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Going for gold: blood planning for the London 2012 Olympic Games

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SUMMARY

The Olympics is one of the largest sporting events in the world. Major events may be complicated by disruption of normal activity and major incidents. Health care and transfusion planners should be prepared for both. Previously, transfusion contingency planning has focused on seasonal blood shortages and pandemic influenzas. This article is the first published account of transfusion contingency planning for a major event. We describe the issues encountered and the lessons identified during transfusion planning for the London 2012 Olympics.

Planning was started 18 months in advance and was led by a project team reporting to the Executive. Planning was based on three periods of Gamestime. The requirements were planned with key stakeholders using normal processes enhanced by service developments. Demand planning was based on literature review together with computer modelling. The aim was blood-stock sufficiency complimented by a high readiness donor panel to minimise waste. Plans were widely communicated and table-top exercised.

Full transfusion services were maintained during both Games with all demands met. The new service improvements and high readiness donors worked well. Emergency command and control have been upgraded. Red cell concentrate (RCC) stock aged but wastage was not significantly increased. The key to success was: early planning, stakeholder engagement, service developments, integration of transfusion service planning within the wider health care community and conduct within an assurance framework.

Key words: blood modelling, blood provision, major event health care planning, transfusion contingency planning.

The quadrennial Olympic and Paralympic Games are the largest and second largest sporting events in the world and the 2012 Games in London was the largest logistical exercise the UK has prepared for in peacetime (TIoCE, 2012; Budgett, 2013; IPC, 2013). During the 3 months over which the games took place 10·8 million ticket holders attended the games, with 20 million spectator journeys made across London alone (GLA, 2012). This mass movement of a population, sudden influx of international visitors and required transformation of local infrastructure presents a challenge to the transfusion service to maintain normal operations (Meehan *et al.*, 1998; Tsouros & Efstathiou, 2004).

Added to this increased operational level, a greater population density and raised threat of terrorist activity leads to a heightened risk of disaster (Meehan *et al.*, 1998; Arnold, 2002; Tsouros & Efstathiou, 2004; Office UFaC, 2011; Home Office U, 2012). This had the potential to create an acute surge in blood demand overwhelming an already pressurised system (Kurup *et al.*, 2002). Large-scale events such as the Olympics are known to present a rare opportunity for widespread international exposure of extremist political agendas through both violent and disruptive means (Brismar & Bergenwald, 1982; Meehan *et al.*, 1998; Tsouros & Efstathiou, 2004). The terrorist attacks in London on the 7 July 2005 occurred the day after the games were awarded to the city, and past events at the games of Munich, Los Angeles and Atlanta, as well as, the recent bombings during the Boston marathon in 2013 are several other such examples (Hiatt & Larmon, 1988; Meehan *et al.*, 1998; Frykberg, 2003; Tsouros & Efstathiou, 2004; Aylwin *et al.*, 2006; Boyle & Haggerty, 2012; Kellermann & Peleg, 2013).

Despite the regularity of events such as the Olympics and the increasing size of this sporting spectacle, transfusion service contingency planning is poorly reported in the literature. This is in contrast to the attention afforded to other blood provision emergencies such as pandemic influenza and seasonal blood shortages (Zimrin & Hess, 2007; Burger & Offergeld, 2010; Kamp *et al.*, 2010; Kuruppu, 2010). The sustained pressure placed on the blood service in the months leading up to, and during planned major events, as well as the potential for further disruption and potential surge in demand following a mass casualty event (MCE) warrants greater attention. This article describes

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the process of blood contingency planning for the 2012 London Olympics. The overall objective was to highlight the issues encountered in planning for these types of event and the lessons identified subsequently, in order to support other nations and blood services during similar future contingency planning.

CONTEXT AND BRIEF

The health care contingency plans for the London Olympics were the result of the collaborative contributions of key individual sectors within the National Health Service (NHS) for England. This was performed under the overall instruction of the government's Department of Health (DH) with restricted planning assumptions detailed by the UK Cabinet Office. Blood-based contingency planning was led by the blood transfusion service within NHS Blood and Transplant (NHSBT), the authority responsible for blood provision to England and North Wales together with organ donation services across the UK. Eighteen months before the start of the Olympics in London, NHSBT formed its own Olympic planning committee. The remit was to ensure that NHSBT maintained critical functions throughout the games, and that the organisation was able to respond to potential emergencies.

The Olympics and Paralympics would eventually involve 32 venues in and outside the capital lasting 3 months (2012). This period of time was termed 'Gamestime' for planning purposes and consisted of three separate stages of assumed operational disruption: the main games (27 July to 12 August) during which severe operational disruption was expected, the changeover period (13 August to 28 August) when disruption would revert to standard summertime levels and the final stage during the Paralympic Games (29 August to 9 September) during which significant operational disruption was expected. The lead up to Gamestime would be further complicated by a number of annual national events and holidays as well as country-wide celebrations for the Queen's Jubilee year. Although smaller in scale these events would create significant population migration and transport disruption with potential to impact on Olympic transfusion preparations.

PLANNING ASSUMPTIONS

The blood service planning brief was divided into two categories. The first consisted of contextual assumptions that related to disruption of 'business as usual' (BAU), whereas the second considered emergency response planning and involved functional assumptions relating to incident response. All modifications to operational procedures needed to be fully communicated and understood across the blood network, with plans sufficiently robust, trained and exercised so as to guarantee their effective delivery prior to Gamestime.

Disruption to the transfusion services' BAU operations was seen as a significant challenge for the organisation, requiring the development of new initiatives with hospitals to manage stock and thereby minimise transport requirements during Gamestime. Major incident planning specifically required the ability to meet transfusion demands in the case of one or more large-scale incidents not previously planned for by the blood transfusion services in the UK. Communication strategies, which historically have presented an issue for planners, would need addressing early to allow improved interaction between stakeholders internally and externally (Meehan *et al.*, 1998; Tsouros & Efstathiou, 2004). Anticipated transport disruption, as previously described by planners of the Atlanta 1996 Games and more recently the Athens 2004 Games required a review of *ad hoc* and routine deliveries to hospital blood banks as well as the facilitation of internal stock movement. The availability of a framework for the collection of whole blood was also recognised as a priority for stock building and would be supported by donor drives using an Olympic incentive and reward scheme.

The major incident planning brief for NHSBT also included other scenarios not under the specific remit of the transfusion service and therefore not discussed further in this article. They included an *Escherichia coli* outbreak severe enough to mandate plasma support and large-scale fires requiring component support and high volumes of donor skin.

COMMAND AND CONTROL

Command and control was based on pre-existing structures (Fig. 1). The NHSBT plan is based on UK DH guidance (DH, 2005). The detailed planning figures were restricted.

DEMAND PLANNING

Business as usual

NHSBT uses a combination of demand data (including seasonal fluctuations) and information on changes in practice, modifications to guidelines and new product availability to inform a stock planning model, providing a multivariate prediction tool from which stock requirements can be determined. Forecasting for Gamestime required application of the Olympic planning assumptions to the base model. This allowed early identification of the potential effects on BAU and instigation of an appropriate response. It also allowed insight into the pattern of hospital demand during an incident response highlighting the three-fold difference between hospital demand and patient requirement under these circumstances.

Major incident

Demand planning combined the casualty numbers provided by DH together with individual casualty requirements and a 'hospital demand factor'. The prediction of individual casualty blood requirement presented a challenge for planners. Previous blood prediction tools have focused predominantly on early casualty physiology and laboratory results to predict a dichotomous outcome of requiring massive transfusion or not (Kuhne *et al.*, 2008;

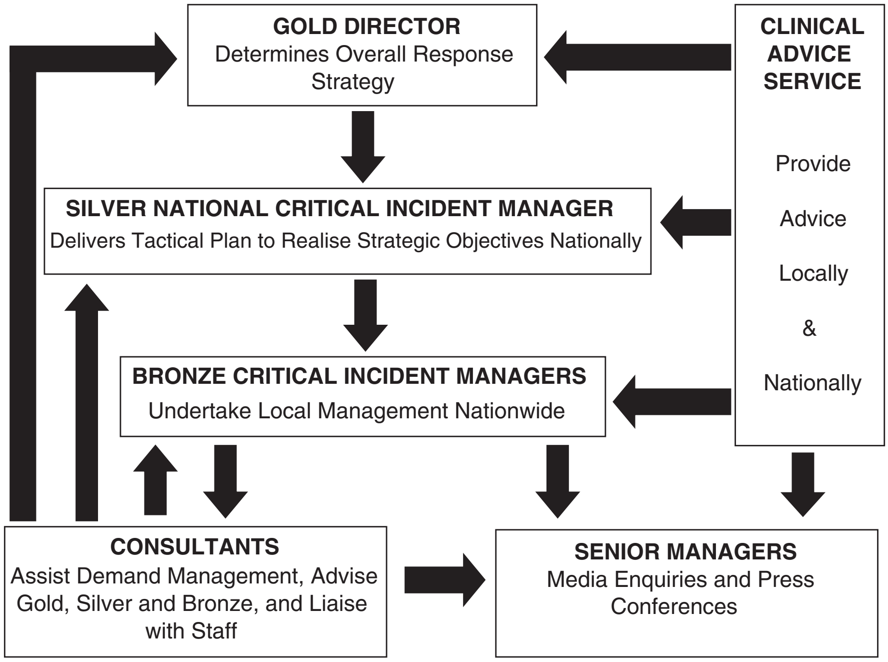

Fig. 1. Diagrammatic representation of the NHSBT command and control structure showing the various member interactions and feedback pathways within the overall hierarchical structure.

McLaughlin *et al.*, 2008; Nunez *et al.*, 2009; Vandromme *et al.*, 2011). Transfusion planning for a mass casualty incident requires broader casualty descriptors. Models suggested in the past have included: number of casualties evacuated, admitted to hospital or classed as severely injured as a function of blood need (Shinar *et al.*, 2006; Rasmussen *et al.*, 2008; Soffer *et al.*, 2008; Beekley *et al.*, 2009). In order to better inform planning, a 100-year worldwide literature review of blood use following MCEs was conducted. The review provided red blood cell (RBC) use for 51 events all occurring within the last 30 years and involving over 11 000 casualties. A significant relationship ($r^2 = 0{\cdot}75$, $P = 0{\cdot}01$) was observed between number of casualties with injury severity scores greater than 15 (ISS > 15) and RBC use in terrorist MCEs (Glasgow *et al.*, 2013). The findings of this study and similar study suggestions for RBC requirement planning are shown in Table 1.

The primary concern for an event during Gamestime was of a terrorist nature involving the use of improvised explosive devices (IEDs) (Office UGH, 2011). These are common place in military operations and amongst certain civilian populations, but have not been experienced on the same scale in the UK since the 2005 attacks (Rodoplu *et al.*, 2004; Aylwin *et al.*, 2006; Dann *et al.*, 2007; Nelson *et al.*, 2007). The lessons identified from that incident have been described previously (Glasgow *et al.*, 2012). These attacks required a total of 338 U (unit) of RBCs across all treating units, with an average of 14·5 U per casualty receiving a transfusion and 6·1 U per patient triaged at scene as a priority one (P1) casualty (Hodgetts, 1995; Aylwin *et al.*, 2006). The 14·5 U per casualty receiving a transfusion was noted to be similar to the mean RBC use of P1 casualties injured by IEDs in the military over the period 2008–2011 (Jansen *et al.*, 2013).

From the events reviewed in the literature, although occasional restocking of RBCs was described, there was no report of any unit running out of RBCs during an event (Vassallo *et al.*, 2005; Aylwin *et al.*, 2006; Shinar *et al.*, 2006; Soffer *et al.*, 2008; Glasgow *et al.*, 2013). However, there was little available data for other blood components such as fresh frozen plasma (FFP), platelets (Plt) and cryoprecipitate (Cryo) (Glasgow *et al.*, 2013). There has been a significant shift towards the increased use of these components in recent years through damage control resuscitation and the treatment of coagulopathy (Brohi *et al.*, 2003; Holcomb *et al.*, 2007; Ma *et al.*, 2007). Although the optimum ratios of RBCs to these components continues to be the subject of much debate, the overriding implication is that future MCEs will demand much higher volumes of these products which are now a mainstay of major haemorrhage protocols (Nunez *et al.*, 2010; Khan *et al.*, 2012; Sinha *et al.*, 2013).

Planning assumptions therefore were based on a compromise between available civilian and military data combined with an appreciation of logistically achieving and maintaining the required stock level for Gamestime. The interquartile range from the civilian MCE literature review was 4·1–8·2 U RBC, the upper quartile being close to the widely accepted lower limit of a massive transfusion (10 U RBC).

Severely injured casualties/P1 were estimated to require 10 U of RBC supported by blood components as specified by a regionally agreed massive haemorrhage protocol (Allard *et al.*, 2012). The less severely injured patients/priority two (P2) casualties were assumed not to routinely require haemostatic component

Table 1. A comparison of previous studies describing the relationship between casualty statistics in mass casualty events (MCE) and the number of units (U) of red blood cells (RBC) required during the event

	Beekley *et al.* (2009)	Soffer *et al.* (2008)	Shinar *et al.* (2006)	Rasmussen *et al.* (2008)	Glasgow *et al.* (2013)*
Study background	Military MCEs	Civilian terrorist MCEs	Civilian terrorist MCEs	Civilian terrorist MCEs	Civilian all types of MCEs (terrorist events)
Casualty descriptor	Evacuated/moderately injured/severely injured	Evacuated/admitted	Injured/severely and moderately injured	Admitted	Injured/evacuated/ admitted/ISS > 15
Average RBC per casualty	1·4 U/2·9 U/6·7 U	0·6 U/1·2 U	1·3 U/6·7 U	3·5 U	1·0 U (1·0)/1·6 U (1·6)/2·9 U (2·9)/8·1 U (5·9)

*Data from other listed civilian MCEs included within this study.

Table 2. The planned volume of the principle blood products required for each triage category

Priority	RBC (U)	FFP (U)	Plt (ATD)	Cryo (pool)	Category Definition
P1	10	6	1	1 – 2	Immediate, requiring immediate intervention
P2	4	0	0	0	Urgent, requiring intervention <6 h
P3	0	0	0	0	Delayed, walking wounded

ATD is adult therapeutic dose (1 ATD = 4 buffy coats). Pool is equivalent to 5 single units.

support and the walking wounded priority three (P3) casualties were deemed not to require any blood at all. A summary of the blood component requirement assigned for each triage category is shown in Table 2.

Planners recognised that some individuals may require far more blood than this. For example, individuals who lost both lower limbs during the London bombings required a mean of 22 U RBC and review of military data suggests that individuals can receive up to 100 blood components during the first 24 h and survive (Allcock *et al.*, 2011). Haemostatic agents and techniques were also recognised as being crucial to reduce the burden on available resources (Rotondo & Zonies, 1997; Shakur *et al.*, 2010).

The final step in planning demand was to apply a 'hospital demand factor' to all required estimates. There was approximately a three-fold difference between hospital demand and patient requirement following the London bombings with a similar experience reported during MCEs elsewhere (Soffer *et al.*, 2008; Glasgow *et al.*, 2012). Despite this, the local shortages of blood components during an incident were realised as a possibility. Hospitals were advised that pre-existing published national RBC and platelet shortage plans would be used as the basis for prioritisation (Committee NBT, 2009b; Committee NBT, 2009a). Planning assumptions also assumed that there would be a disproportionate demand for universal blood components including: group O RBCs, group A platelets and group AB plasma.

STOCK AND DONOR MANAGEMENT

NHSBT policy is to hold sufficient stocks rather than to rely on emergency donations. Donations provided at the time of an emergency are used to replenish stock. Meeting the demand would require optimising the balance between sufficiency and wastage, stock building of frozen components in advance, redistribution of stock and increasing the agility of the donor and manufacturing response during Gamestime.

Inventory

The inventory target for Gamestime required a stock-build to approximately 55 000 U of RBCs (normal stock holding at the time was approximately 45 000 U). This target included an explicit requirement to increase the stock of vulnerable groups of O negative to 7·6 days of use (4850 U) and B negative to 6·9 days of use (975 U). Stock levels of FFP and other frozen components including cryoprecipitate would also need to be increased commensurately to meet targets. The initial estimate for plasma was an increase of 13% with a higher proportion of group AB and groups A high titre negative units. However, a decision was taken not to build stock to meet all planning assumptions affecting FFP, but to have an escalation plan for producing liquid plasma if a surge of whole plasma-type product was required in very specific circumstances. Building a large frozen stock would have required a disproportionate financial investment and escalation was seen as a more proportionate response.

Donation programmes

A whole blood donation programme was developed to meet the volume and group mix inventory requirements described by demand planning. This involved building RBC and frozen product stock in the months leading up to Gamestime and altering donation sessions during Gamestime itself. The stock build program for whole blood consisted of three main phases: an initial public appeal highlighting the need to prepare for a large influx of overseas visitors, followed by a focus on building individual blood groups with the celebrity-based Team GB (Team Give Blood) being introduced, and finally, the timed launch of National Blood week in June 2012, just prior to the games.

In addition to the planned stock build, there was the introduction of a high readiness 'on-call' donor program providing 13 000 registered donors with blood groups O+, O−, AB− and A−. These volunteers agreed to respond at short notice if required and could be communicated with via simple message service (SMS) texting. The purpose of this reserve was for rapid replenishment of red cell stock following a sudden surge in demand. However, it would also provide buffy coats for platelet manufacture and plasma. In addition, high readiness donors were available for platelet donation by apheresis.

Manufacturing

Approximately 80% of platelets are collected by apheresis in static sites; the rest is recovered from whole blood processing. Consideration was given to the possibility of holding higher platelet stock levels during the period. However, as platelets are a labile component with a shelf life of 7 days, this would have resulted in not only increased production but also wastage. A more responsive approach was desired. Options used by planners in other countries include the use of fresh whole blood and mobile apheresis units. The decision was made to slightly increase the stock of platelets in order to meet the challenges set by logistical issues but to have plans to rapidly increase the manufacture of recovered platelets in the event of a MCE. In order to do this, the stock of donor bags that allowed manufacture of recovered platelets was increased to twice the normal stock holding level, and all donor teams carried sufficient stock of these bags to enable them to immediately switch to these bags as directed. Manufacturing capacity was optimised by preparing frozen products in advance. These supply plans were combined with plans for demand management using the pre-existing shortage plans designed with the hospitals.

HOSPITAL SERVICES

Receiving hospitals were consulted, and an engagement plan created, to communicate and agree on how NHSBT and hospitals would operate together during the games to deliver timely and sufficient supplies. Various channels of communication were developed including: planning questionnaires provided to all hospitals involved, telephone and face-to-face meetings with laboratory leads and a dedicated web-based question and answer portal. These techniques empowered individual hospitals to participate fully in the planning process and build comprehensive operational and resilience strategies. The key actions agreed to minimise the potential impact of operational and logistical challenges during the games are summarised in Table 3.

PLANNING ASSURANCE

The NHSBT Chief Executive and the Senior Manager responsible for Olympic preparations met with the DH and provided assurance of the planning process. Internal training took place at Gold, Silver and Bronze levels to ensure that those responding during the Olympics were aware of plans. External validation was conducted through a 1-day table-top exercise conducted with key stakeholders including representatives from the DH, and designed to test the NHSBT plans fully. This method of planning had proven successful during the lead up to previous Olympics in Atlanta and Athens and the lessons identified during the table-top exercise were fed back and incorporated into the final plans (Meehan *et al.*, 1998; Tsouros & Efstathiou, 2004).

GAMESTIME

The opening ceremony to the games marking the start of the Olympics and Gamestime for NHSBT was on Friday 27 July 2012. National RBC stocks achieved their stock target on Monday 23 July following activation of all 13 000 members of the on-call donor panel of which 4000 donors made appointments. During the remainder of the games, overall RBC group stocks fluctuated around the target level. The stock build for FFP was met for most groups but not all; platelet levels reached their target level, but despite on-call donor efforts, NHSBT was unable to fully achieve their cryoprecipitate stock target prior to the games.

All hospital demands for blood components during the games were met and BAU service to patients was maintained during Gamestime. Daily monitoring indicated that the move to an overnight and afternoon routine delivery: met all requirements, did not produce any degradation in NHSBT's ability to meet hospital demand and reduced the number of *ad hoc* and overall routine deliveries. Comparing Gamestime to the same period in 2011 (27 July to 9 September), there was a reduction in the total amount of deliveries from the three London-based NHSBT transfusion centres which ranged from a 35 to 54%.

There was also a consistent fall across all types of deliveries: 51% in *ad hoc* deliveries, 38% in hospitals collecting product and 29% in emergency deliveries. The demands for blood mirrored the fall in deliveries. The decrease ranged from a minimum 7% drop in requests at one hospital to a 90% decrease at another central London tertiary unit. The only increase in transport demand was seen within the independent sector with deliveries up at two units by 17 and 28%. However, deliveries to private hospitals accounts for only a very small proportion of activity.

NHSBT maintained business continuity throughout Gamestime to its normal standard and with improved efficiency. The planning performed by the Olympic organising committee successfully prevented much of the anticipated problems with transport congestion. The donor response met the requirements of the additional stock build and no other resilience measures were activated. The options to increase hospital stock-holding of plasma and irradiated platelets were not widely used. While there was no need to activate major incident plans during Gamestime, NHSBT was able to assure both the DH and hospitals that the blood supply chain was suitably resilient to cope should such an event have occurred.

During the months following the games stock holding was reduced back to normal levels. The stock already held was managed down by reducing manufacture. Wastage of RBCs and frozen components were minimised due to the relatively long expiry of products. RBC wastage was slightly higher than normal. The RBC expiry for August was 1·58% compared with a full year figure for 2011/2012 of 0·9%. Throughout this period, platelet time expiry was well managed and remained within normal tolerances.

LESSONS AND LEGACY

The Olympics Planning Committee conducted a formal review and reported lessons identified with improvements recommended for business continuity. The two main recommendations were: national arrangements for command and control needed to be clearer with a more comprehensive performance management system for both day-to-day management of the emergency planning function and the response. The changes to command and control arrangements have been completed but as yet remain untested. In addition, although frozen stocks were increased, consideration should be given to holding higher frozen stock levels in the future. These products have a long shelf life and can facilitate greater flexibility in other parts of the blood supply chain.

COMMENTARY

This article is the first published account of transfusion contingency planning for a major international public event. The issues considered were both medical and management, and reiterate the necessity of a multi-disciplinary planning team as realised by Public Health planners during previous games (Meehan *et al.*, 1998; Tsouros & Efstathiou, 2004). The main lessons learnt were that transfusion planning must be started in a timely manner in order to engage internal and external stakeholders. The time required should consider the other changes taking place during the planning and delivery period. Recovery and review are important elements of resilience planning. Transfusion service planning must be integrated within the wider community and conducted within an assurance framework.

The main tension in blood planning for major events is the balance between holding sufficient stock in the right place to meet a surge in demand versus avoiding unnecessary waste of valuable blood donation. There was minimal waste in this

Table 3. A summary of the key actions instigated together by hospitals and NHSBT to minimise the potential impact of operational and logistic disruption to transfusion services during Gamestime

Task	Rationale	Action
Changes to routine deliveries	Scheduling and availability of transport for BAU and MCEs	• Deliveries moved to less busy times including overnight, with new staffing and logistic measures to accommodate them • Blue light liveried vehicles used inside Greater London to allow urgent delivery in severe congestion with couriers and police as back-up as required
Reduction in *ad hoc* deliveries	Unable to sustain during the games at normal levels	• Continued *ad hoc* deliveries only for specific components for specific patients at specific times • Hospitals maintained higher stocks of components normally ordered *ad hoc* and held increased levels of frozen stocks • NHSBT monitored requests in order to ensure their appropriateness and facilitate batch delivery when possible • Methods developed to deliver blood to incident scenes when required
Platelet management	Platelets identified as a key trigger for *ad hoc* deliveries	• Hospitals identified that increasing stocks of irradiated platelets would potentially reduce *ad hoc* requests • Hospitals adopted a presumption of irradiation for platelets ordered during the games and accepted leucodepletion for most patients • Stock was optimised and pre-positioned in the Stock Holding Units (SHU) serving the cities associated with the games
Stock position monitoring	Hospitals required to meet a stock build prior to the Gamestime	• NHSBT agreed weekly contact with hospitals to establish stock position and audit • Changes to hospital practice and policy

instance; however, previous events have seen considerable financial implications and loss of public confidence following large-scale blood waste (Schmidt, 2002; Jones, 2003; Erickson *et al.*, 2008). Predicting blood needs for an event is complicated by: mechanism of injury, environment, population and the ability of health systems to respond to the event. Studies have suggested planning on a per patient cohort basis, however, all these tools are general applications and remain vulnerable to change in practice such as the on-going debate over optimum use of component ratios (Stansbury *et al.*, 2009; Davenport *et al.*, 2011).

Acute surges in blood demand mandate an immediate response at a local level. Scheduled events such as the Olympics allow a degree of planning; however, holding excessive stock on shelf is not a practical solution. Focus in this case must therefore concentrate on response with transfusion triaged in MCEs and all efforts must be made to reduce demand through appropriate pre-hospital care. The review of historical civilian MCE blood use demonstrated RBC use is maximal within the first four hours of the event (Glasgow *et al.*, 2013). The high demand for blood during this time period may limit the ability to restock blood in time and raises concerns over a hospital's ability to provide available blood to the casualties' bedside. Although no report in the literature review stated RBC stocks had been exhausted, component demand remains relatively unexplored.

Computer modelling of transfusion services has been successful in other areas of transfusion planning and may offer opportunities in MCE blood planning (Custer *et al.*, 2005; An *et al.*, 2011). Computer simulation of blood provision could allow the rapid experimentation of a complex system under varied constraints and across a range of defined scenarios (Hirshberg & Mattox, 2009; Hirshberg *et al.*, 2010). Simulation as opposed to conventional predictive modelling allows a better understanding of the system as a whole. This includes identifying where bottlenecks exist and the levers within the system which potentially have the greatest influence on outcomes (VanBerkel & Blake, 2007; Reynolds *et al.*, 2011). The cost and disruption to services with this increasingly popular methodology is minimal compared with running real-life simulations and also adaptable based on future changes in practice or protocols (Gunal & Pidd, 2010).

All emergency preparedness planning needs to balance both effectiveness and cost. Inevitably this includes costs of additional training, exercising, additional waste and costs less easily attributed such as staff time. In this event there was also cost of donor recruitment programmes and additional storage. A specific project code was used to track costs where that was possible. The post event process is also important. Recovery and formal review were part of the planning process, involving partner organisations and provided an unexpected Olympic legacy.

CONCLUSIONS

The 2012 Olympics has enabled NHSBT to test both business continuity and emergency planning for the largest international sporting event that has ever taken place in the UK. This article outlines the key actions undertaken by NHSBT to meet the challenges of the Olympic and Paralympic Games. The organisation reviewed the evidence base for demand planning, undertook a controlled stock build, developed a high readiness donor panel and a new product, changed operational practice in consultation with customers and table-top tested these plans before the Games. The command and control arrangements have been subsequently adopted as permanent service developments and serve as a long term Olympic legacy to transfusion support and health care in the UK.

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CONFLICT OF INTEREST

The authors have no competing interests.

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