Health Work
Research Group

University of Southampton

Safe staffing : Understanding the “size and shape” of the nursing workforce

Health economics, decision making under uncertainty and workforce epidemiology….

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- The views expressed are those of the author(s) and not necessarily those of the NICE, the Department of Health and Social Care, arm's length bodies or other government departments.


WHAT'S YOUR
MAGIC NUMBER?

Evidence for the association between nurse staffing levels and patient outcomes

"…compelling…"

- (UK Royal College of Nursing, 2010)

"…overwhelming…"

- (US Joint Commission, 2005)

Summary conclusions from NICE evidence review….

Nurse staffing	• Higher nurse staffing levels associated with lower mortality, fewer falls, less reports of missed care, shorter stay. Mixed evidence on pressure ulcers and drug errors
Skill mix	• A skill mix that is richer in RNs is associated with improved outcomes, including mortality
Assistant staffing (e.g. HCA)	• Higher assistant staffing levels associated with higher rates of falls, pressure ulcers, readmission rates, medication errors, use of physical restraints and lower patient satisfaction

*"**There is a lack of high-quality studies** exploring and quantifying the relationship between registered nurse and healthcare assistant staffing levels and skill mix and any outcomes"*

(NICE Safe staffing guideline (SG1) 2014)

NICE evidence review 2014

From 1993 ***hundreds*** of studies and several reviews looking at nurse staffing, skill mix and outcomes…

Many *very large* studies

Most had ***significant limitations***

All studies ***observational,*** **most *cross-sectional***

Nurse staffing, missed vital signs and mortality

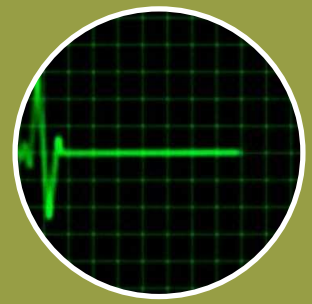
One NHS Trust

Three years

32 general (med / surg) wards

33,000 ward X days of staffing

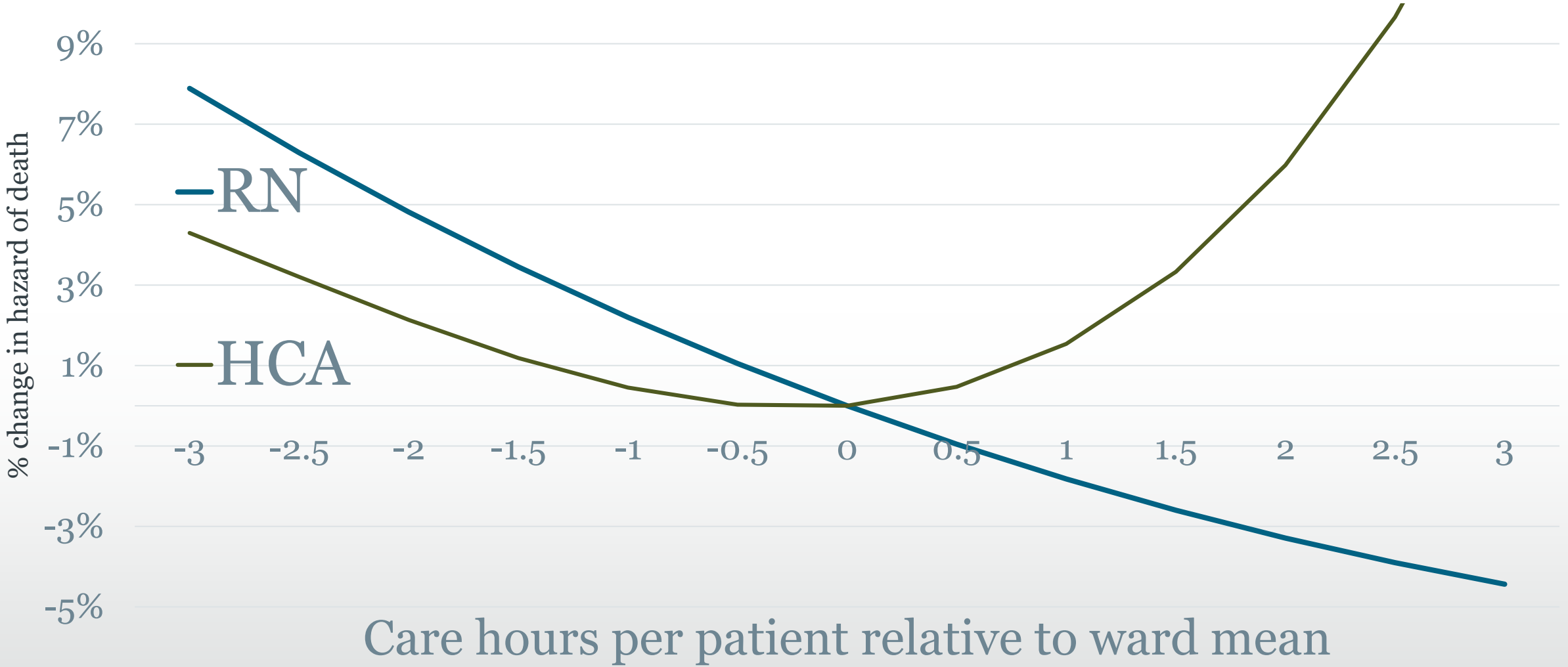
138,000 patients



3,367,000 sets of vital signs observations

Griffiths et al BMJ Quality and Safety DOI: 10.1136/bmjqs-2018-008043
Griffiths et al Health Services & Delivery Research Journal 2018 6, (38)

Effects of variation in staffing levels on mortality



+1 RN Hour Per Patient Day

@WorkforceSoton

+£10 million staffing costs

219 fewer deaths per year

+2% £219 per patient

£47,376 per life saved

10,636 bed days saved

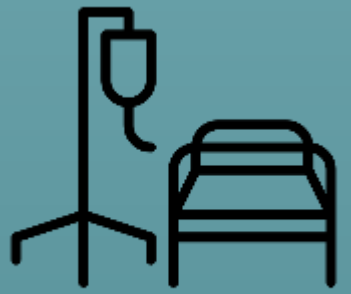
Change staffing / skill mix to reflect establishment

+£1.3 million
staffing costs

50
fewer deaths per year

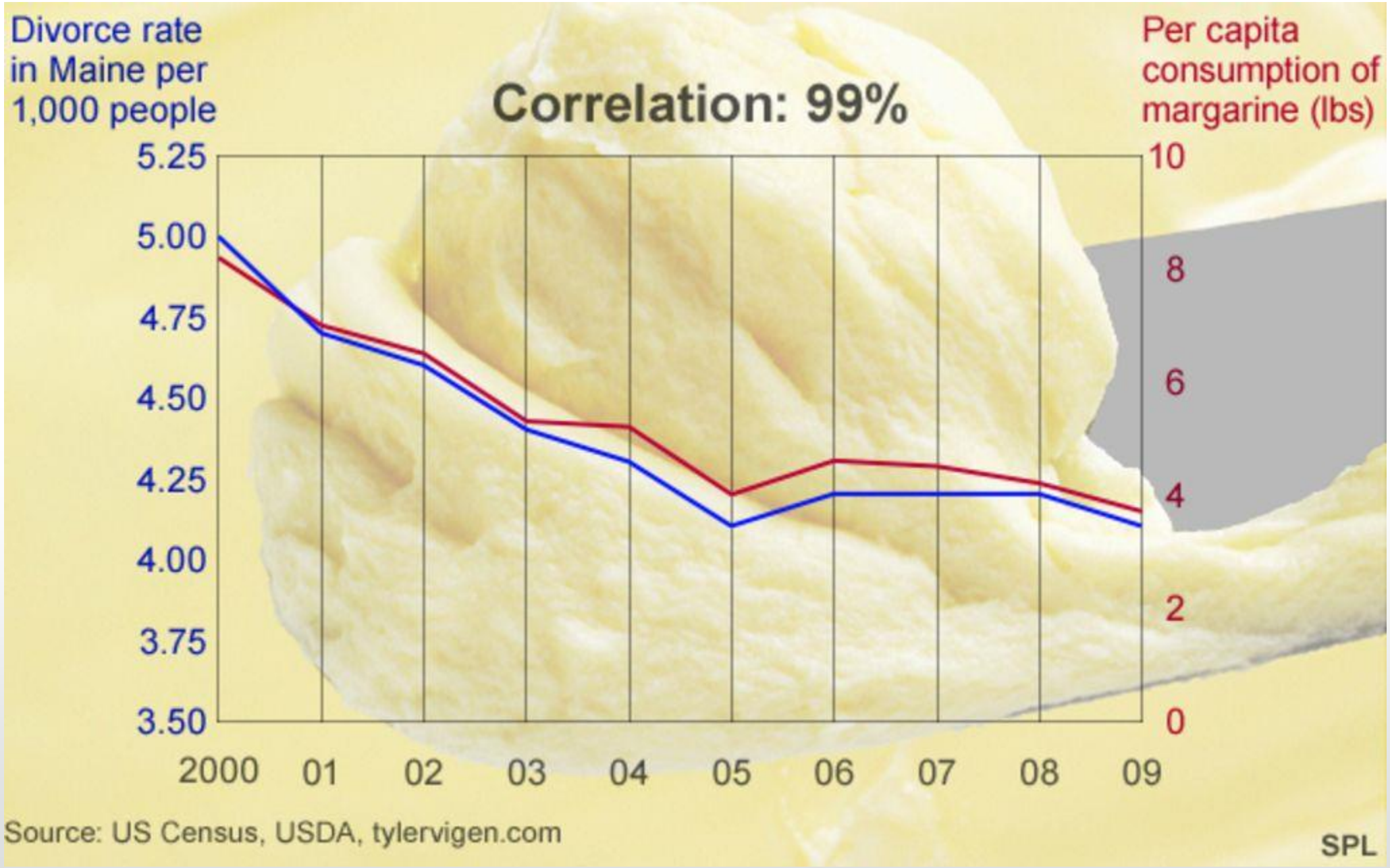
<0.25% £28 per patient

£-486
per life saved



4464
bed days saved

Net saving £24000


Divorce rate in Maine per 1,000 people
Correlation: 99%
Per capita consumption of margarine (lbs)
5.25
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4.25
4.00
3.75
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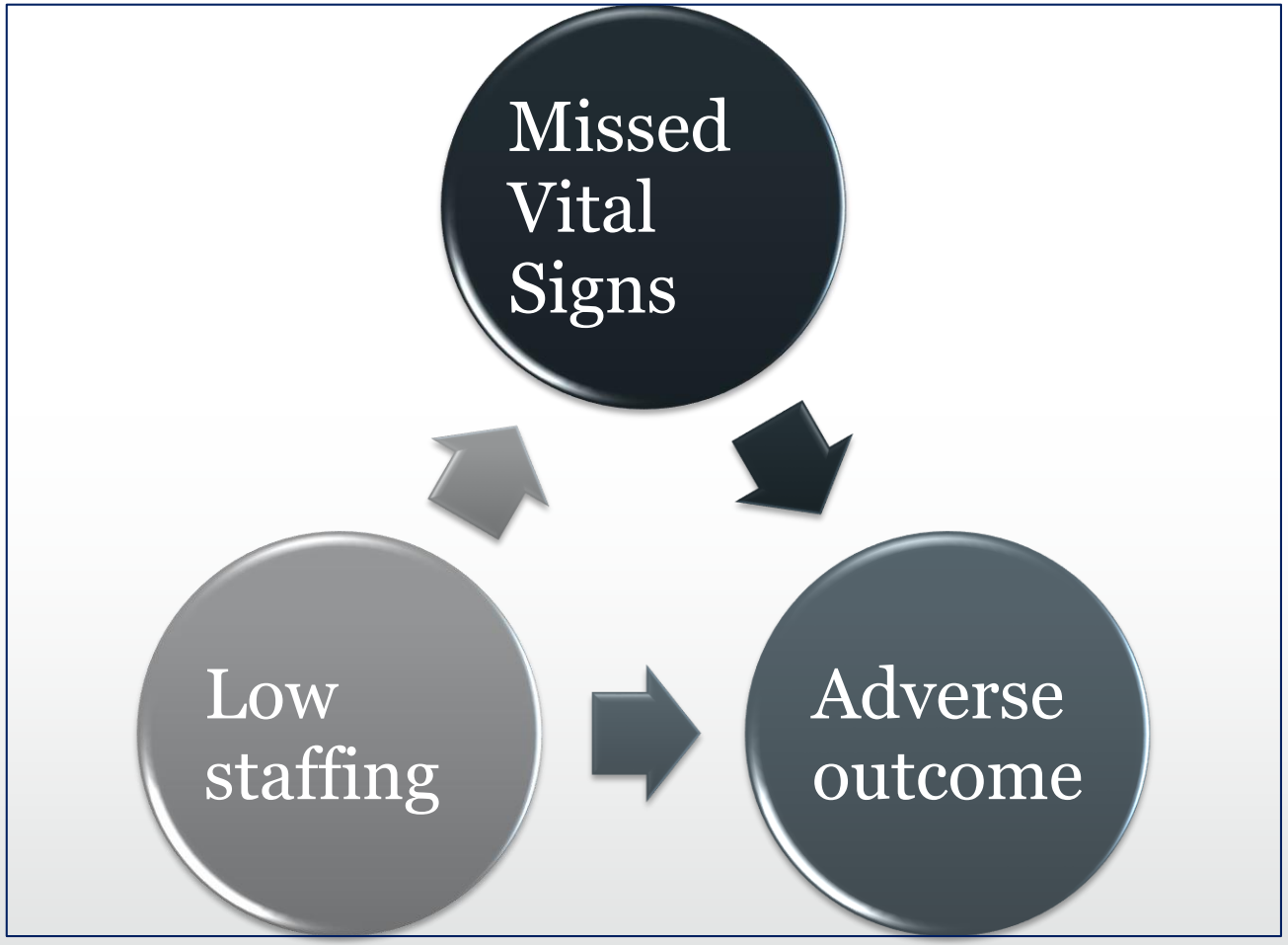
Source: US Census, USDA, tylervigen.com
SPL

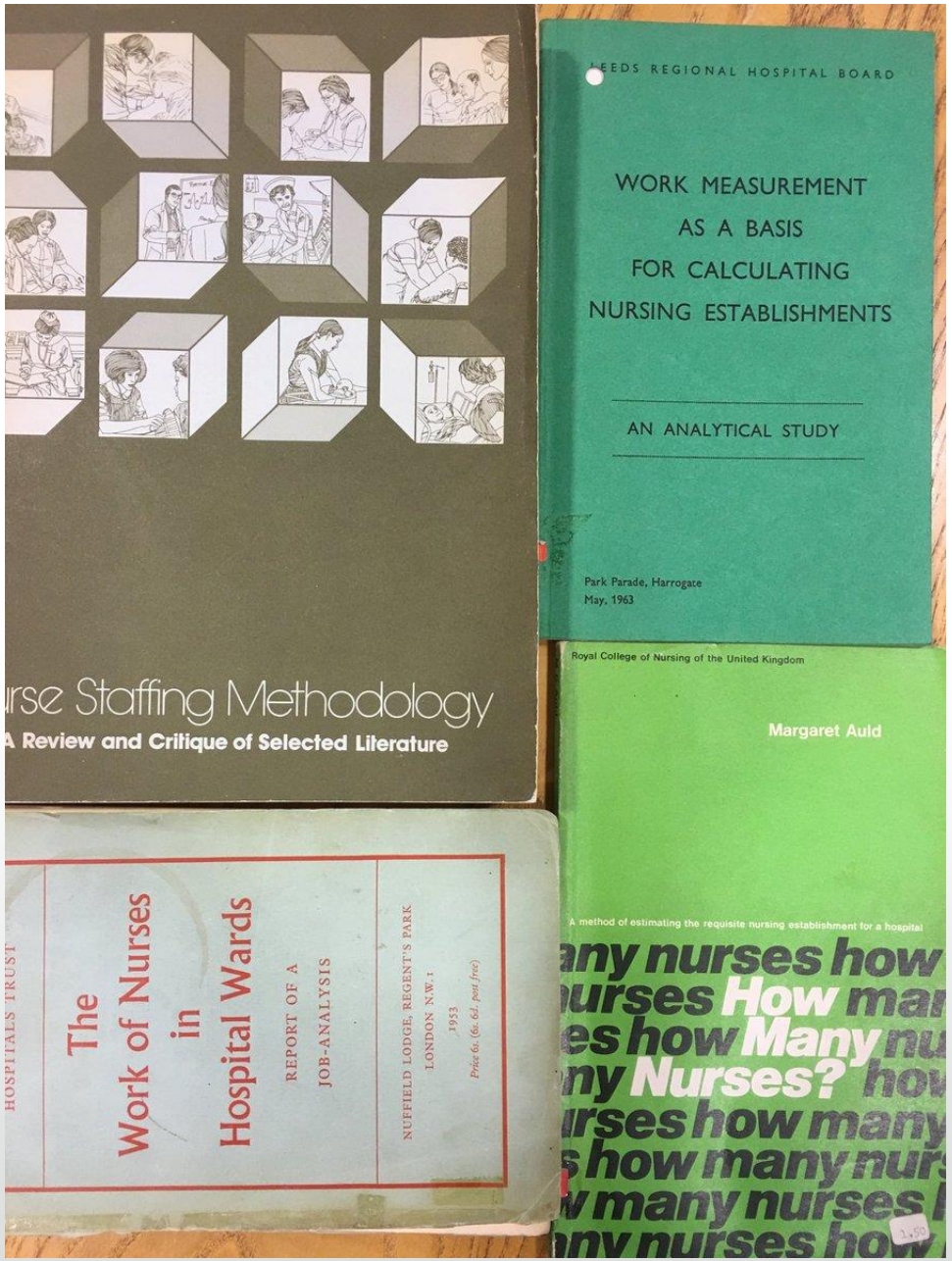
Causal Mechanism?

- Missed vital signs mediates the relationship between low RN staffing and mortality
- NOT the relationship between low HCA staffing and mortality nor RN hours and mortality



Strength (effect size)	• Many of the observed effects are quite small
Consistency & reproducibility	• Findings replicated in a range of different settings and populations & overall evidence is quite consistent
Specificity	• The strongest evidence is on an outcome (mortality) that is NOT specific.
Temporality	• Increasing longitudinal evidence - cause precedes effect
Biological gradient	• Some evidence of plausible dose response relationship
Plausibility	• Plausible mechanisms have been hypothesised & demonstrated
Coherence & analogy	• Evidence that omissions in care associated with adverse outcomes
Experimental evidence	• Limited

"*To my knowledge, it has not been proven that cigarette smoking causes cancer*…there is, you know, in scientific terms, there are hurdles related to causation, and at this time there is no evidence that - they have not been able to reproduce cancer in animals from cigarette smoking" (William Campbell, then President and CEO of Phillip Morris quoted in the NYT December 6, 1993."


LEEDS REGIONAL HOSPITAL BOARD
WORK MEASUREMENT
AS A BASIS
FOR CALCULATING
NURSING ESTABLISHMENTS
AN ANALYTICAL STUDY
Park Parade, Harrogate
May, 1963
rse Staffing Methodology
A Review and Critique of Selected Literature
Royal College of Nursing of the United Kingdom
Margaret Auld
A method of estimating the requisite nursing establishment for a hospital
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HOSPITALS TRUST
The
Work of Nurses
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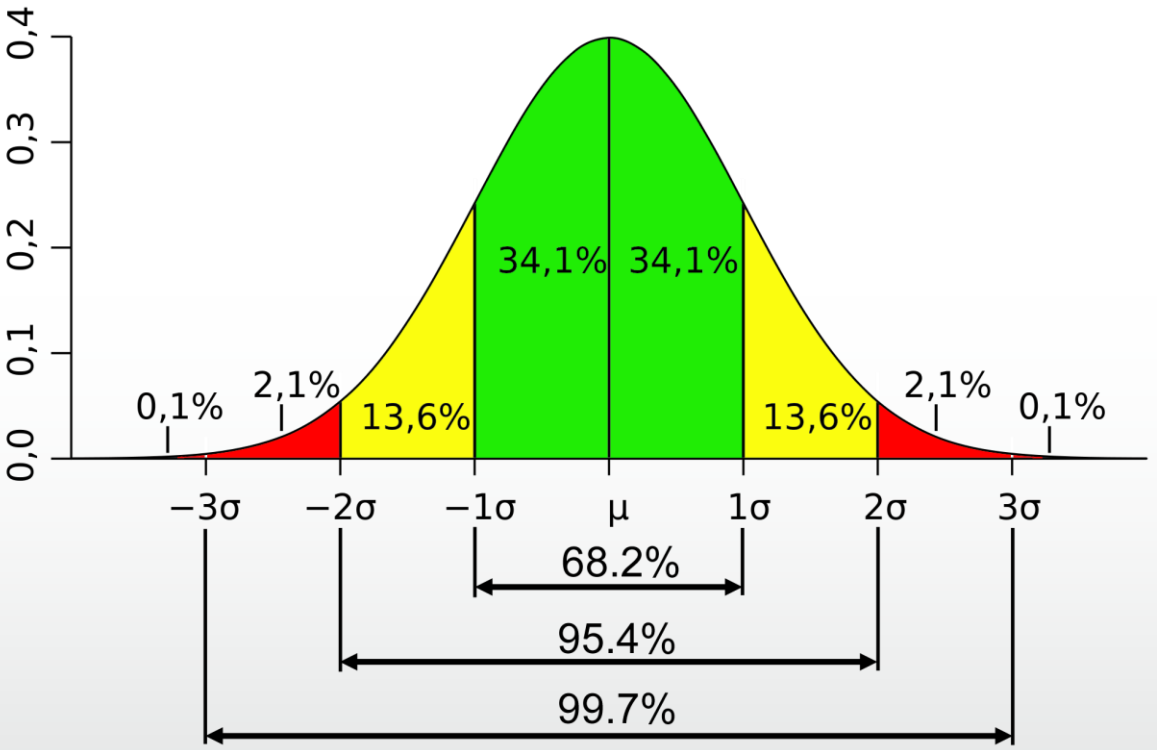
JOB-ANALYSIS
NUFFIELD LODGE, REGENT'S PARK
LONDON N.W.1
1953
Price 6s. (6s. 6d. post free)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68.2%
95.4%
99.7%

What next and what more?

- More generalizable economic evidence
- Allied health professionals
- Outside acute general hospitals
- Staffing tools and methodologies
- Sensitive & specific quality indicators
- New roles & better understanding of risks

	High RN HPPD	Target RN HPPD	Low RN HPPD
High HCA HPPD	Overall capacity high. Supervisory capacity balanced with demand (skill mix) but high demand for delegation	Overall capacity high. Supervisory capacity not balanced with demand (low skill mix) AND high demand for delegation	Overall capacity medium or low. Supervisory capacity not balanced with demand (low skill mix) AND high demand for delegation
Target HCA HPPD	Overall capacity high. Supervisory capacity exceeds demand (skill mix) expected demand for delegation	Overall capacity medium. Supervisory capacity balanced with demand (skill mix), expected demand for delegation	Overall capacity low. Supervisory capacity not balanced with demand (skill mix) AND high demand for delegation
Low HCA HPPD	Overall capacity medium. Supervisory capacity exceeds demand (skill mix) low demand for delegation	Overall capacity low. Supervisory capacity exceeds demand (skill mix) low demand for delegation	Overall capacity very low. Supervisory capacity balanced with demand (skill mix), expected demand for