Overview of the Pediatric Indicator Module

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Acknowledgements

Pediatric Module Development:

- Kathryn McDonald, Stanford University
- Patrick Romano, UC-Davis
- Sheryl Davies, Stanford University
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- Jeffrey Geppert, Battelle Health and Life Sciences
- Corinna Haberland, Stanford University

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- Mamatha Pancholi, AHRQ Project Officer
- Marybeth Farquhar, AHRQ
- Mark Gritz and Jeffrey Geppert, Project Directors, Battelle Health and Life Sciences

chkd.com/images/HospitalVisit.jpg

Children's Hospitalizations, US 2000

- 6.3 million
- $46 billion
- 36% of 1-17 yr olds in Children's hospitals

spinningwheelalpacas.com

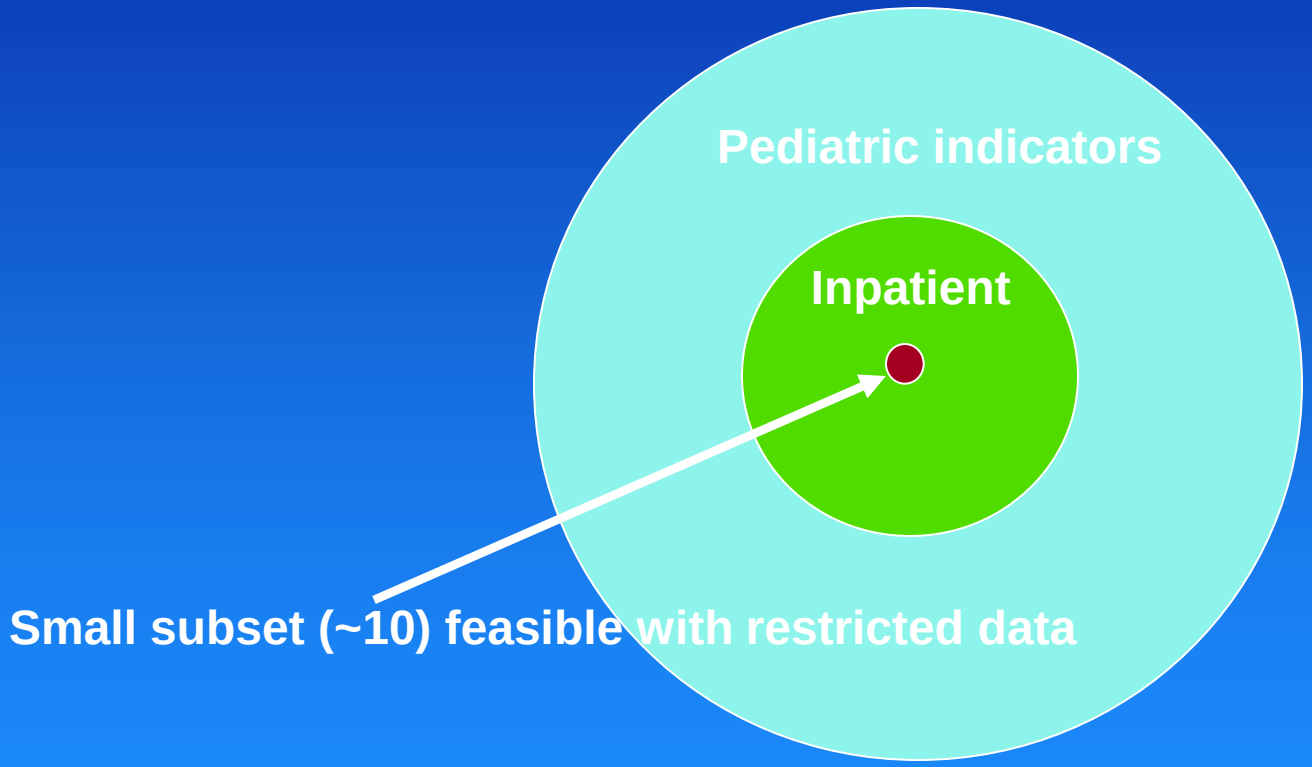
Unique Population

- Dependent on adults
- Constantly developing
- Demographics
- Epidemiology
- Coding in pediatrics

Simpson LA, al DDe. Measures of Children's Health Care Quality: Building towards Consensus. Manuscript in preparation: Background paper prepared for National Quality Forum; 2003 September 19.

Current Measurement State

- Simpson and colleagues search



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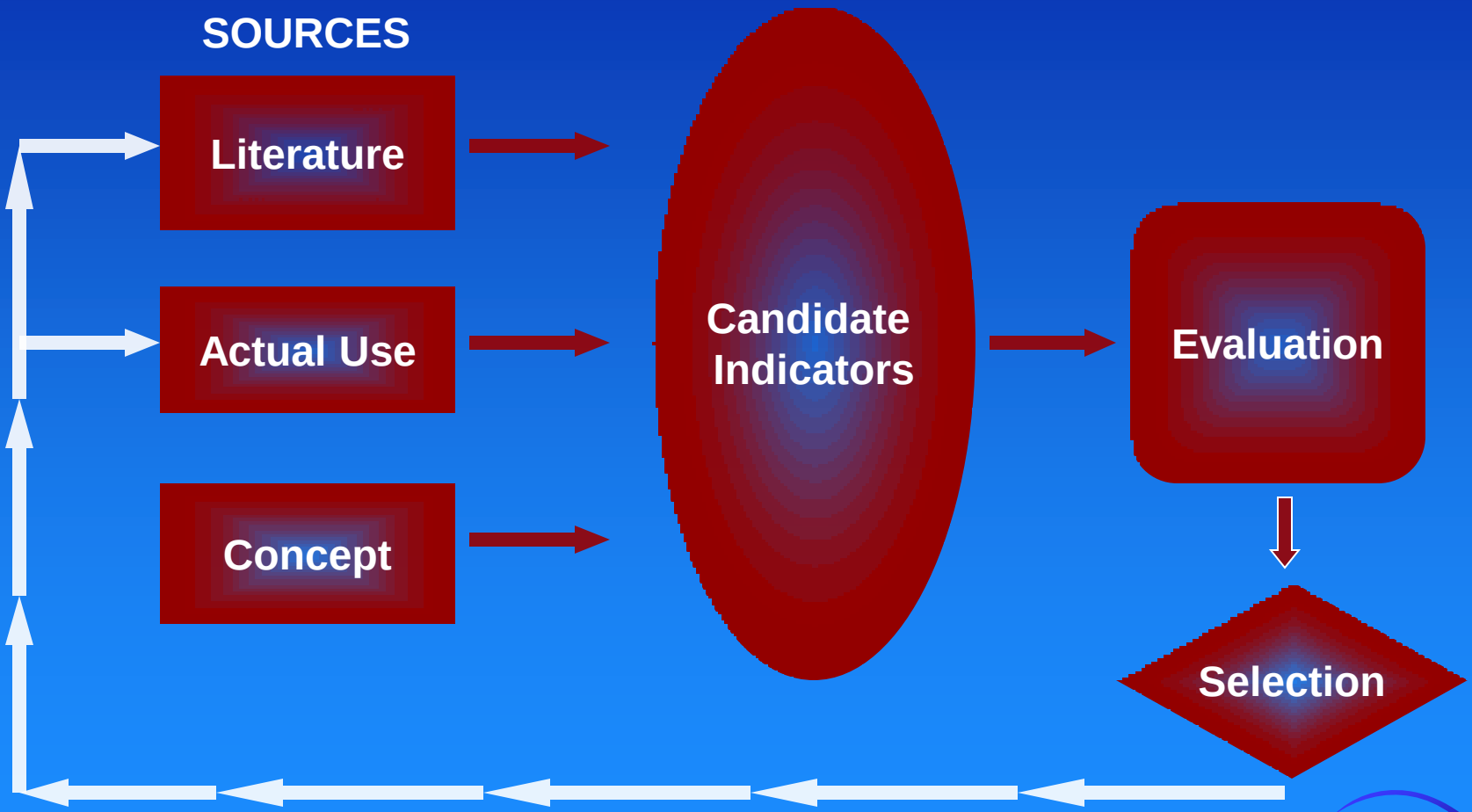
Pediatric Applications of AHRQ QIs

Miller et al., Sedman et al., NACHRI chart reviews

Lessons learned

- Complications DO occur in children
- Some complications clinically different
- Some indicators perform differently in kids or rare with current exclusions
- Death related PSIs seemed less useful as defined in kids

Indicator Module Development



Framework for Assessing Pediatric Indicator Validity

- Face validity/consensual validity
  - Does the indicator capture an aspect of quality that is important and subject to provider control?
- Precision
  - Is there substantial "true" provider-level variation?
- Minimum bias
  - Is it possible to account for differences in severity of illness that could potentially confound comparisons across providers?
- Construct validity
  - Does the indicator identify quality of care problems that are flagged or suspected using other methods?
- Fosters real quality improvement
  - Is the indicator unlikely to be gamed or cause perverse incentives?
- Application/experience
  - Is there reason to believe the indicator will be feasible and useful?

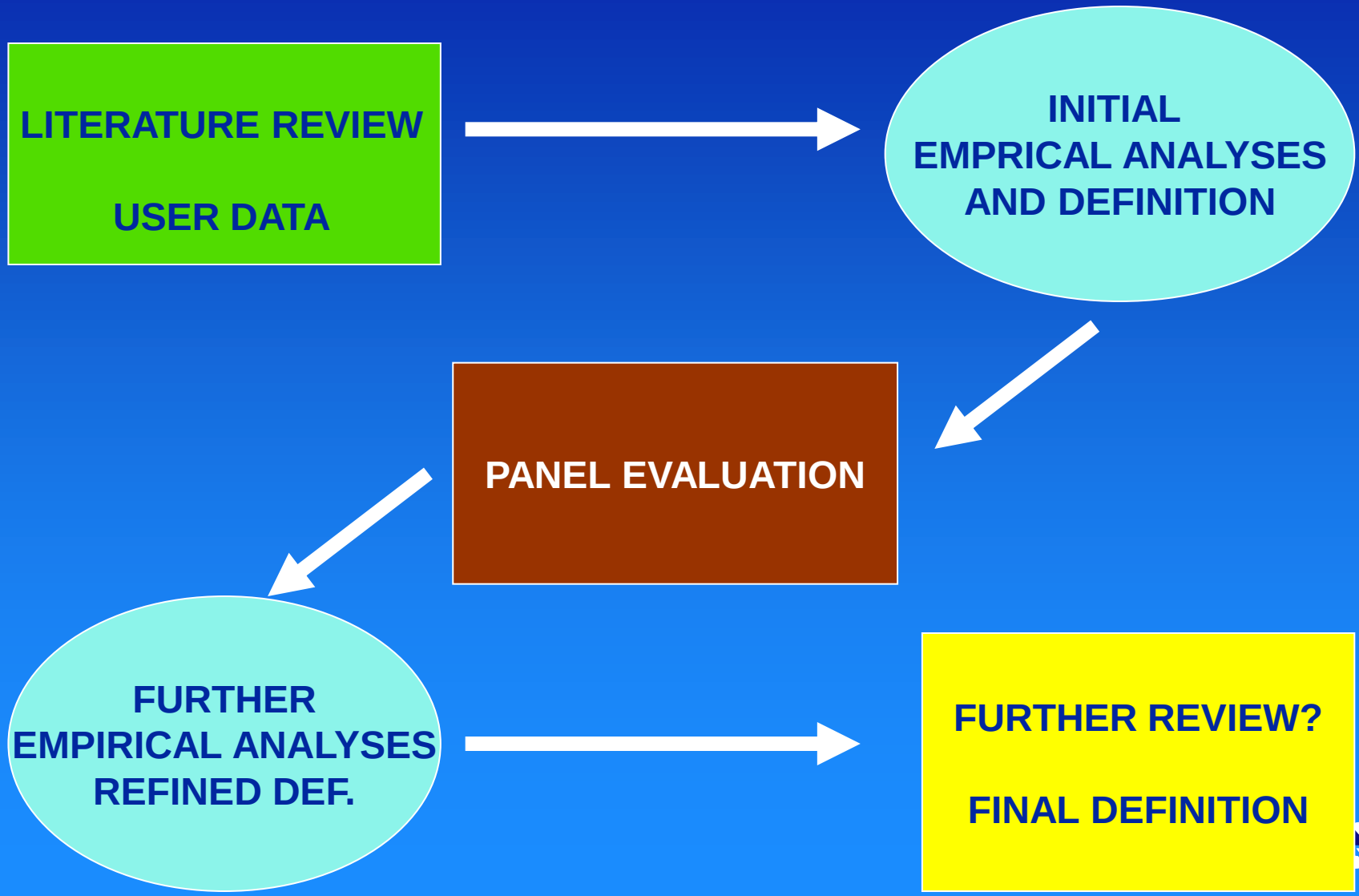
Indicator Development

- Literature review
  - To identify quality concepts and indicators
  - To determine previous work on indicator validity
- Hospital ICD-9-CM coding review
  - To ensure proper definition (correspondence between clinical concept and coding practice)
- Clinical panel reviews
  - To refine indicator definition and risk groupings
  - To establish face validity when minimal literature
- Empirical analyses
  - To explore alternative definitions
  - To assess nationwide rates, hospital variation, relationships among indicators
  - To develop appropriate methods to account for differences in underlying risk

Phased Evaluation

- Phase I
  - Current AHRQ QIs
    - Eliminate QIs covering adult only chronic illnesses or those with questionable validity for kids
- Phase II
  - Novel indicators
    - Require development or updating

Example Indicator Evaluation



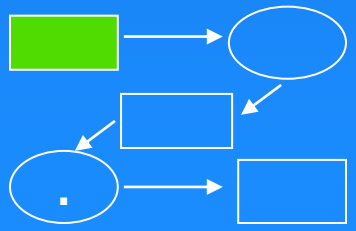
Literature Review and User Data

Decubitus ulcer

Patients with secondary dx 707.0 per 1000 patients

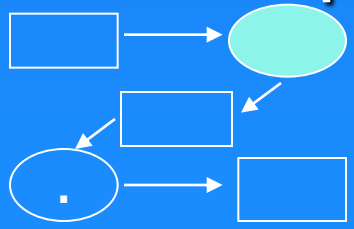
Exclude high risk patients: Transfers from long term care facility, paralysis

EXCLUDE SPINA BIFIDA PATIENTS



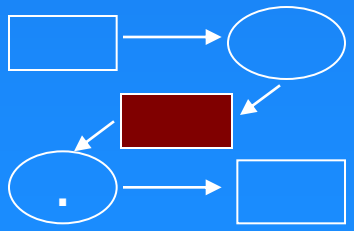
Initial Empirical Results

- Rates by age group and high risk groups
  - Higher rate in higher age groups
  - Ulcers occur more frequently in high risk groups but some occur in traditionally low risk
  - Lower rate in premature neonates
- Rates are provided without commentary to panelists prior to conference



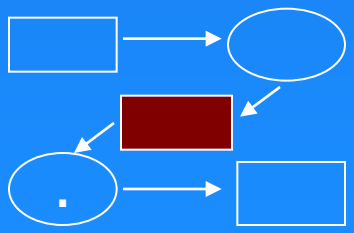
Medical/Surgical Panel Composition

Specialty	Location
Pediatric Emergency Medicine	Dallas, TX
Thoracic Surgery, Congenital Heart Surgery	Washington, DC
Neonatology	Seattle, WA
Neonatal & Pediatric Nursing	San Francisco, CA
Pediatric Surgery, Surgical Critical Care	New Haven, CT
Pediatric Critical Care	Louisville, KY
Pediatric Infectious Disease	Augusta, GA
Pediatric General Surgery	Nashville, TN
Pediatrics	Valhalla, NY
Pediatric Radiology, Diagnostic Radiology	Seattle, WA
Pediatric Oncology	New York, NY
Hospitalist	Philadelphia, PA



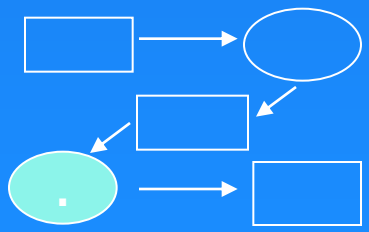
Panel Evaluation

- Expand population to INCLUDE high risk populations
- Prefer stratification scheme
- Skin breakdown in neonates



Post-Panel Investigation

- Empirical analyses
  - Examine rates of decubitus ulcer in potentially high risk groups.
  - Identify similar risk strata
- Coding consult
  - Understand coding guidelines for infants with “skin breakdown” or decubiti



Example Evaluation

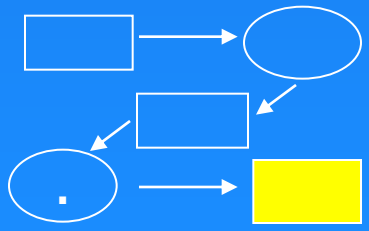
Revised Definition for Decubitus Ulcer

Patients with secondary dx of 707x per 1000 patients

Exclude patients transferred from long term care facility and another acute care facility

Stratify by:

- Low Risk
- High risk (paralysis, spina bifida, anoxic brain damage)



Results
Overarching Themes

- High risk populations are important in children
- Bias and risk groups
- Expanded data
- Application of indicators key
- Feedback and validity testing key

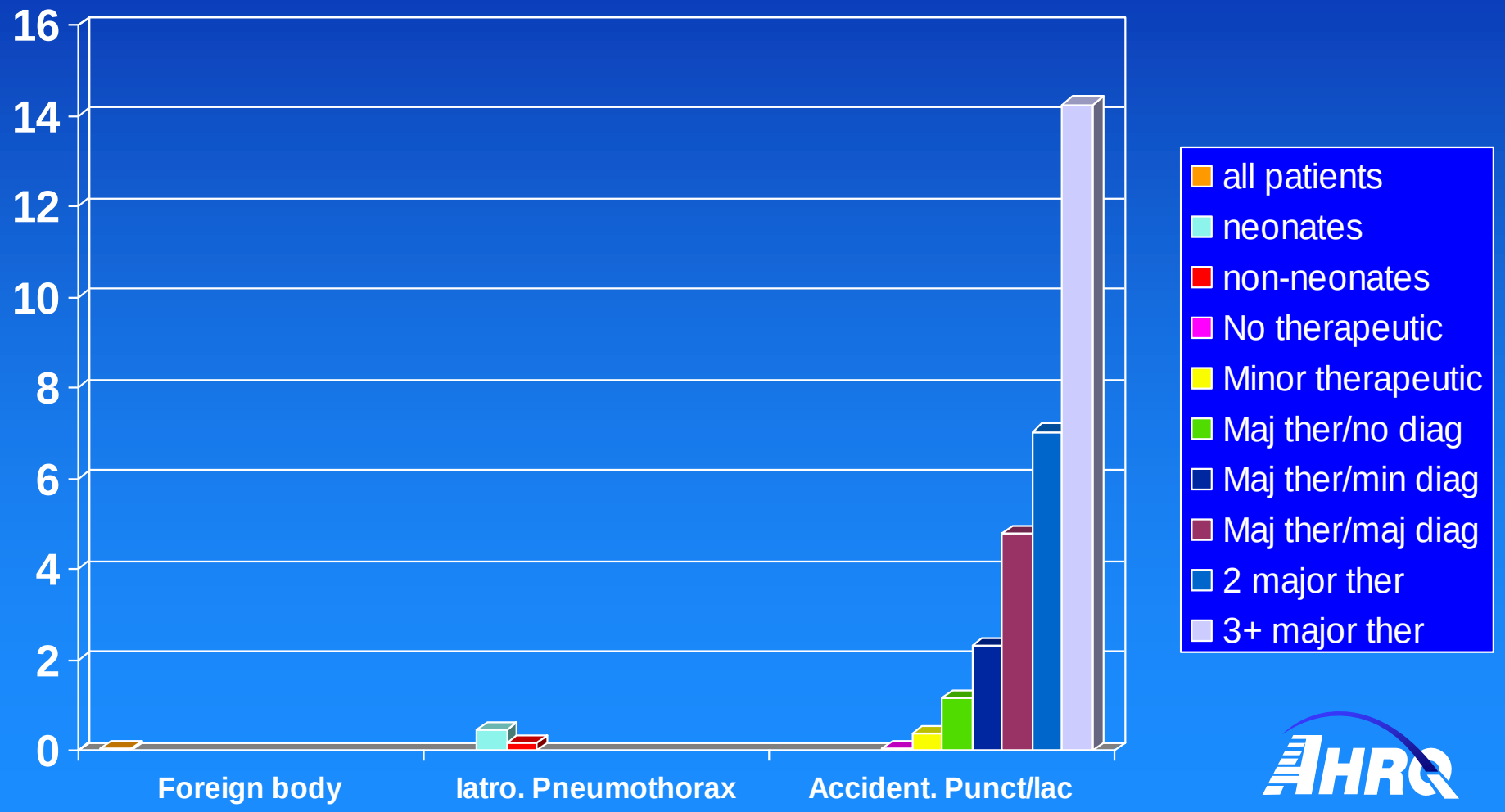
Types of Modifications Made to QIs

- Expand population at risk
  - Decubitus ulcer, postoperative sepsis
- Restricted age range
  - Transfusion reaction, Diabetes, Asthma, Perforated appendix
  - Exclusion of normal newborns
- Stratification/split
  - Iatrogenic pneumothorax, Accidental puncture laceration, Post-op hemorrhage/hematoma
- Added exclusion criteria
  - Post-op wound dehiscence, Post-op respiratory failure, UTI
- Modified numerator
  - Gastroenteritis

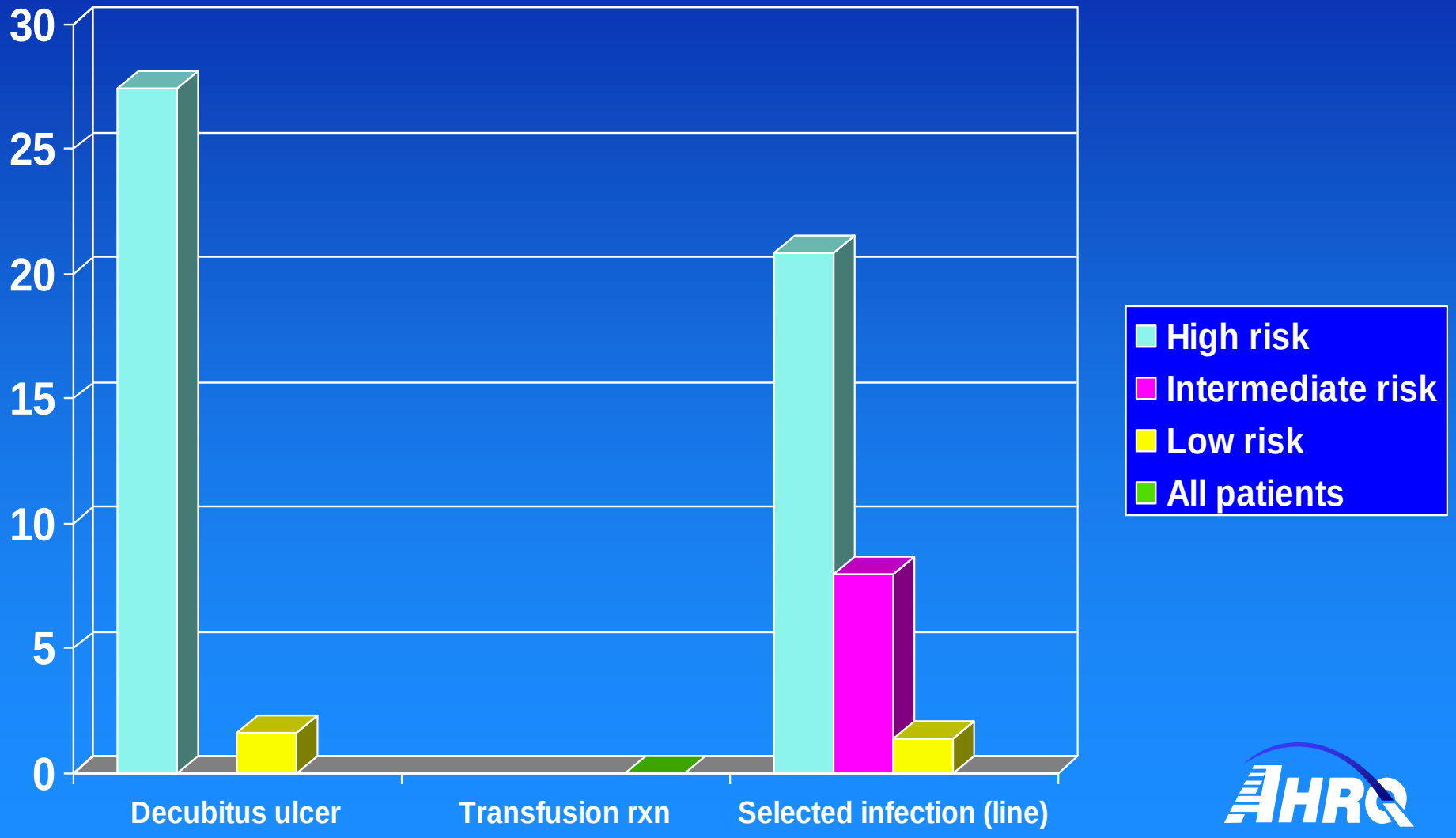
Indicators Not Recommended

- Clinically different in children
- Likely to occur in complex cases in children/ preventability questionable
- Coding concerns
  - Bacterial pneumonia
  - PO physiologic and metabolic derangement
- Combined with other indicator, remaining cases not useful
  - Dehydration

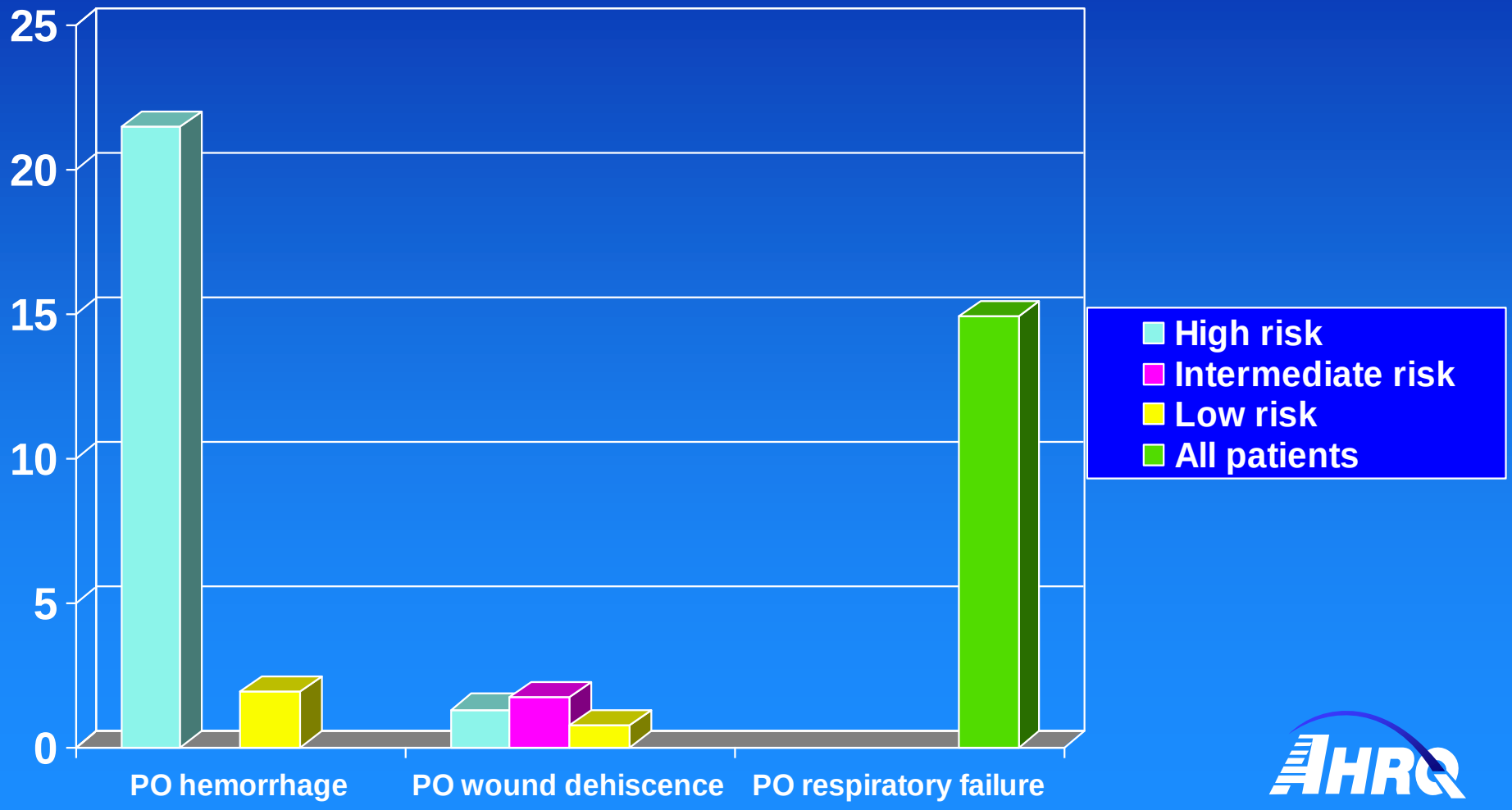
Rates per 1000 Procedure-related Complications



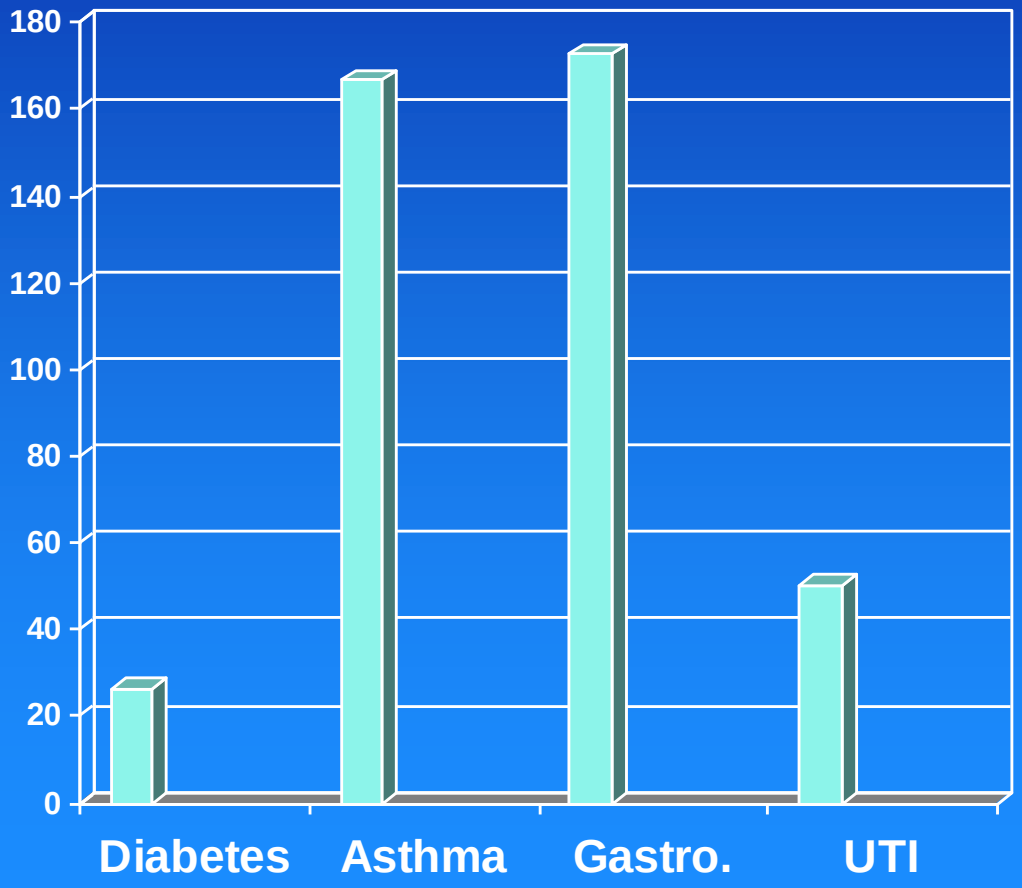
Rates per 1000 Complications in All Patients

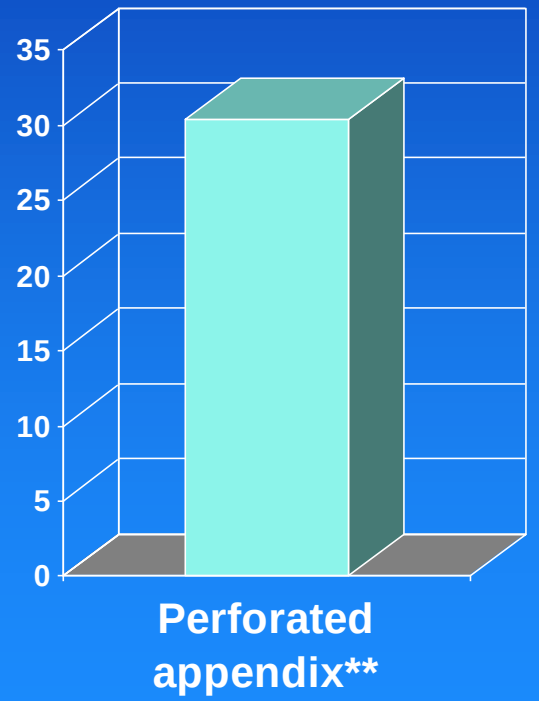


Rates per 1000 Postoperative Complications

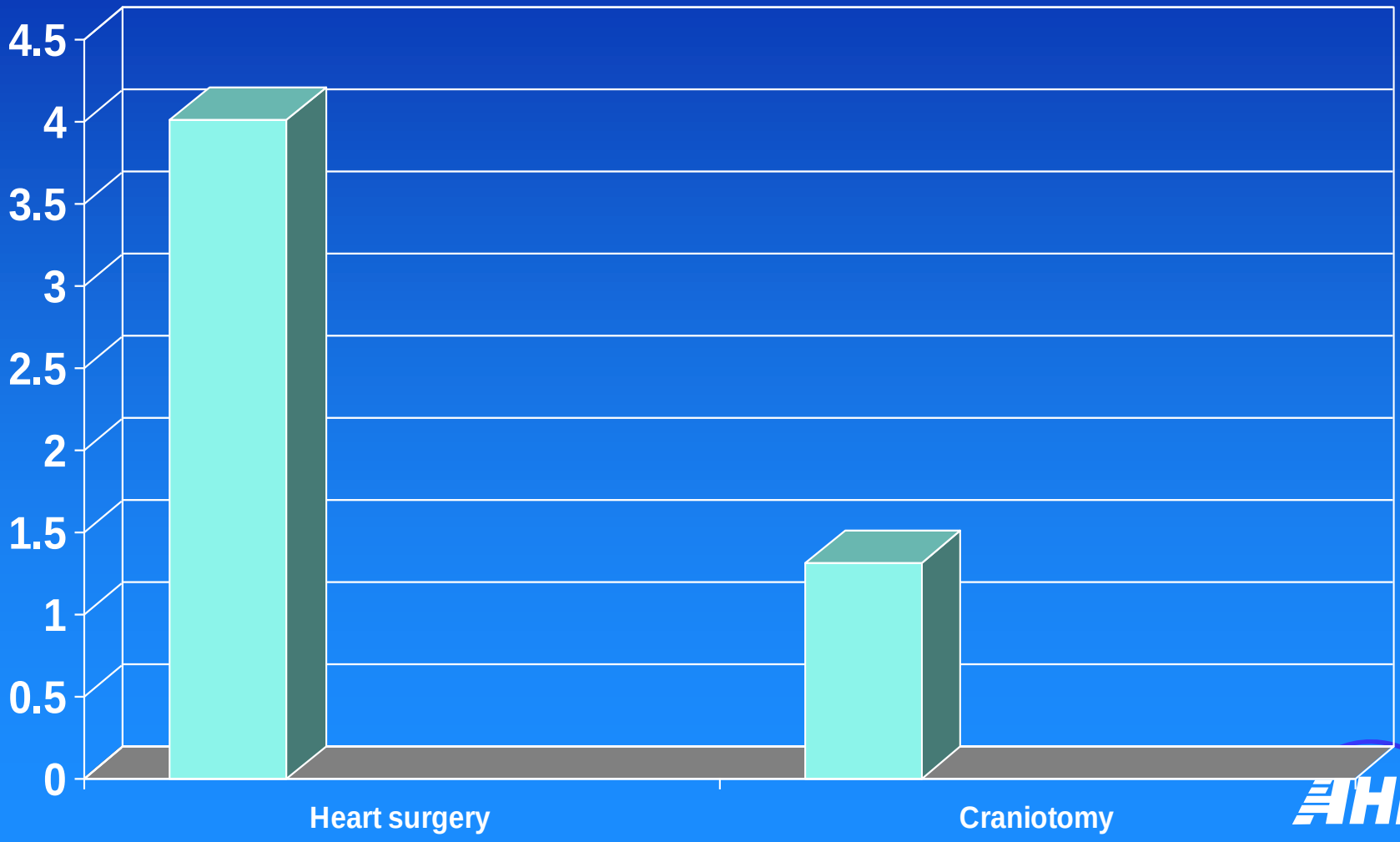


Rates per 100,000 population
Potentially Avoidable Hospitalizations





Rates (%)
Mortality Indicators



Dealing with Bias

- Stratification
  - Clinically transparent, actual numbers
  - Low numbers, overwhelming number of results
- Risk adjustment
  - Allows for comparisons
  - Full adjustment impossible, black box
- Exclusions
  - Easy comparisons, complex cases avoided
  - Low numbers, leaves out cases important to prevent

Risk Adjustment

- Reason for admission/ type of procedure
  - DRGs
- Comorbidity
  - Must develop de novo
- SES risk adjustment
  - Not unique to kids, but may over-adjust

Phase II: Novel Indicators

- Literature review
- Organization contact
  - Federal agencies, professional organizations, advocacy groups, provider organizations
  - 100+ contacted
  - Most indicators submitted not feasible given data constraints

Indicators Under Consideration

Ambulatory Care

- Cellulitis hospitalization rate
- Hospital admissions for influenza-related conditions, age 6-23 months
- Immunizable condition hospitalization rate

Indicators Under Consideration

Neonatal

- Intraventricular hemorrhage
- Respiratory distress syndrome
- Chronic respiratory disease
- Meconium aspiration syndrome rate
- Nectrotizing enterocolitis
- Neonatal mortality
- Nosocomial bacteremia
- Proportion of VLBW infants born at Level III centers
- Retinopathy of prematurity

Indicators Under Consideration

Patient Safety and Mortality

- Aspiration pneumonia
- Postoperative pneumonia
- Catheter-associated venous thrombosis
- Other postoperative metabolic derangements (hyponatremia, hypernatremia)
- Trauma mortality

Phase II: Next Steps

- Literature reviews
- Update existing definitions
- Develop and test definitions using administrative data
- Panel review
- Reformulation of indicators
- Development and release of new software

Timeline

- January 2006
  - PedQI software release with current AHRQ QIs adapted for pediatric cases
- Fall/Winter 2005
  - PQI, IQI, PSI updates converted to adult population focus
- Early 2007
  - PedQI update with new indicators

Implications

- AHRQ PSIs, IQIs and PQIs
  - No longer apply to children, though concepts retained in PedQI
- Children's vs. community hospitals
  - Focus on strata for stratified indicators
  - Compare results within peer groups
- Request to users
  - Monitoring of coding practices essential
  - Communication to AHRQ about early experiences

Acknowledgments

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- Mark Gritz and Jeffrey Geppert, Project Directors, Battelle Health and Life Sciences

Data used for analyses:

Nationwide Inpatient Sample (NIS), 1995-2000. Healthcare Cost and Utilization Project (HCUP), Agency for Healthcare Research and Quality

State Inpatient Databases (SID), 1997-2002 (36 states). Healthcare Cost and Utilization Project (HCUP), Agency for Healthcare Research and Quality

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Questions?