AHRQ Neonatal Quality Indicators: The NQI and the Research Indicators

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AHRQ Quality Indicators (QIs)

- A set of tools for evaluating, monitoring, and comparing the quality and accessibility of health care using ICD-9-CM coded administrative data from hospitals
  - Prevention Quality Indicators (PQI): Avoidable Hospitalizations & Conditions (area level)
  - Inpatient Quality Indicators (IQI): Mortality, Utilization & Volume
  - Patient Safety Indicators (PSI): Avoidable Complications
  - Pediatric Quality Indicators (PDI): Primarily based on PSI

AHRQ Neonatal QI Development Identification of potential indicators

- Literature review
  - Identified previously developed quality measures
    - Grade III & IV intraventricular hemorrhage (IVH)
    - Retinopathy of prematurity (ROP)
    - Necrotizing enterocolitis (NEC)
    - Meconium aspiration syndromes (MAS)
    - Nosocomial blood stream infections (BSI)
    - Neonatal mortality

AHRQ Neonatal QI Development Evaluating Potential Indicators

- CD-9-CM coding review
  - To ensure correspondence between clinical concept and coding practice
- Empirical analyses

  - To explore alternative definitions
  - To assess nationwide rates, hospital variation, relationships among indicators
  - To develop methods to account for differences in risk
- Dealing with Bias

  - Exclude patients at risk for:
    - Complications present on admission
    - Non-preventable complications
  - Stratification – risk groupings

AHRQ Neonatal QI Development Evaluating Potential Indicators

- Expert Panel Evaluation
  - Based on Nominal Group Technique or Modified RAND Appropriateness Method
  - Independent initial evaluation followed by conference call and then final evaluation
  - Panelists assessed face validity, potential bias, gaming and overall usefulness

Potential AHRQ Neonatal QIs – Brief Summary

Measure	Birthweight Limits		Inclusions		Exclusions	
	500-1499g	≥1500g	Inborns	Transfers (<2 d/o)	Principal Dx	Other
IVH (Grade III & IV)	Yes	No	Yes	No	No	Pts. transferred out at <1 week
ROP	Yes	No	Yes	Yes	No	Pts. transferred out, or died at <1 week
NEC	Yes	No	Yes	Yes	Yes	None
MAS	No	Yes	Yes	No	No	None
Nosocomial BSI	Yes	If death, major surgery, ventilation, or transfer in/out	Yes	Yes	Yes	Length of stay <2 days
Neonatal Mortality	Yes	Yes	Yes	Yes	No	1. Transfers to another hospital 2. Dx of Tri 13, or 18, anencephaly, & polycystic renal dz.

Potential Neonatal QIs: Ratings Process

- Recommendation requirements - Median score of ≥7 (9 point scale), without significant disagreement, on one of two questions

    - Useful for quality improvement?
    - Useful for comparative reporting?

Measure	Quality Improvement?	Comparative Reporting?
IVH	7*	6.5
ROP	4	3
NEC	6	6
MAS	3	3
Nosocomial BSI	8	8
Neonatal Mortality	6	7

* Significant disagreement on ratings amongst panelists

# AHRQ Neonatal QIs: Research vs. Implemented QIs

- Highest Rated
  - Important outcome
  - Better known relationship to processes of care (preventability)
  - Fewer concerns about ICD-9-CM codes

- Lower Rated
  - Relationship to processes of care (preventability) questioned
  - Concerns about ICD-9-CM codes available and limits of administrative data

Events Potential Neonatal QI Rates: 2003 KID

Per 1000 population at risk – with birthweight groupings for <1500g

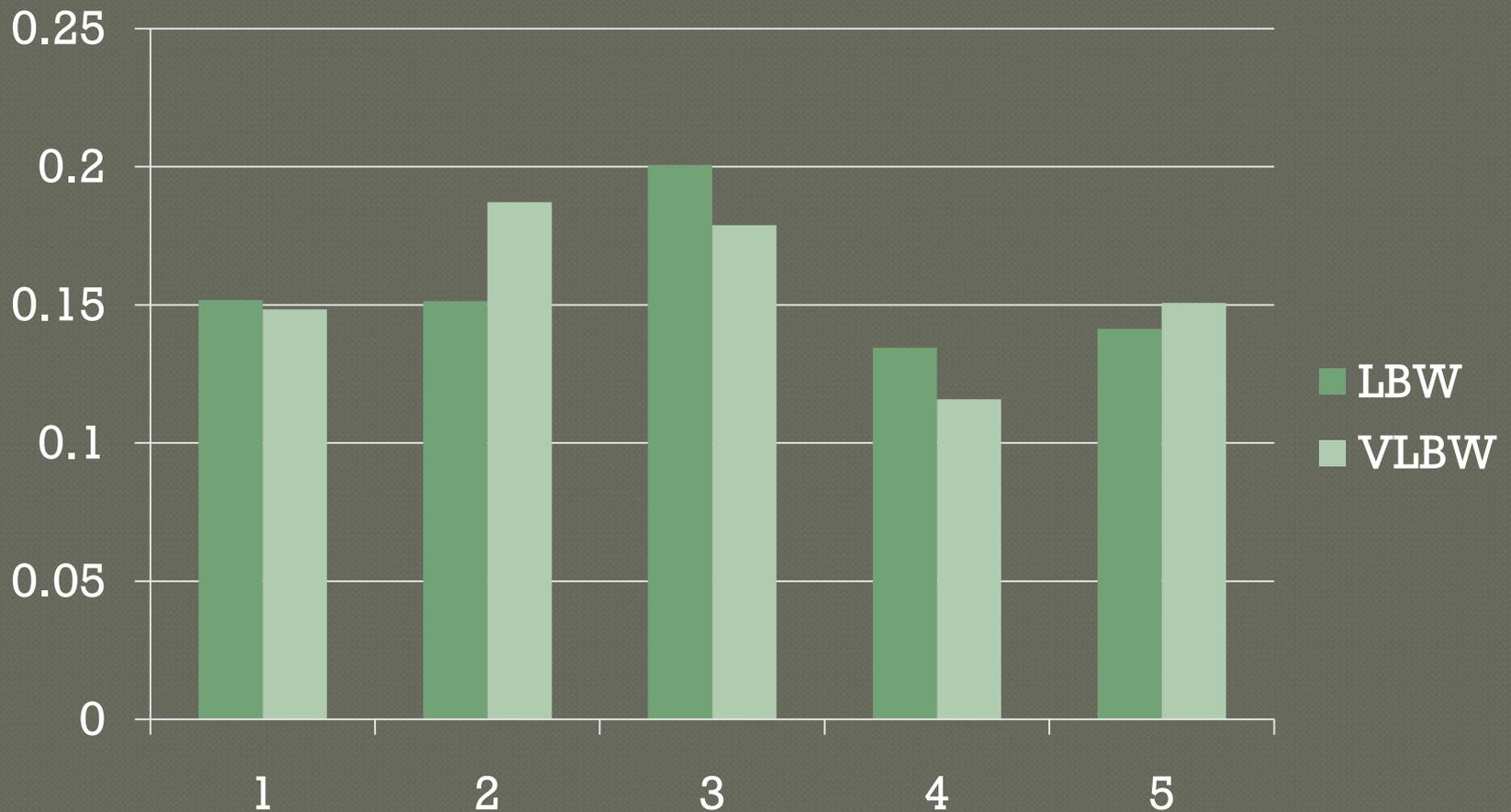# Overall Rates Complications Neonatal Indicators: 2007 SID
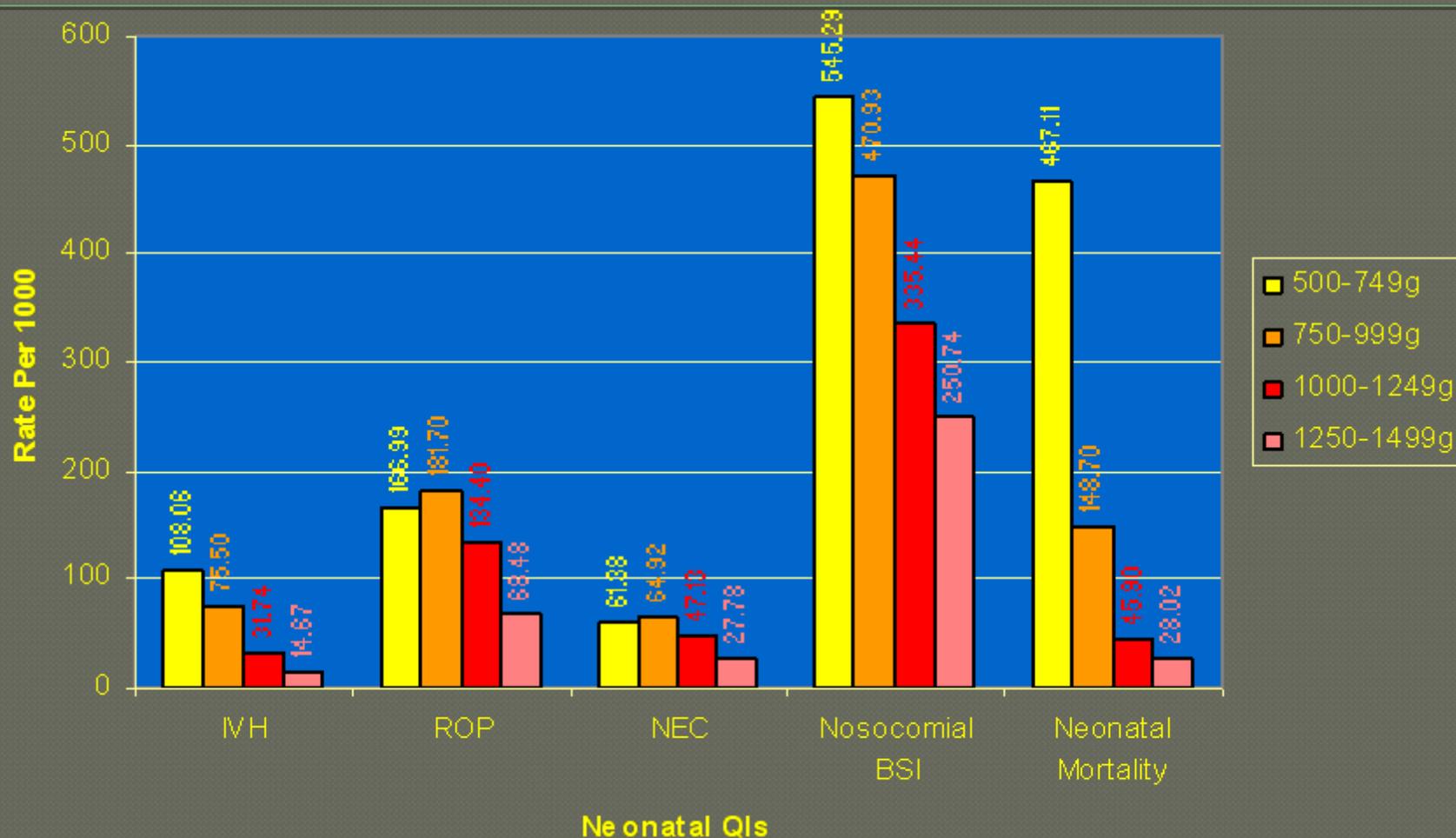
State Inpatient Databases 2007. Agency for Healthcare research and Quality Healthcare Cost and Utilization Project.

IVH: Example of Neonatal Indicator RA Rates by Birthweight Volume Quintiles

IVH: Example of Neonatal Indicator SD by Birthweight Volume Quintiles

NEC: Example of Neonatal Indicator RA Rates by Birthweight Volume Quintiles

NEC: Example of Neonatal Indicator SD by Birthweight Volume Quintiles

Strongest Predictors of Research NQIs

- IVH
  - C-statistic for model is 0.65
  - Birthweight (OR = 3.0)
  - Congenital Renal Disease (OR 3.4)
  - Congenital respiratory anomalies (OR = 4.2)
- ROP
  - C-statistic for model is 0.61
  - Birthweight (OR = 1.7-2.6)
  - Congenital respiratory anomalies (OR = 2.7)
- NEC
  - C-statistic for model is 0.64
  - Birthweight (OR=3.0)
  - Congenital GI anomalies (OR 2.8)

Recent Coding Improvements to Neonatal Coding

- FY 2009 (Beginning October 2008)
- NEC
  - Adds stages of NEC to codes 777.50-777.53
  - Include only more advanced stages of NEC to standardize diagnostic criteria
- ROP
  - Adds stages of ROP to codes 362.20-362.29
  - Include only more advanced stages of ROP to focus on most serious cases

Potential Uses of AHRQ NQIs

- **Implemented NQIs**
  - BSI
    - Has received time limited NQF endorsement
    - QI, Comparative Reporting, research
  - Mortality, Pneumothorax
    - QI, Research, limited comparisons
- **Research indicators**
  - ROP, NEC, IVH
    - Establish evidence base for best practices
    - Understand variation and patterns of complications
    - Investigate administrative data validity

Contact

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