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The Development of UK DVI since the Asian Tsunami in 2004

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Faculty of Forensic and Legal Medicine of the Royal College of Physicians of London

Diploma in Forensic Human Identification

The Development of UK DVI since the Asian Tsunami in 2004

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Abstract:

Disaster victim identification is a global concern. Mass fatality events occur through not only natural but also man-made catastrophes. The characteristics associated with these events ensure that each one offers an independent learning opportunity so that the repetition of mistakes of the past are avoided and also to learn effectively from the experiences.

The United Kingdom has faced several mass fatality incidents since 1966 up to 2005; The Aberfan Colliery Disaster, October 21, 1966, The Brighton Hotel Bombing October 12, 1984, Bradford City Football Stadium Fire, May 11, 1985, Manchester International Airport Fire August 22, 1985, King's Cross Underground Fire, November 18, 1987, Piper Alpha Oil and Gas Platform Diaster, July 6, 1988, The Lockerbie Bombing, December 21, 1988, The Hillsborough Football Stadium Disaster, April 15, 1989, The Marchioness Riverboad Disaster, August 20, 1989, The Dunblane Primary School Shooting, March 13, 1996, The Omagh Bombing, Saturday, August 15, 1998, Rail Incidents, Chinese Lorry Deaths, Dover, June 18, 2000, Operation Lund—Morecambe Bay Cockling Disaster, February 5, 2004 and London Bus and Underground Bombings, July 7, 2005. Each of these events though tragic bring about changes within the mass fatality plan for the better management and control of future incidents by recording the events through experience and highlighting the learning outcomes from these tragedies.

Aims:

This dissertation covers a number of main points in relation to each incident, including, where available, details of force size at the time of the disaster, number of officers involved in the deployment, and relevant experience at the time. Important and concise details of the disaster follow, as well as the recovery and identification methods employed, the number of fatalities and casualties, and lessons learned. The effects on the force and community, both contemporary and long-term, have also been mentioned. And finally, present-day developments in relation to that event are explored. A summary of the important aspects of a particular disaster has also been provided, in terms of legislative, moral, practical, or other contribution to the field of mass disaster planning, preparation, and deployment.

Incidents involving the UK DVI deployment such as the Tsunami in 2004 and the London Bombings in 2005 have been selected to highlight specific lessons learned and to illustrate the journey taken by disaster victim identification in the United Kingdom, including procedural, documentational, and emotional learning curves.

Materials and Methods:

For this dissertation, various sources such as reports, books, plans and guides that have been published were used.

London Mass Fatality Plans:

There have been four versions of the London Mass Fatality Plans that have been published with the first published in June 2005, second in March 2007, third in January 2010 and fourth in April 2012[3].

These plans have been developed using international and UK best practice.
The London Resilience Team liaises with experienced individuals and organizations internationally (including the US Disaster Mortuary Response Team (DMORT), the US National Mass Fatality Institute (NMFI), experts and commercial firms). The Home Office provides copies of plans available to them from across the UK.
The plan was initially invoked by HM Coroner Alison Thompson in respect of the U.K. response to the South Asian Tsunami of December 2004.

The London Resilience Partnership is committed to the continual review and improvement of this plan, taking into account appropriate professional experience and best practice as well as lessons and recommendations made from available debriefs of actual incidents, public inquiries and reports and exercises. The London Resilience Team has access to the latest emerging guidance and policy considerations being developed nationally within the area, and may issue further guidance in due course.
This first plan was agreed upon by the London Regional Resilience Forum in March 2005, and as such issued the plan to be adopted by all London Category one and two responders.

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The Guidance on U.K. D.V.I. was first published in 2011, since the 2004 tsunami, before it was mentioned under the London Mass Fatality Plans versions 1 – 4. The various changes in the U.K. D.V.I. can be noted by the editions made in the mass fatality plans from versions 1 – 4 and by looking at the guidance on U.K. D.V.I. published in 2011.

Guidance on Disaster Victim Identification 2011:

Guidance on U.K. D.V.I. , also known as the first ACPO DVI Manual was produced by the National Policing Improvement Agency (N.P.I.A.) in 2011, an agency established by the Police and Justice Act 2006[4]. The manual was produced as a reference to all agencies that are responsible for dealing with any mass fatality incident.

Prior to the 2004 tsunami and up to 6 months later U.K. had no nationally coordinated response to DVI. Even though some development had taken place since the Marchioness disaster in 1989 where national standards of operation had to be established, there were still a very few numbers of committed and experienced individuals in regards to what the work entailed. It was not until a few months after the 2004 tsunami, where the ACPO was commissioned by the HM Government to create a UK DVI team and publish a Mass Fatality Plan. This planning proved itself important the following month after its publishing in June during the 2005 London bombings. Since the 2005 London events an enormous amount of work has been undertaken to ensure that the public of this nation or from other nations when in the UK, receive a professional, caring and dignified response to assist them when needed most. The UK is now internationally recognized through INTERPOL as being one of the world‘s leaders in this area of work [Debbie Simpson 2011].

National Audit Office/Foreign and Commonwealth Office Report 2006:

The National Audit Office/Foreign and Commonwealth Office submitted a review in October 2005 that comprised of a professional NAO examiner and an experienced FCO career diplomat that focused on what the department could learn to improve in its preparedness and capability for future crises[5]. They carried out their fieldwork in the UK and during visits to Thailand and Sri Lanka. Interviews were carried out with key participants in affected regions and in the UK across various public and voluntary agencies involved. Since the department worked in co-operation with several other agencies, the team also considered on how these links can be made more effective, in their reports. The work carried out by the NAO/FCO looked at the lessons learned from the perspective of service delivery. Views from the victims and their families were considered in regards to the response received by the UK DVI during the tragic event.

Disaster Victim Identification: Experience and Practice 2011:

The various incidents faced by disaster victim identification teams, their experiences and practices in such events within the United Kingdom have been published in the form of a book titled Disaster Victim Identification: Experience and Practice in May 2011. This book covers all mass fatality incidents that have occurred in the UK between 1966 and 2005 and has been referred for this dissertation.

Introduction:

The Centre for Anatomy and Human Identification (CAHID) had partnered with the Association of Chief Police Officers (ACPO), Centre for International Forensic Assistance (CIFA), National Police Improvement Agency (NPIA), and UK Disaster Victim Identification (DVI) to provide an advanced mortuary training course for the national UK DVI response capability[6]. The first course was run in 2007, and the last in 2009 with close to 550 officers trained, representing each of the national police forces in the country. The United Kingdom responded to create a coordinated DVI capability in the aftermath of the Bali bombings, the Southeast Asian tsunami, the London bombings, and the Sharm-el-Sheikh bombings. Until this time, much of the UK response relied on the deployment of members of the Metropolitan Police Service, but it was clear that a more robust resilience was required.

For a successful and professional disaster victim identification (DVI) deployment, the team has to rely on preparedness, advanced communication networks, interagency cooperation, crisis management capabilities, efficient implementation of emergency plans, and a response by trained personnel. In any mass fatality incident an early, rapid deployment of a DVI reconnaissance team led by an experienced DVI commander is essential if the requirements of victim recovery and identification are to be met to the standard of excellence required. A Gold (Strategic), Silver (Tactical), Bronze (Operational) command structure[5] is used by UK emergency services to establish a hierarchical framework for the command and control of major incidents and disasters, including mass fatality incidents (MFIs)[7]. While this system does not explicitly signify hierarchy of rank, the chain of command loosely follows rank order, with the most senior and experienced officers tending to occupy key roles. This structure had been adopted for response to disasters; however, it has been successfully used for all manner of preplanned operations, including football matches and firearms operations. The individuals selected for each element of the team are largely as a result of the police area in which the incident occurs that are in recognition of their training and experience.

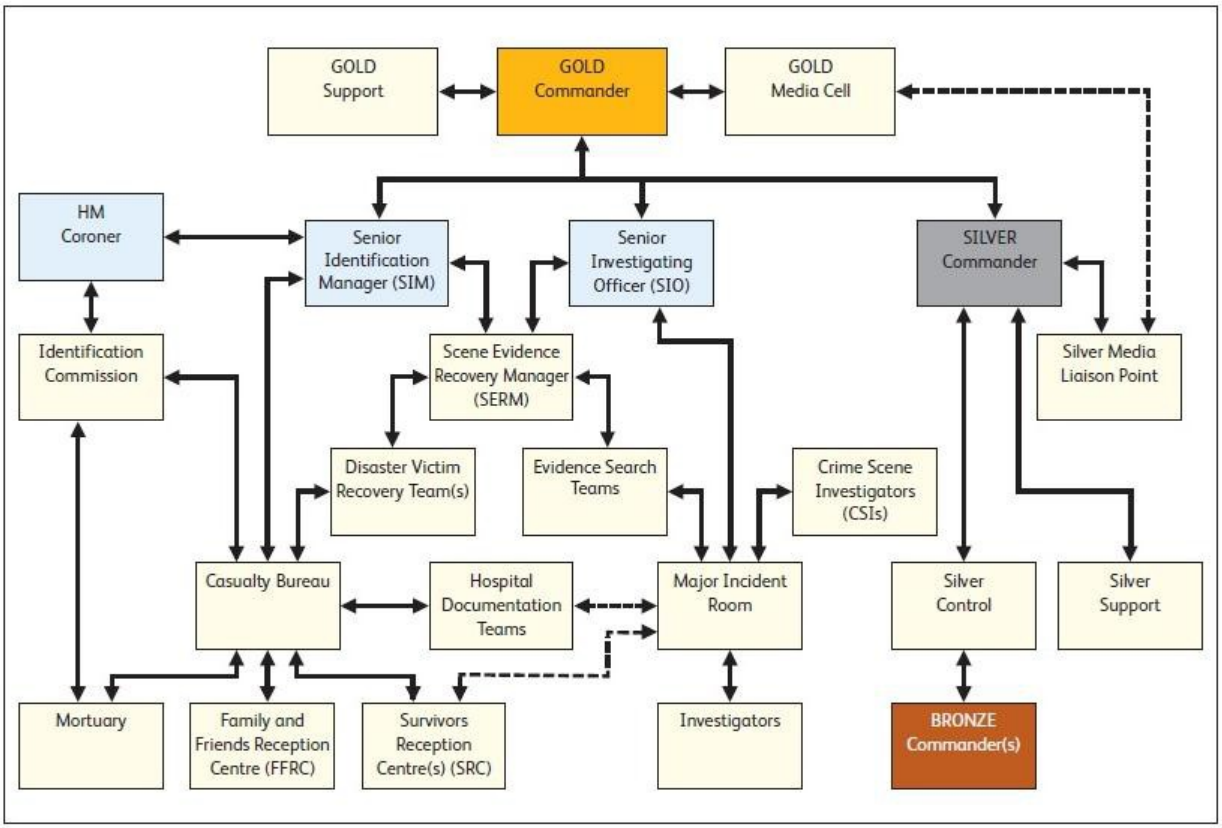

Figure 1. Suggested Structure during Retrieval and Investigation Phase[8].

The mass fatality preparation and deployment is divided into four key stages:

1. **Preparedness phase:** Centered on planning, organization, and training for different disaster scenarios this phase is a continuous cyclical component.

2. **Mitigation phase:** That aims to prevent events occurring. With many types of incidents, such as global natural disasters (Southeast Asian tsunami on December 26, 2004), little can be done in terms of prevention. Other circumstances can be more actively prepared for (e.g., attacks on travel infrastructure July 7, 2005, London bus and tube bombings; London 2012 Olympics in terms of antiterrorism policing).

3. **Response phase:** Focuses on dispatching a team of first responders to the disaster area to provide immediate aid to surviving victims. This is a flexible period that can stretch from a few hours to days. The DVI process can also take place during this initial phase once the survivors have been dealt with (see the following list A–E).

4. **Recovery phase:** This element aims to restore functionality as quickly as possible.

The response phase, that covers the victim recovery and identification aspect of a mass fatality incident, is further subdivided into five processes (A-E):

A. Documentation and retrieval of human remains from the scene
B. Gathering information from family members (casualty bureau, missing persons' reports); collection of antemortem (AM) data by family liaison officers (FLOs)
C. Examination of victims of the disaster at the mortuary; collection of postmortem (PM) data
D. Reconciliation of AM and PM data to identify victims in preparation for the identification commission, usually chaired by a coroner (England, Wales, and Northern Ireland) or procurator fiscal (Scotland) and subsequent release of the deceased to the families.
E. Debriefing of personnel: This phase relates to the critical evaluation of the whole DVI process through a series of debriefs and process review.

A number of elements of body recovery and identification combined are required to facilitate victim identification, following a mass disaster, all of which are equally vital to obtain sufficient information for each individual allowing a secure match between a known missing person and a deceased victim.

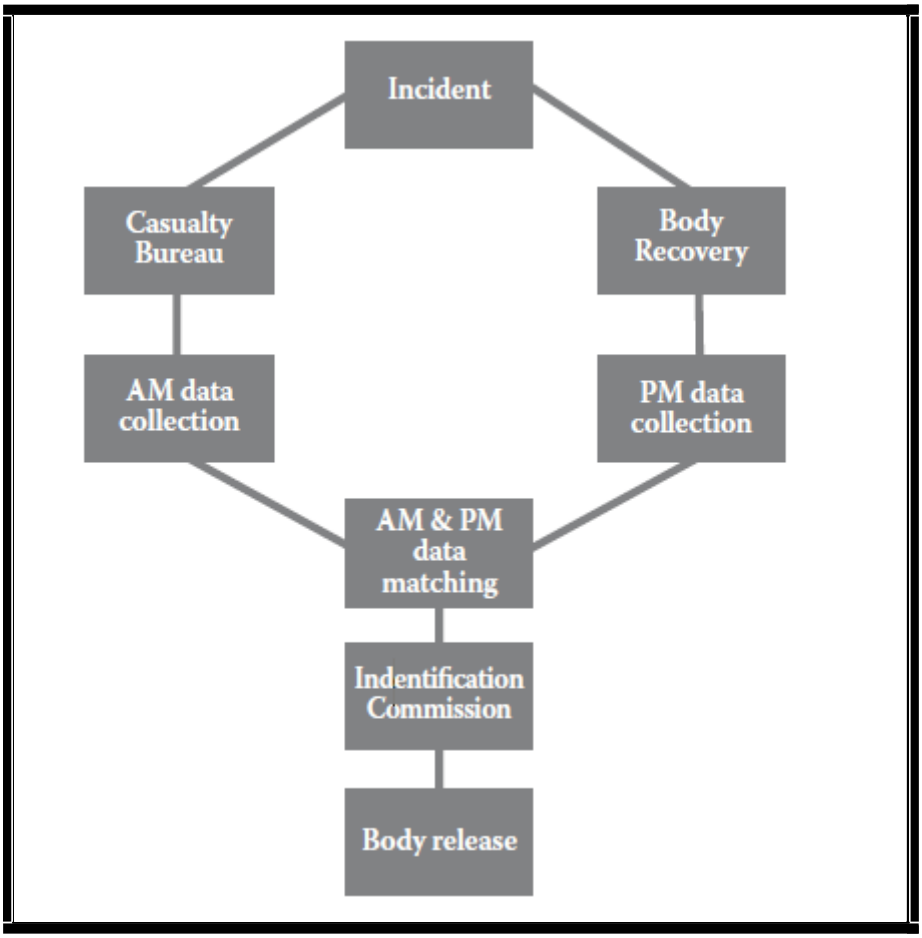

Figure 2. Broad summary of the DVI process[9].

The last aspect, debrief and process review, has two main functions. The first (debrief) aims to ensure that the health of staff involved with the deployment is not adversely affected, and the second (process review) focuses on learning any lessons that become apparent and may influence future deployments.

Police forces geographically combine into 11 regions (comprising eight in England, one in Wales, one in Northern Ireland, and one in Scotland), and depending upon where an incident occurs there may be either a regional or a local response. In case of an overarching response, incident control will lie either within the Association of Chief Police Officers‘ (ACPO) jurisdiction for England, Wales, and Northern Ireland or that of Association of Chief Police Officers of Scotland (ACPOS) within Scotland. The United Kingdom as a whole consists of 44 (The eight former regional police forces in Scotland

were amalgamated into Police Scotland on 1 April 2013) separate police forces plus a number of additional forces, including British Transport Police (BTP), Civil Nuclear Police, and the three island forces of Guernsey, Jersey, and the Isle of Man. The 44 forces reflect accurately the principal responding force to the incidents considered. Figure 3 shows the 11 regions to illustrate the geographical distribution of the incidents across the whole United Kingdom.

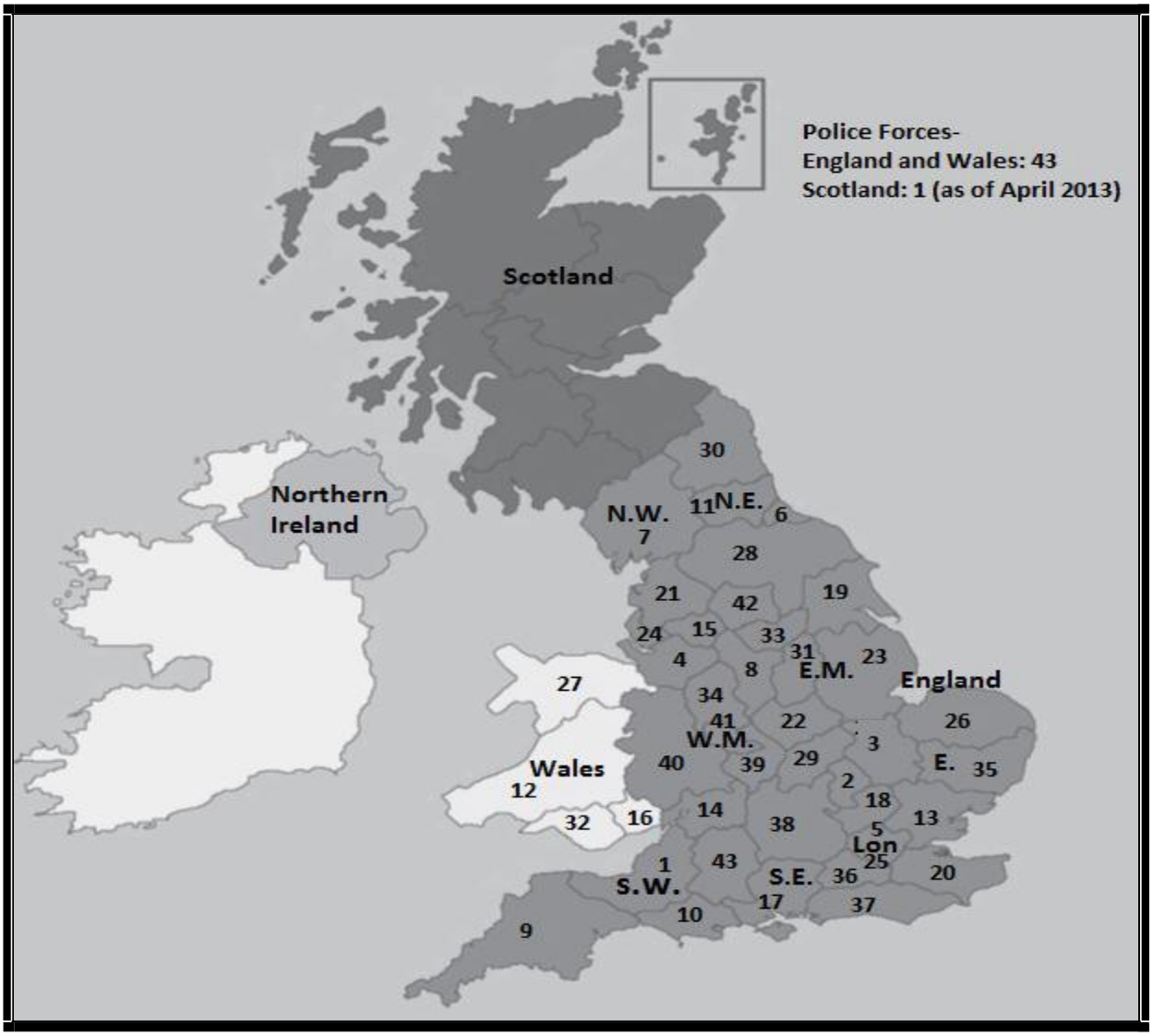

Figure 3. The 44 UK Police Forces: England, Scotland and Wales[10].

How Does DVI change after a DVI Event?

In terms of policy, each police force in the UK writes their own policy document, which is based on the Interpol protocol. This does mean that there are some variations in organizational structure and procedure. When a force or state has experienced a DVI event, de-briefs are part of the recognized process. Inevitably, the previous case dealt with will have a bearing on the review of policy within that police force, for example, the Tsunami in 2004 and London Bombings in 2005. It is natural to write any changes in response to that incident, that being the purpose of review. However, it has to be taken into account that the next DVI incident may not be related. In Merseyside (North West England) in December 2010, a DVI incident was managed on an industrial estate in Kirkby which presented a particular set of problems[11]. The resolution required staff to work at height and in confined spaces. Post de-brief, the DVI commander came to a decision to train DVI staff in working at height and confined spaces awareness. This decision was a direct response to the incident.

However, some DVI commanders may believe that training staff in such skills is unnecessary and that their teams will call upon other services or staff with those skills should they need them. These differences in how teams are managed are a direct result of individual experiences. Interpol does not demand to dictate how teams and policy are managed, their objective is to maintain a minimum standard which will enable countries to work together coherently in the event of DVI events.

In Australia, regular meetings are held between DVI commanders and lessons learned from DVI training or events are shared. Although, there is no formal process for cascading this knowledge to DVI teams and relies on managers to keep team members informed of changes. This is a similar process in the UK. NPIA also manage a forum for sharing of policing research and good practice. Members of police forces can register and upload documents which will assist in sharing the learning in every aspect of policing. Although, it is not routinely used to share good practice, and the entries relating to DVI are minimal.

Developments and Strategy:

In order to involve more Interpol member countries to sign up to the same DVI protocol, minimum standards must remain simple and effective without resulting in excessive costs for poorer countries. This efficiently allows for other member countries to develop their own policies, and produce what they individually consider to be their ‗gold standard' in DVI. Although, there cannot be an expectation of these gold standards being adhered to where, for example British nationals involved in mass fatality events in Thailand. The current thinking is to develop policy in respect to religion and diversity by ensuring policy takes into account good practice in ensuring that the deceased are treated wherever possible in accordance with their religious and cultural beliefs. The UK has policy sections relating to religious beliefs, but this is considered to be an area for training and development.

In addition, there is an acknowledgment that the USA does not use the Interpol protocol and have the ‗D-MORT' process. This relies on the use of undertakers trained in DVI processes to assist the Federal Bureau of Investigation (FBI) Agents in DVI events. The USA is the largest developed country not to sign up to the process.

The Asian Tsunami, December 26, 2004

Introduction:

On the 26th of December 2004 an earthquake occurred off the coast of Indonesia measuring 9.3 on the Richter scale. This earthquake triggered a tsunami that struck the coasts of thirteen countries, causing great devastation and loss of life. The estimate number of the people died was 300,000 that included over 3000 of foreign nationals staying in the area. There were many thousands of foreign nationals who were injured or displaced. This event represented an unprecedented challenge for consular services of many countries, including the United Kingdom.

Figure 4. The earthquake epicenter and spread of the Tsunami[12]

Figure 5. Two satellite images of the Banda Aceh shoreline in Indonesia. The left picture was taken Jan. 3, 2004, and the right picture was taken Dec. 29, 2004, after the tsunami hit[13].

Since the aftermath of successive emergencies such as the 9/11, Bali bombings and small scale events such as major transport accidents, the Foreign and Commonwealth Office (FCO) has progressively enhanced its capability to deal with major crises. The constant challenge continues to be emphasized for the need to subject arrangements even after the tsunami, such as the hurricane Katrina in the USA. Also, the best possible services for distressed Britons cannot be available unless the national response, both overseas and in the UK is well co-ordinated between government departments and agencies, the police and health authorities and the voluntary sector.

The success in delivering consular support is determined by getting the right, suitably experienced people with the right skills, equipped with the right systems and support, into the right places, at the right time. In the chaos of the tsunami this was very demanding, notwithstanding strenuous and dedicated work by many public servants. The government has acknowledged that in the case of the tsunami not all these areas were always achieved, and that on occasions mistakes were made[14]. The important point is to learn the lessons and improve.

Results and Discussion:

The lessons that were learnt from the tragic event were divided into four main groups:
- How is it best to prepare for the handling of potentially large number of callers from the public who are in desperate need of information, and to improve the recording of information about casualties so that the data is captured once, with consistency and held in the same place.
- Broadening the mix of skills that were deployed to affected areas, and extending the FCO pool of experienced consular staff through which the rapid response teams are drawn, not least to help the staffing of protracted crises and to raise standards of expertise.
- To have sufficient plans and agreements in place before any crises to clarify the respective roles and responsibilities of various agencies and how these are to be funded. The Cabinet Office and HM Treasury have an important role here.
- To work with the UK Police and international agencies to boost UK's capability to support Disaster Victim Identification (DVI).

Table 1. The scale of the tsunami relative to other major crises affecting British Citizens[15]

Event	Date	Number of Britons believed to have died	Total number believed to have died	Number of countries afflicted
—9/11 attacks	September 2001	67	2,992	1
Bali Bombings	October 2002	28	202	1
Indian Ocean tsunami	December 2004	141	c.300,000	13

British nationals in difficulty or distress overseas receive consular assistance through the Foreign and Commonwealth Office:

The Foreign & Commonwealth Office (FCO) has its rights under the international Vienna Convention on Consular Relations to assist British nationals in difficulty or distress overseas. It is assigned by the government of the day, and has until now only had internal guidelines setting out its obligations to nationals caught up in tsunami-type situations.

Article 5 of the Vienna Convention on Consular Relations of 1963[16] provides for ―helping and assisting nationals, both individuals and bodies corporate, of the sending State.‖

In recent years the FCO has improved its crisis management capability following previous events.

The FCO after the Bali bombing in October 2002:

• established a crisis response center as an initial point of contact; and

• introduced Rapid Deployment Teams (RDTs), who are groups of trained officers with relevant skills, who are on standby and available to travel anywhere in the world at short notice in the event of a crisis.

In November 2003, there were four members of the British Consulate in Istanbul who died in a terrorist attack. Following this event, the FCO issued a revised emergency planning guidance, that required posts to exercise and test their planning.

It was thought that approximately 10,000 British nationals were in the affected region when the tsunami struck. At the end of September 2005 there were 140 confirmed British dead and one was highly likely to have died, bring the total to 141. There were three of these in the Maldives, 17 in Sri Lanka and 121 including the one unconfirmed in Thailand.

During the Tsunami crisis the FCO responded effectively, but there arouse a need for increased preparedness to deal with future events. The immediate response by the FCO was swift. The FCO staff in London and in affected regions responded immediately as soon as the news of the tsunami broke. The FCO officer arrived in all the affected regions at the earliest possible moments, while the response in London was equally swift.

In London, at 8.30am on the 26th of December, the FCO opened an emergency telephone number for people concerned about friends and relatives. The telephone number was advertised widely on television and radio, in newspapers and on the FCO‘s website. Operating at first from the FCO‘s London headquarters, it soon became apparent that the FCO‘s existing call handling facilities were unable to cope with the volume of calls that were being received. In accordance with a draft service level agreement between the FCO and the Metropolitan Police Service (MPS), the latter took over call handling, at its casualty bureau in Hendon, at 3.00pm on the same day.

The Metropolitan Police‘s call handling capability was also inadequate to deal with the volume of calls received. At the height of the crisis, calls were being received at the rate of 11,000 per hour, or three per second. Of those many concerned British citizens were unable to get through on the emergency line. The situation was exacerbated by the fact that some callers used the number to make non-urgent enquiries such as those related to travel advice, even though the FCO had made it clear in their publicity that the number was only for people concerned about friends and relatives. It was recommended that the FCO work with partners to consider ways of better sifting individuals making non-urgent calls to emergency numbers, including the use of menu-driven telephone software. The FCO and the police have considered technical solutions to this issue.

At first, 36 trained MPS staff were engaged in taking calls. Even though further operators were quickly deployed, this was hampered by the fact that the disaster had occurred during a national holiday. In order to match the urgent need to answer as many calls as possible, the Police decided to deploy operators some of whom had little or no experience in this type of call handling, and had received little training. As a result, the initial information taken by some operators was inadequate to enable the MPS to carry out a proper missing person enquiry. In such circumstances, the MPS or FCO staff had to contact the person making the report again. There were also inaccuracies in people's names and addresses, understandable given the massive volumes, which still caused difficulties. The key issues were how details were recorded and the importance of ensuring that each logged call had a unique reference number to speed up cross-checking. Following these events the Police Service commissioned a review of the capabilities of the Casualty Bureau which was led by an Assistant Chief Constable from the West Midlands force.

At the time of the tsunami the FCO and the police were in the process of negotiating a service level agreement over call handling. It is doubtful whether the MPS‘s call center would have been able to cope with the volume of calls any more easily had the agreement been in place. Nevertheless, the finalization of the agreement was needed.

The police were actively developing a new software known as Casweb at the time. This software enabled police forces to co-ordinate their efforts in responding to major incidents, such as by routing calls to an emergency telephone number on to the police call center best able to take them. This software was used for the first time to manage the response to the Boscastle flood in August 2004. It was not used in response to the tsunami as it had not been satisfactorily tested in the Metropolitan Police area. The police have mentioned that the Casweb is now operational and was well tested during the events of 7 July 2005 in London.

During the crisis the MPS and FCO did not seek to use the call handling resources of the voluntary or private sectors. If done it would have enabled callers to get through more easily to the emergency number, but might have had a further negative impact on the quality of the information recorded by less experienced call handlers. The existing travel advice service provided by the MM Group call center continued to operate throughout the crisis. It was recommended that the FCO considered the merits of establishing service level agreements with other providers of call handling services, such as the private sector or the British Red Cross, to provide further reserve capacity in the event of similar extreme circumstances. Providers that are less experienced in the field of disaster management may still have a useful contribution in handling less sensitive calls, or in lodging the initial, basic details of serious calls.

After the first 48 hours of the crisis, the FCO in London put into place long term arrangements that are still running; including those for direct contact with families of victims in the UK such as management of the assistance package available for distressed citizens; media and parliamentary work; engagement with nongovernment organizations and the police, and liaison with the European Union and other partners.

The FCO also had to handle public controversy around aspects of its own response; some of this was intrinsically complex, and therefore labor-intensive.

At first, there was an intense media interest in casualty numbers, which was initially impossible to establish with confidence; Around 22,000 Britons were initially reported missing and any or all could theoretically have been dead. The FCO had decided not to release such a high figure and risk generating unnecessary alarm. It had taken a more cautious approach, deferring an announcement until the 3rd of January when it disclosed that 199 Britons were ‗highly likely' to have died. This was controversial at the time but consistent with the authoritative casualty figures that were later established; some 141 people are now believed to have died. The Swedish government, on the other hand had quickly announced that 2,300 Swedes were missing and declared a national day of

mourning; which was criticized when the number of dead turned out to be very much lower.

This was a further lesson learned in this area related to the slight difference in British casualty numbers between the FCO and the Police. This was because unlike the Police‘s figures, the FCO‘s had included those deaths it had certified overseas. In future crises there needed to be only one set of figures, produced from an agreed standard methodology.

Secondly, there were vigorous public criticism of the FCO‘s work from several families, including criticism around some developments beyond its power to control. Between the 1st and 9th of January, for example, the cases of ten families generated very negative media coverage of the FCO in around 15 stories. The handlings of legitimate grievances and of media coverage were an additional call on FCO resources. In addition it fell upon the FCO, as the department responsible for certifying deaths overseas, to press for reconsideration of pre-existing practice on death certification; a change which was implemented very quickly. There was a public pressure to relax the rule that a person had to be missing for seven years before being declared dead that grew rapidly in the days following the disaster, again made publicly controversial by media coverage.

Repercussions in Thailand due to the early decision to send a Rapid Deployment Team to Sri Lanka:

A Rapid Deployment Team is a group of FCO officers with relevant skills, who are on standby in London and available to travel anywhere in the world at short notice in the event of a crisis. FCO staff can volunteer to become members of a team and then receive specialist training in crisis management, including helping the bereaved, liaison with the police, coroners and pathologists, and the use of satellite telephones and global navigation systems. The FCO expect between ten and twelve RDT officers to be on standby in London at all times. One team was on stand-by on Boxing Day in 2004.

The FCO sent this RDT to Sri Lanka on 26 December and there were a number of reasons for the decision to deploy the RDT to Sri Lanka rather than Thailand:

• Initial reports suggested that Sri Lanka and the Maldives were more likely to be badly affected than Thailand. The Maldives are also covered by the High Commission in Colombo;

• Other FCO staff trained in crisis management were already on standby in South and South East Asia, and were able to travel more quickly to Bangkok;

• The greater travelling time from London to Bangkok than from London to Colombo

The decision to deploy the RDT to Sri Lanka did, nevertheless, mean that it was not possible to deploy a complete RDT to Thailand. Reinforcements from London only arrived on the 8th and 9th of January. Even though officers from neighboring posts gave a great deal of valuable support, the response in Thailand lacked trained staff with certain key skills and experience. In addition, the initial reports that Sri Lanka and the Maldives had been affected more seriously than Thailand turned out to be incorrect. Conditions on the ground in Thailand were usually better than they were in Sri Lanka, where staff in Colombo had to contend with broken bridges and blocked roads. Embassy staffs in Thailand were able to reach to some of the affected areas within ten hours, except in Phang Nga province where some roads were impassable and others were closed, and on offshore Islands such as Phi Phi where there were also large numbers of British casualties.

Deploying the right skills to perform the right roles as quickly as possible is required for Rapid Deployment:

Some of the staff in Sri Lanka were not aware of the role and responsibilities of the RDT. It was unclear for them whether the remit of the RDT was to command and control or to assist and advise in the response to the crises. It was also found that the RDT had worked very much on its own, and had not sought the assistance of staff with local knowledge of the region. This response echoed reactions to the arrival of RDTs in earlier crises, even though guidance already existed stating that RDT's are there to support local teams, and not to ―take over‖. Clearly this message needed to be reinforced and reiterated.

The Sri Lankan RDT included FCO officers who had a wide range of skills and knowledge. Their experiences demonstrated, however, that there is a need to add other specialists to the mix if RDTs are to operate at full capability. It was recommended that the FCO considered including, as a minimum, a police officer and a representative of the Red Cross in future RDTs, and note that International SOS and British Red Cross Society staff have now begun to deploy with RDTs. There were other possibilities worth considering: A UK coroner could be a valuable addition to large scale incidents, as could a military medic after a terrorist attack - if at the scene quickly enough - to assist with triage decisions. The Police have expressed an interest in providing a fuller role in Rapid Deployment teams, which was recommended that this be discussed between FCO, Association of Chief Police Officers and the Metropolitan Police.

Until the Tsunami, all the FCO's trained RDT volunteers were based in London. Although the RDT was quickly mobilized to Sri Lanka, the response could have been quicker still if there had been RDT volunteers based in the region. It was recommended that the FCO consider establishing a global network of regional RDT volunteers, who would be based at Posts and able to respond quickly to crises in their part of the world. It was noted that the FCO deployed a regional RDT based in Hong Kong to Bali in late 2005, and planned to establish an RDT in the USA the next year.

Benefit of the FCO staff from more training in crisis response and consular work:

Under severe pressure the FCO staff in the region and in London coped tremendously well. They worked extremely long hours and made great personal sacrifices in order to provide the professional and humanitarian response that British nationals expected. However, the traumatic circumstances and the need to make immediate vital decisions that were often based on little or confused information, proved very testing. There were mistakes made and unintended insensitivity shown in certain cases. Officials could have benefited from further training to deal with this kind of emergency. It was recommended that consular staff should undergo regular training in crisis response, reinforced by annual exercises. Also that any regional RDTs that might be set up should also carry out in country training of embassy staff and play a role in exercising emergency plans. All staff going overseas, including officials not normally engaged in consular work could benefit from basic training in dealing with the injured, the bereaved, working to best effect with other agencies such as the Police, and issues around sudden death.

Low use of Emergency plans during the crisis:

All Posts are expected to have emergency plans. These are documents setting out the actions that a Post should take, and the procedures that it should introduce, in the event of an emergency. Before July 2004, Posts had separate consular emergency plans, business continuity plans and terrorism plans. In July 2004 the FCO had introduced a requirement for Posts to incorporate these separate plans into an overall emergency plan. Since the tsunami, further progress has been made in this and by June 2005, 168 Posts had done so.

During the crisis, both Colombo and Bangkok had recently introduced new-style consular emergency plans, which in the case of Bangkok had been tested through desk exercises.

These plans were implemented for the first time during the tsunami. It was found, however, that despite this staff did not make great use of them, finding them to be overlong and of limited relevance to the emergency. There was a need for more concise plan summaries to complement the overall plans, giving individuals the key action points to be followed and contacts to be made. It was recommended that the FCO introduced such plan summaries, initially at those Posts where the risk of emergencies is felt to be greatest, and ensure that these are tested to ensure that they add value in practice. The work has now taken place on more concise plan summaries.

Disaster Victim Identification:

At the end of June, six months after the tsunami, 17 FCO staff were still working full-time on tsunami-related issues, mainly in London, Bangkok and Phuket. Their principal tasks were to support the continuing international Disaster Victim Identification process in Thailand to maximize the possibility of early identification of the remaining missing Britons, to liaise with the police on this and related missing persons enquiries and to help relatives travelling to the area under the FCO‘s assistance package.

Disaster Victim Identification (DVI) is the internationally recognized process by which unidentified bodies are matched with lists of missing persons. In the case of the tsunami, some bodies had been identified by visual means, but most had been and were being identified through the DVI process. There are three means by which a body may be identified through the DVI process – fingerprints, dental records and DNA matching.

DVI work had taken place in all affected countries. In Sri Lanka, for example, the direct involvement of the FCO ended in May with the cremation of the last missing Briton to be identified. The majority of the international DVI effort, however, was based in Thailand. Police officers and other specialists from the UK and around 30 other countries were engaged in gathering _post-mortem‘ identification data at the Thai mortuary sites. At the same time, officers around the world were gathering comparable _ante-mortem‘ identification data on missing persons.

The evidence was sent to the Thai Tsunami Victim Identification Information Management Centre (TTVI-IMC) in Phuket, which attempted to match the two sets of data. Once the Centre had made a definite match, the Thai authorities were responsible for issuing the death certificate and releasing the body for repatriation to the home country. By August of 2005 there were still over 1,600 unidentified bodies of tsunami victims held in Thai mortuaries, of which well over three quarters were likely to be of Thai or Burmese nationals.

During the first months of the identification process, majority of positive identifications were made through the successful matching of fingerprints or dental records. The number of matches made by these methods was progressively declining, however, and the TTVI-IMC had been increasingly reliant on DNA matching as the primary method of making positive identifications.

DNA matching is a long and painstaking process. A senior Thai official estimated in April 2005 that it may take from two to five years for all the remaining bodies held in Thailand to be identified. One of the problems was that genetic data in tissue samples had been damaged faster than expected decay.

Even though the FCO respect the independence of the international DVI process, the sovereignty of the Thai government in issuing death certificates and repatriating bodies. It was recommended, however, that the FCO agree with the relevant other UK agencies to create a national DVI capability that could be deployed quickly overseas when required to support prompt identification and repatriation of remains, possibly as a follow-up component of rapid deployment teams. The Police had put forward that a feasibility study was under way with a view to providing a capability that would meet the needs of crises in the UK as well as overseas. It was also recommended that the FCO work with appropriate international agencies, such as Interpol, to reinforce the lessons learned from these DVI experiences. Such reinforcement may include the establishment of protocols relating to staffing and funding of the DVI process, and undertakings by states to remain actively involved in the process.

London Bus and Underground Bombings, July 7, 2005

Introduction:

On the 7th of July 2005, a coordinated suicide terrorist attack was carried out at the heart of London's transport system during the morning rush hour[17]. The chaos began following the first report of an explosion at 8:50 a.m., with two further explosions on London's underground system and one bus bomb, killing 52 innocent people and the 4 suicide bombers. All four of the bombers were British Muslim men, three of Pakistani and one of Jamaican descent. The Metropolitan Police Service (MPS) was the responding force, with a large number of officers attending the incident sites, with support from SO13 Anti-Terrorist branch and British Transport Police (BTP). This event is now commonly referred to as 7/7.

Figure 6. Damage due to explosion on the No. 30 bus at Tavistock Square[18]

Figure 7. Bomb damage caused to the Circle line tube train[19]

Results and Discussion:

Victim Recovery and Identification:

As there was with no information available regarding who may have been on the transport system at the time the bombs were detonated the incident is termed as an open incident. Although all four locations were accessible by the emergency services, it soon became apparent that the underground stations did not stock sufficient medical supplies to deal with a mass fatality incident (MFI) of this scale and with this number of casualties, a problem highlighted in the subsequent London Assembly report (Greater London Authority, 2006)[20].

The number of victims initially was unknown, although it became apparent as the events unfolded that the existing mortuary facilities available to receive the deceased would not be sufficient. There was also the likelihood that further attacks and subsequent loss of life would take place that day. As a result, during the afternoon of July 7 the decision was taken to establish a resilience mortuary (a demountable structure). A request was made to De Boer, a private company specializing in temporary accommodation, for the supply of the facility. This was not the first time De Boer had supplied similar structures within London and thus had experience in this area.

The level of preplanning, along with recent experience shared through the tsunami, enabled swift progress to be made in terms of design. Location problems were also well dealt with. A potential sticking point was the problem of funding, which was not resolved until very late on July 7. Credit is due to the flexible approach of the De Boer management, as it committed considerable resources to the mortuary while not in possession of any signed contractual agreement.

Figure 8. Resilience mortuary[21]. Staff area included changing facilities, showers, toilets, and PPE collection point. The evidence suite contained domestictype refrigerators and freezers as well as isolation freezers (contained in two small structures). The far left-hand portion of this structure contained offices for forensic specialists, such as pathologists and odontologists. (Photo courtesy of De Boer.)

The temporary mortuary was established within 24 hours on the grounds of the Honourable Artillery Company in inner London. It was furnished with the help of an existing stockpile of equipment funded by the Home Office and provided by De Boer[22]. The mortuary included a postmortem (PM) suite with six fully equipped workstations along with areas for odontological assessment, fluoroscopy, radiology, photography, and scenes of crime officers to work. Importantly, four separate reception and storage areas were provided for the deceased, with each bomb site being designated as a separate area to avoid cross-contamination among scenes. A family viewing area along with office accommodation and meeting rooms, a canteen, staff showers, changing rooms, and personal protection equipment (PPE) collection point were also provided. Over 250 of the staff could be on site at any one time. Hence, the facilities had to be robust and large

enough to accommodate this number of people; one of the benefits of using a temporary mortuary is that it can be extended if required.

At an early stage the MPS invited Disaster Action (DA), which is a charity set up to represent the interests of survivors and the bereaved involved in both national and international incidents, to act as lay advisers to the friends and families of the 7/7 victims. Members of the DA charity became involved in their invited capacity at the family assistance center, which opened within 48 hours of the incident taking place. The experience gained from dealing with those affected by preceding disasters such as the terrorist attack in New York in 2001 and the Asian tsunami in 2004 allowed DA's representatives to become credible advocates for those affected.

The MPS also invited then ACPO Lead for DVI, ACC Graham Sunderland, to advice on DVI matters. A casualty bureau was established, and officers were deployed to various hospitals to collect information from survivors and take reports of missing persons. A telephone line that friends and families of the missing could call was advertised; over 4,000 calls were received. The casualty bureau then split their reports into three categories:

1. Known to have been at the bomb site
2. Known to have been in the area at the time
3. Known to have visited London on that day

Communication was a major problem for the responding forces, as the phone systems at the coordination center at New Scotland Yard (NSY) failed and mobile phone networks had become very congested. In addition, travel was significantly delayed, preventing responding team members from accessing sites, after being deployed at 6:00 p.m. The scenes themselves would also prove very challenging, and it was not until 6:00 a.m. on 8th of July that SO13 and DVI team leaders met to discuss the way forward.

The two sides of the evidential recovery had to be balanced at this stage:
The DVI teams focused on victim recovery and identification while the SO13 officers focused on the criminal investigation. In the past, SO13 would have had unilateral responsibility for the scenes. Senior managers and staff from SO13 had played major roles in the SE Asian tsunami operation and had a good understanding of DVI. Moreover, they recognized that an intelligent and coordinated deployment of DVI staff alongside specially trained counterterrorist crime scene investigators would have the following dual benefits:

- Identifying the perpetrators and their support networks
- Promptly identifying and repatriating those killed by the criminal act

Therefore, DVI processes were explained as were the priorities for SO13. It was agreed upon that four teams would be deployed to the sites to recover the deceased and simultaneously forensically recover the bomb scenes. Each recovery team consisted of the following:

- Two DVI officers
- One SO13 exhibits officer and team leader, who would exhibit all items recovered including the deceased
- Two SO13 officers
- One photographer

In addition to the above, a refrigerated temporary body-holding area, cordon controls, and decontamination facilities were agreed. Under the guidance of the DVI team leader, demarcation lines were set up designating _clean‘ (or _dry‘ or not contaminated) and _dirty‘ (or _wet‘ or biologically contaminated) areas. The suitable PPE for each level of entry into the site was agreed and enforced by the DVI teams. General health and safety became the liability of the DVI team deputy, liaising with Simon Hargreaves of 4-Rail, who was liable for all health and safety issues on the underground system. DVI team members were examined by occupational health for suitability to deploy to such dangerous and stressful working environment; however, the SO13 staff and BTP officers staffing the body-holding area had not been examined. The DVI team leader informed

the SO13 team leaders regarding signs and symptoms of occupational stress and then monitored the SO13 staff members, referring them to occupational health advisers when required. BTP officers were more difficult to support. On 13th of July, a BTP officer was found examining body labels and behaving strangely; he had lost a family member in the bomb on the Piccadilly line. This had not been detected by BTP supervisors and was dealt with by DVI team leaders. The Process of vetting BTP staff deployed to the site was then initiated, and full debriefs was introduced.

The body-holding area was set up using refrigerated storage, and recording continuity of recoveries was made in a body-holding area log. An issue that emerged and caused problems was the unreliable attendance of the mortuary transport to the site for collections. On several occasions transport was requested and failed to attend. This occurred because vans were present at all sites on rotation and would often take several hours to negotiate the busy London traffic. Additional concerns were raised due to the possibility of cross-contamination this may have caused among the four crime scenes.

The process of body recovery was impeded due to a number of factors, a situation that caused considerable criticism from the media and public. Though, few would have been able to understand the difficult circumstances in which the recovery teams found themselves. For the teams working in the underground tube stations, factors such as poor air quality and high temperatures, the fear of secondary devices and tunnel collapse, and the dust that greatly reduced visibility all made the recovery process extremely difficult. In addition to this that the devices had been detonated some hundreds of meters into the tunnels, in extremely confined spaces now filled with debris, and one can begin to understand some of the problems the teams faced. Also, from an early stage this was recognized as a terrorist attack; as a result, SO13 had to undertake detailed forensic examinations to retrieve any material used to produce the bombs or that may have helped identify the perpetrators. This included tiny fragments of the device that may easily be accidentally removed from the scene (e.g., caught on someone‘s shoe) and without which those responsible may not have been traced.

The first deceased individual was received at the temporary holding area during the evening on 8th of July. Mortuary examinations were carried between 8:00 a.m. and 8:00 p.m. daily. Dr. Robert Chapman acted as the lead pathologist and was responsible for coordinating the PM procedures; he was assisted by pathologists from other parts of the UK on a rotating basis. Digital and computed radiography were used for the first time in the temporary mortuary to help in identifying the victims, with a team of radiologists working within the PM suite comparing PM images with those taken from potential victims' ante-mortem (AM) medical records. This allowed a variety of different structures to be visualized on the same image and assisted to identify foreign objects, including both metallic and nonmetallic fragments, which had to be extracted and identified as they may have been part of the bomb. The clothing and personal effects of victims were photographed as they were removed. The vast numbers of the examinations were external only, with physical characteristics such as scars or tattoos being noted on the pink (PM) Interpol forms (Interpol, 2002b)[23]. Internal artifacts (e.g., pieces of metal) were detected during x-ray or fluoroscopic examination. Cause of death in all cases was due to the explosion.

Although there were no official figures available at the time stating as to exactly what the primary method of identification used in each case was, Chapman stated that the majority of victims were identified through odontological assessment, with a number identified through fingerprint analysis and a few through DNA comparisons. The confirmation of identity was based on the Ante-Mortem and Post-Mortem evidence (Interpol, 2002a, 2002b)[23,24] presented to the identification commission, and no viewings by family or friends of the victims took place until after the identification commission had accepted the identity in each case.

After the Incident: Inquiry

A number of lessons were learned following this event. This is always the case following a mass fatality incident on this scale, as recognized by the British Government in a 2006 publication aiming to improve future responses, specifically in relation to supporting the victims as well as the bereaved (UK Government, 2006)[25,26]. For example, on 7th of July, 2005, a number of different agencies had to work together, each with its own priorities and working practices. It is for this reason to be expected that not all mechanisms worked as well as they possibly could. For example, in spite of local authorities making provisions for survivor reception areas, none were used following 7/7. Survivor reception centers (SRCs) are premises identified close to the scene of incidents with the capacity to provide initial support for survivors, to provide a place for refuge and reunion, and to allow for the collection of personal data to assist in the identification process and reduce the list of potential decedents. They are meant as a short-term facility only. Failure to implement this measure was later accused on the pressure of events and concerns over further attacks. A review conducted by the LRRF suggested that suitable premises be identified across London in the event of future disasters[27].

An additional measure that could have been of value in this incident was family assistance centers (FACs), which enable those affected by the disaster to gain as much current information as possible about friends and families who may be involved and provide support, professional advice, and assistance. At the time of the bombings in London there was no FAC plan in existence. A draft plan had been generated, but this had not been shared with the relevant parties. A decision to provide an FAC was taken on the 8th of July, which was initially sited at the Queen Mother‘s Sports Centre. Though, it soon became clear that the premises were unsuitable for the demand placed upon them, and on the 12th of July the center was relocated to the Royal Horticultural Halls. This secondary location supplied improved facilities including more space, private interview rooms, and better welfare provision for staff.

Finally, in terms of other aspects that could have been improved, anecdotal evidence from a mortuary manager deployed to the London resilience mortuary suggested that there were some health and safety issues within the mortuary. For example, clean–dirty demarcation areas were not clearly highlighted at the initial phase, which meant that the access–egress points had to be policed by the anatomical pathology technologists (APTs). In addition, some staff not used to working within the mortuary attempted to consume fluids within the dirty (wet) side, which was quickly stopped.

A number of elements of this event worked exceptionally well, however, and require specific note. For example, that a number of agencies were able to make a prompt and coordinated response to the events of 7/7 did not occur by chance. Plans were in place to deal with a mass casualty disaster as, however there will always be fluidity within plans regardless of how well thought out they are, each event will be entirely unique and will present unique challenges. An aspect of excellent forward planning was the London Resilience Plan, the implementation of which following the 7/7 attacks provided the basis for an integrated emergency response, as it outlined the roles and responsibilities of the different organizations as well as issues surrounding the types and locations of temporary mortuaries, family liaison, and the identification process.

The initial establishment of the resilience mortuary was also a notable achievement, given the scale of the disaster. The fact that De Boer had previous experience in setting up a temporary structure for the victims of the 2004 Asian tsunami undoubtedly helped matters, and it should be noted that any requests for additional accommodation or adaptations were dealt with promptly. Westminster Council, responsible for the management of the mortuary, commended De Boer for its work and positive approach to the task. The viewing facilities that were provided at the mortuary were highly praised not only by expert visitors and faith leaders but, more importantly, also by the families of the victims. The first family that attended a viewing spent 8 hours within the viewing area, although the average time was 2 hours. This required careful management between the mortuary managers and family liaison officers (FLOs) on site to ensure that each family was accommodated.

The MPS also deserves credit for requesting the charity Disaster Action to act as lay advisers to the friends and families of the 7/7 victims. This was the first time that the DA had been invited to take on a front-line role in an advisory capacity and displayed openness to the procedures that were taking place and recognizing the need to provide support and information to members of the public. This could only have helped persuade the families of the victims that respect and transparency were of paramount importance to those tasked with investigating the incident.

Today, incidents on this scale are frequently played out almost live as a result of 24-hour worldwide news. Whenever assessing the success and failures of a contemporary incident, one must remember that there will always be lessons learned. In the region where improvements can be made, it comes down to the cooperation between partner agencies and the need to plan for all eventualities. Safeguards can be built into plans to accommodate those most affected, and even though future events cannot be foreseen, it is possible to predict the scenarios the United Kingdom is most likely to face in the years to come. These plans need to be tested, distributed, and reviewed in line with transforming threats and circumstances.

Since 2002 London has had contingency plans in place after the suicide attacks on New York in 2001, and this provided a framework for the response on 7/7. Soon after that time, LRRF conducted a debrief, that highlighted areas that required further work[28]. This multiagency debrief recognized lessons learned in a number of areas, including survivor arrangements, telecommunications, cordons, and assistance from the country sector.

The necessity to train both suitable and sufficient staff to be able to respond to disasters where mass fatalities are involved is crucial, and, clearly, steps are being taken to move this forward with the formation of the UK disaster victim identification team (UKDVI). When DVI teams deploy, the following principles are essential:

- The same protocols and standard procedures should be followed as in a non-MFI.
- All teams should be multidisciplinary and multiskilled.
- A multiagency approach is required; there must be an understanding of religious and cultural issues.
- All teams should work closely with those responsible for collecting AM data.

Without doubt, funding will always be a limiting factor, and investment needs to continue to ensure the best possible service is provided in these incredibly stressful and intense situations. What can never and should not be overlooked in the immediate aftermath of an incident and the desire to ‗get the job done' is the need of the victims and not just the deceased but also the survivors and the families.

Conclusion:

UK uses the Interpol protocol as do around 50 other Interpol member countries. The remainders do largely agree to the principles of DVI but not the process and paperwork etc. The USA has a different process called DMORT. In the event of multinational deployments, which are always a sensitive subject, this difference in practices can create tensions.

The sharing of information regarding the management and in particular problem solving aspects of DVI incidents could be improved for the benefit of all countries. Although, this is a sensitive subject, and any report that can be accessed by members of the public should be censored and full reports reserved for the benefit of DVI professionals only. The NPIA POLKA (Police OnLine Knowledge Area) site[29], if developed would be an ideal platform for such information sharing.

Each coroner involved in DVI incidents will want to have particular measures to be implemented in a joint operation. In the case of the Victoria bush fires in Australia[30], an example of this was a response to the high temperatures and the effect on human bone. The coroner had asked for all skulls to be bubble wrapped, and teeth present in the skulls ‗glued in' to preserve the positioning for dental records comparisons. This practice formed the part of normal procedures in Australia due to learning from the experience. There would be many other examples of such practices, that could be shared more effectively between DVI teams in every country.

Training is a particular learning point. In Australia, they train all DVI team members in every DVI role. This enabled them to rotate teams depending on where the need was, and also to safeguard the wellbeing of the staff and reduce stress. In the UK the NPIA guidance is that DVI staffs are trained in a particular skilled role and remain within it. There is an opportunity here to explore the effectiveness of both systems, but clearly the Australian system has recent experience of their system working well in practice.

The UK has a very limited budget for any DVI operation. Should an event occur, DVI teams would have to seek authority to use equipment funded under counter terrorism budgets and management. Clearly many DVI events are the result of natural disaster and not terrorism. Yet DVI teams must rely on decisions regarding equipment etc. that is not necessarily suited to the specific needs of DVI. There are some clear overlaps, particularly with areas such as temporary mortuary facilities, but DVI in natural disasters would be better managed if equipment was designed for the needs taking into account DVI user groups. In addition, the ability to exercise and practice with the equipment for every team in the UK would be an advantage.

Co-ordination of DVI exercising, training and skills, in the UK is more difficult between their 44 forces. In view of changes in the structure and budgets of police forces, it is perhaps an opportunity to review the structure of DVI and the need to work more closely and effectively together. It is an area of work that is largely not considered as a

priority until an event occurs. Furthermore, when reviewed, the link to Fire and rescue services and other emergency services should be more closely aligned. There are many emergency services personnel, both in the police and externally who simply are not aware that teams exist in this field of work.

It is fair to say that many individuals would not have heard of the term disaster victim identification (DVI), and, thankfully, nor should they. Sadly, however, all victims' families have not only heard of it but have also experienced it. The response of the United Kingdom to the Indian Ocean tsunami in December 2004 was unprecedented, with approximately 800 personnel being deployed to southeast Asia throughout 2005. The impact on the service was immense, and many lessons were learned that were carried over into subsequent significant incidents, including the July 7, 2005, London bombings and the terrorist attacks in Sharm El Sheikh later the same year[31].

The various accounts of mass fatality incidents that have occurred are a stark reminder that the United Kingdom, are not immune to such atrocities. Whether the incidents are criminal, accidental, or natural disasters may be somewhat irrelevant to families that have lost a loved one. The work involved to ensure that the United Kingdom is prepared could not continue without the ongoing commitment of the Home Office and the Foreign and Commonwealth Office, which recognize its importance.

It is worth remembering and reminding, that this area of work exists to provide the families of victims involved in such tragic and horrifying events with the knowledge and confidence that their loved ones will be identified accurately in a respectful and dignified manner. The authorities and many professionals involved in this essential area cannot make the trauma or heartache go away. Without DVI, however, it could be substantially worse.

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