

How should we measure performance in Ontario Hospitals?

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Outline

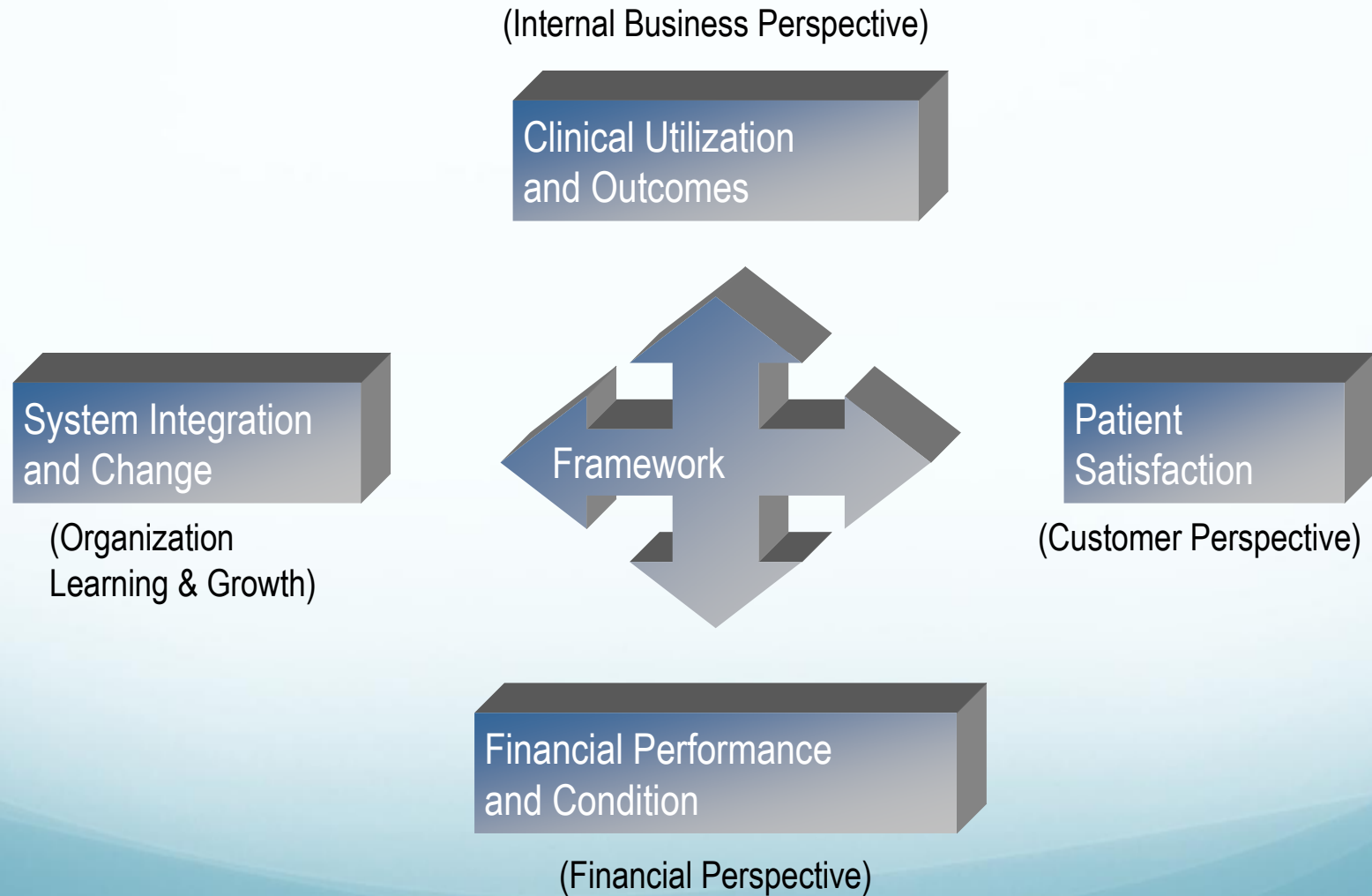
- Background
- Methods
- Main findings
- Discussion and future directions



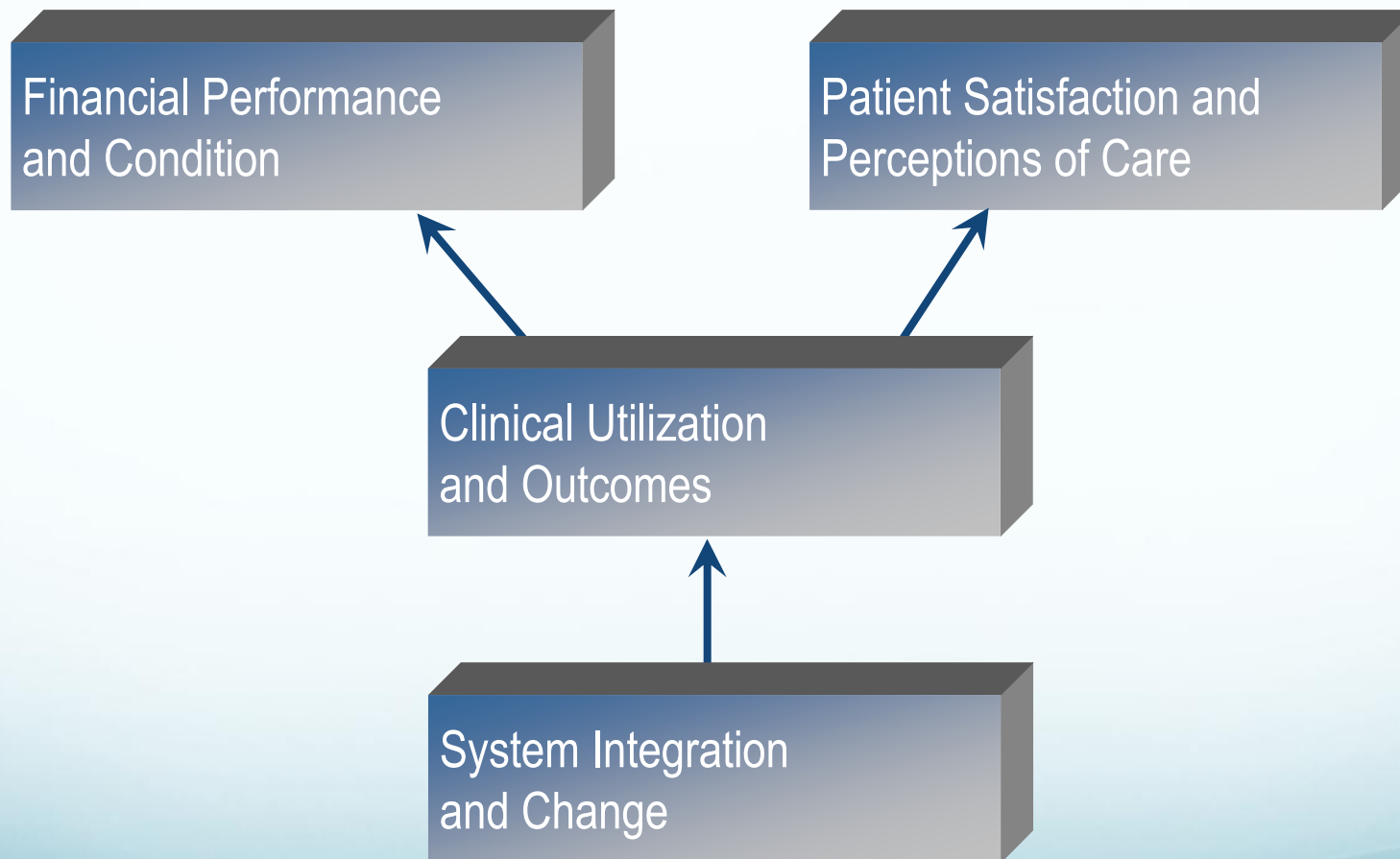
Background

- Performance constitutes a complex concept
 - not a single indicator
 - Multiple systems for measuring performance with several indicators
 - ✓ Framework proposed by Kaplan and Norton
 - Dominant model for healthcare providers
 - ✓ In Ontario, a balanced scorecard since 1998 to publicly report on the performance of hospitals:
 - Main objectives of HR: quality improvement and accountability
 - framework comprises four quadrants

A balanced scorecard based on Kaplan & Norton's four quadrant framework...

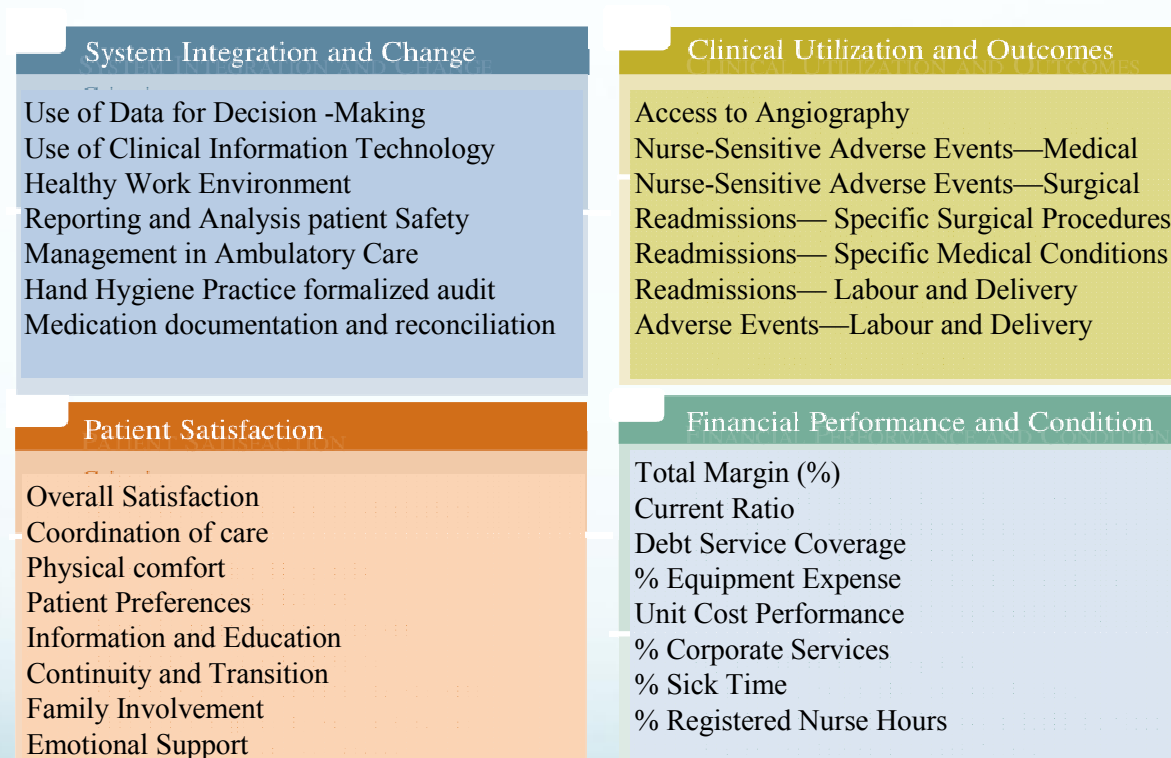


...with an inherent logic underlying the quadrants...



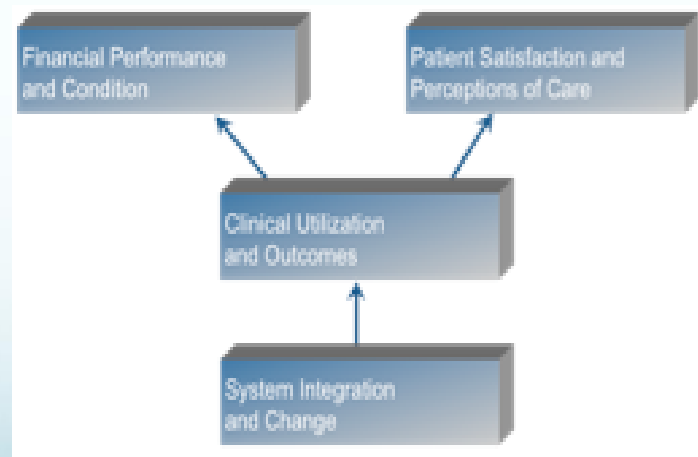
Performance framework

- a total of 30 indicators for all performance quadrants



Background (cont.)

- No evidence that indicators in a given quadrant really belong together
 - Structure of quadrants driven by the data sources
 - ✓ E.g. Financial indicators come from MIS data,
 - Not the best strategy (ignores causal flowchart)



Background (cont.)

- Lack of empirical evidence to sustain and validate performance frameworks may lead to problems:
 - Clarity and relevance of results
 - Judgment on performance (eg: high performers)

Objectives:

- To validate whether the indicators in the current Ontario Hospital Report balanced scorecard match their respective quadrant
 - To explore and confirm the clustering of the items
 - To calculate latent factors for each quadrant
 - To analyze relationships between quadrants

Methods:

Data source

- Publicly reported indicators from the Ontario Hospital Report in 2007 and 2008 were used in a factor analysis.
- All acute care health organizations in Ontario, Canada are eligible:
 - ✓ Two years: to strengthen the methodology and to ensure results are replicable
 - ✓ In 2008, a total of 114 in at least one quadrant (99% of all acute care hospitals)
 - ✓ 108 organizations in 2007 (98.5% of all acute care hospitals)



Methods:

Measures

- 4 quadrants or domains of performance
 - system integration and change (7 indicators: organization)
 - clinical outcomes (7 indicators: readmissions, adverse events and appropriateness)
 - financial performance (9 indicators: financial viability, liquidity, capital, efficiency and human resources)
 - patient satisfaction (mailed questionnaire of 54 questions regrouped into 12 aggregated indicators)

Methods:

Analysis

- Exploratory factor analysis of all indicators to evaluate the clustering of indicators in different quadrants
 - ✓ Common variance, loadings, reliability
 - ✓ Proposing and testing a new grouping of indicators
- Confirmatory analysis to test models that best fit data
 - ✓ Testing of the new combinations
 - ✓ Overall fit
- Analyze the relations between the different latent variables
 - ✓ Raw correlations

Results

- 61 community hospitals, 35 small hospitals and 18 teaching hospitals through the 14 different LHIN.
- All indicators together
 - 4 factors: 47.2% of the common variance (grouping not the same as the quadrants)
 - ✓ all satisfaction items load a same factor
 - ✓ most of but not all SIC items load on the same factor
 - ✓ outcomes measures and financial items: no obvious clustering into one-dimensional factors

New combinations

- Satisfaction with the original 8 items (good loadings and very good reliability of the scale)
- Items significantly associated to their latent factor

Patient Satisfaction
Overall Satisfaction
Coordination of care
Physical comfort
Patient Preferences
Information and Education
Continuity and Transition
Family Involvement
Emotional Support

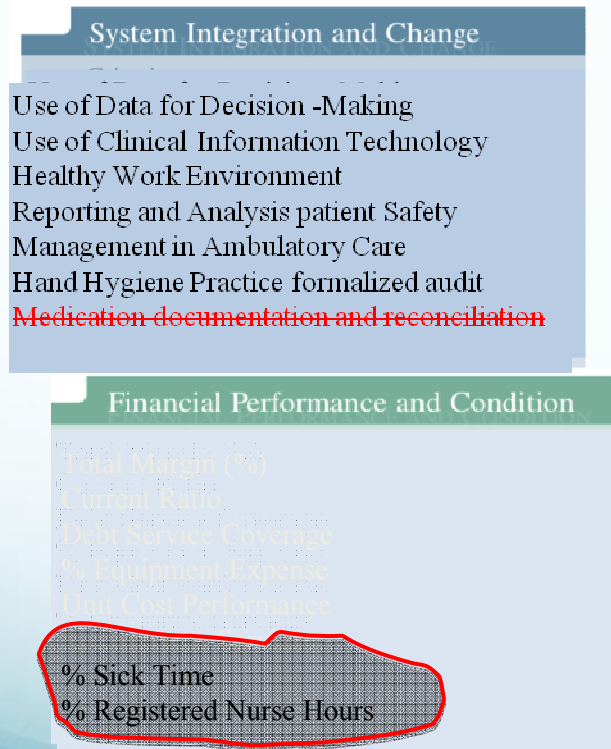
Loadings >80%

Common variance: 81.3%

Alpha: 0.97

New combinations

- SIC with 6 original and 2 new items
- Items significantly associated to their latent factor



Loadings: 23-88%

Common variance: 33%

Alpha: 0.70

Hand Hygiene and percentage of sick time items ??

New combinations

- Financial component with 5 items instead of 8

Financial Performance and Condition

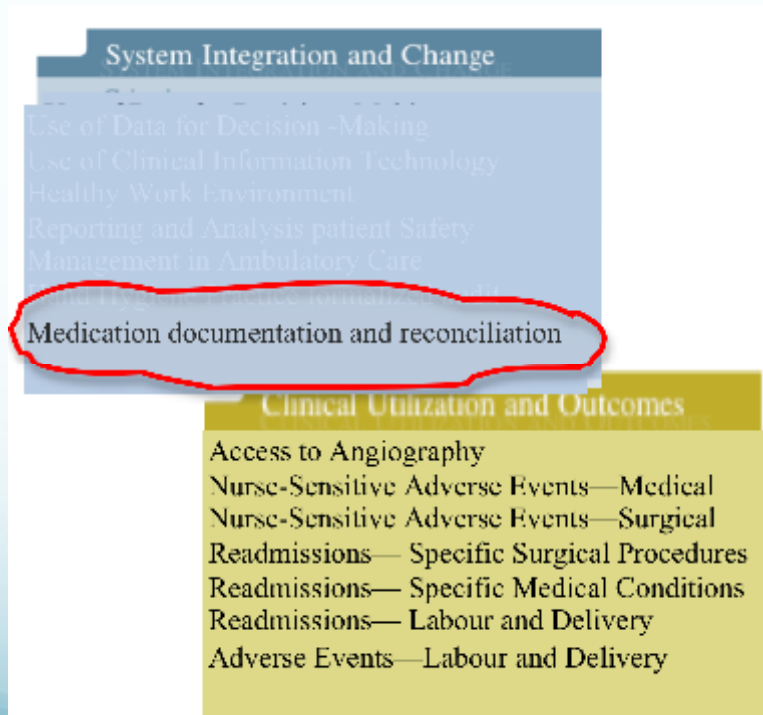
Total Margin (%)
Current Ratio
Debt Service Coverage
% Equipment Expense
~~Unit Cost Performance~~
% Corporate Services
~~% Sick Time~~
~~% Registered Nurse Hours~~

% Equipment Expenses non significant

Alpha: not good

New combinations

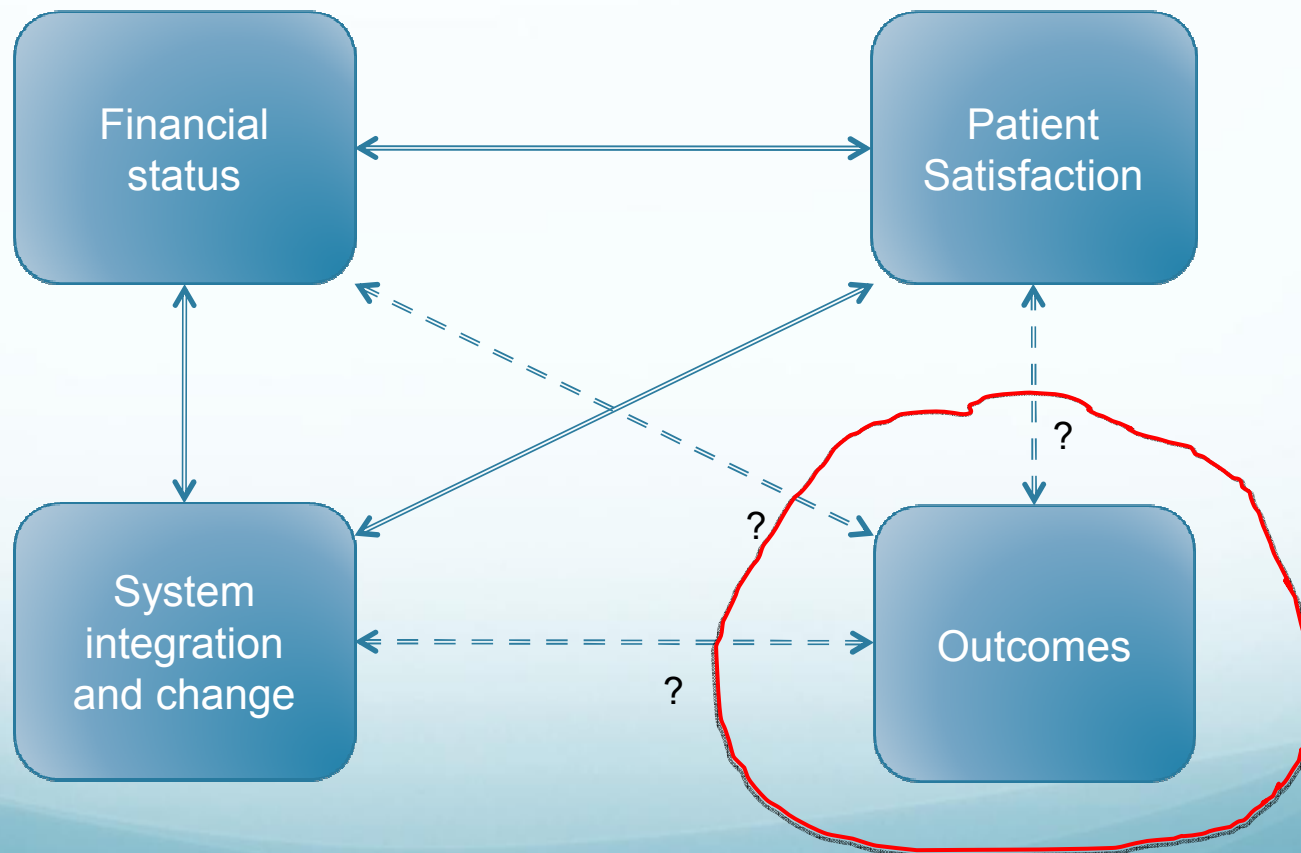
- Non obvious factor from clinical utilization and outcomes items
- Regression weights not significantly different from 0



?

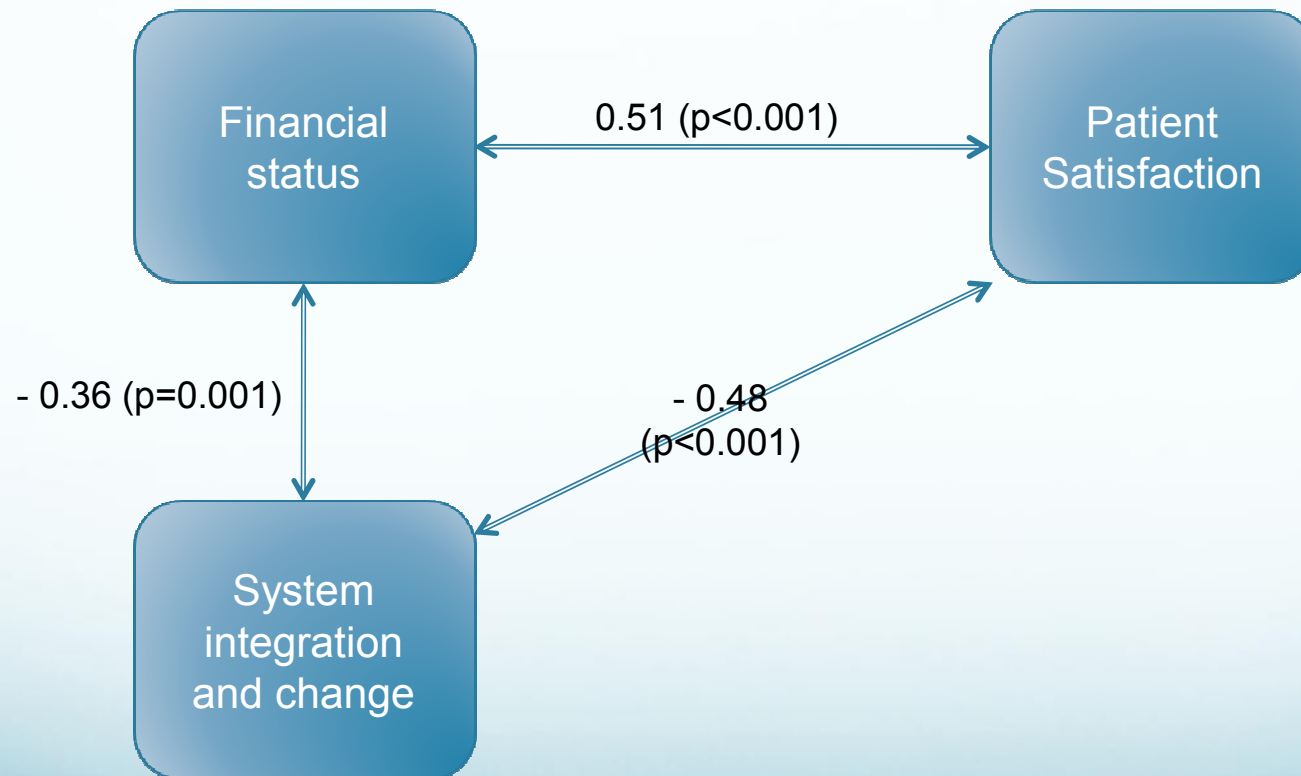
Results (cont.)

- Not possible to estimate a latent factor for outcomes quadrant



Associations between quadrants

- Equations only determined among 3 quadrants



Discussion

- Small sample (missing) and non normality but interesting results (robust method, 2 years)
- Performance quadrants largely hold but some indicators appear on a factor different to the conceptual dimension
 - unique dimension for SIC and client satisfaction as expected
 - Financial items constitute a comprehensible latent factor (capacity to manage the resources and face financial needs)
 - ✓ measurement scale of items (standardization)

Discussion

- Outcomes items hardly represent a valid construct and the results are not in favour of measuring performance in clinical outcomes as a unique latent factor
 - ✓ report the items separately
 - ✓ Need to develop a more comprehensive framework for the measurement of performance in clinical outcomes and quality of care.

Discussion (cont.)

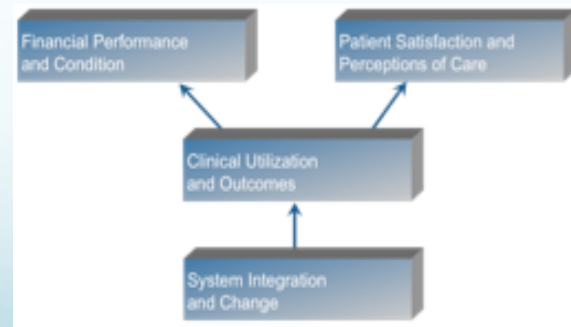
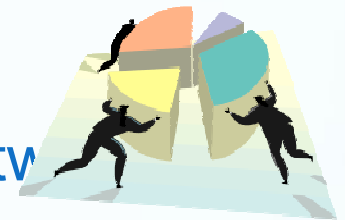
- Results on relations between quadrants raise some questions:
 - Why negative correlation between SIC and patient satisfaction or financial status?
 - ✓ Tradeoffs? competing interests? Priorities? Organisational culture?
 - ✓ Integration not centered to patients?
 - ✓ Are measures in SIC not the ones that would improve financial performance or satisfaction items?
 - ✓ Does SIC cost too much and weaken financial status?
 - Unable to assess relationship between SIC and outcomes

Discussion (cont.)

- Results on relations between quadrants raise some questions:
 - What is revealed in the positive relation between financial status and satisfaction?
 - ✓ satisfied patients more likely to support their organizations, to be interested and get involved in the activities?
 - ✓ good financial condition allow organizations to provide additional and good services and more non-technical support to clients which are then more satisfied?

Discussion (cont.)

- Necessity to find the right balance between the performance domains
- Need to better understand the relationships between performance functions, validate emerging hypotheses
 - ✓ Raw correlations (potential confounders, better estimates)
 - ✓ Causal relations



Thank you!

- COMMENTS
- QUESTIONS

