Satisfied nurses, satisfied patients, and improved patient outcomes.
Is it that simple?

Michael Simon, PhD, MSN

Outline

* Nursing & Patient satisfaction

* Staffing, nurses satisfaction, magnet status are associated with patient satisfaction

* No association between clinical outcomes and patient satisfaction

* NDNQI hospitals have higher patient satisfaction scores

Outline

* **Nursing & Patient satisfaction**

* Staffing, nurses satisfaction, magnet status are associated with patient satisfaction

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What is patient satisfaction?

* Measure of patient perception of the hospital experience
    * Nursing specific
    * Communication/Information related
    * Pain
    * Overall

Literature: Nursing and patient satisfaction

* Factors with evidence for an association:
  * Magnet status -> satisfaction with care
  * Nursing model -> satisfaction with pain management
  * % BSN -> satisfaction with care
  * TNHPPD -> satisfaction with pain management
* Several studies: no association between nurse staffing and patient satisfaction

Kane, et al. 2007

What nursing factors might be related to patient satisfaction?

* Staffing (TNHPPD)

* Skill mix (%RN, %BSN)

* Magnet vs. Non-Magnet

* NDNQI vs. Non-NDNQI

* Work environment (leadership, job satisfaction)

Outline

* Nursing & Patient satisfaction

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Conceptual model
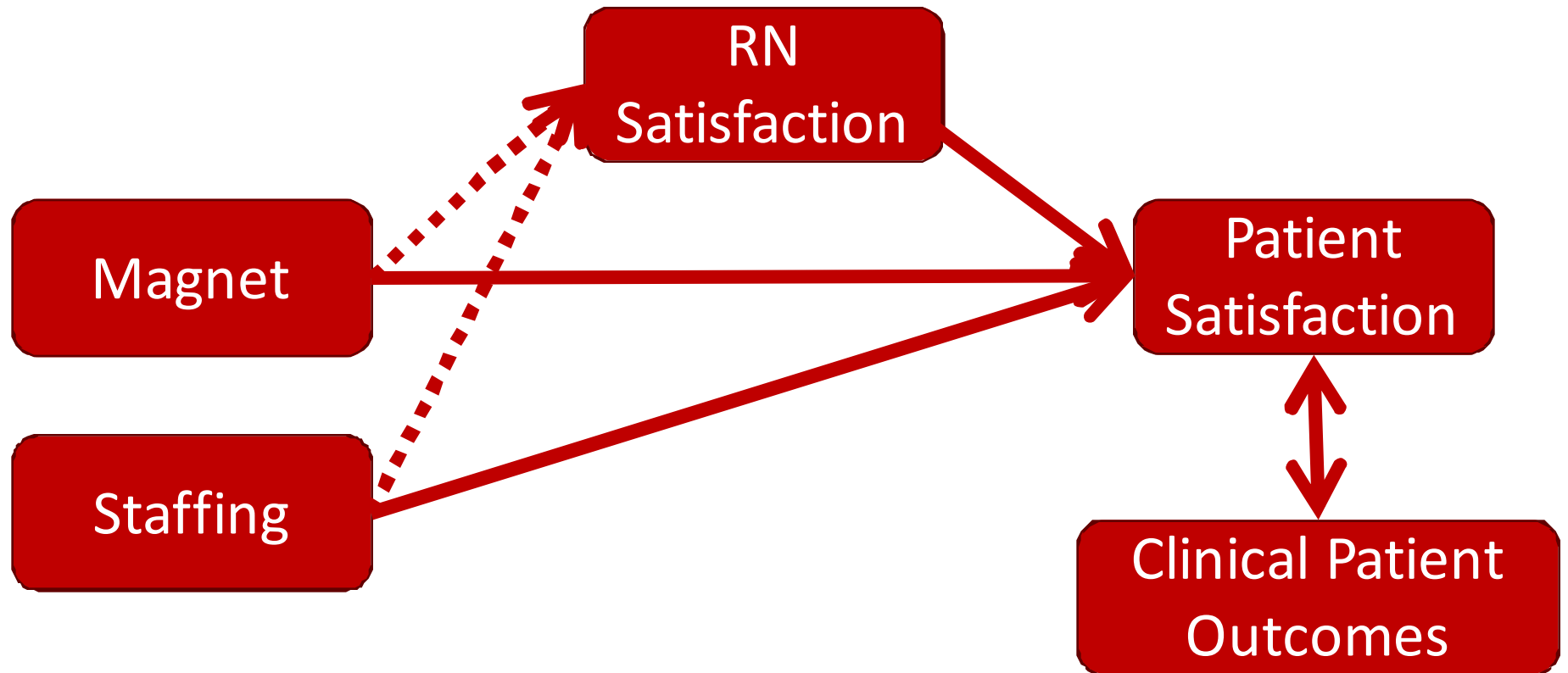
In God we trust; all others must bring data.

W. Edwards Deming

Data sources

NDNQI Measures	NDNQI Survey
AHA Annual Survey	**HCAHPS**

Background: HCAHPS (I)

* "Hospital Consumer Assessment of Healthcare Providers and Systems Survey"
* CMS initiative
    * Publicly reported through www.hospitalcompare.hhs.gov
    * Subject to Inpatient Prospective Payment System (IPPS)
* History of HCAHPS:
    * 2002: Development by AHRQ and CMS
    * 2005: Endorsed by NQF and HQA
    * 2006: Implemented through CMS
    * 2008: First Public reporting
    * 2009: 4,472 hospitals participated

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Background: HCAHPS (II)

* Hospital Level (!)

* Random sample from discharged patients

* Medical, surgical, maternal care

* 4 modes of data collection (Mail, Telephone, Mixed mode, IVR)

* **Results** are mode and patient mix **adjusted**

What is relevant to Nursing in HCAHPS ?

General patient satisfaction

* Rate the hospital overall?
* Would patients recommend the hospital to friends and family?

Patient satisfaction related to communication and information

* How often... do nurses communicate well?
* How often... does staff explain about medicines before giving them?
* Given information about what to do during recovery at home?

Patient satisfaction related to pain management

* How often ... was patients' pain well controlled?

Patient satisfaction related to patient safety

* How often ... do patients receive help quickly?

Data sources: Analysis 1

NDNQI Measures	NDNQI RN Survey	HCAHPS
• Unit level • TNHPPD • Bed Size • Teaching Status • 2009 • 1,183 hospitals	• Unit level • Job Enjoyment • 2009 • 655 hospitals	• Hospital level • Patient satisfaction • 2009 • 4,472 hospitals

Representative sample?

Plain associations

State

Ownership

Teaching Status

Bed size

Magnet

Staffing

RN Satisfaction

Clinical Patient Outcomes

Pat Sat: High Rating

Pat Sat: Recommend

Pat Sat: Communicating well

Pat Sat: Discharge information

Pat Sat: Medicines explained

Pat Sat: Pain well controlled

Pat Sat: Help quickly
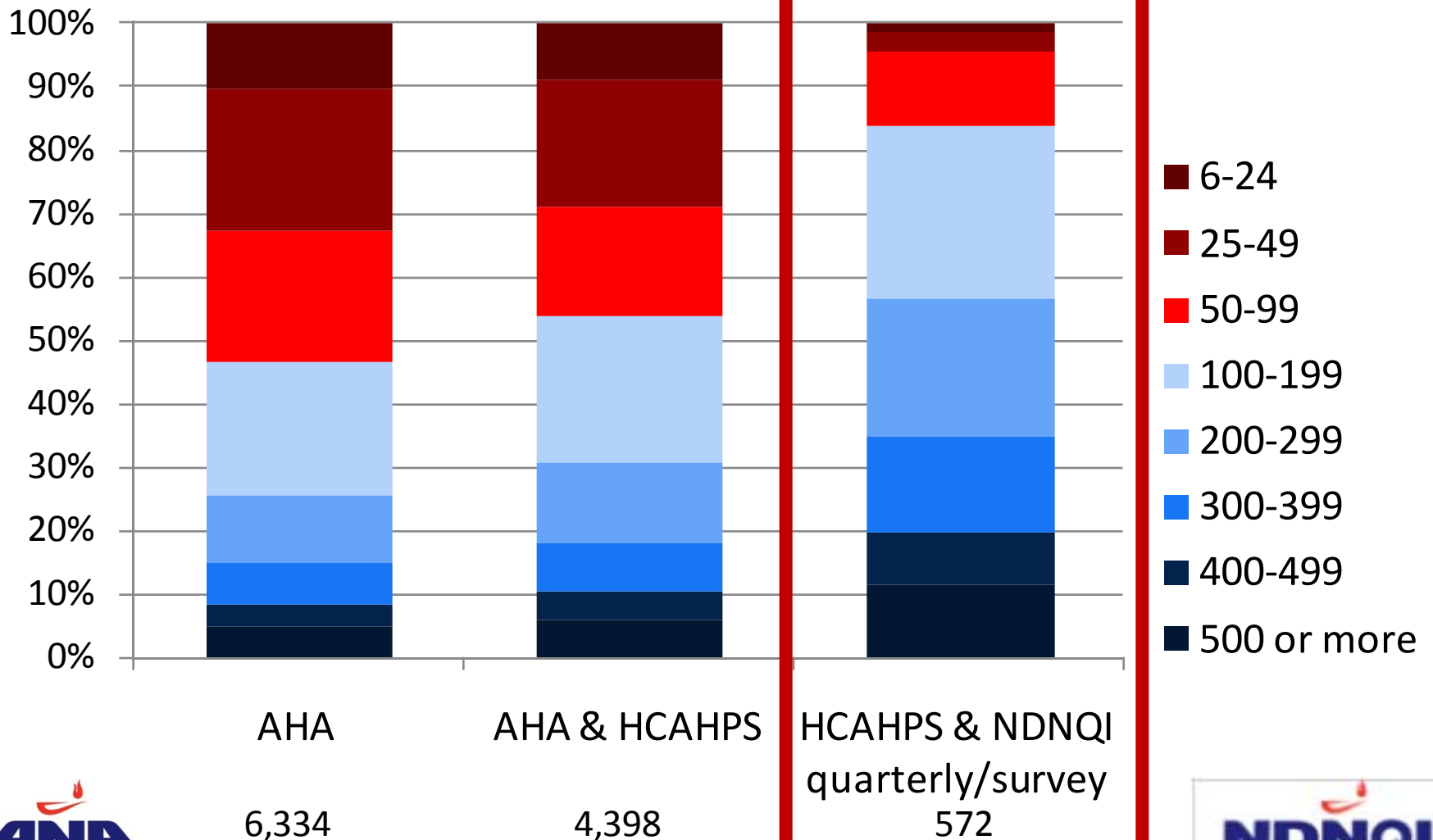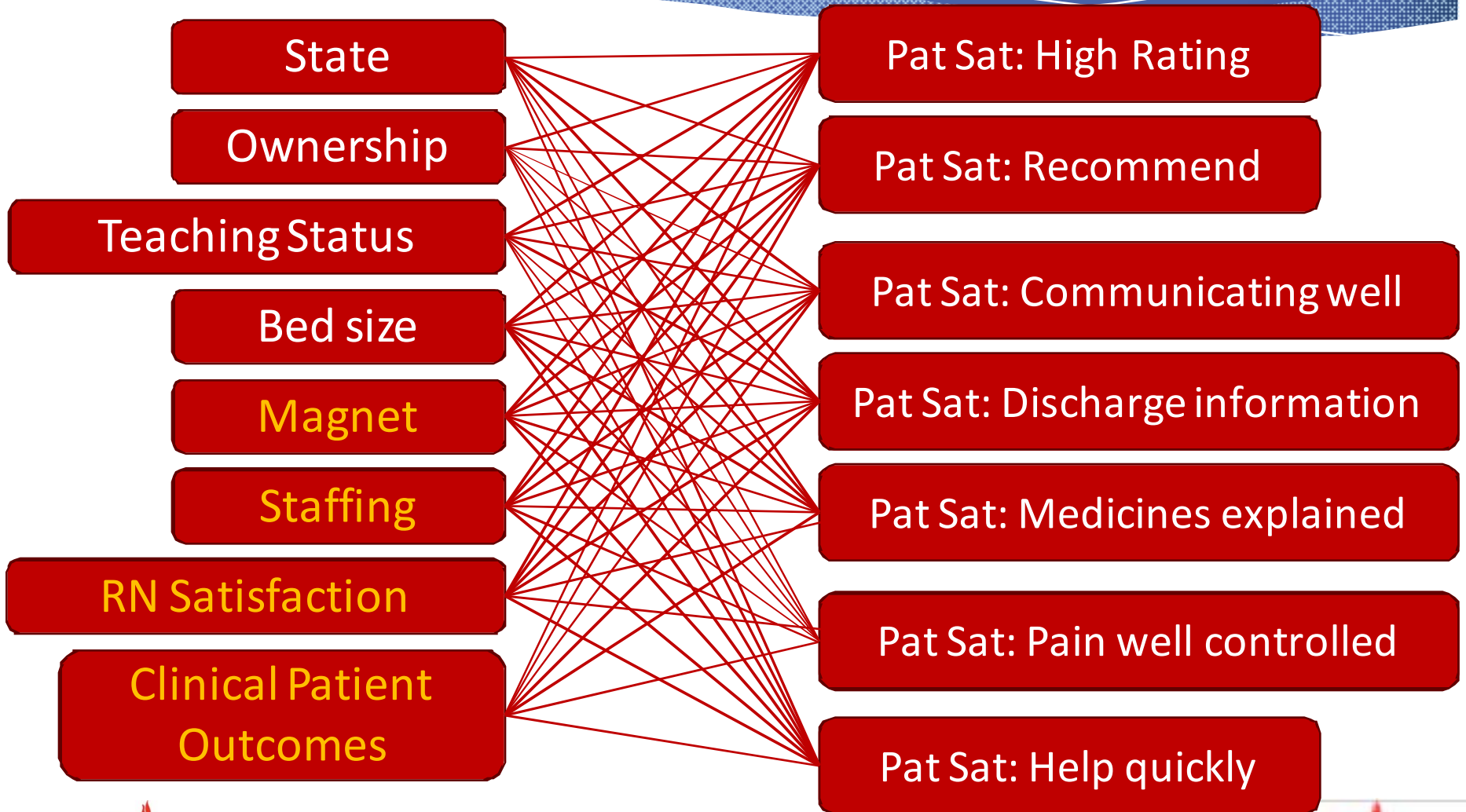
What means "associations"?

R²	R	Strength
0.01	0.10	weak
0.05	0.22	
0.10	0.32	moderate
0.15	0.39	
0.20	0.45	
0.25	0.50	strong
0.30	0.55	
0.35	0.59	

* Strength

* Direction

* Fit

Patient satisfaction and related factors (strength, R^2)
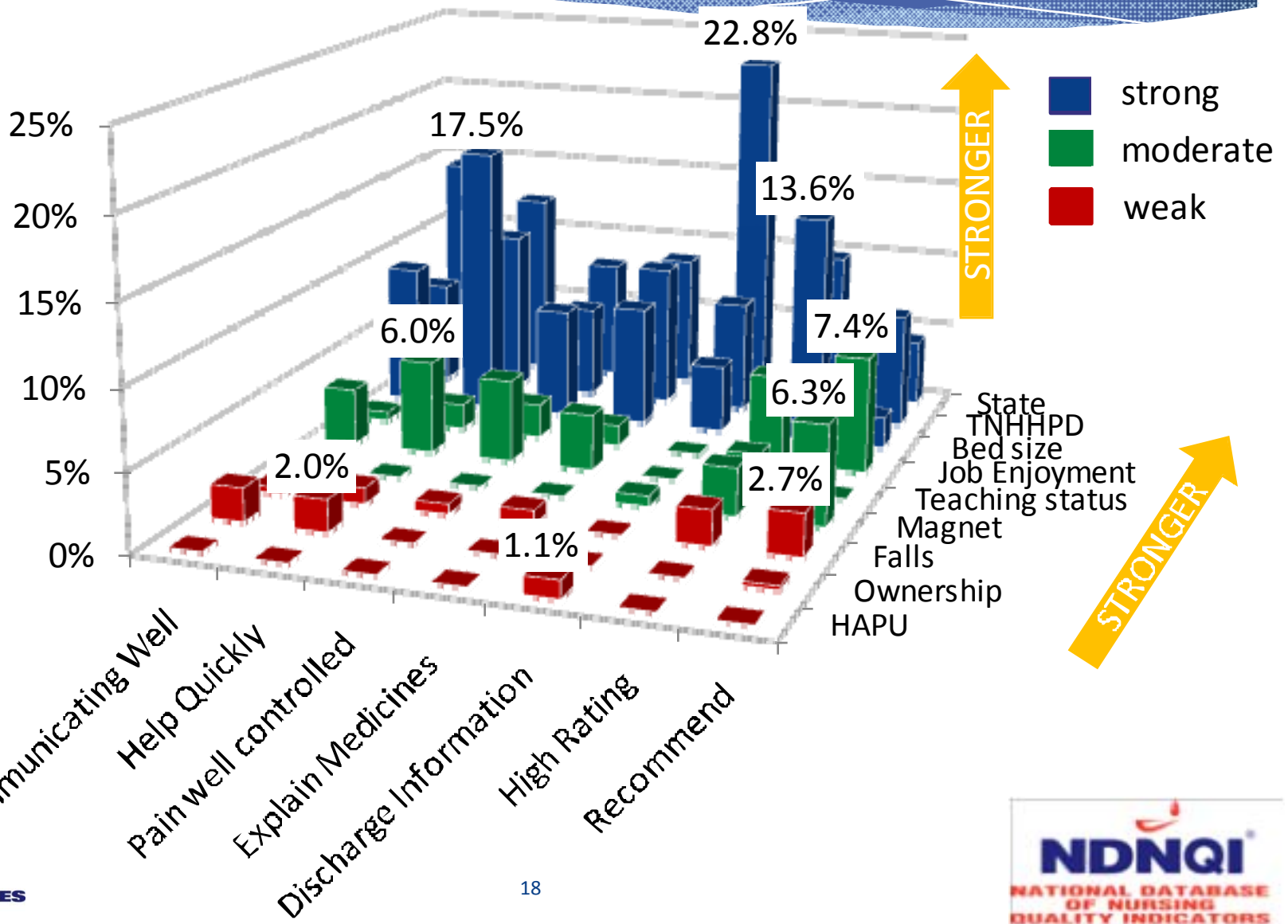
Patient satisfaction and related factors (direction, R^2)

Legend:
- Categorical
- Positive Association
- Negative Association

Values shown: 22.8%, 17.5%, 13.6%, 7.4%, 6.3%, 6.0%, 2.7%, 2.0%, 1.1%

X-axis: Communicating Well, Help Quickly, Pain well controlled, Explain Medicines, Discharge Information, High Rating, Recommend

Z-axis: State, TNHHPD, Bed size, Job Enjoyment, Teaching status, Magnet, Falls, Ownership, HAPU

Y-axis: 0%, 5%, 10%, 15%, 20%, 25%

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Models

Model 1
{ Ownership

State

Teaching Status

Bed Size
+

Model 2 { Magnet
+

Model 3 { Staffing
+

Model 4 [Nurses' Job satisfaction]
+

Model 5 [Clinical Outcomes]

[Patient satisfaction]

20

R² for model selection

Model 1 { Ownership, State, Teaching Status, Bed Size }
+
Model 2 { Magnet }
+
Model 3 { Staffing }
+
Model 4 — Nurses' Job satisfaction
+
Model 5 — Clinical Outcomes

100%
80%
60%
40%
20%
0%

Unexpl Var.
Model 5
Model 4
Model 3
Model 2
Model 1

Patient Satisfaction

Results (R^2)

	Communicating Well	Discharge Information	Medicines Explained	Pain well controlled	Help Quickly	High Rating	Recommend
M1: State, Size, Teaching Status, Ownership	24.0%	24.7%	15.1%	15.3%	29.1%	13.2%	6.7%
M2: + Magnet	25.7%	25.9%	15.4%	16.4%	29.8%	17.0%	12.4%
M3: + TNHPPD	29.9%	28.3%	21.5%	19.5%	35.2%	23.8%	17.4%
M4: +Job Enjoyment	30.7%	28.2%	22.0%	20.6%	35.9%	26.0%	21.1%
M5: +Falls, HAPU	30.5%	28.5%	22.0%	20.4%	36.4%	26.9%	22.5%
Increase M1 –M5	6.5%	3.8%	6.9%	5.1%	7.2%	13.7%	15.8%

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Results: Magnet?

	Communicating Well	Discharge Information	Medicines Explained	Pain well controlled	Help Quickly	High Rating	Recommend
M1: State, Size, Teaching Status, Ownership	24.0%	24.7%	15.1%	15.3%	29.1%	13.2%	6.7%
M2: + Magnet	25.7%	25.9%	15.4%	16.4%	29.8%	17.0%	12.4%
M3: + TNHPPD	29.9%	28.3%	21.5%	19.5%	35.2%	23.8%	17.4%
M4: +Job Enjoyment	30.7%	28.2%	22.0%	20.6%	35.9%	26.0%	21.1%
M5: +Falls, HAPU	30.5%	28.5%	22.0%	20.4%	36.4%	26.9%	22.5%
Increase M1 –M5	6.5%	3.8%	6.9%	5.1%	7.2%	13.7%	15.8%

+3.8%   **+5.7%**

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Results: Staffing?

	Communicating Well	Discharge Information	Medicines Explained	Pain well controlled	Help Quickly	High Rating	Recommend
M1: State, Size, Teaching Status, Ownership	24.0%	24.7%	15.1%	15.3%	29.1%	13.2%	6.7%
M2: + Magnet	25.7%	25.9%	15.4%	16.4%	29.8%	17.0%	12.4%
M3: + TNHPPD	29.9%	28.3%	21.5%	19.5%	35.2%	23.8%	17.4%
M4: +Job Enjoyment	30.7%	28.2%	22.0%	20.6%	35.9%	26.0%	21.1%
M5: +Falls, HAPU	30.5%	28.5%	22.0%	20.4%	36.4%	26.9%	22.5%
Increase M1 –M5	6.5%	3.8%	6.9%	5.1%	7.2%	13.7%	15.8%

mean increase +4.7%

Results: Job Enjoyment?

	Communicating Well	Discharge Information	Medicines Explained	Pain well controlled	Help Quickly	High Rating	Recommend
M1: State, Size, Teaching Status, Ownership	24.0%	24.7%	15.1%	15.3%	29.1%	13.2%	6.7%
M2: + Magnet	25.7%	25.9%	15.4%	16.4%	29.8%	17.0%	12.4%
M3: + TNHPPD	29.9%	28.3%	21.5%	19.5%	35.2%	23.8%	17.4%
M4: +Job Enjoyment	30.7%	28.2%	22.0%	20.6%	35.9%	26.0%	21.1%
M5: +Falls, HAPU	30.5%	28.5%	22.0%	20.4%	36.4%	26.9%	22.5%
Increase M1 –M5	6.5%	3.8%	6.9%	5.1%	7.2%	13.7%	15.8%

+2.2%   **+3.7%**

Results: Clinical outcomes?

	Communicating Well	Discharge Information	Medicines Explained	Pain well controlled	Help Quickly	High Rating	Recommend
M1: State, Size, Teaching Status, Ownership	24.0%	24.7%	15.1%	15.3%	29.1%	13.2%	6.7%
M2: + Magnet	25.7%	25.9%	15.4%	16.4%	29.8%	17.0%	12.4%
M3: + TNHPPD	29.9%	28.3%	21.5%	19.5%	35.2%	23.8%	17.4%
M4: +Job Enjoyment	30.7%	28.2%	22.0%	20.6%	35.9%	26.0%	21.1%
M5: +Falls, HAPU	~~30.5%~~	~~28.5%~~	~~22.0%~~	~~20.4%~~	~~36.4%~~	26.9%	22.5%
Increase M1 –M5	6.5%	3.8%	6.9%	5.1%	7.2%	13.7%	15.8%

mean +0.4%

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Results: Which model explains most?

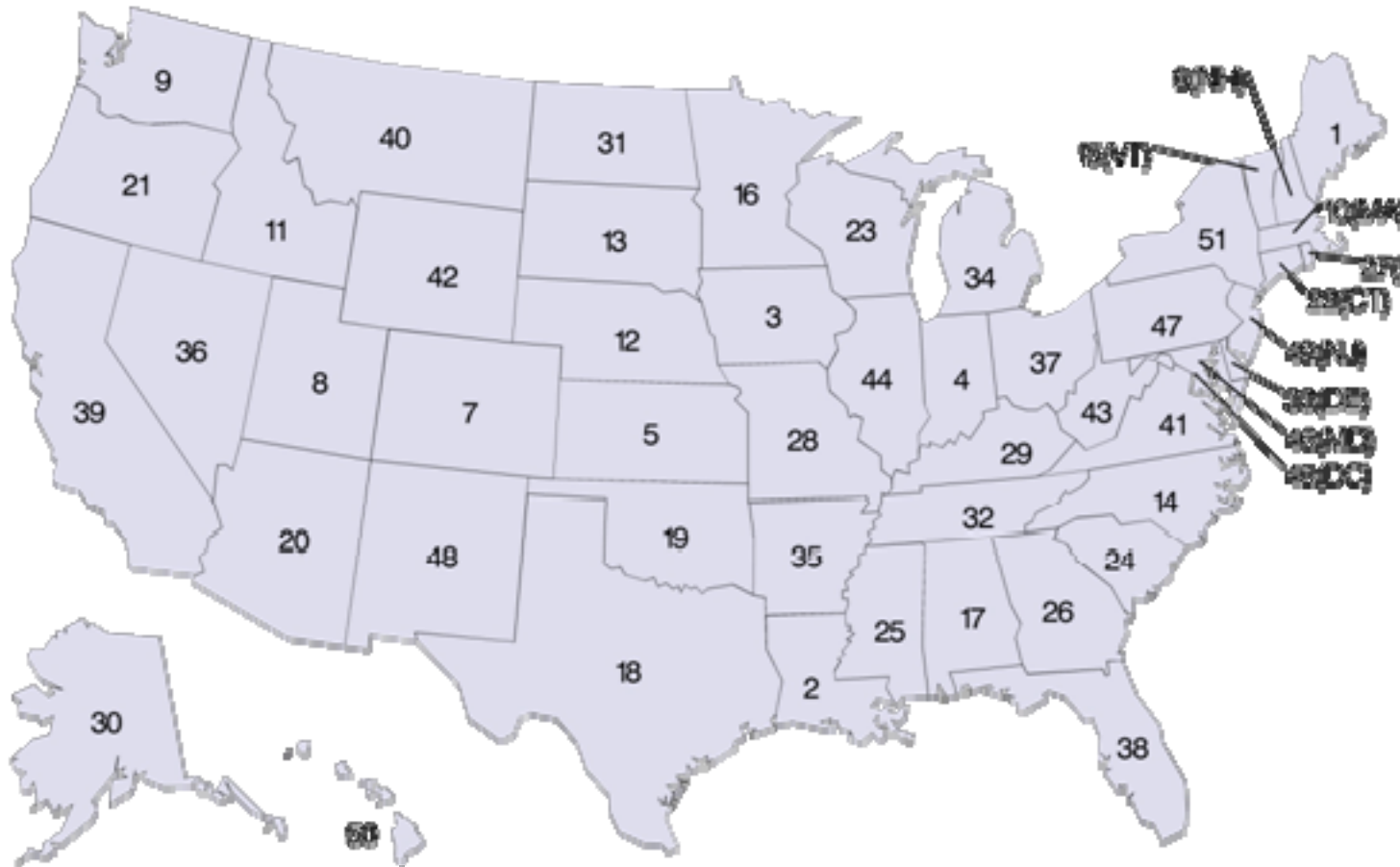|	Communicating Well	Discharge Information	Medicines Explained	Pain well controlled	Help Quickly	High Rating	Recommend
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Results
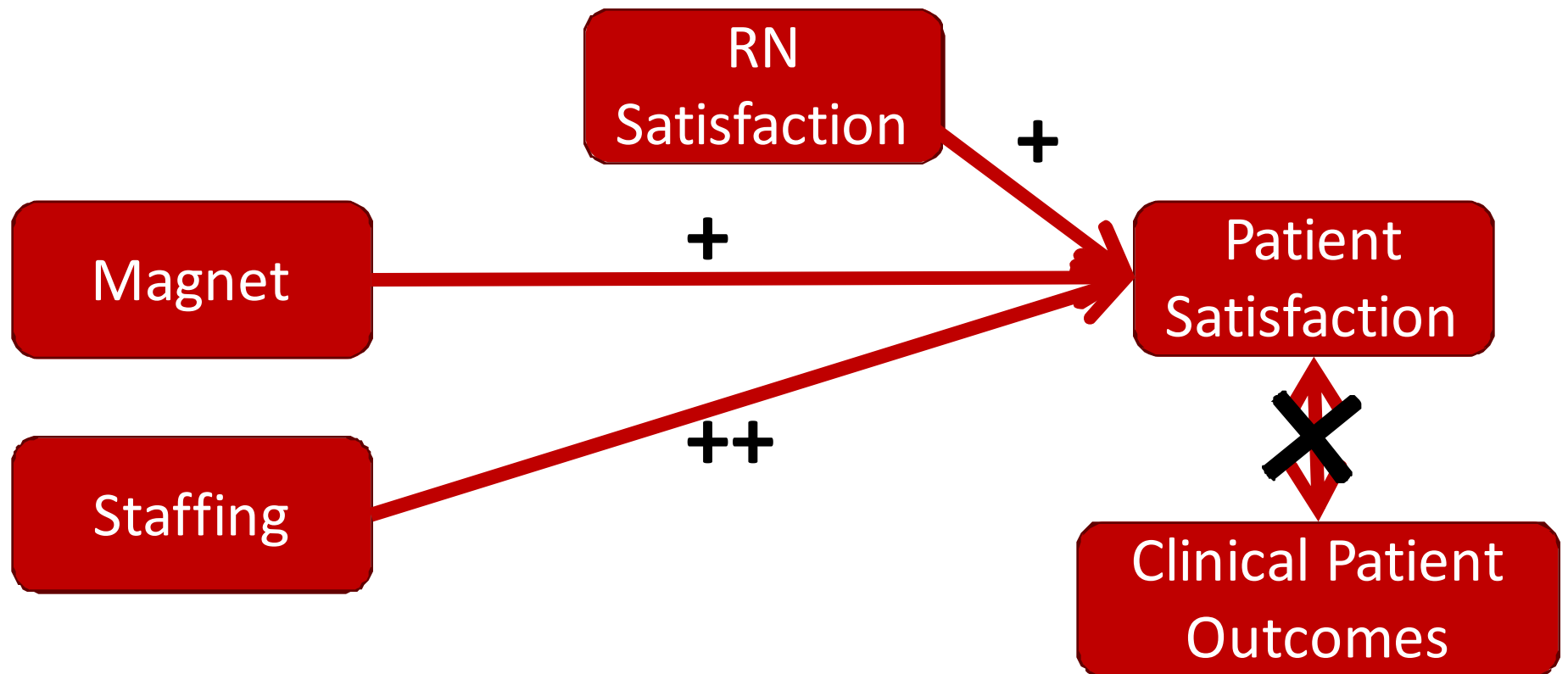
Summary: Analysis 1

* TNHPPD consistently strongly associated with all domains of patient satisfaction

* Job Enjoyment and Magnet status are associated with general patient satisfaction

* Clinical outcomes (falls, HAPU) is not associated with patient satisfaction

* Some patient satisfaction scores (help quickly, discharge information, communicating well) varies substantially by **state**, bed size, ownership and teaching status
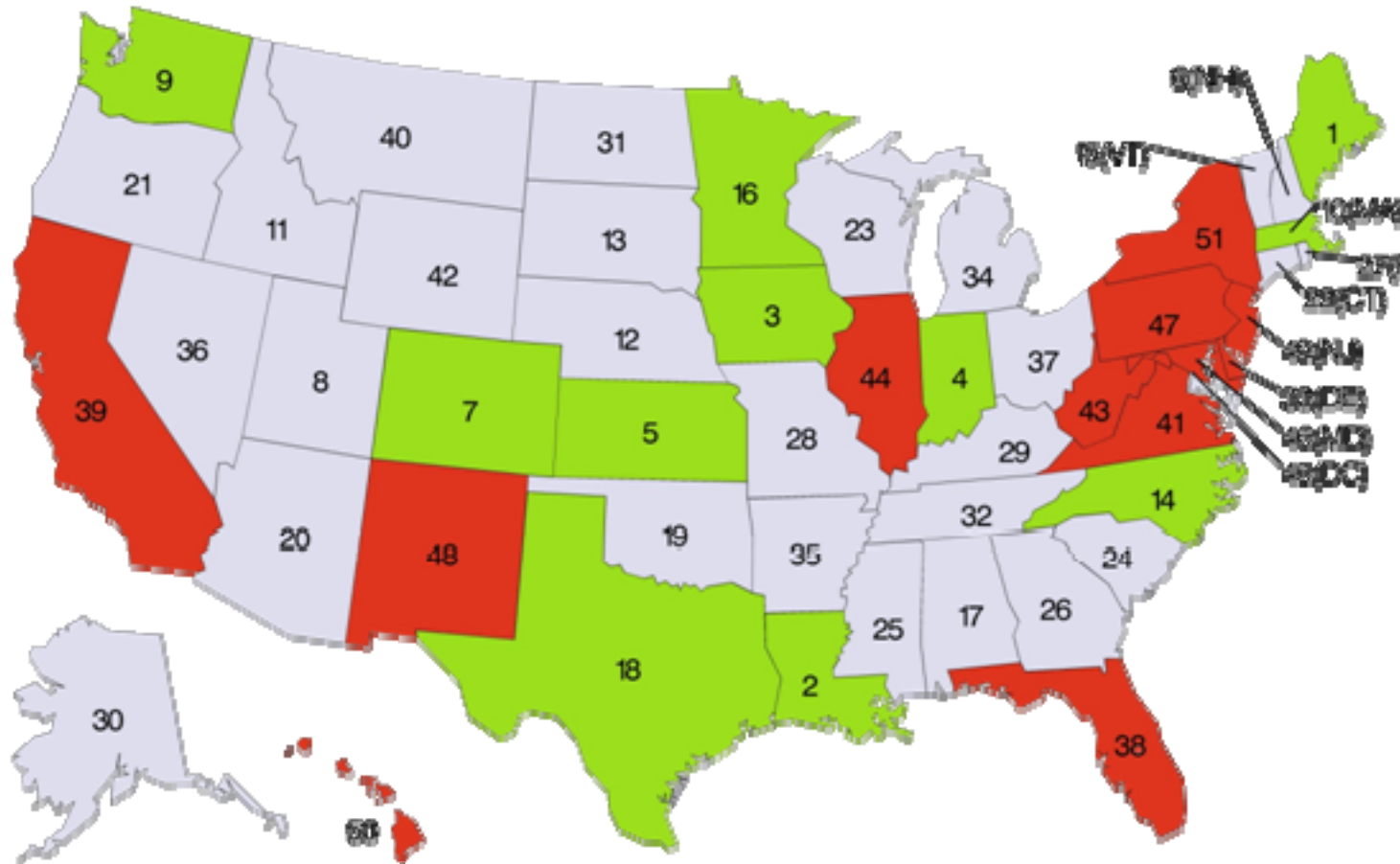
Controlled by bed size, ownership, teaching status and patient characteristics

30

States ranked by patient satisfaction

(Definitely recommend)

Controlled by bed size, ownership, teaching status and patient characteristics

Outline

* Nursing & Patient satisfaction

* Staffing, nurses satisfaction, magnet status are associated with patient satisfaction

* No association between clinical outcomes and patient satisfaction

* **NDNQI hospitals have higher patient satisfaction scores**

Data sources: Analysis 2

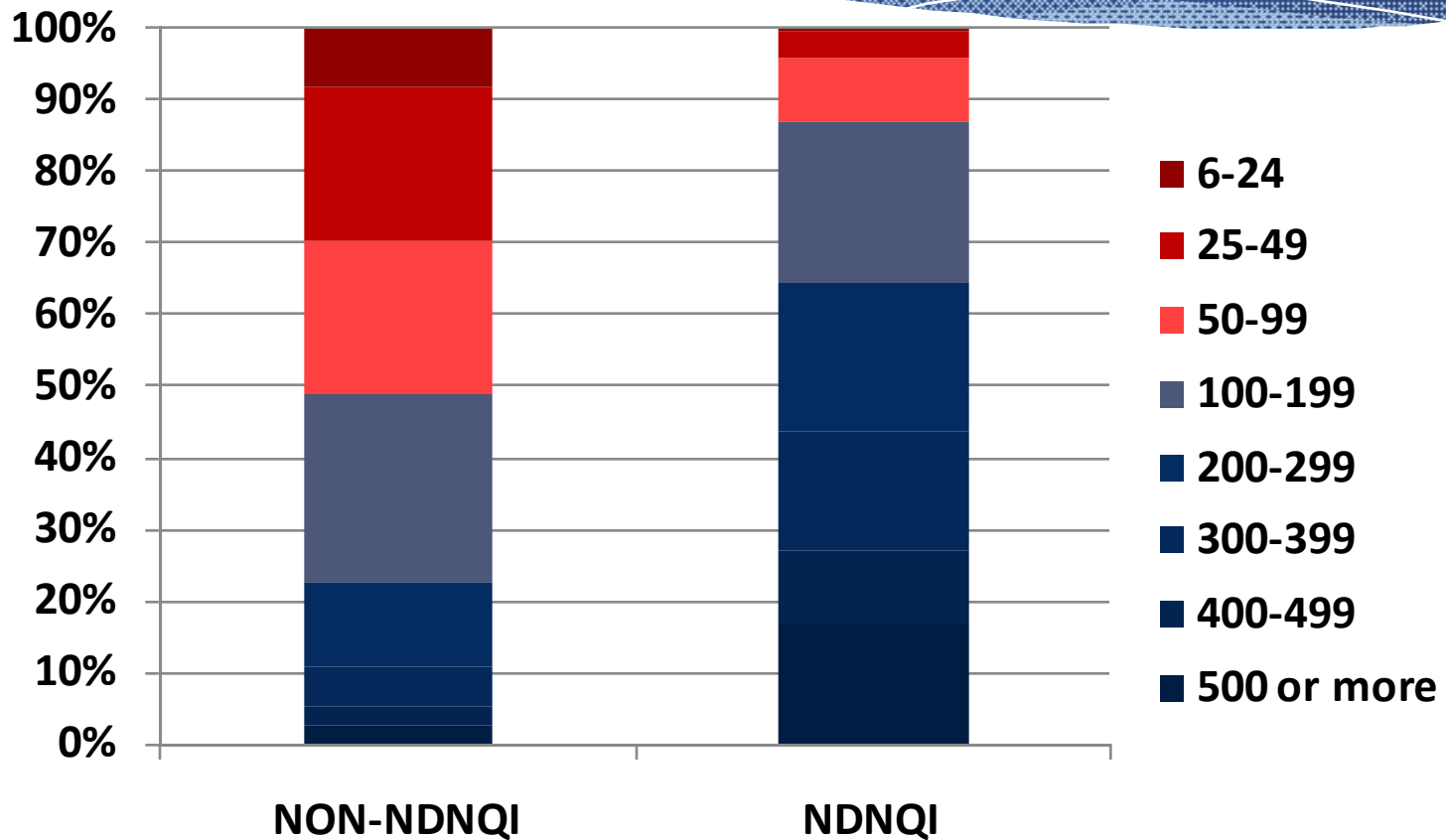| NDNQI Measures	HCAHPS	AHA Annual Survey
• Hospital level	• Hospital level	• Hospital level
• Membership status	• Patient satisfaction	• Hospital demographics
• 2009	• 2009	• 2009
• 1,183 hospitals	• 4,472 hospitals	• 6,334 hospitals

Method: Genetic propensity score matching

* Propensity score matching aims to provide unbiased treatment effect estimates

* For observational studies

* Finds balance in covariates of treatment and control group

* "Genetic matching" uses algorithm to identify the optimal propensity score model and to achieve optimal balance

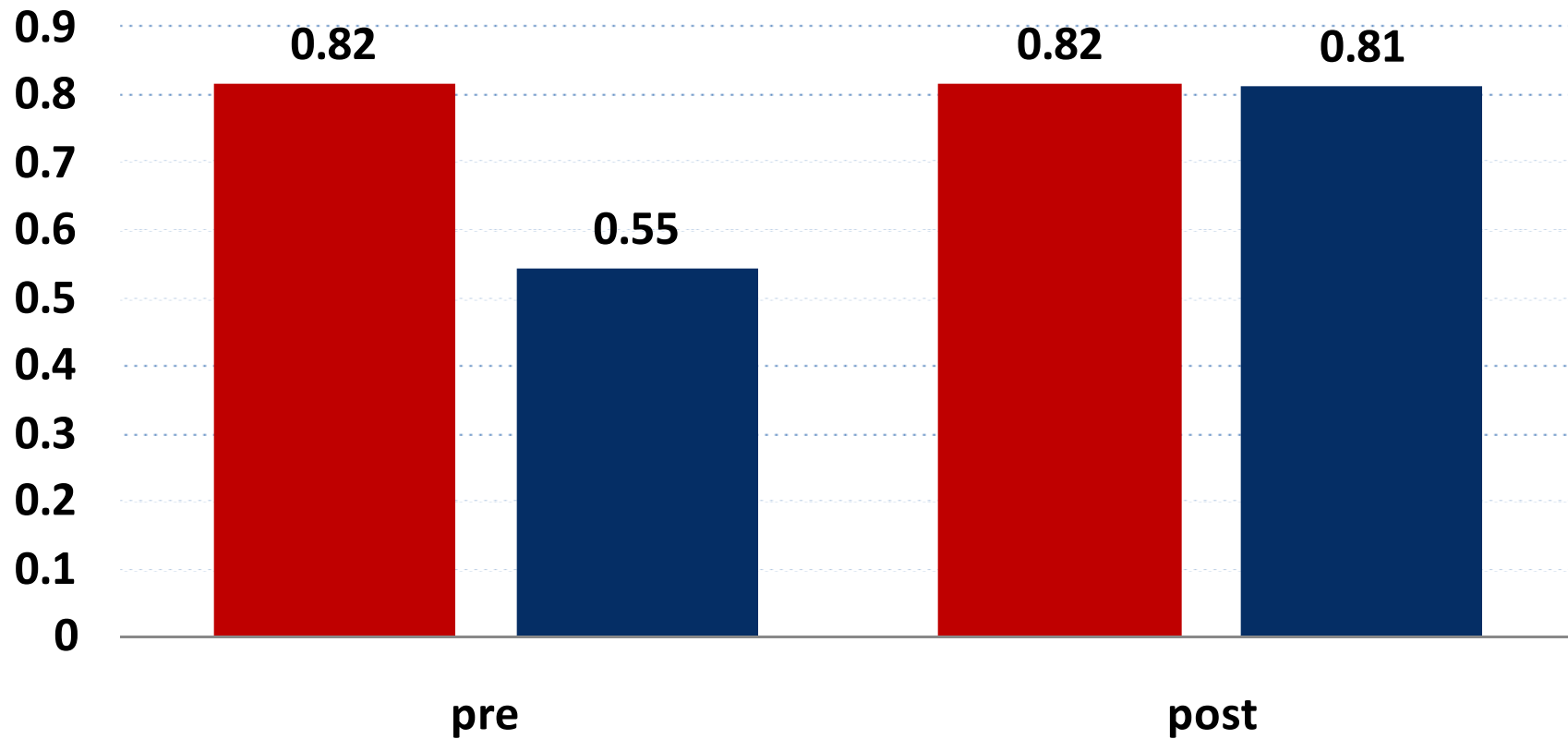# Unbalanced analysis of patient satisfaction: Received help quickly

	NON-NDNQI	NDNQI
N	2,618	1,140
Mean	64.32	60.61
Diff	-3.71 (p<0.0001)	

Bed size categories in unbalanced data set

Legend:
- ■ 6-24
- ■ 25-49
- ■ 50-99
- ■ 100-199
- ■ 200-299
- ■ 300-399
- ■ 400-499
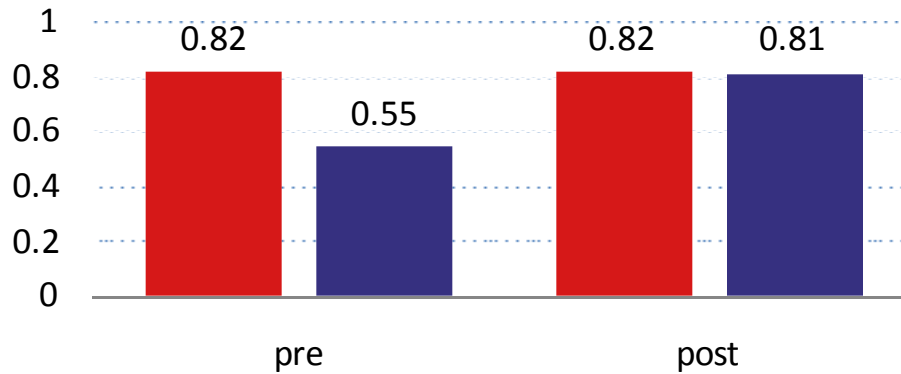- ■ 500 or more

NON-NDNQI: 2,618

NDNQI: 1,140

Selected variables pre- & post matching

Ownership: % not-for-profit

Selected variables pre- & post matching

Ownership: % not-for-profit
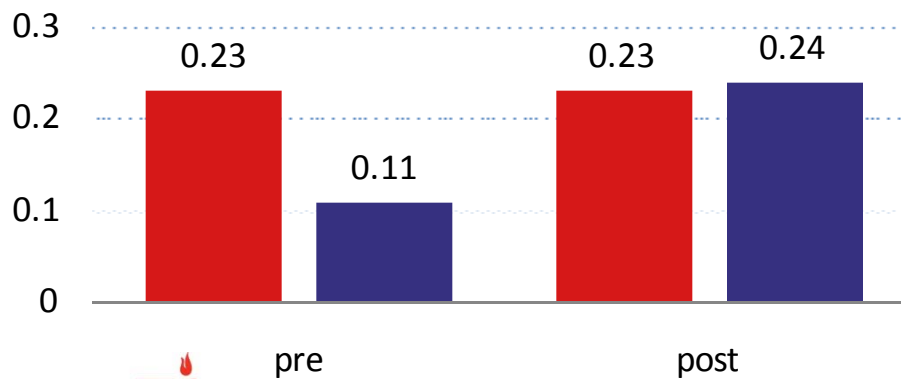

NDNQI pre: 0.82, NON-NDNQI pre: 0.55
NDNQI post: 0.82, NON-NDNQI post: 0.81

■ NDNQI ■ NON-NDNQI

Bed Size: 300-399

NDNQI pre: 0.17, NON-NDNQI pre: 0.05
NDNQI post: 0.17, NON-NDNQI post: 0.17

■ NDNQI ■ NON-NDNQI

Census Devision: Northeast

NDNQI pre: 0.23, NON-NDNQI pre: 0.11
NDNQI post: 0.23, NON-NDNQI post: 0.24
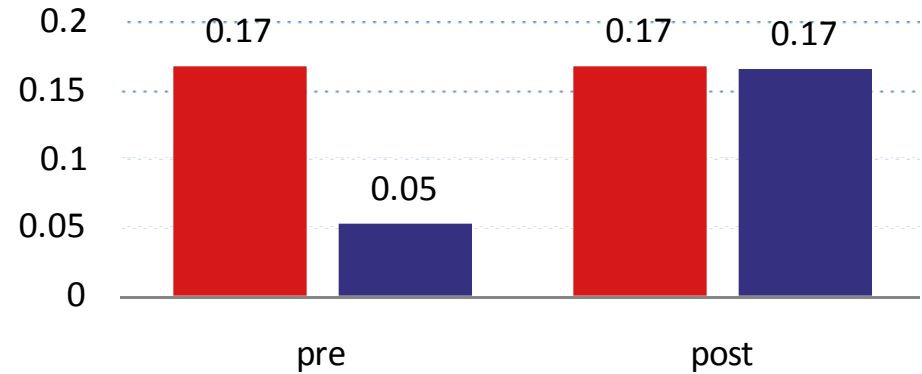
■ NDNQI ■ NON-NDNQI

Medical School Affiliation: % Yes

NDNQI pre: 0.53, NON-NDNQI pre: 0.82
NDNQI post: 0.53, NON-NDNQI post: 0.53
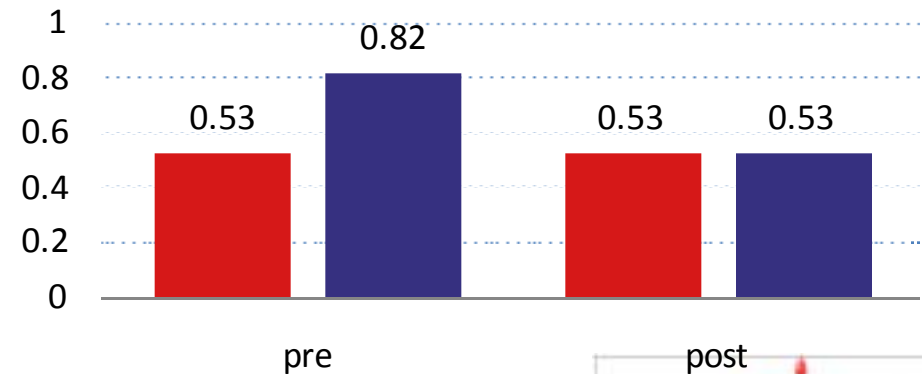
■ NDNQI ■ NON-NDNQI

After genetic matching. Patient satisfaction: Received help quickly

	NON-NDNQI	NDNQI
N	1,140	1,140
Mean	59.05	60.61
Diff (Δ)	1.56 (p<0.0001)	

Results

	Δ	P<	Median	75th	% from Median to 75th
Recommend	3.8	0.00001	69	75	64%
High Rating	3.2	0.00001	66	72	63%
Communicating Well	1.5	0.00001	75	79	49%
Help Quickly	1.6	0.00014	63	69	31%
Explain Medicines	1.2	0.00005	59	63	40%
Pain well controlled	1.3	0.00001	69	72	45%
Discharge Information	1.6	0.00001	82	85	81%

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Summary: Analysis 2

* NDNQI hospitals have higher patient satisfaction scores than Non-NDNQI hospitals

* NDNQI hospitals have higher patient satisfaction scores than Non-NDNQI hospitals

* **NDNQI hospitals have higher patient satisfaction scores than Non-NDNQI hospitals**

Summary

* Strong evidence for an higher staffing – higher patient satisfaction relationship

* Increased RN job satisfaction is associated with increased general patient satisfaction

* Magnets have higher general patient satisfaction

* Structural factors are important (State!)

* NDNQI hospitals have higher patient satisfaction scores

Outlook

* Nursing registries should be included in CMS IPPS

* Further research: longitudinal analysis

* Nursing structures have vital role in patient satisfaction

* No connection between patient satisfaction and clinical outcomes

Thanks!

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www.nursingquality.org