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## Mortality and Nursing Matters

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# Nursing Matters!



Nursing Numbers Matter

Nursing Character Matters

Nursing Environment Matters

# Numbers Matter!



# PATIENT TO NURSE RATIO

Systematic Review 28 Studies 232 342 patients

4 : 1 v's 8 : 1

1000 fewer deaths

(Aiken et al, 2002)

1 to 5 fewer deaths  
per 1000 inpatient days

(Agency for Healthcare Research & Quality, 2013)

# EUROPEAN UNION

(Belgium, England, Finland, Ireland, Netherlands, Norway, Spain, Sweden, Switzerland)

## RN4CAST Study

9 Countries, 300 hospitals 422 730 patients

Increase workload by **1** patient

Increased the likelihood of mortality by

**7%**

(odds ratio 1.068, 95% CI 1.031–1.006)

(Aiken et al 2014)

# Ave Patient : Nurse Ratio



South Korea	11.4: 1
USA	5.7: 1
Finland	5.5: 1
Sweden	5.4: 1
Norway	3.7: 1

(Cho, E. et al, 2014)

# After hours



- During the day 6:1 to 9:1
- After hours range 9:1 to 18:1
- Highest ratios occurred weekends

(Wood S, 2014)

(Neuraz A et al, 2015)





Table 12: Day-of-the-Week Mortality following Hospital Admission with One or More General Anaesthetics by Admission Type (Weekend and Combined Weekdays), New Zealand 2009–2013

ADMISSION TYPE	Deaths		Admissions		Mortality per 100 Admissions (%)	
	Weekdays (Combined)	Weekend	Weekdays (Combined)	Weekend	Weekdays (Combined)	Weekend
<b>Day-of-the-Week Mortality following One or More General Anaesthetics</b>						
Acute	3,845	1,118	228,629	65,121	1.68	1.71
Elective	1,698	94	906,992	10,617	0.18	0.89
<b>Total</b>	<b>5,543</b>	<b>1,212</b>	<b>1,135,621</b>	<b>75,738</b>	<b>0.49</b>	<b>1.60</b>

Numerator: NMC and NMDS: Thirty-day deaths following a general anaesthetic.  
Denominator: NMDS: All hospital admissions with at least one general anaesthetic.

# New Zealand



- DHB nurses increased by 18% (2008 – 2014)
- Admissions increased 16% (last 3 yrs)
- Cases & care more complex

(Nursing Review April/May 2014)

Not uncommon **7:1** patient nurse ratio

(Stuff.co.nz. 28<sup>th</sup> May 2014)

# New Zealand



- Safe Staffing and Healthy Workplaces Unit (SSHU)
- Care Capacity Demand Management (CCDM) TRENDS programme



- 6 wards in 2 DHB's
- 734 shifts
- 24 % met staffing targets

Exposing a patient to below target staffing associated with a **2 – 7%** increase in mortality.

(March 2013 AHRQ)



## SURGICAL SETTING

Most Sensitive Nurse Staffing

(March 2013 AHRQ)

# High volume, high cost surgeries AAA & AVR

No mortality advantage in high volume hospital with poor nurse staffing.

(Arkin et .al. , 2014)

(Wiltse Nicely et. 2013)





Brunman

Now remember, if you start bleeding call us *immediatley*.  
If no one answers keep trying. Your call is very important  
to us.



# Nurse Surveillance

Around the clock observation, assessment, recognition and interpretation of patient data for the early detection and prevention of adverse events.



## Early Warning Scores

Clear signs and symptoms of heralding arrest often exist on average **6 hours** before yet goes unrecognised and/or unappreciated.

(Agency for Healthcare Research & Quality, 2013)



**1/3** of cases where patients met the criteria for a rapid response call the call was not made.

(Mora et al, 2016)



POMRC



HEALTH QUALITY & SAFETY  
COMMISSION NEW ZEALAND

A failure to rescue  
is  
a preventable death

# Character Matters!



# Qualification matters

- 2003 California mandated 4:1 in surgical wards
- Did not mandate the qualification of those nurses (LPN or EN equivalent)

Increasing nurse hours over all without increasing the **skill mix** had no significant effect on patient outcomes.

# Health Care Support Worker (HCSW)

Hospitals with more unregistered nursing support workers (HCSW) per bed had higher mortality rates.

(Duffield et al 2014)

(Griffith et al 2016)





## Education matters

- **10 %** increase in bachelor degrees
- **7%** decrease in likelihood of death

(RN4CAST Study, 2014)

# Why?

Nurse with analytical decision making style

**2x** as likely to call RRT than intuitive decision making style.

Analytical thinking is taught

(Parker C, 2014)

# University graduates

USA	China	South Korea	Thailand	Japan	NZ	UK	Canada	Germany
45%	20%	43%	87%	17%	47%	11%	15%	16%

# Place of training matters!

Having a higher portion of foreign-educated nurses is associated with higher mortality.

(Neff, Cimiotti, Sloan & Aiken, 2013)

# New Zealand

**74%** of RN's gained their qualification in NZ

**26%** of RN with NZ qualification have BNS

(Work Force NZ, 2015)

# Agency does not matter!

No evidence that the use of agency/casual/supplemental RN staff is associated with adverse outcomes for the patient.

(Aiken, Shang, Xue, & Sloane, 2013)

(Xue, Smith, Freund, & Aiken, 2012)

# Experience does not matter!

- South Korea 5.8 yrs
- UK 10.7 yrs
- USA 15.1 yrs
- NZ 16.7 yrs
- Canada 17.7 yrs

# Nursing environment matters



- Staffing and resourcing adequacy
- Nurse participation in hospital affairs
- Solid nursing foundation for quality
- Nurse Manager ability
- Strong leadership
- Collegial relationship between nurses and physicians



# SOUTH KOREA

14 hospitals, 76 036 patients

Reduce workload by **1** patient

Reduce mortality by **5 %**

( Cho et al, 2015)

# Pennsylvania, USA

232 342 patients

Reduce workload by 1 patient

Reduce mortality by 7 %

(Aiken et al, 2002)

Good nurse environments get twice  
the impact from good staffing

Reduce the work load by **1** patient

Reduce the mortality by **14%**

( Aiken, 2011)

# Nursing Matters to Mortality

Mortality review –**MUST** include nurses

- what we do
- our numbers
- our character
- our environment

