



*Agency for Healthcare Research and Quality*

*Advancing Excellence in Health Care*

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# The AHRQ Quality Indicators

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December 4, 2008



# 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

- 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

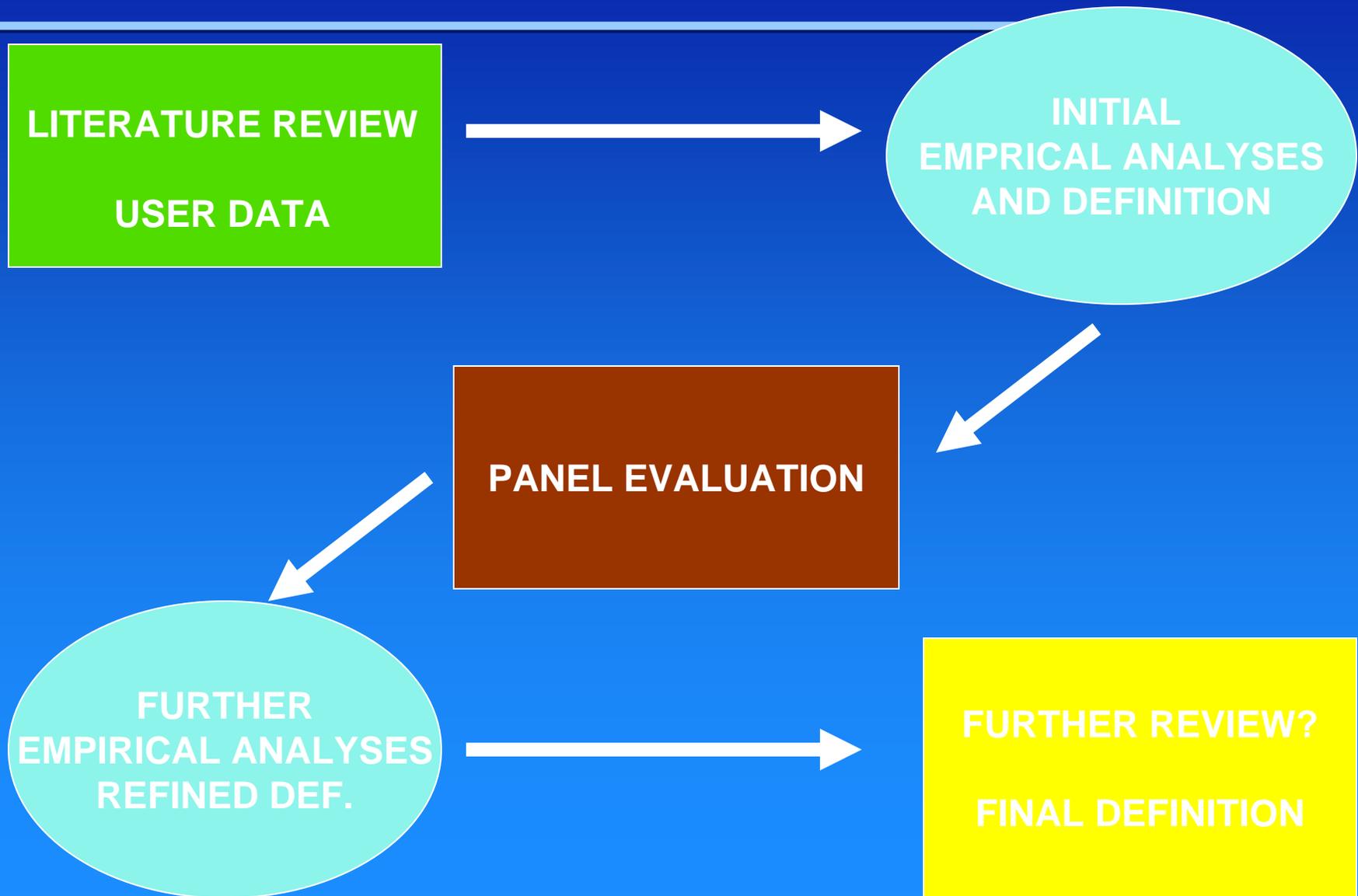


# Background on the QIs

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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

- 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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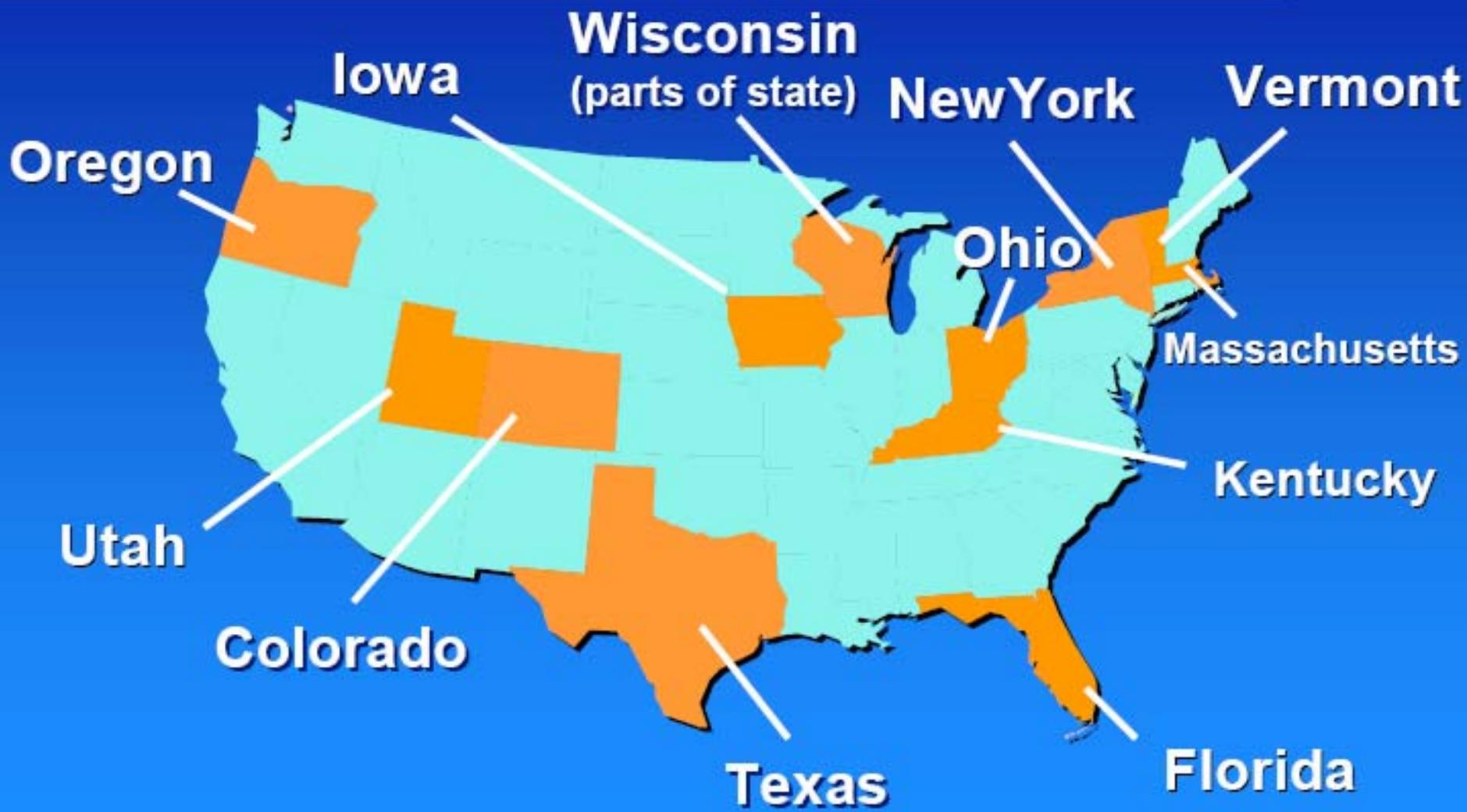


# General Uses of the AHRQ QIs

- 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

- 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)

- 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.



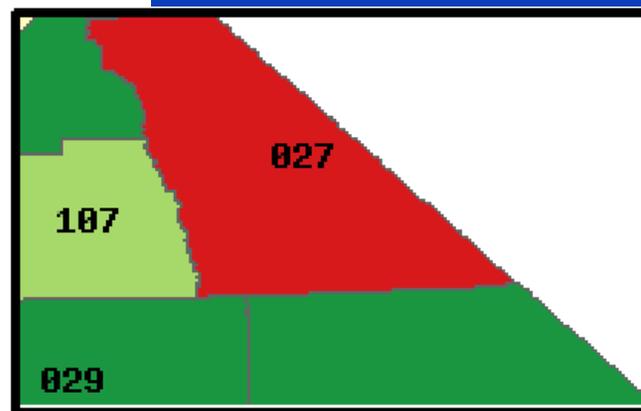
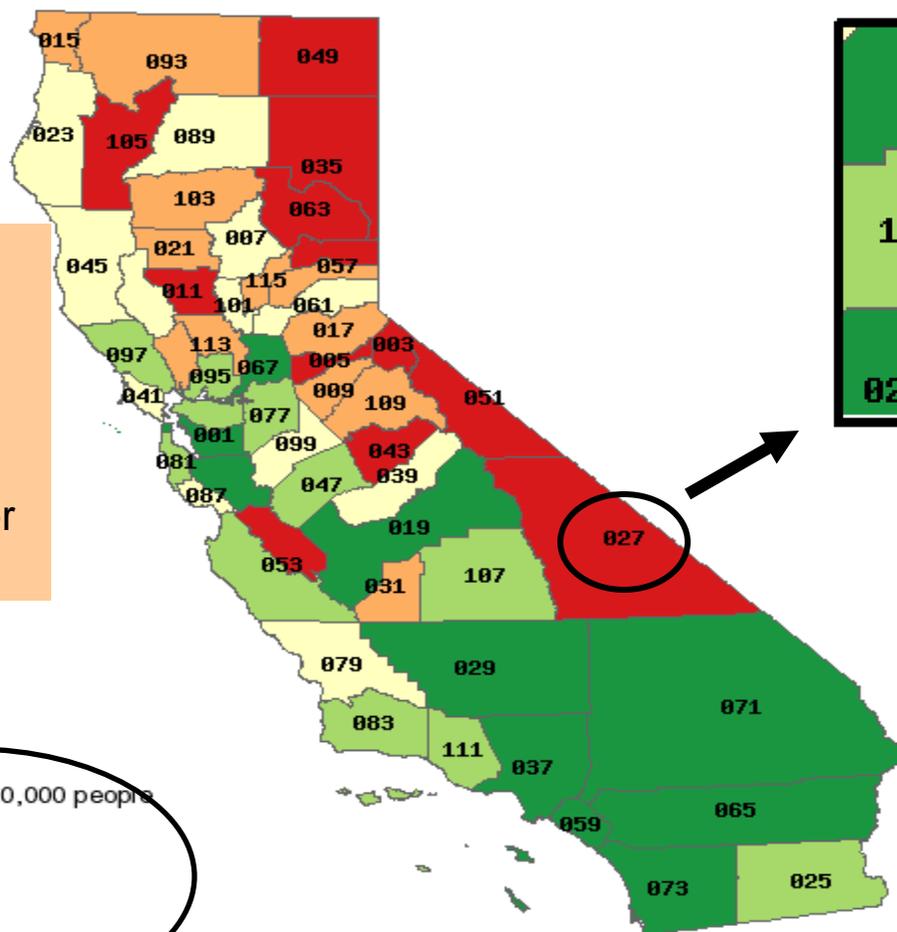
# Main Functions of the PHC Mapping Tool

- 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

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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	0.0003015	0.0000447	higher	\$521
6033	Lake County	13	46,206	0.0002813	0.0001660	0.0000522	higher	\$368
6035	Lassen County	18	26,521	0.0006787	0.0008681	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

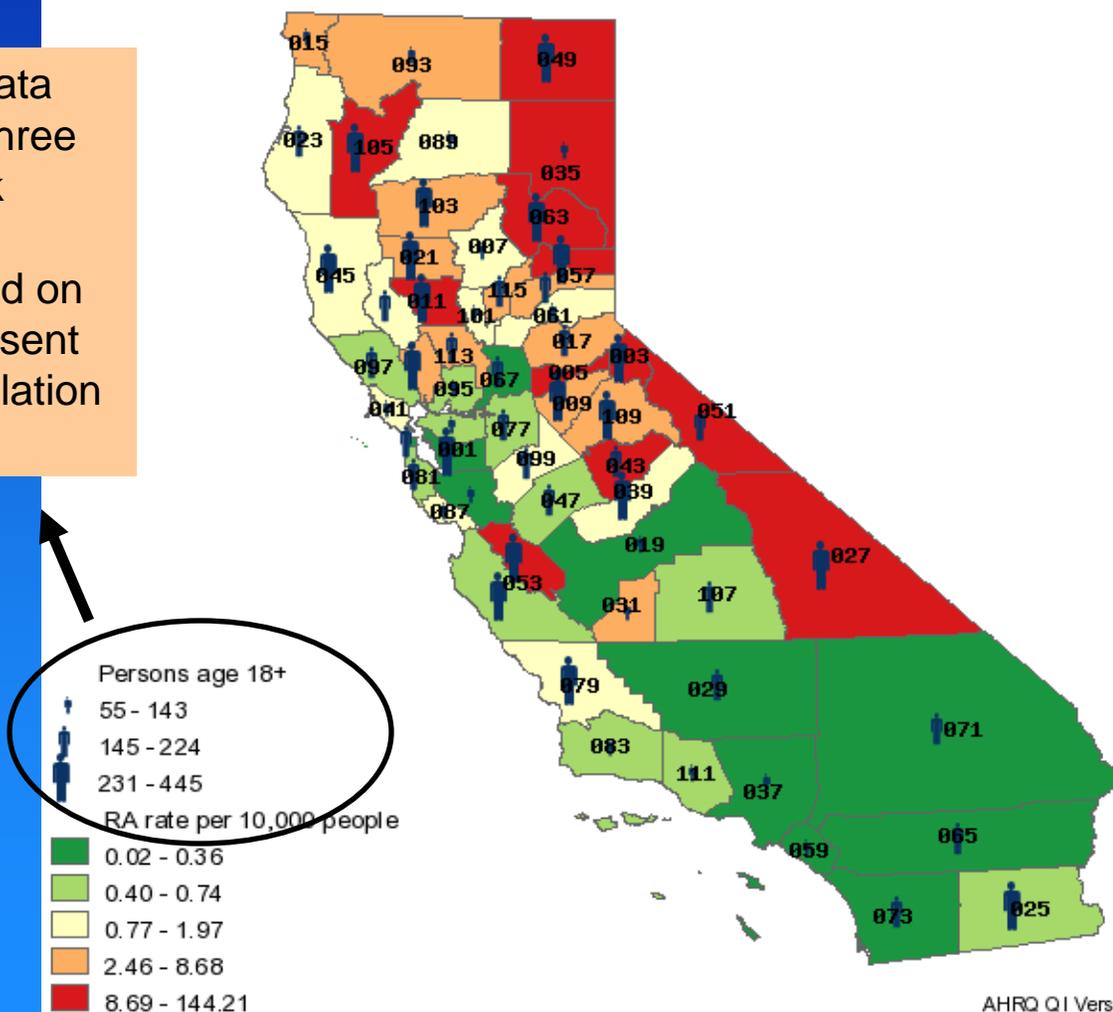
County Risk – Adjusted Rate is significantly higher than state.

Cost Savings Data

# Sample Map for PQI 14, Population Data Added

Uncontrolled Diabetes Admission (2001, PQI14)

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





# For More Information...

## 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!**