Using a "Driver Diagram" to focus improvement efforts
-a tale of 2 mental models and 2 tools

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Agenda

- **VHA Upper Midwest**
- **Our use of the AHRQ SOPS**
- **Frameworks for Interpreting Results**
  - Organizational Dynamics → Driver Diagram
  - Statistical Analysis → "Correlations" Diagram
- **Applications**
- **Key Influencers of and Leverage Points for Culture Perception**
- **Future steps**

Our intent…

Identify (a few) high leverage opportunities for improving patient safety culture

- Avoid chasing low scoring questions that are symptoms, not problems
- Respect executive team's challenge to manage a project portfolio >100

**Harmonize with other cultural attributes and areas of focus**

- High reliability
- Clinical excellence
- Patient/family centered

VHA Mission:

To Improve Members' Clinical and Economic Performance

VHA Upper Midwest Vision:

Members commit to work with each other through VHAUM on initiatives that result in members disproportionately populating the upper deciles of all performance indicators (economic, clinical, operational).

Clinical Improvement **Member Networks** **Economic Improvement**
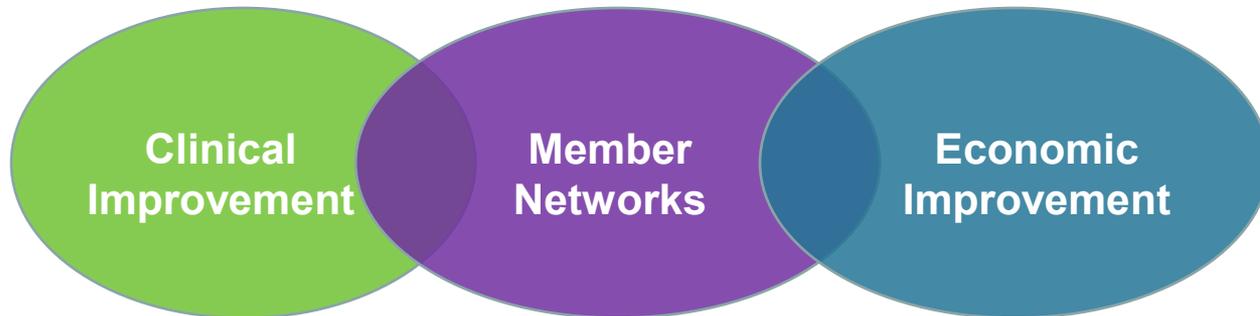
Upper Midwest Region

**Upper Midwest** shareholders and partners
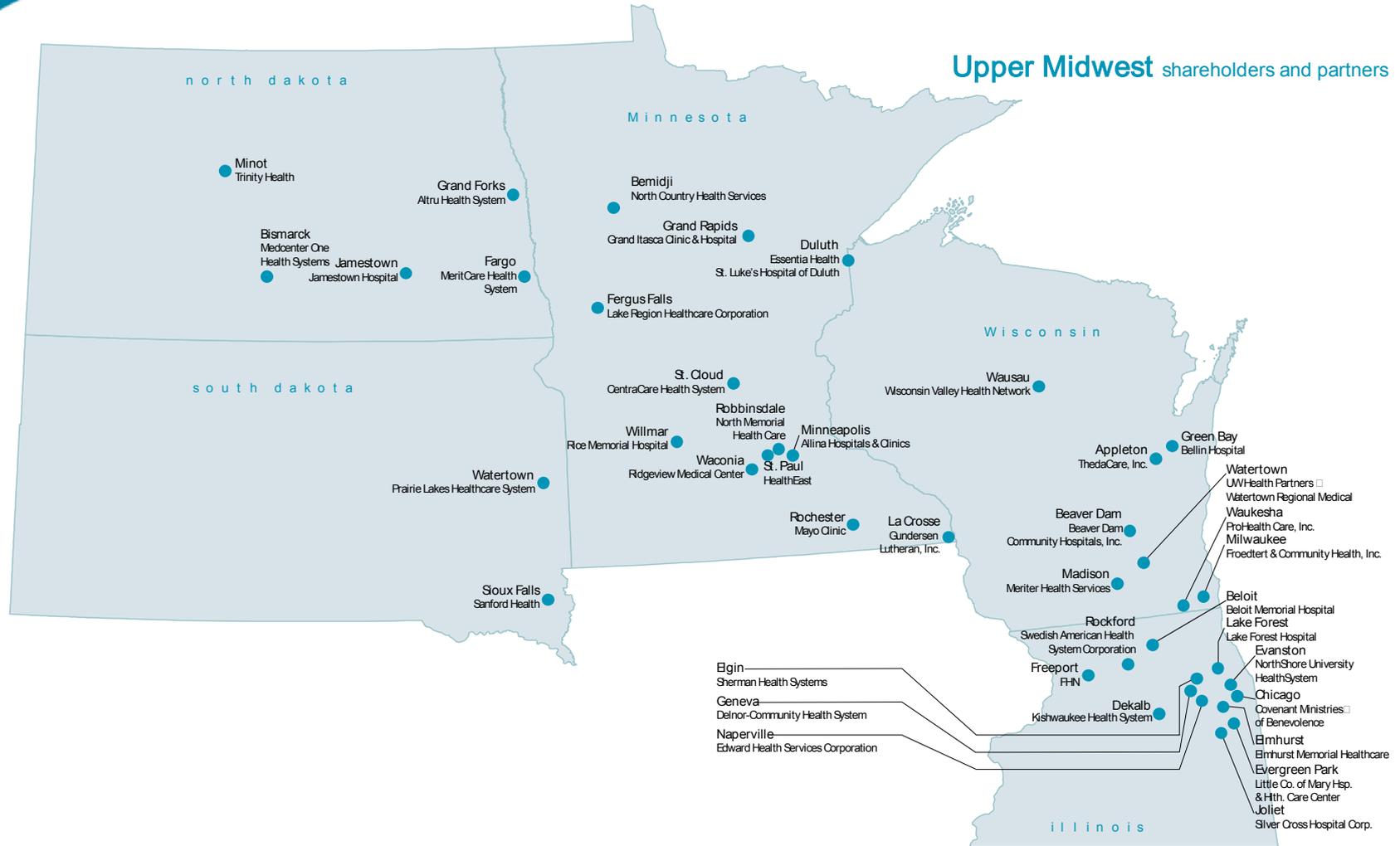
VHA Upper Midwest Embraces AHRQ SOPS

- **20 hospitals surveyed 2009/10,000 responses**
- **20 more hospitals in 2010**
- **Flexible administration**
  - Web
  - Paper
  - Enhanced "front end" demographic data collection → more granular reports
- **Follow-up Options**
  - Tabulate and post on secure ftp site…presentation ready
  - On request
    - Summary reports
    - On site presentations/discussions
    - Integration with all payer quality/HCAHPS/Labor productivity data

Organizational Results – National Comparison

## By Composite Categories of Questions

Chart 3-1. Composite-level % Positive Response—Comparative Results

Patient Safety Culture Composites	% Positive Response (Database Hospitals / Your Hospital)
1. Teamwork Within Units	79% / 80%
2. Supervisor/Manager Expectations & Actions Promoting Patient Safety	75% / 70%
3. Organizational Learning--Continuous Improvement	71% / 67%
4. Management Support for Patient Safety	70% / 63%
5. Overall Perceptions of Patient Safety	64% / 59%
6. Feedback & Communication About Error	63% / 73%
7. Communication Openness	62% / 66%
8. Frequency of Events Reported	60% / 57%
9. Teamwork Across Units	57% / 48%
10. Staffing	55% / 54%
11. Handoffs & Transitions	44% / 31%
12. Nonpunitive Response to Error	44% / 44%

Legend:
- Database Hospitals
- Your Hospital

Scale: 0% 20% 40% 60% 80% 100%

Organizational Results – National Comparison

Individual Question Detail

Chart 3-2. Item-level % Positive Response—Comparative Results (Page 1 of 4)

Item	Survey Items By Composite	Survey Item % Positive Response
	1. Teamwork Within Units	
A1	1. People support one another in this unit.	85% / 82%
A3	2. When a lot of work needs to be done quickly, we work together as a team to get the work done.	86% / 87%
A4	3. In this unit, people treat each other with respect.	78% / 77%
A11	4. When one area in this unit gets really busy, others help out.	68% / 74%
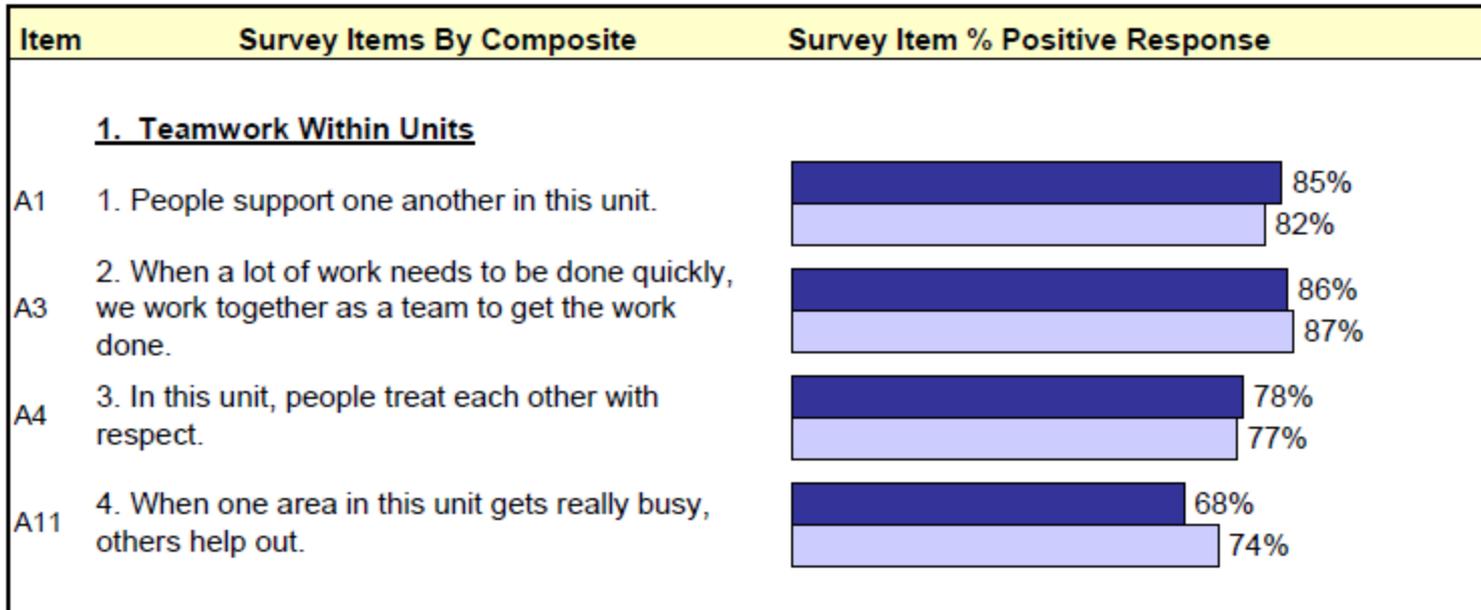
Table A-2. Item-level Average Percent Positive Response by Work Area/Unit (Page 1 of 6)

| Item	Survey Items by Composite	Dataset	Anesthe-siology	Emer-gency	ICU	Lab	Medicine	Obstet-rics	Pedi-atrics	Pharmacy	Psych/Mental Hlth	Radi-ology	Rehab-ilitation	Surgery
	Database: # Respondents	106,839	1,184	9,703	12,040	9,273	17,143	8,088	4,534	5,226	4,298	10,528	7,429	17,393
	Your Hospital: # Respondents	199	0	9	22	4	17	23	5	13	16	17	37	36
1.	**Teamwork Within Units**													
A1	1. People support one another in this unit.	Database	85%	85%	88%	83%	83%	87%	86%	85%	84%	85%	91%	83%
		Your Hospital	-	-	91%	-	82%	83%	-	69%	56%	94%	92%	92%
A3	2. When a lot of work needs to be done quickly, we work together as a team to get the work done.	Database	87%	87%	88%	85%	80%	88%	87%	84%	84%	87%	90%	87%
		Your Hospital	-	-	95%	-	76%	86%	-	77%	73%	88%	89%	97%
A4	3. In this unit, people treat each other with respect.	Database	78%	75%	80%	76%	74%	77%	80%	78%	79%	77%	88%	74%
		Your Hospital	-	-	86%	-	76%	68%	-	62%	50%	88%	81%	75%
A11	4. When one area in this unit gets really busy, others help out.	Database	65%	70%	74%	70%	61%	68%	67%	67%	70%	66%	76%	65%
		Your Hospital	-	-	80%	-	71%	77%	-	46%	50%	53%	73%	91%
2.	**Supv/Mgr Expectations & Actions Promoting Patient Safety**													
B1	1. My supv/mgr says a good word when he/she sees a job done according to established patient safety procedures.	Database	70%	69%	68%	69%	70%	70%	71%	71%	74%	69%	77%	71%
		Your Hospital	-	-	27%	-	63%	68%	-	58%	69%	59%	61%	69%
B2	2. My supv/mgr seriously considers staff suggestions for improving patient safety.	Database	76%	73%	73%	74%	73%	74%	76%	80%	77%	77%	84%	76%
		Your Hospital	-	-	77%	-	69%	64%	-	58%	81%	63%	72%	63%
B3 R	3. Whenever pressure builds up, my supv/mgr wants us to work faster, even if it means taking shortcuts.	Database	74%	72%	70%	80%	72%	72%	75%	78%	73%	78%	80%	71%
		Your Hospital	-	-	77%	-	69%	50%	-	31%	69%	82%	75%	62%
B4 R	4. My supv/mgr overlooks patient safety problems that happen over and over.	Database	76%	75%	75%	77%	74%	76%	78%	79%	78%	80%	84%	77%
		Your Hospital	-	-	95%	-	73%	73%	-	54%	63%	88%	81%	68%

Note: The item's survey location is shown to the left. An "R" indicates a negatively worded item, where the percent positive response is based on those who responded "Strongly disagree" or "Disagree," or "Never" or "Rarely" (depending on the response category used for the item).

VH

Patient Safety Grade
## 20 VHAUM Hospitals
Responses of Excellent or Very Good
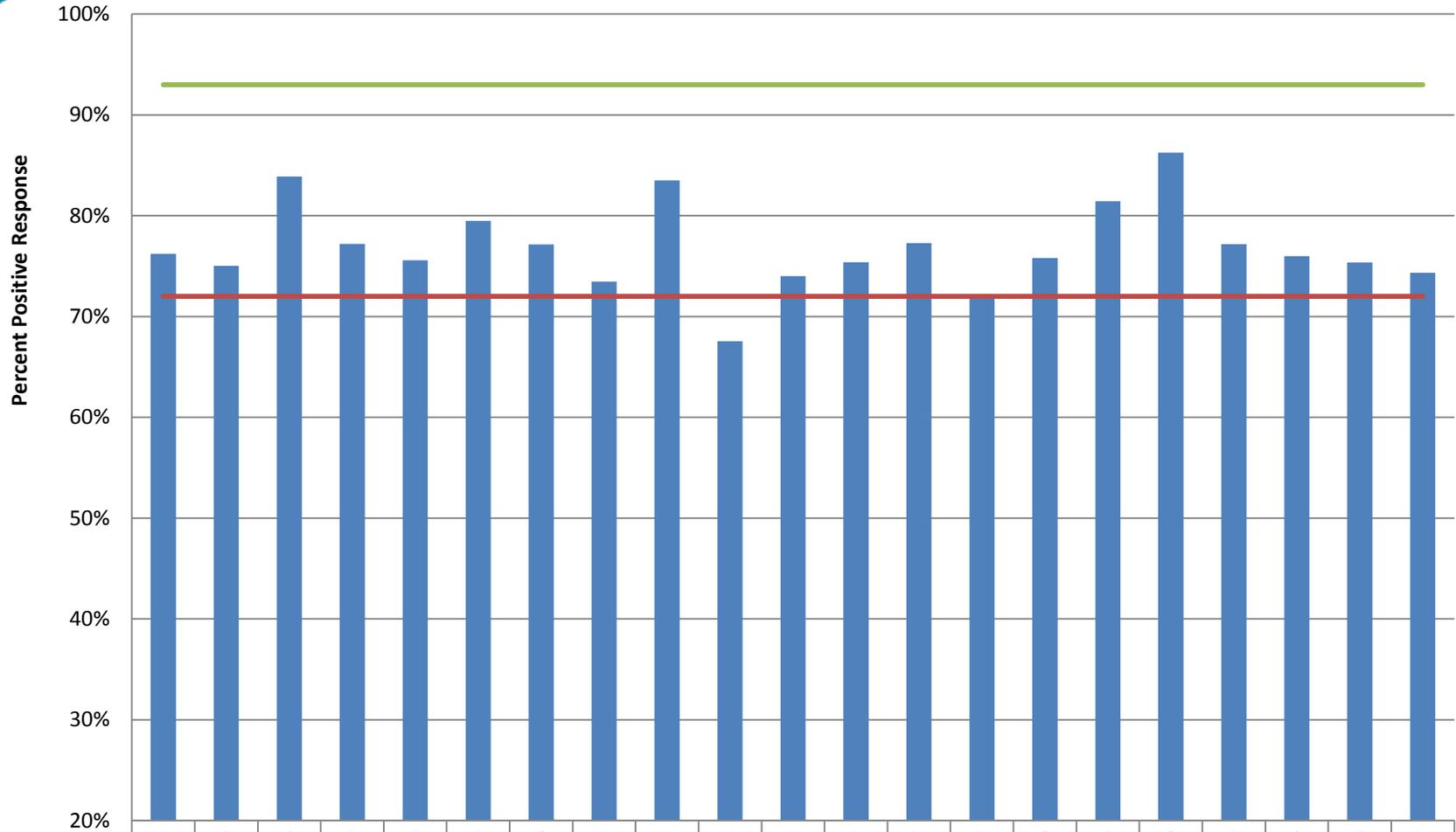
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
Pt Safety Grade	76%	75%	84%	77%	76%	79%	77%	73%	84%	68%	74%	75%	77%	72%	76%	81%	86%	77%	76%	75%	74%
AHRQ DB Average	72%	72%	72%	72%	72%	72%	72%	72%	72%	72%	72%	72%	72%	72%	72%	72%	72%	72%	72%	72%	72%
AHRQ DB 90th %ile	93%	93%	93%	93%	93%	93%	93%	93%	93%	93%	93%	93%	93%	93%	93%	93%	93%	93%	93%	93%	93%

Teamwork Within Units
Composite Measure
20 VHAUM Hospitals
Responses of Excellent or Very Good
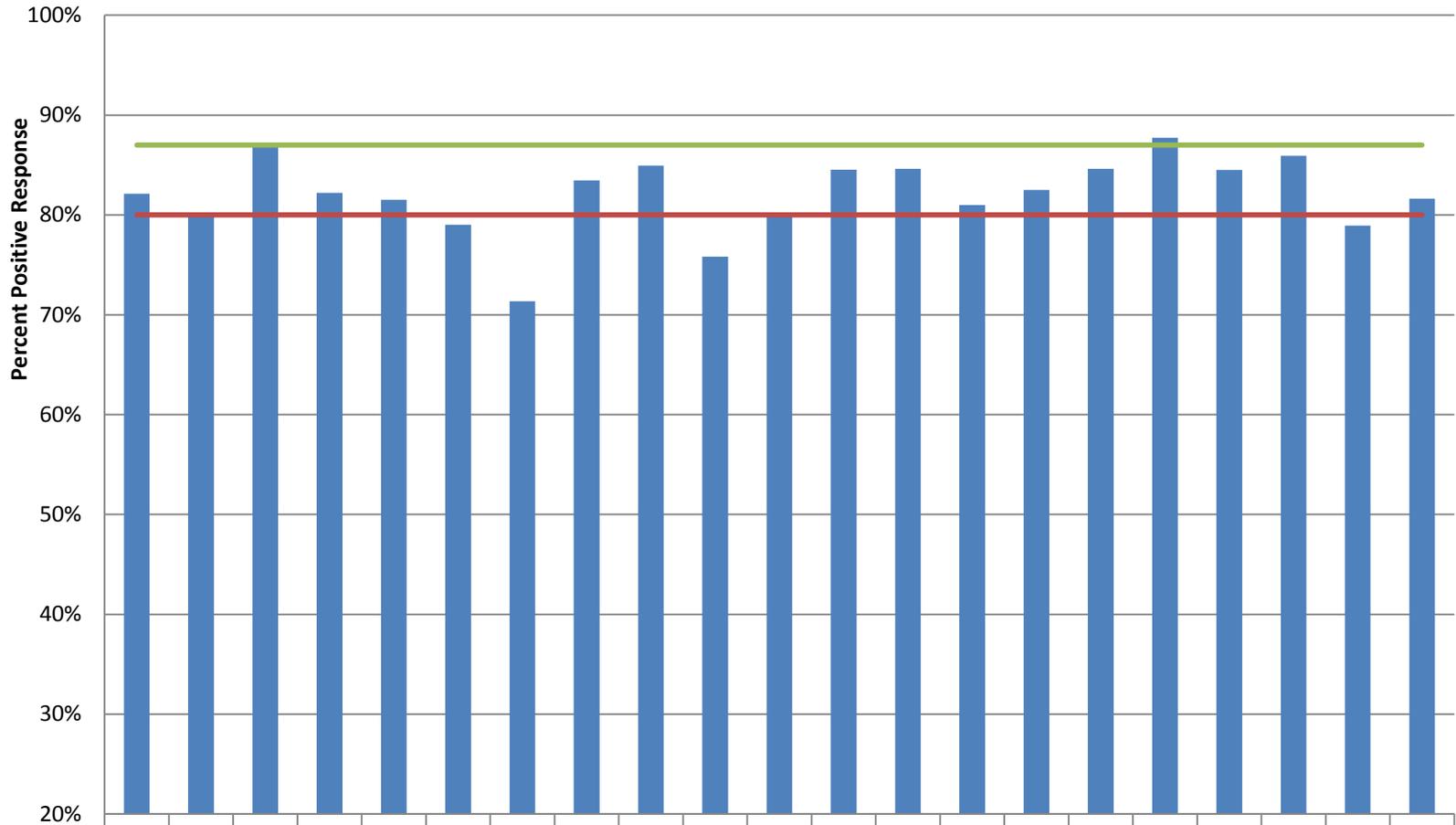
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
Teamwork within units	82%	80%	87%	82%	82%	79%	71%	83%	85%	76%	80%	85%	85%	81%	82%	85%	88%	85%	86%	79%	82%
AHRQ DB Average	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%
AHRQ DB 90th %ile	87%	87%	87%	87%	87%	87%	87%	87%	87%	87%	87%	87%	87%	87%	87%	87%	87%	87%	87%	87%	87%

Handoffs & Transitions
20 VHAUM Hospitals
Responses of Excellent or Very Good
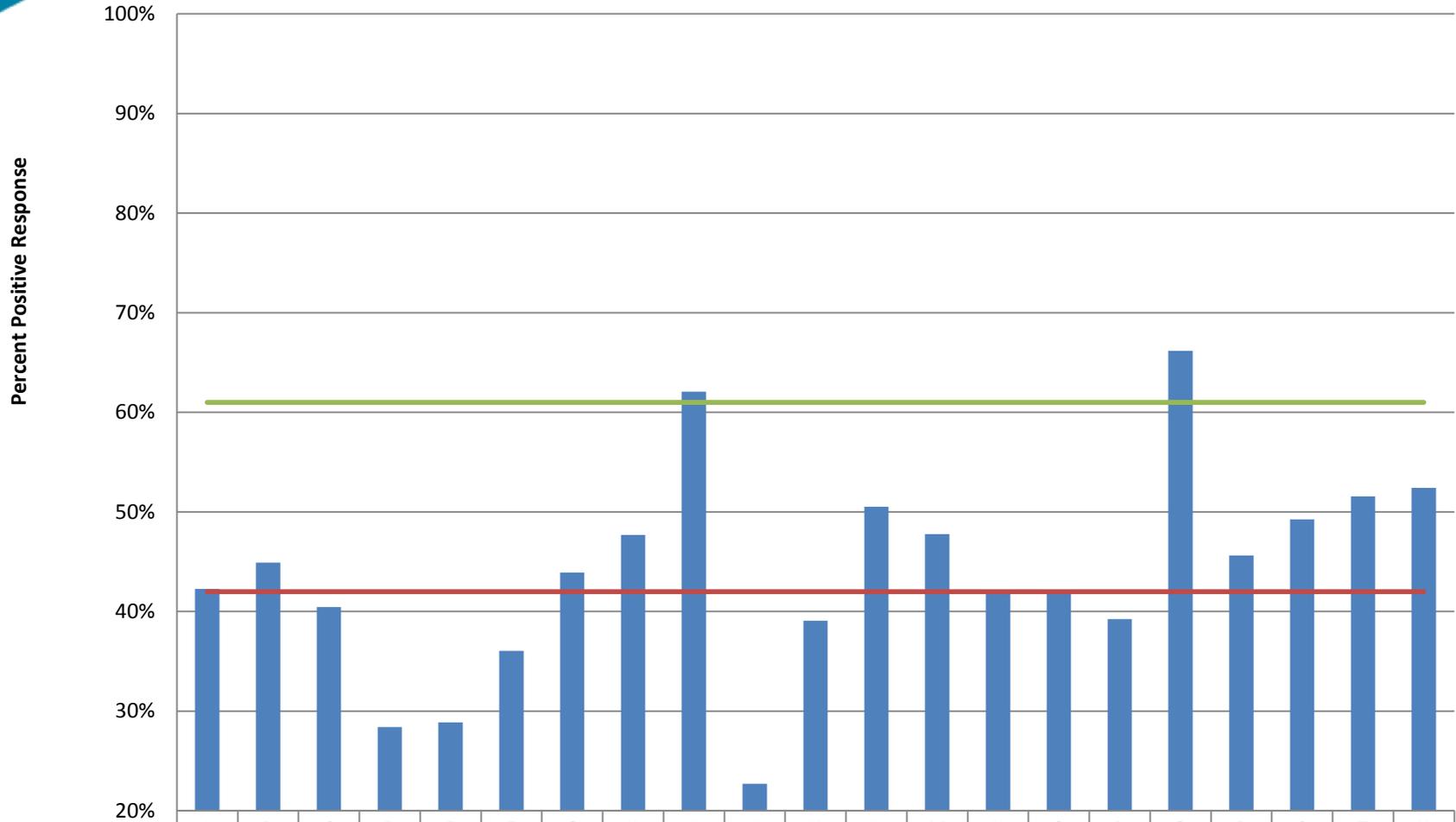
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
Handoffs & Transitions	42%	45%	40%	28%	29%	36%	44%	48%	62%	23%	39%	51%	48%	42%	42%	39%	66%	46%	49%	52%	52%
AHRQ DB Average	42%	42%	42%	42%	42%	42%	42%	42%	42%	42%	42%	42%	42%	42%	42%	42%	42%	42%	42%	42%	42%
AHRQ DB 90th %ile	61%	61%	61%	61%	61%	61%	61%	61%	61%	61%	61%	61%	61%	61%	61%	61%	61%	61%	61%	61%	61%

2009 VHAUM 20 Hospitals
Total Respondents n=9,419

VHA

Percent Positive Responses (y-axis: 20% to 100%)

Categories (x-axis):
- Teamwork within units
- Supervisor/mgr actions re: safety
- Organizational Learning
- Hosp Mgmt Support Safety
- Overall Perception of Patient Safety
- Feedback on Errors
- Communication Openness
- Frequency of Event Reporting
- Teamwork Across Depts
- Staffing
- Handoffs & Transitions
- Nonpunitive Response
- Pt Safety Grade

Legend:
- 20 Hospitals 2009 n=9419
- AHRQ DB Average
- AHRQ DB 10th%ile
- AHRQ DB 90th%ile

Backdrop…..Systems Perspectives

- **A system is a set of interrelated activities that work together to accomplish the aim of the system…in this case…improve perceptions of patient safety**

- **The system optimum is not the sum of the local optima…. optimizing individual components does not optimize the whole**

- **An organization behaves as a system, regardless of whether it is being managed as a system.**

- **Every organization is perfectly designed to produce the outcome it gets**

- **Most problems of organizations are internally caused**

- **Every system has a "weakest" link that ultimately limits success**

- **Strengthening any link in a chain other than the weakest does nothing to improve the strength of the whole chain**

- **Most undesirable effects are caused by a few core problems (which are not obvious)**

- **System constraints may be physical or policy based**

From Senge, Goldratt, and J. Forrester

If the AHRQ SOPS elements define a system, with a purpose of overall perception of patient safety, or patient safety grade

What's Driving the System?

Where do we focus our work?

"System Elements"

Table 1-1. Patient Safety Culture Composites and Definitions

Patient Safety Culture Composite	Definition: *The extent to which….*
1. Communication openness	Staff freely speak up if they see something that may negatively affect a patient, and feel free to question those with more authority
2. Feedback & communication about error	Staff are informed about errors that happen, given feedback about changes implemented, and discuss ways to prevent errors
3. Frequency of events reported	Mistakes of the following types are reported: 1) mistakes caught and corrected before affecting the patient, 2) mistakes with no potential to harm the patient, and 3) mistakes that could harm the patient, but do not
4. Handoffs & transitions	Important patient care information is transferred across hospital units and during shift changes
5. Management support for patient safety	Hospital management provides a work climate that promotes patient safety and shows that patient safety is a top priority
6. Nonpunitive response to error	Staff feel that their mistakes and event reports are not held against them, and that mistakes are not kept in their personnel file
7. Organizational learning–Continuous improvement	There is a learning culture in which mistakes lead to positive changes and changes are evaluated for effectiveness
8. Overall perceptions of patient safety	Procedures and systems are good at preventing errors and there is a lack of patient safety problems
9. Staffing	There are enough staff to handle the workload and work hours are appropriate to provide the best care for patients
10. Supervisor/manager expectations & actions promoting safety	Supervisors/managers consider staff suggestions for improving patient safety, praise staff for following patient safety procedures, and do not overlook patient safety problems
11. Teamwork across units	Hospital units cooperate and coordinate with one another to provide the best care for patients
12. Teamwork within units	Staff support one another, treat each other with respect, and work together as a team

Hospital-level intercorrelations among dimensions in the AHRQ Hospital Survey on Patient Safety Culture

HSOPS Dimension	OVERALL	ERFREQ	SUPV	ORGLRN	TEAMIN	COMMUN	FEED	NONPUN	STAFF	MGMT	TEAMAC	HANDOFF	GRADE
OVERALL --Overall perceptions of patient safety	1.00												
ERFREQ--Frequency of event reporting	.55	1.00											
SUPV--Supervisor/Mgr expectations & actions promoting patient safety	.70	.56	1.00										
ORGLRN--Organizational learning--Continuous improvement	.64	.58	.68	1.00									
TEAMIN--Teamwork within units	.69	.46	.62	.71	1.00								
COMMUN--Communication openness	.64	.52	.67	.56	.63	1.00							
FEED--Feedback & communication about error	.70	.65	.75	.73	.61	.72	1.00						
NONPUN--Nonpunitive response to error	.67	.42	.56	.39	.54	.61	.51	1.00					
STAFF--Staffing	.76	.31	.48	.38	.49	.42	.46	.58	1.00				
MGMT--Management support for patient safety	.75	.53	.65	.67	.53	.50	.67	.52	.56	1.00			
TEAMAC--Teamwork across units	.64	.41	.48	.51	.61	.39	.50	.52	.57	.69	1.00		
HANDOFF--Handoffs & transitions	.62	.41	.38	.32	.47	.35	.42	.55	.62	.58	.81	1.00	
GRADE--Patient safety grade	.69	.43	.58	.54	.57	.56	.59	.51	.52	.57	.49	.41	1.00
average intercorrelation	.67	.49	.59	.56	.58	.55	.61	.53	.51	.60	.55	.50	

Data provided by: Joann Sorra, PhD Westat

June 12, 2009: NOTE: All intercorrelations are significant at p<.05; N = 382 hospitals.

Inter-relationship Diagram

AHRQ 12 Composite Scores
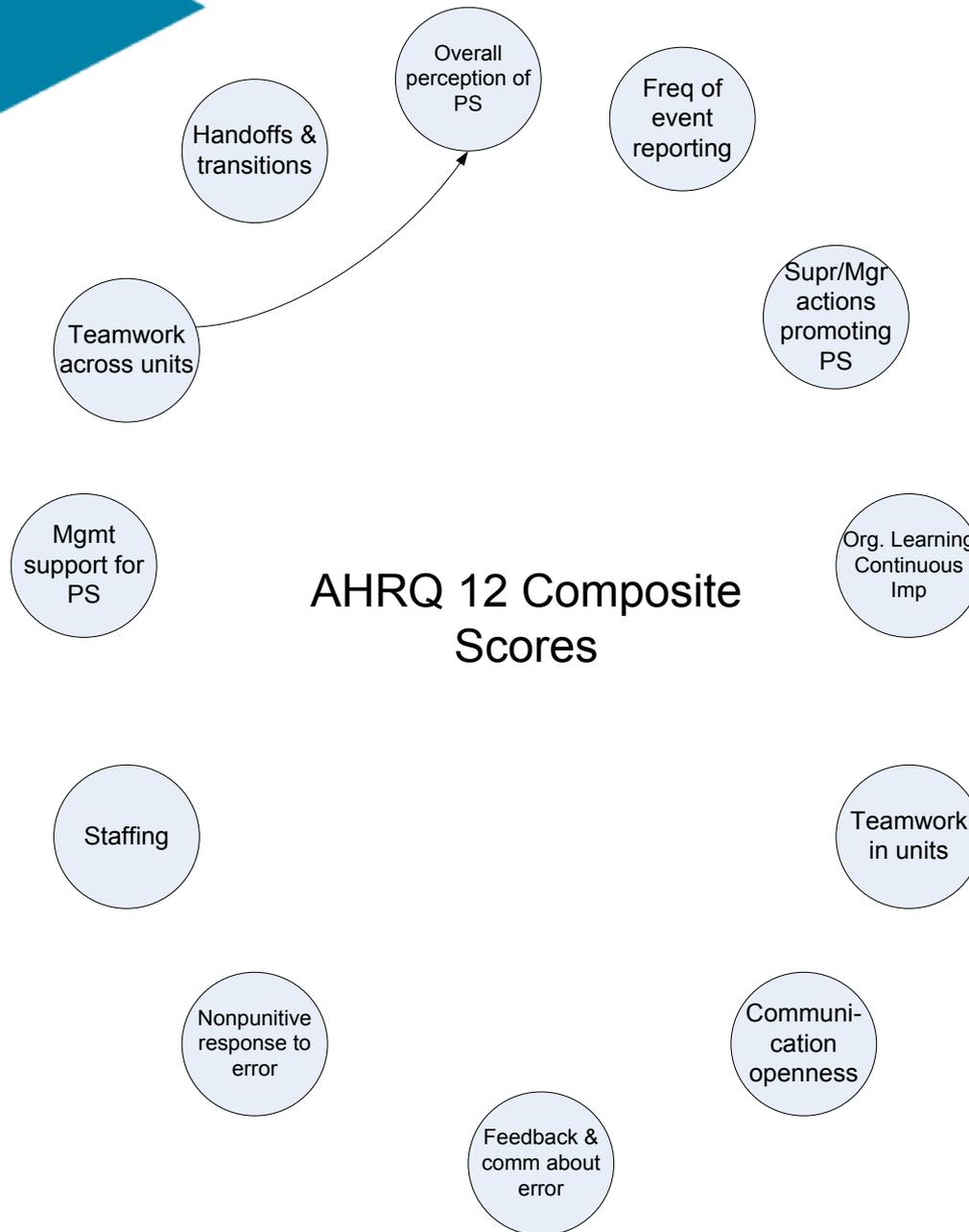
Defining "cause-effect" relationships

Circles (clockwise): Overall perception of PS, Freq of event reporting, Supr/Mgr actions promoting PS, Org. Learning Continuous Imp, Teamwork in units, Communication openness, Feedback & comm about error, Nonpunitive response to error, Staffing, Mgmt support for PS, Teamwork across units, Handoffs & transitions

VHA

Overall perception of PS

6H 0T
Handoffs & transitions

6H 0T
Freq of event reporting

3H 3T
Teamwork across units

2H 2T
Org. Learning Continuous Imp

1H 2T
Staffing

1H 7T
Teamwork in units

Nonpunitive response to error

0H 5T

5H 2T
Feedback & comm about error

2H 5T
Communi-cation openness

Supr/Mgr actions promoting PS

Mgmt support for PS

Inter-relationship Diagram

Removing obvious outcome and 2 drivers
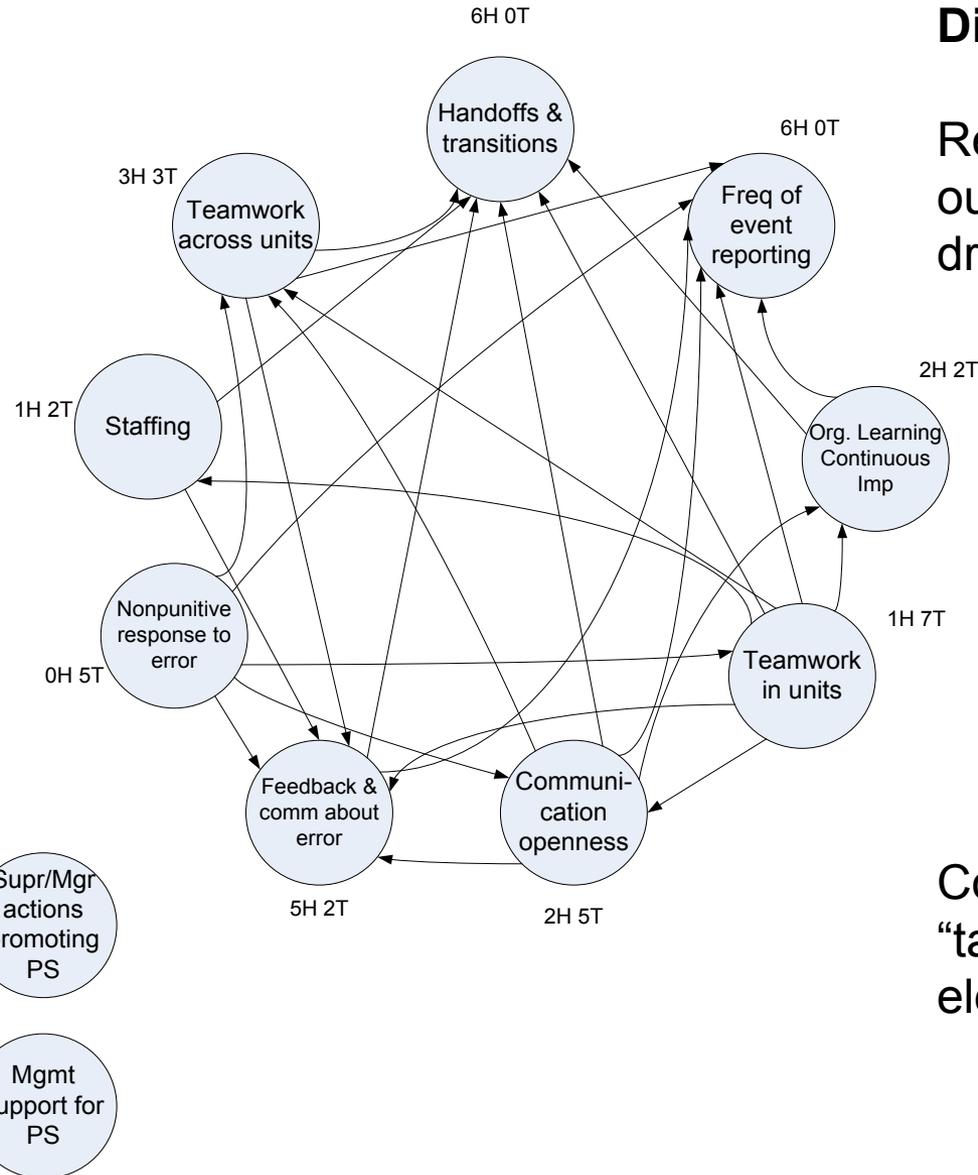
Counting "heads" and "tails" for each element

AHRQ SOPS

Component	Tools	Outcomes
Primary outcome	Pt./family engagement; Scripted communication; Time at bedside	Overall perception of PS
Intermediate outcomes	Knowledge transfer; TeamSTEPPS; Defect analysis/ learning	Handoffs & transitions — 6H 0T; Feedback & comm about error — 5H 2T; Freq of event reporting — 6H 0T
Intermediate process steps; organizational learning; standardized behaviors	Knowledge transfer; TeamSTEPPS; Defect analysis/ learning	Teamwork across units — 3H 3T; Org. Learning Continuous Imp — 2H 2T
Cultural and behavioral expectations	Just Culture; TeamSTEPPS; Defect analysis/ learning	Communication openness — 2H 5T; Nonpunitive response to error — 0H 5T; Teamwork in units — 1H 7T
Leadership; Safety and improvement as core strategies; Leadership behaviors	AHRQ Hospital Leadership and Quality Assessment Tool (HLQAT)	Supr/Mgr actions promoting PS; Mgmt support for PS; Staffing — 1H 2T
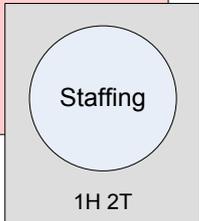
Drivers

Driver Diagram

Create hierarchy

#Heads→outcomes

#Tails→drivers

Segmentation of system elements and improvement tools

Outcomes ↑

Perception

- Overall perception of PS (yellow)
- Overall perception of PS (yellow)

Processes

- Handoffs & transitions (red)
- Freq of event reporting (yellow)
- Feedback & comm about error (yellow)
- Teamwork across units (yellow)
- Org. Learning Continuous Imp (green)
- Staffing (yellow)

- Handoffs & transitions (red)
- Freq of event reporting (yellow)
- Feedback & comm about error (yellow)
- Teamwork across units (red)
- Org. Learning Continuous Imp (yellow)
- Staffing (yellow)

Culture

- Communication openness (yellow)
- Nonpunitive response to error (red)
- Teamwork in units (yellow)

- Communication openness (yellow)
- Nonpunitive response to error (red)
- Teamwork in units (yellow)

Leadership

- Supr/Mgr actions promoting PS (green)
- Mgmt support for PS (green)

- Supr/Mgr actions promoting PS (yellow)
- Mgmt support for PS (yellow)

Red ~ <50%
Yellow ~ 50-69%
Green ~ >=70%

AHRQ Average Scores

Drivers

XYZ Hospital Scores

The Driver Diagram makes "sense" from an organizational dynamics perspective, but is there statistical support for the new model?

Enter Mike Finch

**Confirmatory factor
analysis of the SOPS
questions**

LISREL

AHRQ Dimensions

| Dimension	Items
1. Teamwork Within Units	A1 People support one another in this unit. A3 When a lot of work needs to be done quickly, we work together as a team to get the work done. A4 In this unit, people treat each other with respect. A11 When one area in this unit gets really busy, others help out
2. Supervisor/Manager Expectations & Actions Promoting Patient Safety	B1 My supervisor/manager says a good word when he/she sees a job done according to established patient safety procedures. B2 My supervisor/manager seriously considers staff suggestions for improving patient safety. B3R Whenever pressure builds up, my supervisor/manager wants us to work faster, even if it means taking shortcuts. B4R My supervisor/manager overlooks patient safety problems that happen over and over.
3. Organizational Learning- Continuous Improvement	A6 We are actively doing things to improve patient safety. A9 Mistakes have led to positive changes here. A13 After we make changes to improve patient safety, we evaluate their effectiveness.
4. Management Support for Patient Safety	F1 Hospital management provides a work climate that promotes patient safety. F8 The actions of hospital management show that patient safety is a top priority. F9R Hospital management seems interested in patient safety only after an adverse event happens.
5. Overall Perceptions of Patient Safety	A10R It is just by chance that more serious mistakes don't happen around here. A15 Patient safety is never sacrificed to get more work done. A17R We have patient safety problems in this unit. A18 Our procedures and systems are good at preventing errors from happening.
6. Feedback and Communication About Error	C1 We are given feedback about changes put into place based on event reports. C3 We are informed about errors that happen in this unit. C5 In this unit, we discuss ways to prevent errors from happening again.
7. Communication Openness	C2 Staff will freely speak up if they see something that may negatively affect patient care. C4 Staff feel free to question the decisions or actions of those with more authority. C6R Staff are afraid to ask questions when something does not seem right.
8. Frequency of Events Reported	D1 When a mistake is made, but is caught and corrected before affecting the patient, how often is this reported? D2 When a mistake is made, but has no potential to harm the patient, how often is this reported? D3 When a mistake is made that could harm the patient, but does not, how often is this reported?
9. Teamwork Across Units	F2R Hospital units do not coordinate well with each other. F4 There is good cooperation among hospital units that need to work together. F6R It is often unpleasant to work with staff from other hospital units. F10 Hospital units work well together to provide the best care for patients.
10. Staffing	A2 We have enough staff to handle the workload. A5R Staff in this unit work longer hours than is best for patient care. A7R We use more agency/temporary staff than is best for patient care. A14R We work in "crisis mode" trying to do too much, too quickly.
11. Handoffs & Transitions	F3R Things "fall between the cracks" when transferring patients from one unit to another. F5R Important patient care information is often lost during shift changes. F7R Problems often occur in the exchange of information across hospital units. F11R Shift changes are problematic for patients in this hospital.
12. Nonpunitive Response to Error	A8R Staff feel like their mistakes are held against them. A12R When an event is reported, it feels like the person is being written up, not the problem. A16R Staff worry that mistakes they make are kept in their personnel file.

Modified LISREL based dimensions
(VHAUM category labels)

Modified Categories	Question#	Question
Fear Factor	C2	Staff will freely speak up if they see something that may negatively affect patient care
	C4	Staff feel free to questions the decisions or actions of those with more authority
	C6	Staff are afraid to ask questions when something does not feel right
Error prevalence	A10	It's just by chance that more serious mistakes don't happen around here
	A17	We have patient safety problems on this unit
Safety Focus	A15	Patient Safety is never sacrificed to get more work done
	A18	Our procedures and systems are good at preventing errors from happening
Organizational Learning	A13	After we make changes to improve patient safety, we evaluate their effectiveness
	C1	We are given feedback about changes put into place based on event reports
Organization-wide teamwork	F2	Hospital units do not coordinate well with each other
	F3	Things "fall between the cracks" when transferring patients from one unit to another
	F6	It is often unpleasant to work with staff from other hospital units
	F7	Problems often occur in the exchange of information across hospital units

| Modified Categories	Question#	Question
Reporting Frequency	D1	When mistake is made, but is caught and corrected before affecting the patient, how often is this reported?
	D2	When mistake is made, but has no potential to harm the patient, how often is this reported?
	D3	When mistake is made that could harm the patient, but does not, how often is this reported?
Senior Management	F1	Hospital management provides a work climate that promotes patient safety
	F8	The actions of hospital management show that patient safety is a top priority
Unit Shift Change	F11	Shift changes are problematic for patients in this hospital
	F5	Important patient care information is lost during shift changes
Unit Supervisor	B3	Whenever pressure builds up, my supervisor/manager wants us to work faster, even if it means taking shortcuts
	B4	My supervisor/manager overlooks patient safety problems that happen over and over
Unit Teamwork	A1	People support each other in this unit
	A11	When one area on the unit gets really busy, others help out

We attempted to create a driver diagram with the new composite categories.
No clear hierarchy emerged, and the categories did not fit the Leadership/Culture/ Process/Perception model

VHA

**Patient Safety Grade**

Fear culture
--Fear Factor
--Unit Supervisor

Perceptions of safety
--Reporting Frequency
--Safety Focus
--Learning Organization
--Error Prevalence
--Unit Teamwork

Senior Management

.73

.35

.63

.02

.54

.35

"Correlations" Diagram

RMSEA = .10

Regression coefficients shown
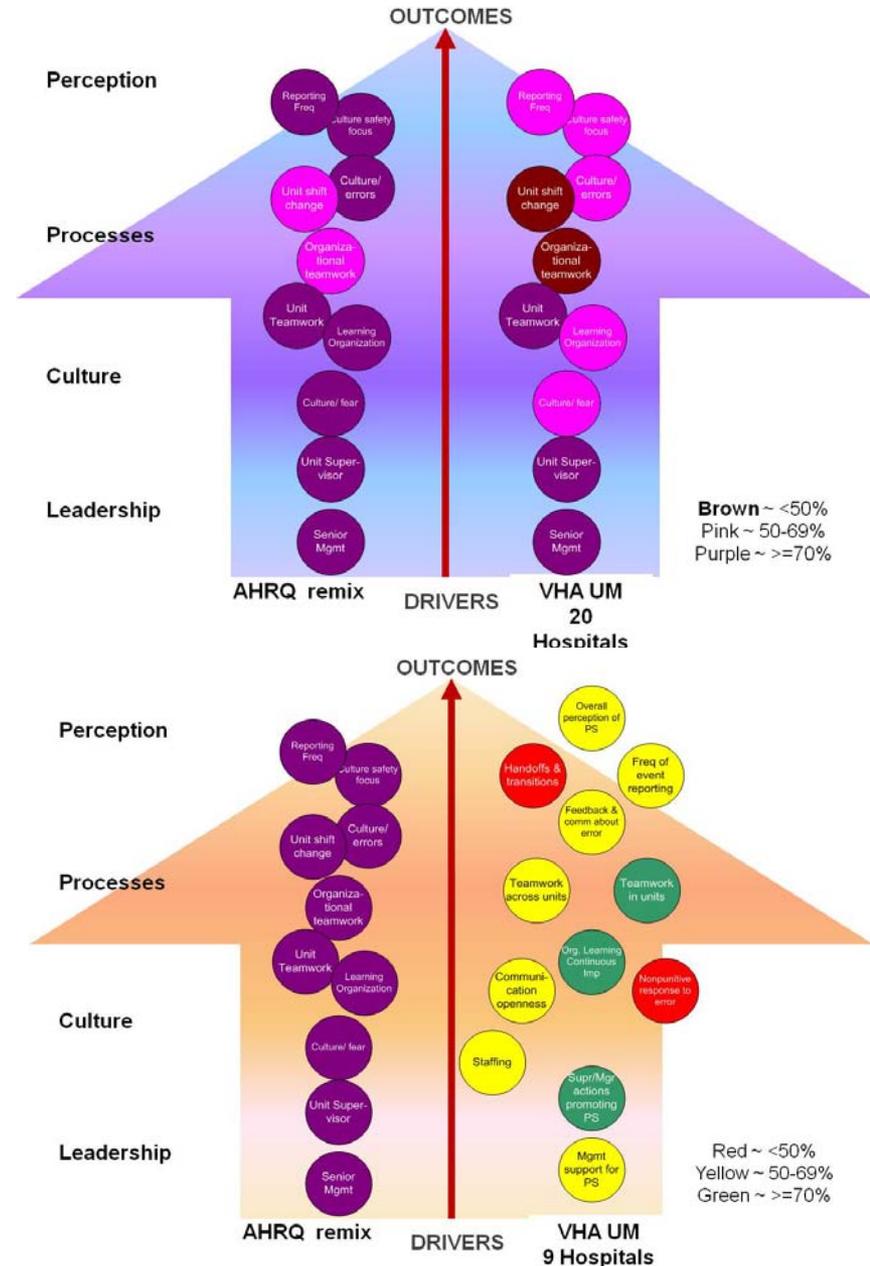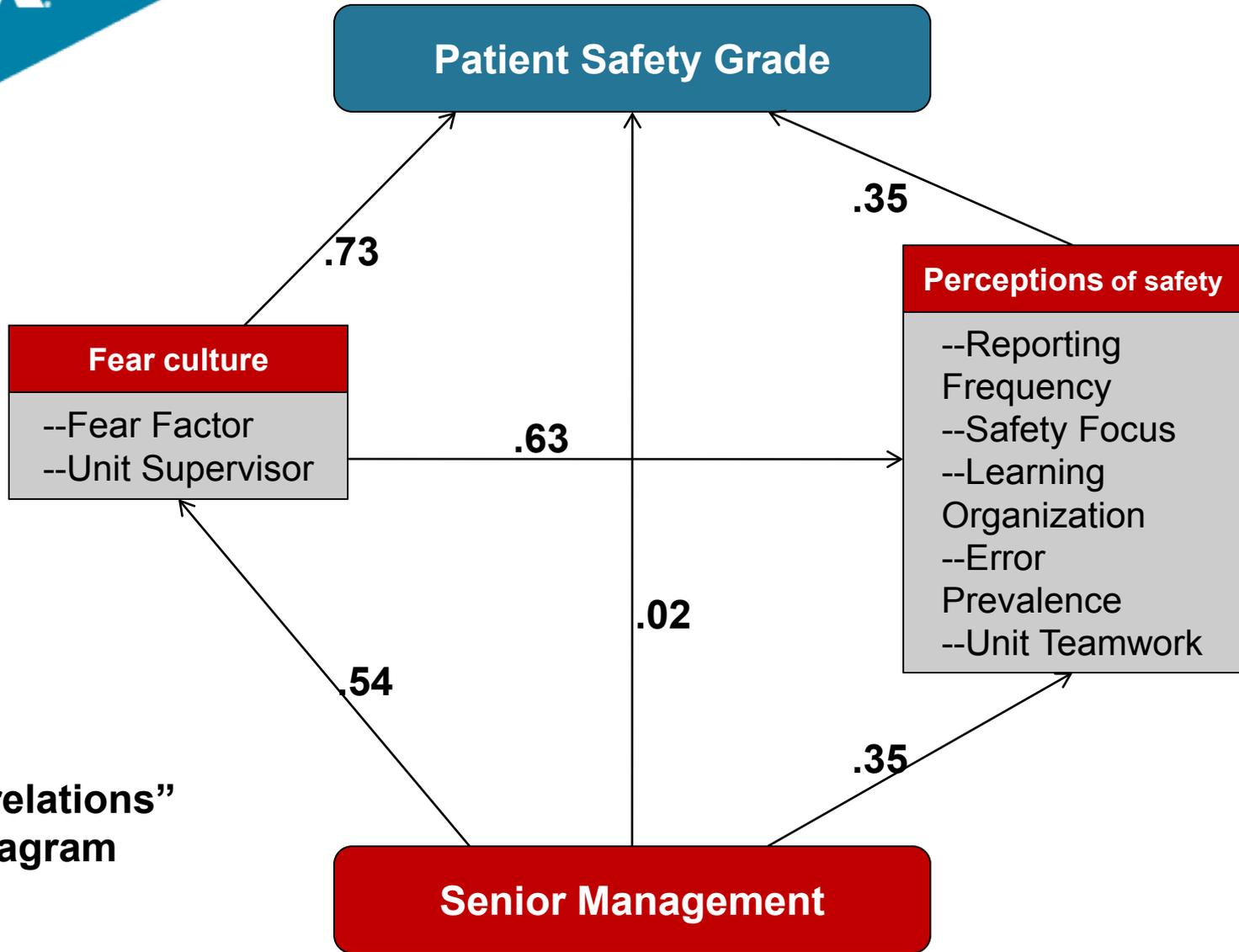
"Correlations" Diagram

AHRQ SOPS remix 90%ile

- Patient Safety Grade
- Reporting Frequency
- Safety Focus
- Learning Organization
- Error Prevalence
- Unit Teamwork
- Fear Factor
- Unit Supervisor
- Senior Management
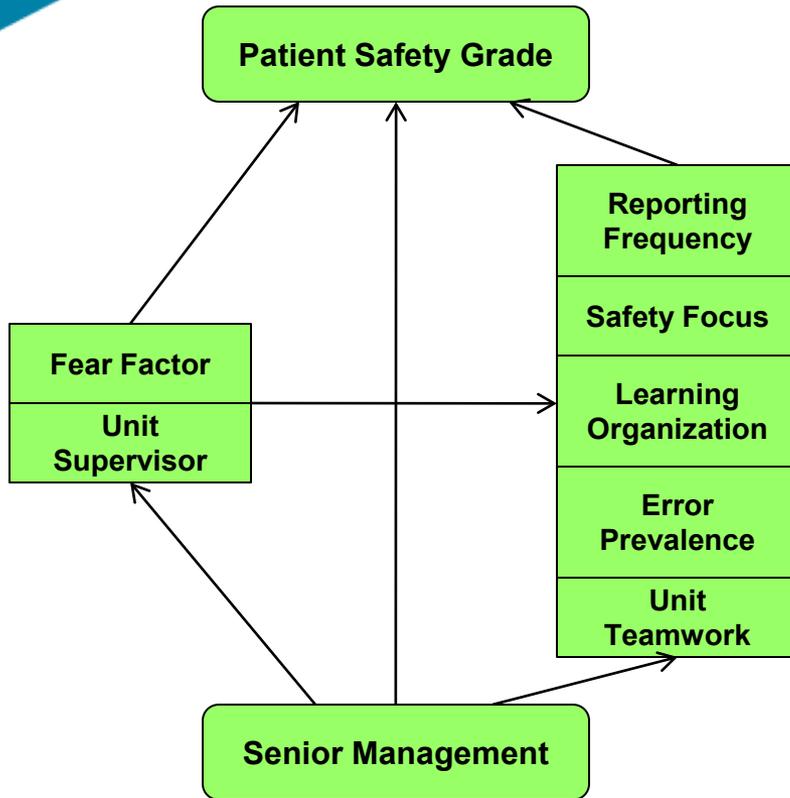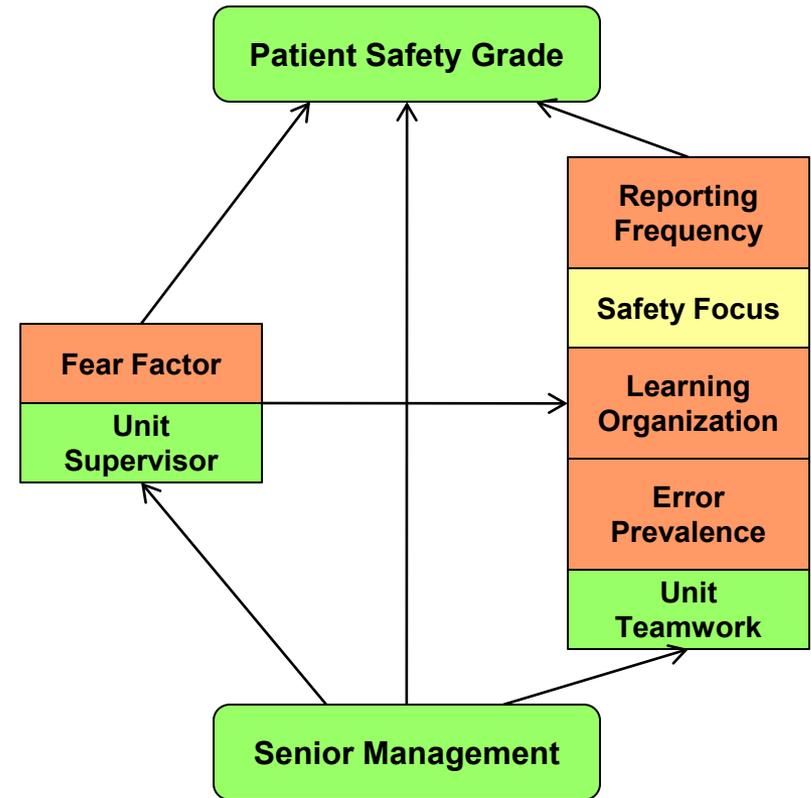
Red ~ <65%
Yellow ~ 65-74%
Green ~ >74%

VHA UM 20 Hospitals

- Patient Safety Grade
- Reporting Frequency
- Safety Focus
- Learning Organization
- Error Prevalence
- Unit Teamwork
- Fear Factor
- Unit Supervisor
- Senior Management

Safety Survey New Category Results
VHAUM 20 Hospitals 2009
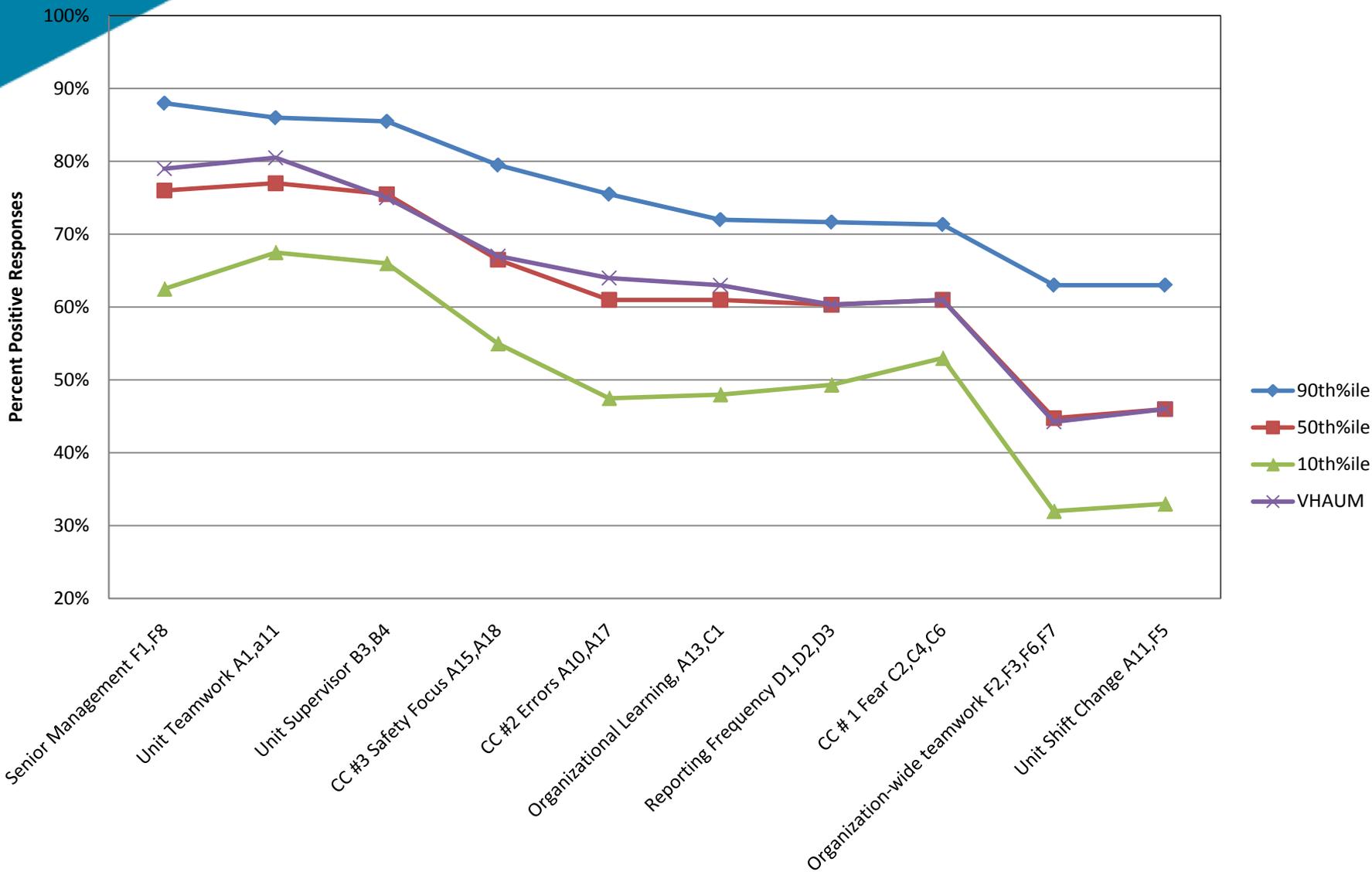
Observations

Senior Management has no direct effect on patient safety grade

Senior Management does have a strong effect on the Fear Culture factors AND the Perceptions factors

The Fear Culture factors drive Perceptions at nearly 2x the rate of Senior Management, and these are the primary drivers with safety grade.

Unit Shift Change and Organizational Teamwork have no direct effect on Patient Safety Grade! (but they have the lowest scores)

Conclusions

Interventions should focus on the alignment within the executive team and between the senior team and unit supervisors (regarding safety as a priority).

Unit managers must:
- Embrace and model just culture principles
- Be competent in and utilize tools (e.g. RCA)
- Be effective communicators, problem solvers, and conflict managers

The natural tendency to focus on the lowest survey scores is not rational if the goal is to improve the patient safety grade.

The Driver Diagram and the "Correlations" Diagram provide tools to analyze SOPS data, identify high leverage opportunities, and prioritize interventions.

Future options for VHAUM work with SOPS

- "Improvement toolkit" customized for results
- Improvement initiatives…driven by test scores and interpretation
- Safety culture network
- Research…
  - Statistical correlation with mortality rates, HCAHPS scores, complications, PSI (POA adjusted), other???
  - Individual questions or composites may have direct effect on these events, even though they do not effect the patient safety grade

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Results are just the beginning