

# Detecting First Order Operational Failures on a National Level Using the Improvement Science Research Network

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## Overview

- In frontline nursing care, operational failures are encountered frequently; these system defects are met with workarounds in 95% of the cases<sup>1</sup> exposing patients to errors, creating inefficiencies in care, and robbing the system of learning opportunities.
- There is an underutilized opportunity for improvement through leveraging front-line staff experience to identify and resolve operational failures.<sup>2</sup>
- We developed an innovative approach to assist frontline providers in systematically identifying operational failures in their clinical microsystem.

## Significance

- Detection of first order operational failures provides opportunities to fix underlying system failures and contributes to organizational learning.
- The project demonstrates the need for:
  - Academic-practice partnerships
  - Careful investigation of context and systems variables
  - National multi-site studies
  - A unique infrastructure to support landmark quality improvement studies

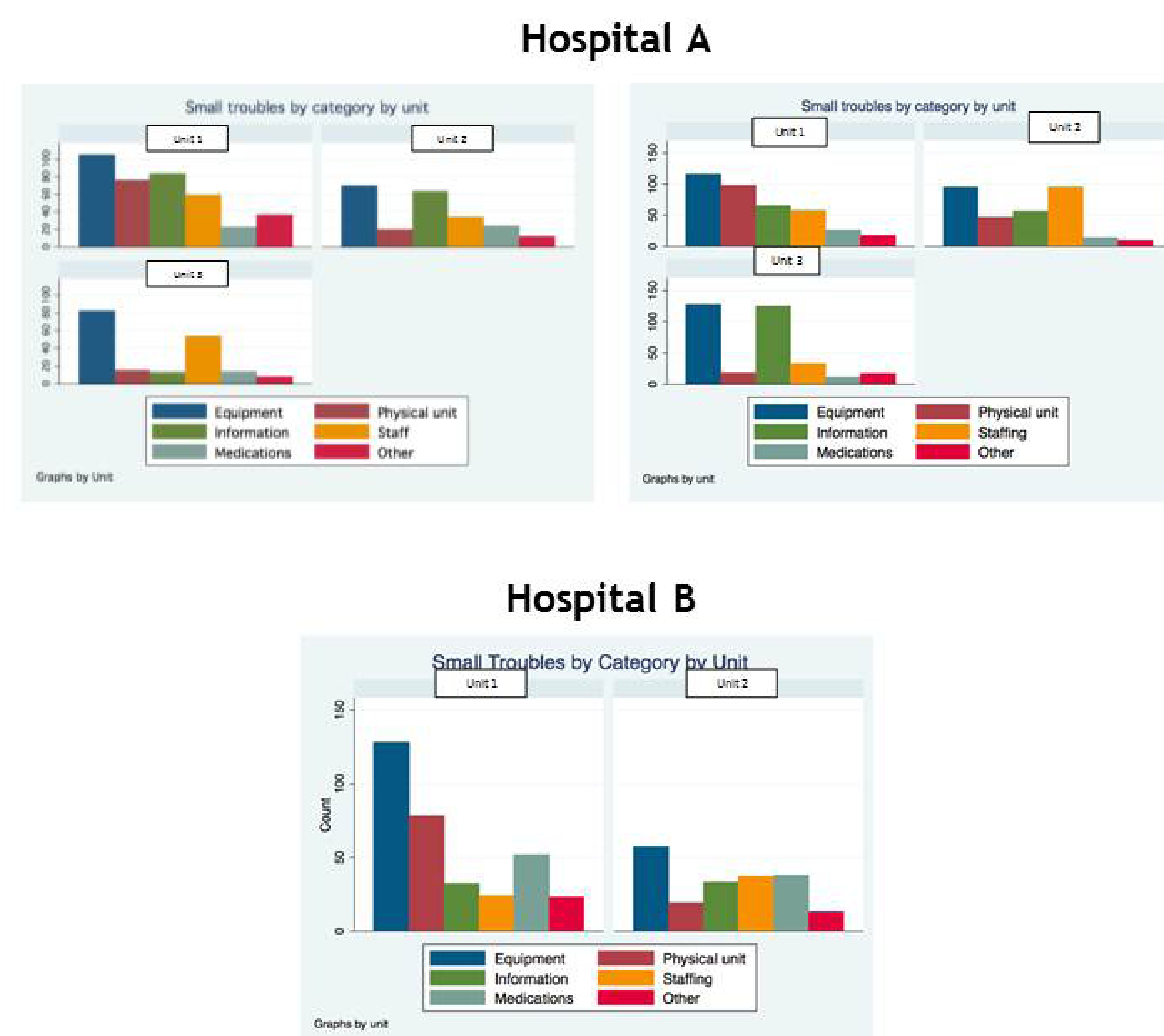
## Study Instrument

- Index-sized pocket cards were used to self report first order operational problems occurring during work shift.
- Staff on 3 local nursing units used the cards to report first order operational failures.
- Small pocket cards were designed and tested; nursing staff recorded in real time the first order operational failures encountered.
- Operational failure categories were developed from prior descriptive work.<sup>2</sup>

## Study Participants and Setting

- Star-1 study population consisted of all nursing staff; Star-2 consisted of full time registered nurses.
- The setting was a 'clinical unit' limited to medical-surgical units with an average patient length of stay of 2 to 4 days.

## STAR-1 Results and Lessons Learned



•Hospital A reported small problems 5.8 times per 12-hour shift (most staff work a 12 hour shift), with the most common categories being equipment/supplies, facilities, and communication

•At Hospital B, small problems were reported 3.6 times per 12 hour shift, with the most common categories being equipment/supplies and medications.

•Type of small problems detected with pocket cards were comparable to those directly observed<sup>2</sup>, with highest failures in equipment/supplies, staffing & communication.

•There were no significant differences in operational failures between intervention and non-intervention units, likely due to the small sample size.

## Transition to STAR-2: National Landmark Study

- The Improvement Science Research Network (ISRN) is a national, virtual laboratory for healthcare QI research.
- The ISRN creates a robust research environment that brings together a network of academic-practice partners to collaborate on IS studies.
- This unique platform is designed to accelerate the development and dissemination of IS in a systems context across multiple hospitals.
- Using the ISRN Collaboratory, STAR-2 was designed to capture a national sample in order to obtain a larger database of operational failures and interacting systems-level variables.
- Fidelity of the protocol is assured through the ISRN's Coordinating Center.
- Using ISRN's unique infrastructure, STAR-2 is able to capture a large, national sample through multiple study sites that are associates in this virtual research network.



Pocket Card

Tools to Assure Fidelity of Study

## STAR-2 Results

- Preliminary results from six clinical units show similar findings to STAR-1 with the most common categories being equipment/supplies and medications.
- A total of 45 additional clinical units from a maximum of 15 ISRN hospitals were recruited for this study.
- Approximately 20 nurses (RNs) are nested in each clinical unit leveraging a minimum of 900 nurses and 6,300 shifts represented in operational failure detection.

## Discussion

- The ISRN provides valuable resources in conducting multisite, quality improvement research.
- This infrastructure enabled the STAR study to capture a national sample to enhance the quality of research and raise scientific rigor.
- Moving improvement science research from small, local samples to larger, national units of analysis facilitates the development of interventions that are STEEP Based.

## References

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