



The Epidemiology of Mortality in Patients Transported by Emergency Medical Services (EMS)

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No Conflicts of Interest



Background

- Modern EMS systems have evolved to become an important link between the community and the health care system
- A historical focus of EMS research has been on specific conditions, often those with a high mortality
- Little is known about the epidemiology of mortality of all transported EMS patients



Study Aim

To describe characteristics of EMS patients who after transport, die in a health care facility.

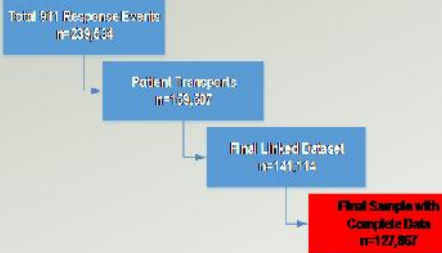


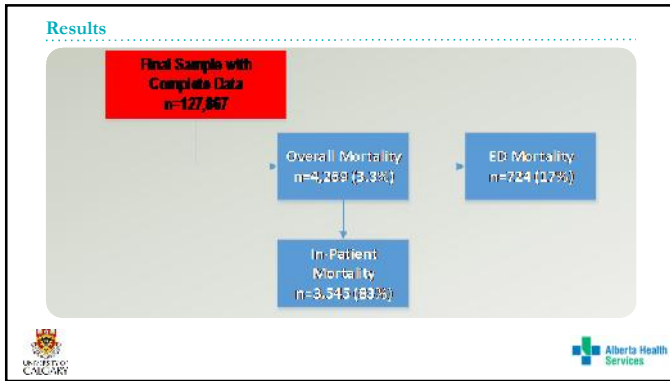
Methods

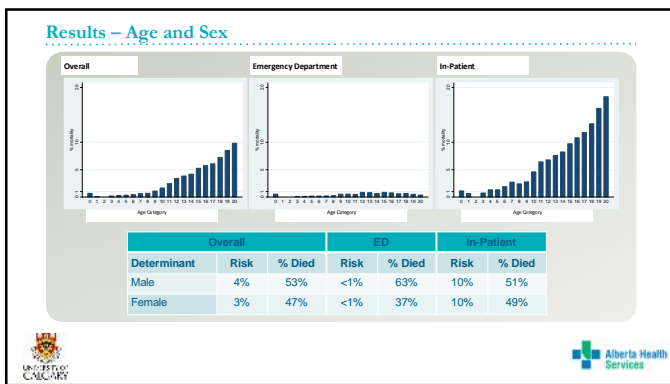
- ALS/BLS system serving approximately 2 million
- One year of data 2015/2016
- Deterministic linkage to health outcome
- Mortality at hospital discharge
- Descriptive statistics including risk of mortality and proportion of those that died

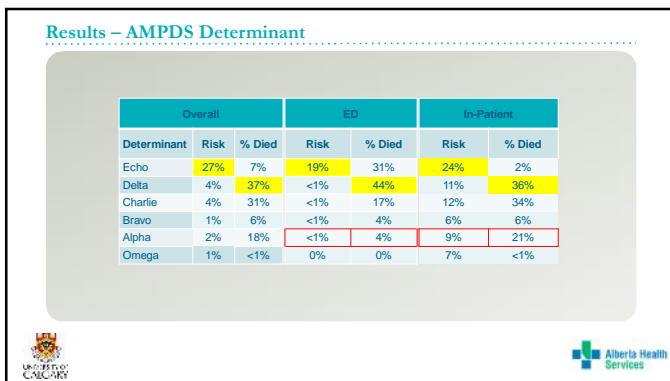


Results













Results – AMPDS Card

Overall		ED		In-Patient	
Card	Risk	Card	Risk	Card	Risk
Card 9 – Cardiac or respiratory arrest	19%	Card 9 – Cardiac or respiratory arrest	29%	Card 9 – Cardiac or respiratory arrest	30%
Card 33 – transfer/interfacility/palliative care	10%	Card 14 – Drowning/Near drowning/Diving/SCUBA	4%	Card 33 – transfer/interfacility/palliative care	24%
Card 6 – Breathing problems	6%	Card 8 – Carbon monoxide/inhalation/HAZMAT	2%	Card 16 – eye problems/injuries	14%



Results – AMPDS Card

Overall		ED		In-Patient	
Card	%Died	Card	%Died	Card	%Died
Card 26 – Sick Person	19%	Card 9 – Cardiac or respiratory arrest	34%	Card 26 – Sick Person	22%
Card 6 – Breathing Problems	18%	Card 31 – Unconsciousness/Fainting (Near)	14%	Card 6 – Breathing Problems	19%
Card 33 – transfer/interfacility/palliative care	16%	Card 6 – Breathing Problems	13%	Card 33 – transfer/interfacility/palliative care	18%



Results – ED Diagnosis

Overall Mortality		ED Mortality		In-Patient Mortality	
ED Diagnosis	Risk	ED Diagnosis	Risk	ED Diagnosis	Risk
Ill-defined and unknown causes of mortality (R95-R99)	100%	Ill-defined and unknown causes of mortality (R95-R99)	100%	Malignant neoplasms of bone and articular cartilage (C40-C41)	80%
Malignant neoplasms of bone and articular cartilage (C40-C41)	80%	Other forms of heart disease (I30-I52)	10%	Malignant neoplasm of breast (C50)	75%
Malignant neoplasm of breast (C50)	61%	Respiratory and cardiovascular disorders specific to the perinatal period (P20-P29)	9%	Persons encountering health services for specific procedures and health care (Z40-Z54)	60%



Results – ED Diagnosis

Overall Mortality		ED Mortality		In-Patient Mortality	
ED Diagnosis	%Died	ED Diagnosis	%Died	ED Diagnosis	%Died
Other forms of heart disease (I30-I52)	20%	Other forms of heart disease (I30-I52)	67%	Other forms of heart disease (I30-I52)	10%
Cerebrovascular diseases (I60-I69)	8%	Ischaemic heart diseases (I20-I25)	4%	Cerebrovascular diseases (I60-I69)	9%
Influenza and pneumonia (J09-J18)	6%	Cerebrovascular diseases (I60-I69)	4%	Influenza and pneumonia (J09-J18)	7%



Results – ED Diagnosis

- Overall mortality rate of 3.3% (95% CI 3.2, 3.4)
 - For every 30 transports there is one death
 - For every one ED death there are five in-patient deaths
- Starting point for future research to identify patients that may be amenable to EMS treatment and mortality reduction

Limitations

Limitation	Impact
Selection bias from linkage	Systematic bias of patients with a high risk of mortality resulting in an underestimate of mortality rate.
External validity	Interpretive caution is required in inferring result to other systems.
Conditions amenable to EMS treatment versus normal course of disease	This study reports all-cause mortality from all-comers.

Conclusions

There are important clinical differences in the characteristics of EMS patients who after transport die in a health care facility.

This is an early example of a North American EMS system linking prehospital data to health system outcomes for all-comers to EMS and a foundation for future research.