Quantifying Nurse Workload and Care Quality with Simulation: Future Health Human Resources Decision Support Tools

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better work better care coalition

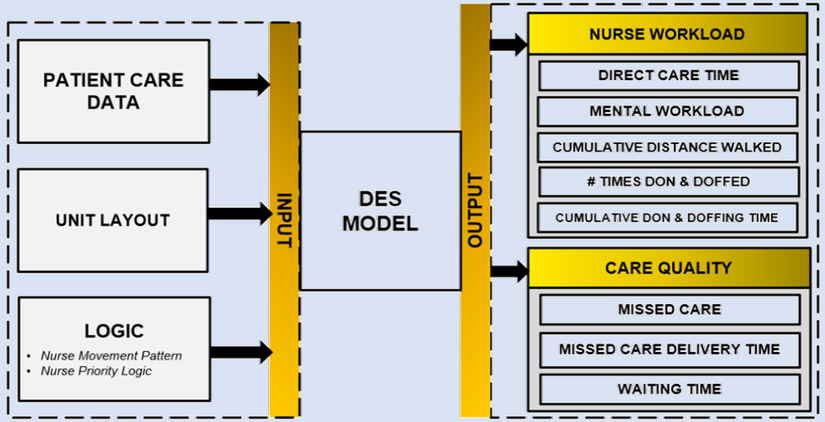
Background

- Globally nursing workload has been exacerbated by the COVID-19 Pandemic
- Workload conditions are unsustainable
- Urgent need to quantify nurse workload under pandemic outbreaks such as COVID-19

Objective

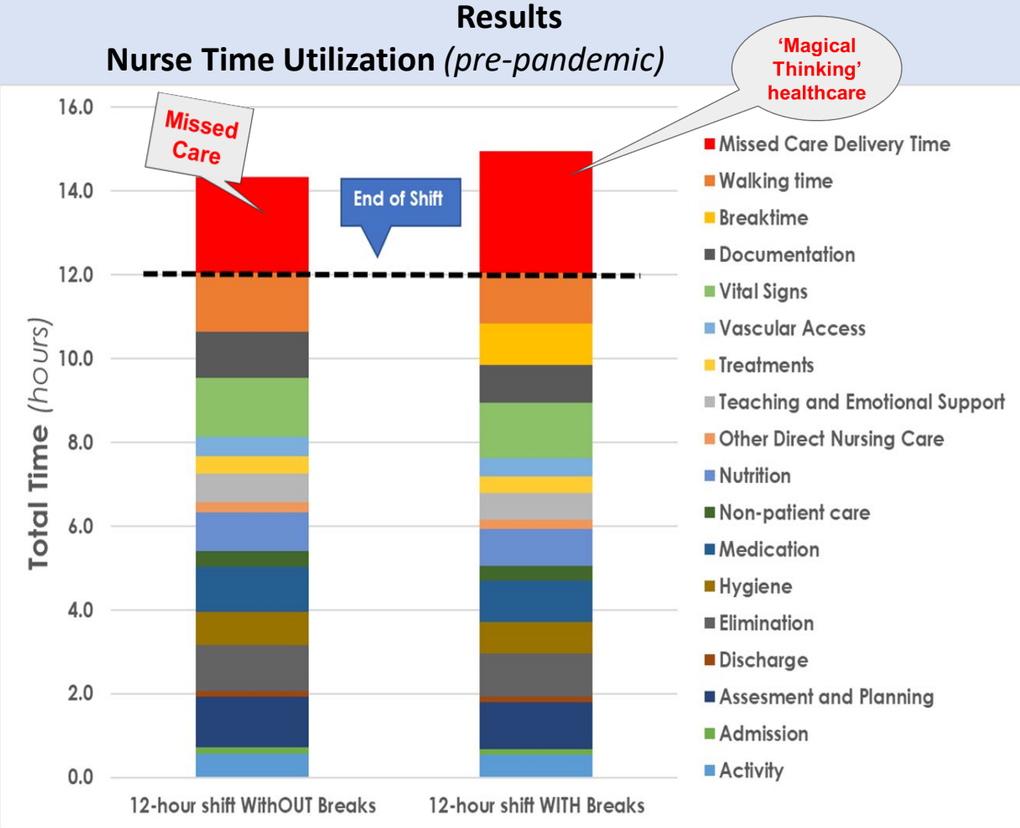
- To design a tool to test various organizational design and staffing policies while caring for COVID-19 patients and to determine the impact of these decisions on nurse workload and quality of care

Approach: Discrete Event Simulation (DES) Model

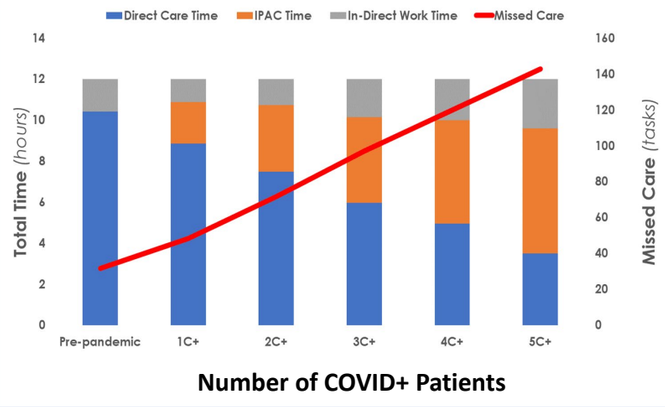


Results

Nurse Time Utilization *(pre-pandemic)*



Impact of IPAC Routines on Care Quality



- 14-hours of tasks in a 12-hour shift
- Nurses walk up to 12 km/shift
- Increased nurses' workload resulted in delayed and missed care
- More COVID-19 patients = increased missed care

Conclusions:

- COVID-19 infection control routines significantly increase nurse workload and negatively impact care quality (e.g., missed and delayed care)
- Overworked nurses cannot complete essential patient care in 12-hour shifts
- DES modeling capability allows quantification of the impacts of changing work conditions and offers potential as a decision support tool for healthcare leaders and policy makers

Daphne Cockwell SCHOOL OF NURSING

HFE Industrial Engineering R&D Human Factors Engineering Lab

UHN Toronto General Toronto Western Princess Margaret Toronto Rehab Michener Institute

CIHR IRSC Canadian Institutes of Health Research Instituts de recherche en santé du Canada

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