# The cost of major trauma care to DHBs

Chris Harmston
Northland District Health board



#### **Outline**

Current data on trauma costs

Funding and costing in New Zealand

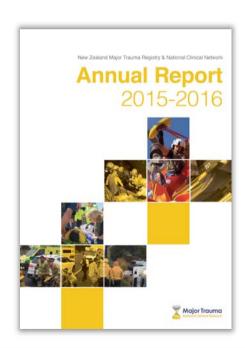
Cost of major trauma in Northland

# Why?

Increased scrutiny in public health funding

Competing demands

Cost improvement



High income countries

- 2 Systematic reviews
  - 1 focused on worldwide costs
  - 1 focused on cost drivers

Queensland data

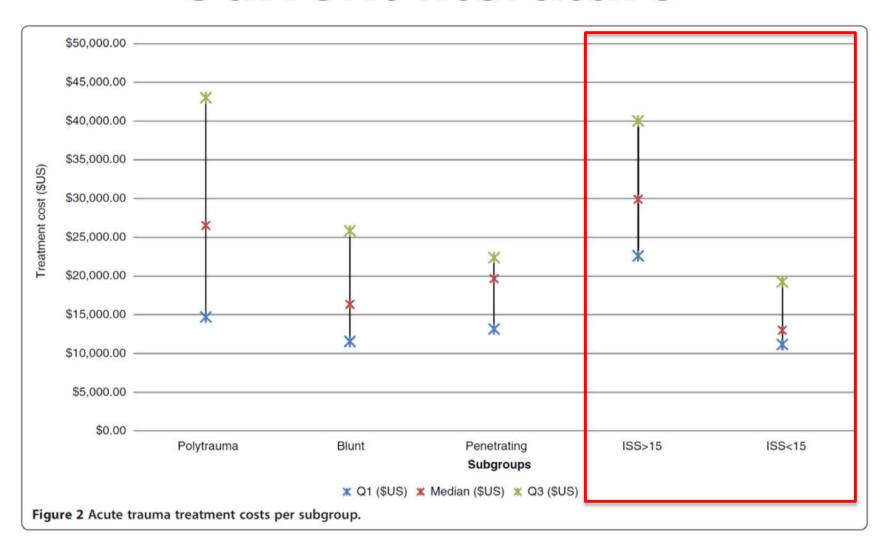
27 Studies

20 Reported on major trauma

Variability in methodology



Country	Articles	Median US \$ Cost	
Switzerland	1	95,380	
Germany	3	41,522	
Australia	2	33,130	
USA	16	22,115	
UK	3	18,535	
Canada	1	8,196	



Adult polytrauma

- Cost drivers
  - ICU
  - Operative intervention
  - Injury severity

European Journal of Trauma and Emergency Surgery

Original Article

#### Cost-Drivers in Acute Treatment of Severe Trauma in Europe: A Systematic Review

Hans-Christoph Pape<sup>1</sup>, Edmund Neugebauer<sup>2</sup>, Saxon A. Ridley<sup>3</sup>, Osvaldo Chiara<sup>4</sup>, Tina G. Nielsen<sup>5</sup>, Michael C. Christensen<sup>5</sup>

Introduction: Throughout the world, trauma is a leading cause of morbidity and mortality in the young and most active group of society. While specialist trauma centers play a critical role in the survival after severe trauma, the assessment of trauma-related costs, budgeting for adequate trauma capacity, and determining the cost-effectiveness of interventions in critical care are fraught with difficulties. Through a systematic review of the European literature on severe trauma, we aimed to identify the key elements that

drive the costs of acute trauma care.

Methods: A PubMed/MEDLINE search for articles relating the costs and economics of trauma was performed for the period January 1995 to July 2007. One hundred and seventy-three European publications were identified. Twelve publications were retrieved for complete review that provided original cost data, a breakdown of costs according to the different ele-ments of trauma care, and focused on severe adult polytrauma. The identified publications presented tudies from the UK (3), Germany (6), Italy (2), and Switzerland (1).

Results: In all publications reviewed, length of stay in the intensive care unit (ICU; 60%) and requirements for surgical interventions (\$25%) were the key drivers of hospital costs. The cost of transfusion during the initial rescue therapy can also be substantial, and in fact represented a significant portion of the overall cost of emergency and ICU care. Multiple injuries often

Department of Orthopaedics, University of Pittsburgh Medical Center, Pittsburgh, PA, USA, "Institute for Research in Operative Medicine, Faculty of Medicine, University of Witten/Herdecke - Campus Cologne, Cologne,

igery, University of Milan, Milan, Italy, 6al Development, Novo Nordisk ArS, Bagsward, Denmark.

ICU and hospital stay, and across all studies a clear relationship was observed between the severity of polytrauma injuries observed and overall treatment costs. While significant differences existed in the absolute costs of trauma care across countries, the key drivers of costs were remarkably similar.

Conclusions: Irrespective of the idiosyncrasies of the national healthcare systems in Europe, severity of injury, length of stay in ICU, surgical interventions and transfusion requirements represent the key drivers of acute trauma care for severe injury.

Key Words Trauma · Costs · Europe · Polytrauma · Severe

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Traumatic injury is recognized as a pandemic disease, and is a scrious and growing global health issue [1, 2]. Worldwide, an estimated 5 million people die each year as a consequence of trauma; a figure predicted to increase to 8.4 million by 2020 [3]. Trauma is primarily a disease of the young, exacting a high toll among an active and productive subgroup of the population. In young men, traumatic injury has been described as "epidemie" [2, 4], and more than 50% of deaths due to

Eur J Trauma Emerg Surg 2009 - No. 1 © Uleas & Vicol

- 17,500 Patients
- 2000 Major trauma
- Mean cost \$28,584



ISS	n	%	Median Cost	<b>Total Cost</b>
<9	9788	68	3510	56,880,168
9-12	2401	17	9704	33,630,296
13-15	376	3	9082	5,025,241
16-24	973	7	11,813	21,984,736
25-39	689	5	17,934	28,620,365
40-75	104	1	15,876	4,708,848

Comparing coding costs and actual costs

\$134/day

\$14.5m dollars

### Take home messages

1. Variation in costs around the world

- 2. Discrepancy actual costs and coding
- 3. Consistent cost drivers

# Funding and costing in NZ

Funding system

Costing systems



### Funding of healthcare in NZ

Vote health \$16.7 Billion

ACC \$4 Billion

Private healthcare

### Funding of healthcare NZ

Population based funding formula

- ACC
  - Block funding
  - Claims



# Costing of Healthcare in NZ

- Diagnosis related groups
  - Codes
  - Average costs
- Actual costs
  - NZ common costings standard
  - Costs each part of care

- Aim
  - Assess actual costs

- Factors influencing costs
- Compare actual and DRG costs



- Methods
  - 2 years
  - Major trauma
    - ISS>12
    - ICU Admission
    - Death

Excluded transfers within 24hours



- Results
  - 199 patients
  - Median age 45
  - M:F 2.4:1
  - 33% of patients identified as Maori
  - 15% Outside Northland

183 patients ISS>112

Median ISS 18

Median LOS 8.5 days

Mortality 12.5%



- Actual Costs
  - Overall cost \$4.6 million
  - Mean \$23 000

- DRG costs
  - Overall cost \$3.39 million
  - Mean \$17 000

ISS group	n	(LOS) (Days)	Mean actual cost (NZ\$)	Mean case-weight cost (NZ\$)	Mean deviation from case-weight cost (NZ\$)	р
<13	16	9.2	\$24, 629	\$15, 605	-\$9, 024	0.936
13-24	155	8.6	\$22, 684	\$16,538	-\$6, 146	0.144
25-40	22	8.1	\$29, 466	\$23, 654	-\$5, 812	0.960
40+	6	1.1	\$9, 379	\$9, 654	\$275	0.928

Intervention		Ave. LOS (Days)	Mean ISS (IQR)	Mean actual cost (NZ\$)	Mean case- weight cost (NZ\$)	Mean deviation from case- weight cost (NZ\$)
וכח	Yes	10.4	18.6 (13-22)	\$32, 584	\$22, 801	-\$9, 782
2	No	6.4	17.6 (13-18)	\$13,507	\$11, 106	-\$2, 401
р		0.0004	0.038	0.008	0.294	
Operation	Yes	12.2	18.8 (14-22)	\$38, 839	\$28, 066	-\$10, 774
Oper	No	6.2	17.9 (13-21)	\$14, 508	\$10, 927	-\$3, 581
р		<.00001	0.171	0.001	0.007	

- Mean cost \$23 000
- Actual and DRG costs
- Cost drivers as per previous studies

#### Conclusions

Understanding costs is important

Body of literature on costs of trauma

Need to expand NZ cost data.....

### **Questions?**