Electronic Health Records Systems, Standards, and Use in HAI Reporting

First Plenary

Chair: David R. Hunt, MD, FACS

9:00 AM – 10:15 AM

Key Question Addressed

1. When, how, and for which HAIs should the transition be made from traditional methods of case finding and reporting—that depend to a large extent on application of written protocol instructions by individuals working in healthcare facilities and manual methods of data collection and data entry—to computer-based algorithms for case detection and use of electronic data sources for populating and submitting numerator and denominator records?

EHR Adoption in the U.S.: Meaningful Questions

David R. Hunt, MD, FACS
Medical Director, Office of Provider Adoption Support
Office of the National Coordinator for Health IT

Louis Pasteur

1822-1895

Dans les champs de l'observation le hasard ne favorise que les esprits préparés.

Lecture, University of Lille (7 December 1854)

February 2009:

Is the EHR market up to the task?

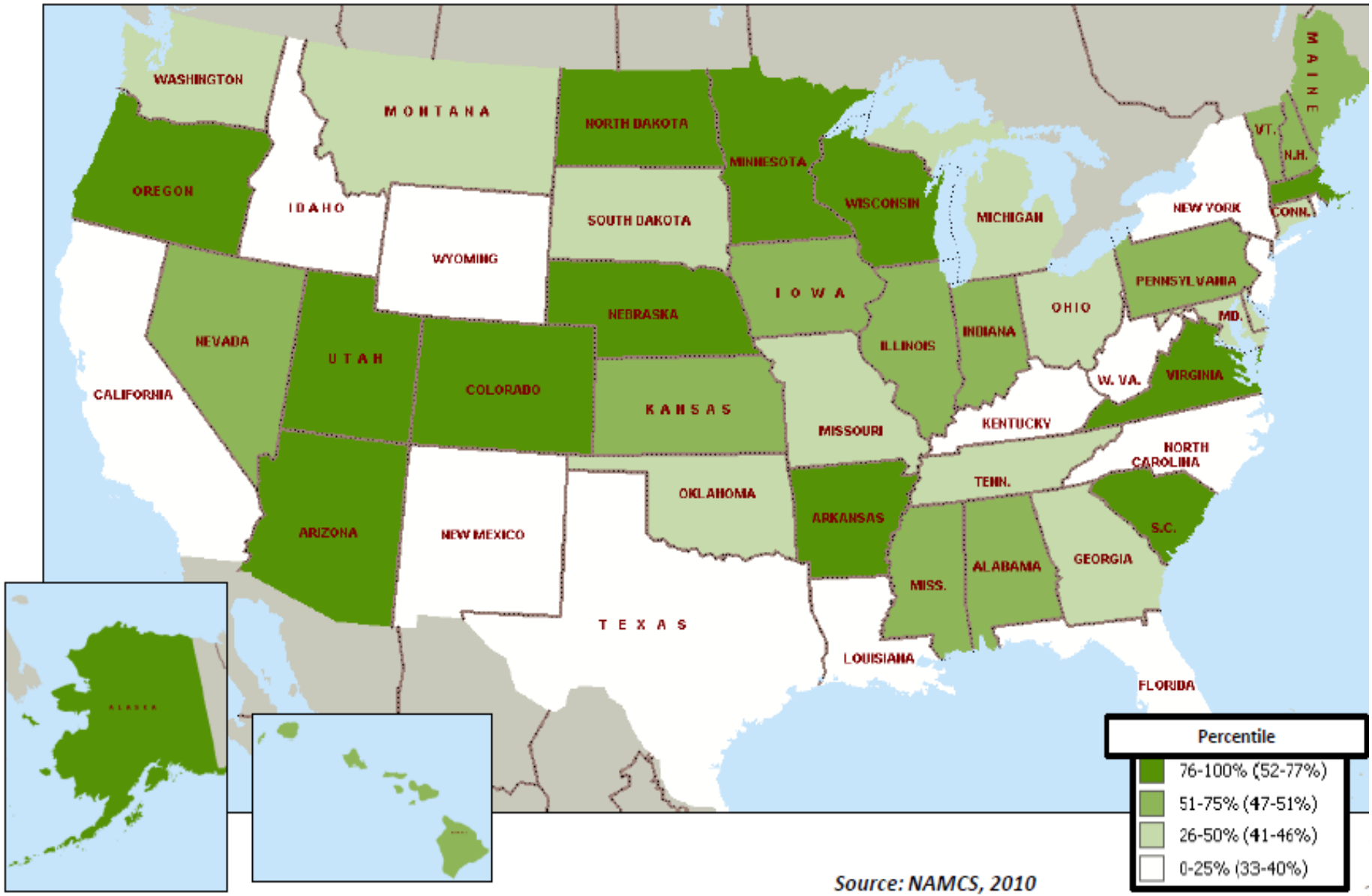
Do we even have enough products?

Will Physicians Adopt?

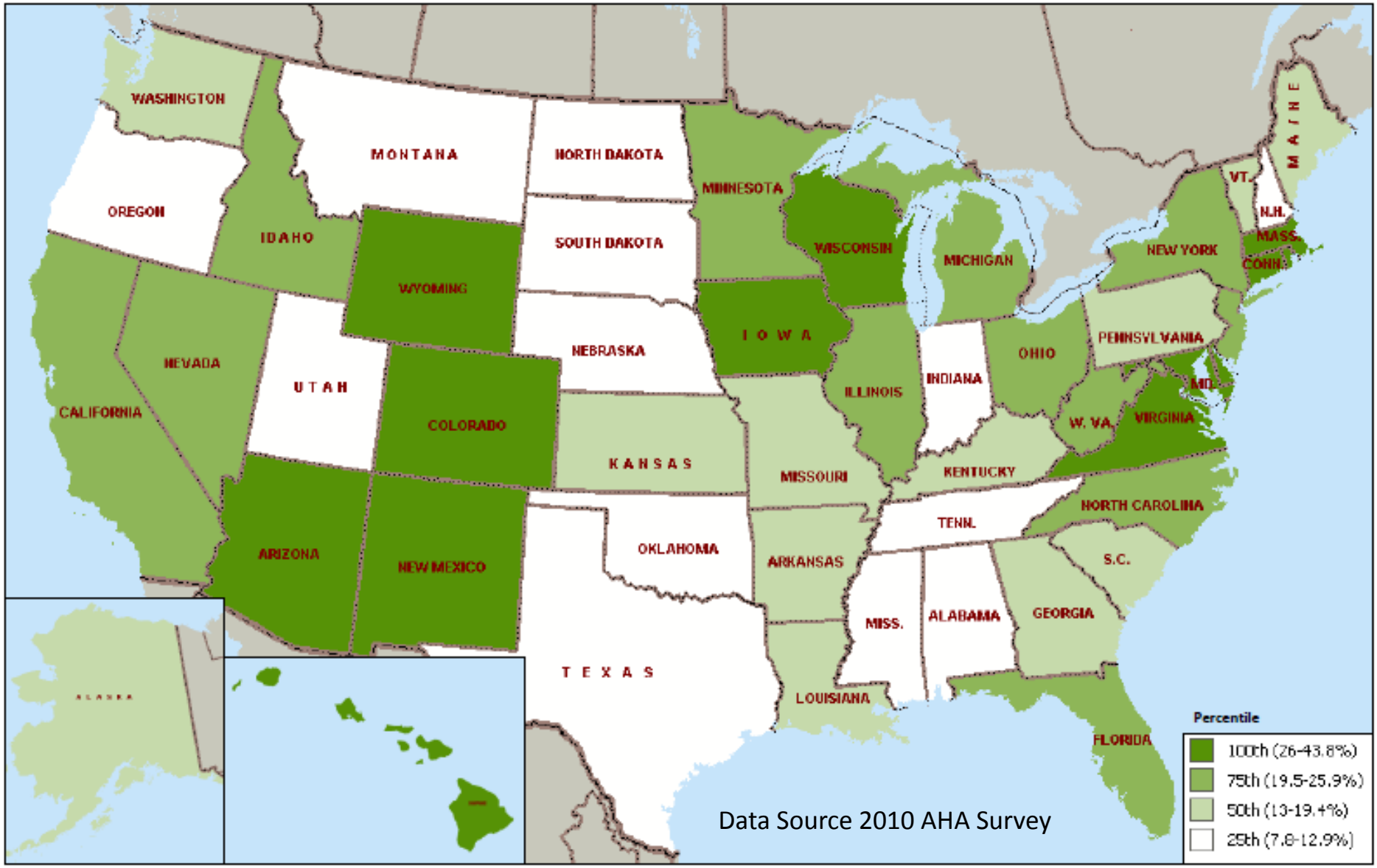
What about rural physicians and small practices?

Can hospitals meet this challenge?

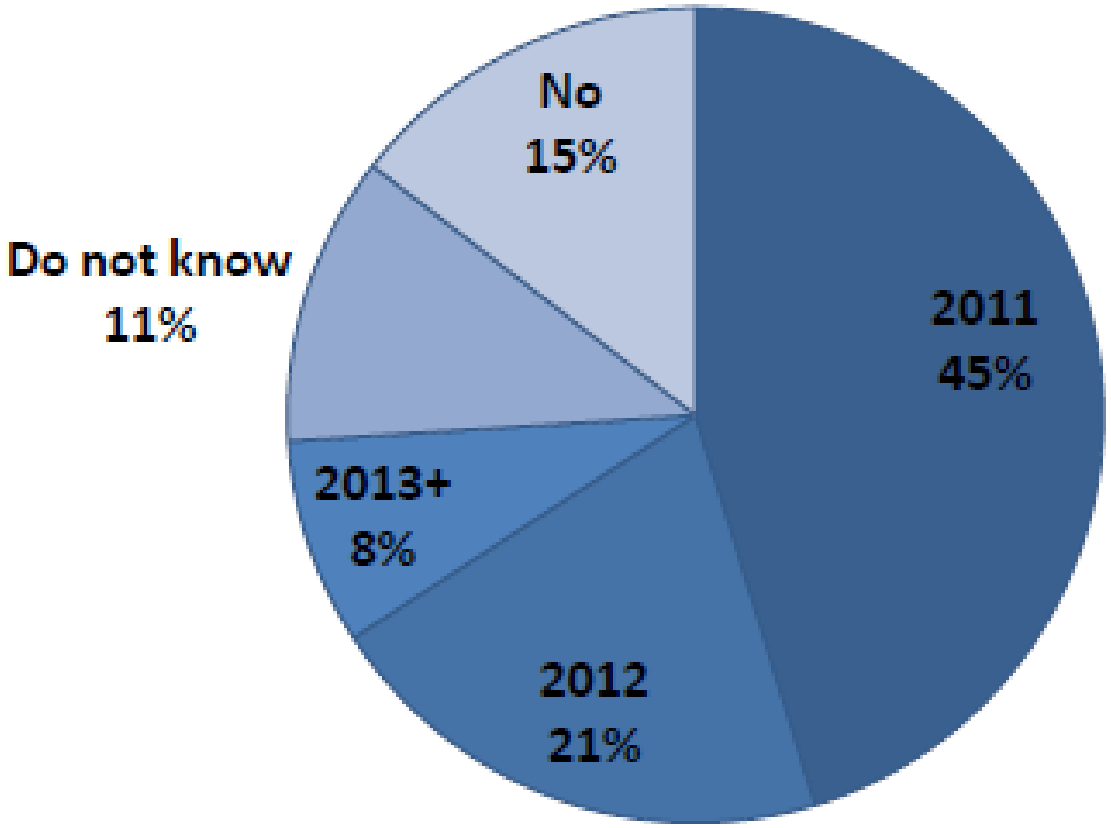
Statewide Estimates Physician Office EHR Adoption



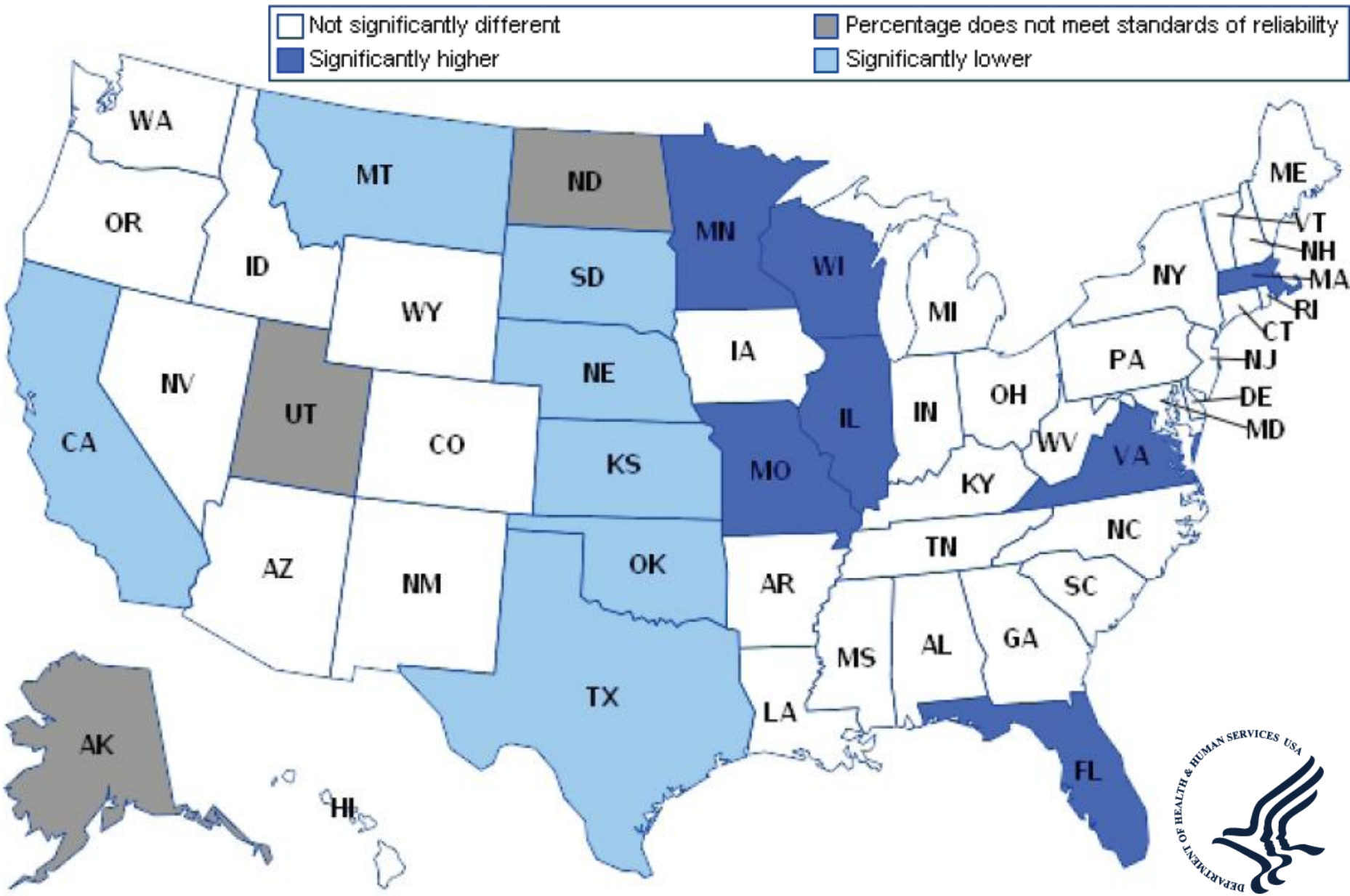
Hospital EHR Adoption



Year Hospitals Intend to Apply for Meaningful Use



State EHR Adoption: Higher or Lower than National Average



Barbara McClintock
(1902 – 1992)

"It soon became clear, however, that tacit assumptions -- the substance of dogma-- served as a barrier to effective communication."

The New England Journal of Medicine

SPECIAL ARTICLE

Electronic Health Records and Quality of Diabetes Care

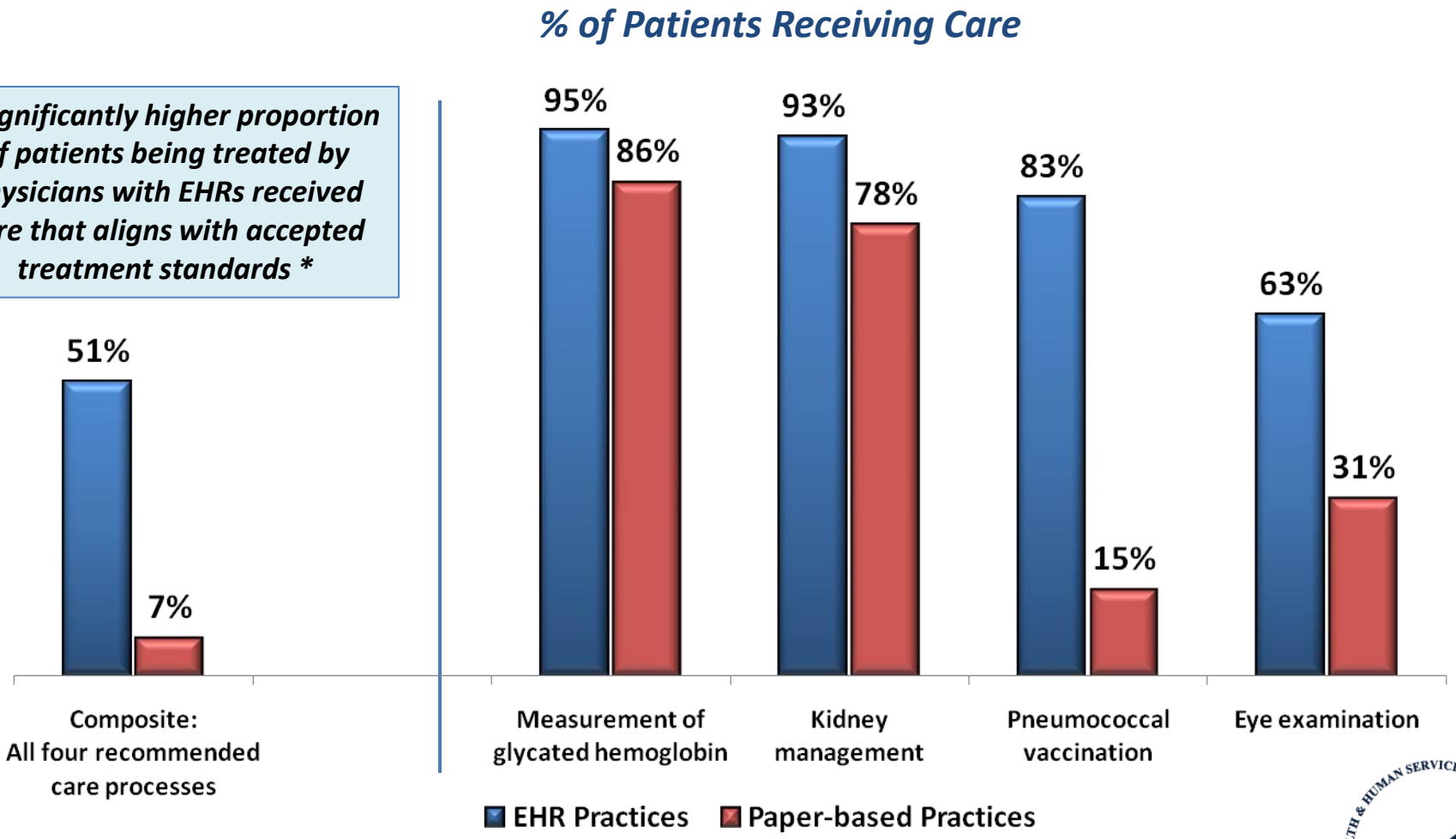
NEJM | August 31, 2011 | Topics: Health IT, Quality of Care

Randall D. Cebul, M.D., Thomas E. Love, Ph.D., Anil K. Jain, M.D., and Christopher J. Hebert, M.D.

Incentives to increase adoption and meaningful use of electronic health records (EHRs) anticipate a quality-related financial return.[1,2] However, empirical data showing either quality improvement or cost savings from EHR adoption are scarce. Available studies have shown few quality-related advantages of current EHR systems over traditional paper-based medical-record systems.[1-5] Projected cost savings are mostly based on models with largely unsupported assumptions about adherence to and the effect of fully functional EHR systems.[6,7] Data are particularly scarce on EHR adoption by "priority primary care

Quality of Diabetes Care: EHR vs. Paper Medical Records

A significantly higher proportion of patients being treated by physicians with EHRs received care that aligns with accepted treatment standards *

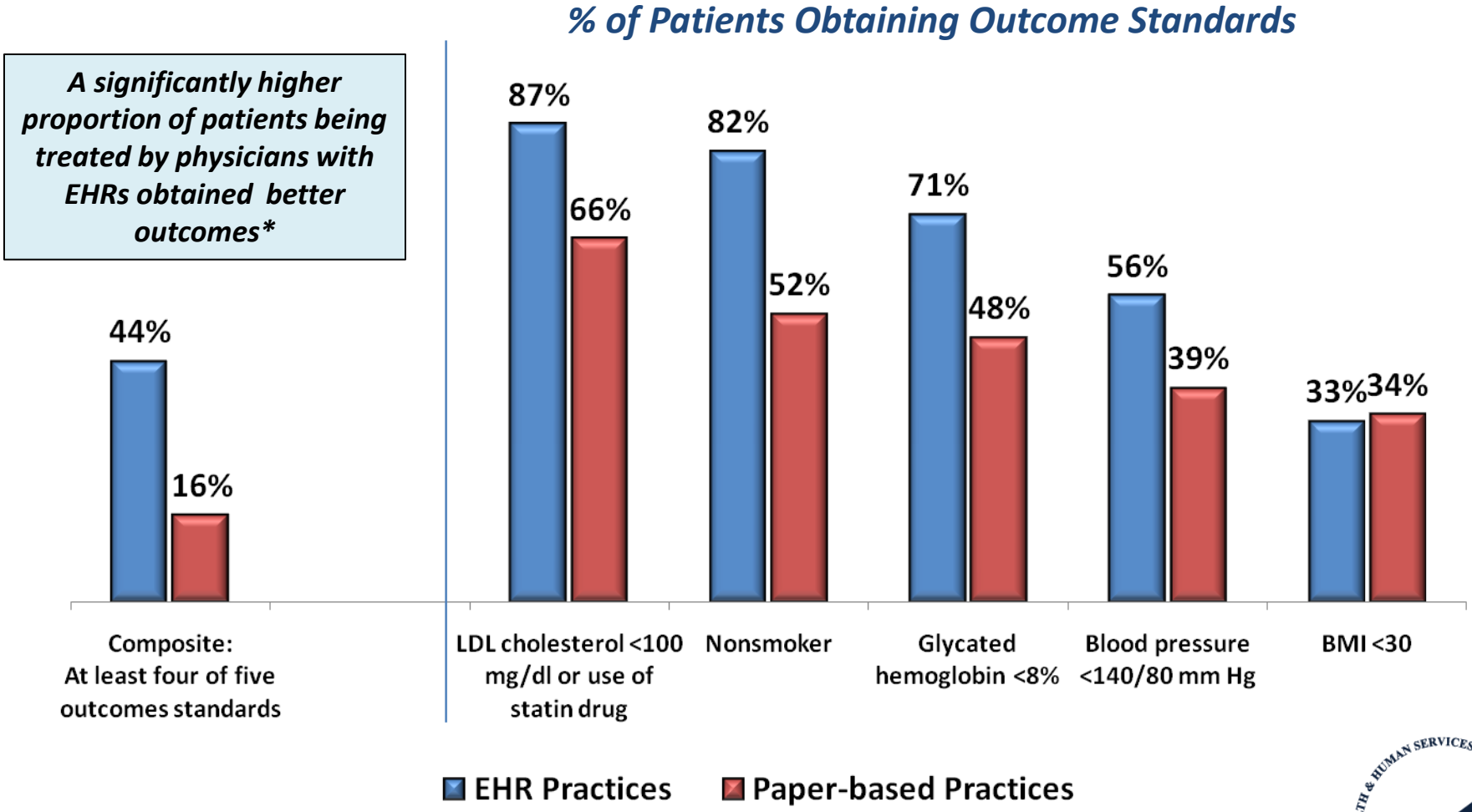


Source: Cebul, R. D., M.D.; et al. (2011). Electronic Health Records and Quality of Diabetes Care. *New England Journal of Medicine, 365:825-833*. Retrieved from http://www.nejm.org/doi/full/10.1056/NEJMsa1102519#t=article

* Even after adjusting for patient demographic characteristics and insurance type, differences remain significant; p<0.001

Health Outcomes : EHR vs. Paper Medical Records

A significantly higher proportion of patients being treated by physicians with EHRs obtained better outcomes*



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* Even after adjusting for patient demographic characteristics and insurance type, differences remain significant; p<0.005

Louis Pasteur

1822-1895

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Lecture, University of Lille (7 December 1854)

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http://www.healthit.gov

CDC's National Healthcare Safety Network (NHSN)

Daniel A. Pollock, MD
Surveillance Branch Chief
Division of Healthcare Quality Promotion
National Center for Emerging and Zoonotic Infectious Diseases
Centers for Disease Control and Prevention

CDC's System for HAI Reporting

- Serves as the operational system for HAI reporting mandates in 29 states (including Washington, DC) and for HAI reporting to multiple CMS programs
- State and federal reporting requirements account for rapid growth from ~300 hospitals in 2005 to ~4800 hospitals in April 2012
- Data are used for HAI prevention and quality improvement at local, state, and national levels
- Technical design enables manual data entry via a web interface or electronic reporting via an industry-standard file format known as Clinical Document Architecture (CDA)

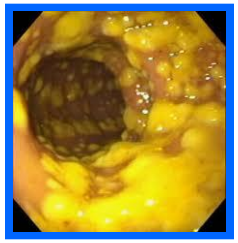
The HAIs that Matter Most Are Reported to NHSN

Central line associated bloodstream infections (CLABSIs)

Surgical site infections (SSIs)

Ventilator associated pneumonias (VAPs)

Catheter associated urinary tract infections (CAUTIs)



Clostridium difficile infections (CDIs)

Some Laboratory Identified Events Are Reported As HAI Proxies*

Methicillin resistant *S. aureus*

Vancomycin resistant *Enterococcus*

Multi-drug resistant *Acinetobacter*

Cephalosporin resistant *Klebsiella*

Carbapenem resistant *Klebsiella*

Carbapenem resistant *E. coli*

*Positive laboratory results that were not present on admission or early in a hospital stay serve as proxy measures for infection and are reported to NHSN

Patient Care Processes Are Reported Because of Their Link to HAI Prevention

Central line insertion practices (CLIP)

Influenza vaccination coverage

Antimicrobial use and resistance (AUR)

Use of NHSN's Patient Safety Component for Mandatory Reporting in 28 States and D.C.

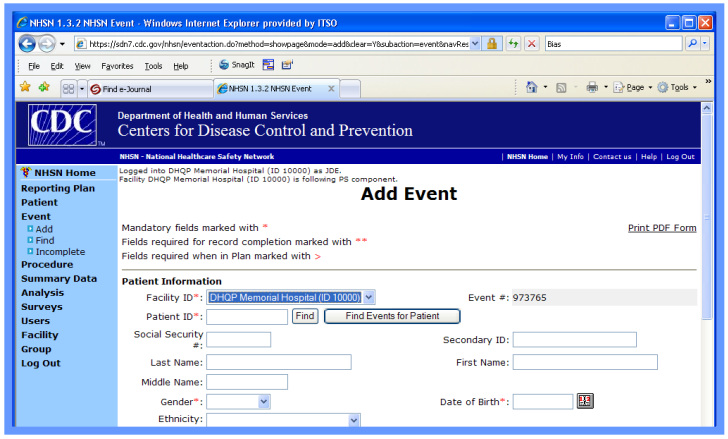
Central line-associated bloodstream infections (CLABSIs)	AL, AR, CA, CO, CT, DC, DE, HI, IL, IN, MA, MD, NC, NH, NJ, NV, NY, OK, OR, PA, SC, TN,TX, UT, VA, VT, WA, WV
Surgical site infections (SSIs)	AL, AR, CA, CO, DE, HI, IL, IN, MA, MD, NC, NH, NJ, NV, NY, OR, PA, SC, TN, TX, VT, WA, WV
Multidrug-resistant organisms and *Clostridium difficile* infections (CDIs)	CA, DC, IL, ME, NJ, NV, NY, OR, PA, TN, UT, and other states considering its use
Ventilator-associated pneumonias (VAPs)	OK, PA, WA
Catheter-associated urinary tract infections (CAUTIs)	AL, AR, IN, NC, NJ, PA, TN, WV
Central line insertion practices (CLIP)	CA, NH
Dialysis events	CO, HI

Healthcare Facility Reporting to CMS via NHSN: Current and Proposed Requirements

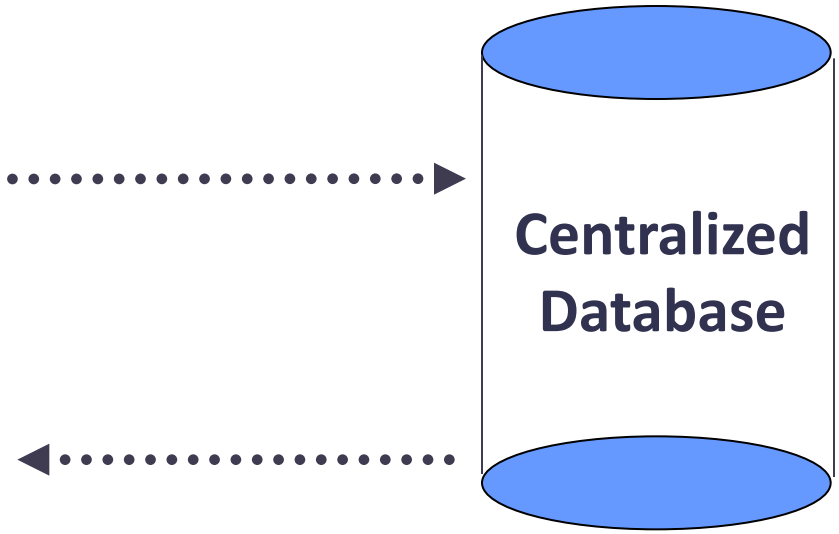
HAI Events	Facility Type	Start Date
CLABSIs	Acute Care Hospital ICUs	Jan 2011
CAUTIs	Acute Care Hospital ICUs (except NICUs)	Jan 2012
SSIs	Colon Surgeries and Abdominal Hysterectomies	Jan 2012
Dialysis Events	Dialysis facilities	Jan 2012
CLABSIs	Long Term Care Hospitals	Oct 2012
CAUTIs	Long Term Care Hospitals	Oct 2012
CAUTIs	Inpatient Rehab Facilities	Oct 2012
MRSA Bacteremia LabID Events	Acute Care Hospitals	Jan 2013
C difficile LabID Events	Acute Care Hospitals	Jan 2013
HCW Influenza Vaccination	Acute Care Hospitals	Jan 2013
HCW Influenza Vaccination	Ambulatory Surgery Centers (ASCs)	Oct 2014
SSIs and other events	ASCs and Hospital Outpatient Departments	TBD

HAI Data Reported by a Facility Are Stored in a CDC Database and Analyzed With NHSN Tools

Healthcare Facility



CDC



National Healthcare Safety Network
SIR for In-Plan Central Line-Associated BSI Data - By OrgID
As of: August 10, 2011 at 4:57 PM
Date Range: All CLAB_RATESALL
if (((bsiPlan = "Y")))

Org ID=14553

Org ID	Summary Yr/Half	infCount	Number Expected	Central Line Days	SIR	SIR p-value	95% Confidence Interval
14553	2010H1	6	3.626	1546	1.655	0.1594	0.607, 3.602
14553	2011H1	0	0.115	50	.	.	

NHSN Web-based Application

NHSN User-Generated Standardized Infection Ratio Table

National Healthcare Safety Network

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Predicted CLABSIs

Observed CLABSIs

Denominator for CLABSI rate

Standardized Infection Ratio

Org ID=14553

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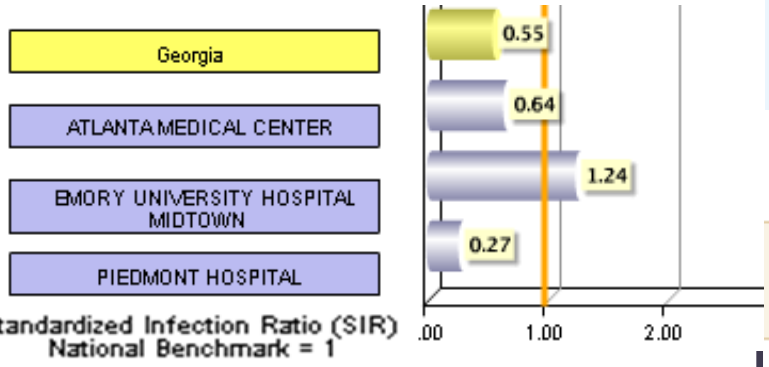
$$\text{Standardized Infection Ratio (SIR)} = \frac{\text{Observed Infections}}{\text{Predicted Infections}}$$

SIRs are Widely Used for HAI Public Reporting But Formats and Levels of Detail Differ

Hospital Compare

Central Line Associated Blood Stream Infec



ConsumerReports.org®

Hospital name	Bloodstream infections	Surgical-site infections
New York Downtown Hospital New York, NY	◓	◓
Lenox Hill Hospital New York, NY	○	○
Memorial Sloan-Kettering	◒	○

BETTER < < < < > > > > WORSE

South Carolina Department of Health and Environmental Control

Hospital Acquired Infections (HAIs) in South Carolina

Hospital	Observed (O) No. of CLABSI	No. of Central Line Days	Statistically 'Expected' (E) No. of CLABSI[a]	Hospital SIR = O ÷ E	95% Lower CI	95% Upper CI	Statistical Interpretation[b]
Abbeville Area Medical Center	0	39	0.06	*	*	*	*
Aiken Regional Medical Center	5	3370	5.06	0.99	0.32	2.31	Not Different
AnMed Health Medical Center	8	5187	9.00	0.89	0.38	1.75	Not Different

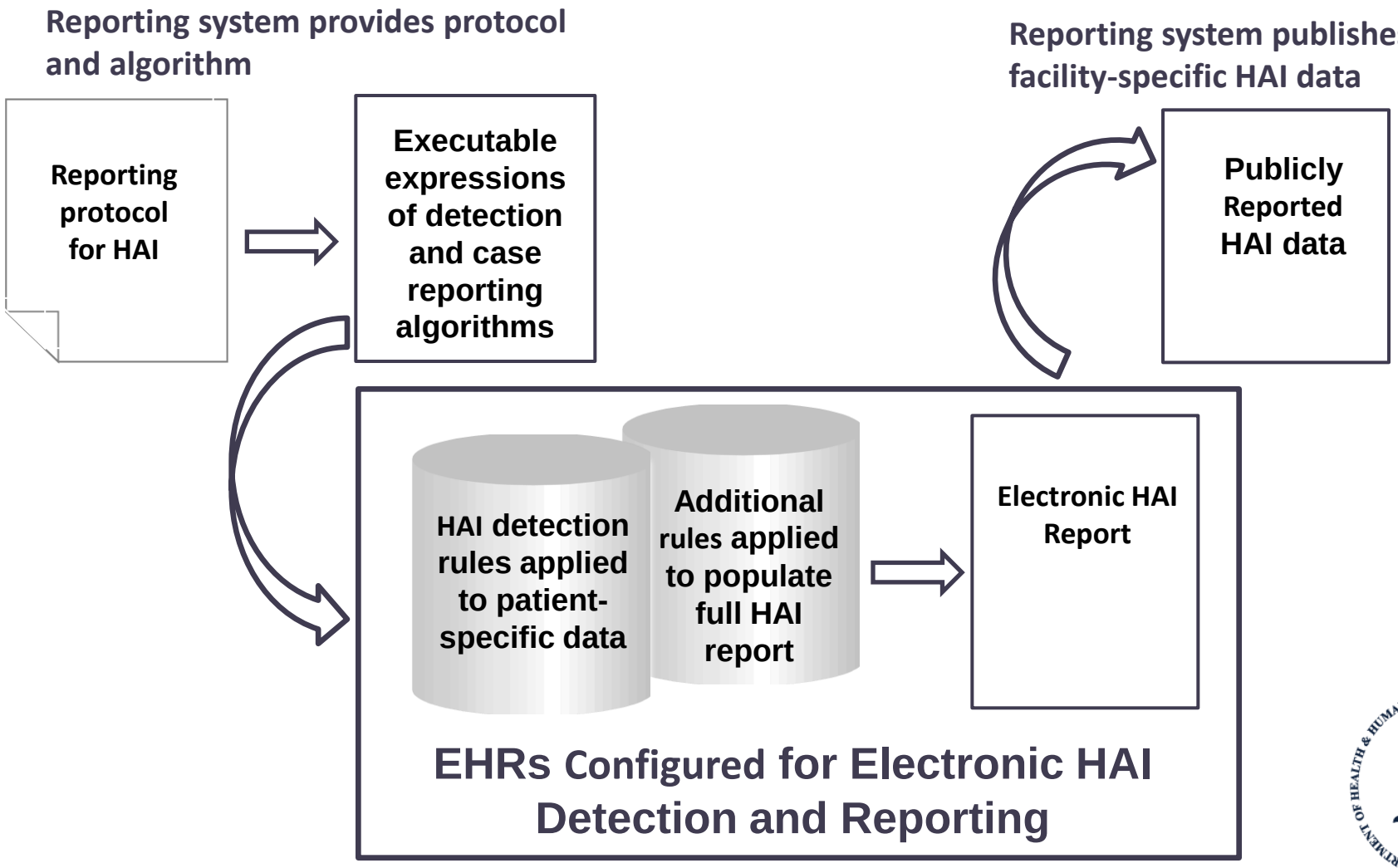
NHSN and Public Reporting: Methodological and Operational Priorities

- Data are understood and used by the public and policy makers
- Data are actionable for patient and healthcare worker safety, infection prevention, and incentivizing clinical performance improvements
- Data are systematically validated
- Summary metrics are robust to criticism from healthcare facilities and care teams assessed
- Reporting burden on healthcare facilities is minimized
- NHSN infrastructure and staff are fully supported
- Transition is expedited from manual to electronic methods of HAI case detection and reporting

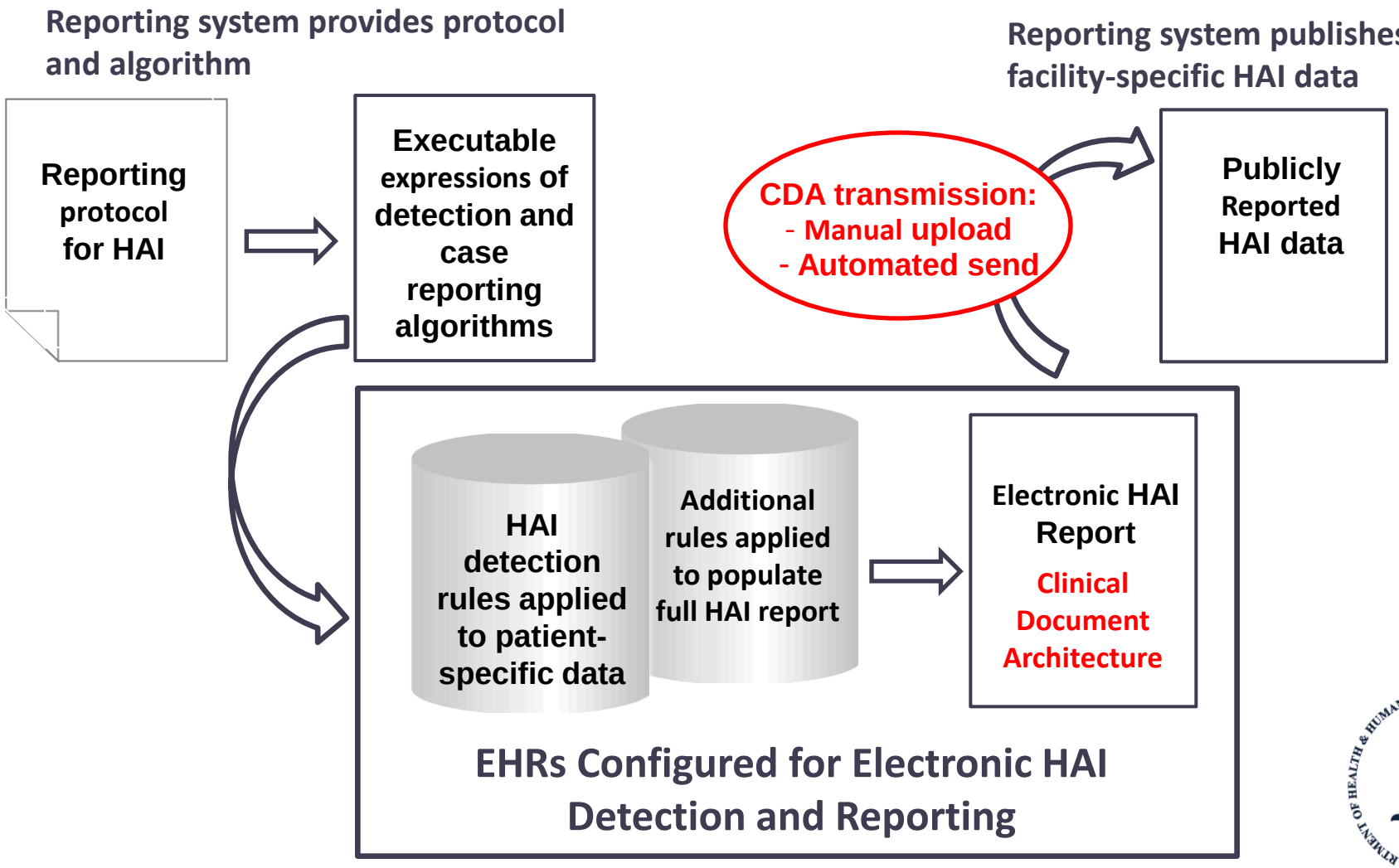
Federal Incentive Program for Electronic Health Record System (EHRs) Adoption

Uncle Sam Wants Meaningful Use!

EHRs and the Supply Chain of Data for Electronic HAI Detection and Reporting



EHRs and the Supply Chain of Data for Electronic HAI Detection and Reporting



Summing Up:
NHSN is the Primary System for HAI Public Reporting at the State and Federal Levels

- NHSN is a fully operational national system; its methods and reports reflect many years of experience with HAIs and their prevention
- NHSN data are immediately accessible to healthcare facilities, and facility-specific HAI data are used by multiple states and CMS
- For CDC and its partners, the main opportunities and challenges are to meet the increasing demands placed on NHSN while transitioning from manual to electronic methods of HAI detection and reporting

Thank You!

Your questions and comments are welcome

Please contact me at dpollock@cdc.gov

Information about NHSN is at www.cdc.gov/nhsn

CrownWeb Overview

James (Jim) Poyer, MS, MBA
Director, Division of Quality Improvement Policy for Acute Care
Quality Improvement Group
Office of Clinical Standards and Quality
Centers for Medicare & Medicaid Services

Outline

- What is CROWNWeb?
- Patient and Clinical Data Management
- CROWNWeb's Usage

What is CrownWeb?

- A. Incorrect  answer.
- B. Web-based data-collection system.
- C. Use outlined in Section 494.180(h) of the ESRD Conditions for Coverage.
- D. Will allow all Medicare-certified facilities to securely submit facility and patient-based data to CMS in real time.

CrownWeb's Uses

- **Provide the renal community with more complete and accurate data about dialysis patients.**
- **Collect quality measures data.**
- **Enable facilities to:**
  - Update facility details
  - Track admit and discharge records
  - Submit clinical data
  - Generate performance reports

CrownWeb's Benefits to CMS and the Health Care System

- Will help renal community transition from the historical paper-based data-collection methods to an electronic "always on" format.
- Will improve timeliness of clinical measures data from approximate two years to sixty days.
- Will help simplify Medicare patient management by providing facilities with immediate access to patient treatment data once admitted.

CROWNWeb's Benefits to ESRD Dialysis Facilities:

- Real-time access to the source data
- Data transfers with patients
- Ability to track and validate patient outcomes rather than waiting for annual reports from CMS
- Single source data repository

CrownWeb Patient Management – Patient Treatment Summary

- **CROWNWeb keeps a detailed history of changes to a patient's modality.**
- **Users must add a new treatment summary whenever there is a permanent change to a patient's treatment.**
- **CROWNWeb shows changes to a patient's:**
  - Primary dialysis setting
  - Primary type of treatment
  - Sessions per week
  - Time per session
  - Attending Practitioner

CrownWeb – Use for Entering CMS Mandated Information

- **Facilities will use CROWNWeb to submit patients' CMS-2728 forms required for all newly diagnosed ESRD patients, regardless of their Medicare status or treatment modality**.
- **The CMS-2728 form serves two purposes**:
  - (1) Provide medical evidence of an end-stage renal condition for Medicare entitlement; and
  - (2) Register a patient in a national renal registry. The form is sent to the appropriate ESRD Network, where it is entered into a national database maintained by Centers for Medicare and Medicaid Services (CMS). The information on the CMS-2728 is highly confidential. It is important in aiding caregivers and assuring quality care for ESRD patients
- **CROWNWeb is designed to recognized when an Initial, Supplemental, or Re-entitlement CMS-2728 form is due.**

CrownWeb Quality Measures

- Adequacy of Hemodialysis and Peritoneal Dialysis
- Anemia Management (Hgb and Iron)
- Mineral Metabolism
- Fluid Weight Management
- Vascular Access Infections
- Hospitalization
- Immunizations (Influenza, Pneumococcal, & Hepatitis B)
- Mortality

CROWNWeb's Release

- CMS has released CROWNWeb in phases to allow enough time for users to register for access, and to perfect the system's functionality.
- CROWNWeb was initially released in February 2009 to select dialysis facilities as part of Phase I.
- Hundreds of facilities have used CROWNWeb to submit data directly to CMS between Phase I and the most recent Phase III Pilot.

CrownWeb – Phase III Release

- Phase III introduced changes to CROWNWeb's security procedures and user interface.
- CMS allowed all users with established QualityNet Identity Management System (QIMS) accounts to access CROWNWeb.
- Phase III ended April 20, 2012.
- CMS announced that it will release CROWNWeb for use by all Medicare-certified dialysis facilities starting June 2012.

CrownWeb – Point of Contact Questions/Comments

Email: CRAFT@projectcrownweb.org

QualityNet Help Desk:

1-866-288-8912

Website: http://www.projectcrownweb.org

Thanks!

2012 HAI Data Summit

AHRQ Common Formats

Noel Eldridge, MS

Center for Quality Improvement and Patient Safety

Agency for Healthcare Research and Quality

The Patient Safety and Quality Improvement Act

- 2005 - Patient Safety and Quality Improvement Act (Patient Safety Act)
- Notice of Proposed Rulemaking (published February 12, 2008)
- Patient Safety Final Rule (effective January 19, 2009)
- Guidance (issued December 30, 2010)

Common Formats: Origin and Basics

- Authorized by the Patient Safety and Quality Improvement Act of 2005, which assigned lead responsibility to AHRQ
- Developed with Federal work group comprising major health agencies (e.g., CDC, CMS, FDA, DOD, VA)
- Subject to public comment
- Reviewed by the NQF expert panel, which provides advice to AHRQ
- Promulgated as "guidance" announced in the Federal Register
- Approved by OMB (process & Formats)

What are Common Formats?

- Common language for patient safety event reporting
  - Common language & definitions
  - Standardized rules for data collection
- Standardize the patient safety event information collected

The Benefit of Common Formats

- Allow aggregation of comparable data at local, Patient Safety Organization (PSO), regional, & national levels
  - PSOs can send provider data to the Network of Patient Safety Databases for national aggregation
  - PSO to PSO sharing and aggregation
  - 77 PSOs currently listed by AHRQ

Generic and Event-specific Modules

- Generic modules – information common to all events
  - Example- reporter, location, harm level, patient demographics, contributing factors
- Event-specific modules
  - Limited to discrete topic areas:
    - Blood, Devices (including HIT), Falls, **Healthcare Associated Infections,** Medications, Perinatal, Pressure Ulcer, Surgery & Anesthesia, VTE
  - Paired with the generic modules to make a complete patient safety report

How do Common Formats work?

- Modules cover all types of patient safety events:
  - Relatively common events
  - Relatively rare events (includes NQF Serious Reportable Events)
- Modular design allows for expansion
  - Addition of new topics
    - e.g., VTE and Readmissions
  - Expansion to new settings
    - e.g., beyond acute care to long-term care

Adverse Events and More

- Modules allows for capture of patient safety event data from ANY patient safety concern
  - Incidents – patient safety events that reached the patient, whether or not there was harm
  - Near misses (or close calls) – patient safety events that did not reach the patient
  - Unsafe conditions – any circumstance that increases the probability of a patient safety event

Healthcare-Associated Infections in Current Common Formats

- Primary bloodstream infection that is central line-associated (CLABSI)
- Pneumonia that is ventilator-associated (VAP)
  - 4 subtypes
- Surgical site infection (SSI)
  - 5 subtypes
- Urinary tract infection that is catheter-associated (CAUTI)
  - 2 subtypes
- Clostridium difficile infection (CDI) – gastrointestinal system infection

- Other Type of infection that developed during admission, not further validated
  - Bone or joint infection
  - Central nervous system infection
  - Cardiovascular system infection
  - Eye, ear, nose, throat, or mouth infection
  - Gastrointestinal system infection – that is not CDI
  - Lower respiratory tract infection (other than pneumonia)
  - Reproductive tract infection
  - Pneumonia that is not ventilator associated
  - Primary bloodstream infection that is not central line associated
  - Skin or soft tissue infection
  - Systemic infection
  - Urinary tract infection that is not catheter associated

NHSN and Common Formats

- Common Formats Event-specific modules for HAIs have been developed with CDC input and concurrence
- HAI Common Formats are a subset of the full NHSN protocols & follow CDC definitions and criteria

Efficiency of Reporting via CFs

- Expert system architecture serves up only questions pertinent to a specific case
- Data collection is quick
- Reports are produced at the local level for:
  - An individual case – with all protocols employed
  - An individual Format – with all cases of that type
- Regional & national reports roll up naturally from local-level data

Standardization Goes beyond Event Descriptions and Algorithms

- Common Formats standardize
  - Definitions*
  - Reports
  - Data collection (“smart” questions)
  - Technical specifications (for software developers)

* Include support materials such as User Guide, Glossary, etc.

Event Reporting and Surveillance

- Common Formats are currently designed as an event-reporting system
  - Contain information in the EHR ***and more***
  - Do not include denominators
- The Formats can be adapted to function as a surveillance system
  - Would include denominators
  - Would not include near misses and unsafe conditions

Future Directions

- Healthcare facilities of the future will need:
  - Surveillance systems ***and***
  - Event-reporting systems
- Electronic Health Records will, through incorporation of defined patient safety events (Common Formats-compatible), be able to:
  - Support data for a surveillance system
  - Auto-populate basic information for an event-reporting system

Three Goals and Scope

- The Common Formats have been designed from the outset to meet the three goals:
  1. Provide information on all types of patient safety incidents ("all-cause harm") and near misses
  2. Support local quality/safety improvement projects
  3. Allow those collecting data to collect it once and to supply it to organizations that need it
- Intended to serve the nation's need to standardize the reporting of adverse events and facilitate measurement, as articulated by IOM and the Patient Safety and Quality Improvement Act

Common Formats on the Web

https://www.psoppc.org/web/patientsafety

Questions & Answers