Determining Nurse Aide Requirements to Provide Care Based on Resident Workload:
A Discrete Event Simulation Model

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Link:

http://authors.elsevier.com/a/1TwP45QyCpsdVb

Vision

Use a validated method to plan and manage long term care staffing

Background

1. High variability in nurse aide staffing

2. About 25% of nursing homes in the US < 2.1 HPRD

3. No objective method to plan staff based on resident workload

4. No effective method to experiment with management interventions to improve staff efficiency

Discrete Event Simulation

- Systems engineering approach that models realistic work environments

- Recommended by IOM as method to improve health care (2005)1

- Widely used in and outside health care

- First used in NHs to determine staffing in 2001 CMS report on minimum staffing2

Source:
1. Dittus RS. Discrete-Event Simulation Modeling of the Content, Processes, and Structures of Health Care. In: Reid PP, Compton WD, Grossman JH, Fanjiang G, eds. Building a Better Delivery System: A New Engineering/Health Care Partnership. Washington (DC); 2005
2. US Centers for Medicare and Medicaid Services, Prepared by Abt Associates Inc. Appropriateness of Minimum Nurse Staffing Ratios in Nursing Homes. Report to Congress: Phase II Final. Volumes I-III. 2001 Baltimore, MD: CMS

How will this work?

Kindly refer to Table 2. of the article

1. <u>Define Resident ADL Care Needs</u>
   - MDS identifies residents needing supervision to full assistance in each ADL care area
   - Two-person assists can be considered

2. <u>Define Schedule of Care</u>
   - E.g., Incontinence care every two hours for people who require toileting assistance

3. <u>Define time to provide episode of care</u>
   - Variability is key factor driving staffing needs *(Table 2)*

How will this work?

Kindly refer to Table 2. of the article

4. <u>Define other work conditions</u>
- Random events (e.g. call lights)
- Travel times
- Care windows (e.g. 2 hours for meals)

5. <u>Describe time available to provide care</u>
- Number of staff
- Productivity estimates
- All time available providing care minus meal breaks

Activities of Daily Living (ADL) Care Required

RESIDENT WORKLOAD CATEGORIES (Prevalence)	WORKLOAD DESCRIPTION	Activities of Daily Living (ADL) CARE REQUIRED				
		Incontinent Toileting Assistance	Repositioning Assistance	Eating Assistance	AM/PM Dressing Hygiene Assistance	Exercise or Range of Motion
1 (3.6%)	Lightest	NO	NO	NO	NO	YES
2 (3.6%)	Light	NO	NO	NO	YES	YES
3 (1%)	Moderate	NO	NO	YES	YES	YES
4 (21.2%)	Heavy	YES	YES	NO	YES	YES
5 (60.2%)	Heaviest	YES	YES	YES	YES	YES
6 (1.4%)	Moderate	YES	NO	NO	NO	YES
7 (7.9%)	Heavy (Bedbound)	YES	YES	YES	YES	YES

Time to provide care

Exercise for people with independent mobility

- Triangular distribution 10, 15, 20 minutes

- 3 times per week: people with PT do not receive

- 8 hour care window expires at 10 pm

Define Work Scenario for Specific Home

- Resident workload categories

- Time to provide care *(Table 2)*

- Schedule of care and care window times *(Table 2)*

- # of aides (e.g. 2.4 HPRD)

- Productivity (e.g. No breaks, 7.5 hours providing care)
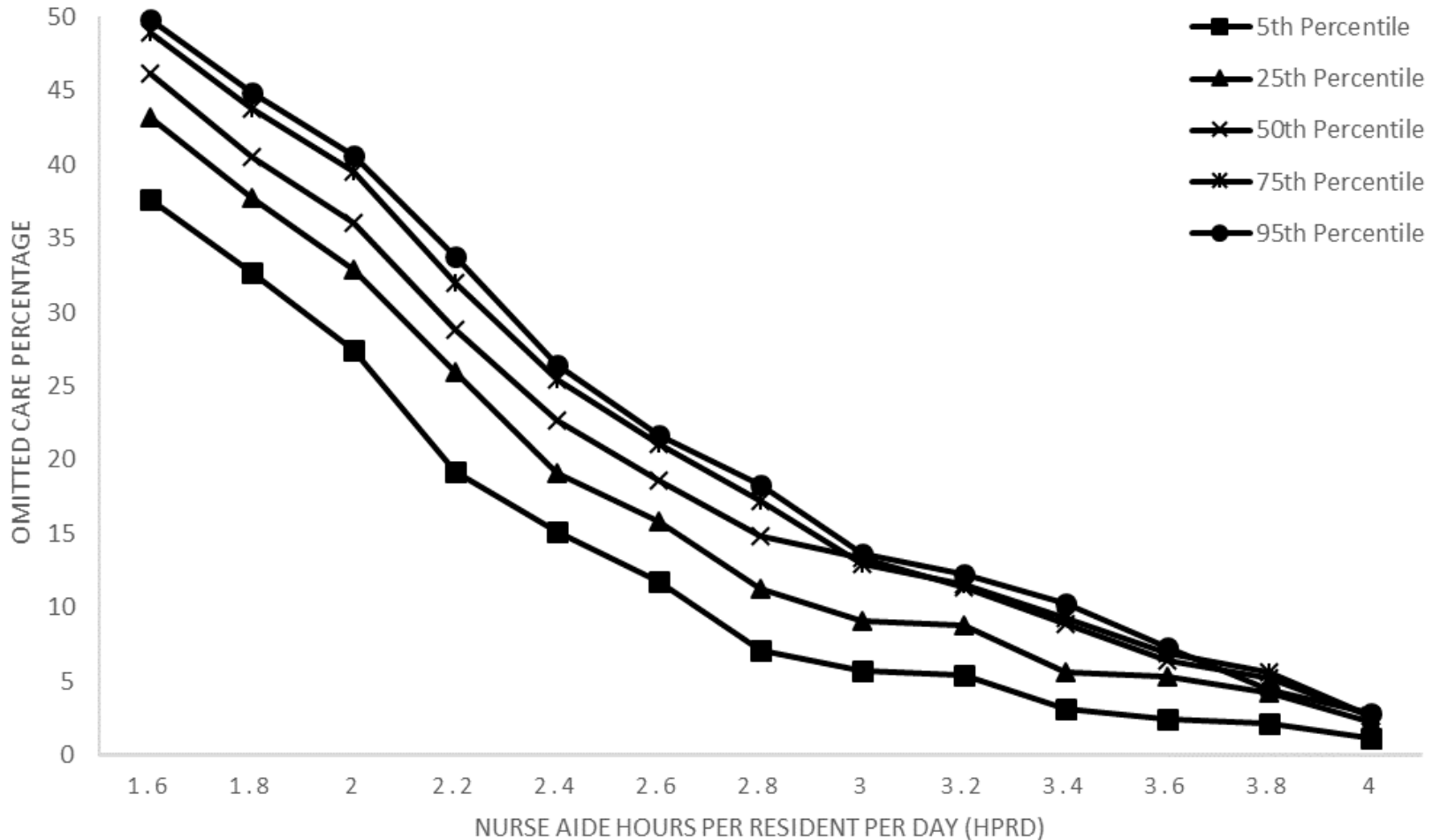
- No two person assists

- **Simulation** – 100 replications over 3 week period
  - **Outcome** – Omitted care time
- All care delivered divided by all care scheduled

Click icon to add picture
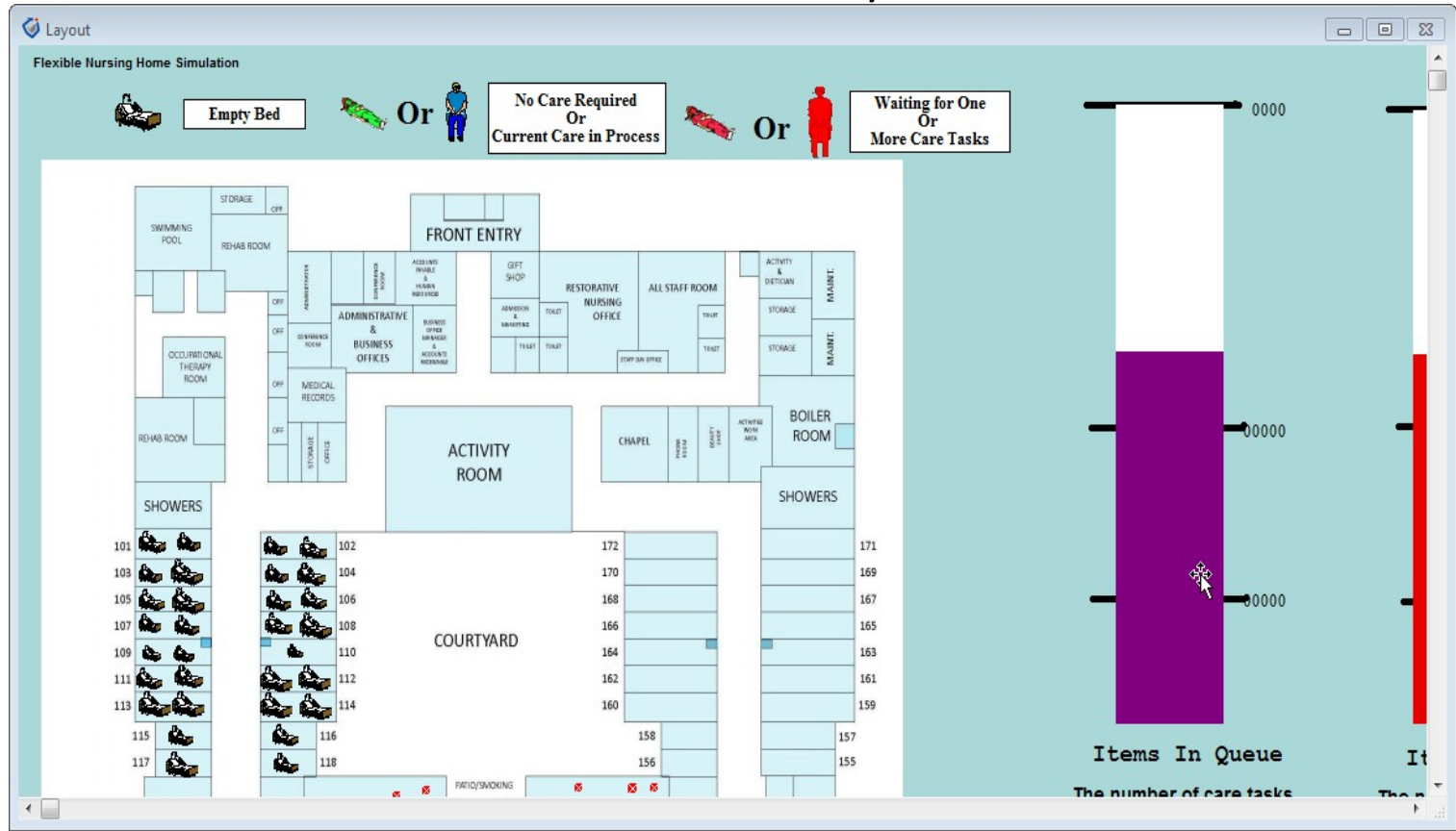
Omitted Care: By Workload & Staffing Levels

FIGURE 1: PERCENTAGE OF OMITTED CARE BY WORKLOAD PERCENTILE AND STAFFING LEVEL

Applications of this approach

Consumer Information

- Quarterly omitted care time for each home based on quarterly staffing and MDS reports

- Other outcomes – waiting times for care in each ADL care, % of tasks completed in each ADL care area

Applications of this approach

Develop Online Management Tool to test

- Different staffing levels

- Different staffing models (e.g. part-time staff)

- Different care schedules

Thank you!

Questions?

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