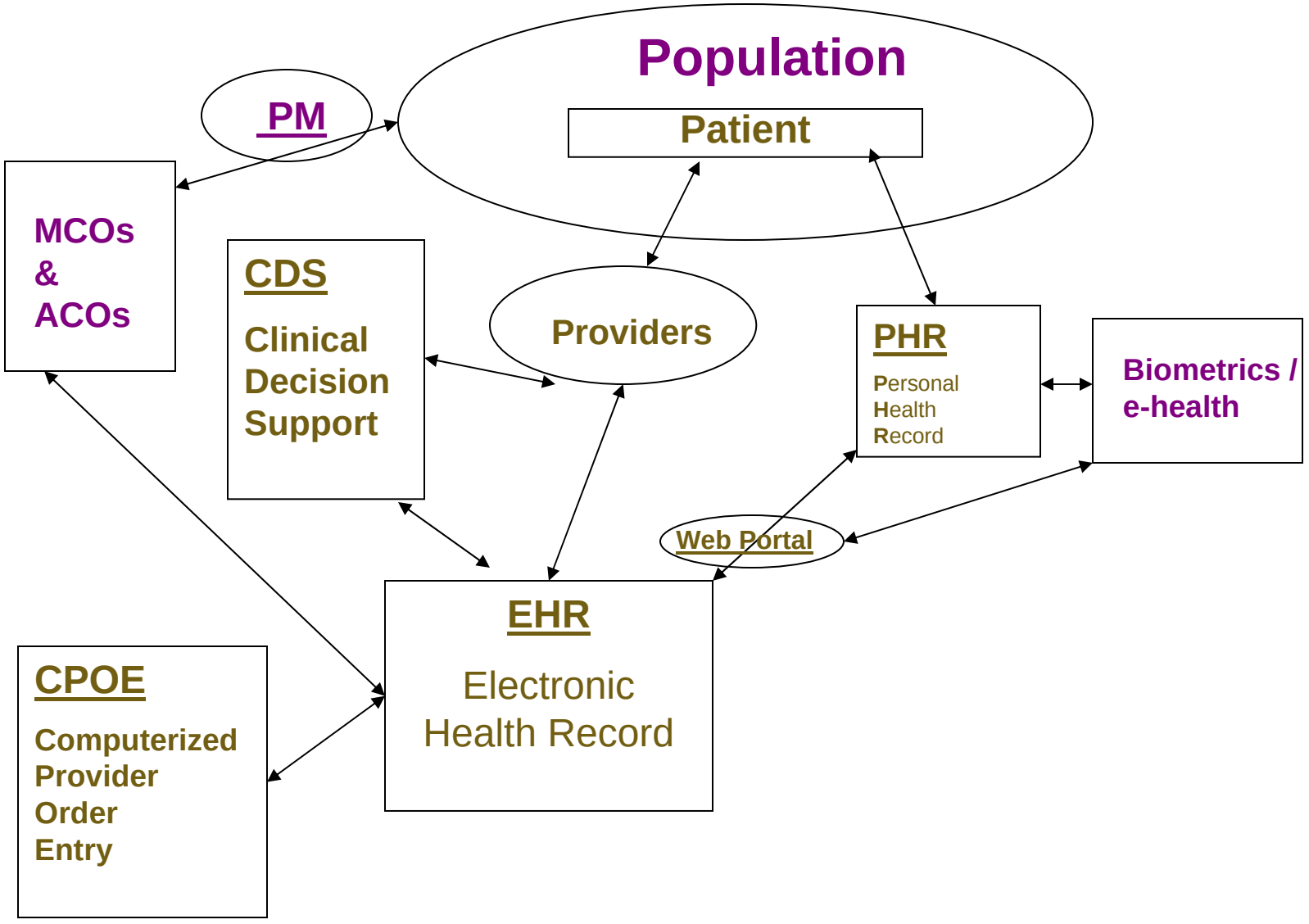


How PM / RA could be applied to HIT / EHRs

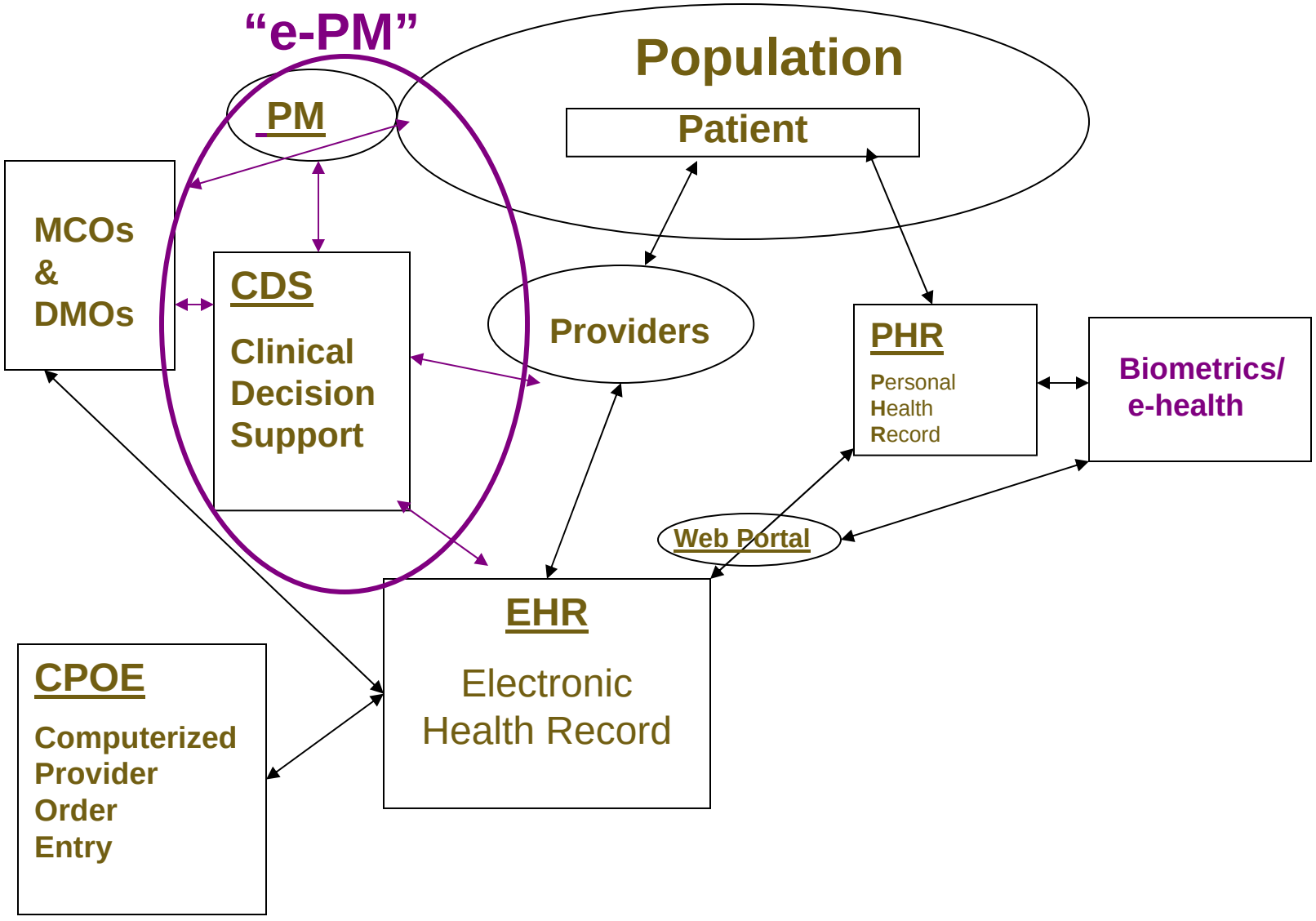
- As reform leads to eventual adoption of EHR / HIT, there will be numerous opportunities for care supported by electronic PM/RA techniques.
  - Health Information Exchanges / RHIOs will link both claims and EHRs and may become PM/RA clearinghouse for all digital data.
  - Integration of population level PM with patient level “clinical decision support systems” (CDS). What I term “e-PM”
  - Next generation of PM tools will need to use information derived from EHRs and patient- centered personal health records (PHRs)



HIT Enabled Healthcare – Clinical HIT support - 1



HIT Enabled Healthcare – Population Based PM - 2



"e-PM" = the Integration of current CDSS / PM

Some Next Steps, Implications and Challenges

Some future challenges for the PM / RA field related to health reform

- Need to continue to fully integrate PM / RA into potentially reformed clinical and fiscal operations.
- New paradigms will likely be needed for the way actuaries / health plans manage risk.
- PM and RA may be used more frequently for equity / quality enhancement to increase service use.
- Transparency and interoperability of PM / RA methods will likely need to increase.

Some future areas of reform-related PM / RA research and development

- Application of PM / RA tools to improving care among previously uninsured.
- Improving current adjusters using risk information from EHRs and other digital sources.
- Given weakness of cost controls in the ACA, increase in approaches for furthering PM's impact on clinician practices and patient outcomes in order to bend the curve.
- Operational integration of PM with digital clinical decision support (CDS.)

You Are Cordially Invited to our Bi-Annual Global Conference at Johns Hopkins.

Learn about the latest developments in risk adjustment and predictive modeling, regardless of which methodology your use.

Marriot Waterfront Hotel

Baltimore, May 6-9 2012

More information at www.acg.jhsph.edu

More Information

- **Information on health reform**
  http://healthreform.kff.org/
- **CMS - HIE Risk Adjustment**
  - **http://cciio.cms.gov/resources/files/riskadjustment_whitepaper_web.pdf**
- **Information on ACOs**
  https://xteam.brookings.edu/bdacoln/Pages/home.aspx
- **Information on PCMH**
  http://www.transformed.com/
- **Information on ACG risk adjustment / predictive modeling:**
  www.acg.jhsph.edu
  Contacts:
  Amy Salls – DST Health Solutions Inc.
  (508) 405-0297 asalls@dsthealthsolutions.com