

The University of Nebraska Medical Center

# Using Hospital SOPS To Evaluate the Impact of Team Training in a Collaborative of 24 Critical Access Hospitals

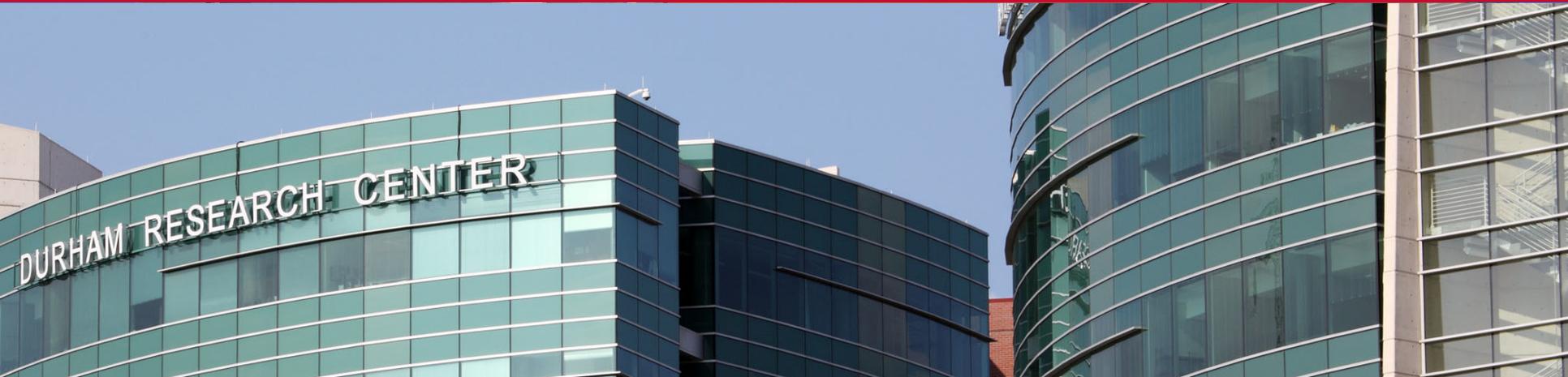
Katherine Jones, PT, PhD and Anne Skinner, RHIA

April 20, 2010

12 CAHPS & 2<sup>nd</sup> SOPS User Group Meeting

**Track:** SOPS Survey Administration & Interpretation of Results

**Session:** Interpreting SOPS Data To Focus Improvement Efforts





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- AHRQ Partnerships in Implementing Patient Safety Grant (1 U18 HS015822)
- Nebraska Department of Health and Human Services
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And

- Hospitals in Nebraska, Iowa, Louisiana



# Our Team...Interdependent Skills

- Katherine Jones, PT, PhD...HSR
- Anne Skinner, RHIA...data management
- Robin High, MA, MBA...statistical support
- Andrea Bowen, BA...data entry
- Roni Reiter-Palmon, PhD...I/O psychology...  
interpretation of findings



# Objectives

- Identify teamwork as an essential component of safety culture
- Describe a collaborative approach to implementing TeamSTEPPS in multiple Critical Access Hospitals (CAHs)
- Recognize adaptations to SOPS used to evaluate the impact of TeamSTEPPS training on safety culture
- Identify factors that impact evaluation of large scale patient safety improvement efforts
- Use Kirkpatrick's Taxonomy of Training Criteria, Diffusion of Innovations theory, and the concept of "decision frame" to interpret longitudinal changes in SOPS results as a result of specific patient safety interventions



# What is a Culture of Safety?

- Enduring, shared beliefs and behaviors that reflect an organization's willingness to learn from errors \*
- Beliefs present in a safe, informed culture\*\*
  - Our processes are designed to prevent failure
  - We are committed to detect and learn from error
  - We have a just culture that disciplines based on risk
  - People who work in teams make fewer errors

\*Wiegmann. A synthesis of safety culture and safety climate research; 2002.

<http://www.humanfactors.uiuc.edu/Reports&PapersPDFs/TechReport/02-03.pdf>

\*\*Institute of Medicine. Patient safety: Achieving a new standard of care. Washington, DC: The National Academies Press; 2004.



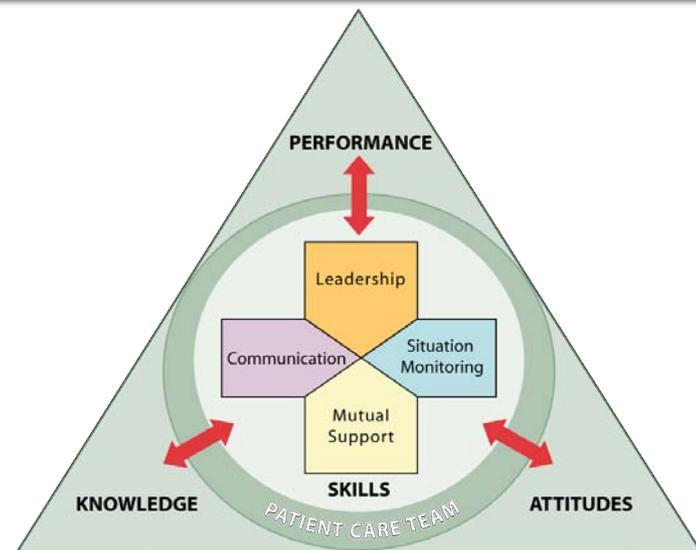
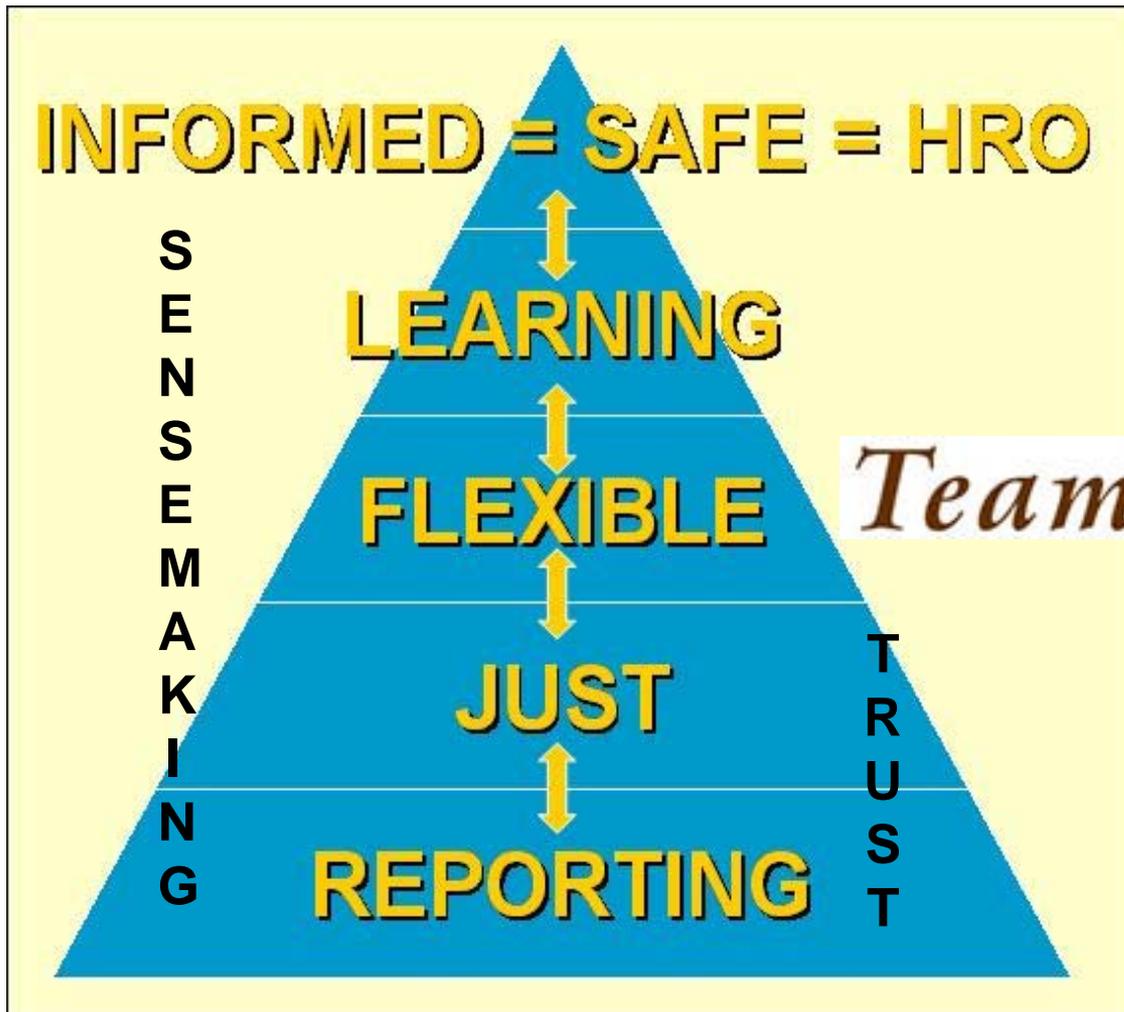
# Joint Commission Standards & Alerts

- Joint Commission 2010 Leadership Standards for hospitals (Standard LD.03.01.01)
  - Leaders create and maintain a culture of safety
  - Leaders evaluate the culture on a regular basis
  - Leaders encourage teamwork; they create structures, processes, and programs to support it
- Sentinel Event Alerts
  - Issue 40: Behaviors that undermine a culture of safety
  - Issue 43: Leadership committed to safety (9/09)

[http://www.jcrinc.com/common/Documents/OnlineExtras/JCLS09/JCLS09\\_H.pdf](http://www.jcrinc.com/common/Documents/OnlineExtras/JCLS09/JCLS09_H.pdf)  
<http://www.jointcommission.org/SentinelEvents/SentinelEventAlert/>



# Teamwork: Essential Component of safety culture



## Team *STEPPS*

Baker et al. (2006). Teamwork as an essential component of high-reliability organizations. *HSR*, 41(4 Pt 2), 1576-1598.

Battles et al. (2006). Sensemaking of patient safety risks and hazards. *HSR*, 41(4 Pt 2), 1555-1575.

Reason, J. (1997). *Managing the Risks of Organizational Accidents*. Hampshire, England: Ashgate Publishing Limited. .



# Implementing TeamSTEPPS

- Rural collaborative training in 3 Cycles
  - April 2008 (24)
  - August 2009 (15)
  - April 2010 (19)

} 46 unique Hospitals 307 MTs
- Maintain community. . .monthly conference calls & annual “Lessons Learned” conference
  - Share TeamSTEPPS Tools
  - Share implementation strategies
  - Share Master Trainers
- Evaluation with rural-adapted Hospital Survey on Patient Safety (HSOPS) Culture

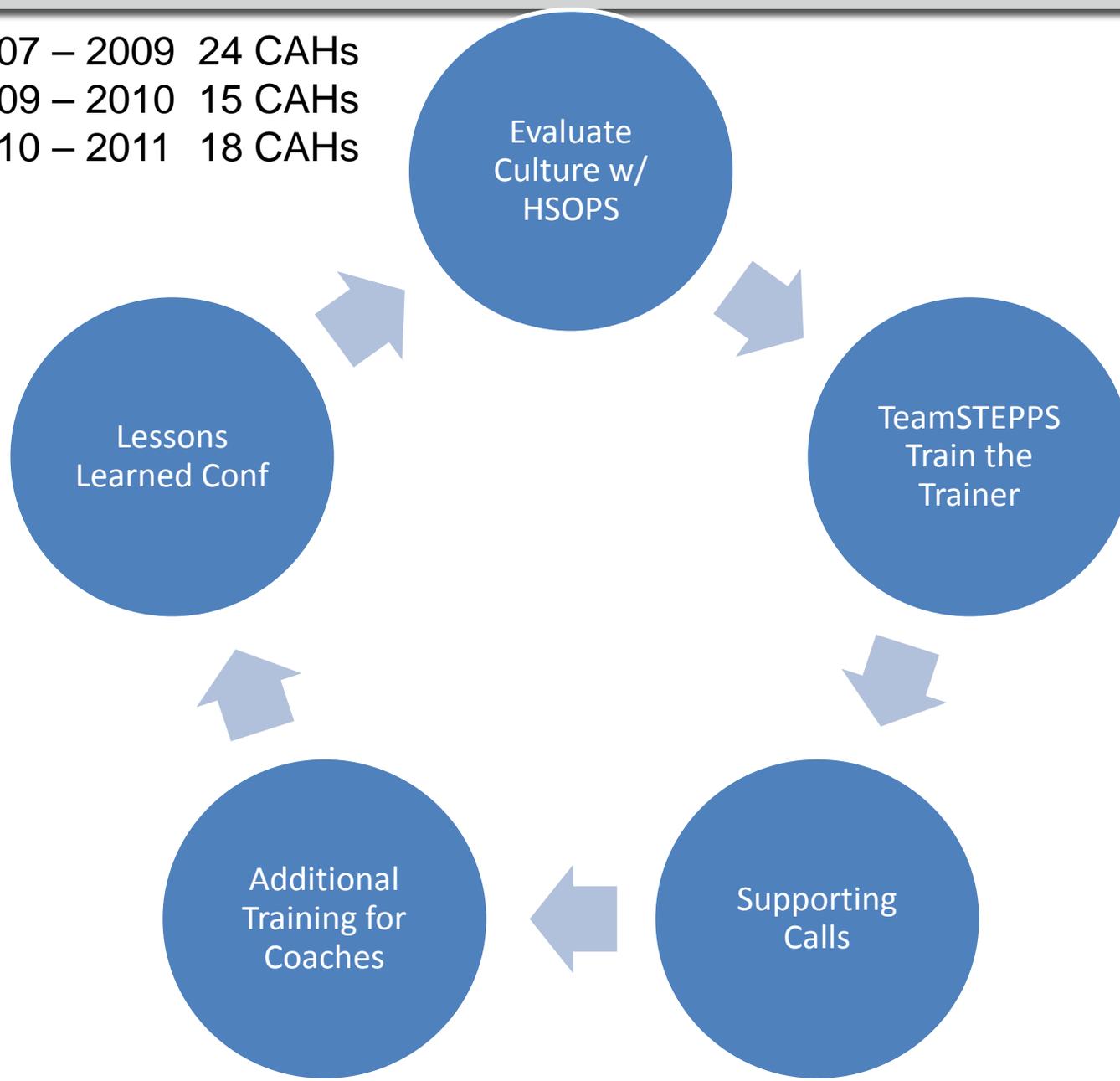


# Implementation Cycle

Cycle I 2007 – 2009 24 CAHs

Cycle II 2009 – 2010 15 CAHs

Cycle III 2010 – 2011 18 CAHs







# What impacts evaluation of improvement efforts?

- Implementation variability...program fidelity
  - Standardized training of TeamSTEPPS master trainers for 24 CAHs by UNMC
  - Variable implementation of TeamSTEPPS by master trainers within the 24 CAHs
- Baseline variability...how did the 24 trained CAHs differ in their pre-TeamSTEPPS HSOPS scores?
  - Organizations with low maturity in safety culture may gain more from a program than those with greater initial maturity
  - Standardized administration and interpretation of HSOPS by UNMC

Benn et al. Studying large-scale programmes to improve patient safety in whole care systems: challenges for research. Soc Science & Medicine. 2009;69:1767-1776.



Kirkpatrick's Taxonomy of Training Criteria

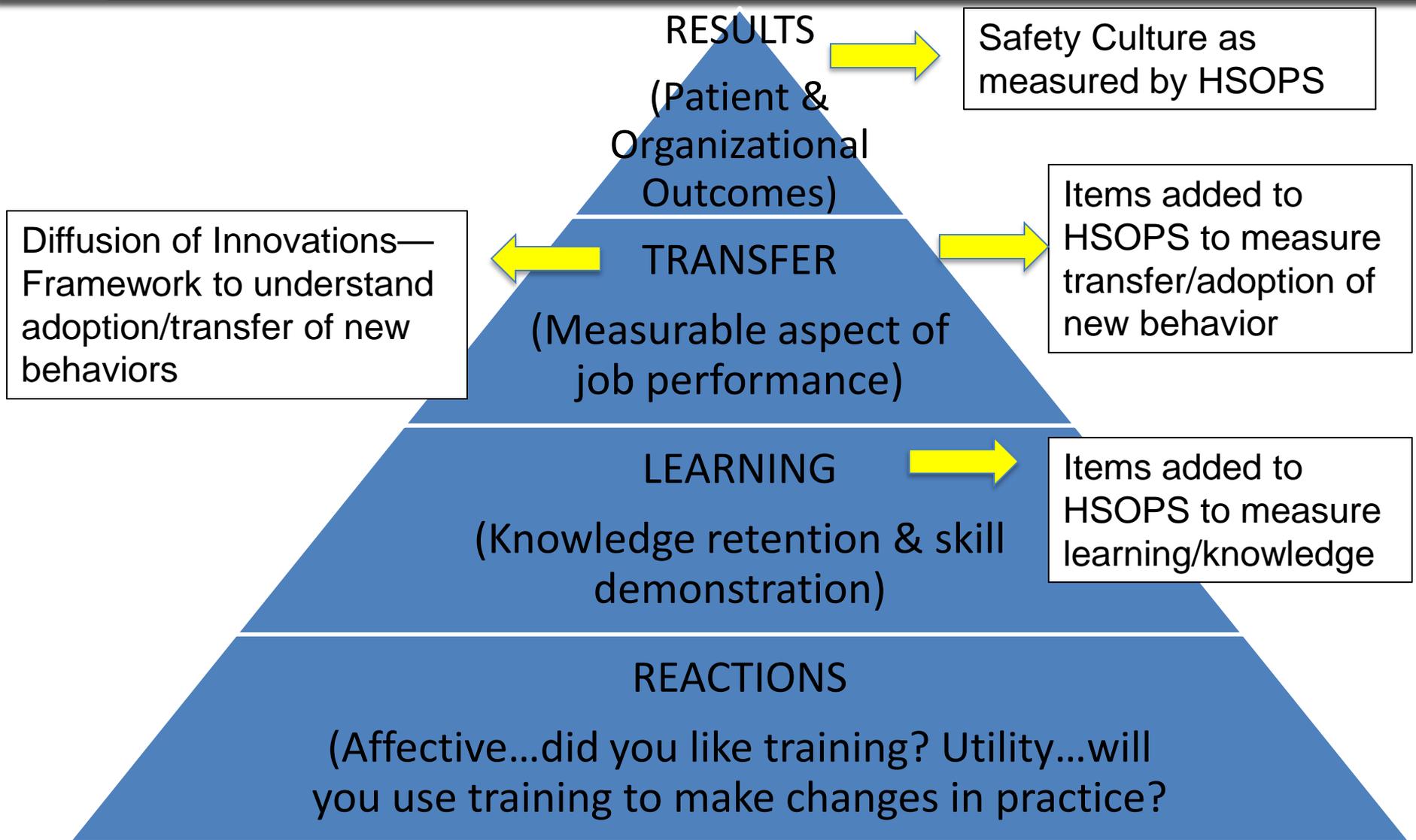
Diffusion of Innovations

Decision Frame

## **EVALUATION FRAMEWORKS**



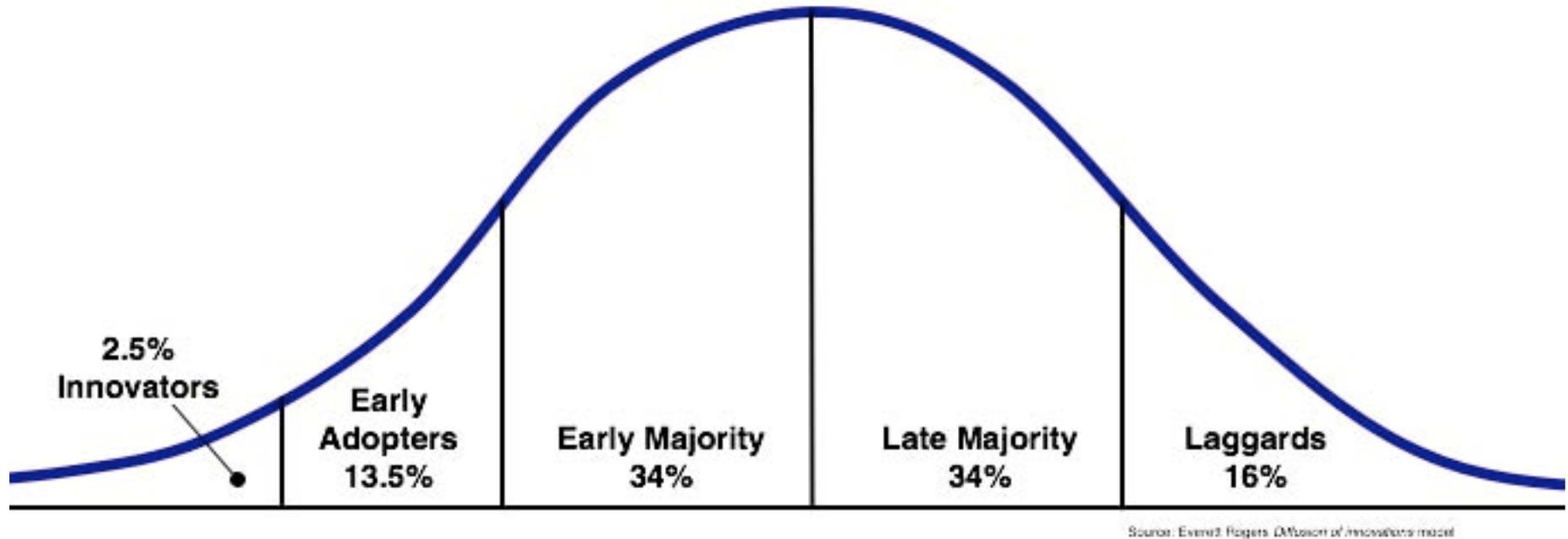
# Kirkpatrick's Taxonomy of Training Criteria



Alliger et al. A meta-analysis of the relations among training criteria. Personnel Psychology. 2006, 50: 341-358.



# Diffusion of Innovations (DOI)



“Getting a new idea adopted, even when it has obvious advantages, is difficult...a common problem for many individuals and organizations is how to speed up the rate of diffusion of an innovation.”

Rogers EM. (2003). *Diffusion of Innovations* (5<sup>th</sup> ed.). New York, NY: Free Press, p. 1.



# Decision Frame



The finding that perceptions of attitudes and behaviors are less positive after a training program is consistent with an altered “decision frame.”<sup>1</sup> A decision frame refers to the mental structures that people use to organize the world, and a key element of the frame is the reference point.<sup>2</sup> If a reference point changes—such as knowledge of specific skills required to produce a desired behavior—then it is likely that respondents may be less positive than previously about attitudes and observed behaviors that are not consistent with their new frame of reference.

1. Tversky A, Kahneman D. The framing of decisions and the psychology of choice. *Science*. 1981;211:453-458.
2. Wright G. Goodwin, P. Eliminating a framing bias by using simple instructions to 'think harder' and respondents with managerial experience: Comment on 'breaking the frame'. *Strategic Management Journal*, 2002;23:1059-1067.



# Evaluation: Team Knowledge Items Added to HSOPS

## SECTION H: Teamwork Skills

Please answer the following questions about your knowledge and practice related to teamwork. For each question, mark the **ONE** best answer. If you are unsure of an answer, please mark "Don't Know".

1. Indicate your experience in teamwork training.

- a. I have no formal team training experience
- b. I have some experience in team skills but not with the TeamSTEPPS program
- c. I have completed SOME training in the TeamSTEPPS modules
- d. I have completed training in ALL of the TeamSTEPPS Fundamental modules
- e. I am a TeamSTEPPS Master Trainer

2. Which one of the following tools allows team members to assign roles, establish expectations, and discuss contingency plans for unusual circumstances?

- a. Don't Know
- b. Check-back
- c. Debrief
- d. Huddle
- e. Brief
- f. Call-out

3. SBAR provides a structured framework for communication among team members and stands for...

- a. Don't Know
- b. Situation, Background, Action, Recommendation
- c. Situation, Background, Assessment, Recommendation
- d. Situation, Behavior, Assessment, Results
- e. Setting, Background, Action, Results
- f. Status, Background, Action, Recommendation

4. Which one of the following tools allow any team member to speak up to those with more authority without provoking a conflict or confrontation?

- a. Don't Know
- b. Call-Out
- c. CUS
- d. STEP
- e. Handoff
- f. I PASS THE BATON

5. A nurse is setting up for a procedure and notices that the physician seems to be on the wrong side of the patient. This physician is often short tempered and has a history of not taking suggestions well. The BEST action for the nurse is to:

- a. Don't Know
- b. Call for a supervisor to come into the room and clarify
- c. Observe and wait for the doctor to double-check
- d. Observe and wait for the patient to correct the doctor
- e. State her concern to the doctor and clarify why she is uncomfortable
- f. Ask the doctor if he knows the correct side

Items 2 – 5 are internally consistent (alpha = 0.71)



# Evaluation: Team Behavior Items Added to HSOPS

Think about your department ...	<u>Never</u>	<u>Rarely</u>	<u>Some- times</u>	<u>Most of the time</u>	<u>Always</u>
6. When people in your department communicate information that requires immediate attention and action, <u>how often do they use a structured communication tool like SBAR?</u> .....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. When people in your department recognize that another member of your team is stressed, <u>how often do they offer help?</u> .....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. When people in your department hand off information to a different department, <u>how often do they use a structured communication tool such as SBAR or I PASS THE BATON?</u> .....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. When information or work loads change in your department, <u>how often do team members call a huddle to adjust plans?</u> .....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. When things don't go according to plan in your department, <u>how often does your team conduct a debrief afterwards to discuss what should be improved?</u> .....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Items 6 – 10 are internally consistent (alpha = 0.83)



# Results: Rural HSOPS Spring 2009

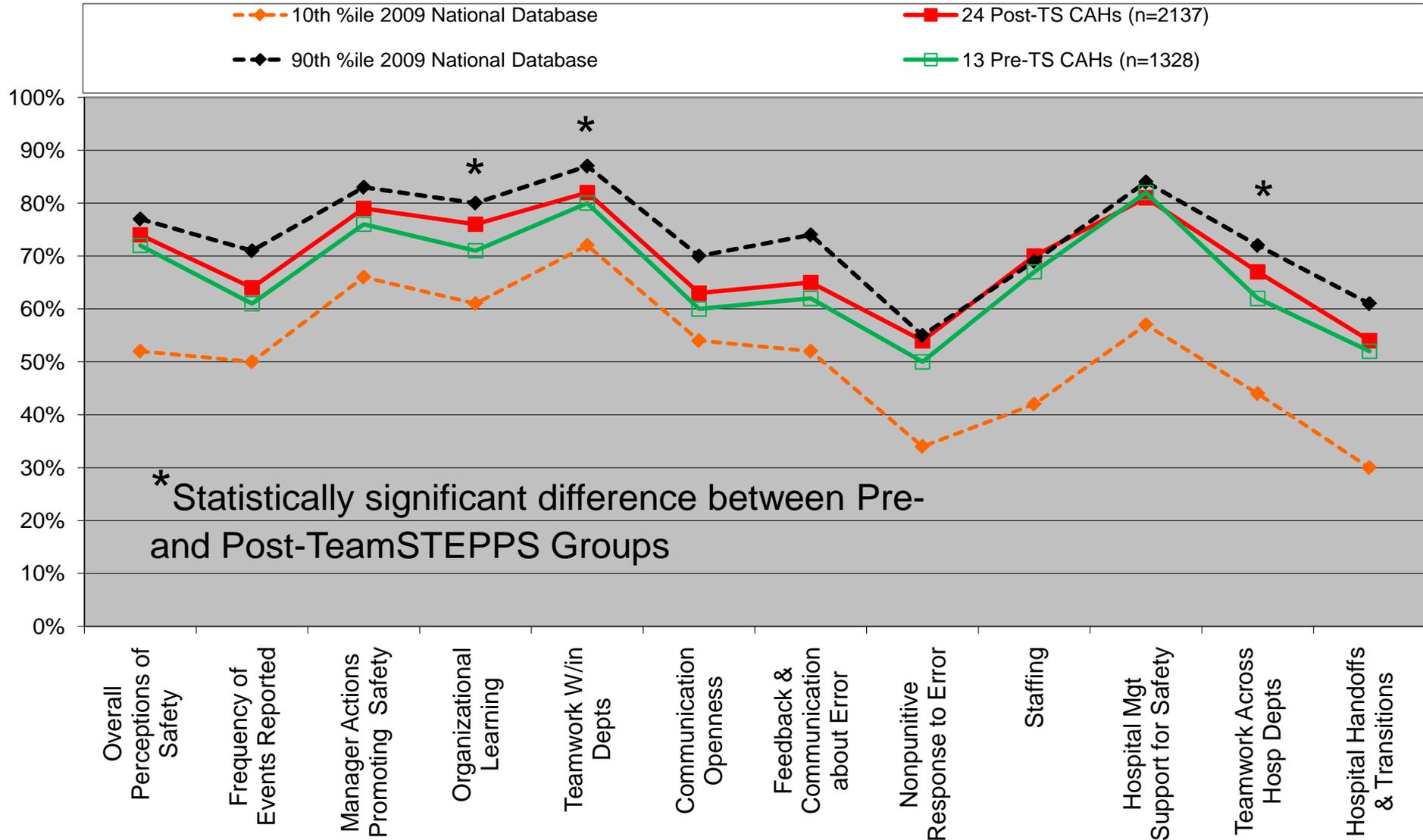
- Population Surveyed
  - 24 Hospitals evaluate impact of TeamSTEPPS Implementation 2008 – 2009 on HSOPS (n=2,137)
  - 13 Hospitals obtain baseline HSOPS prior to TeamSTEPPS Implementation (n=1,328)
  - Added Teamwork Related Items to HSOPS
- Response Rates
  - Aggregate  $3465/4601 = 75.3\%$
  - Median for 24 Post-TS CAHs = 81%
  - Median for 13 Pre-TS CAHs = 76%
  - Range across 37 CAHs 51% - 96%

p=0.825 from  
Wilcoxon Two-Sample  
Test



# Results: Does TeamSTEPPS Impact HSOPS?

HSOPS 2009 Composite Positive Responses for 24 CAHs Post-TeamSTEPPS Training and 13 CAHs Pre-TeamSTEPPS Training



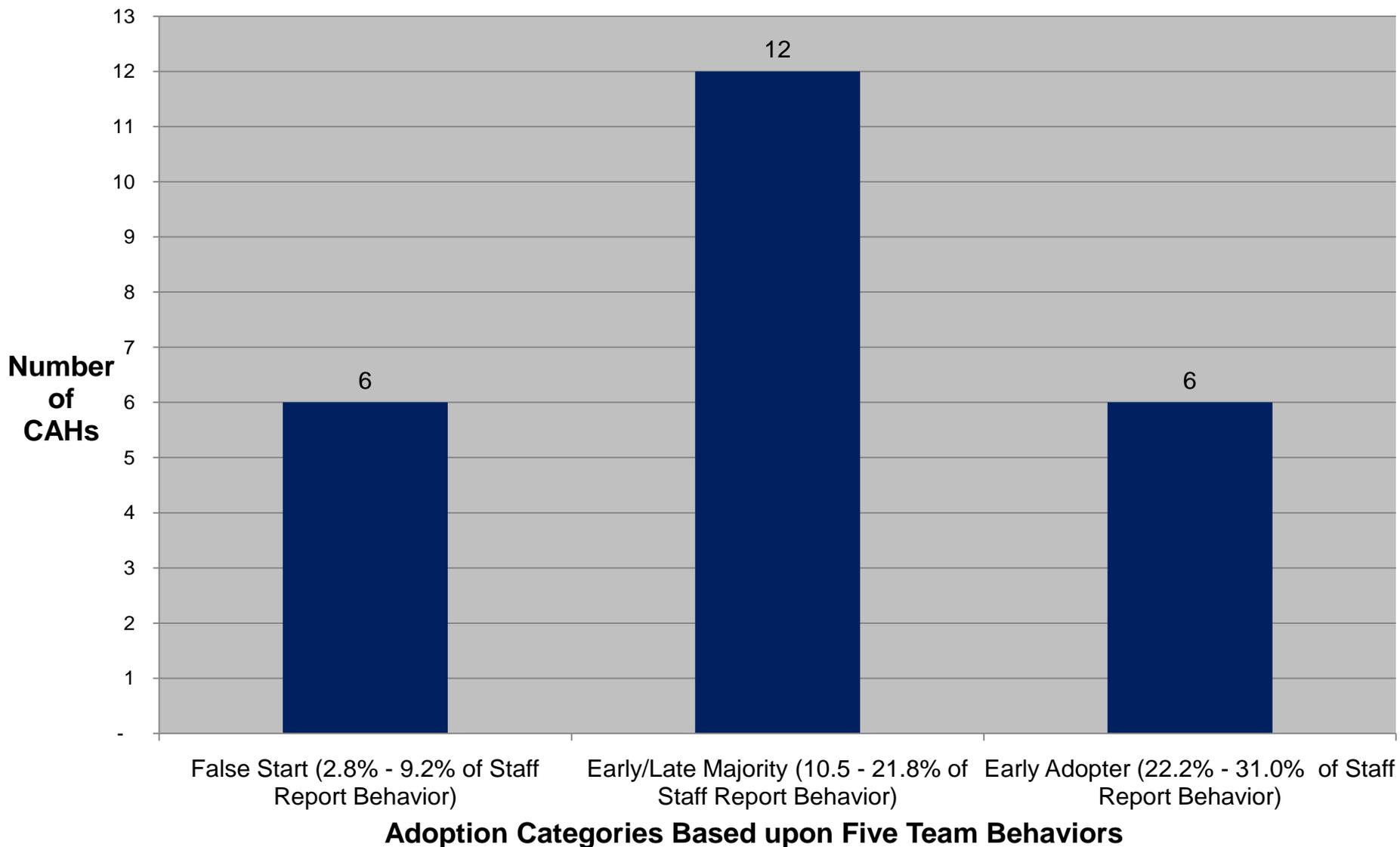


# **WHAT ABOUT VARIABILITY OF IMPLEMENTATION AND BASELINE HSOPS RESULTS?**



# Categorize Trained CAHs by Adoption Status

## Adoption of Team Behaviors in 24 Critical Access Hospitals





# How do “Adoption Groups” differ?

Hospital & Respondent Characteristics	6 Early Adopters (n=574)	12 Early/Late Majority (n=1195)	6 False Start (n= 368)
Mean Hospital Participation in 17 Support Calls	<b>48.0%</b>	<b>51.0%</b>	14.7%
Tenure at Hospital			
0 – 5 yrs	42.3%	42.7%	36.6%
6 – 15 yrs	39.3%	30.6%	35.5%
16 + yrs	<b>18.5%</b>	26.7%	27.9%
Tenure in Profession			
0 – 5 yrs	34.0%	27.3%	24.3%
6 – 15 yrs	36.1%	33.8%	32.5%
16 + yrs	29.9%	32.5%	<b>43.1%</b>

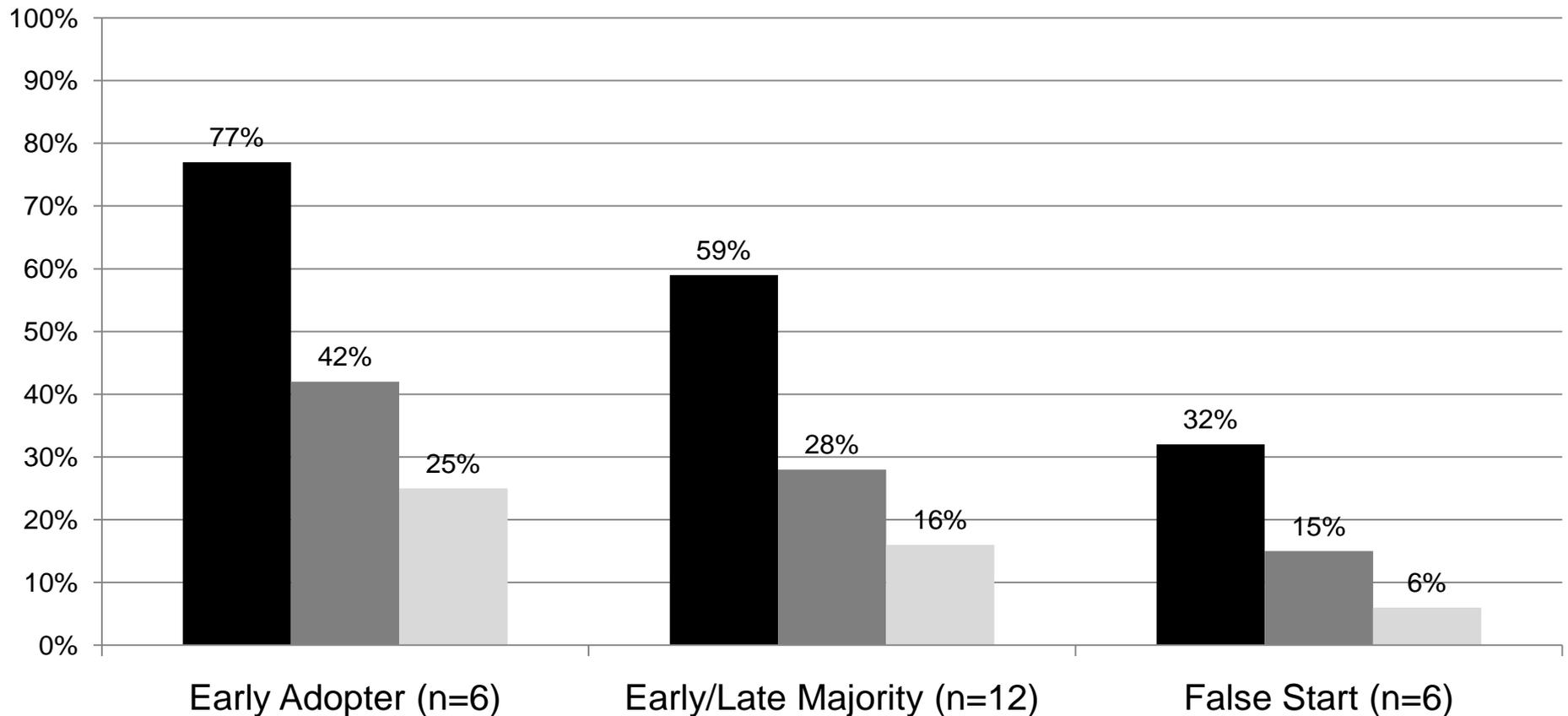
- Early Adopters & Early/Late Majority participated in ½ of calls
- Early Adopters have a smaller proportion of staff with 16+ yrs tenure at hospital than Early/Late Majority or False Start hospitals
- False Start hospitals have greater proportion of staff with 16+ yrs tenure in profession than Early Adopters or



# Results: Variation in Implementation by Adoption Status

## TeamSTEPPS Training, Knowledge, and Behavior for 24 CAHs April 2009

- Completed Training in SOME/ALL TeamSTEPPS Modules
- Correctly Answered 3/4 TeamSTEPPS Knowledge Questions
- Reported Performing 4/5 Team Behaviors Most of Time/Always



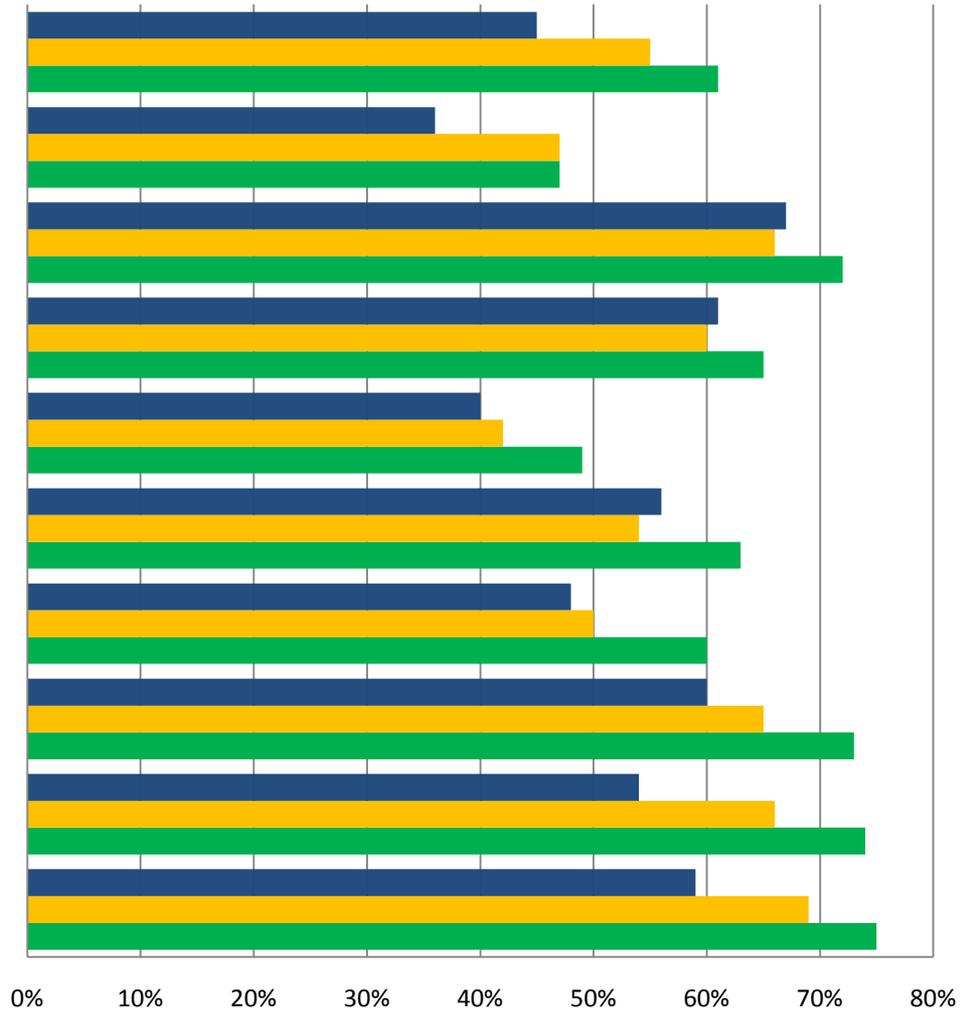


# Context: Early Adopters More Mature at Baseline

## Baseline HSOPS Percent Positive Scores for 24 CAHs by Post-TeamSTEPPS Adoption Status

■ False Start Pre-TS   ■ Early/Late Majority Pre-TS   ■ Early Adopter Pre-TS

- Reporting: When a mistake is made, but is caught and corrected before affecting the patient, how often is this reported?
- Just: Staff worry that mistakes they make are kept in their personnel file.
- Flexible: When one area in this department gets really busy, others help out.
- Flexible: We work in "crisis mode" trying to do too much, too quickly.
- Flexible: Staff feel free to question the decisions and actions of those with more authority.
- Flexible: Important patient care information is often lost during shift changes.
- Flexible: Problems often occur in the exchange of information across hospital departments.
- Learning: Mistakes have led to positive changes here.
- Learning: Hospital management seems interested in patient safety only after an adverse event happens.
- Informed: It is just by chance that more serious mistakes don't happen around here.





Generalized linear mixed models were used to account for the clustering of respondents within hospitals and repeated measurement of respondents over time.

**RESULTS REVEAL FRAMING AND  
THAT ADOPTION OF NEW  
BEHAVIORS CHANGES CULTURE;  
NOT TRAINING OR NEW  
KNOWLEDGE IN ISOLATION**



# Results: Framing Effects

## Change in HSOPS Percent Positive Scores for 24 CAHs by Post-TeamSTEPPS Adoption Status

■ False Start Post-TS Change

■ Early/Late Post-TS Change

■ Early Adopter Post-TS Change

Reporting: When a mistake is made, but is caught and corrected before affecting the patient, how often is this...

Just: Staff worry that mistakes they make are kept in their personnel file.

Flexible: When one area in this department gets really busy, others help out.

Flexible: We work in "crisis mode" trying to do too much, too quickly.

Flexible: Staff feel free to question the decisions and actions of those with more authority.

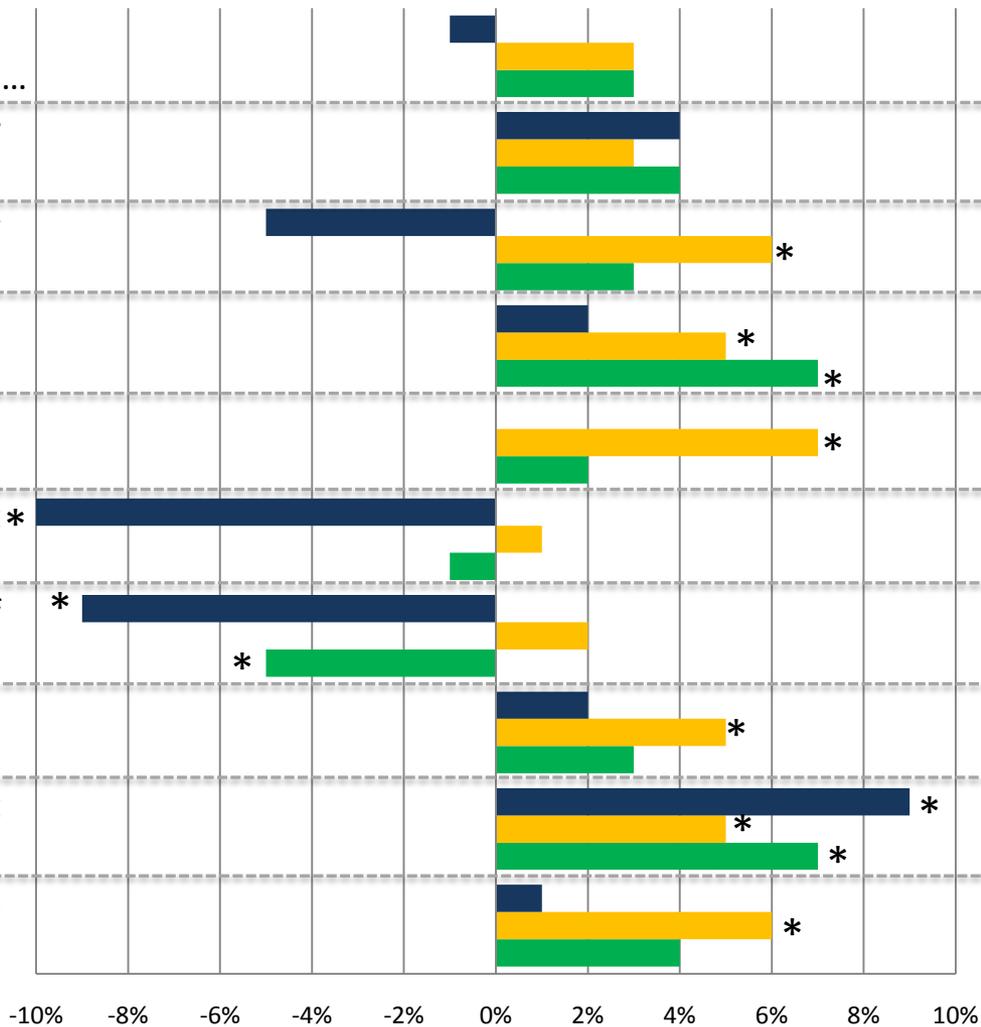
Flexible: Important patient care information is often lost during shift changes.

Flexible: Problems often occur in the exchange of information across hospital departments.

Learning: Mistakes have led to positive changes here.

Learning: Hospital management seems interested in patient safety only after an adverse event happens.

Informed: It is just by chance that more serious mistakes don't happen around here.



\*Statistically significant change  $p < 0.05$



## EVERY 5% Increase in proportion of staff ADOPTING team behaviors is associated with an increase of ...

- 20% in odds of responding that near misses reported “Most of time/Always”
- 11% in odds of disagreeing that “Staff worry that mistakes they make are kept in their personnel file.”
- 15% in odds of agreeing that others help out when it gets busy
- 11% in odds of agreeing that staff feel free to question decisions/actions of those with more authority
- 22% in odds of disagreeing that important patient information is lost during shift change
- 19% in odds of agreeing that “Mistakes have led to positive changes here.”
- 24% in odds of disagreeing that “Hospital mgt seems interested in patient safety only after an adverse event happens.”
- 25% in odds of disagreeing that “It is just by chance that more serious mistakes don’t happen around here.”



## EVERY 5% Increase in proportion of staff KNOWING team skills is associated with an increase of ....

- 5% in odds of responding that near misses reported “Most of time/Always”
- 6% in odds of disagreeing that “We work in “crisis mode” trying to do too much, too quickly. ”
- 6% in odds of agreeing that “Mistakes have led to positive changes here.”
- 7% in odds of disagreeing that “Hospital mgt seems interested in patient safety only after an adverse event happens.”
- 5% in odds of disagreeing that “It is just by chance that more serious mistakes don’t happen around here.”



EVERY 5% Increase in proportion of staff TRAINED in team skills is associated with an increase of ....

- 4% in odds of agreeing that “Mistakes have led to positive changes here.”
- 7% in odds of disagreeing that “It is just by chance that more serious mistakes don’t happen around here.”

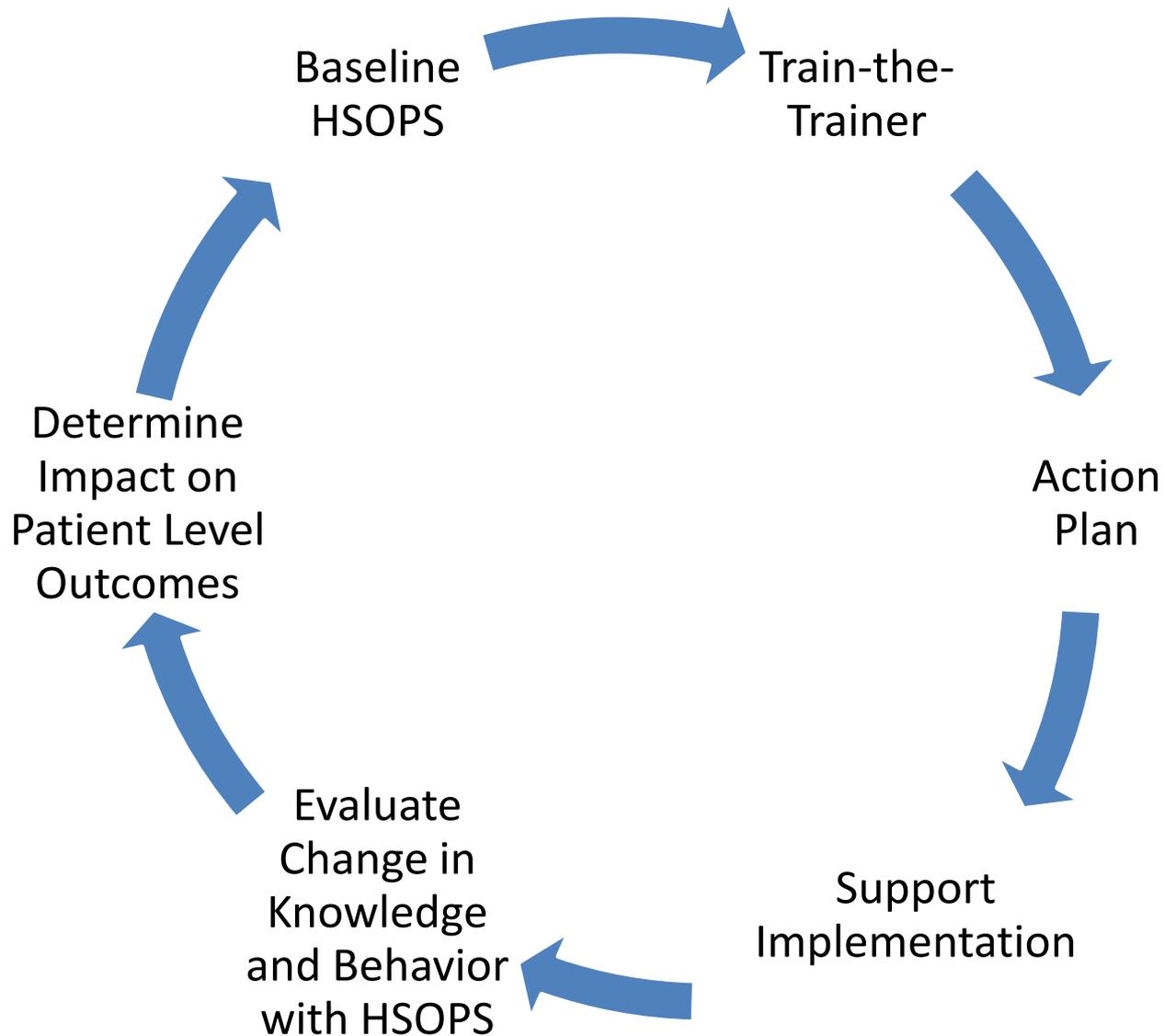


# Conclusions

- Adoption of team behaviors positively impacts all components of safety culture; esp. leadership support & organizational learning
- Training and new knowledge without adoption of new behaviors has less impact on culture; must use successful implementation strategies
- Evaluation of interventions intended to change safety culture requires measurement of implementation and baseline HSOPS variability
- Organizations with more mature safety cultures may gain less from an intervention than those with less mature cultures
- Changing frames of reference may create dissatisfaction & create the urgency to support future change
- Organizations resistant to change may have long term, passive employees that simply accept the status quo (Zhou & George, Academy of Management Journal 2001;44:682-696)



# Need for Future Research





# Contact Information

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Web site where Rural-Adapted TeamSTEPPS  
SOPS is posted

[www.unmc.edu/rural/patient-safety](http://www.unmc.edu/rural/patient-safety)