



Major Trauma Audit in Ireland; Where are we now?

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TRAUMA

Radiology

Orthopaedics

Plastic
Surgery

Coroner

Neurosurgery

Rehab

General Surgery

ICU/ Anaesthesia

Health
Services
Management

Emergency
Medicine

EMS

Preventive
Medicine/Public Health

Police

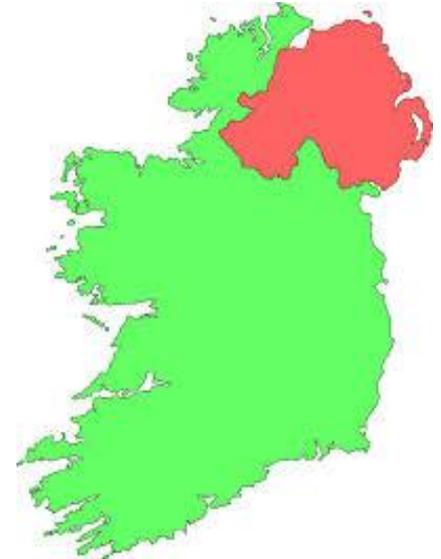
- 
- A satellite-style map of Ireland, showing the island's green terrain and surrounding blue waters. The map is centered on the island, with the text overlaid on the left side.
- 27 Receiving Trauma Hospitals**
 - **2 Adult Neurosurgical centres**
(Beaumont, Cork University Hospital)
 - **Pelvic Acetabular Centre (Tallaght)**
 - **Spinal Centre (Mater)**
 - **Burns Centre (St. James's)**
 - **Cardiothoracic centres**
 - **Plastic centres**
 - **Maxillofacial centres**

Ireland from space

Trauma System

Fundamental Components

- injury prevention
- pre-hospital care
- acute care facilities
- post-hospital care
- ***performance measurement through registry/audit***

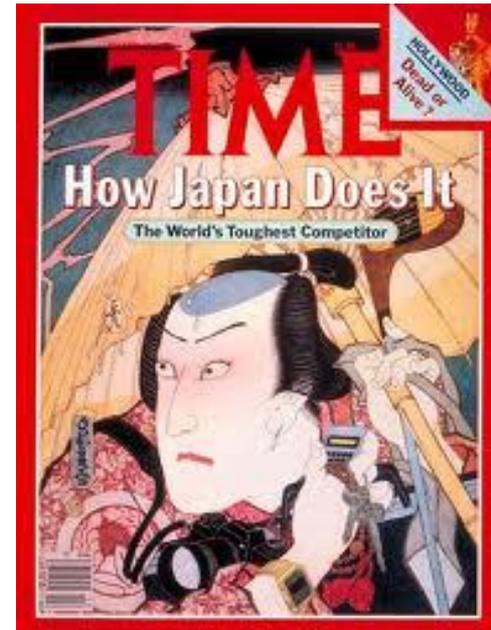


Improving the journey from roadside to recovery

'You can't manage what you don't measure'

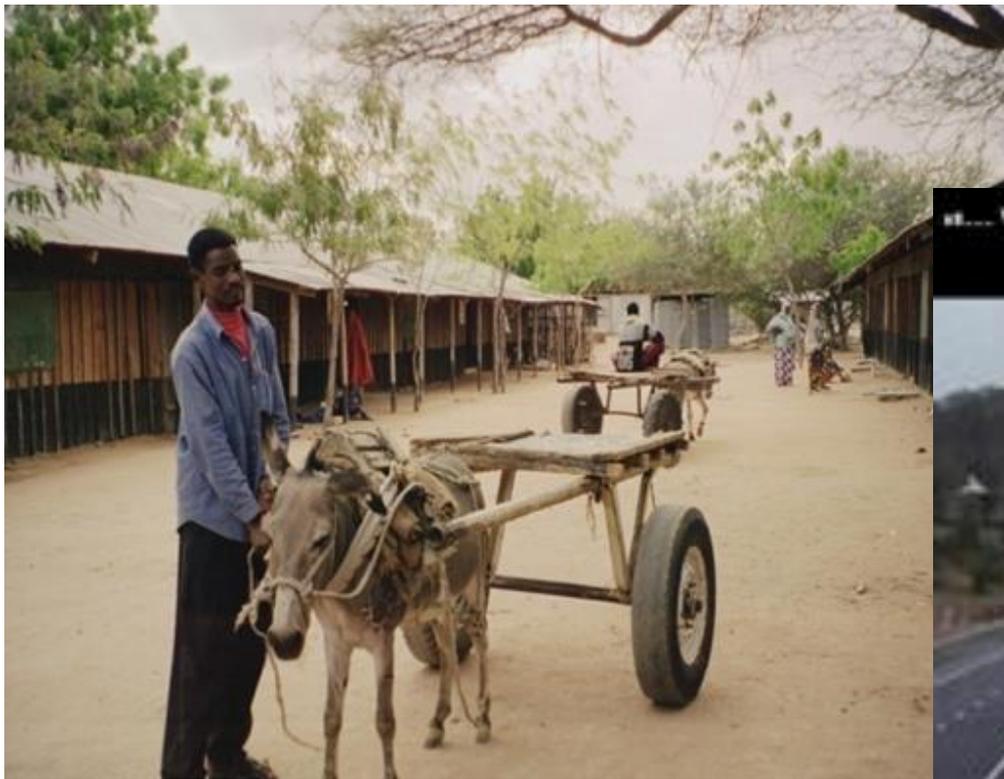


**William Edwards Deming,
1900-1993**





**Major Trauma Audit is the dash-board
for the trauma system.**





Australia

Austria

Belgium

Cambodia

Canada

China

Czech

France

Germany

Greece

Hungary

Iceland

India

Iran

Ireland

Israel

Italy

Jamaica

Japan

Malawi

New Zealand

Netherlands

Norway

Pakistan

Portugal

Serbia

Singapore

South Africa

South Korea

Spain Sweden

UAE

UK

US

Uganda

O' Reilly G, Injury, July 2012

Roles of Major Trauma Audit

- Monitor Care
 - Benchmark
- Monitor compliance with best practice/evidence based guidelines
- Monitor for equity of access
- Provide feedback
- Stimulate competition
- Risk adjusted outcomes
- High societal and financial cost of poor outcomes



**Continuous Quality
Improvement Cycle**



TARN

The *Trauma Audit & Research Network*

- Associated with University of Manchester
- Largest European trauma registry established in 1990
- Self funded through hospital membership fees
- Clinically led, academic and independent
- Hospitals in England, Wales, Ireland, Denmark & Switzerland

TARN Data Collection

Inclusion Criteria

Admission > 72 hours or

- Admission to an intensive care area or
- Transferred out for continuing care or
- Transferred in for continuing care or
- Died

And whose injuries fulfill the TARN injury criteria

Collected through the patient pathway post injury

- Observations
- Interventions
- Investigations
- Clinician & Grade

Location based

- Incident
- Pre Hospital
- EM Department
- Imaging
- Theatre
- Intensive Care Unit
- Ward
- Discharge
- Rehabilitation



Measures Process and Outcomes



Performance Review Indicators

- ❖ Summary of Approved cases for any specified time period.
- ❖ Highlights **Key Performance Measures** that underpin TARN reports:



Age
Gender
Arrival date/time
Injury Mechanism
ISS
GCS
Probability of Survival (Ps)
Outcome
Total Los
Critical care Los
Trauma Team presence

ED attendants/grade
NICE criteria met
Shocked patients
No of Operations
Date/time 1st Operation
Time to 1st Operation
Date/Time 1st CT
Time to 1st CT
Transfer from/to
Injuries
Glasgow Outcome Score

Standards of Care

Injury to the Brain & Skull

Injuries to the Spine

Injuries to the Chest

Injuries to the Limbs & Pelvis

Hospital Details

Head Injuries

CT Imaging of the head should be performed within 1 hour of arrival for patients with a head injury and a GCS of less than 13

NICE Head Injury Guidelines 2007

Addenbrooke's Hospital

Cases submitted and eligible for this standard:

Year	Cases
2009	70
2010	71
2011	83
2012	79
2013	1

304 patients were admitted directly from the scene of the injury to this hospital between January 1st 2009 and December 31st 2013 and fulfilled these specific head injury criteria

286 patients had a CT Scan

278 of the CT Scans had full dates and times recorded

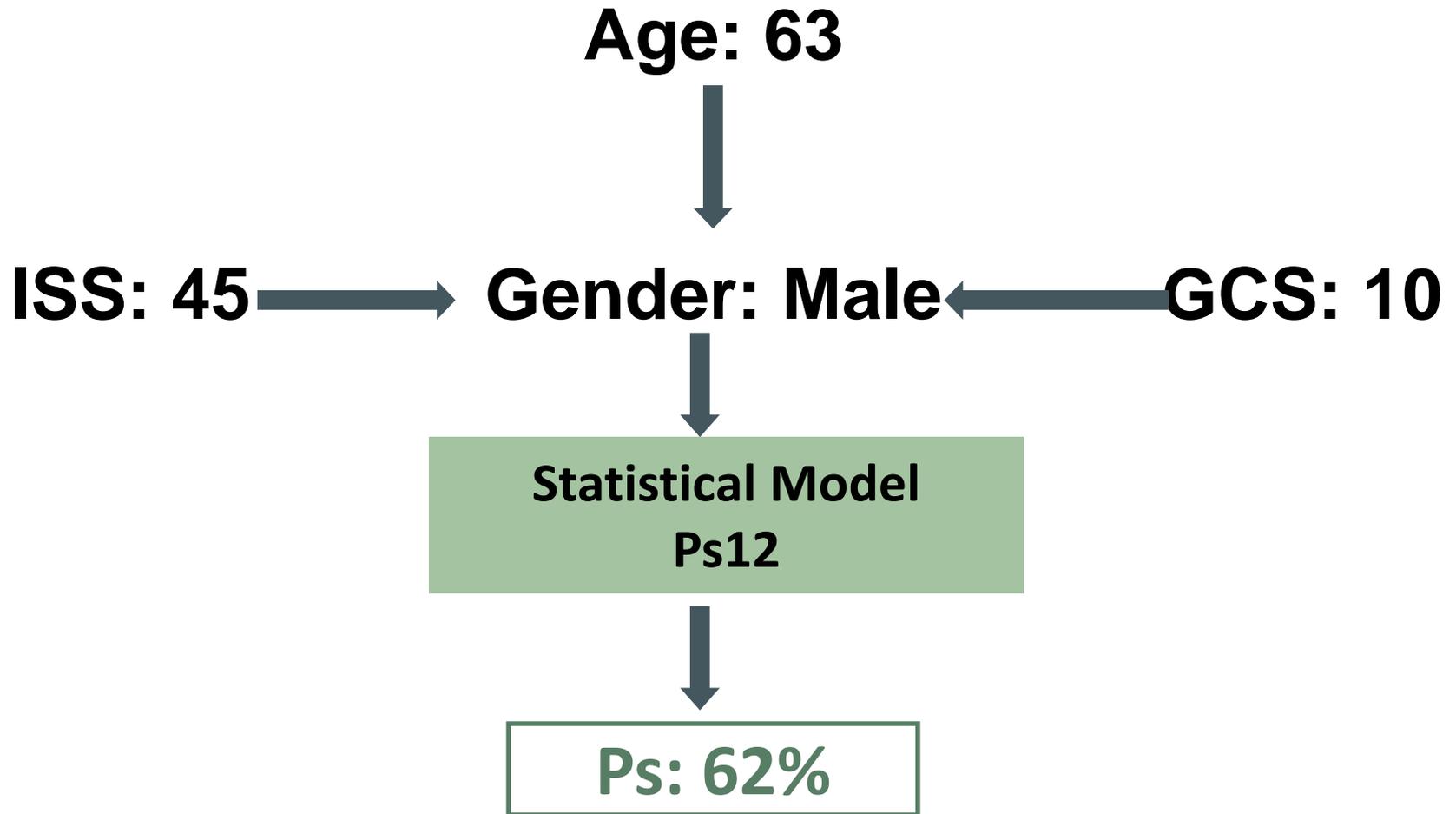
Time to CT Scan

Median Time to receiving a CT Scan (hrs)	
Addenbrooke's Hospital	National Database
0.65 hrs	0.77 hrs

6 patients died from their injuries within 2 hours and did not have a CT Scan



Probability of Survival (Ps12): 4 components



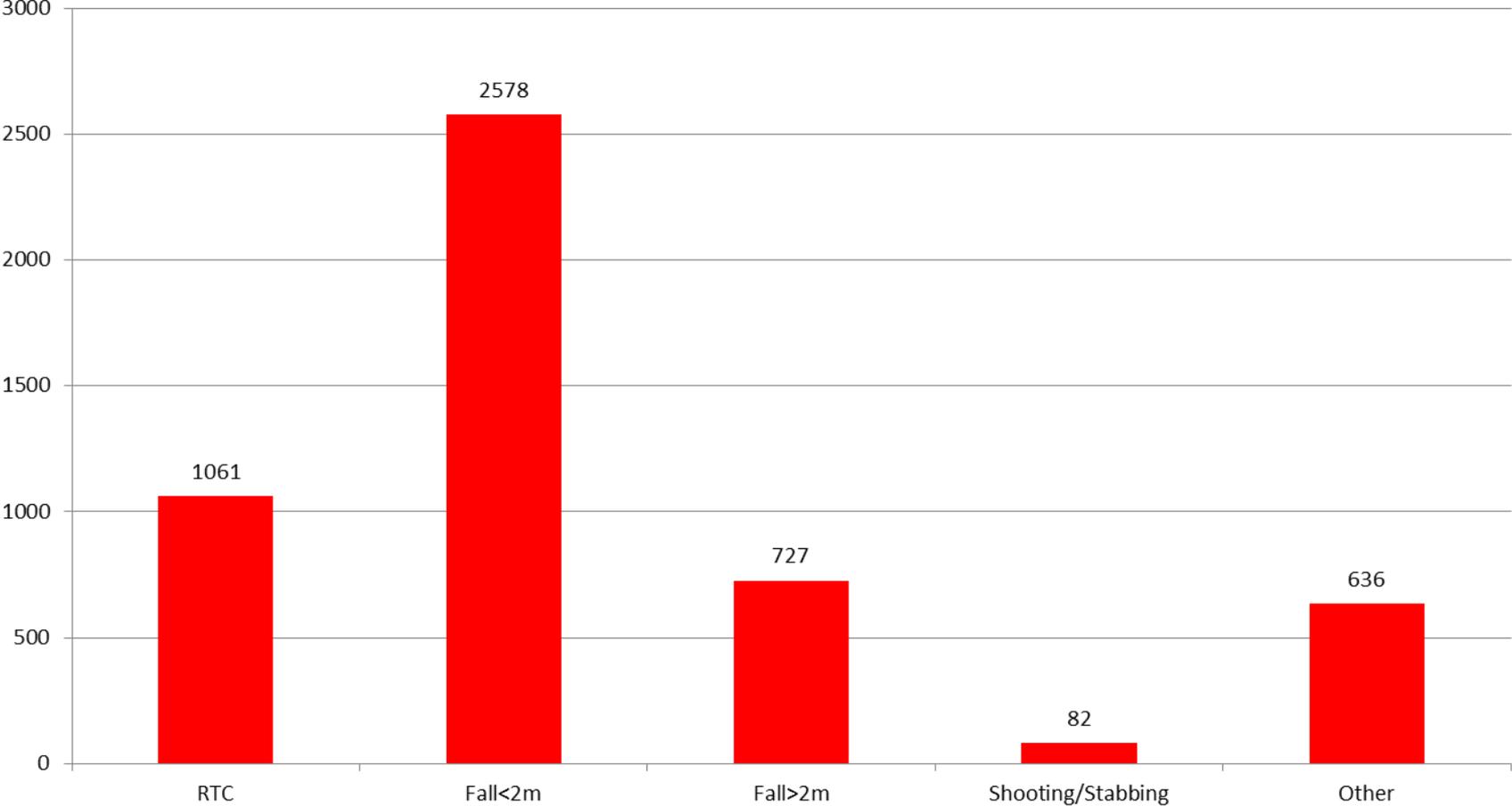
PS14 developments

Launched December 2014

1. Pre-Existing Medical Conditions (PMC) added

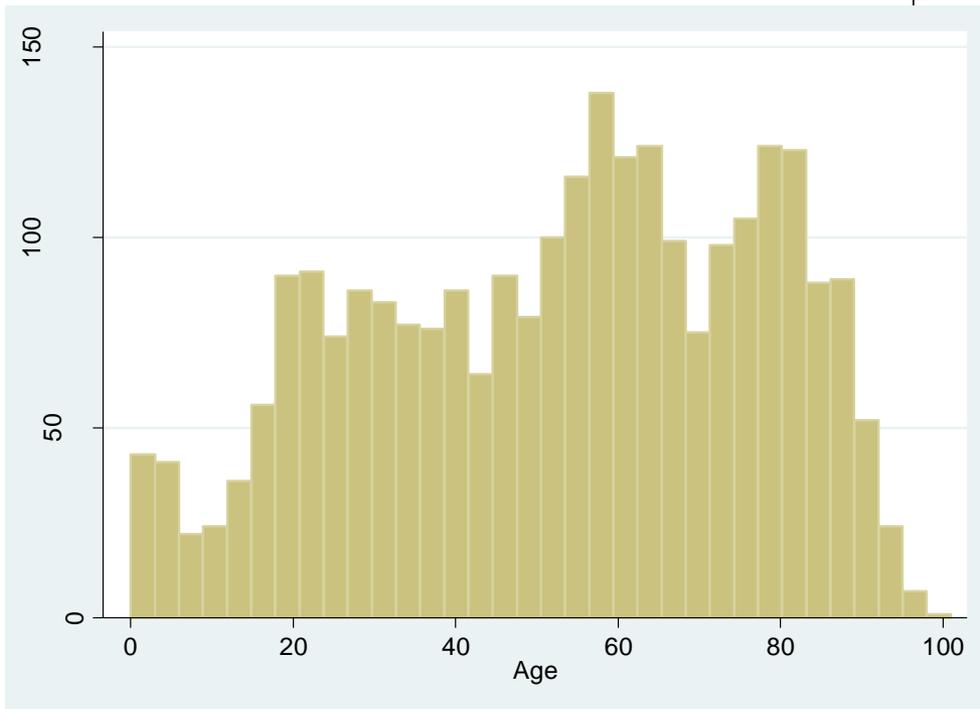
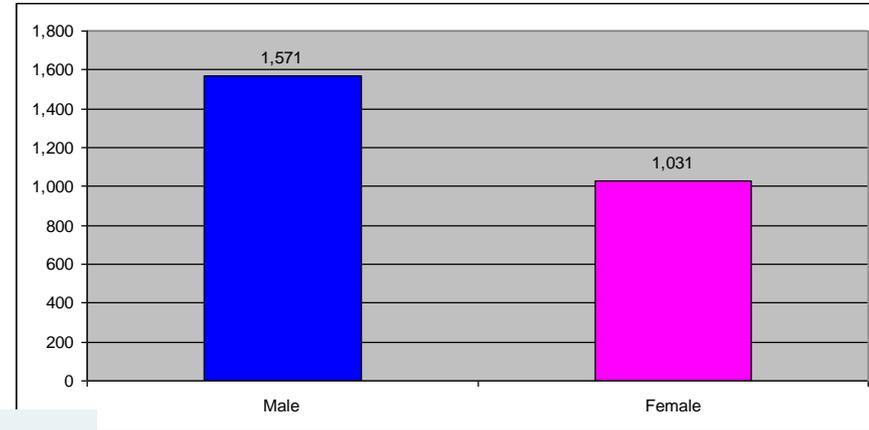
Charlson comorbidity index (CCI) adds 'weighting' PMC

Mechanism of Injury

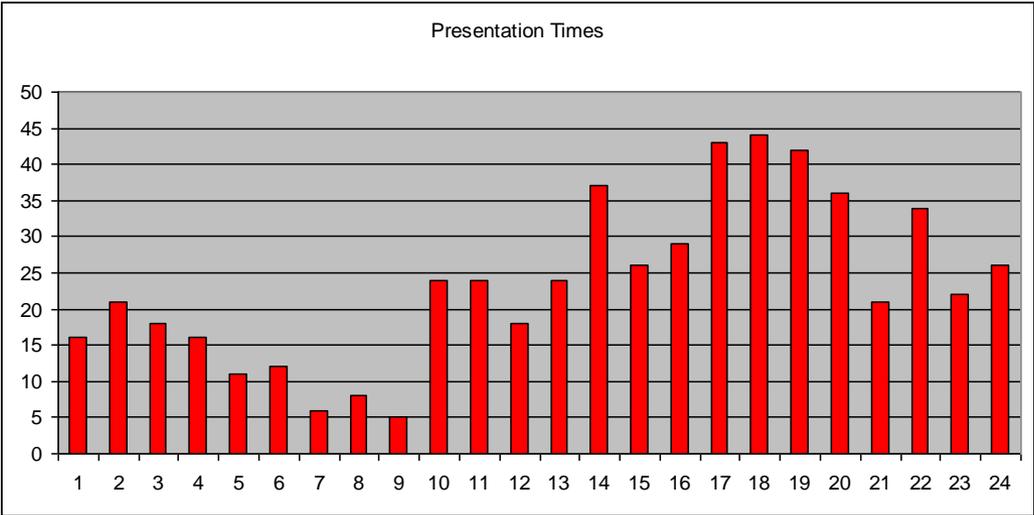
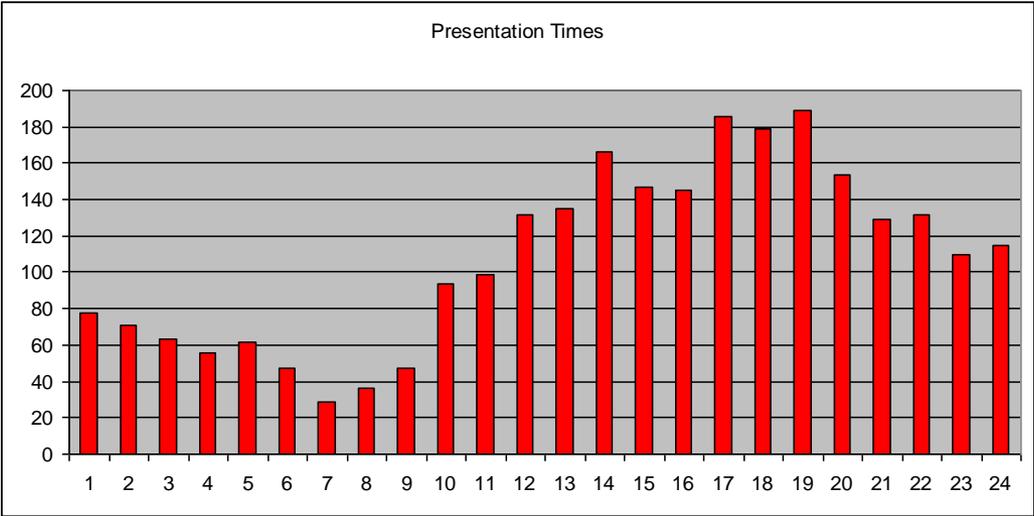


Patient Demographics

- Age Median (IQR)
 - Female 66(48,81) years
 - Male 48(28,64) years



Presentation Times across hours of the day



ISS>15

Ireland

Case mix standardised rate of survival (Ws) & Ws Breakdown (Ps14)

01 April 2014 to 31 December 2015

Patients who died at or were discharged from this hospital are eligible for Ws calculations. Patients who were transferred out from this hospital and not re-admitted are excluded.

Outcome at 30 days or discharge

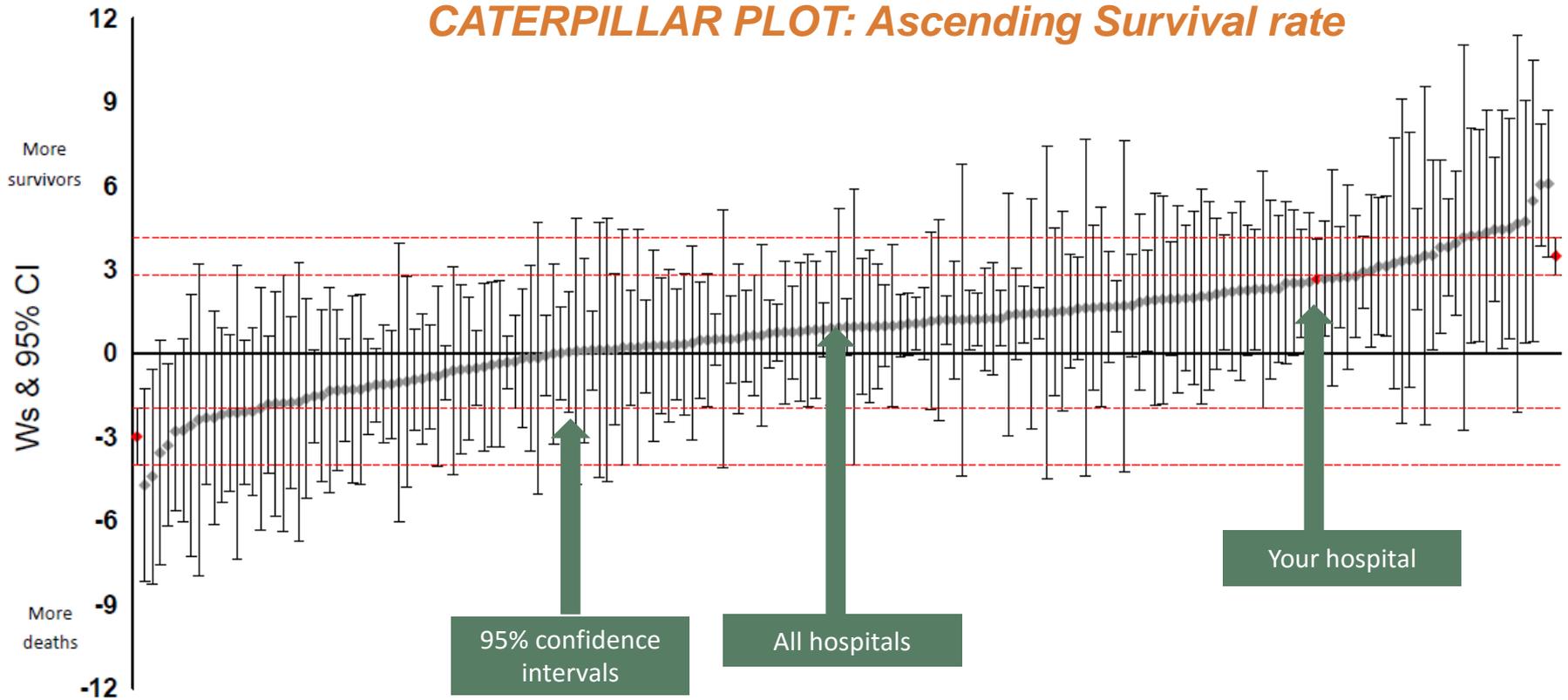
PS Band	Number in band	Observed Survivors	Expected Survivors	Difference*	TARN fraction	Ws	95% confidence interval
95 - 100	3282	3262	3236.35	0.78	0.72	0.56	
90 - 95	601	582	558.86	3.85	0.12	0.47	
80 - 90	343	326	294.92	9.06	0.07	0.60	
65 - 80	200	166	147.66	9.17	0.04	0.36	
45 - 65	138	76	77.46	-1.06	0.03	-0.03	
25 - 45	71	22	25.28	-4.62	0.02	-0.07	
0 - 25	36	6	4.86	3.16	0.01	0.04	
<i>Total</i>	<i>4671</i>	<i>4440</i>	<i>4345.39</i>			1.93	1.34 - 2.52

Comparative Outcome Analysis for all TARN registered hospitals - 01 April 2013 to 31 December 2014

Outcome at 30 days or discharge

The Ws must be reviewed in conjunction with the Data Completeness and Accreditation figures.

CATERPILLAR PLOT: Ascending Survival rate



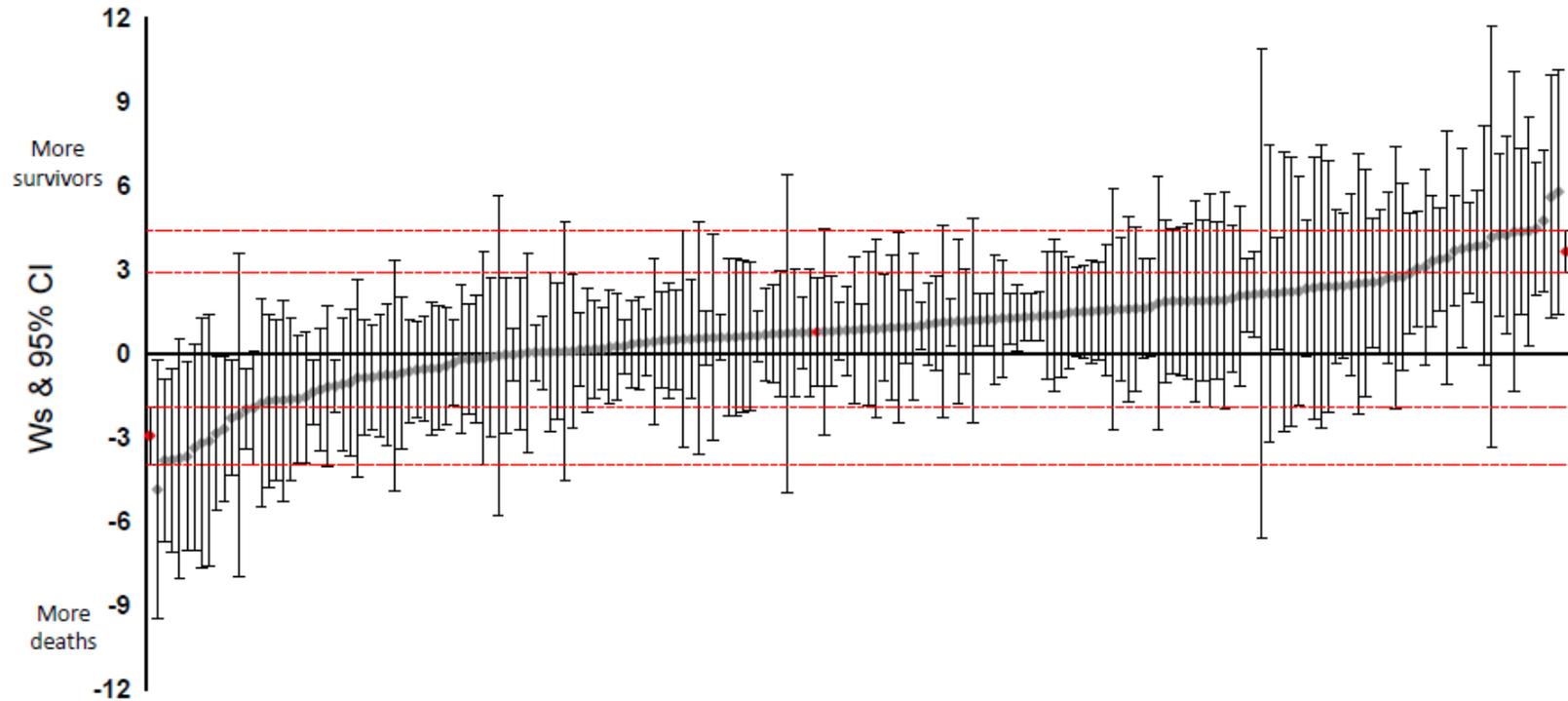
Cork University Hospital

Comparative Outcome Analysis for all TARN registered hospitals - 01 April 2014 to 31 December 2015

Outcome at 30 days or discharge

Cork University Hospital is highlighted

The Ws must be reviewed in conjunction with the Data Completeness and Accreditation figures.

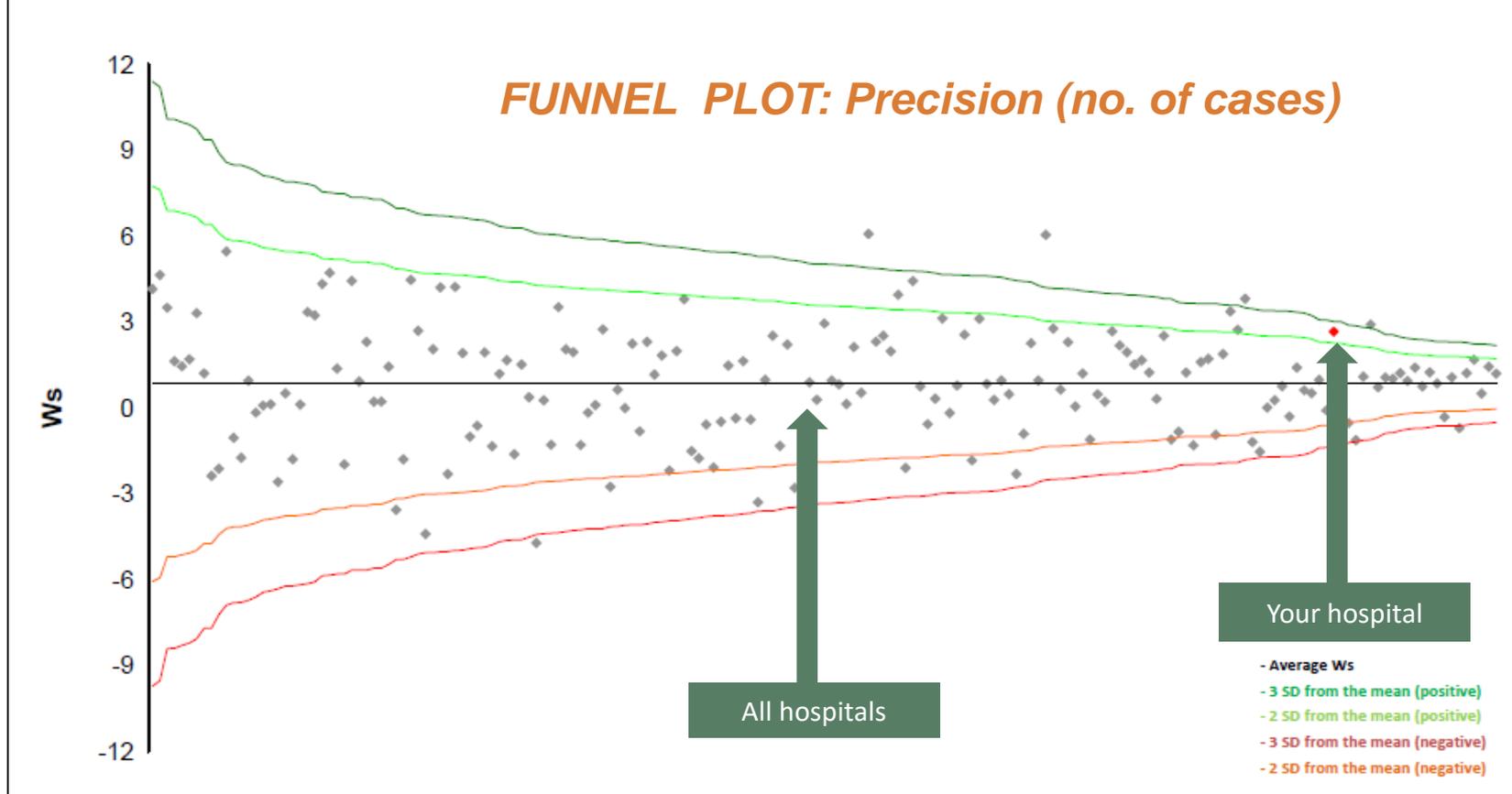


The highlighted points at either end of the chart and dashed horizontal lines indicate the combined Ws for the top and bottom 10 hospitals of the dataset.

Comparative Outcome Analysis for all TARN registered hospitals - 01 April 2013 to 31 December 2014

Outcome at 30 days or discharge

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Lower Precision: Fewer cases
(not as reliable)

Greater Precision: More cases
(more reliable)

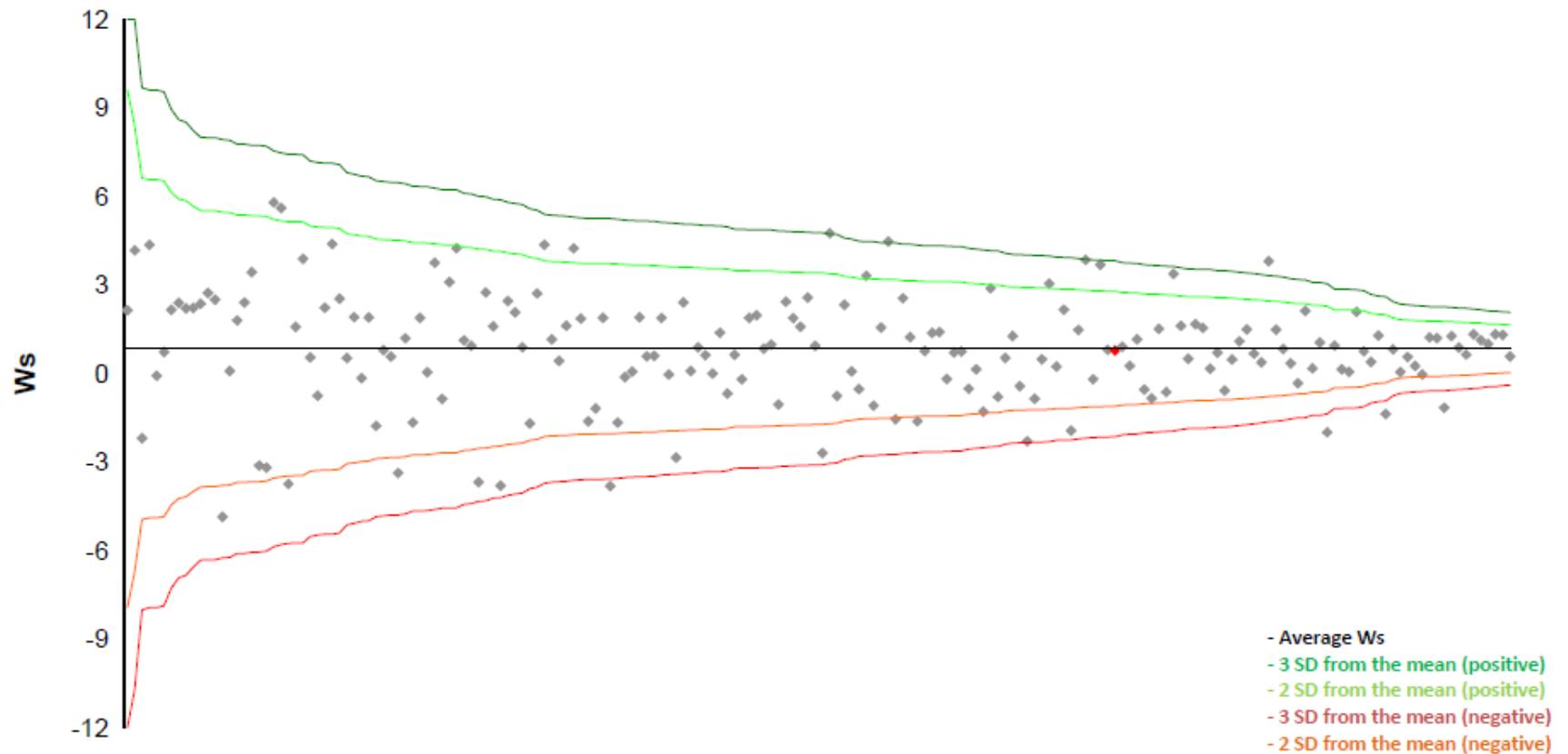


Comparative Outcome Analysis for all TARN registered hospitals - 01 April 2014 to 31 December 2015

Outcome at 30 days or discharge

Cork University Hospital is highlighted

The Ws must be reviewed in conjunction with the Data Completeness and Accreditation figures.

Hospitals are plotted in order of precision ($1 / \text{standard error}$).

Sustainable Structure

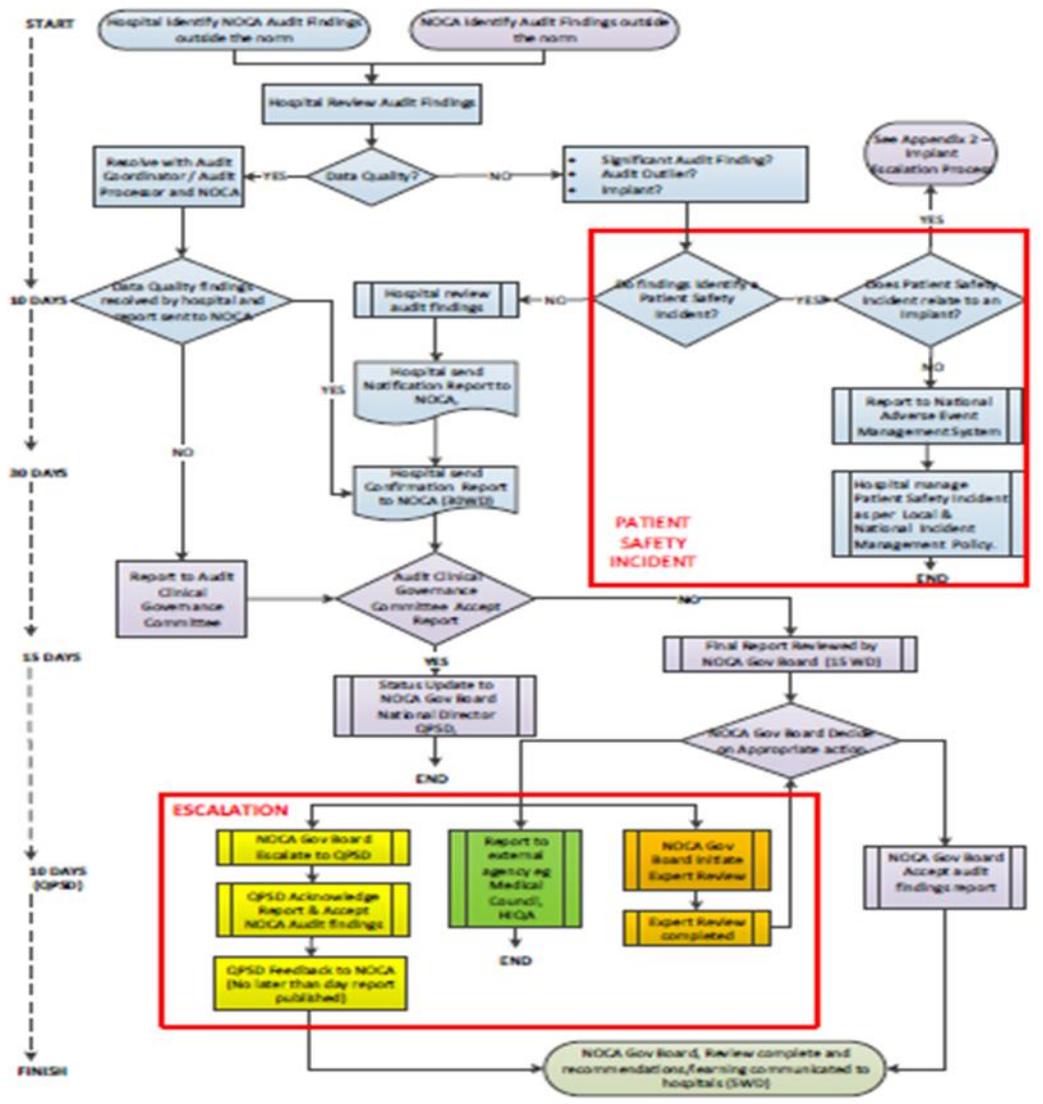


NOCA MTA Governance Group

National Board for College of Emergency Medicine	Dr Conor Deasy CHAIR
Royal College of Surgeons, Ireland -General Surgery	Mr Ken Mealy
Irish Association of Vascular Surgeons	Mr Morgan McMonagle
Irish Committee for Emergency Medicine Training	Dr Gerry Lane
Irish Institute of Trauma and Orthopaedic Surgeons	Mr Joe O Bernie/ Mr Brendan Daly
Irish Association of Plastic Surgeons	Mr Alan Hussey
Irish Association for Emergency Medicine / Academic Committee	Dr Patricia Houlihan
Paediatric Emergency Medicine	Dr Turlough O' Donnell
National Emergency Medicine Programme for MTA	Dr George Little
National Emergency Medicine Programme Lead	Dr Una Geary
HSE Office of Nursing & Midwifery Services	Ms Geraldine Shaw
Emergency Medicine Nursing Interest Group	Ms. Fiona McDaid
Royal College of Physicians Ireland -Pathology	Dr Patrick Hayden
Royal College of Physicians Ireland -Public Health	Dr Orla Healy/Caroline Mohan-Mason
Royal College of Physicians Ireland -Rehabilitation Medicine	Dr Jacinta Morgan/Jacintha McElligott
Joint Faculty of Intensive Care Medicine of Ireland-Intensive Care	Dr Rory Dwyer/Jeanne Moriarty
Pre Hospital Emergency Care Council	Ms Jacqueline Egan
National Ambulance Service	Mr Vincent Daly
Patient Representative	Ms Iryna Pokhilo
Therapy representative	Ms Rosie Quinn
Royal College of Surgeons in Ireland -Faculty of Radiologists	Dr Peter MacMahon
Royal College of Surgeons in Ireland -Neurosurgery Programme	Mr David Allcutt
Data manager with Trauma Audit experience	Ms Anna Duffy
Data Manager -HIPE	Mr Des O Toole

Policy Name:	NOCA Escalation Policy
Policy No:	NOCA-GEN-POL014
Effective Date:	27/09/2014
Review Date:	01/10/2016

Appendix 1: NOCA Escalation Policy



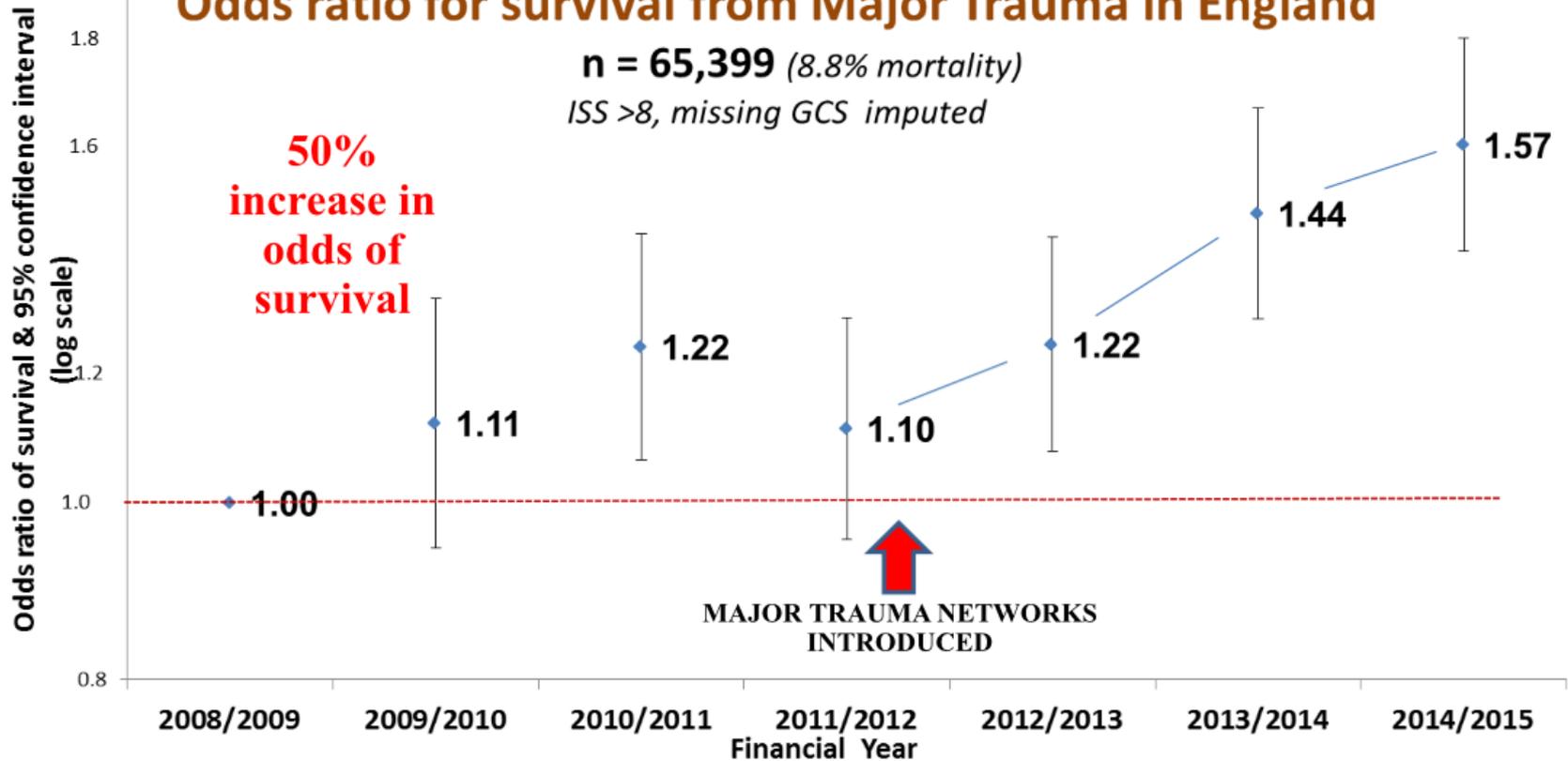
Engagement with Hospitals on Audit findings

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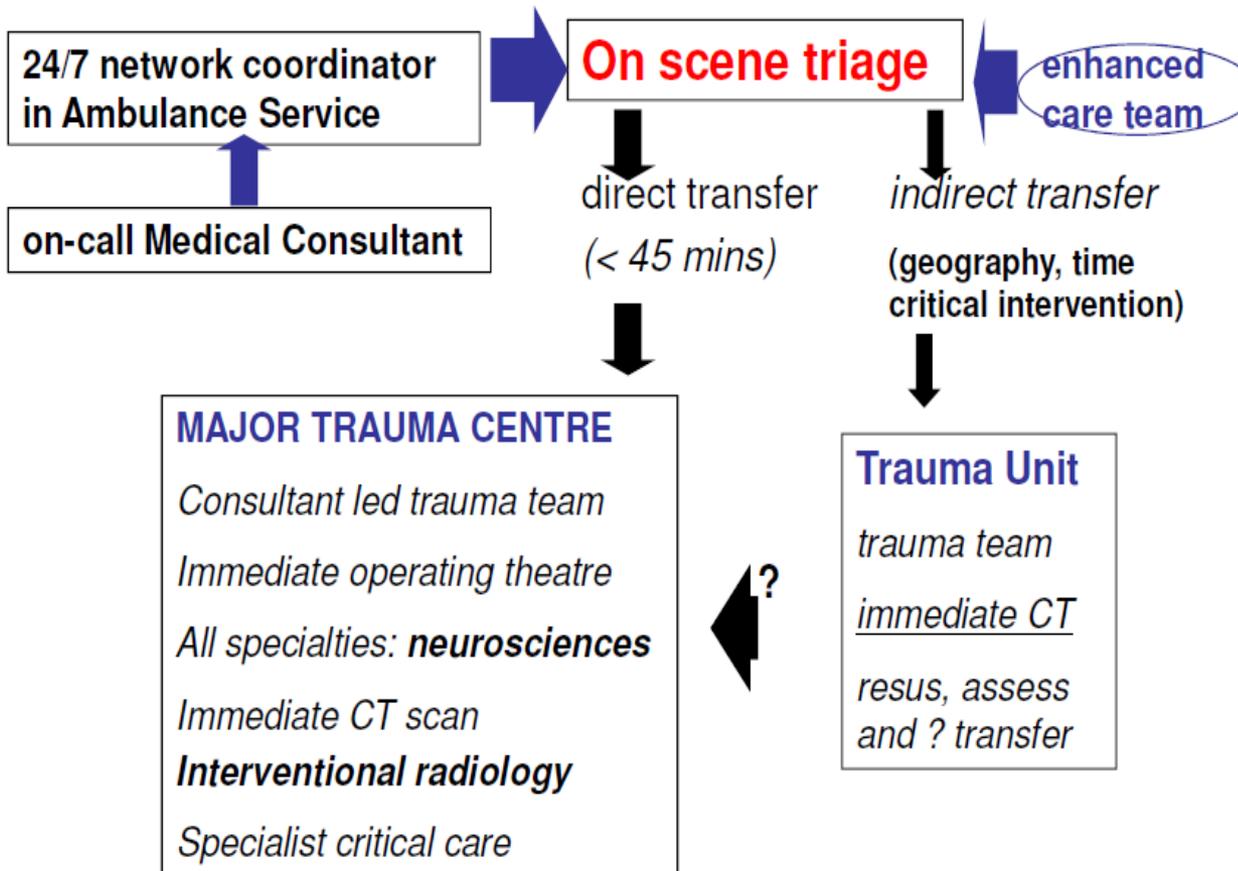
Policy Title	NOCA Escalation Policy		
Authors	Fiona Cahill / Marina Cronin / Mr Ken Mesly		
Reviewed by	Dr Philip Crowley HSE QPSD Prof Sean Tierney NOCA Dr Jennifer Martin HSE QPSD / Meureen Flynn HSE QPSD / Eunan Friel RCSI / Kieran Tangney RCSI Deirdre Coyne HSE QPSD / John Kenny HSE QPSD Mary Baggot / Roseanne Smith / Brid Moran / Deirdre Burke - NOCA		
Approved by	NOCA Governance Board September 2014		
Issue Date	27 th Sept 2014	Revision Due	01 October, 2016
Version	2.13		

Odds ratio for survival from Major Trauma in England

n = 65,399 (8.8% mortality)
ISS >8, missing GCS imputed



Preferred acute patient pathway



Prof Keith Willett



30
Prof Chris Moran

Best Practice Tariff Criteria

Level 1 ISS > 8 and the following criteria met:

- the patient is **treated in an MTC**
- **Complete patient data submitted to TARN registry** within 40 days of discharge
- **MDT Rehabilitation prescription is completed for each patient**
- **Tranexamic acid administered** within 3 hours of injury

Level 2 ISS > 15 Level 1 criteria are met, plus either:

- Patient received by **a trauma team led by a Consultant** within 30 (5) minutes of arrival
- If the patient is transferred as an **'urgent' transfer then the transfer should take place within 2 calendar days** of referral from the trauma unit.

Summary

- Fundamental importance of Major Trauma Audit
 - Can help develop strategy and measure the impact of changes
- Vital QA and QI tool
- Making Audit Mandatory
 - Sustainability
 - Data Coordinators



A scenic landscape featuring a body of water on the left, a rocky coastline with several sea stacks, and a grassy hillside on the right. The sky is a warm, hazy orange, suggesting a sunset or sunrise. The overall mood is serene and natural.

Recovery

**Trauma systems reduce
mortality and improve functional
and quality of life outcomes**

**Audit is the dash-board of the
Trauma System**

Injury