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GO Boldly.

Death in Low Mortality Diagnosis Related Groups (LM-DRG)

A review of the indicator in Victorian hospitals

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Outline

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A hospital performance indicator

- Intends to identify unexpected in-hospital deaths
- Measure of deaths in patients admitted with a condition or procedure with a low associated risk of death
 - Headache
 - Epistaxis
 - Lens Procedures
 - Tonsillectomy
- Aims to identify deaths that are likely to be attributable to health care error

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A hospital performance indicator

- USA
 - 1989: Audit of 8109 randomly selected medical records from 104 hospitals
 - > Deaths in LM-DRG performed the best of 11 screening criteria
 - > Patients in LM-DRG who died were 5.2 (95% CI: 3.2–8.4) times as likely as all other patients who died (9.8% vs 1.7%) to have a quality problem associated with their care
 - 2002: Adopted by the AHRQ as a patient safety indicator (PSI)

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A hospital performance indicator

- Australia
 - 2008: Translated (ICD-9->ICD-10-AM) and adopted by the Victorian Department of Health
 - > AusPSI
 - 2009/10: included in the 25 national indicators of safety and quality in health care for hospitals proposed by the AIHW

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Computation

- Numerator:
 - Episodes with a separation type of "death"
- Denominator:
 - Episodes 18 years and older in low-mortality DRGs over the previous 3 years or less than 0.5% in any of the previous 3 years
- Excludes:
 - Trauma, immunocompromised state, or cancer episodes
 - Posthumous organ donors
 - Hospital boarders

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Validity

INTERNAL MEDICINE JOURNAL

Internal Medicine Journal 40 (2010) 250-257

REVIEW

Validity of the indicator 'death in low-mortality diagnosis-related groups' for measuring patient safety and healthcare quality in hospitals

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Validity

- 12 articles of low methodological quality
- Poor measure of patient safety
 - Only 3 studies found evidence of lower quality of care in 'deaths in low-mortality DRG' than in other cases
- May be useful as a screening tool
 - Further research is required

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Hannon 1989

Targeting Criterion	(1) Total Cases	(2) Nurse Reviews	(3) No. of Cases Forwarded to First Physician (%)		(4) Cases in Which Care Departed from Standards		(5) Cases in Which Care Caused or Contributed to Patient Death	
			N	%	N	%	N	%
Primary Surgical Procedures with Mortality Rate Less than 5%	607	578	124	21.5	33	5.7	16	2.8
DRGs with Mortality Rate Less than 5%	301	284	65	24.8	26	9.8	15	5.7
Death Occurred within 7 Day of any Surgical Procedure	1,279	1,229	242	19.7	59	4.8	46	3.7
Death Occurred on 2nd Day Following any Surgical Procedure	832	802	141	17.6	35	4.4	20	2.5
Surgical Case with Fluids/Electrolyte Imbalance Reported as a Secondary Diagnosis	1,419	1,384	128	9.2	30	2.2	17	1.2
Surgical Case with Renal Failure Reported as a Secondary Diagnosis	167	161	29	18.0	7	4.3	3	1.9
Surgical Case with Cardiorespiratory Arrest Reported as a Secondary Diagnosis	155	151	34	22.5	9	6.0	4	2.6
Other Complications of Surgery	472	463	142	30.7	33	7.1	25	5.4
Burn is Reported as a Secondary Diagnosis	992	965	343	35.9	35	3.7	24	2.5
Poisoning is Reported as a Secondary Diagnosis	30	27	3	11.1	2	7.4	1	3.7
Total of above	5,564	5,362	833	15.5	208	3.9	130	2.4
Total of non-targeted cases	2,545	2,479	161	6.5	43	1.7	24	1.0

*The total number of cases having each of the individual criteria is larger than the total because some cases have more than one criterion

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Validity

- USA:
 - Study including 2071 hospitals found no association (P=0.78) between hospital accreditation scores and death in LM-DRG rates
 - Study including 4504 hospitals found an inconsistent association with three measures of hospital quality in patients aged 65 years or older
 - > Death in LM-DRG had weak and often inverse relationships with these quality measures
- UK
 - 2009: no correlation HSMRs and number of deaths in low-mortality healthcare resource groups

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Validity

- Paediatric settings
 - 2006: 2 studies reported that many of the deaths flagged as 'death in LM-DRG' were not unanticipated
 - > 45% of flagged cases were hospice patients or had 'do not resuscitate' orders
 - > 72% of deaths were regarded as non-preventable
 - > Limitations in risk adjustment for comorbidities
 - > Recommended not be used in paediatric populations

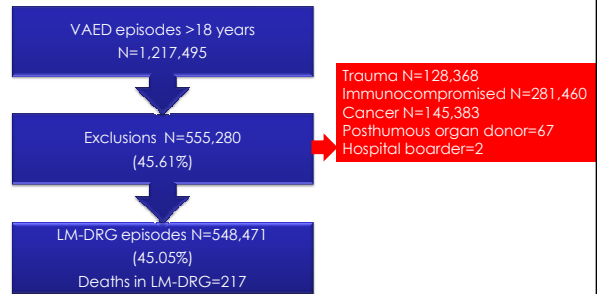
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A profile of Victorian Deaths in Low Mortality DRG

Methods

- Cohort study of patients admitted to Victorian public hospitals in the 2007-08 financial year
- Research questions:
 1. What is the incidence of deaths in LM-DRG
 2. What is the case profile of LM-DRG deaths
- Data source
 - VAED

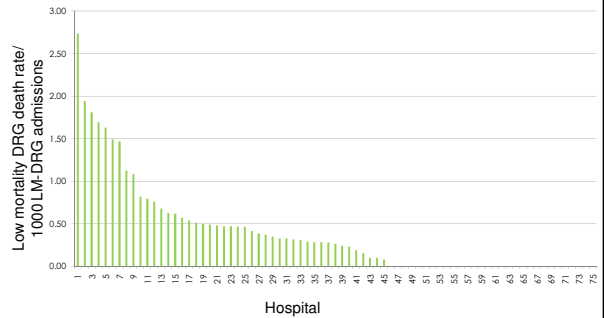
Population 2007-2008



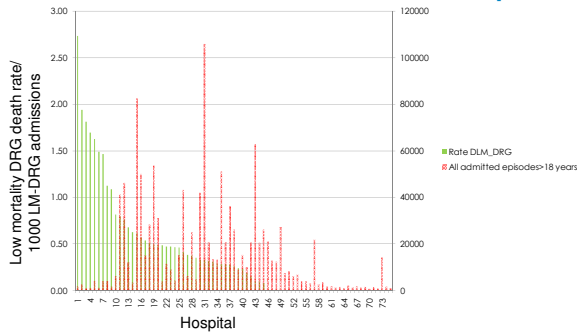
Frequency

Low risk DRG deaths	Number of Hospitals	%	Cumulative %
0	64	52.03	52.03
1	23	18.7	70.73
2	12	9.76	80.49
3	7	5.69	86.18
4	5	4.07	90.24
6	2	1.63	91.87
7	2	1.63	93.5
8	1	0.81	94.31
9	1	0.81	95.12
11	2	1.63	96.75
13	1	0.81	97.56
14	1	0.81	98.37
17	1	0.81	99.19
20	1	0.81	100
Total	123	100.00	

Incidence rate of Deaths in LM-DRG >500 LM-DRG admissions

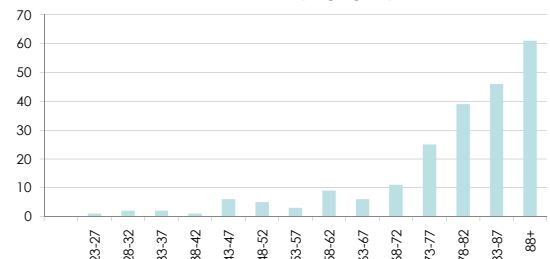


Volume Death in LM-DRG relationship

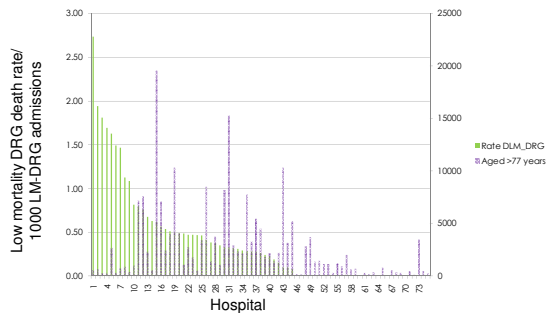


Case profile: Age

LM-DRG deaths by age group



Aged volume death relationship



Summary

1. Validity: Is it measuring what it is intended to measure?
 - Limited evidence that the indicator 'Death in low mortality DRG' measures quality and safety performance in the hospital setting
2. Sensitivity: 'Needle in the haystack'
 - Appears to have poor sensitivity for identifying episodes associated with poor quality of care
 - Age, palliative care and comorbidity confounding
3. "Added value"
 - Detection of quality of care issues that would otherwise have gone undetected?

Where to from here

- Criterion validity studies in the Australian setting
- Investigation of the use of age and comorbidity adjustment to improve sensitivity
- Exploration of overlap with other indicators (e.g. HSMR) and mortality review procedures
- Studies of therapeutic impact
 - Does measurement and reporting of Deaths in LM-DRG drive change that results in improved patient outcomes?

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