National Audit Office

# Major trauma care in England

## Methodology

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1 This report examined major trauma services in England and identified what improvements need to be made to the care for people with severe injuries. We examined the effectiveness of the planning and delivery of services, and the quality of care provided, including patient outcomes. The main elements of our fieldwork took place between May and September 2009.

## Evaluation of statistical data

2 We obtained data commissioned from the Trauma Audit and Research Network (TARN) by the Department of Health to develop a national picture of the quality of major trauma care. The data collected by TARN from participating hospitals include pre-hospital times, mechanism of injury, injury severity, times to treatment, length of stay, and outcomes based on mortality. The TARN database uses a model to calculate the likely rates of survival for particular injuries or combinations of injuries, taking into account age, gender and the person's response to the type of injuries. The database then compares the number of expected survivors against the number of actual survivors to produce a rate of survival for each hospital.

## Review of key policy documents, standards of care, and academic literature

3 We reviewed a range of published and unpublished research and other reports on trauma to develop our understanding of the development of major trauma care; identify standards of care; and to identify data sources for triangulation with data collected from TARN and on our visits.

## Estimation of the incidence of major trauma

4 We estimated the incidence of major trauma by examining Office for National Statistics (ONS) mortality data for 2007 and TARN data for the five years between 1 January 2003 and 31 December 2007. By examining ONS mortality data, we estimated that there were around 6,700 deaths resulting from trauma in England in 2007. However, as the TARN dataset is incomplete, an estimate based only on these data will underestimate the true scale of major trauma.

5 In addition, even with complete data collection, not all deaths due to major trauma are admitted to an emergency department. Airey et al reported that 35 per cent of all people with major trauma died before reaching an emergency department, and a further 11 per cent died before they were admitted to an emergency department.[1] On the basis of these figures, we assumed that only about 56 per cent of all deaths due to major trauma could be captured by the TARN dataset even if the TARN data were complete.

6 We examined the feasibility of the TARN data being used as a representative sample of the ONS data and found that, when comparing the distribution of mortality, gender and mechanism of injury, there was no material difference between the population characteristics of the two datasets. Therefore, we assumed that the TARN data could be used as a good sample of the ONS data. By treating the TARN data as a sample of the ONS data, the incompleteness in reporting cases of major trauma could be adjusted. We also accounted for those cases which did not result in an emergency department admission by adjusting the TARN mortality rates using the Airey estimate referred to above.

7 On this basis we estimated that there are around 20,000 major trauma cases in England each year, and about 5,400 deaths per year due to major trauma in England. We also estimate that about 2,400 of these 5,400 deaths would have occurred before admission to an emergency department.

## Economic analysis/modelling of the costs of major trauma

8 By using TARN data and applying inflation indicators reported in the Personal Social Services Research Unit document Unit Costs of Health and Social Care 2008, we used two published papers on the cost of treating blunt and penetrating trauma in England and Wales to estimate the cost of treating major trauma. These costs included the cost of ambulance transportation, the immediate hospital stay, and the cost of all surgical procedures performed during that stay. Costs associated with longer-term treatment and rehabilitation following discharge from hospital were not included in our estimate. We also used TARN data and Department for Transport data to estimate the value of lost economic output due to major trauma deaths and serious injuries.

## Telephone interviews and visits with strategic health authorities (SHAs)

9 We held telephone interviews with all ten SHAs to gain an understanding of the existing delivery of major trauma care within SHA areas, and any plans for reorganisation. We also visited those SHAs where work towards the reorganisation of trauma networks was underway.

1 Airey Cm, Franks AJ (1995). *Major trauma workload within an English Health Region.* Injury 1995 Jan;26(1):25-31.

## Visits to ambulance trusts and acute trusts

**10** We visited 10 ambulance trusts and nine acute trusts to gain an understanding of the local arrangements and challenges for the regionalisation of services for major trauma. At acute trusts, we typically interviewed the medical director, lead emergency consultant, emergency department staff, clinical governance leads, and counselling and chaplaincy staff. At ambulance trusts we typically interviewed the medical director.

## Census of non-TARN hospitals

**11** A questionnaire was sent to hospitals with an emergency department which do not submit data to TARN to establish why they do not do so. Questionnaires were sent to 88 hospitals and 61 responses were received (a response rate of 69 per cent). The questionnaire also requested information on consultant presence in emergency departments.

## Survey of TARN-contributing trusts

**12** A questionnaire was sent to NHS acute trusts with hospitals that submit data to TARN to establish what benefits arise from doing so. Questionnaires were sent to 75 trusts and 45 responses were received (a response rate of 60 per cent). The questionnaire also requested information on consultant presence in emergency departments.

## Semi-structured interviews with the Department of Health and key stakeholders

**13** We held semi-structured interviews with the Department of Health and key stakeholders to gain a more in-depth understanding of services for major trauma, identify issues, and to triangulate with quantitative data. The key stakeholders included the National Confidential Enquiry into Patient Outcome and Death (NCEPOD), TARN, and The Royal College of Surgeons of England.

## Telephone discussions with patient representative groups

**14** We held telephone interviews with patient representative groups to gain an understanding of the patient experience following major trauma. These groups included Headway, and the Child Brain Injury Trust.