AHRQ Quality Indicators 101: Background and Introduction to the AHRQ QIs

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AHRQ – Agency within DHHS
AHRQ mission

To improve the quality, safety, efficiency & effectiveness of health care for all Americans
Overview

1. Origins
2. Current modules
3. Advantages & challenges
4. Recent improvements
5. Uses of the AHRQ QIs
6. Tools: public reporting & quality improvement
7. National Quality Forum Endorsement
8. Additional activities
9. Questions
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AHRQ QIs & the Healthcare Cost & Utilization Project (HCUP)

The AHRQ QIs utilize HCUP in measure development & maintenance

So what is HCUP?

- HCUP: Partnership among States, industry & AHRQ
- Uniform database for cross-State studies; includes clinical, demographic, and resource use information
- Represents all inpatient discharge data from 44 participating States — represents approximately 95% of all discharges
AHRQ Quality Indicators (QIs)

- Developed through contract with UCSF-Stanford Evidence-based Practice Center & UC Davis
- Use existing hospital discharge data, based on readily available data elements
- Incorporate a range of severity adjustment methods, including APR-DRGs* & co-morbidity groupings
- Current modules: Prevention, Inpatient, Patient Safety, Pediatric & Neonatal

* 3M All Patient Refined - Diagnosis Related Groups
Example of indicator evaluation

- **LITERATURE REVIEW**
  - USER DATA

- **INITIAL EMPIRICAL ANALYSES AND DEFINITION**

- **PANEL EVALUATION**

- **FURTHER EMPIRICAL ANALYSES REFINED DEF.**

- **FURTHER REVIEW?**
  - **FINAL DEFINITION**
Structure of AHRQ QIs

- Measure definitions based on a number of data elements, e.g.:
  - ICD-9-CM* diagnosis & procedure codes
  - Medicare Diagnostic Related Groups (DRGs), Major Diagnostic Categories (MDC), sex, age, procedure dates, admission type, admission source, discharge disposition, discharge quarter, point of origin, present on admission

- Numerator: Number of cases with the outcome of interest (e.g., postoperative sepsis, avoidable asthma hospitalization asthma, death)

- Denominator: Population at risk (e.g., pneumonia patients, elective surgical patients, county population from census data)

- Observed rate: The numerator / denominator

- Volume counts for selected procedures

- Counts of admissions at an area level for certain types of admissions

* International Classification of Diseases, Ninth Revision, Clinical Modification
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AHRQ Quality Indicators

Inpatient QIs
- Mortality,
- Utilization,
- Volume

Prevention QIs (Area Level)
- Avoidable
- Hospitalizations / Other Avoidable Conditions

Pediatric QIs

Neonatal QIs

Patient Safety QIs
- Complications,
- Unexpected Death
Inpatient Quality Indicators (IQIs)

**Volume Indicators**
- Esophageal resection
- Pancreatic resection
- Abdominal Aortic Aneurysm (AAA) repair
- Coronary Artery Bypass Graft (CABG)
- Percutaneous transluminal coronary angioplasty (PTCA)
- Carotid endarterectomy

**Utilization Indicators**
- Cesarean delivery rate
- Primary cesarean delivery rate
- VBAC rate
- VBAC rate, uncomplicated
- Laparoscopic cholecystectomy rate
- Incidental appendectomy in the elderly rate
- Bilateral cardiac catheterization rate
- CABG (area level rate)
- PTCA (area level rate)
- Hysterectomy (area level rate)
- Laminectomy or spinal fusion (area level rate)
Inpatient Quality Indicators (cont.)

- **Mortality Indicators for Inpatient Conditions**
  - Acute myocardial infarction (AMI)
  - AMI, without transfer cases
  - Congestive heart failure
  - Gastrointestinal hemorrhage
  - Hip fracture
  - Pneumonia
  - Acute stroke

- **Mortality Indicators for Inpatient Procedures**
  - AAA repair
  - CABG
  - Craniotomy
  - Esophageal resection
  - Hip replacement
  - Pancreatic resection
  - Carotid endarterectomy
  - PTCA
Patient Safety Indicators (PSIs)

- Death in low mortality DRGs
- Pressure ulcer
- Death among surgical inpatients with treatable serious complications
- Foreign body left during procedure *
- Iatrogenic pneumothorax *
- Central venous catheter-related bloodstream infection *
- Postoperative hemorrhage or hematoma *
- Postoperative hip fracture
- Postoperative physiological and metabolic derangement
- Postoperative PE or DVT

* Indicator also provided as an area-level indicator
Patient Safety Indicators (cont.)

- Postoperative respiratory failure
- Postoperative sepsis
- Postoperative wound dehiscence *
- Transfusion reaction *
- Accidental puncture or laceration *
- Birth trauma – injury to neonate
- OB trauma – vaginal delivery with instrument (3rd or 4th degree laceration)
- OB trauma – vaginal delivery without instrument (3rd or 4th degree laceration)

* The indicators are also provided as area-level indicators
Pediatric Quality Indicators (PDIs)

- **Inpatient Indicators**
  - Accidental puncture or laceration
  - Pressure ulcer
  - Foreign body left in after procedure
  - Iatrogenic pneumothorax
  - Pediatric heart surgery mortality
  - Pediatric heart surgery volume
  - Postoperative hemorrhage or hematoma
  - Postoperative respiratory failure
  - Postoperative sepsis
  - Postoperative wound dehiscence
  - Transfusion reaction
  - Central venous catheter-related bloodstream infection
Area-Level Indicators

- Asthma admission rate
- Diabetes short-term complication admission rate
- Gastroenteritis admission rate
- Perforated appendix admission rate
- Urinary tract infection admission rate
Neonatal Quality Indicators (NQIs)

- **Inpatient Indicators**
  - Iatrogenic pneumothorax in neonates
  - Neonatal mortality
  - Central line bloodstream infection in neonates
Prevention Quality Indicators (PQIs)

- Bacterial pneumonia
- Dehydration
- Urinary tract infection
- Perforated appendix
- Low birth weight
- Angina without procedure
- Congestive heart failure
- Hypertension

- Adult asthma
- COPD
- Diabetes complications - short term
- Diabetes complications - long term
- Uncontrolled diabetes
- Lower extremity amputation among patients with diabetes
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Advantages

- **Public Access**
  - All development documentation & details on each indicator available on Web site
  - Software available to download at no cost
    - Documentation & software at: [www.qualityindicators.ahrq.gov](http://www.qualityindicators.ahrq.gov)
  - Standardized indicator definitions
  - Can be used with any administrative data, e.g. HCUP, MEDPAR*, State data sets, payer data, hospital internal data
  - Hospitals can replicate results

* Medicare Provider Analysis & Review (Medicare administrative inpatient data)
Advantages (cont.)

Scope

- Over 90 individual measures
- Each measure can be stratified by other variables including patient race, age, sex, provider, geographic region
- Include priority populations & areas, e.g.:
  - Child health, women’s health (pregnancy & child-birth), diabetes, hypertension, ischemic heart disease, stroke, asthma, patient safety, preventive care
- Focus on acute care, but crosses over to community & outpatient care delivery settings
Advantages (cont.)

- Harmonization of measures
- Indicator maintenance and updates
- Tools & technical assistance
- National benchmarks:
  - National Healthcare Quality Report
  - National Healthcare Disparities Report
  - HCUPnet
Current limitations & challenges

- Outcomes data less actionable than processes
- Limited clinical detail
- Risk adjustment challenges
- Accuracy hinges on accuracy of documentation & coding
- Data potentially subject to gaming
- Time lag of the data
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Recent improvements

- Composite measures
  - Developed composite measures for the IQIs, PSIs, PQIs & PDIs

- Risk adjustment based on administrative data
  - Additional risk adjustment methods for AHRQ QIs

- Updated literature reviews
  - Completed IQIs, PDIs & PSIs

- Reporting template
  - Tested & refined

- National Quality Forum review & endorsement of a number of the QIs

- Use of present on admission & point of origin data
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General uses of the AHRQ QIs

- **Hospital quality improvement efforts**
  - Individual hospitals & health care systems, such as:
    - Banner Health (a multi-hospital system in AZ)
    - Norton Healthcare (a multi-hospital system in KY)
    - Baycare Health System (a multi-hospital system in FL)
    - Ministry Health Care (a multi-hospital system in WI)
  - Hospital association member based reports, such as:
    - University Healthsystem Consortium
    - Dallas - Fort Worth Hospital Council
    - Premier (note: Premier participating in CMS pay for performance demonstration, which includes AHRQ QIs)
General uses of the AHRQ QIs

- **Aggregate reporting:** National, state, regional
  - National Healthcare Quality / Disparities Reports
  - Commonwealth Fund’s Health Performance Initiative

- **Research**
  - Tracking quality of care for populations over time & across areas
  - Tracking disparities in care over time and across areas
  - Comparing quality between different types of hospitals or hospital systems (e.g., size, volume, teaching status, ownership, accreditation, critical access status)
  - Evaluating impact of interventions to reduce costs or improve quality (e.g., resident work hours reform, electronic health information systems, hospital mergers & consolidations)
General uses of the AHRQ QIs

- **Value based purchasing / pay for performance (P4P)**
  - CMS - Premier Demo
  - Anthem of Virginia
  - The Alliance (Wisconsin)

- **Hospital level public reporting**
  - Currently: Statewide public reporting *(upcoming slide)*
  - Upcoming: CMS Hospital Compare, including Veterans Affairs medical centers *(upcoming slide)*

- **Hospital profiling: Public reporting & P4P**
  - Blue Cross / Blue Shield of Illinois
Two-thirds of the US has access to a public report in their state that use the AHRQ QIs.

AHRQ QIs appear in public reports in 25 states.
Centers for Medicare & Medicaid Services (CMS) Hospital Compare

Hospital Compare is a public report of 4,500+ hospitals produced by CMS

AHRQ QIs (below) to be added per a recent Inpatient Prospective Payment System (IPPS) rule

**Individual measures**

- Death among surgical inpatients with serious treatable complications
- Iatrogenic pneumothorax
- Postoperative wound dehiscence
- Accidental puncture or laceration
- AAA repair mortality
- Hip fracture mortality

**Composites**

- Patient safety for selected indicators
- Mortality for selected conditions

(See next slide for measures within each composite)
CMS Hospital Compare (cont.)

- **Composite**: Patient safety for selected indicators
  - Pressure ulcers
  - Iatrogenic pneumothorax
  - Central venous catheter-related bloodstream infections
  - Postoperative hip fracture
  - Postoperative pulmonary embolism or DVT
  - Postoperative sepsis
  - Postoperative wound dehiscence
  - Accidental puncture or laceration

- **Composite**: Mortality for selected conditions
  - AMI mortality
  - CHF mortality
  - Acute stroke mortality
  - GI hemorrhage mortality
  - Hip fracture mortality
  - Pneumonia mortality
Additional AHRQ QIs to be added per the FY11 IPPS rule:

- Postoperative respiratory failure
- Postoperative pulmonary embolism or DVT

The above 2 PSI measures are scheduled to be added to Hospital Compare in FY12
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AHRQ tools for public reporting the AHRQ QIs: Recent & current

- **Reporting templates (or model reports)**
  - Tool for reporting sponsors to use the best evidence on public reports

- **Reporting guidance**
  - Report on the appropriate uses of the AHRQ QIs based on the evidence to date

- **Quality Indicators Learning Institute**
  - Web conference series to disseminate technical information of various aspects of public reporting
AHRQ tools for public reporting
the AHRQ QIs (cont.)

- **MONAHRQ software**
  - Software to input hospital administrative claims data & produce a website to publicly report performance in the AHRQ QIs at the hospital & community level
  - MONAHRQ Web site at: [www.monahrq.ahrq.gov](http://www.monahrq.ahrq.gov)

- **MONAHRQ Learning Network**
  - Provide information & technical assistance to users & potential users of MONAHRQ
AHRQ tools for quality improvement using the AHRQ QIs: Upcoming

- Quality improvement toolkit under development for hospital use to make improvement related to the AHRQ IQIs & PSIs

- Some specifics of the toolkit:
  - Methods to evaluate the data for identifying opportunities for improvement
  - Strategies for implementing interventions (or evidence-based best practices)
  - Methods to measure progress

- Available late - 2011
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Currently, NQF endorsement in regard to:

- **47 of the AHRQ QIs**
  - Inpatient Quality Indicators (IQIs): 12
  - Patient Safety Indicators (PSIs): 10
  - Prevention Quality Indicators (PQIs): 14
  - Pediatric Quality Indicators (PDIs): 10
  - Neonatal Quality Indicators (NQIs): 1

- **3 AHRQ QI composites**
  - Mortality for selected conditions
  - Patient safety for selected indicators
  - Pediatric patient safety for selected indicators
# National Quality Forum Endorsement: IQIs

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<thead>
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<td>IQI 1</td>
<td>Esophageal Resection Volume</td>
<td>IQI 16</td>
<td>CHF Mortality</td>
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<td>IQI 2</td>
<td>Pancreatic Resection Volume</td>
<td>IQI 17</td>
<td>Acute Stroke Mortality</td>
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<td>IQI 4</td>
<td>Abdominal Aortic Aneurysm (AAA) Repair Volume</td>
<td>IQI 19</td>
<td>Hip Fracture Mortality</td>
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<td>IQI 8</td>
<td>Esophageal Resection Mortality</td>
<td>IQI 20</td>
<td>Pneumonia Mortality</td>
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<td>Pancreatic Resection Mortality</td>
<td>IQI 24</td>
<td>Incidental Appendectomy in the Elderly</td>
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<td>IQI 11</td>
<td>AAA Repair Mortality</td>
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## National Quality Forum Endorsement: PSIs

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<tr>
<td>PSI 2</td>
<td>Death in Low Mortality DRGs</td>
<td>PSI 12</td>
<td>Postoperative PE or DVT</td>
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<td>PSI 4</td>
<td>Death Among Surgical Inpatients With Treatable Serious Complications</td>
<td>PSI 14</td>
<td>Postoperative Wound Dehiscence</td>
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<td>PSI 5</td>
<td>Foreign Body Left in During Procedure</td>
<td>PSI 15</td>
<td>Accidental Puncture or Laceration</td>
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<td>PSI 6</td>
<td>Iatrogenic Pneumothorax</td>
<td>PSI 16</td>
<td>Transfusion Reaction</td>
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<td>PSI 11</td>
<td>Postoperative Respiratory Failure</td>
<td>PSI 17</td>
<td>Birth Trauma – Injury to Neonate</td>
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<td>PDI 1</td>
<td>Accidental Puncture or Laceration</td>
<td>PDI 7</td>
<td>Pediatric Heart Surgery Volume</td>
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<td>PDI 2</td>
<td>Decubitus Ulcer</td>
<td>PDI 11</td>
<td>Postoperative Wound Dehiscence</td>
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<td>PDI 3</td>
<td>Foreign Body</td>
<td>PDI 13</td>
<td>Transfusion Reaction</td>
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<td>PDI 5</td>
<td>Iatrogenic Pneumothorax</td>
<td>PDI 14</td>
<td>Asthma Admission Rate (area rate)</td>
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<td>PDI 6</td>
<td>Pediatric Heart Surgery Mortality</td>
<td>PDI 16</td>
<td>Gastroenteritis Admission Rate (area rate)</td>
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<td>NQI 3</td>
<td>Blood Stream Infection in Neonates</td>
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# National Quality Forum Endorsement: PQIs

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<td>PQI 1</td>
<td>Diabetes, Short-Term Complications</td>
<td>PQI 10</td>
<td>Dehydration</td>
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<td>PQI 2</td>
<td>Perforated Appendicitis</td>
<td>PQI 11</td>
<td>Bacterial Pneumonia</td>
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<tr>
<td>PQI 3</td>
<td>Diabetes, Long-Term Complications</td>
<td>PQI 12</td>
<td>Urinary Tract Infections</td>
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<td>PQI 5</td>
<td>Chronic Obstructive Pulmonary Disease</td>
<td>PQI 13</td>
<td>Angina without Procedure</td>
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<td>PQI 7</td>
<td>Hypertension</td>
<td>PQI 14</td>
<td>Uncontrolled Diabetes</td>
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<tr>
<td>PQI 8</td>
<td>Congestive Heart Failure</td>
<td>PQI 15</td>
<td>Adult Asthma</td>
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<tr>
<td>PQI 9</td>
<td>Low birth weight</td>
<td>PQI 16</td>
<td>Lower Extremity Amputations among Patients with Diabetes</td>
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Highlights of additional activities

- AHRQ funded HCUP Partner projects to add more clinical data to statewide administrative databases (e.g. present on admission, lab values)

- AHRQ proposed coding changes & clarifications to ICD-9 to enhance accuracy & use of some indicators
  - Retinopathy of prematurity
  - Necrotizing enterocolitis
  - Disruption of postoperative wound
  - Deep vein thrombosis
  - Transfusion reaction

- Working with other measure developers to align specifications of similar measures
  - The Joint Commission
  - Centers for Medicare & Medicaid Services
  - National Perinatal Information Center
  - Researchers
The OECD Health Care Quality Indicators Project includes a patient safety component.

The project conducted a pilot with seven countries to translate a number of PSIs to the WHO’s version of ICD 10.

A paper on the pilot was recently published in the International Journal of Quality Health Care – volume 21, number 4, pages 272 – 278.

The pilot has recently expanded – Currently 18 countries are participating.
Pilot Objectives:

- Gather evidence on the scientific acceptability of the PSIs
  - Medical record reviews, data analysis, clinical panels, evidence reviews
- Consolidate the evidence base
- Improve guidance on the interpretation and use of the data
- Evaluate potential refinements to the specifications
Validation pilot, phases 1 to 4

- **Phase 1 (Concluded)**
  - Focus on estimating false positive rate for 5 PSIs (# 6, 7, 12, 13, 15)
  - 6 articles published or soon to be published

- **Phase 2 & 3 (Currently in data analysis)**
  - Focus on estimating false positive rate for 2 other PSIs (# 9, 10)
  - Will also estimate false negative rate (sensitivity) for these 2 PSIs and up to 6 more PSIs (# 5, 6, 7, 11, 14, 15)

- **Phase 4 (Ongoing)**
  - Collaboration with University HealthSystem Consortium on 3 PSIs (# 3, 11, 12)
    - 2 articles published (PSI 11, 12) and 1 in preparation (PSI 3)
  - Collaboration with Veterans Health Administration on 10 PSIs (# 3, 5, 6, 8, 9, 11-15)
    - 3 articles published or soon to be published (PSI 6, 11-13, 15)
  - Collaboration with National Perinatal Information Center on PSI 17
Current Measurement Work

Measure & Beta Measurement pipeline

- Readmission measures
- Health care associated infections
- Emergency Preparedness measures
- Care coordination measure development
- Emergency dept. PSI measure development
- Emergency dept. PQI measure development
- Medicaid Home & Community Based Services population measures

Exploration of Measure Enhancement pipeline

- Integration of lab values
- Further integration of present on admission
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For more information…

- Web site: [http://qualityindicators.ahrq.gov](http://qualityindicators.ahrq.gov)
  - QI documentation and software are available
  - Sign up for AHRQ QI listserv

- Support E-mail: [support@qualityindicators.ahrq.gov](mailto:support@qualityindicators.ahrq.gov)

- Support Phone: (888) 512-6090 (voicemail)

- Staff: [Mamatha.Pancholi@ahrq.hhs.gov](mailto:Mamatha.Pancholi@ahrq.hhs.gov)
  [John.Bott@ahrq.hhs.gov](mailto:John.Bott@ahrq.hhs.gov)