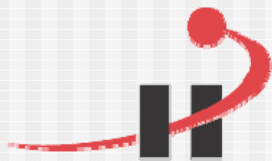


Patient Safety and Organizational Culture-Family Satisfaction in the ICU

Researchers' Cafe—Jan 25, 2008

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Michael Smith Foundation for
Health Research



CIHR IRSC



Outline

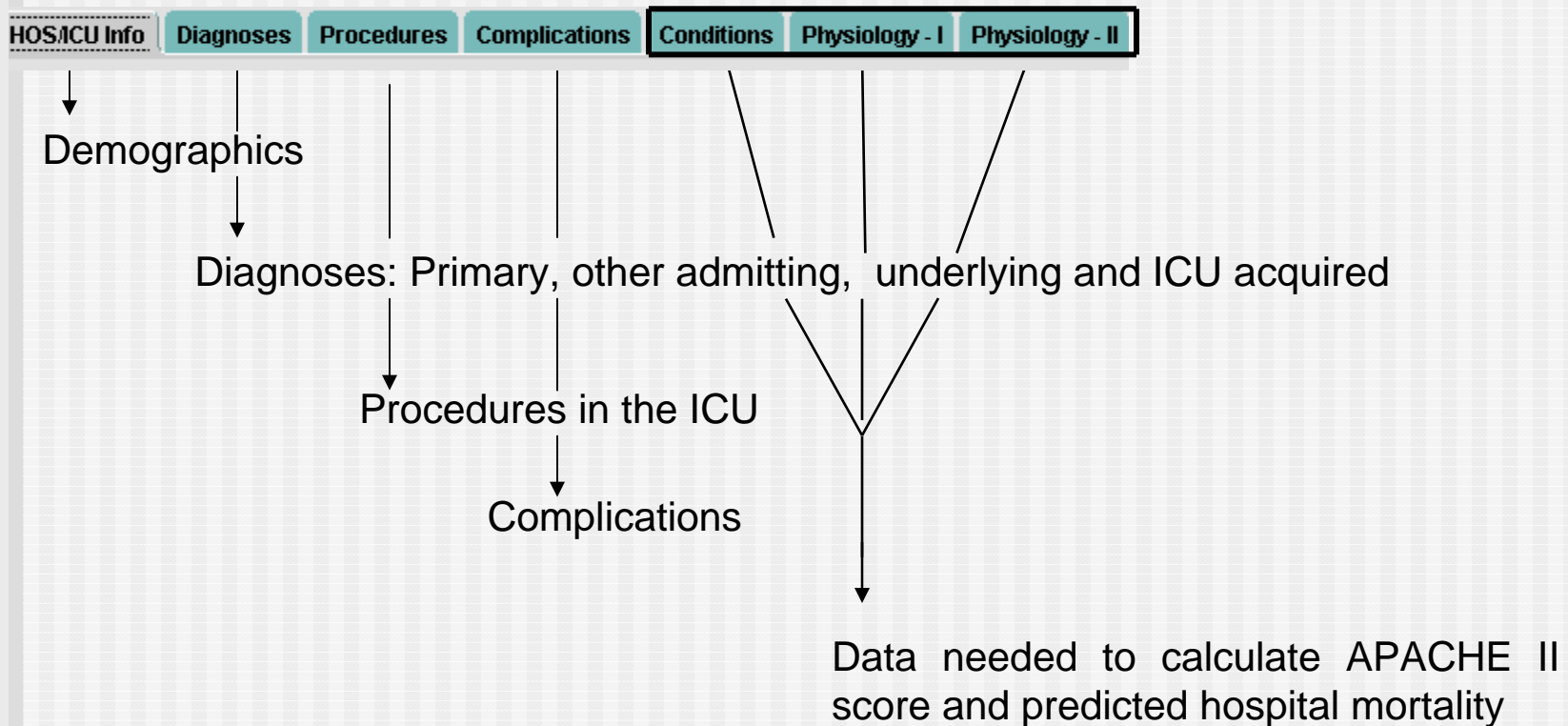
- Review of ICU Patient Safety Team mandate and progress
- Review of Organizational Culture-family satisfaction project—preliminary results
- What's in it for Fraser Health?

ICU Patient Safety Team-Objectives

1. Enhance existing **ICU database** to include key safety outcomes and expand this database to 16 ICUs in 3 health authorities
2. Work with B.C. Patient Safety Task Force to develop and evaluate an **incident reporting** system in the ICU
3. Develop and implement data collection for **medication errors** in the ICU
4. Measure human resource management (**work experience and hours**) in ICUs and relate these measures to patient safety
5. Measure **organizational and safety culture** in ICUs and relate these measures to patient safety

1. Enhance ICU Database

Before April 1st, 2006 we collected:



After April 2006:



Central Vascular Catheters: timing (start and stop dates), number of lumens, and insertion site.

Data to calculate APACHE II, III and IV, predicted length of stay and predicted mortality



ICU attending team, time until first enteral feeding, etc.

Sepsis related organ failure assessment score

To track those patients physically located outside the ICU but still being cared for by the ICU team

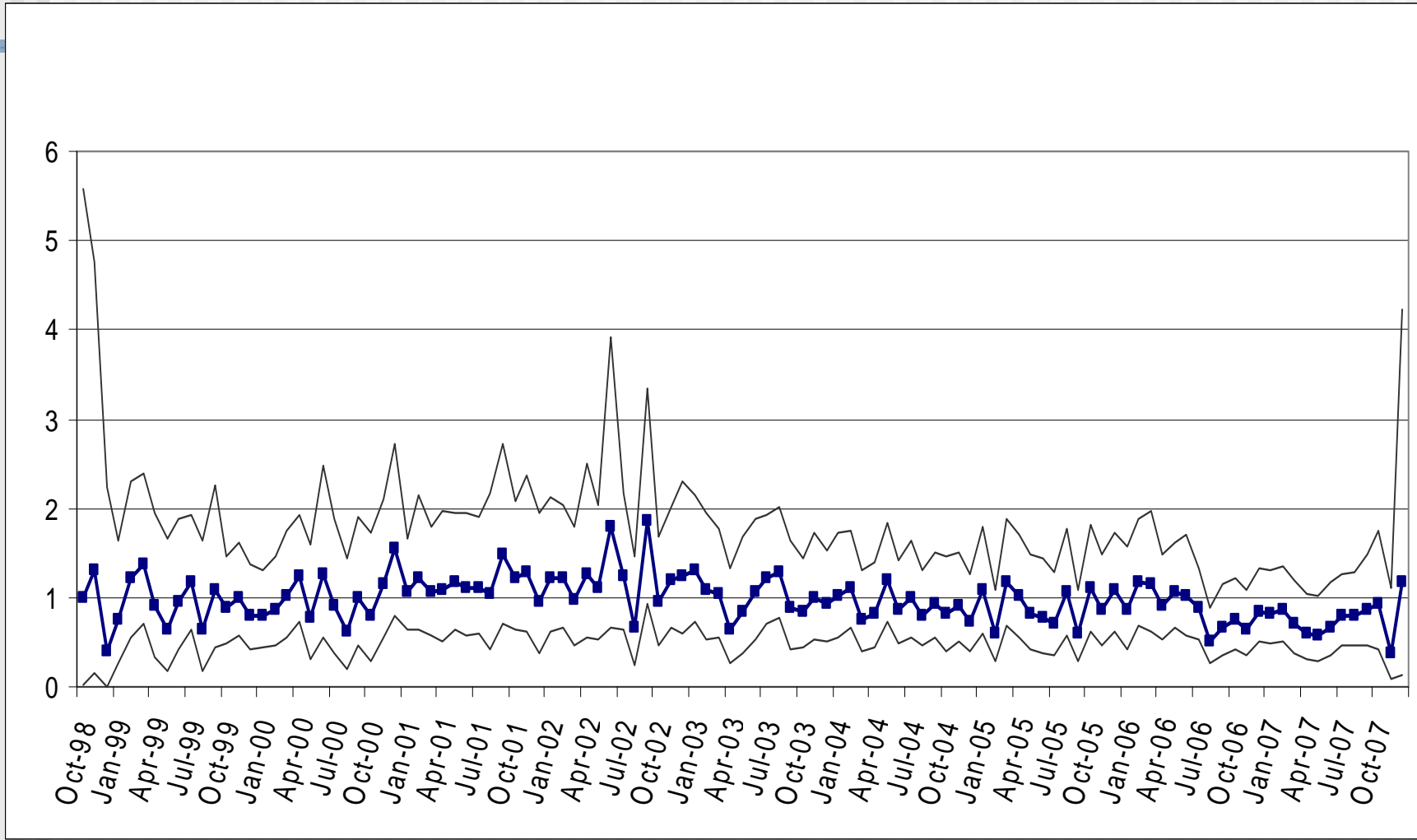
Ventilatory support
(to measure the duration of the ventilation weaning process)

Vasoactive drugs

Blood utilization information

Level of care needed by patient recorded day by day

Standardized Mortality Ratio-- SPH ICU 1998-2007



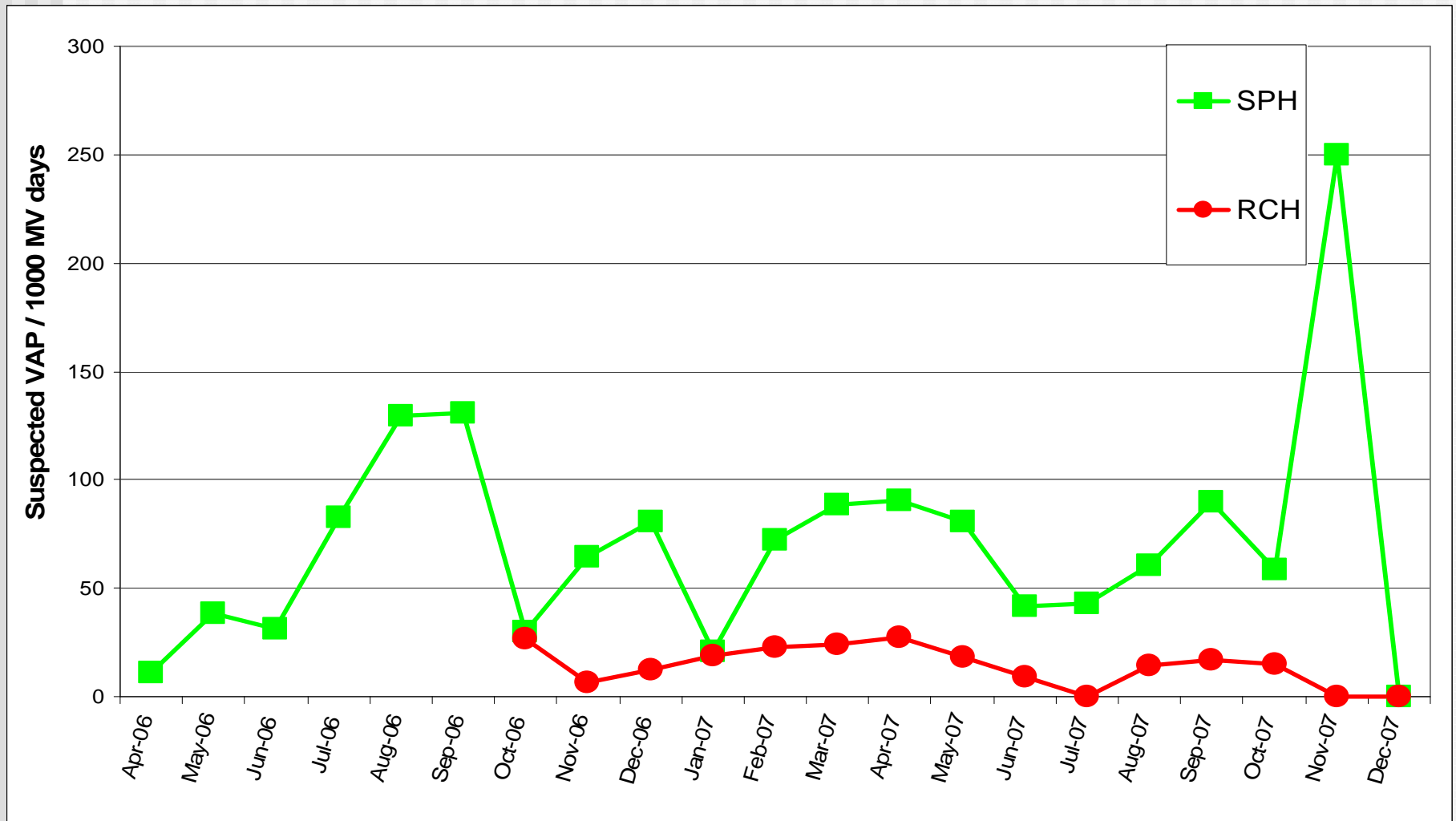
Safety-related clinical outcomes

VAP CATHE... DIARRHEA EXTUB... HYPOGL... BLEED...

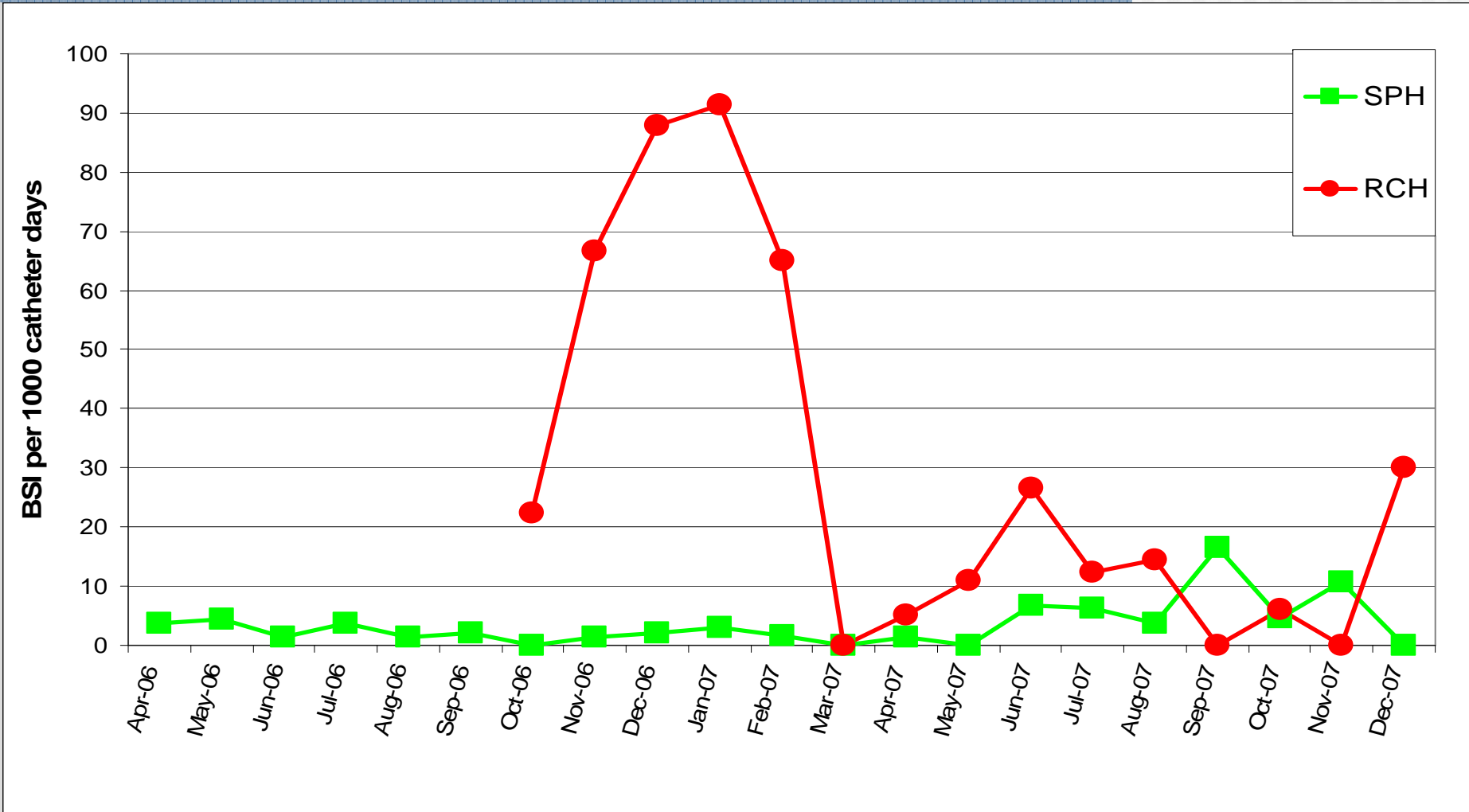
- Ventilator Associated Pneumonia
- Catheter-related bloodstream infections
- Clostridium difficile diarrhea
- Unplanned extubation
- Hypoglycemia while on insulin/hypoglycemics
- Bleeding while receiving anticoagulants

Ventilator-Associated Pneumonia

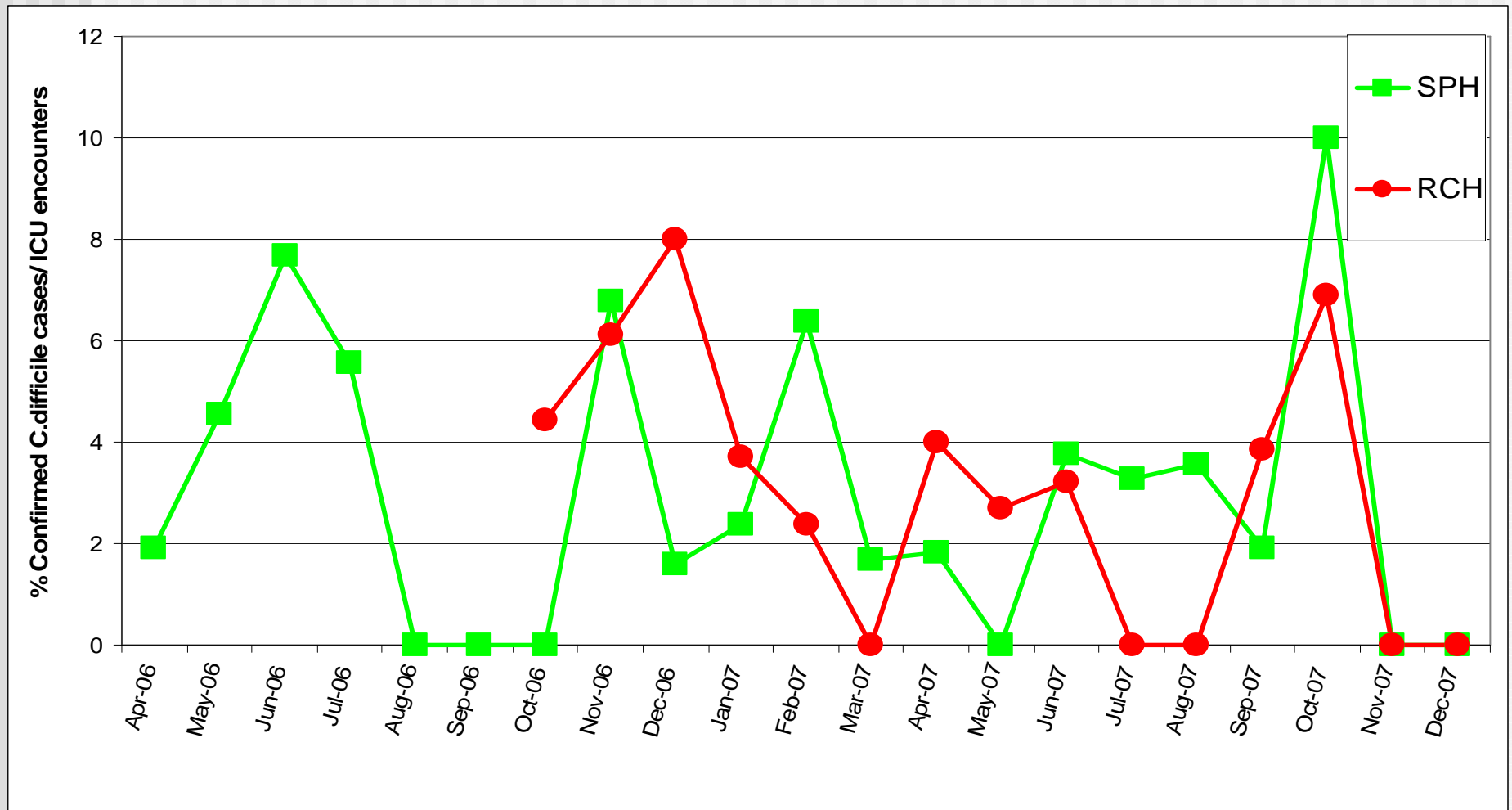
(ventilated \geq 48 h—excluding patients who had pneumonia as 1^o or other ICU admitting diagnosis)



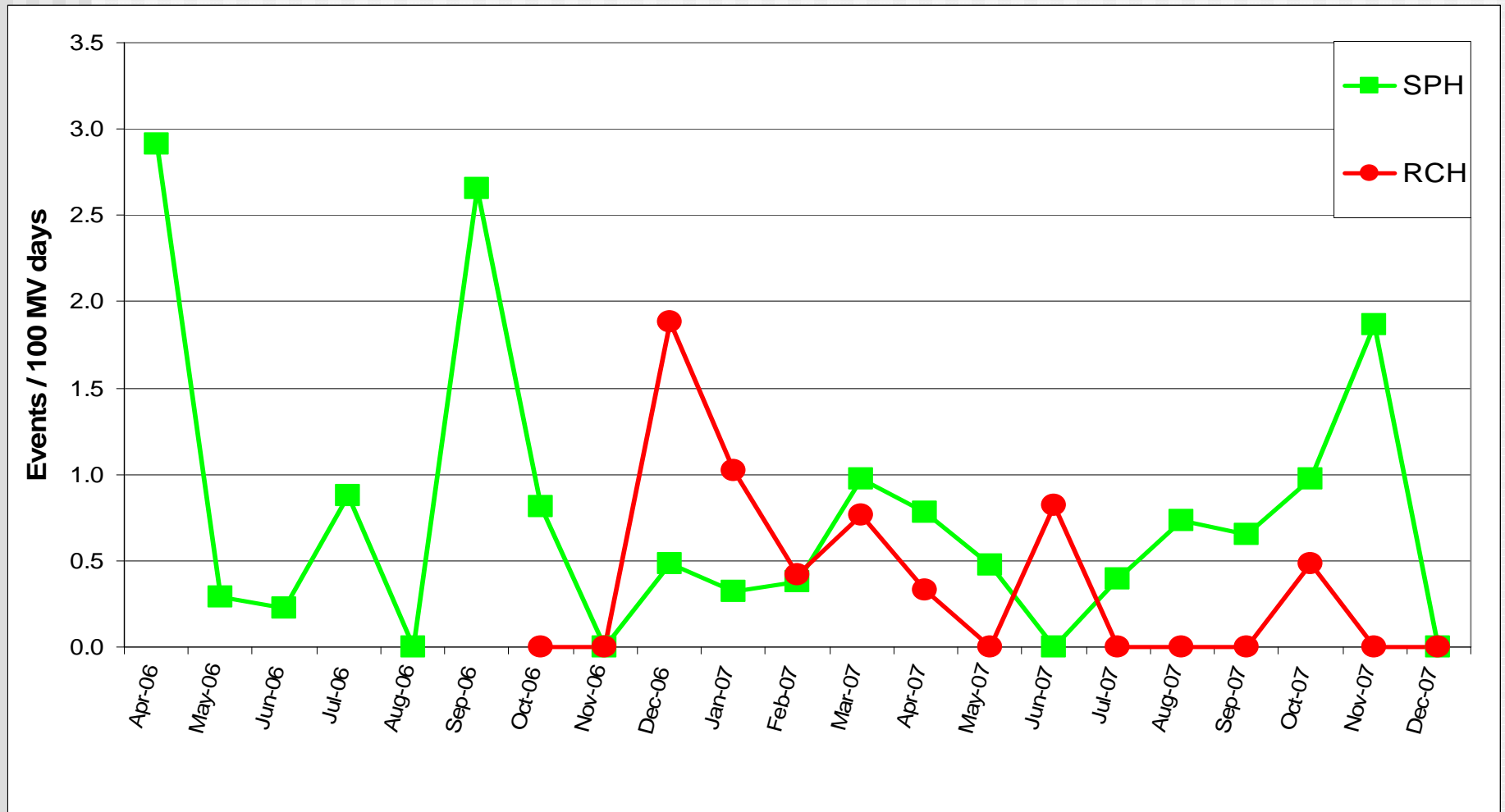
Catheter-related bloodstream infection



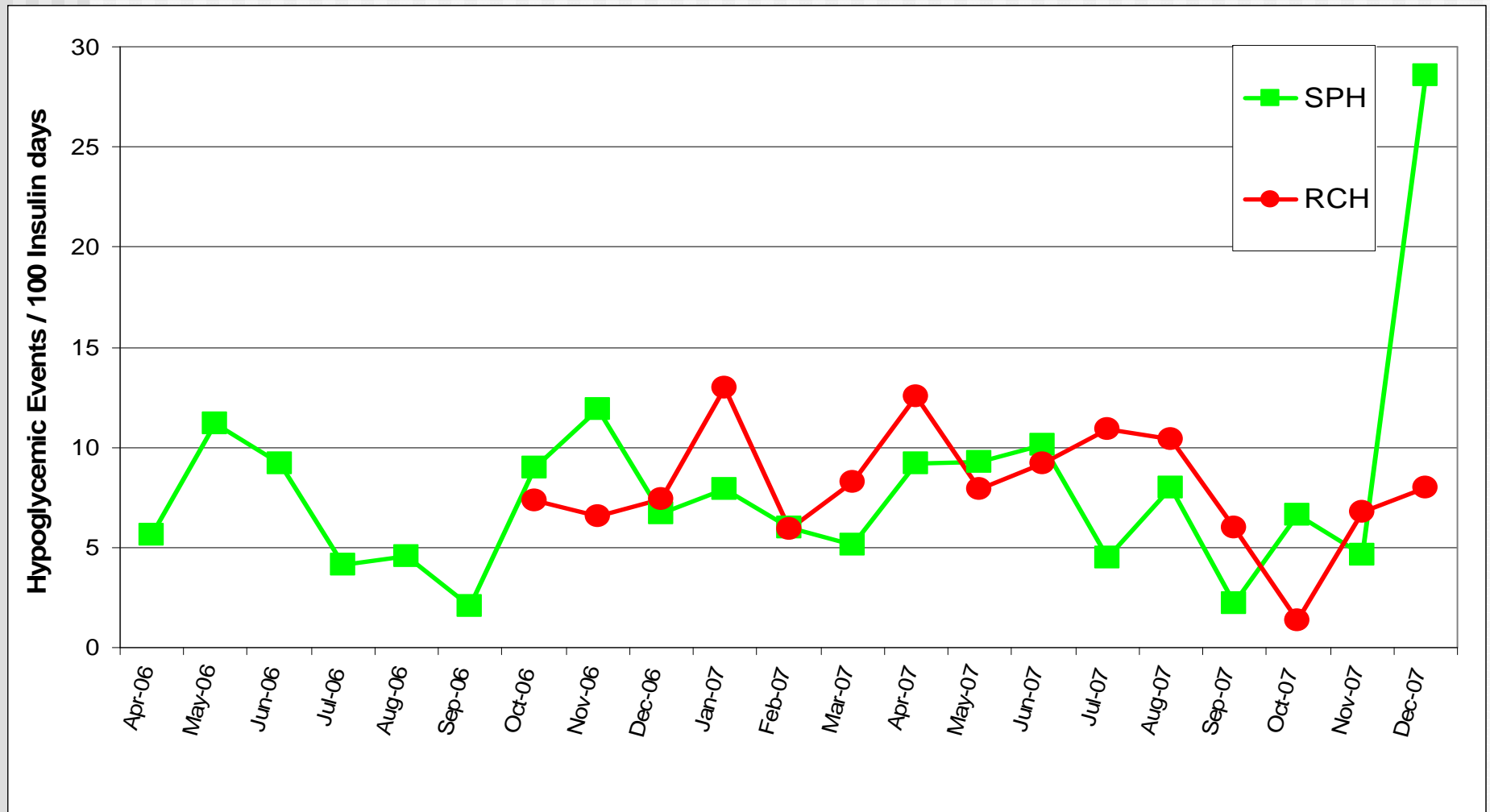
Clostridium Difficile Diarrhea



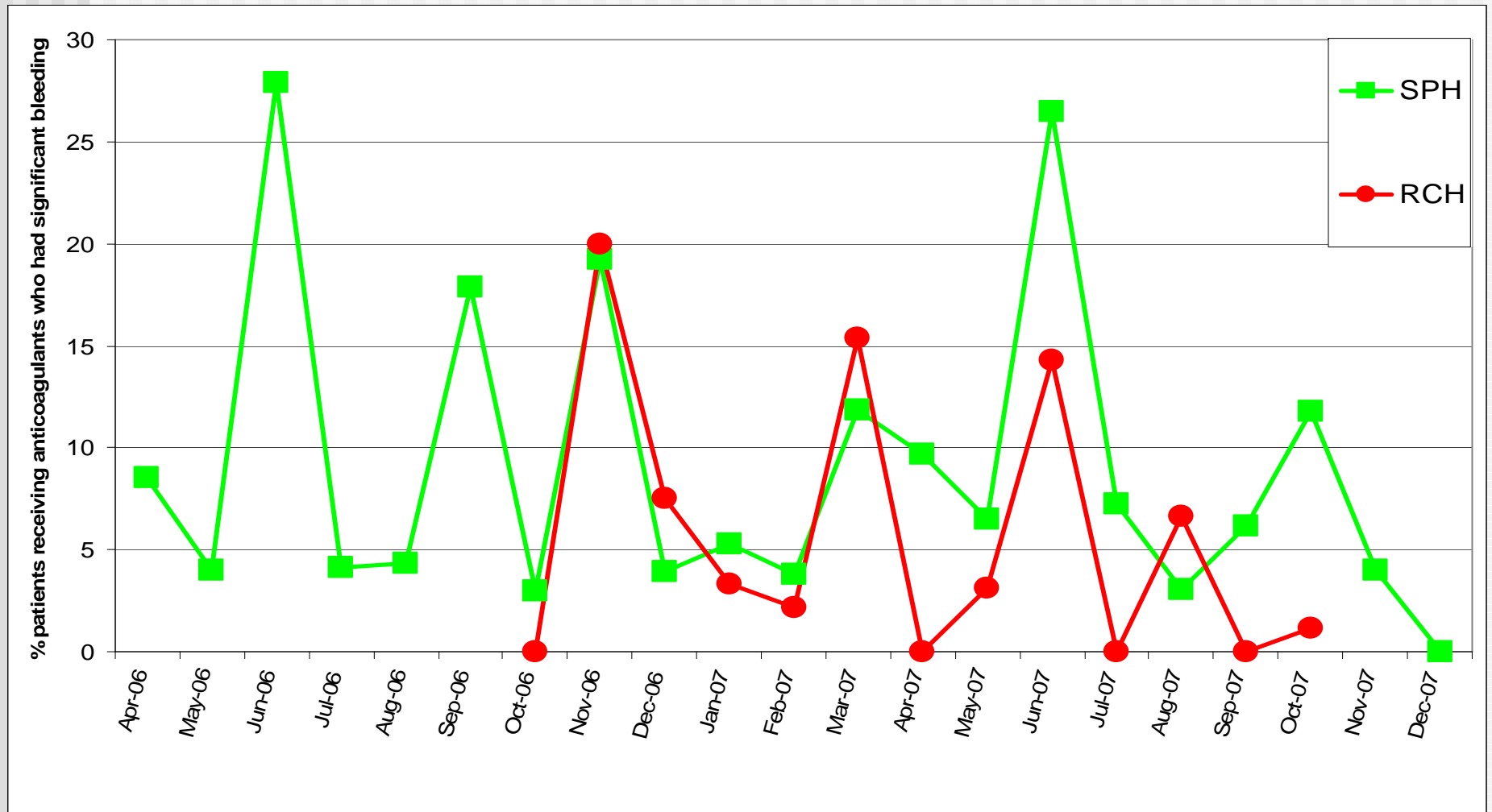
Unplanned extubation



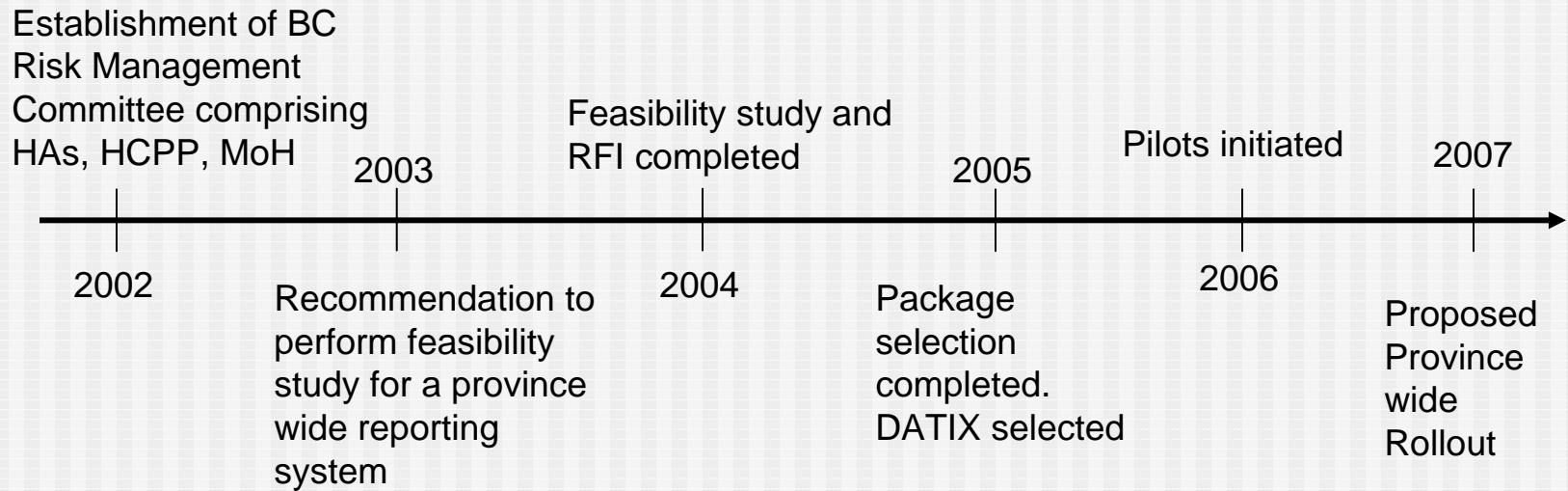
Hypoglycemia on Insulin



Bleeding while on anticoagulants



2. Patient Safety and Learning System (PSLS) Project



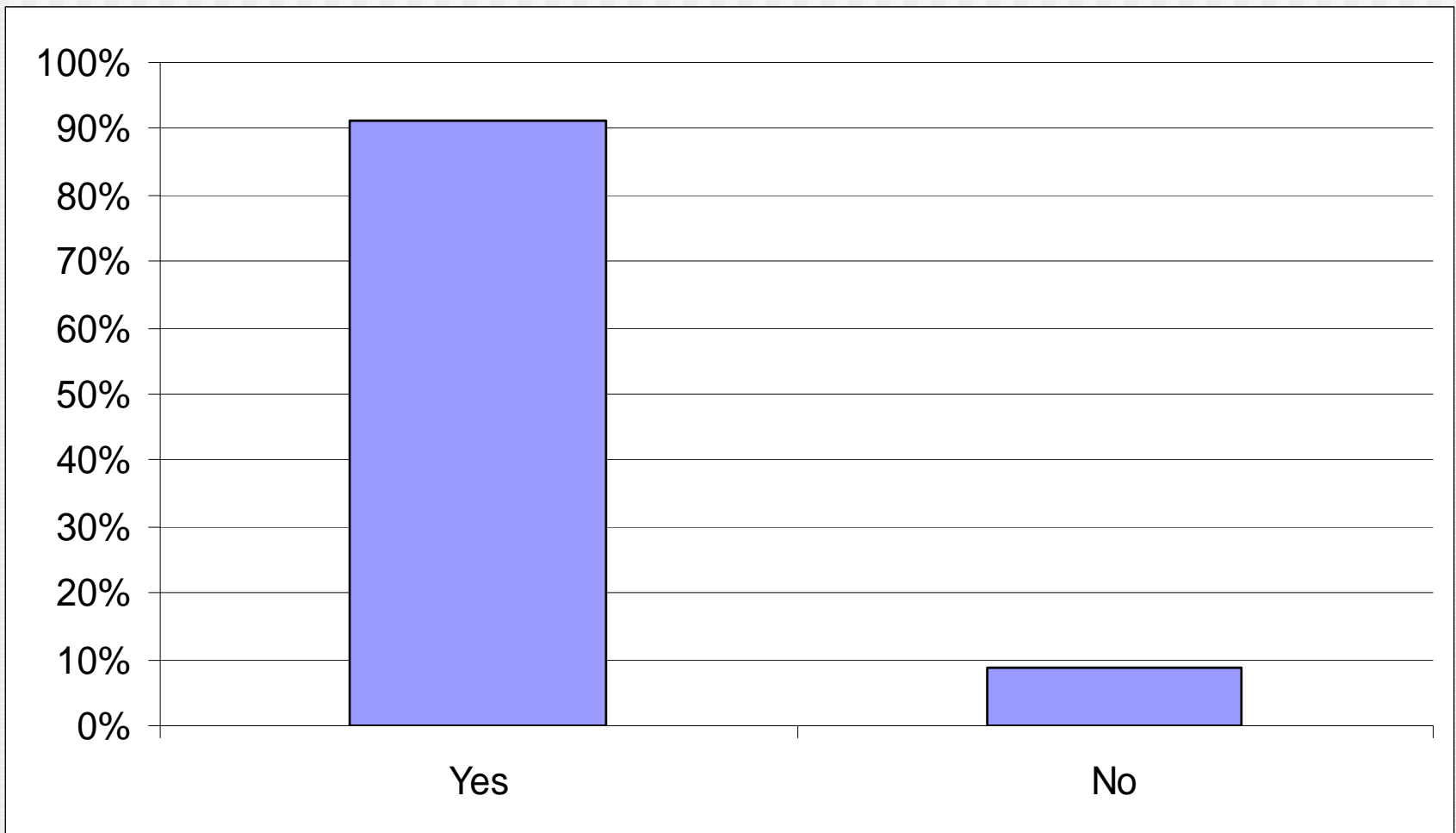
PSLS Pilot--Functional Scope

- VCHA – 120 users
 - Tower 8 – General Surgery (VGH)
 - patient and staff events, complaints and claims
- PHSA – 320 users
 - Neonatal Intensive Care Unit (C&W)
 - patient events, complaints and claims
- FHA – 15 – 20 users
 - QSRM Group – central use, FHA wide
 - Serious patient events

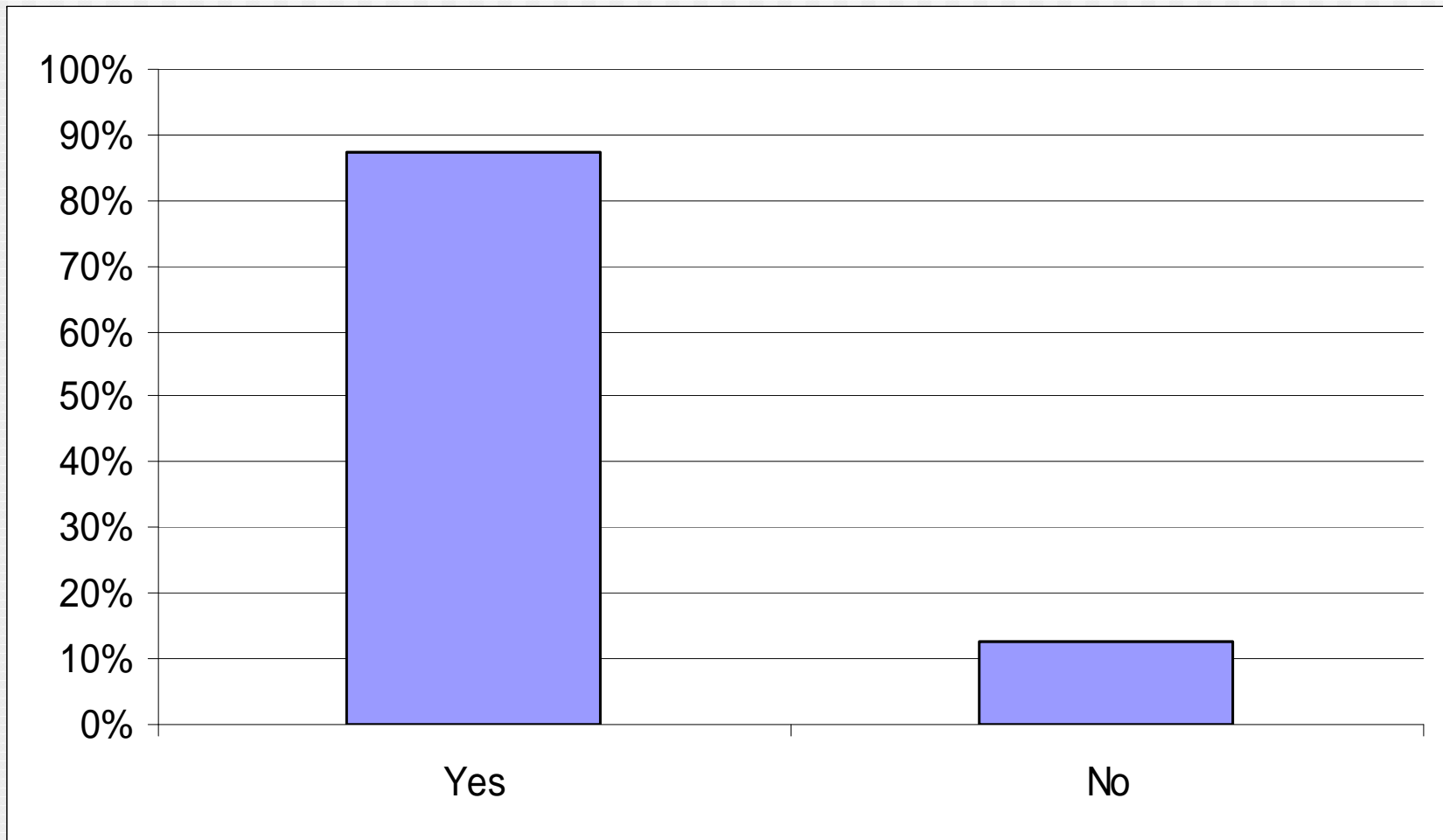
3. Measurement of Medication errors in the ICU (Wilmer, Louie)

- Systematic Review of literature on existing measures
 - Wide variation in definitions of errors, events, and steps in medication process; and in measures used
- Web-based survey of Canadian hospital pharmacists to determine how medication safety is measured in ICUs
 - 34/146 respondents
- Exploring direct observation methods based on Critical Care Safety Study

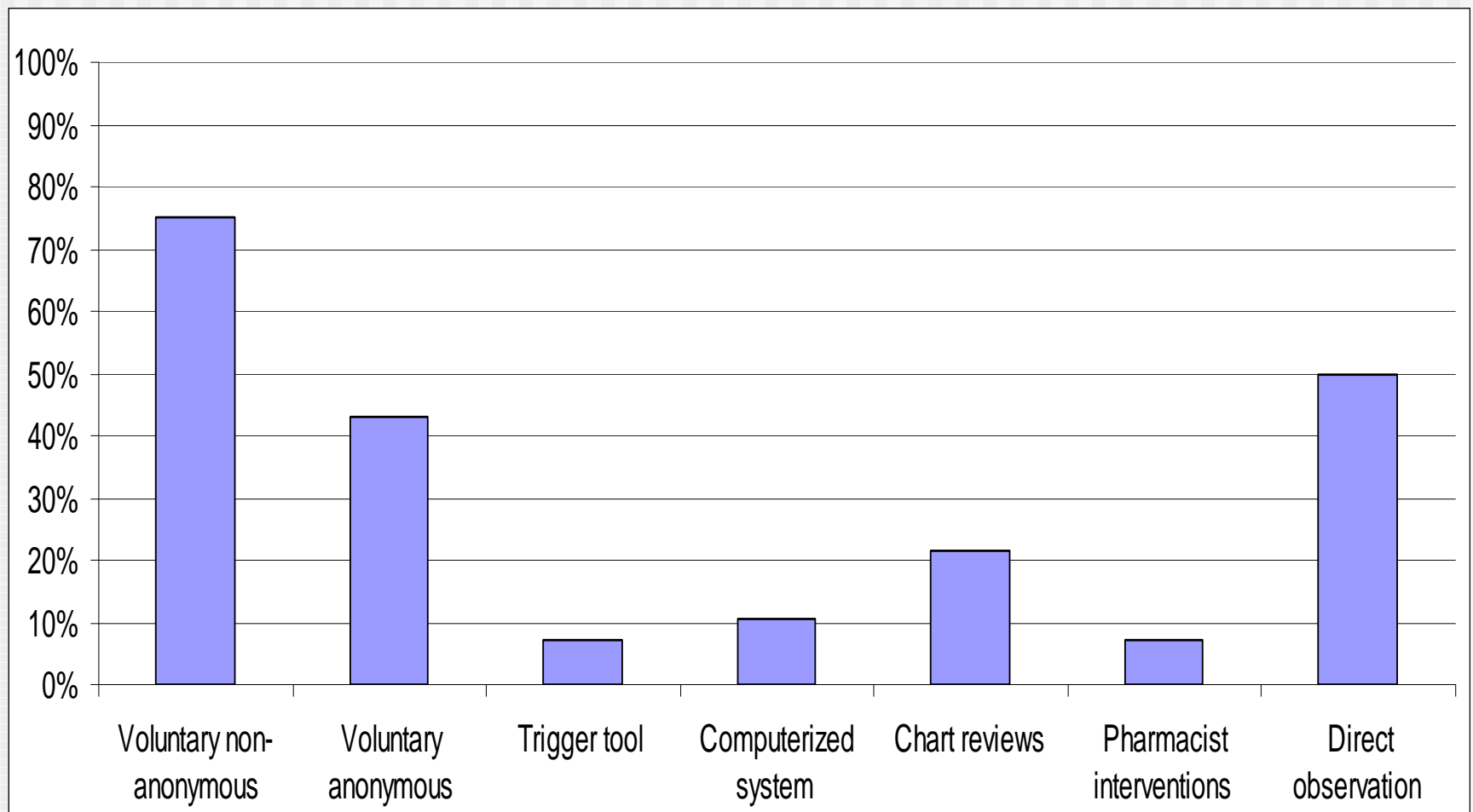
“Does your ICU have a pharmacist that is familiar with the ICU patients' conditions, and that reviews the patients' drug therapy with the ICU team at least 5 days a week, during day time hours?”



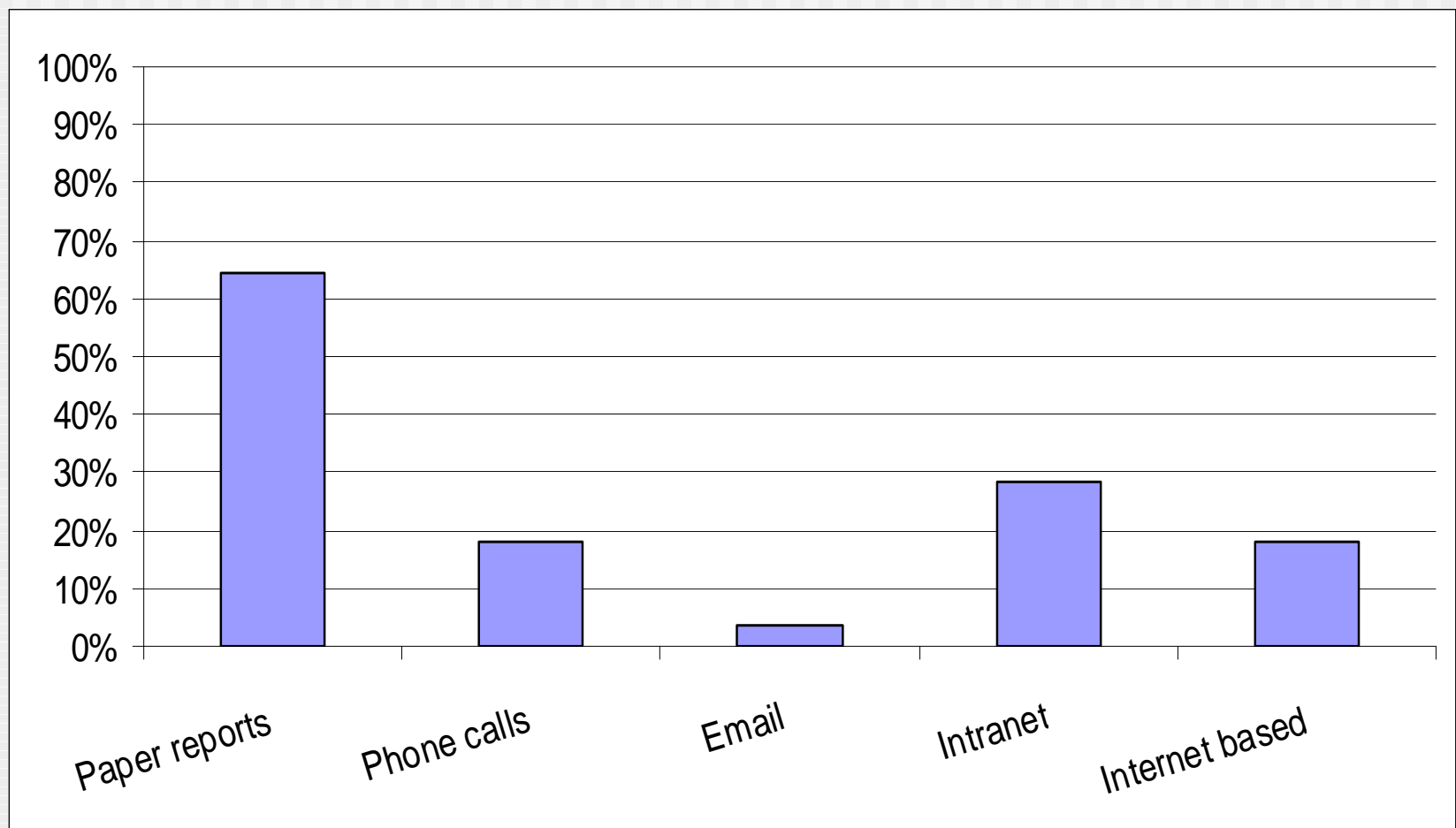
“Does your ICU have a process for tracking medication errors and adverse drug events?”



“Please identify which of the following processes your ICU uses for identifying medication errors”



“If voluntary reporting of medication errors is used, specify by which means”



4. Human Resource Management

- To assess the impact of 'human factors' on safety outcomes in the ICU
- Measure work schedules, workload, fatigue, experience, training, moral distress, etc.
- Link work data to patient safety data
- Work experience and work hours log developed

Methods:

- Collecting work schedule information at SPH ICU from Sept 2006 to October 2007
- Record information about which nurse was caring for a particular patient on a particular day
- Assess association between adverse safety outcomes and schedules
 - first analysis: hypoglycemic events while on insulin infusion
 - 34 episodes of hypoglycemia--31 first episodes analyzed

Analysis: case crossover fashion (adverse events)

	Jan 1	Jan 2	Jan 3	Jan 4	Jan 5	Jan 6	Jan 7	Jan 8	Jan 9
RN #	1	22	13	15	7	36	54	16	<u>8</u>

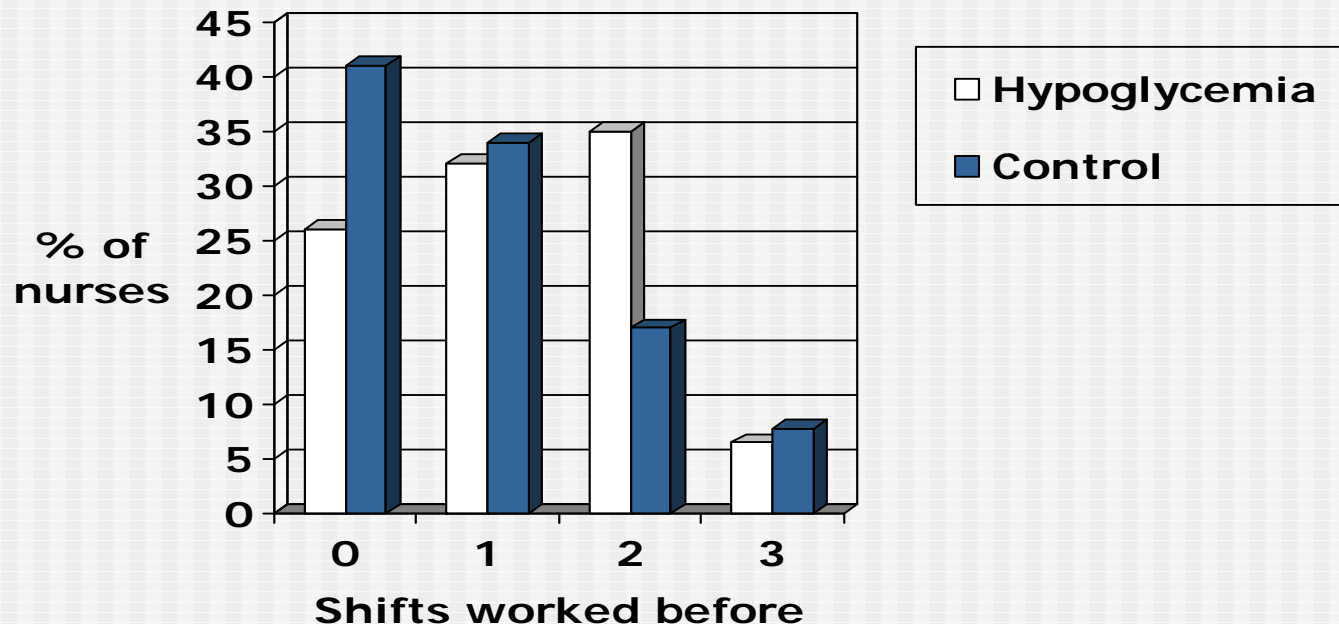
eg. Patient in ICU on insulin drip for 9 days, had hypoglycemic event Jan 9 on night shift.

Compare number of 12-hr shifts of RN#8 (in the previous 72 hrs) with other nurses (RN#s: 36, 54, 16) on 3 previous night shifts.

Preliminary Results: (take with grain of salt)

- 31 RN working at time of hypoglycemic events matched to 64 RNs working during control periods in same patient (some patients not in ICU or on insulin drip previous 3 days)
- Average number of 12-hr shifts worked in previous 72 hrs:
 - RN working during hypoglycemic event: 1.23 shifts
 - RN working during control periods: 0.92 shifts
 - $p=0.02$

Prelim Results continued



Conditional Logistic Regression:

- For each extra shift worked in previous 72 hrs, OR of event=2.0 (1.1-3.6) $p=0.02$
- For 2+ shifts in previous 72 hrs vs. 1 or less, OR=3.5 (1.2-10.7), $p=0.02$

Conclusions from this pilot study

- Patient safety may be adversely affected by heavy nursing work schedules

Future Plans:

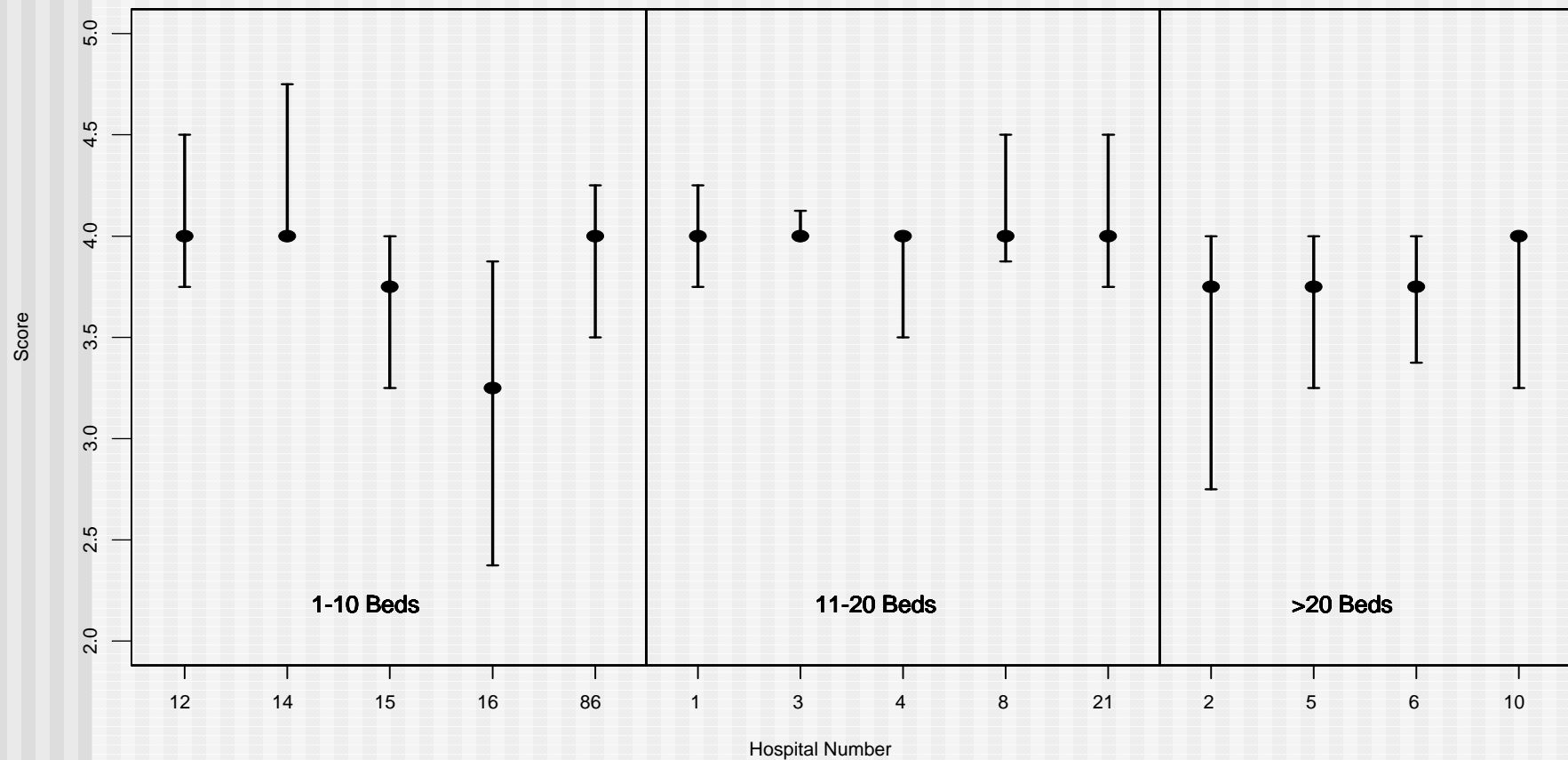
- Control for experience, age
- Examine other safety outcomes
 - Bleeding on anticoagulants, unplanned extubations
- Other hospitals
- Examine other human factors issues using similar statistical methodology
 - Experience, age, nurse/patient ratios

5. Organizational and Safety Culture Surveys

- Organizational/safety culture surveys returned from 14 hospitals
- Surveys scanned and data summarized by domain

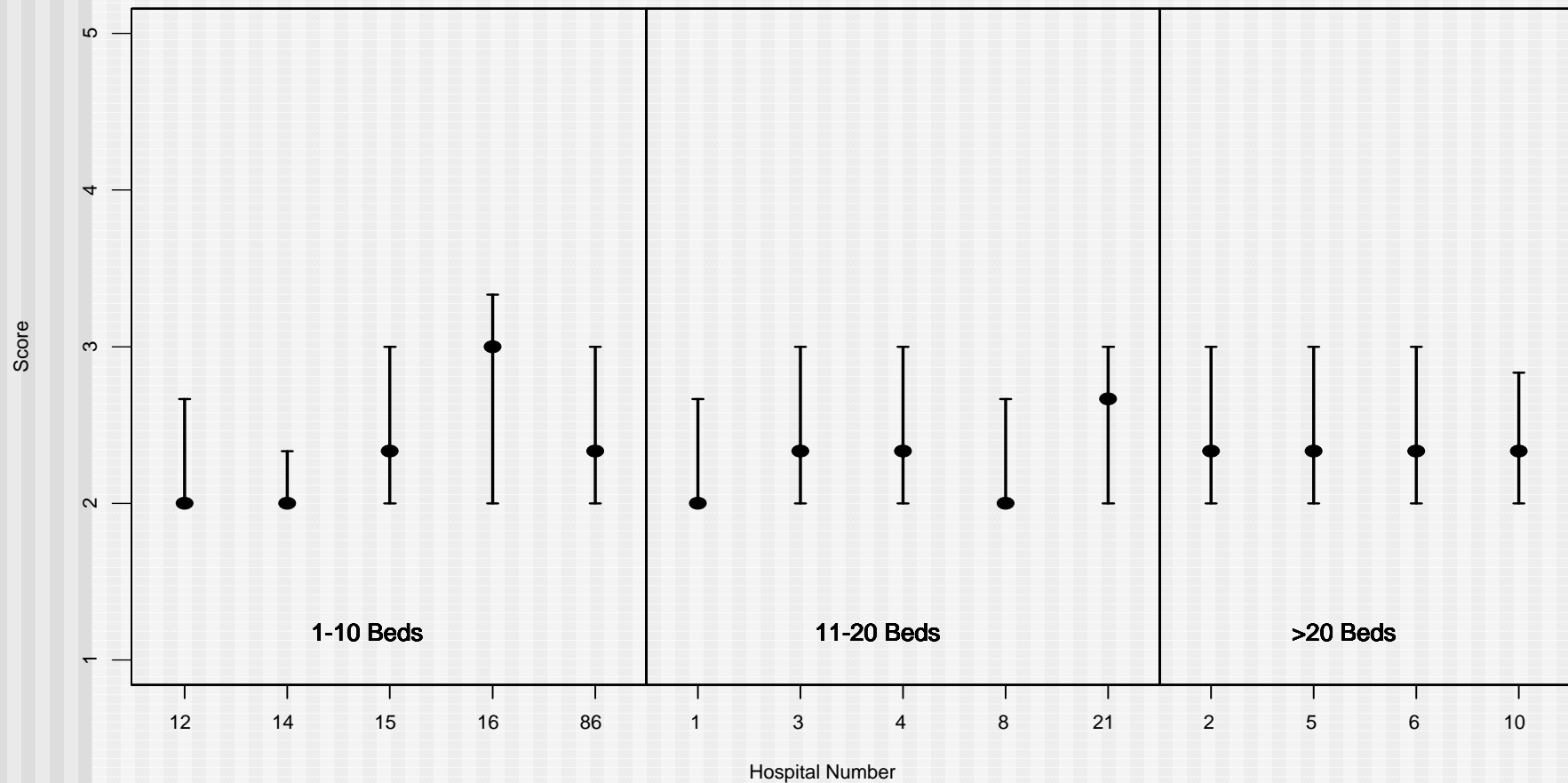
Organizational Culture: between group communication openness

Between-Group Communication Openness

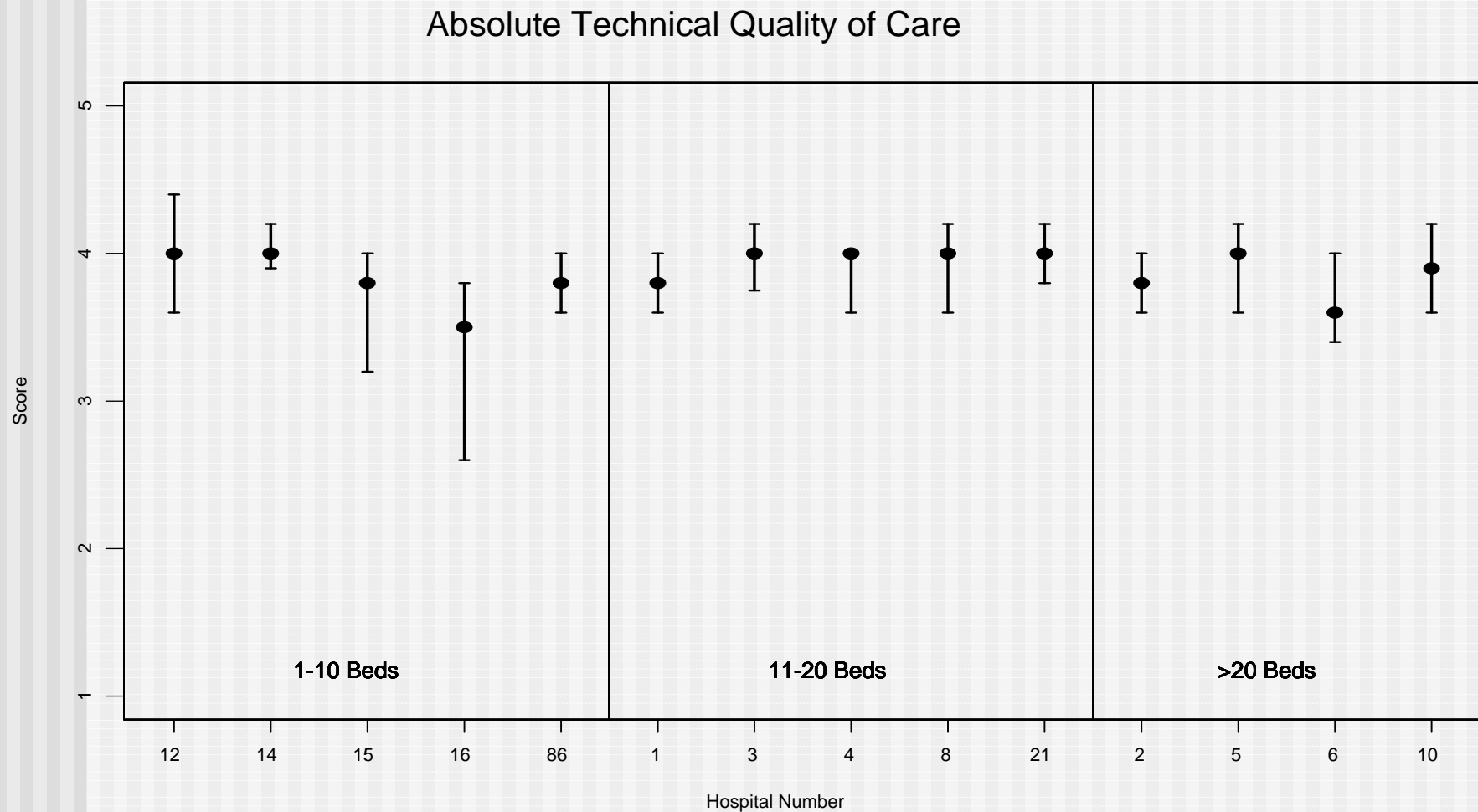


Organizational Culture: between group avoiding conflict strategy

Between-Group Avoiding Conflict Strategy

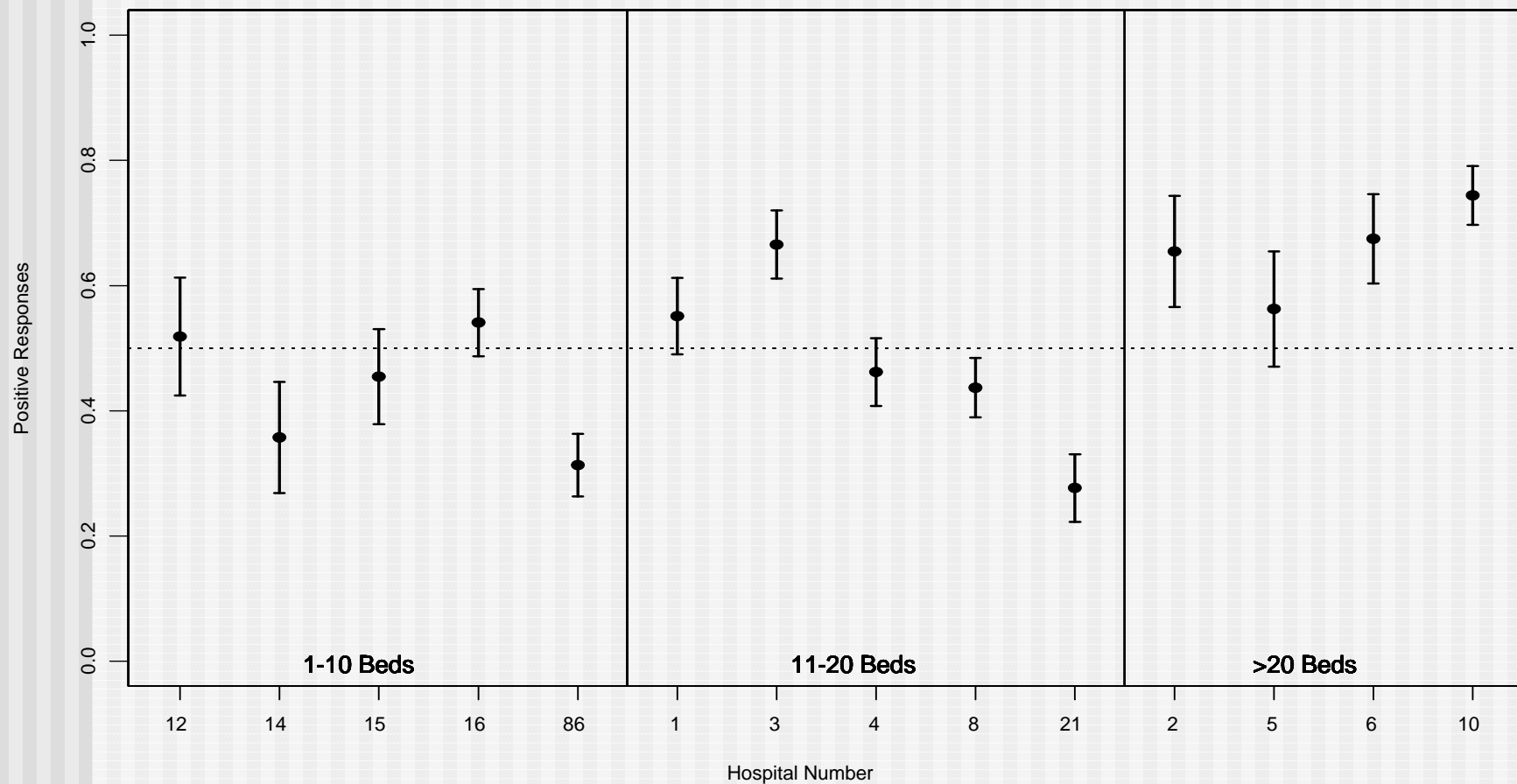


Organizational Culture: technical quality of care



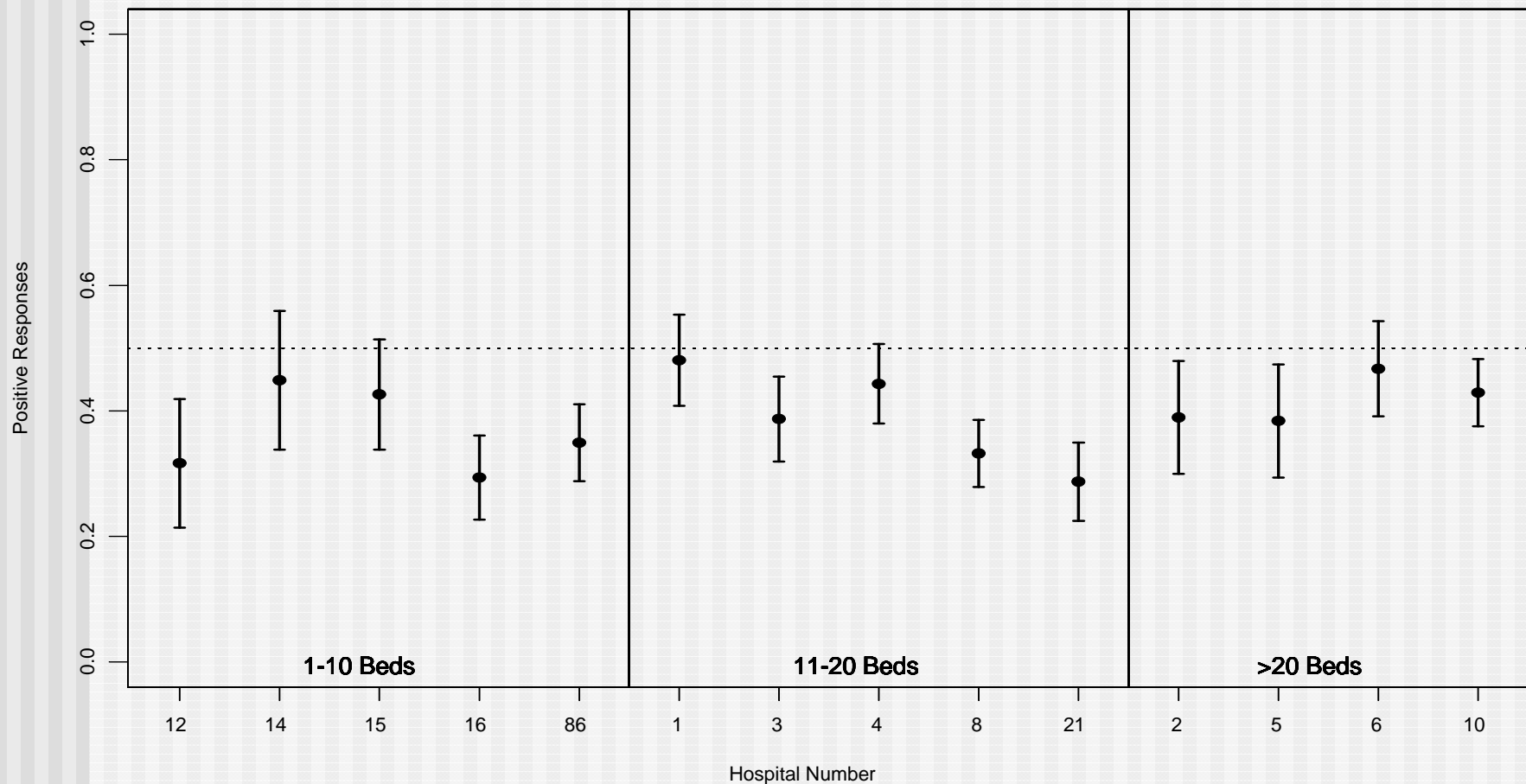
Safety Culture: Overall Perceptions of Safety

Overall Perceptions of Safety



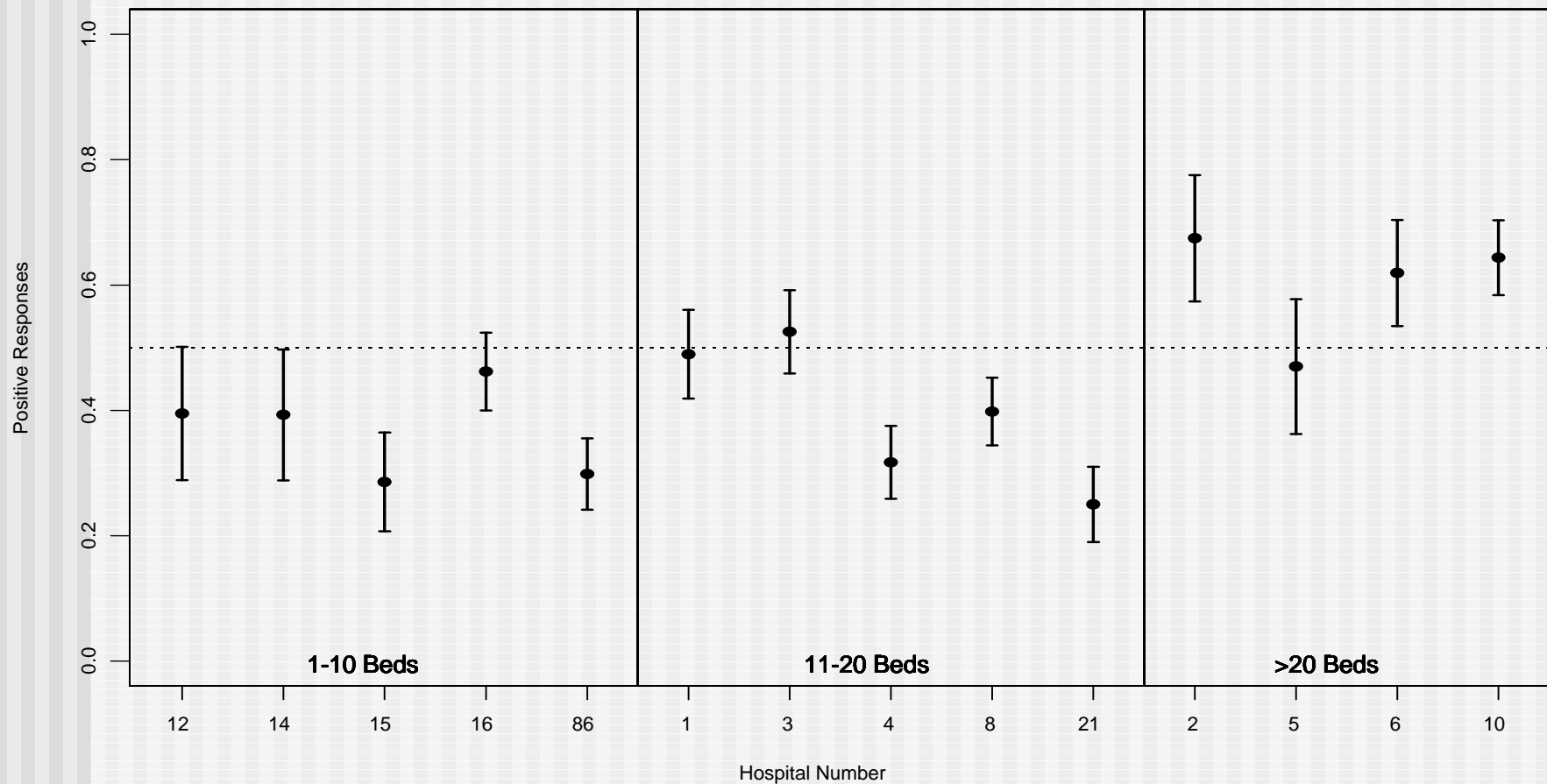
Safety Culture: Frequency of Events Reported

Frequency of Events Reported



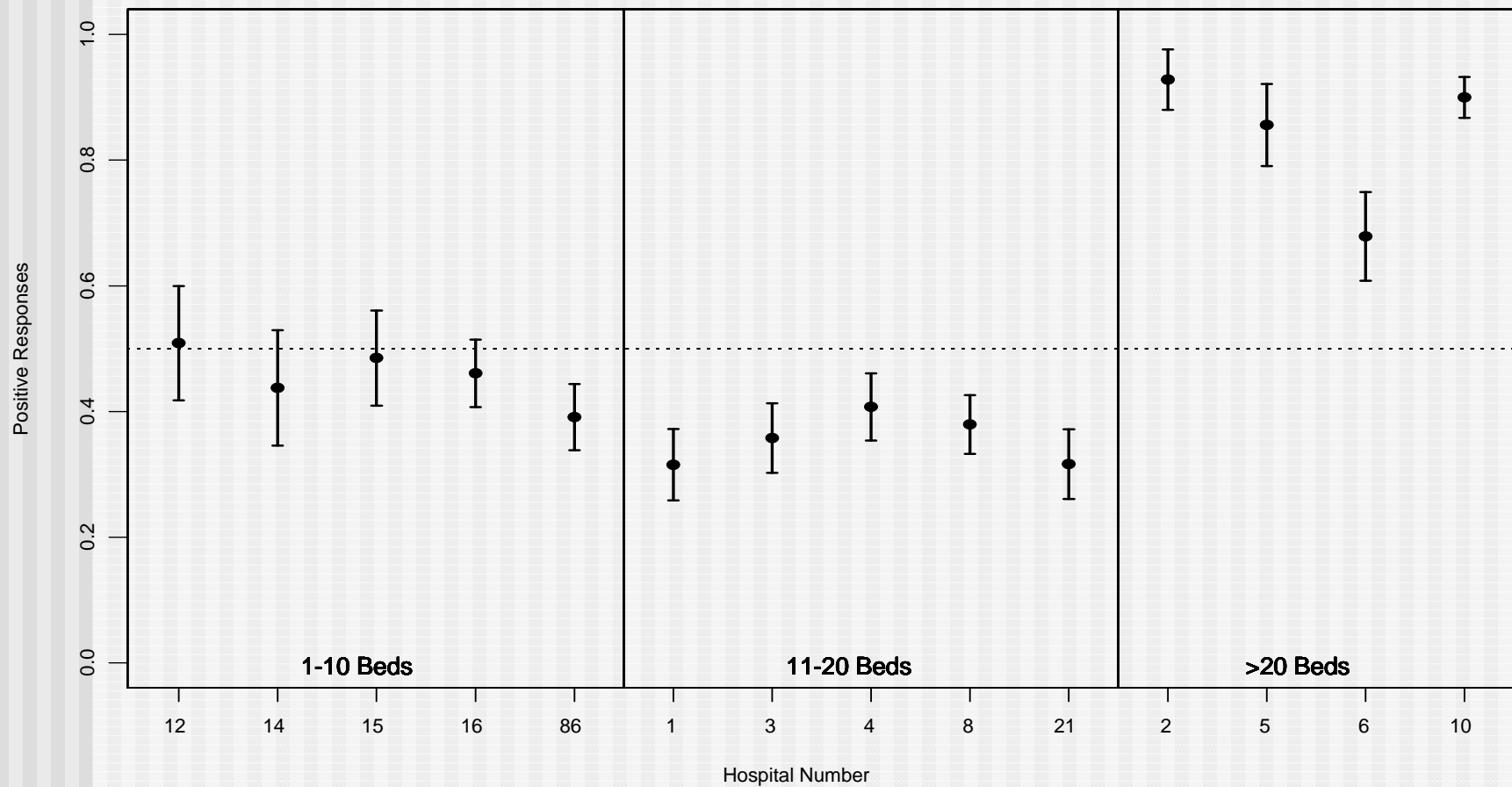
Safety Culture: Non-punitive response to error

Nonpunitive Response to Error



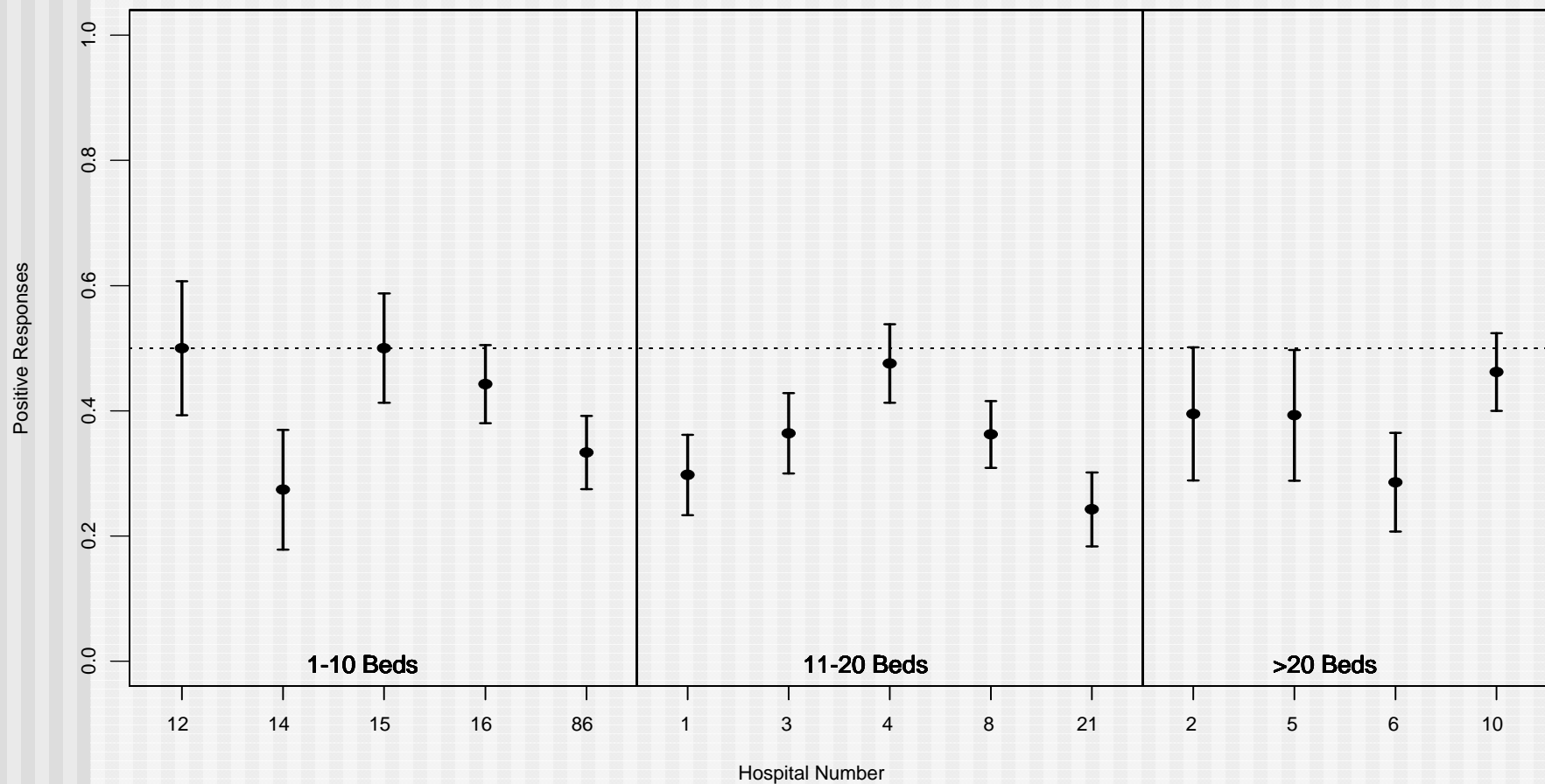
Safety Culture: Teamwork across hospital units

Teamwork Across Hospital Units



Safety culture: Hospital management support of patient safety

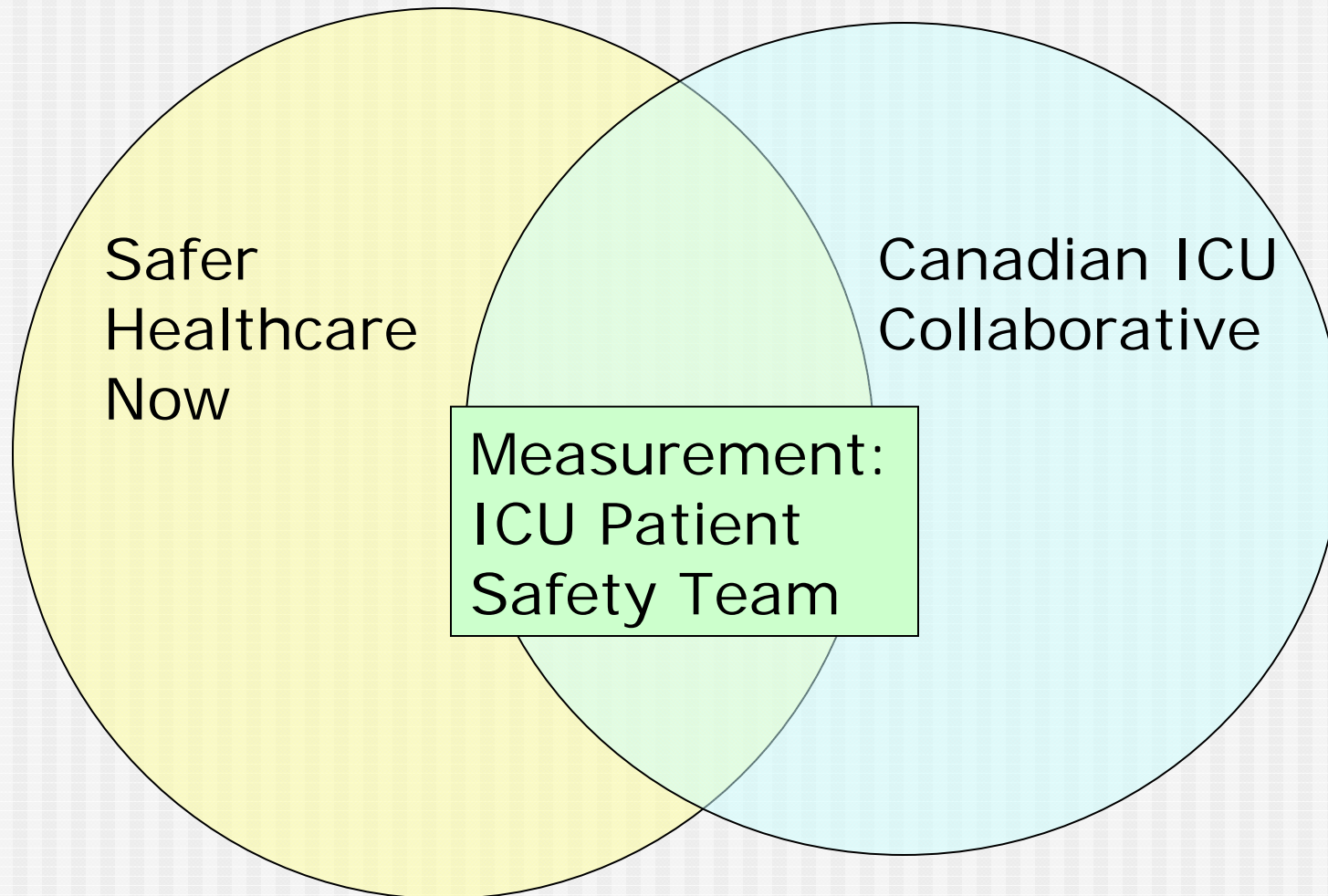
Hospital Management Support for Patient Safety



ICU Patient Safety Team: Research Output

- Papers published:
 - Pneumothorax. Qual and Safety in Health Care, 2007
 - Fatigue in ICU. Lung, 2007
- Paper submitted:
 - ICU workload and patient outcomes
- Abstracts accepted for presentation:
 - Systematic review of medication safety
 - Survey of medication safety measurement
 - Worker hours and hypoglycemia
 - Sedation practice—SPH vs. St. Eloi (France)
- Grant applications:
 - Role of moral distress in safety culture—not yet funded
 - Worker hours and patient safety--submitted

How does this project relate to other initiatives?

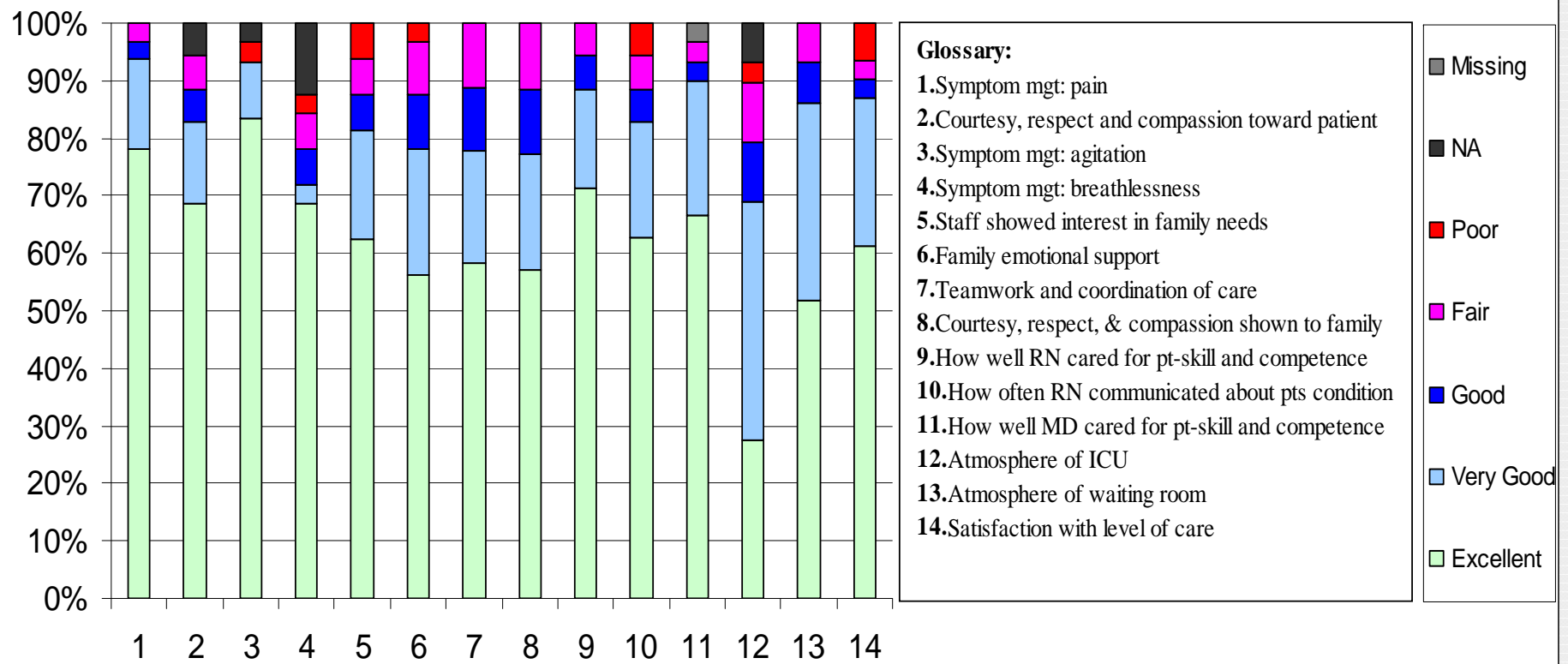


Organizational Culture and Family Satisfaction: Specific Aims

- Measure organizational culture and family satisfaction in 16 ICUs in B.C. and 4 ICUs outside B.C.
- Correlate measures of organizational culture with measures of family satisfaction

Family Satisfaction—sample output

Family Satisfaction with Care - ICU survivors



Knowledge Translation Plan

- Results to each site with comparison to other similar ICUs
- Consult with ICU and hospital leaders to plan changes (eg organizational culture)

What's in this for Fraser Health?

- Build research capacity and bridges among clinicians, researchers, and decision-makers
- Promote and facilitate education about patient safety and family satisfaction—focus of attention
- Add patient safety and family satisfaction indicators to 'scorecards'
- Create incentives for leaders related to improvements in patient safety and family satisfaction

Thank you from the Team!!

