

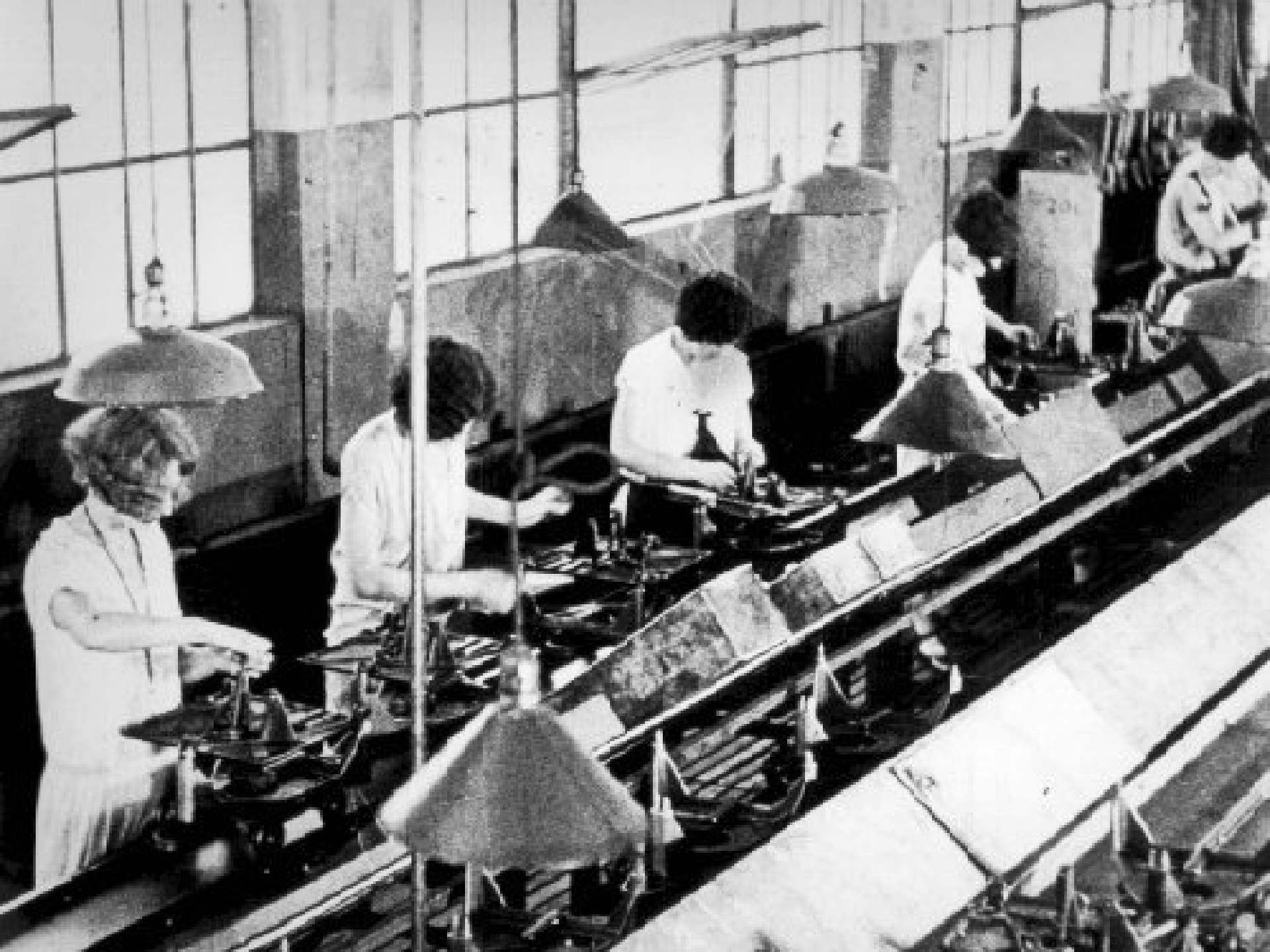
INFORMATION FREE ZONE



Measuring Nursing Work in Ontario

Mary Ferguson-Paré, RN, PhD
University Health Network

Annabelle Bandurchin, MHSc
University Health Network



Increasing the Professional Role of Nursing in Ontario

Mary Ferguson-Paré, RN, PhD
University Health Network

Annabelle Bandurchin, MHSc
University Health Network

Where are we at?

- The cost-benefit relationship of collecting nursing workload data has been deemed unfavourable
- But nursing workload data was the only tool we had available for making staffing decisions and predicting the cost of nursing

3 demonstration projects

- Assess the feasibility of HOBIC admission scores as a predictor of patient demand for nursing
- Determine the indicators that best support nurse leaders make staffing decisions
- Predict the cost of acute care nursing

Assessing the feasibility of HOBIC

To determine the relationship between HOBIC admission scores, workload scores, and nurses' judgement of patient care requirements.

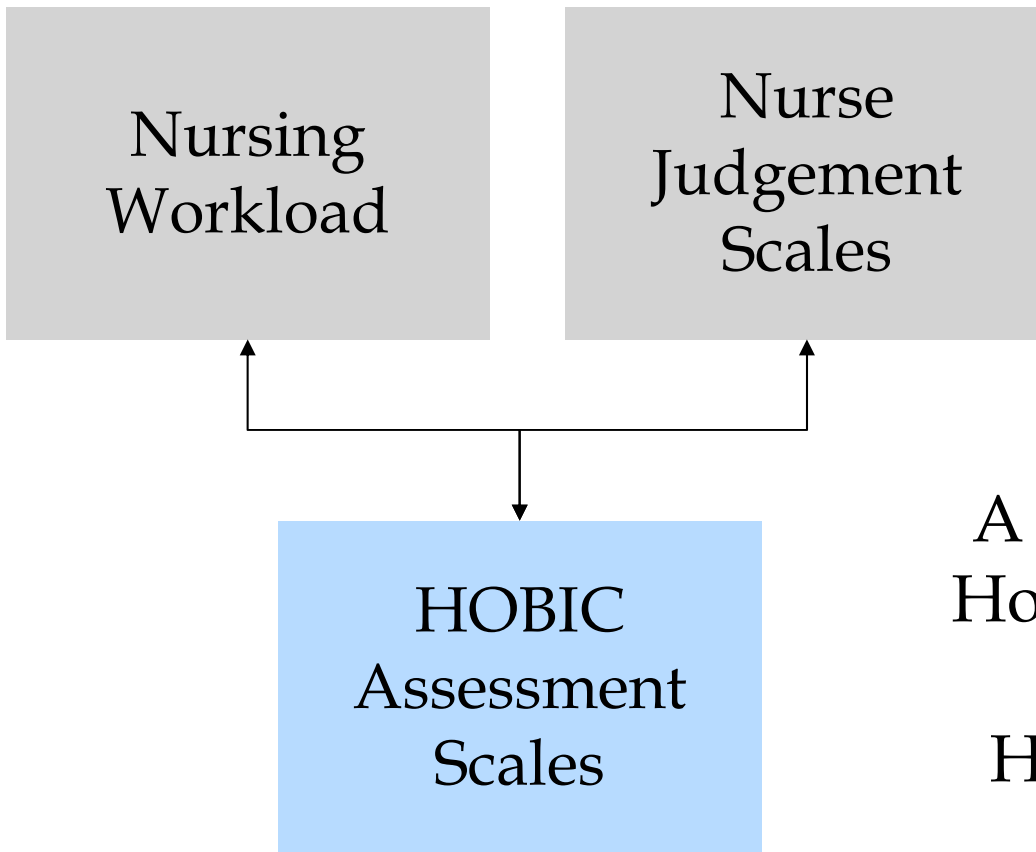
Demonstration sites

14 units
4750 patients



NIAGARA HEALTH SYSTEM
SYSTÈME DE SANTÉ DE NIAGARA
Working within an integrated system for a healthier Niagara.

Data collection



Collected at 3 of the 5 demonstration sites.

Validation
Compared to similar patients admitted to this unit, the amount of nursing time this patient will need in the first 24 hours of admission will be:

How do you feel about these questions? the level of nursing care this patient will need the better the documentation, the better the workload data

very low, low, average, high, very high

Nursing workload in first 24 hours

Facility	Unit	Max	Mean	Min
CGH	Med	332.0	192.9	0.5
	Surg	474.0	198.3	6.0
HDH	2E	3129.0	1271.8	89.5
	2N	2696.5	1145.0	51.2
HHSC	Surg	1039.5	765.9	4.0
	E-wing	1322.3	814.2	55.2
	F-wing	1558.7	783.3	6.5

Validation survey

- 84% would like to continue answering the questions.
- 85% somewhat or strongly agreed that the questions captured their opinion of a patient's workload requirements.
- Almost all (98%) used their assessment and observation skills to answer the questions.
- 38% were willing to answer a short set of questions daily or more often.
- Another 38% were willing to answer the same short set of questions either at admission only or on admission and discharge.

Correlations

Need	1.000
Time	0.895
Level	0.893
ADL	0.467
Continence	0.377
Fatigue	0.315
LOS	0.229
Falls	0.223
Dyspnea	0.111
Pain	-0.009
Nausea	-0.020

The patient's need for nursing care in the first 24 hours will be

ADL, Continence and Fatigue variables were slightly or moderately correlated with the judgment scale

Multi-variate models

Three HOBIC variables explained a meaningful amount of variance in the judgment of the amount of nursing time needed in the first 24 hours.

When considered all together in one model, ADL, CONTINENCE and FATIGUE explained over **25% of the variance**.

Conclusions

- ADL, Continence and Fatigue scales do explain a small amount of the variance in nurse judgment of nursing time, there are other factors that contribute to the amount of nursing time required.
- Nurses can easily provide valuable information regarding the work requirements of their patients.

Next steps

- Are nurse judgment variables valid and reliable?
- Is nurse judgment correlated with the amount of nursing time provided to patients?
- Is there value in collecting nurse judgment on a daily basis?
- Is there a difference between the judgment of RNs and RPNs?
- Does experience affect the judgment ratings?
- Can nurse judgment be used as a variable in a model that predicts the cost of nursing?
- Can ADL, fatigue and continence scales be used in a model that predicts the cost of nursing?

Determining the indicators for decision-making

To determine the indicators that best support nurse leaders to measure nursing work and make informed staffing decisions

To develop a “nursing dashboard” inclusive of indicators which demonstrate the most utility and value to nurses

7 demo sites from across the province



Strategy

Determine the important indicators

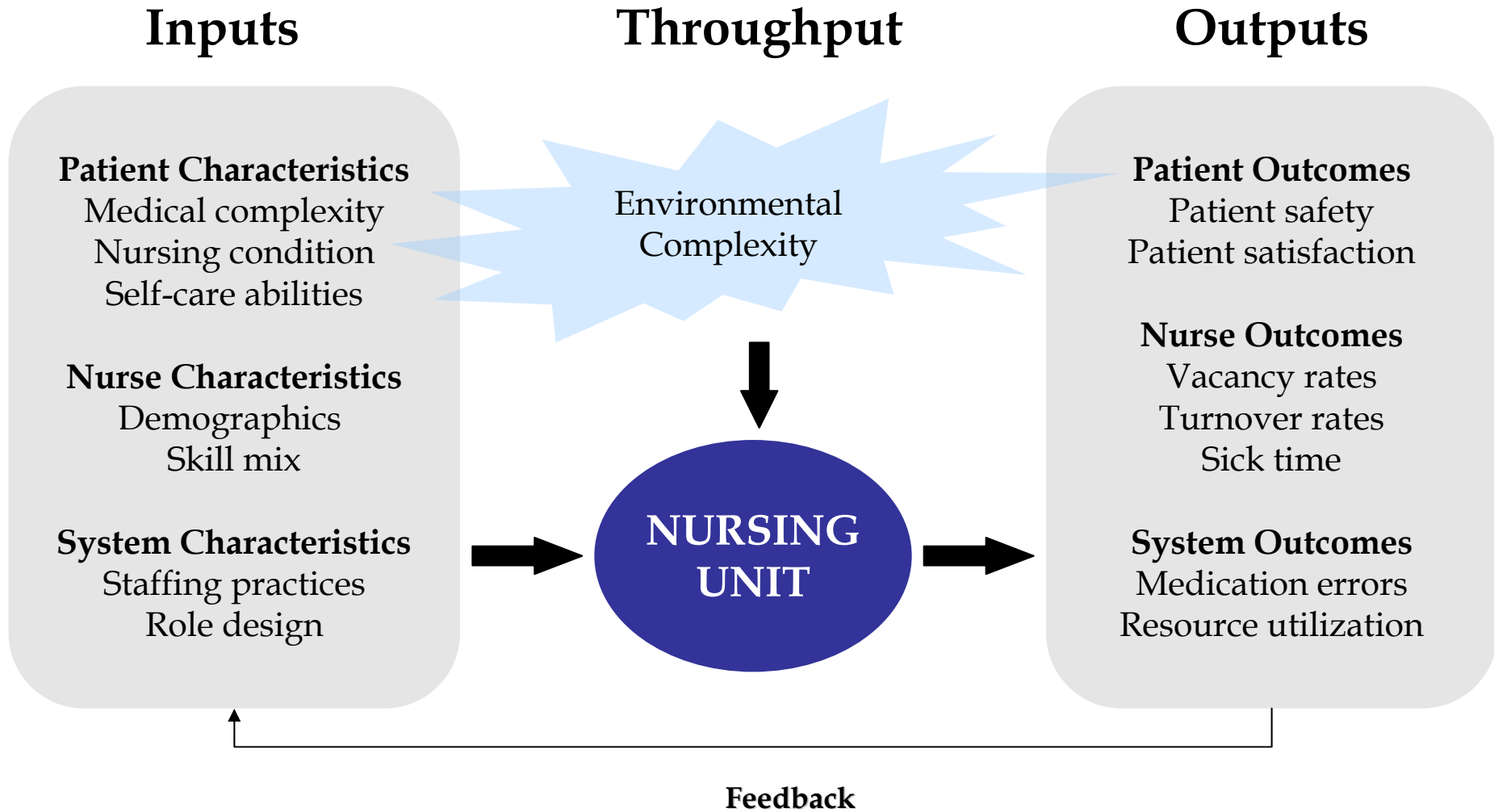
Develop a nursing dashboard

Strategy

Determine the important indicators

Develop a nursing dashboard

Gather and study attributes



Determine preferred attributes

“Wish lists” of attributes that were considered the most important and relevant for making staffing decisions were created.

Once the sites began creating the dashboard, it became evident that some attribute information was unavailable and that new data sources would need to be created in order to gather the necessary information.

Prioritize, rank and validate attributes

Priority

Secondary

Non-priority

Medical severity	Nursing interventions	Job stress
Environmental complexity	Patient volumes	Educational preparation
Nurse experience	Co-morbidities	Patient age
Patient turnover	Patient self-care abilities	Nursing skill mix
Nurse to patient ratio	Physical and psychosocial	Nursing support staff
Cognitive status	Unit type	Falls
Infection control	Medical diagnosis	Nurse to patient ratio
Nurse vacancy		Nurse illness
Predictability of patients		

Strategy

Determine the important indicators

Develop a nursing dashboard

Locate data sources

- Nurse staffing decisions are made at the unit level but most hospital data collection systems have been designed for administrative purposes, at an organizational level.
- Support work on tools for capturing attributes that are currently unavailable, including medical severity and environmental complexity.
- Design and define the parameters for a “nursing dataset” – the first of its kind. The dataset should be based on the most important attributes for decision making, rather than what is currently available via administrative datasets.

Develop indicator definitions

- Using common definitions would assist in unit, program, regional and provincial comparisons.
- Continue to develop and validate clear and consistent indicator definitions for important attributes.

Create an automated process

- Support the creation of a web-based nursing dashboard template that can automatically generate important indicators from the data in the “nursing dataset”. The template should be easily installed and utilized in any hospital site across the province.

Educate nurses

- Nurses currently make daily staffing decisions using their professional knowledge of patient acuity, and the level of experience of the nurses on their unit. Most of the time, hard data is either unavailable or hard to find.
- Design an education session or workshop that can be deployed to nurses and nurse managers throughout the province. The education session should focus on teaching nurses about data and how important indicators can be used to support their decision making.

Predicting the cost of nursing

To develop a model that accurately allocates the cost of nursing care, and takes into consideration all factors that affect the cost of nursing care.

Strategy

Conduct a Time and Motion Study to gain a “gold standard” dataset for the total amount of nursing time received by a sample of patients

Link nursing time data from Time and Motion Study with other data sources to explore predictors

Correlate nursing time data from Time and Motion Study with direct nursing cost data from Case Costing

Use direct nursing cost data from Case Costing to explore predictors

Conduct a Time and Motion study



Leading with Innovation
Serving with Compassion

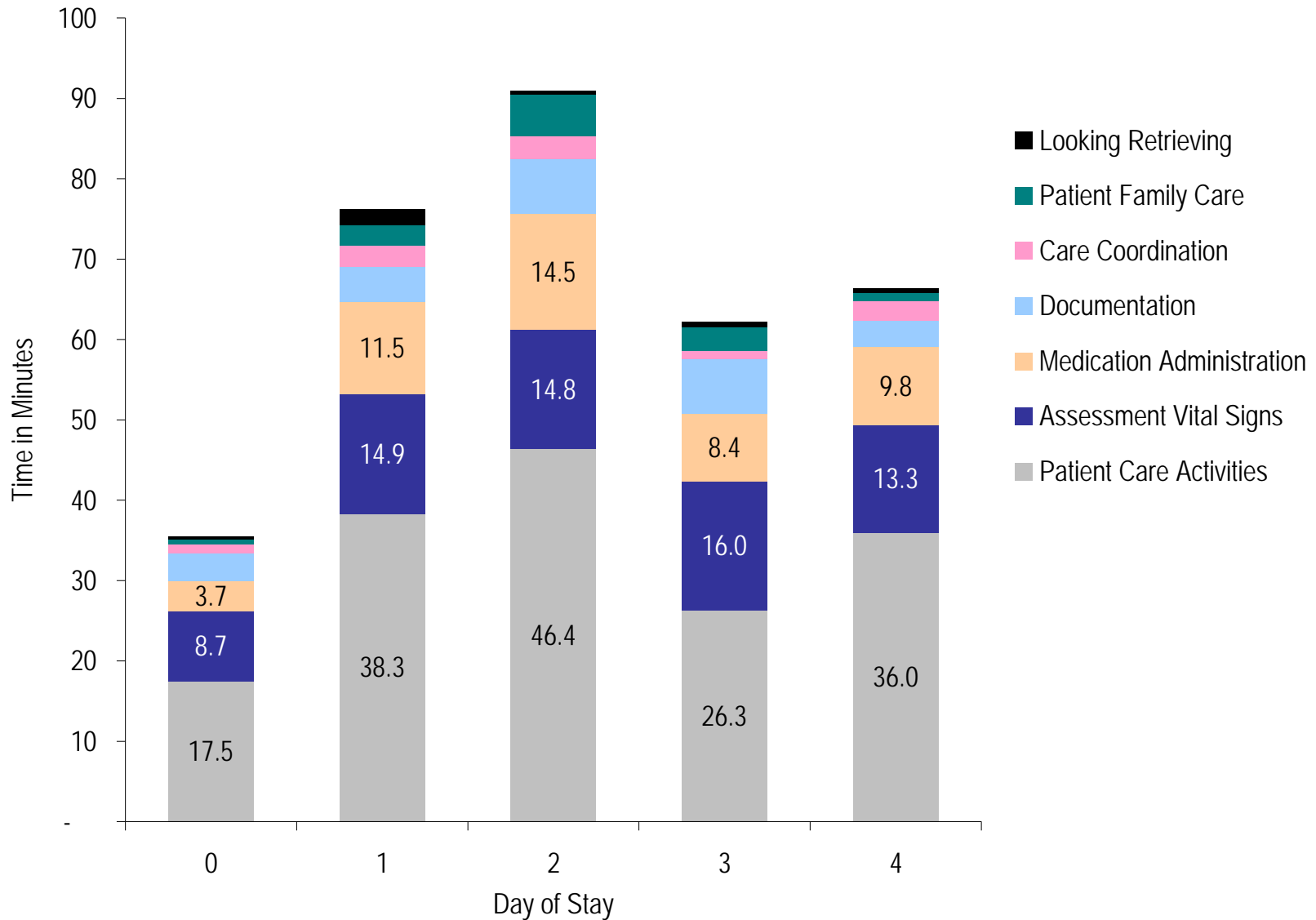
ST. MICHAEL'S HOSPITAL

A teaching hospital affiliated with the University of Toronto



LAKERIDGE HEALTH
Better Together

Conduct a Time and Motion study



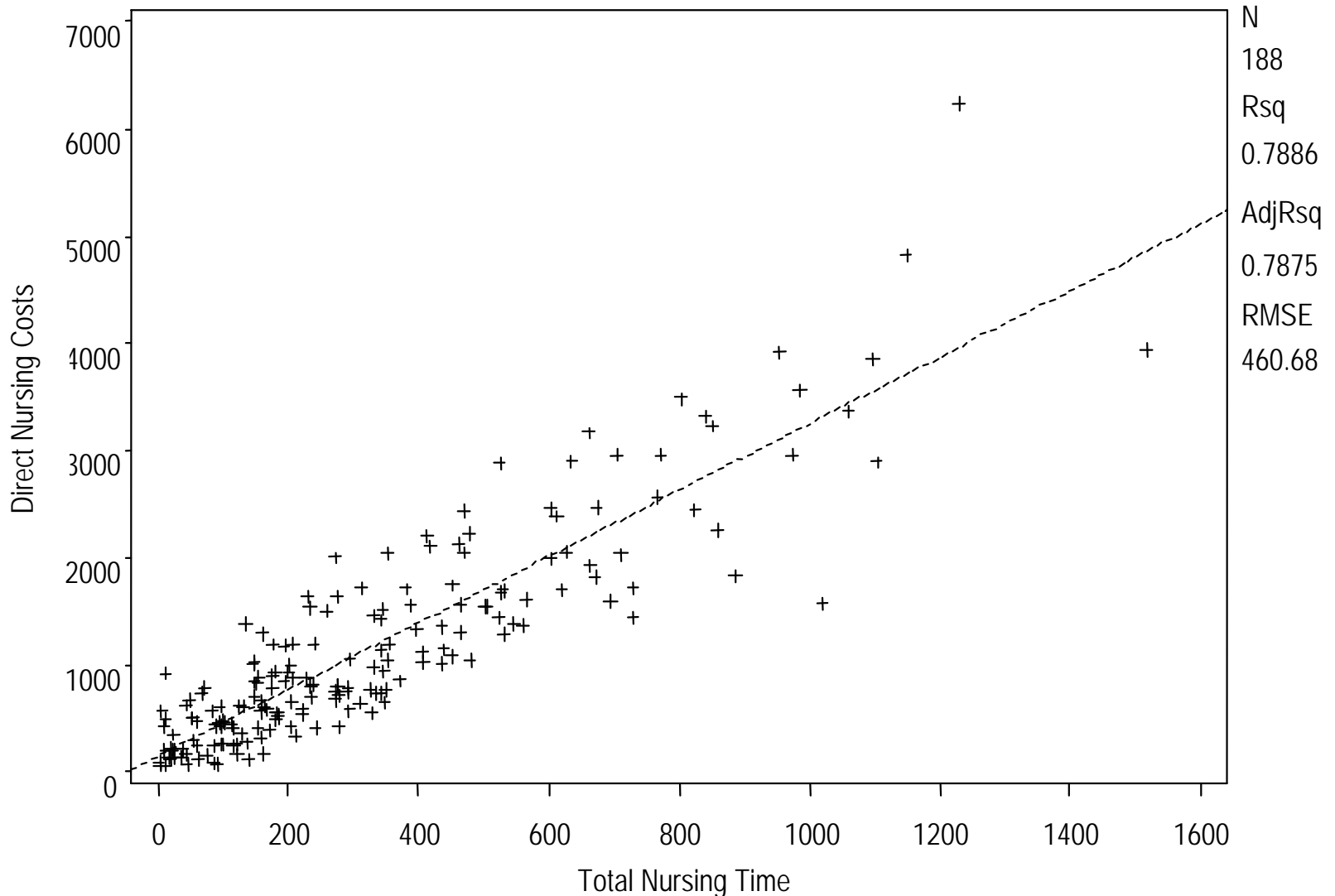
Link Time and Motion to predictors

- Captured the full length of stay of 57 patients
- Length of stay, RIW, diagnostic costs, therapy costs, emergency costs, pharmacy, operating room costs and ICU costs were tested as dependent variables in a linear regression model.
- F values were not significant in any model used to explain the variation in the total nursing time spent for the subset of the 57 patients in the study.
- **Insignificant findings** are likely a result of small sample size.

Correlate nursing time to nursing costs

Direct Nursing Costs = 153.13 + 3.1018

Total Nursing Time



Link nursing cost data to predictors

Length of stay, therapy costs, laboratory costs, diagnostic costs, ICU/CCU costs and pharmacy costs

Unit	n	R-Square	CoVar	RMSE
Medical	6,598	0.73	8.21	0.60
Surgical	11,642	0.69	8.17	0.56
Combined	4,327	0.80	6.63	0.47

Conclusion

- Nursing workload data, from 3 randomly chosen wards, correlates highly with a time and motion study.
- A fairly robust model was developed using existing data sources to estimate nursing input into a patient's costs. The model was able to explain over 70% of nursing resource utilization.
- **We can predict the amount of nursing time required without measuring the tasks conducted by a nurse.**

Next steps

- Test the model against several years of data in other organizations where the a reliable workload measurement system exists.
- Conduct a time and motion study on a randomly selected unit to determine whether the proposed model predicts the cost of nursing.
- Investigate additional patient-level variables that can be easily extracted from an electronic record to determine if they add power to a model.
- Investigate if unit-level variables that explain differences in practice environments may be added to a nursing cost model.
- Increase the number of patient-level variables collected for the Case Costing dataset.

