



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

**Russ Mardon, Ph.D.  
Westat**

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**Westat  
1650 Research Blvd.  
Rockville, MD 20850  
[russmardon@westat.com](mailto:russmardon@westat.com)  
301-294-2037**

# Acknowledgements



## Westat

Joann Sorra, Ph.D.

Kabir Khanna, M.A.

Naomi Dyer, Ph.D.

Theresa Famolaro, M.P.S.

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Claudia Steiner, M.D.

## Advisors

Ron Hays, Ph.D.

Patricia Merryweather

## *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

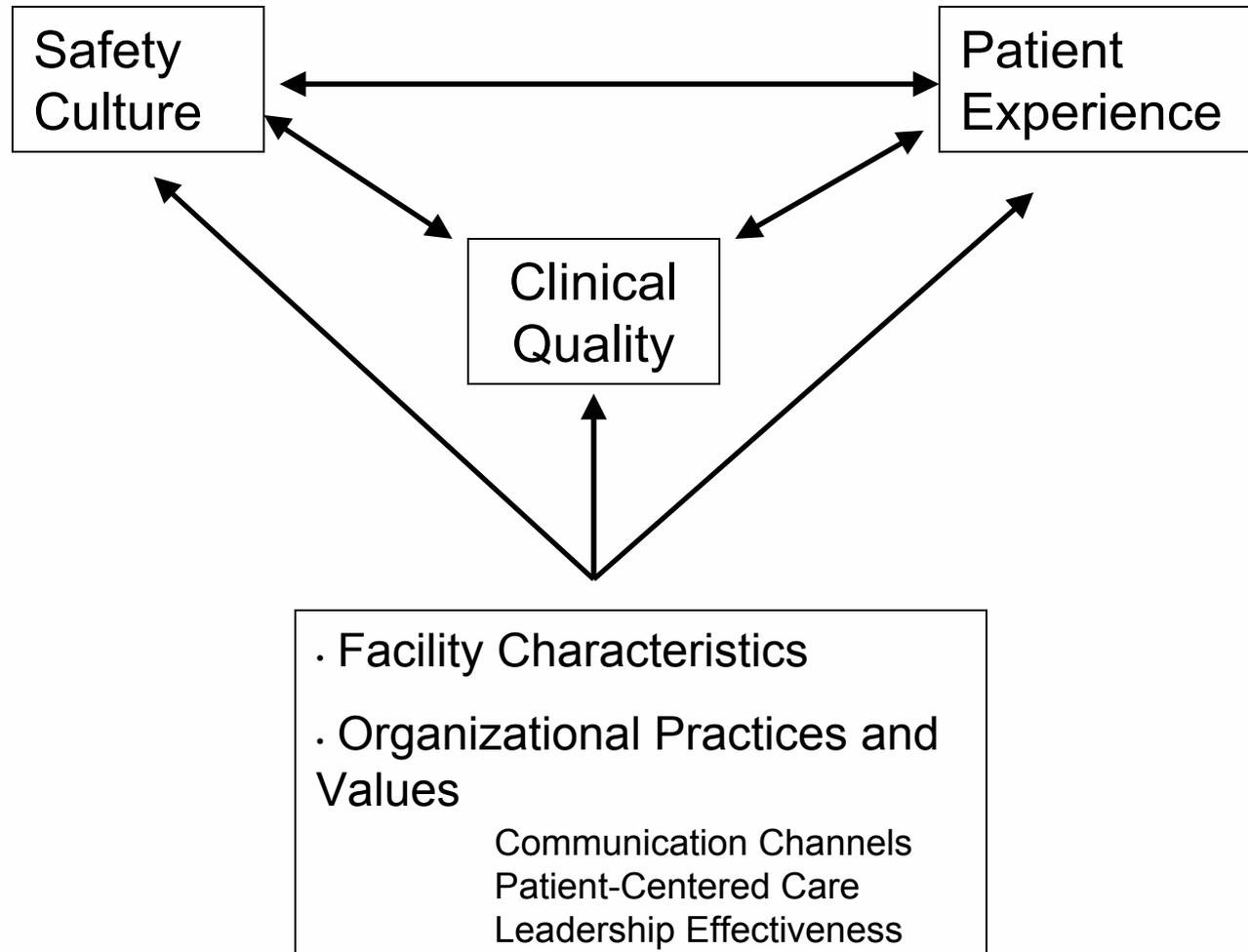
Goals: Generate hypotheses and identify general patterns of associations across measure sets.

# 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



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**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
  - # 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