“Meaningful Use of Electronic Health Records: Progress Since HITECH”

Michael Furukawa, PhD
Director, Office of Economic Analysis, Evaluation and Modeling
Office of the National Coordinator for Health Information Technology
Department of Health and Human Services

Johns Hopkins  DHSI Grand Rounds
May 3, 2013
1. Describe HITECH and Meaningful Use objectives to transform health care through health IT

2. Present statistics on adoption of EHRs among physicians and hospitals

3. Discuss policy implications of HITECH and challenges ahead with MU
HR 1 -- 111th Congress
$787 Billion
Highly partisan vote
Healthcare gets $147.7 Billion
  $87B for Medicaid
  $25B for support for extending
care
  $10B for NIH
  $19B directly for HIT

Meaningful Use
in health care through
adoption of EHRs among
healthcare professionals

HITECH = Health Information
Technology for Economic and Clinical
Health MU
American Recovery & Reinvestment Act of 2009 (Stimulus Bill)

- HR 1 -- 111th Congress
- $787 Billion
- Highly partisan vote
- Healthcare gets $147.7 Billion
  - $87B for Medicaid
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HITECH = Health Information Technology for Economic and Clinical Health
Three-Part Aim:

★ Better Healthcare  ★ Better Health  ★ Reduced Costs

Paper Records
Pre 2009
A system plagued by inefficiencies

HITECH Act
2009
EHR Incentive Program and 62 Regional Extension Centers

EHRs & HIE
2014
Widespread adoption & meaningful use of EHRs
Meaningful Use as a Building Block

Aim:
Health ★ Reduced Costs

EHRs & HIE
2014

62 Widespread adoption & meaningful use of EHRs
Meaningful Use as a Building Block
Meaningful Use as a Building Block

Stage 1 MU
- Basic EHR functionality, structured data
- Privacy & security protections

Stage 2 MU
- Care coordination
- Patient informed
- Structured data utilized
- Privacy & security protections
Meaningful Use as a Building Block

Stage 1 MU
- Basic EHR functionality, structured data
- Privacy & security protections

Stage 2 MU
- Care coordination
- Structured data utilized
- Privacy & security protections

Data utilized to improve delivery and outcomes
- Care coordination
  - Medicine
- Privacy & security protections
Meaningful Use as a Building Block

- Data utilized to improve delivery and outcomes
  - Patient self management
    - Care coordination
    - Evidenced based medicine
      - Registries for disease management
    - Privacy & security protections
  - Care coordination
  - Patient informed
    - Structured data utilized
    - Privacy & security protections
  - Basic EHR functionality, structured data

Stage 1 MU
Stage 2 MU
PCMH 3-Part Aim
Meaningful Use as a Building Block

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Care coordination
- Patient informed

Data utilized to improve delivery and outcomes

Patient self management
- Evidenced based medicine
- Registries for disease management
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Improved population health
- Enhanced access and continuity
- Data utilized to improve delivery and outcomes
- Patient engaged, community resources
- Patient centered care coordination
- Team based care, case management
- Registries to manage patient populations
- Privacy & security protections

PCMH 3-Part Aim
- ACO’s
- “Stage 3 MU”
Meaningful Use as a Building Block

- Improved population health
- Enhanced access and continuity
  - Data utilized to improve delivery and outcomes
  - Patient self management
    - Patient engaged, community resources
    - Team based care, case management
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- Care coordination
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PCMH 3-Part Aim
- Privacy & security protections

ACO’s “Stage 3 MU”
Meaningful Use as a Building Block

Utilize technology

- Basic EHR functionality, structured data
- Privacy & security protections

- Structured data utilized
- Privacy & security protections

- Care coordination
- Patient informed

- Care coordination
- Evidenced based medicine

- Registries for disease management
- Registries for patient populations

- Data utilized to improve delivery and outcomes
- Patient self management

- Data utilized to improve delivery and outcomes
- Patient engaged, community resources

- Patient centered care coordination
- Team based care, case management

Improved population health
Enhanced access and continuity

Stage 1 MU
Stage 2 MU
PCMH 3-Part Aim
ACO’s “Stage 3 MU”
Meaningful Use as a Building Block

Access to information

Utilize technology

- Improved population health
  - Data utilized to improve delivery and outcomes
  - Patient self management
- Enhanced access and continuity
  - Data utilized to improve delivery and outcomes
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- Patient centered care coordination
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PCMH 3-Part Aim
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ACO's "Stage 3 MU"
- Patient engaged, community resources
- Team based care, case management
- Privacy & security protections
Meaningful Use as a Building Block

Utilize technology

Access to information

Transfer health

- Improved population health
- Enhanced access and continuity

Stage 1 MU

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- Patient informed
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Stage 2 MU

- Care coordination
- Structured data utilized
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PCMCH 3-Part Aim

- Data utilized to improve delivery and outcomes
- Patient self management
- Privacy & security protections

ACO’s “Stage 3 MU”

- Data utilized to improve delivery and outcomes
- Patient engaged, community resources
- Team based care, case management
- Registries to manage patient populations
HITECH Framework: a Building Block

- Regional extension centers
- Workforce training
- Medicare and Medicaid incentives and penalties
- State grants for health information exchange
- Standards and certification framework
- Privacy and security framework

Transform health care

- Improved population health
- Enhanced access and continuity

Access to Information

- Data utilized to improve delivery and outcomes
- Patient self-management
- Patient engaged, community resources

Care coordination

- Care coordination
- Patient informed
- Evidenced based medicine
- Team based care, case management

Structured data utilized

- Registries for disease management
- Registries to manage patient populations
- Privacy & security protections

Privacy & security protections

Stage 2 MU

PCMH 3-Part Aim

ACO’s “Stage 3 MU”
HITECH Framework for MU of EHRs

Regional extension centers

Workforce training

Medicare and Medicaid incentives and penalties

State grants for health information exchange

Standards and certification framework

Privacy and security framework

Adoption of EHRs

Meaningful use of EHRs

Exchange of health information

Improved individual and population health outcomes
Increased transparency and efficiency
Improved ability to study and improve care delivery

Research to enhance HIT

Taken from: Blumenthal, D. "Launching HITECH," posted by the NEJM on 12-30-2009.
Regional Extension Center (REC) Program

Initial Program Goal:
100,000 priority primary care providers achieve meaningful use (MU) by 2014

Every REC:
- Has a defined service area and specific number of providers
- Provides unbiased, practical support throughout process
- Serves as two-way pipeline to federal and local resources

Approach differs by REC:
- Independent operations
- Affiliation with QIOs and universities
- Partnership with other ONC grantees (Beacon and HIE)
- Variety of hospital and payer partnerships
ONC Health IT Workforce Training Program

Program Goal: Achieve meaningful use (MU) by 2014

University-Based Training
Help more than 1,500 people receive certificates

Focuses on the following professional roles:
- Clinician or public health leader
- Health information management and exchange specialist
- Health information privacy and security specialist
- Research and development scientist
- Programmers and software engineer
- Health IT sub-specialist

Focuses on:
- Practice information
- Clinical
- Clinical Engineering
- Informatics
- Training
ONC Health IT Workforce Training

Health IT Professionals

- **University-Based Training**
  - Help more than 1,500 people receive certificates

- **Community College Consortia**
  - Help train more than 10,500 new Health IT professionals

- **Curriculum Development Centers**
  - Development of educational materials

- **Competency Examination Program**
  - Basic Competency Assessment

Focuses on the following professional roles:

- Clinician or public health leader
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- Health information privacy and security specialist
- Research and development scientist
- Programmers and software engineer
- Health IT sub-specialist

Focuses on the following professional roles:

- Practice workflow and information management redesign specialists
- Clinician/practitioner consultants
- Implementation support specialists
- Implementation managers
- Technical/software support
- Trainers
The State HIE Program

- Foster exchange networks
  - Build capacity of local and affinity models
  - Reduce cost and complexity, including policies that encourage exchange

- Monitor exchange and fill the gaps
  - Support the "little guy" – small providers
  - Avoid closed networks and silos
  - Consumer-mediated exchange

- Ensure exchange across networks
  - Every provider has at least one option to meet information exchange requirements of
  - Governance and trust
  - Common standards to connect the nodes
The State HIE Program

Foster exchange networks
- Build capacity of local and affinity models
- Reduce cost and complexity, including through shared services
- Policies that encourage exchange

Monitor exchange and fill the gaps
- Support the “little guy” – small providers, special populations
- Avoid closed networks and silos
- Consumer-mediated exchange

Ensure exchange across networks
- Every provider has at least one option for meeting health information exchange requirements of Meaningful Use
- Governance and trust
- Common standards to connect the nodes
17 communities each funded ~$12-16M over 3 yrs to:

**Build and strengthen** health IT infrastructure and exchange capabilities - positioning each community to pursue a new level of sustainable health care quality and efficiency over the coming years.

**Improve** cost, quality, and population health - *translating investments in health IT in the short run to measureable improvements in the 3-part aim.*

**Test innovative approaches** to performance measurement, technology integration, and care delivery - *accelerating evidence generation for new approaches.*
<table>
<thead>
<tr>
<th>EHR functionalities matter</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Electronic Clinical Information</strong></td>
</tr>
<tr>
<td>Patient demographics</td>
</tr>
<tr>
<td>Physician notes</td>
</tr>
<tr>
<td>Nursing assessments</td>
</tr>
<tr>
<td>Problem lists</td>
</tr>
<tr>
<td>Medication lists</td>
</tr>
<tr>
<td>Discharge summaries</td>
</tr>
<tr>
<td>Advance directives</td>
</tr>
<tr>
<td><strong>Computerized Provider Order Entry</strong></td>
</tr>
<tr>
<td>Lab reports</td>
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<tr>
<td>Radiology tests</td>
</tr>
<tr>
<td>Medications</td>
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<tr>
<td>Consultation requests</td>
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<tr>
<td>Nursing orders</td>
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<tr>
<td><strong>Results Management</strong></td>
</tr>
<tr>
<td>View lab reports</td>
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<tr>
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<tr>
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<tr>
<td>View diagnostic test results</td>
</tr>
<tr>
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</tr>
<tr>
<td>View consultant report</td>
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<tr>
<td><strong>Clinical Decision Support</strong></td>
</tr>
<tr>
<td>Clinical guidelines</td>
</tr>
<tr>
<td>Clinical reminders</td>
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<tr>
<td>Drug allergy results</td>
</tr>
<tr>
<td>Drug-drug interactions</td>
</tr>
<tr>
<td>Drug-lab interactions</td>
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<tr>
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</tbody>
</table>
Physician adoption has grown rapidly

Percent of office-based physicians with EHRs: 2008-2012

- Any EHR: 42% in 2008, 48% in 2009, 51% in 2010, 57% in 2011, 72% in 2012
- Basic EHR: 17% in 2008, 21% in 2009, 25% in 2010, 34% in 2011, 40% in 2012
Physician Adoption of MU Functionalities

Percent of office-based physicians with capability to meet MU Stage 1 objectives: 2011

- Computerized provider order entry for medication orders: 65%
- Record demographics: 72%
- E-Prescribing: 55%
- Medication allergy list: 57%
- Active medication list: 57%
- Drug interaction checks: 51%
- Maintain problem list: 54%
- Clinical summaries to patients: 38%
- Clinical decision support rules: 40%
- Clinical quality measures: 30%

Percent of physicians
Physician Adoption of MU Functionalities

Percent of office-based physicians with capability to meet MU Stage 1 objectives: 2011-2012

- Computerized provider order entry for medication orders: 65% in 2011, 80% in 2012, change 15%
- Record demographics: 72% in 2011, 79% in 2012, change 7%
- E-Prescribing: 55% in 2011, 73% in 2012, change 18%
- Medication allergy list: 57% in 2011, 68% in 2012, change 11%
- Active medication list: 57% in 2011, 68% in 2012, change 11%
- Drug interaction checks: 51% in 2011, 67% in 2012, change 16%
- Maintain problem list: 54% in 2011, 66% in 2012, change 12%
- Clinical summaries to patients: 38% in 2011, 56% in 2012, change 18%
- Clinical decision support rule: 40% in 2011, 50% in 2012, change 10%
- Clinical quality measures: 30% in 2011, 43% in 2012, change 13%
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Percent of physicians

2011: [bar graph]
2012: [bar graph]
Change 2011-2012: [arrows]
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| Functionality                                      | 2011 | 2012 | Change
|---------------------------------------------------|------|------|--------
| Computerized provider order entry for medication orders | 65   | 80   | 15
| Record demographics                               | 72   | 79   | 7
| E-Prescribing                                     | 55   | 73   | 18
| Medication allergy list                           | 57   | 68   | 11
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Hospital adoption has also grown rapidly.

- **Basic With Notes**
  - 2008: 9.4
  - 2009: 12.2
  - 2010: 15.6
  - 2011: 27.6
  - 2012: 44.4

- **Any Certified EHR**
  - 2008: 9.4
  - 2009: 71.9
  - 2011: 92.3

**Legend:**
- Blue line: Basic With Notes
- Red line: Any Certified EHR
Hospital Adoption of MU Functionalities

Percent of hospitals with capability to meet MU Stage 1 objectives: 2011
Percent of hospitals with capability to meet MU Stage 1 objectives: 2011-2012

- Record Demographics
- Maintain Problem List
- Active Medication List
- Record Vital Signs
- Record Smoking Status
- CDS Rule
- Clinical Quality Measures
- Medication Allergy List
- CPOE for Medication Orders
- Drug Interaction Checks
- Drug Formulary Checks
- Advance Directives
- Patient List
- Clinical Lab Test Results
- Patient Electronic Access
- Electronic Copy of Discharge
- Electronic Exchange of Clinical
- Patient-specific Education
- Transition of Care Summary
- Syndromic Surveillance Data
- Submit Lab Results to Public Health
- Immunization Registries Data

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- 2011 MU Stage 1
- 2012 MU Stage 1
Percent of hospitals with capability to meet MU Stage 1 objectives: 2011

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Hospital Adoption of MU Functionalities

Percent of hospitals with capability to meet MU Stage 1 objectives: 2011-2012
MU Attainment by Eligible Professionals

521,600
Total Eligible Professionals

- Total Professionals Registered: 386,024
- Total Professionals Paid: 255,772

2012 Goal
2013 Goal

Source: CMS EHR Incentive Program
Data as of 3/31/2013
MU Attainment by Eligible Hospitals

5,011
Total Eligible Hospitals

Total Hospitals
Registered: 4,333

Total Hospitals Paid:
3,858

2013 Goal

2012 Goal

Source: CMS EHR Incentive Program
Data as of 3/31/2013
Total EHR Incentive Payments to All Eligible Providers by Month

Payments to All Eligible Professionals and Hospitals Under the Medicare or Medicaid EHR Incentive Programs

Amount Paid per Month (Millions)

Cumulative Amount Paid (Millions)
<table>
<thead>
<tr>
<th>Questions</th>
<th>REC</th>
<th>State HIE</th>
<th>Beacon</th>
<th>Workforce</th>
<th>SHARP</th>
<th>Global</th>
</tr>
</thead>
<tbody>
<tr>
<td>Context: What are the <em>structural</em> and <em>environmental</em> characteristics of the grantees?</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Implementation: What <em>approaches</em> did the grantees take to <em>implement</em> programs?</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Effectiveness: How <em>effective</em> were grantees in achieving program objectives?</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Impact: What was the <em>impact</em> of the program on care, costs, and health?</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

**Contractor**

<table>
<thead>
<tr>
<th>Contractor</th>
<th>AIR</th>
<th>NORC</th>
<th>NORC</th>
<th>NORC</th>
<th>NORC</th>
<th>MPR</th>
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<tbody>
<tr>
<td>Award ($)</td>
<td>4.27M</td>
<td>5.38M</td>
<td>3.34M</td>
<td>2.48M</td>
<td>642k</td>
<td>3.99M</td>
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</tbody>
</table>
Evaluation Logic: Telling the HITECH Story

**CONTEXT & CHARACTERISTICS**
- Grantee characteristics
- ONC regulations
- Health care reform

**IMPLEMENTATION**
- Strategic & operational plans
- Governance & organization
- Interventions & Services
- Practice & Clinical transformation

**EFFECTIVENESS (short-term)**
- Adoption and exchange
- Milestones to Meaningful Use
- Graduating students employed in HIT jobs

**IMPACT (long-term)**
- Impacts on care, cost, and population health
- Reduction in disparities
- Sustainability

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Timely, Formative Feedback  |  Insights, Summative Feedback

**Deliverables:** Peer-reviewed articles, Briefs, Case Studies, Blog posts
Regional Extension Centers are working with 140k+ Primary Care Providers

Regional Extension Center (REC) Cooperative Agreement Program
Enrollment: PCPs by State or County
National

Total Providers Enrolled: 148,448
Percent to “Enrollment” Goal: 138%
Percent to “Live on EHR” Goal: 92%
Percent to “Demonstrate Meaningful Use” Goal: 22%

Progress to Primary Care Providers Goal

Summary and Citations
To promote health information technology (health IT) adoption and meaningful use, the Health Information Technology for Economic and Clinical Health Act (HITECH) authorized the Office of the National Coordinator for Health IT (ONC) to implement the Health IT Regional Extension Center (REC) Cooperative Agreement Program. The REC Program provides information, guidance, and technical assistance to health care providers to support and accelerate their efforts to become meaningful users of electronic health records (EHR). The REC program is funded to provide technical assistance for EHR implementation to 100,000 primary care providers through 62 sites located nation-wide.

http://dashboard.healthit.gov/rec/
Workforce: Community Colleges meeting goals

Students Enrolled and Students Completed

- Cumulative Enrollment
- Cumulative Completion
- Cumulative Enrollment (adjusted for attrition)

Students:
- Aug-10: 1,000
- Sep-10: 2,000
- Oct-10: 3,000
- Nov-10: 4,000
- Dec-10: 5,000
- Jan-11: 6,000
- Feb-11: 7,000
- Mar-11: 8,000
- Apr-11: 9,000
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- Jun-11: 11,000
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- Jan-13: 30,000
- Feb-13: 31,000
- Mar-13: 32,000
- Apr-13: 33,000
- May-13: 34,000
- Jun-13: 35,000

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- Sep-10: 2,000
- Oct-10: 3,000
- Nov-10: 4,000
- Dec-10: 5,000
- Jan-11: 6,000
- Feb-11: 7,000
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*Active = at least one directed message sent between production endpoints or at query during previous calendar quarter

**Data self-reported by HIE grantees, Denominators calculated with 2011 Medicare claims data.
HIE: Exchange is increasing across the nation

18 states had more than 10% of their hospitals actively engaged in sharing health information electronically as of 6-30-12

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Improve cost, quality, and population health - translating investments in health IT in the short run to measurable improvements in the 3-part aim.

Greater Cincinnati Beacon Community
Asthma Care

Keystone Beacon
All-cause 30-day Readmissions for CHF Patients

Note: PHO high-risk asthma population with a rating of diabetes control. For the figure above, the number of high-risk asthma patients included in the measure ranges from 1,316 to 1,543.

Note: Catchment area data from hospital billings for all patients eligible for care management services at Beacon-participating hospitals. Intervention group data for patients receiving care management services through Beacon; quarterly admissions for CHF and COPD ranges from 143-316.
EHR Certification

Certified Health Facilities showing improvement in quality, and population health - translating investments in the short run to measureable improvements in the 3-part aim.

Asthma Control (ACT>=19)

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Meaningful Use Attestations – Market Concentration

Competitiveness of CEHRT market among MU attestations, relative to other IT industries

Herfindahl-Hirschman Index (HHI) of...

- <0.01  “Perfect” competition
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Market Concentration Index

<table>
<thead>
<tr>
<th>Industry</th>
<th>HHI</th>
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<tbody>
<tr>
<td>EHRs with Eligible Professional Attestations</td>
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</tr>
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*Herfindahl-Hirschman Index – a measure of the size of individual firms in relation to the industry. It is an indicator of the amount of competition among firms within an industry.

Source:
- CMS EHR Incentive Program Data as of 10/31/2012
- CHPL Data as of 10/31/2012
- Mobile OS – Netmarketshare (2012)
HITECH Lessons Learned

- Politics and money
- Partnerships with local stakeholders
- Dependence on EHR vendors and HISPs
- IT is just a tool, transformation requires behavior change
Perceived Impacts of EHRs

Percent of physicians agreeing that their EHR has the following impacts: 2011

- Produces clinical benefits for my practice
  - EHR does not meet MU criteria: 79%
  - EHR meets MU criteria: 88%
  - EHR meets MU criteria w/ 2+ years EHR experience: 92%

- My practice functions more efficiently
  - EHR does not meet MU criteria: 76%
  - EHR meets MU criteria: 79%
  - EHR meets MU criteria w/ 2+ years EHR experience: 85%

- Produces financial benefits for my practice
  - EHR does not meet MU criteria: 56%
  - EHR meets MU criteria: 67%
  - EHR meets MU criteria w/ 2+ years EHR experience: 72%

Evidence of the Benefits from HIT

Systematic review of recent studies on impact of health IT

Negative | Neutral | Mixed-Positive | Positive
--- | --- | --- | ---
-11 | 13 | 20 | 56

All outcomes

Quality

-5 | 14 | 24 | 57

Safety

-19 | 5 | 7 | 70

Efficiency

-21 | 19 | 17 | 43

NOTES: Study period includes articles published between January 2010 and December 2012.
Focus on INTEROPERABILITY in the Stage 2 Meaningful Use Criteria

- E-prescribing (ambulatory and inpatient discharge)
- Transition of Care summary exchange:
  - Create & transmit from EHR
  - Receive & incorporate into EHR
- Lab tests & results from inpatient to ambulatory
- Public health reporting – transmission to:
  - Immunization Registries
  - Public Health Agencies for syndromic surveillance
  - Public health Agencies for reportable lab results
  - Cancer Registries
- Patient ability to View, Download and Transmit their health data to a 3rd Party
- Create an export summary of patient data, in order to enable data portability
Consumer e-health & Patient Engagement

- Patient as Partner
- Engaged patients demonstrate better health outcomes
- Patients increasingly expect engagement via IT, as in many other aspects of their lives
- Meaningful Use criteria

66% of Americans say they would consider switching to a physician who offers access to medical records through a secure Internet connection – according to a 2011 Deloitte Survey
Thank You!

Michael.Furukawa@hhs.gov

(202) 690-3950
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Source:
CMS EHR Incentive Program Data as of 10/31/2012;
CHPL Data as of 10/31/2012;
Wireless – US Dept Justice (2011);
Mobile OS – Netmarketshare (2012)
Beacon: Communities showing improvement

**Improve** cost, quality, and population health - *translating investments in health IT in the short run to measurable improvements in the 3-part aim.*

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Asthma Care

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All-cause 30-day Readmissions for CHF Patients

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** Data self-reported by HIE grantees, Denominators calculated with 2011 Medicare Inpatient Hospital Data
Regional Extension Centers are working with 140k+ Primary Care Providers

Regional Extension Center (REC) Cooperative Agreement Program
Enrollment: PCPs by State or County
National

- Total Providers Enrolled: 148,448
- Percent to “Enrollment” Goal: 138%
- Percent to “Live on EHR” Goal: 92%
- Percent to “Demonstrate Meaningful Use” Goal: 22%

Progress to Primary Care Providers Goal

Specialties of Primary Care Providers Enrolled with RECs

Enrolled Providers
- 300 - 1,000
- 1,001 - 1,350
- 1,351 - 2,050
- 2,051 - 4,150
- 4,151 - 12,300

Last Updated: 09/18/2012

Summary and Citations
To promote health information technology (health IT) adoption and meaningful use, the Health Information Technology for Economic and Clinical Health Act (HITECH) authorized the Office of the National Coordinator for Health IT (ONC) to implement the Health IT Regional Extension Center (REC) Cooperative Agreement Program. The REC Program provides information, guidance, and technical assistance to health care providers to support and accelerate their efforts to become meaningful users of electronic health records (EHR). The REC program is funded to provide technical assistance for EHR implementation to 100,000 primary care providers through 62 sites located nation-wide.

http://dashboard.healthit.gov/rec/
Evaluation Logic: Telling the HITECH Story

**CONTEXT & CHARACTERISTICS**
- Grantee characteristics
- ONC regulations
- Health care reform

**IMPLEMENTATION**
- Strategic & operational plans
- Governance & organization
- Interventions & Services
- Practice & Clinical transformation

**EFFECTIVENESS** (short-term)
- Adoption and exchange
- Milestones to Meaningful Use
- Graduating students employed in HIT jobs

**IMPACT** (long-term)
- Impacts on care, cost, and population health
- Reduction in disparities
- Sustainability

**Timely, Formative Feedback**

**Insights, Summative Feedback**

**Deliverables:** Peer-reviewed articles, Briefs, Case Studies, Blog posts
## Evaluating HITECH: Research Questions

<table>
<thead>
<tr>
<th>Questions</th>
<th>REC</th>
<th>State HIE</th>
<th>Beacon</th>
<th>Workforce</th>
<th>SHARP</th>
<th>Global</th>
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<td><strong>Context:</strong> What are the <em>structural</em> and <em>environmental</em> characteristics of the grantees?</td>
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<td><strong>Implementation:</strong> What <em>approaches</em> did the grantees take to <em>implement</em> programs?</td>
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<tr>
<td><strong>Effectiveness:</strong> How <em>effective</em> were grantees in achieving program objectives?</td>
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<td><strong>Impact:</strong> What was the <em>impact</em> of the program on care, costs, and health?</td>
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<td>2.48M</td>
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<td>3.99M</td>
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MU Attainment by Eligible Hospitals

5,011
Total Eligible Hospitals

- Total Hospitals Registered: 4,333
- Total Hospitals Paid: 3,858

2013 Goal
2012 Goal

Source: CMS EHR Incentive Program
Data as of 3/31/2013
Hospital Adoption of MU Functionalities

Percent of hospitals with capability to meet MU Stage 1 objectives: 2011-2012
Hospital Adoption of MU Functionalities

Percent of hospitals with capability to meet MU Stage 1 objectives: 2011

- Record Demographics
- Submit Lab Results to Public Health
- Immunization Registries Data
- Transition of Care Summary
- Medication Reconciliation
- Electronic Exchange of Clinical...
- Patient-specific Education
- Electronic Copy of Discharge...
- Patient Electronic Access
- Patient List
- Clinical Lab Test Results
- Advance Directives
- Drug Formulary Checks
- Drug Interaction Checks
- CPOE for Medication Orders
- Medication Allergy List
- Clinical Quality Measures
- CDS Rule
- Record Vital Signs
- Record Smoking Status
- Active Medication List
- Maintain Problem List
- Syndromic Surveillance Data...
Hospital adoption has also grown rapidly.
## Physician Adoption of MU Functionalities

### Percent of office-based physicians with capability to meet MU Stage 1 objectives: 2011-2012

<table>
<thead>
<tr>
<th>Functionality</th>
<th>2011</th>
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<th>Change 2011-2012</th>
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<tr>
<td>Computerized provider order entry for medication orders</td>
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<td>Record demographics</td>
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<td>Medication allergy list</td>
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<td>Active medication list</td>
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<td>Drug interaction checks</td>
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<td>67</td>
<td>16</td>
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<tr>
<td>Maintain problem list</td>
<td>54</td>
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<td>Clinical summaries to patients</td>
<td>38</td>
<td>56</td>
<td>18</td>
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<tr>
<td>Clinical decision support rule</td>
<td>40</td>
<td>50</td>
<td>10</td>
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<tr>
<td>Clinical quality measures</td>
<td>30</td>
<td>43</td>
<td>13</td>
</tr>
</tbody>
</table>

**Percent of physicians**

- **2011**
- **2012**
- **Change 2011-2012**
### Physician Adoption of MU Functionalities

#### Percent of office-based physicians with capability to meet MU Stage 1 objectives: 2011

<table>
<thead>
<tr>
<th>Functionality</th>
<th>Percent of Physicians</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computerized provider order entry for medication</td>
<td>65</td>
</tr>
<tr>
<td>Record demographics</td>
<td>72</td>
</tr>
<tr>
<td>E-Prescribing</td>
<td>55</td>
</tr>
<tr>
<td>Medication allergy list</td>
<td>57</td>
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<tr>
<td>Active medication list</td>
<td>57</td>
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<tr>
<td>Drug interaction checks</td>
<td>51</td>
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<tr>
<td>Maintain problem list</td>
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<tr>
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<tr>
<td>Clinical quality measures</td>
<td>30</td>
</tr>
</tbody>
</table>
### Physician Adoption of MU Functionalities

#### Percent of office-based physicians with capability to meet MU Stage 1 objectives: 2011-2012

<table>
<thead>
<tr>
<th>Functionality</th>
<th>2011</th>
<th>2012</th>
<th>Change 2011-2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computerized provider order entry for medication orders</td>
<td>65</td>
<td>80</td>
<td>15</td>
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<tr>
<td>Record demographics</td>
<td>72</td>
<td>79</td>
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<td>E-Prescribing</td>
<td>55</td>
<td>73</td>
<td>18</td>
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<tr>
<td>Medication allergy list</td>
<td>57</td>
<td>68</td>
<td>11</td>
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<tr>
<td>Active medication list</td>
<td>57</td>
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<td>43</td>
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</tbody>
</table>
Hospital adoption has also grown rapidly.
MU Attainment by Eligible Professionals

521,600
Total Eligible Professionals

Total Professionals Registered: 386,024
Total Professionals Paid: 255,772

2013 Goal
2012 Goal

Source: CMS EHR Incentive Program
Data as of 3/31/2013
## Evaluating HITECH: Research Questions

<table>
<thead>
<tr>
<th>Questions</th>
<th>REC</th>
<th>State HIE</th>
<th>Beacon</th>
<th>Workforce</th>
<th>SHARP</th>
<th>Global</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Context:</strong> What are the <em>structural</em> and <em>environmental</em> characteristics of the grantees?</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td><strong>Implementation:</strong> What <em>approaches</em> did the grantees take to <em>implement</em> programs?</td>
<td>X</td>
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<tr>
<td><strong>Effectiveness:</strong> How <em>effective</em> were grantees in achieving program objectives?</td>
<td>X</td>
<td>X</td>
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<tr>
<td><strong>Impact:</strong> What was the <em>impact</em> of the program on care, costs, and health?</td>
<td></td>
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<td>X</td>
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<tr>
<th>Contractor</th>
<th>AIR</th>
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<tbody>
<tr>
<td>Award ($)</td>
<td>4.27M</td>
<td>5.38M</td>
<td>3.34M</td>
<td>2.48M</td>
<td>642k</td>
<td>3.99M</td>
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</tbody>
</table>
Evaluation Logic: Telling the HITECH Story

**CONTEXT & CHARACTERISTICS**
- Grantee characteristics
- ONC regulations
- Health care reform

**IMPLEMENTATION**
- Strategic & operational plans
- Governance & organization
- Interventions & Services
- Practice & Clinical transformation

**EFFECTIVENESS** (short-term)
- Adoption and exchange
- Milestones to Meaningful Use
- Graduating students employed in HIT jobs

**IMPACT** (long-term)
- Impacts on care, cost, and population health
- Reduction in disparities
- Sustainability

**Timely, Formative Feedback**
- Insights, Summative Feedback

**Deliverables:** Peer-reviewed articles, Briefs, Case Studies, Blog posts
18 states had students Enrolled and Students Completed sharing health information.

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</table>

* Active = at least one direct query during previous calendar year
** Data self-reported by HIE
HIE: Exchange is increasing across the nation

18 states had more than 10% of their hospitals actively engaged in sharing health information electronically as of 6-30-12

<table>
<thead>
<tr>
<th>State</th>
<th>% of Acute Care Hospitals Actively* Participating in Directed Exchange that is supported or enabled by State HIE grantees**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delaware</td>
<td>100%</td>
</tr>
<tr>
<td>Vermont</td>
<td>79%</td>
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<tr>
<td>Michigan</td>
<td>48%</td>
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<tr>
<td>Arkansas</td>
<td>45%</td>
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<tr>
<td>New York</td>
<td>42%</td>
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<tr>
<td>Minnesota</td>
<td>34%</td>
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<tr>
<td>North Dakota</td>
<td>34%</td>
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<tr>
<td>Colorado</td>
<td>26%</td>
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<tr>
<td>California</td>
<td>20%</td>
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<tr>
<td>Alaska</td>
<td>18%</td>
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<tr>
<td>Utah</td>
<td>14%</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>State</th>
<th>% of Acute Care Hospitals Actively* Participating in Query-Based Exchange that is supported or enabled by State HIE grantees**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delaware</td>
<td>67%</td>
</tr>
<tr>
<td>New York</td>
<td>65%</td>
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<tr>
<td>Maryland</td>
<td>54%</td>
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<td>New Jersey</td>
<td>32%</td>
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<td>Arizona</td>
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<td>Colorado</td>
<td>26%</td>
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<td>Nebraska</td>
<td>20%</td>
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<tr>
<td>Idaho</td>
<td>17%</td>
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<tr>
<td>Kentucky</td>
<td>16%</td>
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<tr>
<td>Michigan</td>
<td>15%</td>
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<tr>
<td>Tennessee</td>
<td>12%</td>
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</tbody>
</table>

* Active = at least one directed message sent between production end points or at least one patient record query during previous calendar quarter

** Data self-reported by HIE grantees, Denominators calculated with 2011 Medicare Inpatient Hospital Data
Beacon: Communities showing improvement

**Improve** cost, quality, and population health - *translating investments in health IT in the short run to measureable improvements in the 3-part aim.*

Greater Cincinnati Beacon Community
Asthma Care

Keystone Beacon
All-cause 30-day Readmissions for CHF Patients

Note: PHO high-risk asthma population with a rating of diabetes control. For the figure above, the number of high-risk asthma patients included in the measure ranges from 1,316 to 1,543.

Note: Catchment area data from hospital billings for all patients eligible for care management services at Beacon-participating hospitals. Intervention group data for patients receiving care management services through Beacon; quarterly admissions for CHF and COPD ranges from 143-316.
EHR Certification Program:
Certified Health IT Product List (CHPL)

Improvement

Health IT.gov

Keystone Beacon

- Lower 30-day Readmissions for CHF Patients

Graph showing growth of Total Products, Total Unique Products, and Total Vendors from April 18, 2011, to February 18, 2012.

Graph showing comparison between Intervention Group and Catchment Area for Q1 2011 to Q3 2011.

Note: Catchment area data from hospital billings for all patients eligible for care management services at participating hospitals. Intervention group data for patients receiving care management services through Beacon; quarterly admissions for CHF and COPD ranges from 143-316.
EHR Certification Program:
Certified Health IT Product List (CHPL)

- Total Products
- Total Unique Products
- Total Vendors

Graph showing the growth over time: 4/18/2011 to 4/18/2013.
- Total Products: 3164
- Total Unique Products: 1804
- Total Vendors: 959
Competitiveness of CEHRT market among MU attestations, relative to other IT industries

Herfindahl-Hirschman Index (HHI) of...

- <0.01  “Perfect” competition
- 0.01 to 0.15  Unconcentrated, highly competitive
- 0.15 to 0.25  Moderately concentrated and competitive
- >0.25  Highly concentrated, may be less competitive

*Herfindahl-Hirschman Index – a measure of the size of individual firms in relation to the industry. It is an indicator of the amount of competition among firms within an industry.

Source:
CMS EHR Incentive Program Data as of 10/31/2012;
CHPL Data as of 10/31/2012
Mobile OS – Netmarketshare (2012)
• Politics and money

• Partnerships with local stakeholders

• Dependence on EHR vendors and HISPs

• IT is just a tool, transformation requires behavior change
Perceived Impacts of EHRs

Percent of physicians agreeing that their EHR has the following impacts: 2011

- Produces clinical benefits for my practice:
  - EHR does not meet MU criteria: 79%
  - EHR meets MU criteria: 88%
  - EHR meets MU criteria w/ 2+ years EHR experience: 92%

- My practice functions more efficiently:
  - EHR does not meet MU criteria: 76%
  - EHR meets MU criteria: 79%
  - EHR meets MU criteria w/ 2+ years EHR experience: 85%

- Produces financial benefits for my practice:
  - EHR does not meet MU criteria: 56%
  - EHR meets MU criteria: 67%
  - EHR meets MU criteria w/ 2+ years EHR experience: 72%

Evidence of the Benefits from HIT

Systematic review of recent studies on impact of health IT

- Negative
- Neutral
- Mixed-Positive
- Positive

All outcomes
-11 13 20 56

Quality
-5 14 24 57

Safety
-19 5 7 70

Efficiency
-21 19 17 43

Focus on INTEROPERABILITY in the Stage 2 Meaningful Use Criteria

- E-prescribing (ambulatory and inpatient discharge)
- Transition of Care summary exchange:
  - Create & transmit from EHR
  - Receive & incorporate into EHR
- Lab tests & results from inpatient to ambulatory
- Public health reporting – transmission to:
  - Immunization Registries
  - Public Health Agencies for syndromic surveillance
  - Public health Agencies for reportable lab results
  - Cancer Registries
- Patient ability to View, Download and Transmit their health data to a 3rd Party
- Create an export summary of patient data, in order to enable data portability
Consumer e-health & Patient Engagement

- Patient as Partner
- Engaged patients demonstrate better health outcomes
- Patients increasingly expect engagement via IT, as in many other aspects of their lives
- Meaningful Use criteria

66% of Americans say they would consider switching to a physician who offers access to medical records through a secure Internet connection – according to a 2011 Deloitte Survey
Focus on INTEROPERABILITY in the Stage 2 Meaningful Use Criteria

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HITECH Lessons Learned

- Politics and money
- Partnerships with local stakeholders
- Dependence on EHR vendors and HISPs
- IT is just a tool, transformation requires behavior change
Meaningful Use Attestations – Market Concentration

Competitiveness of CEHRT market among MU attestations, relative to other IT industries

Herfindahl-Hirschman Index (HHI) of...

- <0.01: "Perfect" competition
- 0.01 to 0.15: Unconcentrated, highly competitive
- 0.15 to 0.25: Moderately concentrated and competitive
- >0.25: Highly concentrated, may be less competitive

Market Concentration Index:

- EHRs with Eligible Professional Attestations: 0.08
- EHRs with Eligible Hospital Attestations: 0.12
- National Wireless Carriers: 0.25
- Mobile/Tablet Operating Systems: 0.46

*Herfindahl-Hirschman Index – a measure of the size of individual firms in relation to the industry. It is an indicator of the amount of competition among firms within an industry.

Source:
- CMS EHR Incentive Program Data as of 10/31/2012
- CHPL Data as of 10/31/2012
- Mobile OS – Netmarketshare (2012)
EHR Certification Program:
Certified Health IT Product List (CHPL)

- Total Products
- Total Unique Products
- Total Vendors

Mobile/Tablet Operating Systems

Reference:
IS EHR Incentive Program Data as of 10/31/2012;
L Data as of 10/31/2012
less – US Dept Justice (2011)
bile OS – Netmarketshare (2012)