ORIGINAL ARTICLE

Effects of international football matches on ambulance call profiles and volumes during the 2006 World Cup

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Emerg Med J 2007;24:405–407. doi: 10.1136/emj.2007.046920

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Accepted 13 March 2007

Background: Prompt ambulance attendance is aimed at improving patient care. With finite resources struggling to meet performance targets, unforeseen demand precludes the ability to tailor resources to cope with increased call volumes, and can have a marked detrimental effect on performance and hence patient care. The effects of the 2006 World Cup football matches on call volumes and profiles were analysed to understand how public events can influence demands on the ambulance service.

Methods: All emergency calls to the Hampshire Ambulance Service NHS Trust (currently the Hampshire Division of South Central Ambulance Service, Winchester, UK) during the first weekend of the 2006 World Cup football matches were analysed by call volume and classification of call (call type).

Results: On the day of the first football match, call volume was over 50% higher than that on a typical Saturday, with distinct peaks before and after the inaugural match. Call profile analysis showed increases in alcohol-related emergencies, including collapse, unconsciousness, assault and road traffic accidents. The increase in assaults was particularly marked at the end of each match and increased again into the late evening.

Conclusion: A detailed mapping of call volumes and profiles during the World Cup football shows a significant increase in overall emergency calls, mostly alcohol related. Mapping of limited resources to these patterns will allow improved responses to emergency calls.

The demands on the UK ambulance service continue to grow, with a 6% increase in emergency calls documented in 2005–6.¹ In addition to this increasing call volume, extreme weather conditions^{2–3} and public events^{4–6} create significant additional fluxes in demand. With limited resources struggling to meet performance targets, unforeseen demand precludes the ability to tailor resources to cope with increased call volumes, and can have a marked detrimental effect on performance and hence patient care.

Surprisingly little work has been carried out to examine the effect of the above variables on ambulance workload. In particular, the effects of national events on the ambulance service have been poorly documented. Football matches are known to increase local demand through increase in the number of spectators (>30 000 people at larger stadiums), alcohol-related incidents and, at some matches, the associated civil disorder. The national interest in football may probably affect call profiles and volumes not only in the local vicinity of the game, but also across the UK, particularly when the national team is playing.

The year 2006 witnessed World Cup matches which, in the initial stages, involved the England team. During this period, Hampshire Ambulance Service (currently the Hampshire Division of South Central Ambulance Service, Winchester, UK) received some of its highest call volumes on record, with Saturday, 10 June 2006, the day of the England versus Paraguay match, being the busiest day experienced over the preceding 6 months. On this day, the Trust received 734 emergency calls to the control room, over 50% higher than that on a typical Saturday. We therefore analysed our data during the World Cup period to determine the effect of international football matches on ambulance workload and call profile in Hampshire.

MATERIALS AND METHODS

All emergency calls to the Hampshire Ambulance Service NHS Trust are received by a central control room. Data relating to the

calls are logged and stored on a mainframe computer. All emergency (999) calls are triaged using the Advanced Medical Priority Dispatch System (AMPDS) software (Priority Dispatch Corp, USA, V.11.1). The patient's primary condition is determined and allocated a chief complaint classification from the information provided by the caller, according to an algorithm. This allows the call-taker to ask more condition-specific predetermined questions, in order to identify the clinical condition of the patient. From this information, a code is allocated to the call, which has a subsequent resource/priority level assigned to it.

Call volume from the weekend of the first football match involving England was analysed on an hourly basis. The most common main complaints and, in particular, calls classified as "assault" were specifically analysed for Saturday, 10 June 2006, when England played their opening game against Paraguay. Data were compared with estimated call profile and volume for an average Saturday, taking an average of data from Saturdays during the period from 1 March 2006 to 31 May 2006.

RESULTS

Results are shown graphically in figs 1, 2 and 3, and compare call profiles and volumes seen on an average weekend with those recorded during the weekend of the opening match of the national football team.

Figure 1 shows the overall number of emergency calls to the control room on an hourly basis. The England versus Paraguay football match kicked off at 14:00 and finished at 15:45. Saturday, 10 June 2006, was the second busiest day of 2006, with the Trust receiving 734 emergency calls within the control room; over 50% higher than that on a typical Saturday, with call volume being highest between 18:00 and 19:00. On Saturday, 10 June 2006, a peak in calls was seen in the morning before the kick-off. During the game, the call volume

Abbreviation: AMPDS, Advanced Medical Priority Dispatch System

Figure 1 Weekend call volume from 00:00, 9 June 2006, to 24:00, 11 June 2006, compared with the average weekend call volumes (average taken from 1 March 2006 to 31 May 2006). The timing of the England versus Paraguay football match is also shown.

decreased to average levels and then increased significantly once the game had finished, reaching a maximum in the early evening and not subsiding to normal call volumes until approximately 02:00 the following day. The peaks above normal call volume on Friday, 9 June 2006, and Sunday, 11 June 2006, also correlate with World Cup football matches played on those days, with a pattern of increased calls before the first game, a subsidence of calls during the actual matches, and an increase in calls after the end of each game and in the late evening.

Figure 2 analyses the call profiles in relation to those on Saturday, 10 June 2006, and compares the top 10 most common classifications with call profiles expected on an average Saturday. An increase is seen with falls (18.5%), assaults (138%), breathing problems (9.6%), chest pain (15.4%), unconsciousness (33.5%), unknown problems—collapse (44.4%), road traffic accidents (118%) and traumatic injury (31.2%). There were fewer calls than expected for “sick person” and overdose.

Figure 3 shows the number of assault incidents on an hourly basis during Saturday, 10 June 2006. The Sweden versus

Trinidad and Tobago football match kicked off at 17:00 and finished at 18:45. The average pattern for a Saturday shows a moderate number of assaults from the preceding evening reaching a peak at approximately 02:00 and declining by 05:00. Assaults begin to increase in the early afternoon, but do not increase significantly until about 21:00, when the rate increases until 02:00. The pattern and volume of assaults on Saturday, 10 June 2006, are distinctly different. A distinct peak in assaults is seen late in the morning before the kick-off of the first match. Assault rates then decrease to average values till the England match is finished, when they begin to increase significantly above expected rates. There is a decline in assaults during the following Sweden versus Trinidad and Tobago match, but rates again increase once the match is finished, and a further peak is seen in the evening, reaching a peak at midnight. For the 24 h period on Saturday, 10 June 2006, assault rates increased by 138% above that normally expected.

Table 1 shows the effect of this increased demand on the overall performance on Saturday, 10 June 2006, and in comparison with that on an average Saturday. Category A calls

Figure 2 Top 10 incident types on Saturday, 10 June 2006, compared with the average top 10 incident types on an average Saturday (average taken from 1 March 2006 to 31 May 2006). The corresponding Advanced Medical Priority Dispatch System call classification is given in parentheses.

Figure 3 Number of assault incidents on Saturday, 10 June 2006, against the average number of assaults on an average Saturday (average taken from 1 March 2006 to 31 May 2006). The timing of the England versus Paraguay and Sweden versus Trinidad and Tobago football matches is also shown.

Table 1 Call volumes according to category and associated performance figures for Saturday, 10 June 2006, compared with the average figures for June 2006

June 2006 average				Saturday, 10 June 2006			
Category	Call volume	8 min response time (%)	19 min response time (%)	Category	Call volume	8 min response time (%)	19 min response time (%)
A	98	76.2	74.6	A	131	62.6	87.8
B	178	—	90.5	B	226	—	76.1

Category A calls are deemed as life-threatening and require an 8 min response. Category B calls are classified as urgent and require a 19 min response.

are deemed as life-threatening and require an 8 min response. Category B calls are classified as urgent and require a 19 min response. Performance did not return to normal levels until midnight.

DISCUSSION

The South Central Ambulance Service provides emergency services to 1.6 million residents across 1400 square miles, and, although it is classified as a rural ambulance service, it has several large cities within its boundaries (Southampton, Portsmouth, Winchester, Basingstoke). In 2005–6, the service received a total of 99 200 emergency (AMPDS category A) and urgent (AMPDS category B) calls. The UK ambulance services are expected to meet specific performance targets, and are commissioned to attain, but not exceed, these targets. Ambulance performance across the UK is therefore very close to these targets, and relatively small increases in demand can lead to significant falls in performance. Over recent years, the efficiency of ambulance utilisation has greatly increased, with resources being mapped to times of peak requirement. This has contributed to the improvement in ambulance response times seen over the past 5 years. In order to balance resources with demand, a detailed understanding of call volumes and profiles is required. Although this can be achieved for average days, specific events can cause large fluctuations in demand. An understanding of the effects of these events on call volume and profile can aid in resource planning and in providing the subsequent ability to maintain performance and patient care.

Few published data exist documenting the effects of national events on ambulance demand. Although the public interest in the World Cup was immense, the subsequent effects on ambulance demand were relatively unknown. The data presented show a significant increase in demand for ambulance resources, related in particular to times immediately before and after the England match and also in the late evening, as revellers continue their celebrations or commiserations in city centres. Seven of the top 10 incidents are drinking-related incidents, with assaults, collapse, unconsciousness and road traffic accidents showing particularly large increases. With the longer pub opening times, the sudden increase in calls that were previously seen after the traditional 23:00 closure is no longer seen. The biggest rise in activity was in the number of assaults, with the Trust receiving 2.5 times more assault calls than normal.

Table 1 shows the effect of this increased and unforeseen demand on overall ambulance performance. The Trust was unable to deal with the large rise in activity, and was trying to

catch up for the rest of the day. Performance did not return to normal levels until midnight. Having established the increased volume of calls resulting from the initial day of the World Cup, resources were reconfigured to cope with anticipated increased demand on subsequent days. Plans were also put in place to work with other agencies (eg, nightclubs) to minimise alcohol-related incidents, to reduce the risk of assaults and to limit the overall increase in emergency calls arising from venues where football festivities were taking place.

To the best of our knowledge, the effect of international football events on ambulance call volumes and profiles has not been published previously. Although demands on ambulance resources for local football matches are well known to their respective ambulance Trusts, the demand from the World Cup exceeded our estimates and resource planning. Most events seem to be assaults and alcohol-related incidents, which increased significantly. Future planning for these events must not underestimate the significant rise in ambulance demand from this and similar events.

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Competing interests: None declared.

Contributors: CDD, FT and CG were involved in the study protocol. CG and MG were responsible for clinical data collection. All were responsible for data analysis and writing up of the results. All made critical revisions to the manuscript. CD is the guarantor.

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