

# Suffolk Show 2011: Prehospital Medical Coverage in a Mass-gathering Event

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## Abbreviations:

HSE: Health and Safety Executive  
PPR: patient presentation rate  
SJA: St John Ambulance  
SMO: senior medical officer  
TTHR: transport to hospital rate

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## Abstract

**Introduction:** Despite their popularity and unique characteristics, county shows, also known as agricultural fairs, are amongst the least-studied mass-gathering events. Suffolk Show is one of the biggest such events in the UK, attracting tens of thousands of people annually over a 2-day period. In addition to trade stands and live-stock displays, the 2011 show included top international show jumping and other sport activities.

**Problem:** Due to the range of activities and large number of attendees of different ages and medical backgrounds, combined with a lack of objective data about medical contacts made during these events, medical officers and local emergency services find planning an appropriate level of medical coverage for county shows particularly challenging. This study involved analyzing the characteristics of medical contacts during a major county show and assessing the level of medical coverage provided.

**Methods:** Data collected from St John Ambulance (SJA) and British Red Cross standard medical records of all contacts on the show ground over the two days were analyzed in terms of demographics, presenting complaints, medical history, and discharge destination. The Event Safety Guide by the Health and Safety Executive (HSE) was the agreed standard for the level of medical coverage.

**Results:** More than 90,000 people visited the show, with a total of 180 medical contacts recorded. Patient presentation rate (per 1,000 attendees) was 2.0 and the transport to hospital rate (per 1,000 attendees) was 0.1.

Of the 112 cases handled by SJA, 74 (66%) were women and 49 (44%) were 18-64 years of age. Wounds, lacerations and abrasions made up 26 (23.2%) of all presentations to SJA, followed by foot and lower limb blisters at 20 (17.8%). Hypertension was the most common medical history in presentations to SJA (11 cases, 10%), followed by asthma in 7 (6%).

**Conclusion:** The majority of presentations were due to minor injuries or ailments. An understanding of the event characteristics, demographics, and nature of medical contacts will provide organizers, medical officers, and local emergency services with information about the level of coverage and resources required. This data can further help advance knowledge of mass-gathering medicine across the various types of events.

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## Introduction

Mass-gathering health research is still developing, and there is little published data available about the characteristics of medical or emergency presentations and organization and resources needed for medical coverage during county shows.

Approximately six million people attend 1- or 2-day agricultural and county shows each year, usually from late May through early September.<sup>1</sup>

There are currently in excess of 50 such shows in the UK, varying in size but each typically attracting several thousand people who will engage in a wide range of activities over the show period. Similar events, often known as agricultural shows or fairs, happen annually in many other parts of the world, such as the United States, Australia, and New Zealand.

The large number of people of all ages and with a wide range of health or medical background issues attending these events represents a significant challenge to the organizers in terms of health and safety as well as provision of an appropriate level of medical coverage. The range of activities and events during a show, as later described, considerably increases the variety of hazards and risks, including the potential risk of catastrophe. These wide-ranging events, as opposed to music, sporting, or other similar events targeted for a more defined population engaging in a limited number of activities over shorter periods of time, make medical management of county shows particularly challenging.

Suffolk Show, as the county's biggest annual event, is one of the best-known county shows in the UK. In 1960, the show moved to its permanent site covering a total area of 100 hectares in Ipswich. The event normally comprises livestock displays; trade stands showcasing farming and industrial machinery and local crafts and products; competitions; traditional fun fair; food and drink; show jumping; and entertainment, including live evening music concerts. New to the 2011 show was the Sports Village, which was awarded the 2012 Olympics marquee for promoting sport and physical activity and offered everyone a chance to try a new sport. Options included rugby, martial arts, boxing, and a mini-BMX bicycle track. Top international show jumping was another feature of the 2011 event, and there also was a military display which involved abseiling stunts from helicopters. The 2011 show included a royal visit.<sup>2</sup>

The closest hospital to the showground is three miles away. The Ipswich Hospital NHS Trust is a busy district general teaching hospital affiliated with the University of Cambridge Medical School and offering a wide range of general and specialist services, including a 24-hour Emergency Department.

The objective of the study was to achieve a better understanding of the nature and demographics of medical contacts, and compare the level of medical coverage of the 2011 Suffolk Show with that recommended in the Event Safety Guide published by the Health and Safety Executive (HSE).<sup>3</sup>

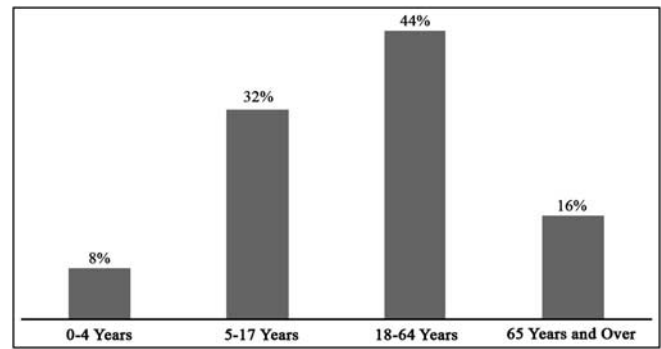
## Methods

All medical contacts made on the showground during the two days of the show were included in the study. Data collected were analyzed in terms of the general demographic information, presenting complaints, past medical history, arrival and discharge time, and discharge outcome of the contact. Patient presentation rate (PPR) and transport to hospital rate (TTHR) were calculated.<sup>4</sup>

The study was approved by the Ipswich Hospital NHS Trust. A list of information needed was discussed and agreed with the team leaders at the Organizing Committee meeting. This information was extracted from the standard records kept by both the British Red Cross and Suffolk St John Ambulance (SJA) for all medical contacts over the show period anywhere on the showground, including communal areas, trade stands, sports and activity stations, parking lots, and entrances.

All data collected were anonymized and patient identifiable details were omitted in collating the information.

The Event Safety Guide was the agreed standard against which adequacy of medical coverage was assessed. The HSE-proposed scoring system provides an estimate of the reasonable level of resources required based on characteristics of an event.



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**Figure 1.** Age Distribution of Cases Seen by SJA

Abbreviation: SJA, St John Ambulance

## Results

Medical coverage for the event was provided primarily by SJA and British Red Cross services. This was overseen by the Honorary Senior Medical Officer (SMO), an experienced General Practitioner, who further recruited the services of a team of experienced medical doctors from emergency medicine, surgical, and general practice backgrounds. Team members worked in shifts to guide, assist and supervise the delivery of care at the point of contact.

Showground coverage was divided between SJA and the Red Cross, with clearly sign-posted stands accessible to the public. Stewards and medical staff were instructed to use grid references on the showground map to identify locations, and all requests for assistance were routed via the control room.

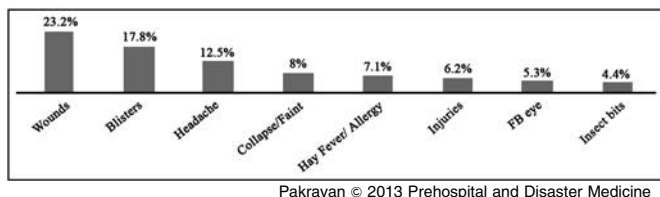
The show ran on the first and second days of June; both days were sunny with temperatures reaching 24°C. There were 800 trade and food stands, and more than 90,000 people visited the show over the two days.

St John Ambulance provided three ambulances and a rapid response unit, with the Red Cross providing an additional two ambulances. There were four or five paramedics present at any time, three from SJA and the rest from the Red Cross. Also, there were a number of trained first aiders, nurses and health care practitioners present at the stands who could treat minor injuries. Five doctors covered the two days, working in 2.5 hour shifts so that, in addition to the SMO, one other doctor was present on the showground at all times.

A total of 180 medical contacts were recorded over the two days; 112 were seen by SJA and 68 by the Red Cross. In total, 64 (35.5%) of presentations were under 18 years of age. There were 78 medical contacts on the first day and 102 on the second day, with a total of nine hospital transfers. The PPR (calculated using a rounded figure of 90,000 for crowd size) was 2/1,000 attendees and the TTHR was 0.1/1,000 attendees.

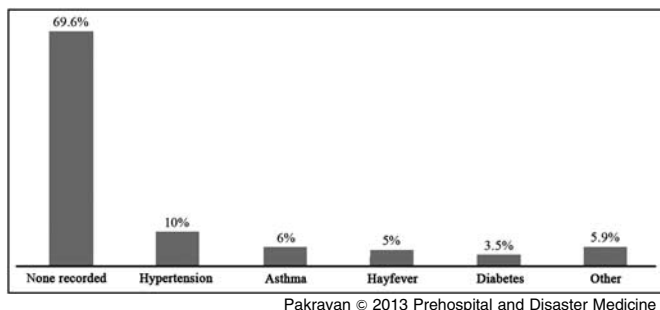
Further details were available only from SJA. Of 112 cases seen by SJA, 49 (44%) were 18-64 years of age and 36 (32%) were 5-17 years of age (Figure 1). Of all the SJA cases, 74 (66%) were female. There were nine cases of faint and collapse, of which five (55.5%) were in the over 65 age group. Staff, exhibitors, stand holders, and competitors made up 18 (16%) of all presentations to SJA.

The most common presenting complaints were wounds, lacerations and abrasions (26 cases, 23.2%), followed by foot and lower limb blisters (20 cases, 17.8%) and headache (14 cases, 12.5%). Other presentations included faint and collapse (9 cases, 8%), allergy and hay fever (8 cases, 7.1%), trauma and musculoskeletal



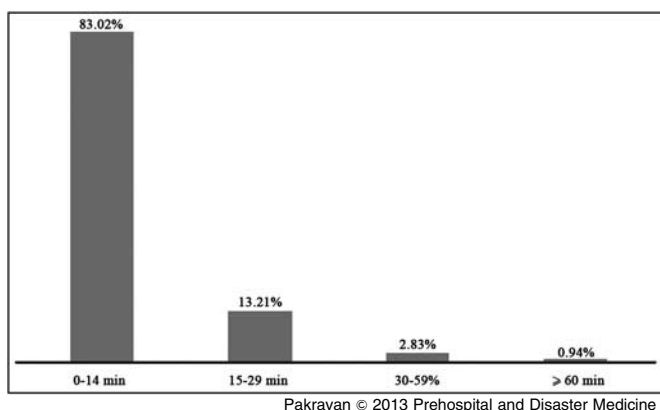
**Figure 2.** Common Presenting Complaints of Cases Seen by SJA

Abbreviations: FB eye, foreign body in eye; SJA, St John Ambulance



**Figure 3.** Medical History in Cases Seen by SJA

Abbreviation: SJA, St John Ambulance



**Figure 4.** Time from Arrival to Discharge or Transport to Hospital

injuries (7 cases, 6.2%), foreign body in the eye (6 cases, 5.3%), and insect bite (5 cases, 4.4%). The remaining cases were infrequent and sporadic complaints such as sunburn, epistaxis, earache, and viral conditions (Figure 2).

Pre-existing problems, where the patient had attended the show despite feeling unwell or was requesting further assessment and/or treatment, comprised 12 (10.7%) presentations.

The main findings for medical history in SJA cases were hypertension (11 cases, 10%), asthma (7 cases, 6%), hay fever (6 cases, 5%), and diabetes (4 cases, 3.5%) (Figure 3). In total, 35 (31%) of patients were on one or more medications at the time of presentation, including the three patients who were transferred to hospital by SJA.

In more than 95% of the contacts, patients walked to the care providers to seek help. The average time from arrival to discharge or transfer to definitive care in the 106 fully-recorded contacts was 9.2 minutes (Figure 4). In six cases, this data had not been sufficiently recorded.

## Discussion

A comprehensive description of a mass gathering would, in addition to the number of people, include other factors which potentially could complicate provision of appropriate medical care.<sup>4,5</sup>

In addition to crowd size, multiple demographic, geographical and environmental factors can influence medical load and potential health hazards during an event. Some of these factors are type and duration of the event, intention of the crowd, type of the venue, weather and temperature, presence of alcohol, and even VIP visits.<sup>3-7</sup>

Although data about the exact age mix of the people who attended the show was not available, considering the age distribution of the cases seen by SJA, it would be reasonable to assume the crowd in attendance was a reflection of the general population. A higher proportion of crowds in a mass gathering will seek and require medical attention compared with the general population.<sup>4-8</sup> Many of these requests for care, as also evidenced by the findings of this study, are due to minor injuries and ailments.<sup>3-9</sup>

Stratification of events based on their general characteristics has been used successfully to predict medical load during minor and intermediate mass-gathering events.<sup>10</sup> Nonetheless, where previous data is available, retrospective models for prediction of medical workload in mass gatherings tend to be more accurate than prospective forecasting methods.<sup>11</sup>

The HSE Event Safety Guide provides event organizers with recommendations to improve safety. This includes a scoring system for event medical coverage. Although these guidelines are not compulsory, and were primarily aimed at music events, they are widely referred to by organizers of other types of events, and are even used as a template for developing similar guidelines in other parts of the world.<sup>3-8</sup>

Based on the HSE scoring system for the level of medical coverage, Suffolk Show 2011 would score 50, which means the minimum recommended resources required at any one time during the event would have been four ambulances, three doctors and one support unit as well as 40 first aiders, 12 ambulance personnel and six nurses. Despite the fact that medical coverage for the show was at a lower level than recommended, on-site treatment of minor presentations was provided successfully, along with timely, effective retrieval, stabilization and transfer to definitive care for more serious cases.<sup>3,4</sup>

Data available from a survey of 201 mass gatherings over a 12-month period with a combined crowd of more than 12 million shows a PPR of 0.992/1,000 and a TTHR of 0.027/1,000 attendees.<sup>12</sup> The discrepancy between these figures and those of the current study may be partly due to the difference in crowd sizes studied, but may also be a reflection of the unique characteristics of county shows.

## Conclusion

County shows, due to their nature and popularity, represent a challenge to medical officers and local emergency services for provision of the appropriate level of medical coverage.

The majority of medical contacts during Suffolk Show 2011 were due to minor injuries or ailments. This shows the importance of on-site availability of sufficient resources for managing the most common presentations. These findings can be particularly useful in planning for the required facilities; range, amount and type of equipment; medications; and materials.

Organizers of such events also can use this data to educate patrons and stewards about potential health hazards and ways of reducing risks and medical workload through prevention and preparation.

#### Acknowledgements:

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