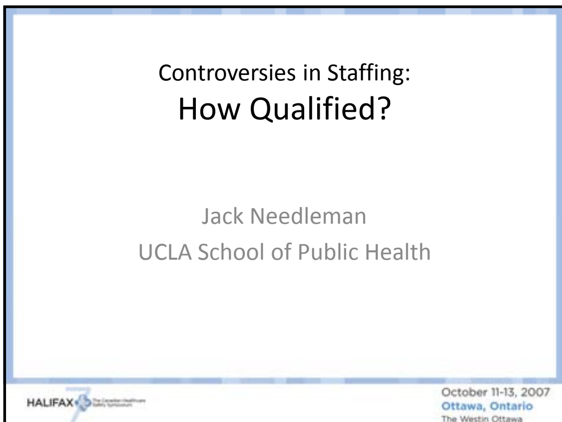
Controversies in Staffing:
How Qualified?
Jack Needleman
UCLA School of Public Health
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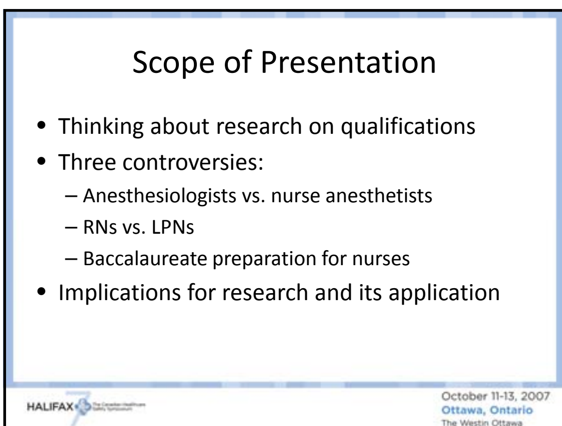
Scope of Presentation
• Thinking about research on qualifications
• Three controversies:
– Anesthesiologists vs. nurse anesthetists
– RNs vs. LPNs
– Baccalaureate preparation for nurses
• Implications for research and its application
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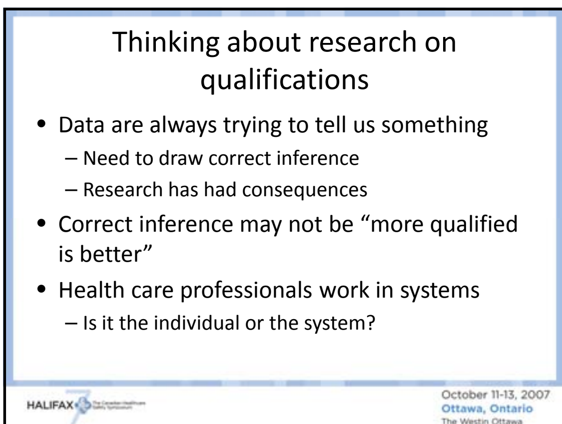
Thinking about research on qualifications
• Data are always trying to tell us something
– Need to draw correct inference
– Research has had consequences
• Correct inference may not be "more qualified is better"
• Health care professionals work in systems
– Is it the individual or the system?
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Anesthesiologist Direction

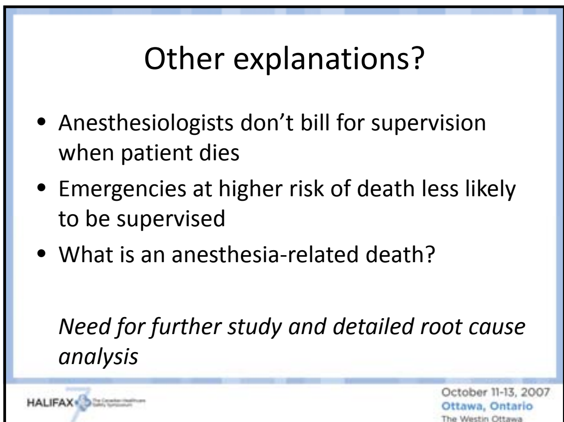
- Silber et al., "Anesthesiologist direction and patient outcomes" Anesthesiology, 2000
  - Distinguishes between directed & undirected treatment of nurse anesthetists
  - Looks at overall mortality and failure to rescue
  - Finds lower mortality when anesthesiologists directed care
- Impact: Medicare restrictions on CRNAs

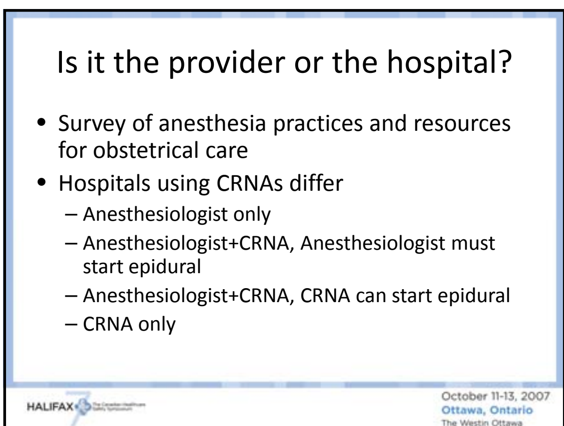
Key Findings

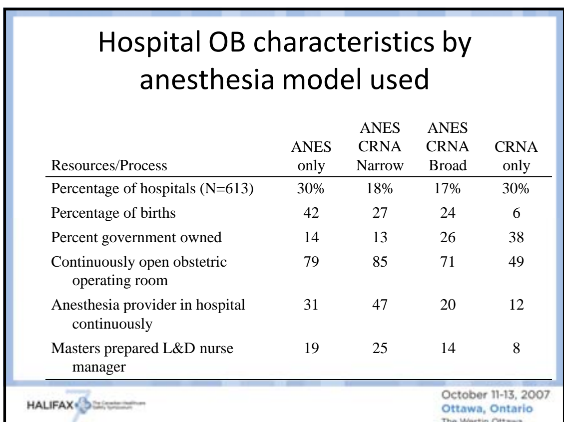
- Overall surgical mortality
  - OR 1.08 when CRNA not directed
  - Excess mortality: 2.5 deaths/1000
- Failure to Rescue (deaths among patients with complications)
  - OR 1.10
  - Excess mortality 6.9 deaths/1000
- Efforts to control for hospital and patient

Reflections on findings

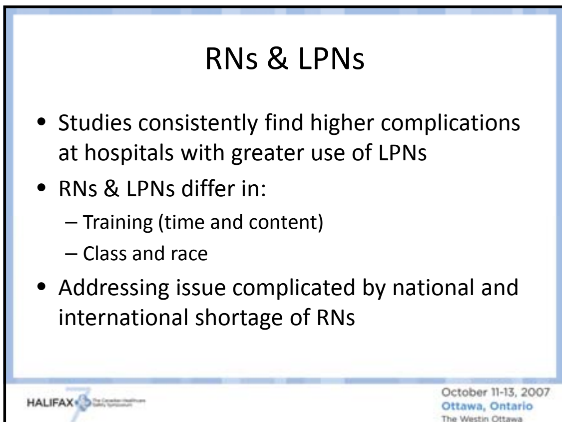
- Efforts to control for patient and hospital characteristics & selection
  - Assertion that anesthesia, not other factors
  - In subsequent study, for OR for non-Board certified anesthesiologists of 1.13, but concluded may be hospital, not physician, effect
- Other studies put rate of anesthesia-related deaths at ~1/150,000

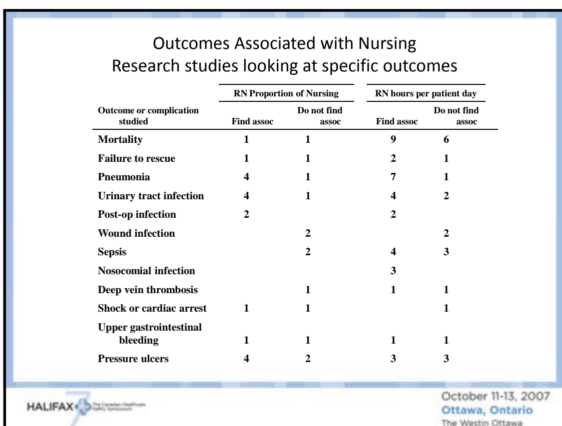




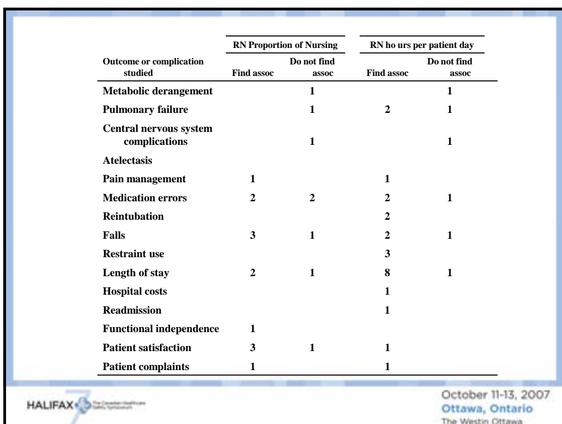


Resources/Process	ANES only	ANES CRNA Narrow	ANES CRNA Broad	CRNA only
Percentage of hospitals (N=613)	30%	18%	17%	30%
Percentage of births	42	27	24	6
Percent government owned	14	13	26	38
Continuously open obstetric operating room	79	85	71	49
Anesthesia provider in hospital continuously	31	47	20	12
Masters prepared L&D nurse manager	19	25	14	8

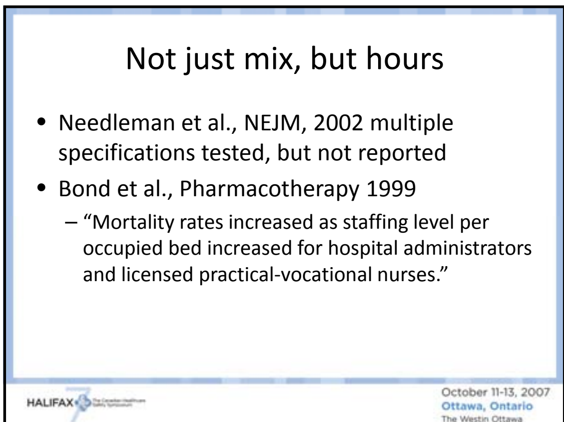




Outcome or complication studied	RN Proportion of Nursing: Find assoc	RN Proportion of Nursing: Do not find assoc	RN hours per patient day: Find assoc	RN hours per patient day: Do not find assoc
Mortality	1	1	9	6
Failure to rescue	1	1	2	1
Pneumonia	4	1	7	1
Urinary tract infection	4	1	4	2
Post-op infection	2		2	
Wound infection		2		2
Sepsis		2	4	3
Nosocomial infection			3	
Deep vein thrombosis		1	1	1
Shock or cardiac arrest	1	1		1
Upper gastrointestinal bleeding	1	1	1	1
Pressure ulcers	4	2	3	3



Outcome or complication studied	RN Proportion of Nursing: Find assoc	RN Proportion of Nursing: Do not find assoc	RN ho urs per patient day: Find assoc	RN ho urs per patient day: Do not find assoc
Metabolic derangement		1		1
Pulmonary failure		1	2	1
Central nervous system complications		1		1
Atelectasis				
Pain management	1		1	
Medication errors	2	2	2	1
Reintubation			2	
Falls	3	1	2	1
Restraint use			3	
Length of stay	2	1	8	1
Hospital costs			1	
Readmission			1	
Functional independence	1			
Patient satisfaction	3	1	1	
Patient complaints	1		1	


Not just mix, but hours
• Needleman et al., NEJM, 2002 multiple specifications tested, but not reported
• Bond et al., Pharmacotherapy 1999
– "Mortality rates increased as staffing level per occupied bed increased for hospital administrators and licensed practical-vocational nurses."
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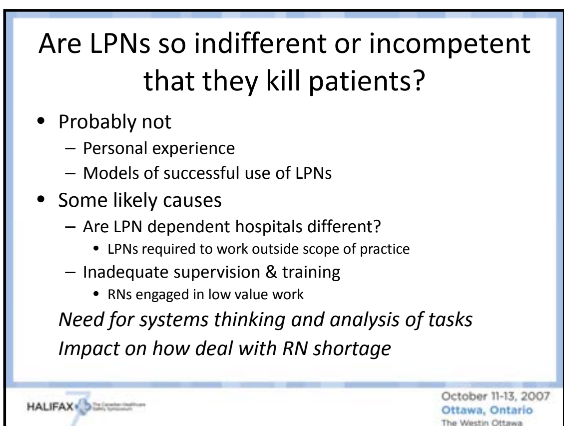
Are LPNs so indifferent or incompetent that they kill patients?
• Probably not
– Personal experience
– Models of successful use of LPNs
• Some likely causes
– Are LPN dependent hospitals different?
• LPNs required to work outside scope of practice
– Inadequate supervision & training
• RNs engaged in low value work
Need for systems thinking and analysis of tasks
Impact on how deal with RN shortage
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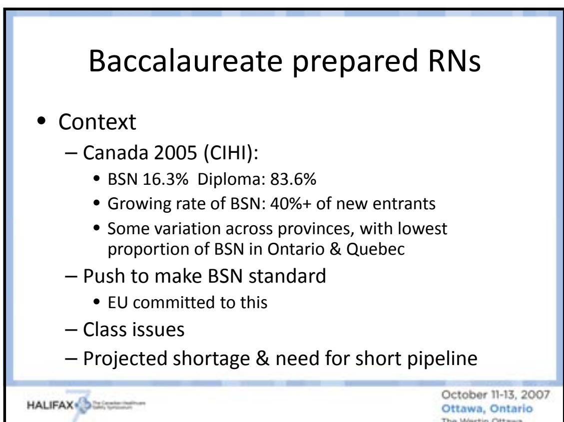
Baccalaureate prepared RNs
• Context
– Canada 2005 (CIHI):
• BSN 16.3% Diploma: 83.6%
• Growing rate of BSN: 40%+ of new entrants
• Some variation across provinces, with lowest proportion of BSN in Ontario & Quebec
– Push to make BSN standard
• EU committed to this
– Class issues
– Projected shortage & need for short pipeline
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Research findings
• 1988 meta-analysis (Johnson, RINH)
– BSNs better at: communication skills, knowledge, problem solving, professional role, and teaching
• Other studies: higher scores on licensing exams, lower rates of professional discipline
• Mortality differences at hospitals with higher proportion of BSN prepared nurses:
– Aiken, 2003 (Pennsylvania)
– Estabrooks, 2005 (Alberta)
– Tourangeau, 2007 (Ontario)
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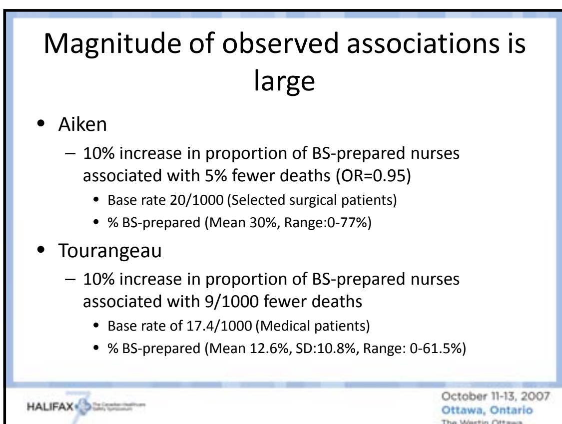
Magnitude of observed associations is large
• Aiken
– 10% increase in proportion of BS-prepared nurses associated with 5% fewer deaths (OR=0.95)
• Base rate 20/1000 (Selected surgical patients)
• % BS-prepared (Mean 30%, Range:0-77%)
• Tourangeau
– 10% increase in proportion of BS-prepared nurses associated with 9/1000 fewer deaths
• Base rate of 17.4/1000 (Medical patients)
• % BS-prepared (Mean 12.6%, SD:10.8%, Range: 0-61.5%)
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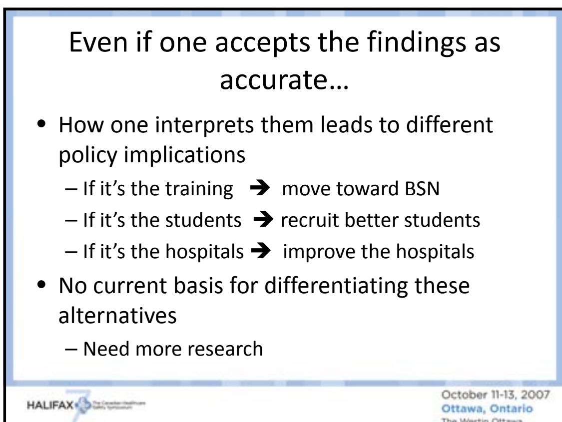
Even if one accepts the findings as accurate…
• How one interprets them leads to different policy implications
– If it's the training → move toward BSN
– If it's the students → recruit better students
– If it's the hospitals → improve the hospitals
• No current basis for differentiating these alternatives
– Need more research
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Even if it is the training…

- What elements need to be emphasized?
  - Could these be added to ADN or diploma programs
- How should the looming RN shortage influence planning
  - E.g., expand ADN→BSN? Make mandatory
- What implications for current workforce?
  - How should we strengthen the skills and capabilities of current staff?

Conclusion

- Need to read the research thinking about the magnitudes and plausibility of findings
- Broaden possible interpretations considered
  - Think about the system, not just individuals
- Think broadly about changes in policy and practice suggested by findings

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