



# ***Survey of Patient Safety Culture in U.S. Hospitals: External Validity Analyses***

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# Acknowledgements



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## *HSOPS External Validity*



- Hospitals worldwide are administering the AHRQ hospital patient safety culture survey (HSOPS)
- How is patient safety culture related to
  - Patient satisfaction with care?
  - Patient harm?
  - Good clinical processes?

# *HSOPS External Validity*



- AHRQ funded an exploratory external validity analyses to examine correlations between HSOPS and:
  1. Consumer Assessment of Healthcare Providers & Systems (CAHPS) Hospital Survey
  2. AHRQ Patient Safety Indicators (PSIs)
  3. Hospital Quality Alliance (HQA) Core Measures

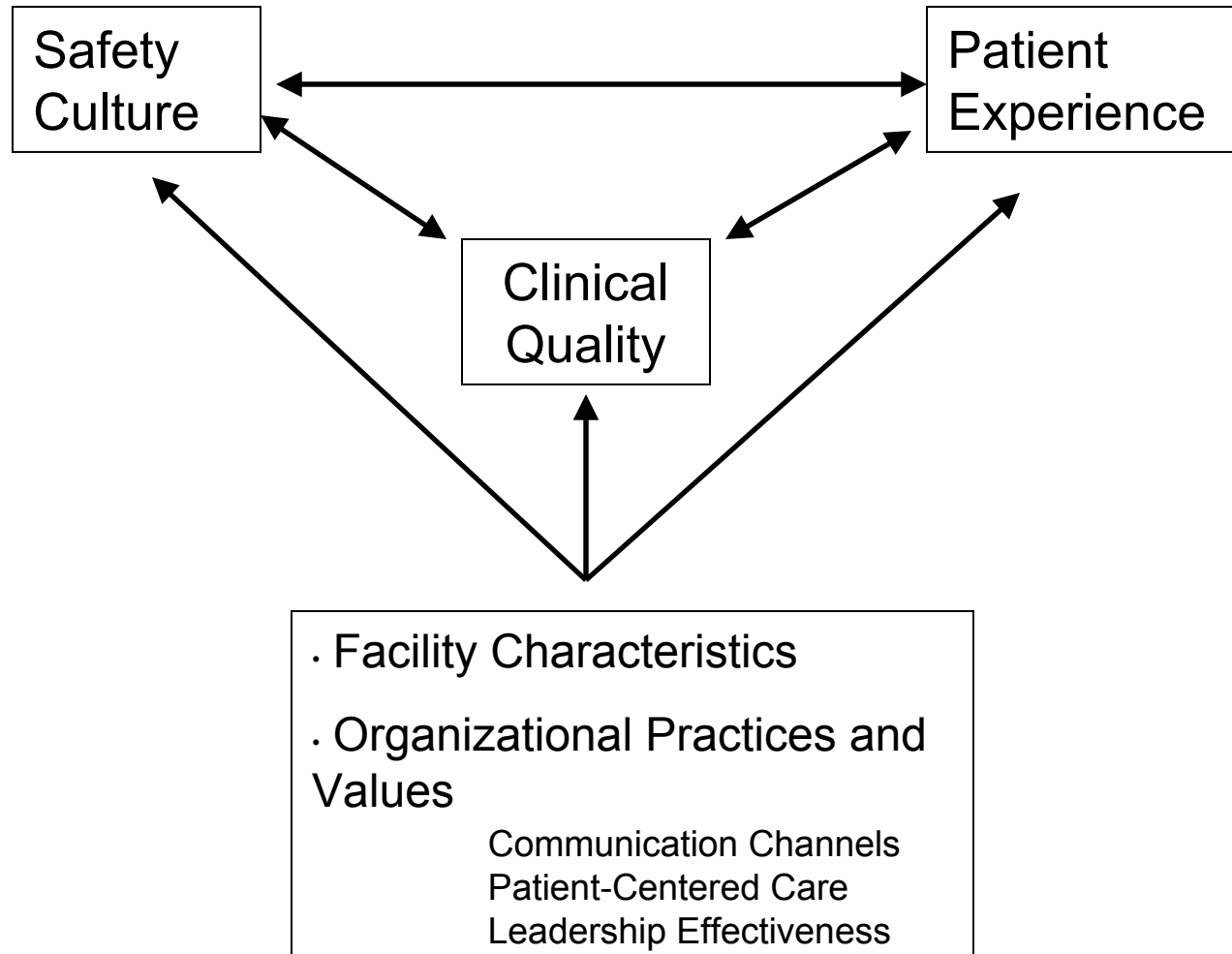
Goals: Generate hypotheses and identify general patterns of associations across measure sets.

# *HSOPS Measures*



1. Communication Openness
2. Feedback and Communication About Error
3. Handoffs and Transitions
4. Teamwork Across Units
5. Teamwork Within Units
6. Management Support for Patient Safety
7. Non-Punitive Response to Error
8. Supv/Mgr Expectations & Actions Promoting Pat Safety
9. Staffing
10. Organizational Learning/Continuous Improvement
11. Frequency of Events Reported
12. Number of Events Reported
13. Patient Safety Grade
14. Overall Perceptions of Patient Safety
15. Overall Summary

# Conceptual Model



## *Previous Research*



- Better safety culture reduces safety incidents (Baker, Singer et al 2007, this study).
- Fewer incidents leads to higher patient satisfaction (Weingart, et al, 2006).
- A recent study showed a positive correlation between overall measures of safety culture and patient satisfaction (Wolosin, 2007).
- Evidence from other industries shows that culture affects operational results and customer satisfaction.

## *Limitations*



- Small and self-selected group of hospitals
- Possible unmeasured confounding variables
- Multiple comparisons
- Time periods for data sources did not exactly coincide
- Limitations of administrative data sources





## **Analysis 1:**

# **HSOPS & Consumer Assessment of Healthcare Providers and Systems (CAHPS) Hospital Survey**

**[www.cahps.ahrq.gov](http://www.cahps.ahrq.gov)**

# *Hospital CAHPS*



- . Patient satisfaction survey asking about hospital care
- . 9 Hospital CAHPS composites
  1. Communication with nurses
  2. Communication with doctors
  3. Communication about medicines
  4. Responsiveness of hospital staff
  5. Discharge information
  6. Pain management
  7. Hospital environment (clean & quiet)
  8. Overall rating of hospital (0 worst to 10 best)
  9. Willingness to recommend to family & friends

# *Analysis Methods*



- Examined partial correlations between HSOPS composite scores & Hospital CAHPS
  - Controlled for bed size, teaching status & government ownership
- Data from 75 hospitals
- HSOPS data from 2005 & 2006
  - 12 composites, grade, # events, overall composite
- 9 Hospital CAHPS composites from patients discharged in 2005 & 2006

## *Results: HSOPS & Hospital CAHPS*



- 26% of correlations were statistically significant ( $p < .05$ )
- All significant correlations were positive, indicating that hospitals with better patient safety cultures had patients who rated the hospital higher on quality of care
  - Positive “r”s ranged from .24 to .46, average = .31

## *Results: HSOPS & Hospital CAHPS*



- HSOPS composites with more significant correlations:
  - Teamwork within units (5 HCAHPS measures)
  - Organizational learning, Staffing, Patient safety grade (4 HCAHPS measures)
  
- HCAHPS composites with more significant correlations:
  - Hospital environment (9 HSOPS composites)
  - Communication with nurses (8 HSOPS composites)
  - Responsiveness of staff (6 HSOPS composites)

## *Summary: HSOPS & Hospital CAHPS*



- Most relationships positive, in the right direction
- However, only 26% of possible relationships were statistically significant and some of these were negative



# **Analysis 2:**

## **HSOPS & AHRQ Patient Safety Indicators (PSIs)**

## *AHRQ Patient Safety Indicators (PSIs)*



- Based on inpatient discharge data
- Measures rates of potential complications or adverse events following:
  - Surgery
  - Procedures
- Adjusted for case-mix differences
- Hospital-level rates of adverse events per 1,000 patients
  - [http://www.qualityindicators.ahrq.gov/psi\\_overview.htm](http://www.qualityindicators.ahrq.gov/psi_overview.htm)



# *PSIs Selected for Analysis*



We examined 11 PSIs plus overall PSI composite

- Decubitus ulcer (PSI 3)
- Latrogenic pneumothorax (PSI 6)
- Selected infections due to medical care (PSI 7)
- Postoperative:
  - Hip fracture (PSI 8)
  - Hemorrhage or hematoma (PSI 9)
  - Physiologic & metabolic derangements (PSI 10)
  - Respiratory failure (PSI 11)
  - Pulmonary embolism or deep vein thrombosis (PSI 12)
  - Sepsis (PSI 13)
  - Wound dehiscence in abdominopelvic surgical patients (PSI 14)
- Accidental puncture and laceration (PSI 15)

# Analysis Methods



- Examined partial correlations between HSOPS composite scores & AHRQ PSIs
  - Controlled for bed size, teaching status & government ownership
- Data from 179 hospitals, matched using AHA ID
- HSOPS data from 2005 & 2006
  - 12 composites, grade, # events, overall composite
- 12 PSIs (adjusted rates) computed from 2005 HCUP data for hospitals in 28 states

## *Results: HSOPS & AHRQ PSIs*



- 18% of correlations statistically significant ( $p < .05$ )
- “r”s ranged from  $-.17$  to  $-.29$
- Negative relationships indicated hospitals with better patient safety cultures had lower rates of adverse events

## *Results: HSOPS & AHRQ PSIs*



- HSOPS composites with more significant correlations:
  - Handoffs & Transitions (6 PSIs)
  - Teamwork Across Units (4 PSIs)
- PSIs with more significant correlations:
  - Physiologic & metabolic derangements (PSI 10)
  - Pulmonary embolism or deep vein thrombosis (PSI 12)
  - Sepsis (PSI 13)
  - Wound dehiscence in abdominopelvic surgical patients (PSI 14)

## *Summary: HSOPS & AHRQ PSIs*



- Most relationships were negative (i.e. in the right direction), supporting external validity of HSOPS.
- Findings point to safety culture areas to focus on for quality improvement
- However, only 18% of possible relationships were statistically significant



# **Analysis 3:**

## **HSOPS & Hospital Quality Alliance (HQA) Core Measures**

# *Hospital Quality Alliance (HQA)*

## *Core Measures*



- Hospitals submit data on hospital care processes to CMS
- Many HQA measures are same/similar to ORYX measures reported to the Joint Commission
- 24 measures, we examined 20:
  - Heart attack (AMI) - 6
  - Heart failure (HF) - 4
  - Pneumonia (PN) – 7
  - Surgical care/infection prevention (SCIP/INF) – 3

# Hospital Quality Alliance (HQA) Core Measures



- . Rates
  - o # eligible patients who received recommended care
    - . total # patients eligible to receive the care
- . Only included rates where total # eligible patients  $\geq 30$  (excluded 1 rate)
- . Only included rates with a full year of data (excluded 3 rates)

[www.hospitalqualityalliance.org/hospitalqualityalliance/qualitymeasures/qualitymeasures.html](http://www.hospitalqualityalliance.org/hospitalqualityalliance/qualitymeasures/qualitymeasures.html)



# *Analysis Methods*



- Examined partial correlations between HSOPS composite scores & HQA core measures
  - Controlled for bed size, teaching status & government ownership
- Data from 182 hospitals matched using AHA ID
- HSOPS data from 2005 & 2006
  - 12 composites, grade, # events, overall composite
- 20 HQA core measures from 2006 & 2007

## *Results: HSOPS & HQA Core Measures*



- Only 9% of correlations were positive & statistically significant ( $p < .05$ )
- “r”s ranged from .16 to .35, average = .24
- Positive relationships indicate hospitals with better patient safety cultures had higher rates of providing recommended care to patients
- One core measure—smoking cessation counseling (AMI-4)—had 7 significant negative relationships with HSOPS

## *Results: HSOPS & HQA Core Measures*



- HSOPS composites with more significant correlations:
  - Teamwork Across Units (6 measures)
  - Handoffs & Transitions (5 measures)
  
- Core measures with more significant positive correlations:
  - PN-7 Flu vaccination related to 5 HSOPS composites
  - HF-1 Discharge instruction related to 3 HSOPS composites
  - SCIP/INF-2 Antibiotic selection related to 3 HSOPS composites

## *Summary: HSOPS & HQA Core Measures*



- Most relationships positive, in the right direction
- Findings point to same safety culture areas to focus on as AHRQ PSIs
- However, only 9% of possible relationships were statistically significant

## Take-Away Messages



- Most relationships in all three analyses were in the right directions, lending support to HSOPS external validity
- Associations with HCAHPS measures were strongest for teamwork within units, staffing, and safety grade measures
- Associations with PSIs and HQA measures were strongest for HSOPS Handoffs and Teamwork across units measures
- Data sets are cross-sectional and limited, therefore they cannot support causal inference