



# The AHRQ Quality Indicators

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# Overview

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1. The QIs and QI Modules
2. NQF-Approved Measures
3. Public Reporting
4. Validation Efforts
5. QI Tools



# Quality Indicators & HCUP

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- HCUP: Partnership among States, industry, and AHRQ
- Uniform database for cross-State studies; includes clinical, demographic, and resource use information
- Represents all inpatient discharge data from participating States—represents approximately 90 percent of all discharges

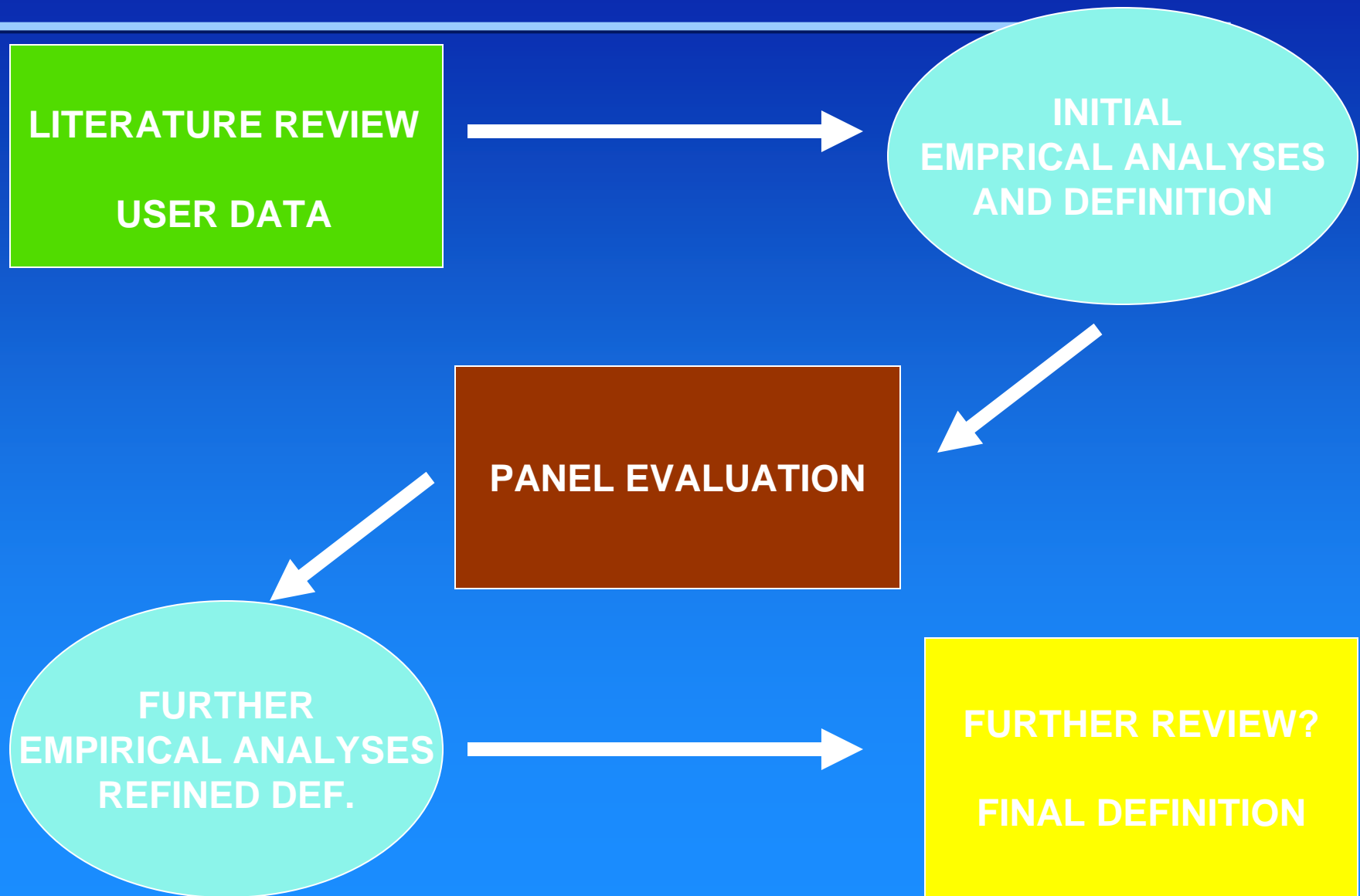


# Background on the QIs

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

# Example Indicator Evaluation



# Current QI Modules

**Inpatient QIs**

**Mortality  
Utilization  
Volume**

**Pediatric  
QIs**

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

**Neonatal QIs**

**Patient Safety  
QIs**

**Complications  
Unexpected Death**



# Prevention Quality Indicators

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- The original QI module (released 2001)
- Focus on quality of care for ambulatory care-sensitive conditions

# List of PQIs

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- Diabetes, short-term complications
- Perforated Appendix
- Diabetes, long-term complications
- Chronic Obstructive Pulmonary Disease
- Hypertension
- Congestive Heart Failure
- Low Birth Weight
- Dehydration
- Bacterial Pneumonia
- Urinary Infections
- Angina without Procedure
- Uncontrolled Diabetes
- Adult Asthma
- Lower Extremity Amputations among Patients with Diabetes





# Inpatient Quality Indicators

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- Second set of QIs (released 2002)
- Focus on quality of care inside hospitals
- Includes measures of inpatient mortality, utilization, and volume

# List of IQIs

## Mortality Rates for Medical Conditions:

- Acute Myocardial Infarction
- AMI, without transfer cases
- Congestive Heart Failure
- Stroke
- Gastrointestinal Hemorrhage
- Hip Fracture
- Pneumonia

## Mortality Rates for Surgical Procedures:

- Esophageal Resection
- Pancreatic Resection
- Abdominal Aortic Aneurysm Repair
- Coronary Artery Bypass Graft
- Percutaneous Transluminal Coronary Angioplasty (PTCA)
- Carotid Endarterectomy
- Craniotomy
- Hip Replacement



# List of IQIs (cont'd.)

## Hospital-Level Procedure Utilization Rates:

- Cesarean Section Delivery
- Primary Cesarean Delivery
- Vaginal Birth After Cesarean (VBAC), uncomplicated
- VBAC, all
- Laparoscopic cholecystectomy
- Incidental Appendectomy in the elderly
- Bi-lateral cardiac catheterization

## Area-Level Utilization Rates:

- Coronary Artery Bypass Graft
- PTCA
- Hysterectomy
- Laminectomy or spinal fusion



# List of IQIs (cont'd.)

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## Volume of Procedures:

- Esophageal Resection
- Pancreatic Resection
- Abdominal Aortic Aneurysm Repair
- Coronary Artery Bypass Graft
- PTCA
- Carotid endarterectomy



# Patient Safety Indicators

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- Third set of QIs (released 2003)
- Focus on potential adverse events occurring during hospitalization

# List of PSIs

## Hospital-Level:

- Complications of anesthesia
- Death in Low Mortality DRGs
- Decubitus Ulcer
- Failure to Rescue
- Foreign Body Left in During Procedure
- Iatrogenic Pneumothorax
- Selected Infections Due to Medical Care
- Postoperative Hip Fracture
- Postoperative Hemorrhage or Hematoma
- Postoperative Physiologic or Metabolic Derangements
- Postoperative Respiratory Failure
- Postoperative Pulmonary Embolism or Deep Vein Thrombosis
- Postoperative Sepsis
- Postoperative Wound Dehiscence in Abdominopelvic Surgical Patients
- Accidental Puncture or Laceration
- Transfusion Reaction
- Birth Trauma – Injury to Neonate
- Obstetric Trauma – Vaginal Delivery with Instrument
- Obstetric Trauma – Vaginal Delivery Without Instrument
- Obstetric Trauma – Cesarean Delivery



# List of PSIs (cont'd.)

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## Area-Level:

- Foreign Body Left in During Procedure
- Iatrogenic Pneumothorax
- Selected Infections Due to Medical Care
- Postoperative Wound Dehiscence in Abdominopelvic Surgical Patients
- Accidental Puncture and Laceration
- Transfusion Reaction
- Postoperative Hemorrhage or Hematoma



# Pediatric Quality Indicators

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- Fourth set of QIs (released 2006)
- Measures similar to other modules, but focus on pediatric population



# List of PDIs

## Hospital-Level:

- Accidental Puncture or Laceration
- Decubitus Ulcer
- Foreign Body Left in During Procedure
- Iatrogenic Pneumothorax in Neonates at Risk
- Iatrogenic Pneomothorax in Non-Neonates
- Pediatric Heart Surgery Mortality
- Pediatric Heart Surgery Volume
- Postoperative Hemorrhage or Hematoma
- Postoperative Respiratory Failure
- Postoperative Sepsis
- Postoperative Wound Dehiscence
- Selected Infections Due to Medical Care
- Transfusion Reaction



# List of PDIs (cont'd.)

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## Area-Level:

- Asthma Admission Rate
- Diabetes Short-Term Complications Rate
- Gastroenteritis Admission Rate
- Perforated Appendix Admission Rate
- Urinary Tract Infection Admission Rate



# Advantages

## ■ Public Access

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

\* Medicare Provider Analysis and Review



# Advantages (cont'd)

## ■ Scope

- Over 100 individual measures
- Each measure can be stratified by other variables including patient race, age, sex, provider, geographic region
- Include priority populations and areas: Child health, women's health (pregnancy and child-birth), diabetes, hypertension, ischemic heart disease, stroke, asthma, patient safety, preventive care
- Focus on acute care but do cross over to community and outpatient care delivery settings



# Advantages (cont'd)

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- Harmonization of measures
- Indicator maintenance, updates
- Tools and technical assistance
- National benchmarks
  - National Healthcare Quality Report
  - National Healthcare Disparities Report
  - HCUPnet



# Current Limitations & Challenges

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- Outcomes data less actionable than processes
- Lack clinical detail
- Risk adjustment challenges
- Accuracy hinges on accuracy of documentation and coding
- Data potentially subject to gaming
- Time lag



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# National Quality Forum Endorsement

- Suitable for comparative reporting and quality improvement
- Evaluated for importance, scientific acceptability, usability, and feasibility
- An effort to harmonize and standardize measures among developers
- AHRQ Quality Indicators
  - 14 Prevention Quality Indicators (PQIs)
  - 12 Inpatient Quality Indicators (IQIs)
  - 8 Patient Safety Indicators (PSIs)
  - 9 Pediatric Quality Indicators (PDIs)





# National Quality Forum Endorsement

IQI	Label	IQI	Label
IQI #01	Esophageal Resection Volume	IQI #16	CHF Mortality
IQI #02	Pancreatic Resection Volume	IQI #17	Acute Stroke Mortality
IQI #04	Abdominal Aortic Aneurysm (AAA) Repair Volume	IQI #19	Hip Fracture Mortality
IQI #08	Esophageal Resection Mortality	IQI #20	Pneumonia Mortality
IQI #09	Pancreatic Resection Mortality	IQI #24	Incidental Appendectomy in the Elderly
IQI #11	Abdominal Aortic Aneurysm (AAA) Repair Mortality	IQI #25	Bilateral Catheterization



# National Quality Forum Endorsement

PSI	Label	PSI	Label
PSI #02	Death in Low Mortality DRGs	PSI #12	Postoperative DVT or PE
PSI #04	Death Among Surgical Inpatients With Treatable Serious Complications	PSI #14	Postoperative Wound Dehiscence
PSI #05	Foreign Body	PSI #15	Accidental Puncture or Laceration
PSI #06	Iatrogenic Pneumothorax	PSI #16	Transfusion Reaction



# National Quality Forum Endorsement

Indicator	Label	Indicator	Label
PDI #01	Accidental Puncture or Laceration	PDI #07	Pediatric Heart Surgery Volume
PDI #02	Decubitus Ulcer	PDI #11	Postoperative Wound Dehiscence
PDI #03	Foreign Body	PDI #13	Transfusion Reaction
PDI #05	Iatrogenic Pneumothorax	NQI* #02	Blood Stream Infection in Neonates*
PDI #06	Pediatric Heart Surgery Mortality		

\*NQI- Neonate Quality Indicator

\*Endorsement pending



# Composite Measures

- Inpatient Quality Indicators
  - Mortality for Selected Procedures
  - Mortality for Selected Conditions
- Patient Safety Indicators
  - Overall Safety
- Pediatric Quality Indicators
  - Overall Safety
- Volume-Outcome
  - Resection, AAA repair, pediatric heart



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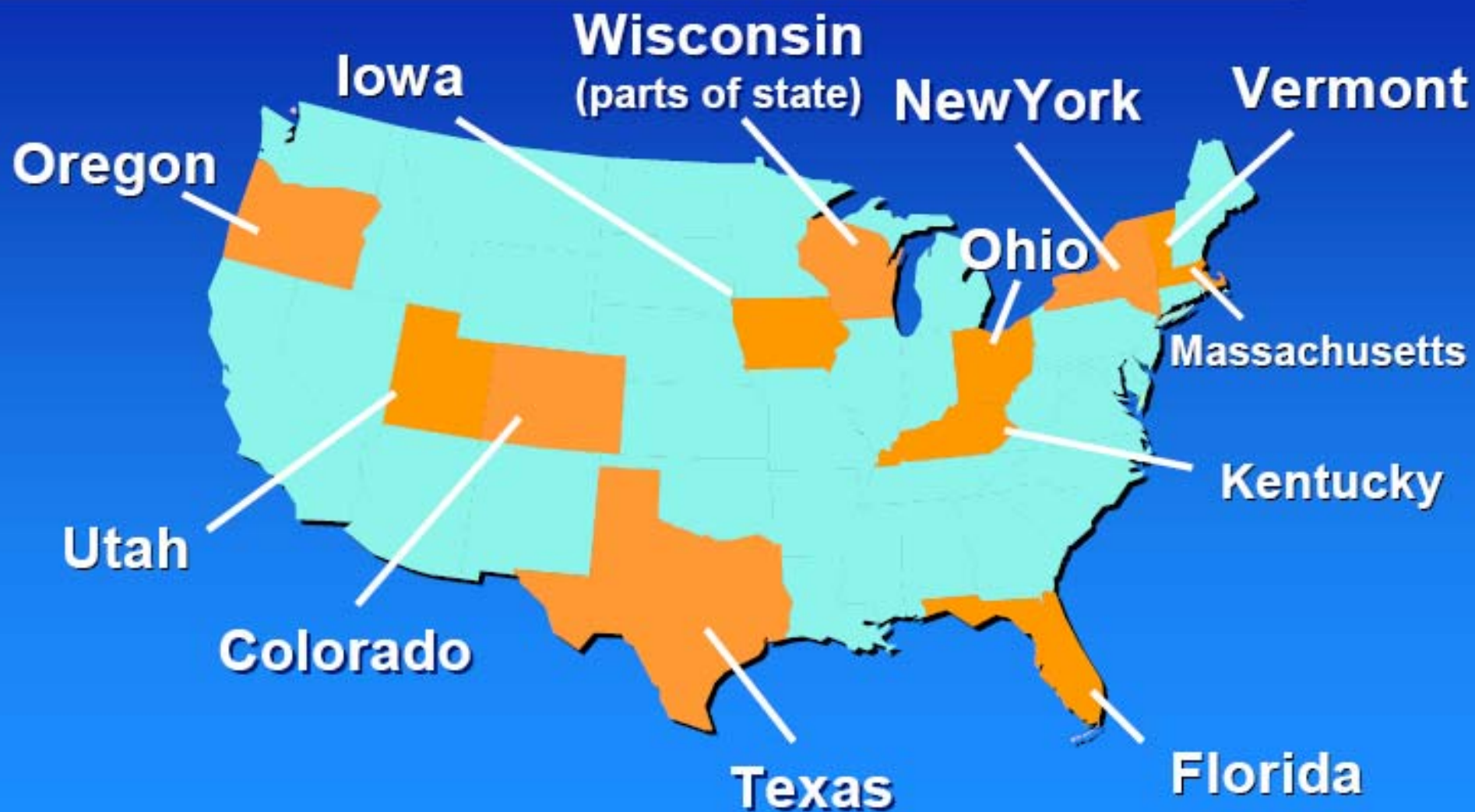


# General Uses of the AHRQ QIs

- Hospital Quality Improvement – Internal and External
  - Individual hospitals and health care systems
  - Hospital association member-only reports
- National, State, and Regional Reporting
  - National Healthcare Quality/Disparities Reports
  - Commonwealth Fund's Health Performance Initiative
- Pay-for-Performance by Hospital
  - CMS/Premier Demo
  - Anthem of Virginia
- Hospital Profiling
  - Blue Cross/Blue Shield of Illinois
- Comparative Public Reporting



# 12 States Use QIs for Public Hospital Reporting





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# Validation Studies

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- AHRQ sponsored
  - Phase I
    - Simple Review
    - In-depth Review
    - Supplemental Review
  - Phase II
    - Currently Recruiting



# Validation Pilot, Phase I

## ■ 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, Phase I

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## ■ Conclusions

- The five evaluated PSIs have variable PPVs, which should be considered in selecting indicators for public reporting and pay-for-performance
- Pilot-tested a mechanism for supporting ongoing validation work, which can be applied to estimate sensitivity in Phase II



# Validation Pilot, Phase II

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- Validation Pilot, Phase II
  - Pending OMB review
  - Estimate sensitivity (false negatives) in addition to PPV (false positives)
  - 16 organizations have indicated an interest in participating in Phase II
  - Encourage hospitals in HCUP partner States to participate



# Other Validation Studies

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- University HealthSystem Consortium – Patient Safety Indicators



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# Windows Quality Indicators Software (WinQI)

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- Allows users to run AHRQ QI analysis with data they provide
- Current users: federal govt., state govt., hospital associations, individual hospitals, researchers
- Software enables calculation of QI rates as well as generation of reports



# Preventable Hospitalization Costs: A County-Level Mapping Tool

The PHC mapping tool is a QI software application designed to help organizations to:

- better understand geographical patterns of potentially preventable hospital admission rates for selected health problems.
- allocate resources more effectively by calculating potential cost savings if admission rates are reduced.





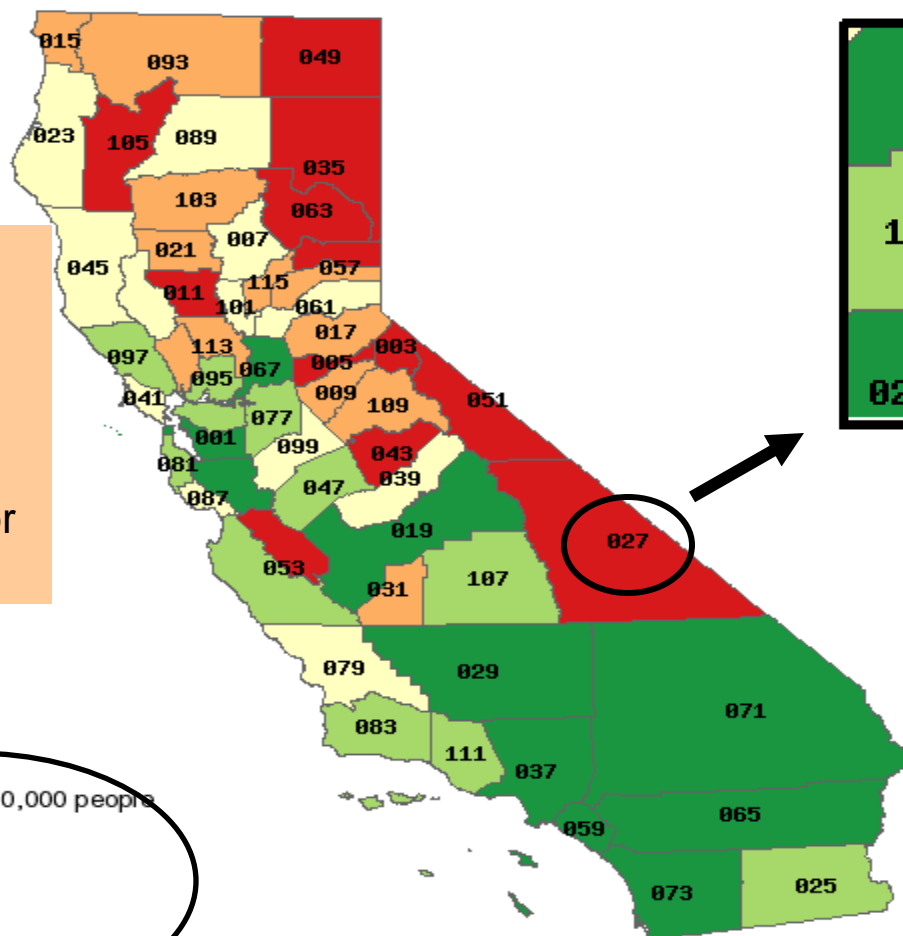
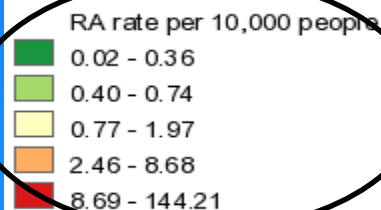
# Main Functions of the PHC Mapping Tool

- Creation of maps that show the rates of hospital admission for selected health problems on a county-by-county basis.
- Calculation of potential cost savings that may occur if the number of hospital admissions for selected health problems in each county is reduced.
- Ability to place additional information about local populations onto maps to indicate the number of persons who are at greatest risk for those health problems in each county.

# Sample Map for PQI 14, Uncontrolled Diabetes Admission

Uncontrolled Diabetes Admission (2001, PQI14)

Data Quintiles.  
 Green is the  
 lowest 20%, or  
 lowest rates.  
 Red is the  
 highest 20%, or  
 highest rates.





# Excel Spreadsheet Produced by PHC, with Cost Savings Estimate

Microsoft Excel - PQI

File Edit View Insert Format Tools Data Window Help

Type a question for help

Arial 10 B I U

Reply with Changes... Egd Review...

C11 22

Area	Name	Numerator	Denominator	Rate per person	Risk adjusted rate per person	SE of risk adjusted rate	Difference from Overall Risk Adjusted Rate	Cost savings given 10% reduction in numerator
0	California	1,140	25,171,190	0.0000453	0.0000453	0.0000029		\$32,424
6001	Alameda County	19	1,108,591	0.0000171	0.0000265	0.0000172		\$929
6003	Alpine County	20	955	0.0209424	0.0144214	0.0003919	higher	\$246
6005	Amador County	21	28,763	0.0007301	0.0011921	0.0001100	higher	\$0
6007	Butte County	23	157,356	0.0001462	0.0000976	0.0000301		\$701
6009	Calaveras County	15	32,570	0.0004605	0.0005644	0.0000895	higher	\$0
6011	Colusa County	15	13,204	0.0011360	0.0010547	0.0001224	higher	\$0
6013	Contra Costa County	22	718,723	0.0000306	0.0000544	0.0000229		\$0
6015	Del Norte County	19	20,739	0.0009161	0.0006762	0.0000871	higher	\$275
6017	El Dorado County	22	120,461	0.0001826	0.0003085	0.0000547	higher	\$0
6019	Fresno County	21	557,168	0.0000377	0.0000165	0.0000129	lower	\$275
6021	Glenn County	24	18,437	0.0013017	0.0008683	0.0000878	higher	\$783
6023	Humboldt County	19	97,859	0.0001942	0.0001349	0.0000389	higher	\$0
6025	Imperial County	13	99,386	0.0001308	0.0000567	0.0000305		\$1,171
6027	Inyo County	24	13,762	0.0017439	0.0016970	0.0001227	higher	\$787
6029	Kern County	20	462,865	0.0000432	0.0000347	0.0000192		\$401
6031	Kings County	30	93,932	0.0003194	0.0002815	0.0000447	higher	\$524
6033	Lake County	13	46,206	0.0002813	0.0001660	0.0000522	higher	\$368
6035	Lassen County	18	26,521	0.0006787	0.0008680	0.0001014	higher	\$898
6037	Los Angeles County	18	6,976,376	0.0000026	0.0000021	0.0000050	lower	\$0
6039	Madera County	20	89,182	0.0002243	0.0000950	0.0000318		\$362
6041	Marin County	21	197,811	0.0001062	0.0001603	0.0000403	higher	\$0
6043	Mariposa County	15	13,588	0.0011039	0.0011194	0.0001261	higher	\$158
6045	Mendocino County	20	65,149	0.0003070	0.0001967	0.0000458	higher	\$281
6047	Merced County	24	143,815	0.0001669	0.0000735	0.0000255		\$1,750

PQI14

Draw AutoShapes

Ready

NUM

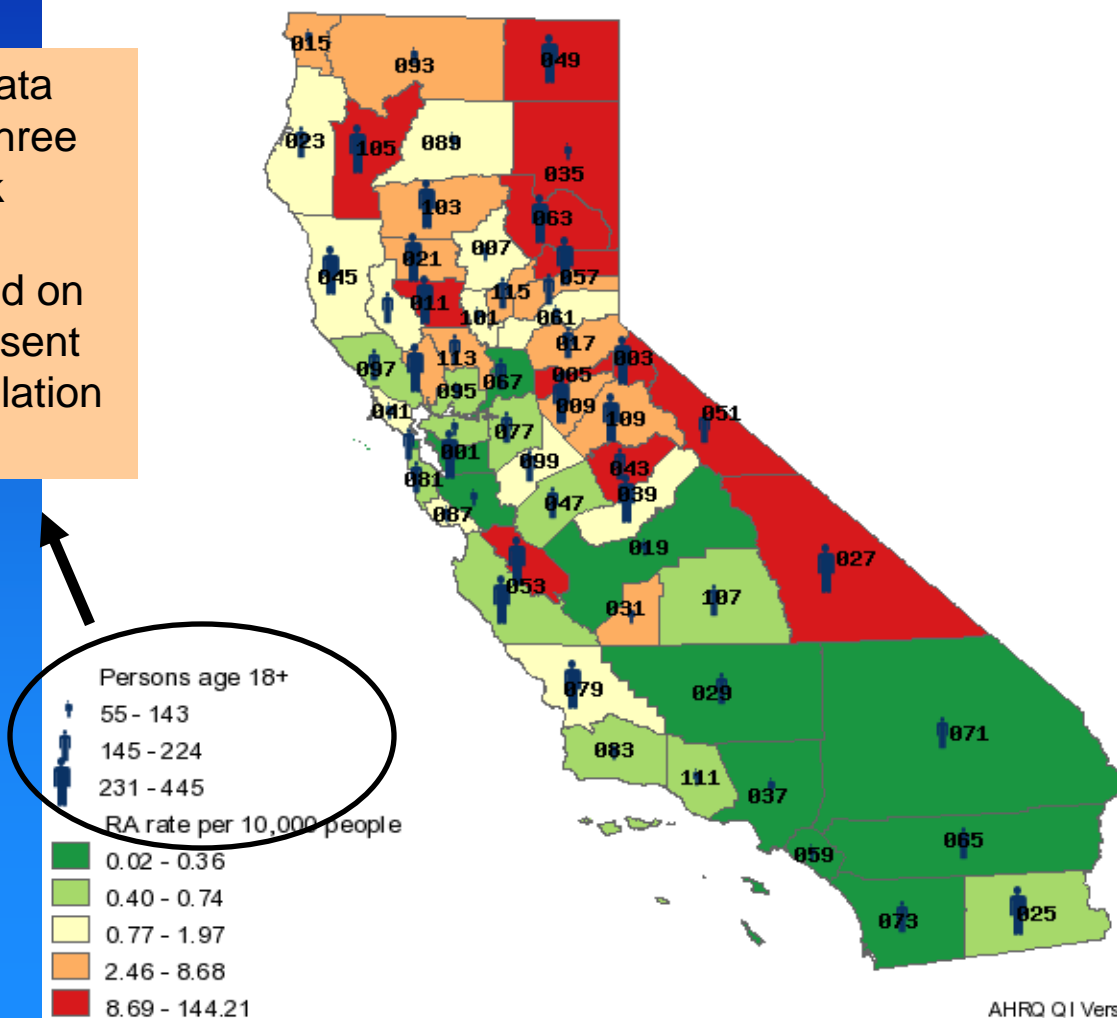
County Risk –  
Adjusted Rate is  
significantly higher  
than state.

Cost  
Savings  
Data

# Sample Map for PQI 14, Population Data Added

Population data  
 broken into three  
 groups. Stick  
 figures  
 superimposed on  
 map to represent  
 relative population  
 size.

Uncontrolled Diabetes Admission (2001, PQI14)





# For More Information...

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## Quality Indicators:

- Web site: <http://qualityindicators.ahrq.gov/>
  - QI documentation and software are available
- 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)



# Presenter Contact Info

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# Questions?



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# Thank You!