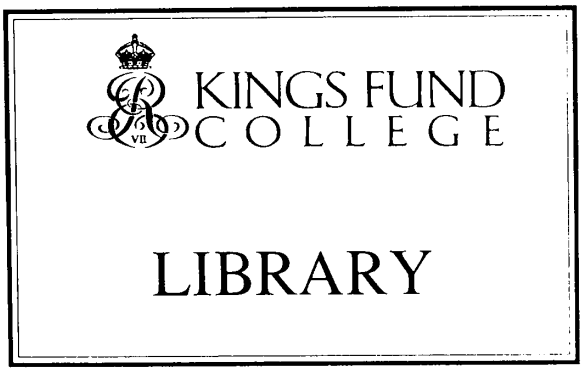
RESEARCH REPORT 15

Too Many Cooks?

The response of the health-related services to major incidents in London

Bill New

King's Fund Institute



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Contents

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The research had two elements: a literature search and review of the experience of major incidents over the past twenty years; and a series of unstructured interviews with key personnel from the agencies involved in the planning for or response to a major incident. Many thanks go to the following who gave their time to take part in the interviews:

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Summary

A major incident is a high profile event which places the emergency services in the spotlight of public attention at a time of great strain. It typically involves a number of autonomous agencies working together in hostile conditions. Some of these individuals will be working in an unfamiliar environment for the first time. Many lives are at stake. For these reasons it is important that the response is well planned and co-ordinated, thus retaining the public's confidence in the emergency services whilst efficiently responding to those in need.

However, there is no single body looking at the delivery of health services as a whole in London. Accident and Emergency consultants in the capital felt that this absence of London-wide planning was also affecting the response of the emergency services to major incidents. This report investigates the organisation of the health-related response to such incidents. It is based on a review of the literature over the past fifteen years and interviews with key individuals with experience of major incident planning and response. Five of the most recent major incidents are analysed in detail: the King's Cross Underground fire, the Clapham, Purley and Cannon Street rail crashes, and the Marchioness riverboat sinking.

Three important difficulties emerged in relation to the response to these incidents. First, a large number of autonomous bodies typically become involved leading to problems of co-ordination. The London Ambulance Service, the London Fire Brigade, the Metropolitan, City or Transport Police, hospital medical teams, British Association for Immediate Care (BASICS) doctors, and the London boroughs all regularly attend. The only London-wide co-ordinating body – the London Emergency Service Liaison Panel (LESLP) – has included only the fire, police and ambulance services in its membership in the past.

The second difficulty involves the occasional over-provision of medical care at the scene of major incidents. Such care in the UK has traditionally been provided by hospital-based medical teams and BASICS immediate-care doctors. This country has not had a well-developed system of paramedic care on emergency ambulances. However, current changes in the UK's ambulance services represent a shift toward the paramedic model. These changes are likely to simplify the future response to major incidents; however, the ambulance service must be given a clear responsibility for the initial call-up of further medical assistance.

The third difficulty relates to the relationship between the political 'centre' and agencies involved in the response. There is evidence of an 'implementation gap' between central guidance (in the form of Health Circular HC(90)25 and it predecessor) and the actual course of events. This particularly applies to the appointment of individuals to control medical matters at the scene, the organisation of that medical support, and liaison between the scene and hospitals available to receive casualties. It also applies to Hospital Major Incident Plans.

An analysis of these difficulties has led to the following recommendations; the page numbers refer to the location of a fuller discussion in the text.

Short-term recommendations

- The LESLP should be expanded to include representatives of all the key agencies involved in the response to a major incident (p. 38).
- Hospital Major Incident Plans are not consistent in their planning for major incidents. The Department of Health needs to take steps to monitor the implementation of its guidance, and the regional Health Emergency Planning Officers should be aware of the unco-ordinated nature of hospital planning (pp. 35-36).
- Under the new administrative arrangements in the NHS, all hospital major incident plans are to be secured by contractual agreements. The commissioners of such plans should use the explicit statement of objectives which the contracting process offers to ensure that hospitals have consistent plans (pp. 36-37).

Long-term recommendations

- The development of a paramedic-based ambulance system will mean that the role of the Ambulance Incident Officer will grow in importance. Some incidents – particularly those without trapped casualties – will be manageable without the need for hospital-based support (pp. 27-30).
- Central guidelines need to clearly resolve two issues of particular concern to the official inquiries: the financial status and operational role of BASICS, and the lack of standardised clothing for identifying clearly each agency and individuals' levels of medical expertise (pp. 30 & 34).

- Future guidelines should also consider whether there would be value in a distinction between 'standard' guidance for which there is no scope for local flexibility, and 'illustrative' guidance which allows for local variation (p. 35).
- The findings of this report would support a London-wide Regional Health Authority to facilitate the work of co-ordinating the plans of London's hospitals and the London Ambulance Service (p. 37).

Major incidents will always involve a degree of tension and anxiety. In such circumstances the scene should involve as few agencies as possible. Nevertheless, the planning process should involve all those who might become involved. This is the very least that is required for roles and responsibilities to be properly understood.

Glossary of key terms

Ambulance Incident Officer	The Officer of the Ambulance Service with the overall responsibility for the work of that service at the scene of a major incident. He or she liaises closely with the Medical Incident Officer to ensure effective use of the medical and ambulance resources at the scene.
Ambulance Liaison Officer	At the receiving hospital, the Ambulance Officer responsible for the provision of mobile radio communications between the hospital and the ambulance service, and for the supervision of the ambulance service activity at the hospital.
BASICS	The British Association for Immediate Care (BASICS) is a voluntary organisation whose membership is largely made up of GPs. Members offer their services at the scenes of serious accidents, such as road traffic accidents, and major incidents. Many of these individuals have experience of working in conditions associated with major incidents.
Central Ambulance Control	The permanent office which receives all calls for the Ambulance Service in a specified geographical area (in London, the old GLC boundary), and co-ordinates and allocates them to stations or vehicles.
Emergency Control Vehicle	This vehicle provides an 'on-scene' communication facility which may be at a distance from the incident site. It provides a focal point for NHS/ medical resources attending the incident, as well as for the ambulance service. Ideally, the point should be in close proximity to the Police and Fire Service Control Point vehicles (subject to radio interference constraints). The London Ambulance Service's Rapid Response Units can also perform this function.
Emergency Services	The ambulance, fire, and police (also known as the 'uniformed' services). In some incidents the coastguard service will be involved, although it is not specifically referred to in this report.
HC(90)25	Health Circular number twenty-five, 1990. The circular provides comprehensive guidance from the Department of Health on the arrangements for dealing with major incidents within the NHS. It is intended to form the basis for agencies' major incident plans.
Health Service Emergency Planning Officer (HEPO)	Each regional health authority is required to appoint an accountable senior officer (the 'HEPO') to advise, co-ordinate and monitor the major incident plans of districts, hospitals and ambulance services within his or her region.
Listed Hospitals	Hospitals listed by the regional health authorities as adequately equipped to receive casualties on a 24 hour basis and able to provide, when required, the Medical Incident Officer and/or a Mobile Medical Team.
Medical Incident Officer	The medical officer with overall responsibility, in close liaison with the Ambulance Incident Officer, for the management of the medical resources at the scene of a major incident. He or she should not be a member of a mobile medical team, and should not become involved in the treatment of casualties.
Mobile Medical Team	A hospital-based team of medical staff, available from every listed hospital, and transported to the scene by the ambulance service on request by the Medical Incident Officer or Ambulance Incident Officer. The team will typically include nursing staff as well; for the purposes of this report the term refers to all the personnel of such a team.
Receiving Hospital(s)	The hospital(s) selected, by the ambulance service (from those listed by the regional health authority), to receive casualties in the event of major incident.

Introduction and background

Major incidents are high profile events, placing key agencies in the public eye at a time when they are under the greatest strain. Although the total number of lives lost is small in comparison with the major causes of preventable deaths, the public's confidence in life-saving organisations is put to the test. It is vital that their response is seen to be orderly and efficient.

During the last years of the 1980s, the United Kingdom, and in particular London, witnessed a series of these large-scale accidents. In period of just under two years from 6th March 1987, when the Herald of Free Enterprise capsized off Zeebrugge, until 8th January 1989, when a Boeing 737 crashed on the M1 near Kegworth, an unprecedented sequence of incidents occurred on and around the British mainland: the Hungerford shooting (16 injured, 16 dead), the Enniskillen IRA bombing (60, 11), the Kings Cross Underground fire (60, 31), the Piper Alpha fire in the North Sea (25, 165), the Clapham Junction rail crash (123, 35) and the Pan Am air bombing over Lockerbie (5, 270). When this loss of life is combined with the 137 killed at Zeebrugge and the 46 at Kegworth, the total from seven incidents was 711. It was the perception that this sequence constituted an increase in the frequency and severity of such incidents, along with the concerns raised by official inquiries into the response of the emergency services, which lie behind the writing of this report.

Some of the incidents which received the most publicity occurred in London, a city which has its own share of problems relating to the delivery of health care. In 1987 the King's Fund reported on health services planning for inner London: 'It is not in fact possible to draw a coherent or a comprehensive picture of inner London's future health services from the published plans of the four (Thames) Regions, nor indeed from the unpublished documents to which we have had access' (King's Fund, 1987). The key problem is that there is still no statutory body with overall responsibility for health and health care on a London-wide basis. Official inquiries into the most recent major incidents have revealed a similar lack of coherent and comprehensive planning, whilst at the same time the experience gained at these events has not been collected into a single piece of analysis. This report seeks to address such issues; the rest of this introduction outlines in rather greater detail what it does, and does not, take as its subject matter.

The report focuses on London. This is not to suggest that the capital is more important than any other part of the UK. There are, however, a number of reasons why London merits special attention. It has a particular set of problems, and advantages, in its position as the nation's capital. It has a large and complex transport system moving millions of people around in a relatively small area. It has a large number of hospitals with well-equipped Accident and Emergency departments. The organisation of health delivery is split across four Regional Health Authorities, with no London-wide organisational body apart from the London Ambulance Service (LAS); in the same way, the 32 Local Boroughs plan and operate largely separately. Finally, as mentioned above, there has been a perceived increase in the frequency and severity of major incidents in the capital.

The report also concentrates on the medical response to major incidents, and places this response in a broader policy framework. One reason for this is the recent Home Office review of the detailed arrangements at a major incident, which refers to a very wide range of bodies – including industry and the armed services (Home Office, 1992). The Institute's study seeks to complement this work. But it is also a contention of this report that the most difficult issues of co-ordination are to be found in the delivery of medical care at the scene of an incident.

In fact, it became clear that the response to major incidents is closely related to wider issues of emergency care. These issues include the provision of paramedics in the standard ambulance response, the use of hospital-based Mobile Medical Teams, and the possibility of reorganising some elements of Accident and Emergency services into Trauma Centres. Major incidents bring into sharp relief problems which bedevil the medical response to traumatic injury during the course of their day-to-day work. It also became clear that one of the key features of the response to a major incident – co-ordinating a large number of autonomous bodies in a single operation – was also part of the larger issue of the appropriate relationship between central policy-makers and implementing agencies. It has already been noted that London lacks a strategic body responsible for the health needs of the city, making such a relationship in the capital particularly difficult. But transferring a central policy decision into the appropriate action at the implementation stage is rarely a smooth and simple process.

It is in this context that the NHS reforms could have a significant impact on the co-ordination of the medical agencies involved. Under the new administrative arrangements, purchasing and providing roles will be split between health authorities and GPs on the one hand, and hospitals, community units and ambulance services on the other. Those responding to major incidents in the future will be contracted to do so by a purchasing, or commissioning, authority. These authorities may find that they can use contractual 'muscle' to ensure that implementing agencies follow central guidelines. It might also be the case that a London-wide purchasing body is necessary, not just for emergency planning, but to oversee health and health care generally.

These and other issues are explored at greater length in chapter four. But one example of how major incidents relate to wider issues is indicated by asking the following question: is there real evidence that any more lives could be saved, or injuries treated more effectively? The vast majority of patients whose lives are at risk are indeed saved. However, studies show that seriously injured casualties involved in major trauma die more often than they would if given the best possible clinical intervention (Royal College of Surgeons of England, 1988; McKibbin *et al.*, 1991). These are known as 'anomalous deaths', and without the aid of systematic analysis it can be very hard to disentangle these deaths from those which were unavoidable. Nevertheless, evidence to public enquiries (Fennell, 1988; Hidden, 1989) and studies like that cited above from the Royal College of Surgeons suggest that organisational improvements could be made which allow for seriously injured people to be treated more quickly and effectively. It is a premise of this report that, in a similar way, organisational improvements can be made to the response of agencies to major incidents.

The final point to be made regarding the focus of the report is that it is concerned with organisational issues **between** agencies. Developments which occur within agencies are only discussed to the extent that they have a clear relationship to inter-agency matters. For example, many of the operational arrangements within hospitals have little to do with arrangements between the hospital and other agencies. To analyse such arrangements here would involve an intractable degree of detail – those wishing to investigate hospital planning in such detail are directed in particular to the work of Peter Savage (for example: Savage, 1979 and 1984). Similarly, problems which the LAS encounter when negotiating heavy metropolitan traffic, and the long response times which sometimes result, are outside the scope of this paper. This strategy will undoubtedly leave some with the feeling that their particular area of interest has been neglected; however, the selective focus of this report is considered necessary for a clear analysis of a complex subject.

Defining a major incident

A major incident will tend to involve many agencies and individuals. It can occur in the most unlikely and inconvenient environment, and it will be unpredictable and uncommon. For all these reasons it will involve a response which is out of the ordinary, and which will put a strain on organisational and managerial systems designed, inevitably, for less extreme eventualities.

Early attempts to define a major incident usually referred to a specific number of dead or injured. For example, the London Ambulance Service itself used to describe a major incident as a 'major emergency'. It was defined as 'any incident which is determined as such by the senior police, ambulance or fire officer first on the scene or any incident in which the number of live casualties to be handled is estimated to exceed 50 ...' (London Ambulance Service, 1970). The trouble was that this tended to define a major incident as something requiring a significant medical response and, moreover, it makes an implicit assumption about the size of an incident which would cause a strain on local resources. The following circumstances illustrate the constraints of such a definition:

- a relatively small number of people are killed or injured, but in a rural area where the concentration of hospital and emergency service resources are limited (for example, the shooting incident in Hungerford);
- a large number of people are killed and few are injured, creating a huge strain on fire, police and local authorities, but relatively little on the medical response (for example, the plane crash at Lockerbie);
- many people are injured, none killed, but many need hospital admission; this can cause a strain on all the emergency services (for example, an incident similar to the Cannon Street railway crash where two people were killed, but many injured).

Instead of the old LAS approach, then, it is more useful to concentrate on a definition in terms of a local reaction to an incident, and this is what Health Circular HC(90)25 (Department of Health, 1990) attempts to do, but only in relation to the Health Service.

> *A major incident arises when any occurrence presents a serious threat to the health of the community, disruption to the (health) service, or causes or is likely to cause such numbers of casualties as to require special arrangements by the health service* (Ch. 2, Para 2).

This necessarily vague definition allows for the fact that an incident must be assessed in terms of its impact on local services. Current ambulance service arrangements have also taken this into account.

> *In Health Service terms, a major incident is one which, because of the number and severity of LIVE casualties, or its location, requires special arrangements by the Health Service* (Regional Ambulance Officers Group, 1990, Section 2, Para 2).

The ambulance service recognises that 'there is no standard definition which would satisfy the Health Service, the emergency services and local authorities, each tending to look at such incidents from the point of view of its own responsibilities' (Regional Ambulance Officers Group, 1990).

One further refinement, however, is useful. Major incidents can be broken down into four categories (Thornley, 1987; Lyall, 1987):

- 'simple' – many communications (roads, telecommunications etc.) largely functioning;
- 'compound' – war-time situation: roads/ railways impassable and hospitals wrecked;
- 'compensated' – medical resources are able to cope;
- 'uncompensated' – casualty load beyond medical capacity.

From this taxonomy we can assign all UK major incidents over the last twenty years to a 'simple and compensated' category. This emphasises that although a 'special' response by the emergency services is required, it is not beyond their capabilities. A final point is that these incidents have a tangible focal point, unlike, for example, an influenza epidemic or a nuclear accident such as that at Chernobyl. Whereas these latter examples would undoubtedly place a severe strain on the emergency services, their 'diffuse' nature poses qualitatively different organisational issues outside the scope of this paper.

Outline of the report

Having introduced the issues and background in chapter one, chapter two outlines in more detail the agencies involved in the response. Chapter three describes five recent incidents in London, the difficulties which were encountered and how the responses of the agencies involved compared with what might be expected from reading central guidelines. Chapter four examines the issues raised in the previous chapter in more depth. In particular, the roles of the London Ambulance Service, the British Association for Immediate Care, and hospital personnel is discussed, along with the difficulties of transforming central guidelines into appropriate action 'on the ground'. Finally, chapter five presents a summary and recommendations.

2 Agencies involved in the response to a major incident

An important feature of the response to a major incident is the number of autonomous agencies involved, each with their own chains of command, and each concerned with the implementation of their own statutory responsibilities. Some agencies – particularly the London Boroughs and the British Association for Immediate Care (BASICS) – do not have statutory guidelines at all and respond at the request of other agencies, or occasionally on their own initiative.

In view of this organisational complexity, it is important to clarify the structure and function of each of the agencies in turn. They are arranged into three groups.

- **Health and health-related agencies.** These include the London Ambulance Service (LAS), hospital Accident and Emergency (A&E) departments, and voluntary organisations, including the British Association for Immediate Care (BASICS).
- **The non-health-related agencies.** These include the Metropolitan Police, the City Police, the British Transport Police and the London Fire and Civil Defence Authority (LFCDA), the latter being responsible for the London Fire Brigade and, to a certain extent, the response of the London boroughs;
- **Central planning agencies.** These include central government departments, the National Health Service (NHS) and the London Emergency Services Liaison Panel (LESLP).

Health and health-related agencies

Those agencies which have a specifically health-related function are numerous in themselves. There are, however, significant differences in their roles, expertise and status, and they are each described in some detail in this section.

The London Ambulance Service

The London Ambulance Service provides patient transport services for a population roughly coterminous with the old Greater London Council boundary (see map), although hospitals served sometimes lie outside this area. The population served is approximately seven million, covering 620 square miles. In Great Britain as a whole (England, Scotland and Wales), these services carry some 25 million patients per year, mainly by ambulance or the hospital car service, and employ some 24,000 staff (National Audit Office, 1990). In 1988–89 the NHS spent about £400 million on ambulance services.

Patient journeys are classified as either 'emergency', 'urgent' or 'non-emergency (routine)'. Emergency journeys are requested by means of the '999' call. Urgent journeys are those requested by doctors, dentists or midwifes, and require a patient to be transported to hospital within a specified time. The routine, non-emergency services are usually planned by the ambulance service and involve the transport of patients between home and hospital, clinic or day centre.

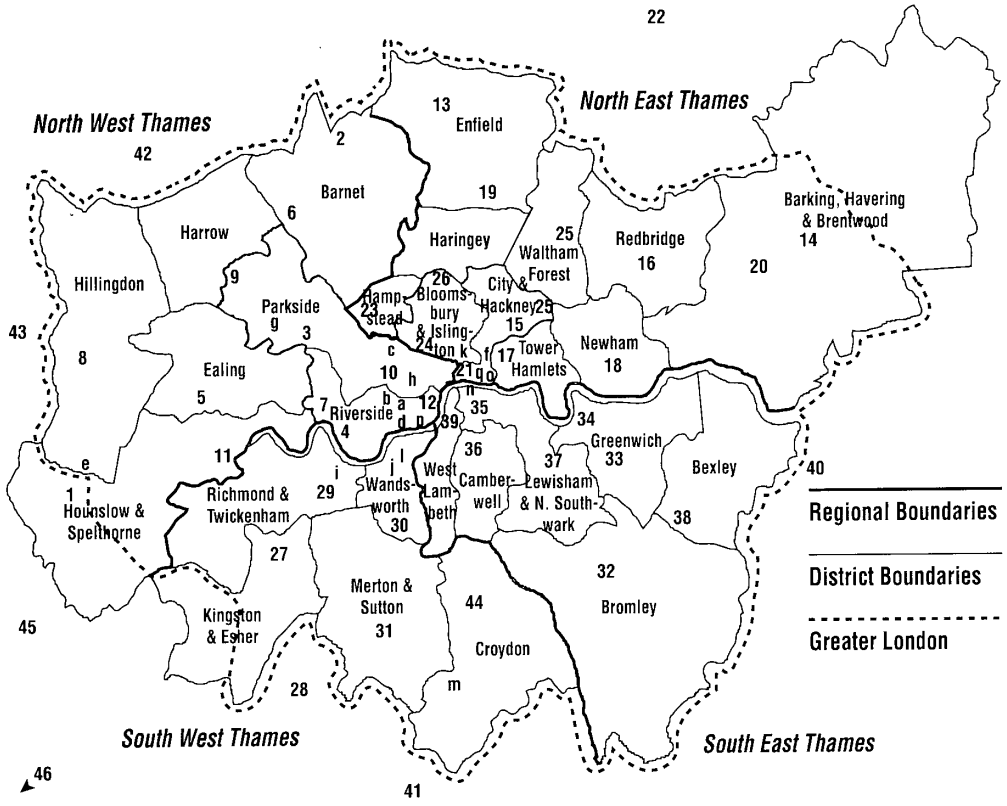
Forty years ago the ambulance services carried only emergency patients. In Great Britain, emergency and urgent cases now represent less than 15 per cent of total patients carried, although they still represent between 60 and 75 per cent of costs. Originally the local authorities controlled the ambulance services; the NHS took over in 1974, and has delegated responsibility for the provision of these services to health authorities in England and Wales. The Common Service Agency runs the service in Scotland.

The LAS is ultimately responsible to the South West Thames Regional Health Authority but is managed by a largely independent board, consisting of executive and non-executive members, operating at arm's length from the Region (Sheldon, 1990). It had a total of 841 vehicles in 1990–91, of which 325 were '999' or A&E vehicles (NUPE, 1991 a&b). The remainder consist of 504 'sitting case' ambulances and 12 taxis. The service also hires private taxi firms and operates the ambulance car service whereby volunteers drive their own saloon car. One million, three hundred thousand patient journeys were made in 1990 by these vehicles, approximately three times as many as by emergency vehicles. There are a total of 72 ambulance stations in London.

During a major incident the LAS has the following broad areas of responsibility: to alert the 'receiving' hospitals of a major incident; to provide a focal point at the scene for medical resources and for communication to hospitals; and to ensure the effective pre-hospital treatment and efficient distribution of the casualties to hospital (Regional Ambulance Officers Group, 1990).

Organisational arrangements are undergoing substantial change in the ambulance service at the time of writing. Four key areas of reform can be identified.

'Listed'* hospitals served by the LAS, and selected major incidents



'Listed' hospitals

1 Ashford Hospital
2 Barnet General Hospital
3 Central Middlesex Hospital
4 Charing Cross Hospital
5 Ealing Hospital
6 Edgeware General Hospital
7 Hammersmith Hospital
8 Hillingdon Hospital
9 Northwick Park Hospital
10 St Mary's Hospital
11 West Middlesex Hospital
12 Westminster Hospital
13 Chase Farm Hospital
14 Harold Wood Hospital
15 Homerton Hospital
16 King George V Hospital
17 The Royal London Hospital
18 Newham General Hospital
19 North Middlesex Hospital
20 Oldchurch Hospital
21 St Bartholomew's Hospital
22 St Margaret's Hospital
23 The Royal Free Hospital
24 University College Hospital
25 Whipps Cross Hospital
26 Whittington Hospital
27 Kingston Hospital
28 Epson District Hospital
29 Queen Mary's Hospital (Roehampton)
30 St George's Hospital
31 St Helier Hospital
32 Bromley Hospital
33 Brook Hospital
34 Greenwich District Hospital
35 Guy's Hospital
36 King's College Hospital
37 Lewisham Hospital
38 Queen Mary's Hospital (Sidcup)
39 St Thomas' Hospital
40 West Hill Hospital
41 East Surrey Hospital
42 Watford General Hospital
43 Nexham Park Hospital
44 Mayday Hospital
45 St Peter's Hospital
46 Royal Surrey County Hospital

Incidents

a Chelsea Barracks bomb
b Hyde Park bombing
c Regent's Park bombing
d Harrods bombing
e Heathrow bombing
f Liverpool Street Station train crash
g Wembley Station train crash
h Oxford Circus tube fire
i Putney gas explosion
j Battersea train crash
k King's Cross tube fire
l Clapham train crash
m Purley train crash
n Marchioness pleasureboat sinking
o Cannon Street train crash
p Victoria Station bombing
q City of London bombing

*(Those hospitals listed by the RHA as adequately equipped to receive casualties on a 24 hour basis, and able to provide a Medical Incident Officer and Mobile Medical Team)

First, new managerial arrangements in the LAS are being implemented. The separation of the Management Board from South West Thames Regional Health Authority, could be followed by application for NHS Trust status under the 1991 reforms, although this is unlikely to be until the 'fourth wave' of trust applications. The purchaser-provider split has no obvious implications for the LAS' major incident response since emergency transport will not be discretionary – that is, District Health Authorities (DHAs) will be obliged to contract the services of the LAS. However, contracting will allow DHAs and the LAS more flexibility in deciding who provides non-emergency transport, and this may encourage the imaginative use of non-specialised services. For example, at the Cannon Street incident two double-decker buses were used to transport 'walking-wounded' to hospital. It is clear that LAS vehicles do not constitute the sole resource available for transporting casualties.

A second area of reform, now well advanced, is that of 'tiering' (National Audit Office, 1990). This system involves the separation of emergency from non-emergency work, so that the two elements are administered separately and lessen the need to use highly expensive emergency vehicles for non-emergency and routine work. The LAS is fully tiered but the implications for major incident response are not clear. If this development allows for the reduction in the total number of emergency vehicles – whilst maintaining the same level of service under normal conditions – the provision of these services may become stretched under the 'extraordinary' conditions of a major incident. There is indeed some evidence that the number of emergency vehicles has fallen slightly over the past few years: NUPE estimate that the number has dropped from 387 in 1987–88 to 325 in 1990–91. However, the National Audit Office found that of the LAS' 894 ambulances in June 1989, '200 (were) apparently surplus to requirements' (National Audit Office, 1990). The reduction in emergency ambulances may simply be the disposal of redundant stock.

A third major reform of ambulance provision involves the adoption of a nationwide programme to base paramedics on emergency ambulances. These paramedics would be trained in basic medical procedures appropriate for immediate care in the event of serious trauma. The implications for major incident response are potentially profound and will be explored at greater length in chapter four. It has already been decided that all qualified ambulance staff must be trained in defibrillation and that every emergency ambulance should have at least one fully-trained paramedic crew member by 1996 (NHS Management Executive, 1990b). In addition to this the London Ambulance Service has bought ten Rapid Response Units (RRUs) and is operating two paramedic motorcycles on a trial basis (LAS News Release, 1991; NUPE, 1991a).

These RRUs and motorcycles are not for patient transport. Instead, their purpose is to transport paramedic care to the scene of an accident quickly to undertake resuscitation and stabilisation. In particular, the new Renault Espace RRUs, staffed by a Duty Manager, a paramedic and a Qualified Ambulance Person, have been equipped with the latest medical technology and a sophisticated radio communications system, enabling it to fulfil the role of Emergency Control Vehicle at the ambulance control point. The Duty Manager would act as the Ambulance Incident Officer. These teams are likely to be central to any major incident response in the future. The use of helicopters is also a significant development in this respect (see Box 1).

The final development is the appointment of three Emergency Planning Managers, and a Senior Emergency Planning Officer, to the LAS. These individuals represent the first specific role for emergency planning within the service, and will provide an organisational link with similar departments in the other emergency services and with hospitals. At the time of writing these posts have only just been filled, and so it is too early to evaluate their effectiveness. The link between ambulance and hospital response is crucial to good co-ordination, as is the co-ordination of London's hospitals' major incident plans. One recent development to this end is the newly-formed 'South East NHS Emergency Planning Forum' which provides a means for the exchange of views between health authority emergency planners and their colleagues in the LAS.

The central feature to emphasise, and which informs much of the ensuing discussion, is that the UK ambulance service has not, until now, had a significant medical element in the day-to-day operation of the service. This is not to say that there has not been medical guidance, nor that the ambulance service has not worked closely with medical colleagues operationally. However, the absence of medical or paramedic personnel on ambulances or in control centres has been in direct contrast to some European and North American systems.

Hospital Accident and Emergency departments

The Hospital Casualty Department had been a feature of large hospitals in the UK long before the specialty of Accident and Emergency medicine developed. As early as 1869 the Lancet observed that the outpatient departments of most London hospitals were overcrowded and their staff overworked. Many reforms were introduced over the next 100 years, chiefly with the intention of restricting attendances to casualty departments to those who were genuine 'casualties'. Separate 'outpatient' services were developed for those with

referrals from GPs. A key report was published in 1962, from a committee chaired by Sir Harry Platt, which recommended the centralisation of accident services into 24 hour 'Accident and Emergency departments' (Kelly & Mckeown, 1987) and a shift in emphasis toward skilled treatment of trauma. At first, orthopaedic consultants were put in charge of these departments, but the growth of demand for trauma treatment and the shift in the orthopaedic specialty toward joint replacement, meant that by the beginning of the 1970s a new specialty was being born – Accident and Emergency (A&E) medicine (Wilson, 1980). The precise date of this birth is 1971 when 32 experimental consultant posts were created. However, the gestation period had been underway for some time with doctors at subconsultant level working in emergency departments for many years.

The prime function of an A&E consultant, and that of A&E medicine, is to:

> *provide diagnostic service to a high standard, the provision of immediate resuscitation, the definitive care of minor injuries and emergencies, and thereafter reference to the appropriate department of those patients who clearly require admission* (Lewin, 1978, p. 17).

There were 206 whole time equivalent consultants in the specialty in England in 1989–90 (Department of Health, 1992). In London, within the area served by the LAS there are 46 'listed' hospitals on the LAS 'Alert Numbers' file – as used in Central Ambulance Control (October 1990). Six hospitals have two consultants – Northwick Park, St Bartholomew's, St George's, University College, Wexham Park and St Mary's, Paddington – and three have a part-time consultant. This gives a total of 50.5 whole time equivalents in A&E medicine at the end of 1991. These consultant numbers derive from personal communication with individuals within the hospitals. They are a best estimate at the time of writing, although are by no means stable.

'Listed' hospitals are those which are listed by Regional Health Authorities as equipped to receive casualties on a 24-hour basis, and able to supply a Medical Incident Officer and Mobile Medical Team. As the map shows, a number of these hospitals lie outside the GLC boundary.

The medical staff of an A&E department typically comprise Senior House Officers and A&E Consultants. There tend to be relatively few 'middle grade' staff such as Registrars. It is largely A&E personnel which constitute the membership of the Mobile Medical Team, but other members of the hospital staff are often recruited, particularly anaesthetists. The Medical Incident Officer can be a senior medical member of the hospital, not necessarily from the A&E department, and is occasionally recruited from the voluntary organisation BASICS.

Every listed hospital must have a major incident plan. These plans are the responsibility of the hospital itself, which is encouraged to liaise with other hospitals and the emergency services. It is not obliged to do so, however, and the final plan reflects the individual hospital's perception of appropriate procedures.

1

HELICOPTERS

The use of helicopters is already well-established in Germany, France and the USA for the provision of transport services to and between hospitals. A number of studies have been completed on the system in Germany and 'it has been claimed that a minimum of eleven lives have been saved each year for each of the 35 helicopter stations ... ' (Royal College of Surgeons, 1988). Any move to a more centralised system of trauma care will encourage provision in the UK to ensure that journey times do not become prohibitively long.

There is already some experience of helicopter use in this country. Five ambulance helicopters are flying at the time of writing: in the Scottish Highlands, West Midlands, Cornwall and Kent, and one in London at the Royal London Hospital. Two joint Police/Ambulance helicopters are operating in Wiltshire and Sussex. The West Midlands helicopter serves the North Staffordshire Trauma Centre. The London scheme – known collectively as the Helicopter Emergency Medical Service – is jointly funded by Express Newspapers and the Department of Health, initially for three years from 1990. It operates from a helipad on the roof of the Royal London in response to calls from the LAS. Although funding for these schemes is a mixture of public, private sponsorship and voluntary donation, and consequently lacks long-term commitment, more are planned.

Evaluation of effectiveness is difficult due to the paucity of cases and the ethical impossibility of randomised controlled trials. Nevertheless, evaluations are currently taking place in London, Cornwall and Sussex. The chief problem encountered by the Kent and Royal London Hospital services has been non-essential call outs: over 90% for Kent and 50% for the Royal London (Tomlin, 1990). The German experience suggests that this can be improved by the use of rigorous question protocols when the emergency call comes in. It is harder to establish the clinical effectiveness of the helicopters within the current (non-Trauma Centre) provision of Accident & Emergency services: results from Cornwall were positive (Royal College of Surgeons, 1988), whilst those from Kent were equivocal (Helicopter Steering Committee, 1990). Clearly the true test of helicopters will be as part of an integrated Trauma system, when casualties will typically have to travel longer distances. Well-developed call-out protocols and advanced pre-hospital resuscitation and stabilisation capabilities will be essential in such circumstances.

2

BASICS

The British Association for Immediate Care is the key charitable organisation involved in the immediate response to a major incident. Most of the members of BASICS are GPs who have experience of dealing with serious injury at the scene of accidents, typically road traffic accidents. Current members also include A&E consultants and registrars, and anaesthetists. Many have experience at major incidents. They are skilled in a wide range of resuscitation techniques, and are used to working at the scene of accidents alongside the statutory emergency services.

At present approximately one-third of the UK is covered by 94 schemes involving 1,850 doctors in addition to 375 individual members and 320 associate members (BASICS, 1991). Greater London now has a scheme specifically devoted to its geographical area – 'BASICS LONDON'. Previously the North East Metropolitan Accident Unit assisted at some of London's incidents. BASICS LONDON has twenty members on active call-out within the area bordered by the M25, and a call-out sheet is kept at Central Ambulance Control.

Members are typically alerted by the police or ambulance services (they are in radio contact with ambulance HQ in London, Hertfordshire and Essex) and in London the police can frequently offer a helicopter service to transport them quickly if they are many miles from the incident (Hidden, 1989).

BASICS' doctors carry a wide range of equipment relating to medical treatment with them in their cars, along with clothing, identity and triage labels, and communication equipment. The basic principles of immediate care have been long established by the doctors associated with BASICS, and are essentially unchanged since the 1970s: the maintenance of airway; the control of haemorrhage; the easing of pain and 'shock'; and the stabilisation of fractures (Winch *et al.*, 1976). To this end BASICS' equipment is more sophisticated than that of traditional ambulance crews, and now includes quite advanced kit: amputation and cricothyrotomy sets, chest drains, Ketamine anaesthesia, monitors including pulse oximetry, and defibrillators (Hines, 1985, and personal communication, 1992).

It is clear that although voluntary and unaccredited as a professional organisation, and with the associated dangers this entails in terms of a lack of comprehensive coverage, BASICS occupy a peculiar niche in the response to a major incident. In short, they are the only body of individuals at the scene who both have long experience of giving medical assistance under conditions associated with major incidents (unlike Mobile Medical Teams), and who are trained to provide relatively advanced medical treatment (training which ambulance crews and paramedics do not currently possess). Their proper co-ordination and utilisation is thus of major importance.

The specialty of A&E medicine is growing at a fast rate relative to other specialties (Health & Personal Social Services Statistics, 1979 to 1989). In part, the growth in the number of consultant posts reveals an acknowledgment of the contribution of A&E medicine within the medical community. However, the vast majority of London's listed hospitals still only have one consultant in charge of their A&E department, and this can limit the scope for consultants adopting the role of Medical Incident Officer to manage the medical response at the site. Who best fills this role is a long-standing issue and one returned to in chapter four.

These features of the relatively recent development of the specialty of A&E medicine has meant that it has not had a long tradition of integration with other agencies. Such integration is particularly important in the response to a major incident. In particular, the only body specifically concerned with London-wide emergency planning – the London Emergency Services Liaison Panel – has never had an A&E representative. This panel is discussed further below.

Voluntary groups

Voluntary groups also have an important role in helping the medical response. In particular the Red Cross and the St John's Ambulance can provide first aid, transport of patients if required, and emotional support in general. They work in conjunction with local authorities and the LAS. The Salvation Army are often in attendance to provide refreshments. One further voluntary group has a rather more prominent role in the medical response, when their members are available: The British Association for Immediate Care (see Box 2). This prominence is due to their experience of providing assistance at major incidents, including many of those in London.

Non-health-related agencies

The Police and Fire services are an inevitable part of the response to a major incident. This report is concentrating on the health-related response, but to properly understand the context in which the health-related agencies operate, an outline of the number, function and organisation of the remaining agencies is necessary.

London's Police Forces

Greater London has, in fact, five Police Forces which could become involved in the response to a major incident.

- The Metropolitan Police is the largest police force in the UK, with 28,000 officers. Unlike other forces it is not controlled by a police authority comprised of local councillors and

magistrates, but instead is accountable directly to the Home Secretary.

- The City of London force polices the City, as a result of the historical development of the 'square mile'. It has not been merged into the Metropolitan Police simply due to its special knowledge of the particular circumstances of the area. In other respects it is similar to other forces, and its operations are closely co-ordinated with those of the Metropolitan Police. It is accountable to the City of London Corporation Police Authority.
- The British Transport Police is a national but independent force, responsible for policing the railways and London Underground. Their officers have the same powers and responsibilities as regular police officers. Their duties as constables override the duties owed to the British Railways Board as employees, and they are legally accountable to a police committee established by the Department of Transport.
- The Ministry of Defence Police and Parks Police are smaller forces, and are responsible for Ministry of Defence property and the Royal Parks.

The primary duty of all police forces is to preserve the peace, to protect life and to act to deal with emergencies. In the case of a major incident, the police generally assume overall control and are responsible for security at the scene. They are also responsible for obtaining and securing evidence, identification of the dead and the running of the casualty bureau which collates and disseminates information on casualties. The geographical area in which the incident occurs determines which particular force takes control. However, the Fire Brigade often assume control in practice, particularly when the scene is dangerous. They automatically assume control when there is a fire or chemical hazard.

There is little controversy surrounding the Police's response to a major incident. Indeed, the Major Incident Plan of the Metropolitan Police was commended at the inquiry to the fire at the King's Cross Underground Station (Fennell, 1988). Nevertheless, other agencies must be aware of the police's role, and their plans need to reflect an appropriate division of responsibilities.

The London Fire Brigade and the London Boroughs

The London Fire Brigade is now under the control of the London Fire and Civil Defence Authority, a body composed of nominated elected councillors from individual boroughs. This authority was established after the abolition of the Greater London Council, the organisation previously responsible for providing fire services in London. The statutory duty of fire brigades is to act to save life and prevent damage to property as a result of fire. However, it has become a fire service tradition that they will attend other incidents where there is no fire, if they can use their equipment and expertise to help save life or serious injury. Their presence is therefore assured at all major incidents.

The London Fire and Civil Defence Authority is also responsible for aspects of civil defence in the capital, and thus has a role in co-ordinating the London boroughs' civil defence plans, if requested to do so. Although individual boroughs have a statutory responsibility to produce a civil defence plan for their own area, there is no such requirement for the boroughs to provide a major incident response as such, or to prepare a major incident plan. Nevertheless, some boroughs, particularly Wandsworth, have extremely comprehensive plans and have demonstrated their effectiveness in practice (Hidden, 1989).

The role of the fire brigade at a major incident is largely without controversy. However, the London Fire Brigade have for some time considered that, in response to the Purley rail crash, 'in order to improve the effectiveness, efficiency and safety of those involved ... command and control responsibilities of the Fire Brigade should be statutorily recognised' (Cooksey, 1990). A similar submission was also made to the Clapham inquiry. Neither inquiry felt it appropriate to recommend that current procedures should be altered in law. It was felt that, rather than the issue of 'overall control', effective communication between incident officers at the scene was the key issue.

Central planning agencies

Government policy rarely fits neatly into central government departments and this is particularly true for major incident planning, given the number of agencies involved and the diversity of statutes under which they operate. Nevertheless, the Department of Health and the Home Office are the most important: between them they are responsible for hospital, ambulance, police and fire services. The third agency of central importance to the planning process in London is the London Emergency Services Liaison Panel (LESLP). It is a voluntary body and has no connection with government.

Department of Health

The Department of Health's chief responsibility is the formulation and dissemination of official guidance for the NHS response to a major incident. The most recent is HC(90)25 (Department of Health, 1990). This document provides the clearest position of central government *vis à vis* operational

arrangements, and provides a framework for action and a baseline for future reforms. It replaces HC(77)1 which had been operational between 1977 and October 1990. HC(90)25 applies to England; Scotland and Wales have their own guidance.

The circular requires that Regional Health Authorities employ a Health Service Emergency Planning Officer (HEPO), and ensure that District Health Authorities have comprehensive plans. The HEPOs are responsible for advising on, co-ordinating and monitoring districts' plans. They should also review plans regularly and take special account of the possibility of incidents being spread over large areas and across boundaries. Districts, for their part, must ensure that all appropriate units and ambulance services also have comprehensive plans and that reviews and exercises take place regularly. Furthermore, the guidance makes it clear that, as from April 1991, these major incident plans must be secured by contractual arrangements.

The circular is viewed by all the agencies involved (including the Department of Health) as just what its title would imply: guidance. As such, agencies feel able to develop their own systems where they feel this would be appropriate. Chapter four analyses the suitability of these arrangements, and of the guidance itself, in greater detail.

Unfortunately for empirical analysis, the 'new edition' is too recent for its effects to be observed on the actual response of the health agencies themselves. However, as discussed in Box 4 (page 21), HC(90)25 does not represent a significant shift in policy, although it does significantly clarify certain roles, responsibilities and terminology. In terms of specific areas of the response, HC(90)25 concerns itself with the following aspects: general principles; the roles of the ambulance service and hospitals; the areas which these agencies' plans should cover; civil defence; local authorities (briefly); and a general glossary. The document goes into considerable detail with respect to the ambulance service, hospitals and their plans.

The Home Office

The Home Office is ultimately responsible for the provision of police and fire services in the UK, although it does not exercise direct managerial control over them with the exception of the Metropolitan Police. In the rest of the UK these services are responsible to local boards of various kinds. However, the Home Office does have an overall responsibility for policy in these areas, and partly as a response to the recent spate of major incidents which have occurred in the UK, Mr David Brook was appointed Civil Emergencies Adviser to the Home Secretary in December 1989. He is supported by a small Civil Emergencies Secretariat, and the appointment is part of a wider strategy which also included widening the remit of the Civil Defence College to cover peacetime emergency planning. It is now known as the Emergency Planning College.

The new adviser does not have an operational role during an emergency but is closely concerned with general questions of planning and training and with drawing out the broad lessons to be learnt from particular incidents. To achieve this he works 'closely with senior officers of the emergency services, local authorities, voluntary bodies, safety inspectorates, Government Departments and others concerned' (Written Answers, Hansard, 15 June 1989).

The London Emergency Services Liaison Panel

The London Emergency Services Liaison Panel (LESLP) was established in 1973 for the 'uniformed' services, although the British Transport Police were only invited to become members in the wake of the King's Cross inquiry. The list of organisations with membership during 1991 were:

- Three of London's police forces (excluding the Parks and Ministry of Defence forces);
- The London Ambulance Service;
- The London Fire and Civil Defence Authority (with an extra member from its Emergency Planning Division);
- Two representatives of the London Boroughs from the summer of 1991;
- The London Scientific Services, a scientific consultancy which provides advice on fire and safety matters.

Each organisation can nominate two members who will sit on the panel at any one time; these members are the occupants of nominated posts and not individuals. The panel's terms of reference state that its aim is 'to promote the highest level of effective liaison between London's emergency services at jointly attended special or major incidents'.

The LESLP, as currently constituted, is in essence a provider group, acting as a forum to ensure roles and responsibilities are understood, to discuss, explore and improve existing procedures, and to anticipate and suggest ways of meeting new operational situations. It has no authority, however: it is a voluntary body, and it can only recommend procedural changes. As the terms of reference state: 'it remains the unchallenged right of the respective head of service to accept or reject its proposals'.

The question of membership is a vexed one. For now it is sufficient to say that other agencies and individuals involved in the planning and immediate response to a major incident – namely, London A&E consultants, the HEPOs and BASICS – have expressed interest in the panel as a forum

for a more comprehensive exchange of information between all the involved parties, but are not currently represented. There are some problems with expanding the panel in this way – one being that it may become too cumbersome – but as it is the only London-wide planning and co-ordinating body between the emergency services, it is an important focus for developing these relationships.

Summary

A key feature of the response to a major incident is the number of autonomous agencies involved. This poses a major problem of co-ordination. To assist this process, a number of central planning bodies have been charged with the responsibility for co-ordination and liaison. As far as the operational agencies are concerned, they must be able to act confidently and effectively with one another. It is the job of the pre-planners to outline roles and responsibilities, with an appropriate degree of flexibility, so as to aid this process. In the next chapter, case studies dealing with the actual experience of five major incidents are presented. These show that the paradigm is rarely achieved, and that a well-ordered response is, on occasion, lacking.

3 The experience of major incidents in London

In this chapter the analysis turns to how the agencies have operated together in practice. Five incidents, all of which occurred within a four year period between 1987 and 1991, are studied, and the lessons and concerns of those who investigated them are discussed. The aim is to elicit continuing themes running through the incidents, which are then be addressed more fully in chapter four.

The response to the five incidents is contrasted with what might be expected from a reading of central guidelines and accepted good practice – see Box 3, which provides a description of how an incident might be dealt with by the agencies concerned if everyone acts broadly in line with policy. In some areas guidelines are vague; in others they are extremely precise. Neither of these strategies is necessarily inappropriate, but by examining the practical response to incidents an assessment can be made of the areas in which tight central direction is the best policy, and those where local flexibility is more appropriate.

All but one of the incidents analysed here occurred before the most recent guidance was issued. It is thus much too early to assess its efficacy, but nevertheless – as Box 4 argues – the broad thrust of its recommendations remains the same.

Selecting incidents for analysis

Any selection of major incidents will exhibit a degree of arbitrariness; this is an inevitable result of there not being a universally agreed-upon definition. Table 1 presents one such selection, but it is merely illustrative, relying on an intuitive assessment of the media attention each generated,

3

A TYPICAL RESPONSE

Central Ambulance Control may be alerted to a major incident from any of the emergency services. Control alerts one or more 'receiving' hospitals, either to 'STANDBY' or 'DECLARED' status. Radio handsets are delivered to the hospital(s) for communication with Central Control and the Emergency Control Vehicle at the scene; aerials should already be in place. An Ambulance Liaison Officer has responsibility for radio communication and the supervision of ambulance service activity at the hospital. The first alerted hospital sends out a Medical Incident Officer on request from the ambulance service; occasionally this role is undertaken by a BASICS doctor. The ambulance service provides transport for the Medical Incident Officer and Mobile Medical Teams.

At the scene, the police take overall control; they have responsibility for dealing with the media, organising the mortuary and running a casualty bureau. In cases of fire, chemical or radiation hazards, or where otherwise mutually agreed, the fire brigade take control. The officers in charge of their respective services are known as the Police Incident Officer and the Fire Incident Officer and they will liaise with their central control headquarters. Similarly, the Ambulance Incident Officer is responsible for all ambulance service arrangements at the scene. The Medical Incident Officer co-ordinates the medical response and liaises via the Emergency Control Vehicle and Ambulance Incident Officer with the receiving hospitals. Mobile Medical Teams are normally requested by the Ambulance Incident Officer in the first instance; thereafter the need for, and administration of, medical support is the responsibility of the Medical Incident Officer. Mobile Medical Teams should report to the Emergency Control Vehicle on arrival at the scene, where the Medical Incident Officer is stationed.

Casualties should normally be brought to the Mobile Medical Teams by members of search and rescue teams of the emergency services, unless these casualties are trapped. The ambulance Emergency Control Vehicle should be the sole point for medical communication to external positions (Central Ambulance Control and receiving hospitals). Hospitals should be kept up to date as to the number and state of expected casualties. The Ambulance Incident Officer, together with the Medical Incident Officer, decide on the distribution of casualties between hospitals.

All four incident officers should make themselves known to each other and should liaise regularly. Additional help from receiving hospitals or from BASICS should be requested by the Medical Incident Officer via the ambulance service. The police operate a helicopter service which can be offered to BASICS if the incident occurs some distance from the available members of the London scheme. The police can request local authority support and manage their assistance along with local authority Emergency Planning Officers.

When the last of the live casualties has been removed from the scene, receiving hospitals should be notified. A doctor and police officer will need to co-operate in the identification and documentation of the dead. The Medical Incident Officer may decide to stay at the scene and provide a continuing medical presence whilst the work of clearing the site continues.

4

REPLACING HEALTH CIRCULAR HC(77)1 WITH HC(90)25

Health circulars HC(77)1 (Department of Health and Social Security, 1977) and HC(90)25 (Department of Health, 1990) are analysed in terms of three key elements in the medical response – alerting procedures, pre-hospital care, and communication and distribution of patients – and how the revised guidelines, HC(90)25, have updated procedures relating to these elements.

Alerting Procedures

The main changes under this heading have been terminological. Previous terminology used by ambulance services for alerting hospitals was typically of the 'Yellow/Red Alert' type, although HC(77)1 left the precise system to 'local decisions'. HC(90)25 now recommends MAJOR INCIDENT – STANDBY and MAJOR INCIDENT DECLARED – ACTIVATE PLAN as the appropriate terminology. This message is to be made by ambulance control via a dedicated line (incoming calls only) as recommended by the Hidden Report. Furthermore, all involved hospitals are now termed 'receiving' hospitals instead of 'designated' and 'supporting' hospitals. The colour code procedure may have resulted in five minutes being lost at the Clapham incident in sending out a medical team from St George's, due to confusion at the hospital switchboard (Hidden, 1989). Changing the name of hospitals expecting casualties to 'receiving' appears to be a response to actual events in which casualties have been distributed fairly evenly between 'designated' and 'supporting' hospitals. Both these changes are sensible, and likely to avert potential confusion in the response of agencies in the future. They do not represent a major change of policy.

Pre-hospital medical care

Changes in the way pre-hospital medical care is organised relate to two sets of individuals: the Medical Incident Officer and the Mobile Medical Team.

First, the Medical Incident Officer. The title was changed from Site Medical Officer to correspond with the terminology used for other Incident Officers in the ambulance, fire and police services. The source of the Medical Incident Officer has been clarified, with hospital major incident plans providing for ' ... from the first receiving hospital only, the immediate dispatch via the ambulance service, of the Medical Incident Officer to the scene of the incident' (Department of Health, 1990). In HC(77)1 the relevant section states: 'As part of the hospital major accident procedure the Site Medical Officer will immediately proceed to the scene ...' – it was not made clear whether this individual should be a member of the designated hospital, or 'supplied by the health authority'.

The role of the Medical Incident Officer has been clarified in two respects: he or she should be suitably trained (although the only detail is that this should include radio-communication skills), and it is not recommended that he or she should undertake a clinical role (previously it was expected that he might have to in 'the early stages'.)

Second, the Mobile Medical Team. The procedure for calling the Mobile Medical Team has changed only marginally, and this involves emphasising that they should only attend if requested, and that the ambulance service should transport them. It is emphasised that the teams should report to the ambulance Emergency Control Vehicle. Again, these are not new policies. The substance of their summoning procedure and their role remain exactly as before.

Communications and Distribution of Patients

Communications now have a chapter to themselves in HC(90)25, and if there has not been a policy shift, it is certainly true that in response to the King's Cross inquiry in particular the communication element has been expanded, with the following areas emphasised:

- **designated ex-directory telephones, receiving incoming calls only, in all receiving hospitals;**
- **weekly testing of such telephones;**
- **the responsibilities of the ambulance service for on-scene communications, including the use of personal radio-telephones.**

To summarise, the main changes have involved tightening terminology, strictly defining the sources of the Medical Incident Officer, and enlarging the responsibilities of ambulances and hospitals regarding communications. It should be noted that this is only in those areas central to the medical response and to this report. The guidelines contain much extra detail useful for individuals involved in the response. Nevertheless, there does not appear to have been a significant shift in policy; in particular, there is no new mechanisms for ensuring that hospitals and the ambulance service actually implement these guidelines.

and including those which generated the most interest. For the purposes of this report it seemed appropriate to study only those incidents which had been the subject of an official inquiry. In this way, the rather more subjective and anecdotal press reporting could be avoided. Four – the King's Cross Underground fire, the Clapham and Purley rail crashes, and the Marchioness sinking – have already had their inquiries published. They also include an assessment of the response of the emergency services, something which was not undertaken in inquiries prior to that for the King's Cross fire. These four are therefore obvious candidates for analysis.

One other incident is also included: the Cannon Street rail crash. The official inquiry was published as this report went to press (Cooksey, 1992). For the first time since the King's Cross inquiry no more than a passing reference was made to the response of the emergency services.

Table 1 Major incidents in London since 1980

There are no clear criteria for defining a major incident. The following list merely attempts to give an impression of those events which gained a significant amount of public attention, and reveals, in particular, the increasing severity of those which occurred towards the end of the 1980s. Figures should be treated with caution since there is rarely agreement between agencies as to the number of casualties.

Date	Location	Incident	Approx Number of Casualties*
7/10/81	Chelsea	Barracks bombing	72; 2 dead
21/7/82	Hyde Park	Bombing	22; 3 dead
21/7/82	Regent's Park	Bombing	30; 6 dead
17/12/83	Harrods	Bombing	90; 5 dead
20/4/84	Heathrow	Airport bombing	22
16/5/84	Liverpool Street Station	Train crash	40
11/10/84	Wembley	Train crash	18; 6 dead
24/11/84	Oxford Circus	Underground fire	15
10/1/85	Putney	Gas explosion	10; 8 dead
31/5/85	Battersea	Train crash	105
18/11/87	King's Cross	Underground fire	60+; 31 dead
12/12/88	Clapham	Train crash	123; 35 dead
4/3/89	Purley	Train crash	88; 5 dead
20/8/89	River Thames (Marchioness)	Pleasureboat sinking	80; 51 dead
8/1/91	Cannon Street Station	Train crash	265; 2 dead
18/2/91	Victoria Station	Bombing	38; 1 dead
10/4/92	City of London	Bombing	93; 3 dead

*First figure relates to the approximate number of casualties treated in hospital.

Sources: Walsh, 1989; Fennell, 1988; Hidden, 1989; Cooksey, 1989; Marriott, 1991; LAS communication, 1990; BASICS personal communication, 1992; Times newspaper reports.

However, an analysis is included here due to some particularly well-publicised problems with the medical response, and the existence of a detailed internal report from the LAS (Lloyd, 1991). Nevertheless, caution should be exercised in drawing firm conclusions from the experience at this incident.

The account of the five incidents has also benefited from interviews with some of the medical and ambulance incident officers involved.

King's Cross Underground fire

A fire which started on an escalator in the King's Cross Underground Station on 18 November 1987 erupted into a flashover killing 31 people and injuring more than 60. The fireball enveloped an underground ticket hall, and it was there that the majority of the casualties sustained their injuries. These were chiefly related to smoke inhalation and burns, and the injured were taken to University College Hospital and St Bartholomew's Hospital in roughly equal proportions. The fact that this incident occurred underground meant that there were particular problems for communication between the members of the emergency services. Fourteen ambulances were committed to the incident in total.

The Fennell Report (1988) deals with this incident, and is an extremely detailed and extensive work. It was the first official inquiry into a major incident which included a section on the response of the emergency services. That section highlighted a number of concerns, in particular relating to the London Fire Brigade and the LAS.

- Fire officers did not carry personal radios with them for on-site communication.
- There had been a breakdown in communication between the senior incident officers of the emergency services, and joint exercises were recommended.
- LAS drivers had no procedure for radioing into control on arrival at the scene and the Emergency Control Vehicle was not despatched until two hours after a major incident was declared.
- There was difficulty in contacting senior officers to fulfil the role of Ambulance Incident Officer.

These criticisms were accepted by the relevant bodies, and action has been taken during the intervening years to rectify matters. The scale of the incident, however, and the consequent visibility of communication and co-ordination difficulties, meant that in every major incident since King's Cross the emergency services have been put under scrutiny. The King's Cross incident did not specifically call attention to the medical response – the official inquiry did not make it clear what part, if any, Mobile Medical Teams and BASICS doctors played. However, the problems associated with the LAS response resulted in a rekindling of interest in issues of pre-hospital care and the efficient communication between the scene and receiving hospitals. Every official inquiry into major incidents since the King's Cross fire has included a section on the response of the emergency services.

Clapham Junction railway accident

On 12 December 1988, a crowded commuter train collided with the rear of another stationary train in a cutting just south of Clapham Junction British Rail station. As a result of the collision 37 people died, nearly 500 were injured and 123 needed hospital treatment. Many casualties were trapped, five for a considerable period of time. Three hospitals were alerted: St George's, Tooting was 'designated' the main receiving hospital in line with the terminology of the time, and St Stephen's and St Thomas' were alerted as 'supporting' hospitals. This alerting procedure, from LAS Central Control at Waterloo, also used the terminology 'Yellow Alert' for a standby position, and subsequently 'Red Alert – Major Incident Declared'. A Mobile Medical Team was sent from both St Stephen's and St George's, and later from St Thomas'. BASICS was alerted by the police, confirmed that their presence was required with Central Ambulance Control and were flown to the scene in a police helicopter. The overwhelming majority of the 123 casualties were taken to St George's.

The Hidden Report (1989), which dealt with this incident, was also a very substantial, and public, investigation. It also included a large section on the response of the emergency services. Its main concerns are set out below.

- There were substantial time-lags in alerting procedures for hospitals and in the subsequent arrival of the Medical Incident Officer and Mobile Medical Teams.
- Communication was poor between the scene and the receiving hospital due to there not being an aerial at the newly opened A&E department.
- Personnel at the incident were poorly identified, particularly those with medical experience. Clothing offered insufficient protection.

Hidden also notes a number of other features of the incident which were not criticised at the time, but which are relevant to this analysis. Being alerted by the police, BASICS managed to arrive without a specific request from the scene (although, as mentioned above, they did confirm with Central Ambulance Control), and therefore without the knowledge of the Medical Incident Officer. Nevertheless, they arrived somewhat more quickly than the Mobile Medical Teams, and at roughly the same time as the Medical Incident Officer. Further, it was noted by this latter individual – an Orthopaedic surgeon from St George's – that at one stage there were too many medical personnel at the scene and that they would be better utilised in their own hospitals.

The response of both BASICS and the London Borough of Wandsworth were both praised by the public inquiry. BASICS' areas of expertise has already been noted in the previous chapter; Wandsworth, however, responded in a more comprehensive manner than had previously been experienced. It is not clear who initially notified the Borough of the incident, but on arrival a council officer initiated their Borough-wide plan as 'Category 1', the most severe. The services they provided involved clearing trees, cutting railings, acting as stretcher bearers, tending to the slightly hurt, directing traffic and providing cones and signs, and providing lighting as the day drew on. This 'plan' is not a statutory responsibility, however.

Finally, and this was not specifically noted in the official inquiry, there was some concern amongst members of St Stephen's and St Thomas' that although they had been alerted to a major incident (both hospitals had actually sent a Mobile Medical Team) they were not utilised. Although there are no details on the specific nature of the injuries sustained and the treatments needed, it is probable that the use of three A&E departments instead of one, with the numbers of casualties involved, would have led to more effective treatment for at least some of those concerned.

Purley railway collision

On 4 March 1989, a train from Horsham to Victoria was struck from behind by a train from Littlehampton to Victoria while both trains were moving. The leading six carriages of the Littlehampton train were derailed and deflected down an embankment. Five passengers were killed and 88 required hospital treatment. Casualties were distributed between three hospitals. The 'designated' hospital was the Mayday, Croydon,

which received 45 casualties. The 'supporting' hospitals were the St Helier Hospital, Carshalton which received 12, and the East Surrey Hospital, Redhill which received 31, eleven of whom made their own way. Twenty-four of those casualties treated at the Mayday were taken by the police. Both the LAS and the Surrey Ambulance Service provided vehicles, totalling twenty-seven. Two Emergency Control Vehicles were provided, one from each service, although this did not seem to cause any confusion. All casualties were cleared within two hours of the incident; only one person was trapped for any length of time. Two Mobile Medical Teams were provided, one from St Helier and the other from East Surrey. Six BASICS doctors were also requested by the police: three came in their own vehicles, two in police cars, and one in a police helicopter. Again, as at Clapham, they confirmed that their presence was required with Central Ambulance Control.

The inquiry was not public, undertaken as it was by the Railway Inspectorate of the Department of Transport, and did not make specific recommendations regarding the co-ordination of the emergency services. However, the following points were raised in its account.

- Initial overall control was confused; ultimately the Fire Brigade took this role, as it had at Clapham.
- The role of Medical Incident Officer was not undertaken until at least 1 1/4 hours after the incident, and at about the same time the Mobile Medical Teams left the scene. The individual concerned was a member of BASICS.
- Casualties were removed from the site without the use of triage labels.

The main point of interest from the point of view of this report is the medical response. A number of concerns can be identified. First, no Medical Incident Officer was requested from the 'designated' hospital. Second, Mobile Medical Teams operated without a Medical Incident Officer. Third, the Teams were operational at the scene for less than an hour, during most of which time there were also BASICS doctors in attendance. The first two of these observations are strikingly at odds with expected procedures, whether one refers to 1977 or 1990 guidelines, or indeed many published sources of good practice (Hines, 1985; Miles, 1990; Walsh, 1989).

Marchioness riverboat sinking

On 20 August 1989, at 1.45 am, the passenger launch Marchioness and the dredger Bowbelle, both bound down river, collided in the River Thames just upstream of Cannon Street Railway Bridge. As a result the Marchioness sank: 51 died and 80 survived, most of whom were in need of hospital treatment. The rescue operation was under the command of the 'Thames' Division of the Metropolitan Police. The London Fire Brigade had a supporting role, chiefly assisting as look-outs on bridges and providing lighting equipment. A total of 14 ambulances, including the Emergency Control Vehicle, were committed to the scene. St Thomas' was the 'designated' hospital, and received 54 casualties, Westminster and Guy's Hospitals were 'supporting' and received 4 and 13 casualties respectively; 9 were transported by the police to unrecorded destinations. One Mobile Medical Team from St Thomas' Hospital was sent to the scene, as were four BASICS doctors, one of whom assumed the role of Medical Incident Officer.

The Marriott Report (1991), for the Marine Accident Investigation Branch, found little with which to be concerned about the emergency services' response. It noted that communications in the LAS were still a problem as they were at King's Cross – particularly regarding radioing in on arrival at the scene and alerting senior officers – but that 'action to remedy them is well advanced (and) therefore no further recommendations are made on this subject' (Marriott, 1991). The Report also notes that it had been suggested in the media that the LAS response was generally inadequate, and it rejected this allegation as well, noting that the majority of the survivors had been dealt with within one hour of the incident occurring.

However, there are two other sources of information on the Marchioness Incident: a debriefing at New Scotland Yard, and NUPE's leak of the Emergency Control Vehicle's and Central Ambulance Control's computer logs of events. The former notes that communication between the receiving hospitals and the scene are still less than adequate, with hospitals lacking knowledge of the extent of casualties. This, it must be said, can be information about which those at the scene are not clear. With the Marchioness nobody knew the number of people on the boat, so casualty figures could only be guessed at. Such confusion is also often the case with train crashes: as mentioned later in this chapter, the number of trapped casualties at Cannon Street was not clear for some time.

The LAS logs reveal the timing of the arrival of the Medical Incident Officer and the Mobile Medical Team. These arrived approximately 40 minutes and one hour after the incident, by which time, according to the official inquiry, the 'majority of the survivors had been dealt with' (Marriott, 1991). It is not clear from the log who requested these individuals. At any event, it did not appear to be as a result of a request from the Ambulance Incident Officer. It should also be noted that a BASICS doctor assumed the role of Medical Incident Officer.

The other point to note here is that although a 'senior officer' took some time to arrive, this did not prevent the more junior Ambulance Incident Officer from successfully distributing patients between St Thomas' and the supporting hospitals – particularly when the message came from St Thomas' that they were 'full'. Although this incident occurred in the middle of the night, it is clear that a major A&E department can start to feel under pressure after approximately 40 patients, as was the case at St Thomas'.

Cannon Street railway station crash

On 8 January 1991 a train from Sevenoaks, Kent, failed to slow down on arrival at Cannon Street Station and crashed into the buffers. 265 people were injured and two died. Many passengers were trapped for some considerable time, the longest for approximately 3½ hours. A total of 36 LAS vehicles were committed, including one Emergency Control Vehicle, two Equipment Vehicles and nine Patient Transport Vehicles. The Helicopter Emergency Medical Service was also utilised. The City of London Police took overall command and control. St Bartholomew's, Guy's and the Royal London Hospitals were all notified as receiving hospitals. The distribution of the casualties was documented in detail by the LAS:

By the LAS	St Bartholomew's	53
	Guy's	12
	London	11
By LRT Bus	Guy's	104
By 'other' means	St Bartholomew's	48
	Guy's	20
	London	12
Made own way to St Thomas'		5
TOTAL (Bart's 101; Guy's 136; London 23; St. Thomas' 5)		**265**

Five Mobile Medical Teams and four BASICS doctors were also involved in the response.

Due to there being no official inquiry at the time of writing, issues relating to this incident should be treated with caution. Nevertheless, the following list gives some indication of events which caused concern.

- It appears that there was, for a time at least, two individuals who considered themselves the Medical Incident Officer. Partly as a result of this, there was confusion as to the nature and extent of the medical presence at any one time.
- The use of cellular portable telephones by medical personnel to communicate with receiving hospitals meant that the Emergency Control Vehicle was bypassed. An accurate record of equipment requested was therefore not taken, and some equipment was duplicated.
- Clothing was inappropriate in the case of both ambulance and medical staff. Levels of medical expertise were not clearly indicated on clothing.
- Even though there were a number of trapped casualties (the exact figure is not clear, but there were more than five) the medical presence was considered excessive.

These concerns are a synthesis of the LAS report from the Director of Operations (Lloyd, 1991), the LAS Central Ambulance Control log and interviews with one of the Medical Incident Officers and a BASICS doctor at the scene. The Medical Incident Officer also produced a report of the incident (Hines, 1991). It is clear from these reports that neither the Ambulance Incident Officer nor the Medical Incident Officer were controlling the call-up of further hospital-based medical support. This problem was made worse by the fact that a certain number of the medical personnel did not report to the Emergency Control Vehicle.

Summary

The central observation to be made from studying these incidents is that there appears to be evidence of an 'implementation gap'. This is a situation in which central policy fails to elicit the best possible response at the time of an incident – when policy is implemented. There may be two reasons for this failure. Central guidelines may, in certain respects, be specifying a response in too much detail, exposing as ineffective existing mechanisms for communicating policy to those who implement it. On the other hand, there may be areas where clear central guidance is lacking.

In any event, it is likely that central guidelines can only be part of a strategy for obtaining a coherent and well organised response. Attention must also focus on the opportunities offered by developments within the agencies themselves. The discussion of these issues in the next chapter therefore relate to two areas. First, the operational response on the day of the incident is analysed, where current practice is being challenged by the development of a comprehensive fleet of paramedic-based ambulances and rapid response vehicles. Second, attention is focused on the appropriate guidance and action from central planners, both in terms of the substance of the guidance, and the organisation of the bodies charged with its formulation and dissemination.

Themes and controversies

It is clear that the response to a major incident involves a large number of autonomous agencies. A significant proportion of the concerns raised by official inquiries relate to the response of those agencies assisting with or providing medical aid. These issues are discussed in this chapter, and are organised into the two following sections.

- Issues relating to the response of the emergency services on the day of the incident.
- Issues relating to pre-planning and the formulation of guidelines.

This approach follows the development of 'bottom-up' analysis of the implementation of policy in the theoretical literature (Ham and Hill, 1983). The initial focus is on the agencies and individuals directly involved in policy implementation, and on their actions, goals and strategies, rather than the more orthodox starting point of central planning or policy making bodies, analysis of which then follows through the goals to their implementation.

The approach has the advantage of being more sensitive to the 'implementation gap'. Two possible theoretical reasons for the evidence of such a gap are suggested here. First, professionals often work to the goals and ethics of their profession, and these might not accord neatly with a particular set of policy guidelines. Second, the statutes and directives under which individual agencies operate may conflict with those of other agencies, particularly concerning roles and responsibilities.

These circumstances are particularly likely to apply during a major incident. A number of quite separate professional bodies are working together and may not find it easy to accord with central guidelines apparently requesting rather specific courses of action. Furthermore, each of these professional agencies are operating under their own statutes. These statutes may overlap, even if they do not actually conflict. For these reasons it may be difficult for central policy to successfully allocate roles and responsibilities in what is an extremely uncommon event – that is, one for which agencies do not often get the chance to practice these roles. Instead, professional imperatives may be more influential in determining how individuals react.

In recognition of the importance of the agencies themselves in the implementation process, the 'bottom-up' analysis of this chapter starts with these 'operational' agencies before considering central 'planning' bodies. It may be that the 'implementation gap' will never be completely eliminated, given the nature of a major incident. However, it is hoped that adopting the bottom-up approach will provide a better understanding of the appropriate form that central policy guidelines should take.

The operational response to a major incident

The operational response is broken down into two categories: the response at the scene, and links between the scene and receiving hospitals. Figures 1 and 2 give a diagrammatic representation of the response and interservice communications.

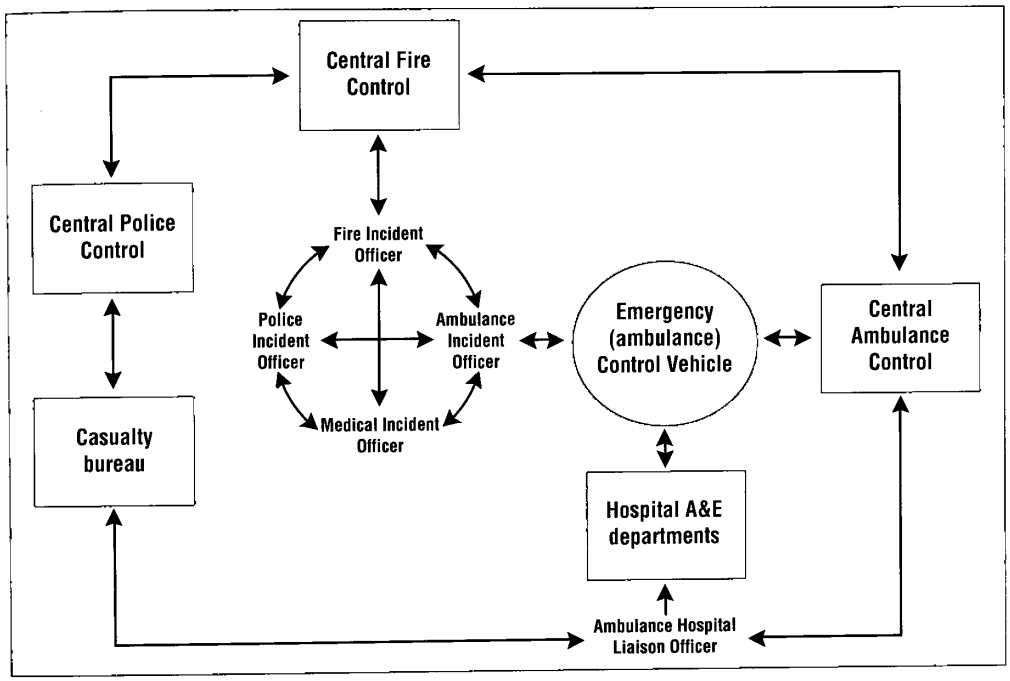
The scene

The 'scene' of an incident can be defined as that area within which the police (or fire brigade if appropriate) assume overall command. The police have the initial responsibility for marking out the various areas within the vicinity of the incident for vehicles, equipment, rest centres, temporary mortuary, liaison points, and for ensuring that the rescue work can continue unhindered. The term is used here to include all these points and therefore all the Incident Officers. The police use a 'gold/silver/bronze' taxonomy to describe the various levels of authority and activity.

- Gold – the central control point or individual – for example, Central Ambulance Control;
- Silver – the scene under the control of the police or fire brigade, and defined in authority terms by the various Incident Officers;
- Bronze – the 'site' or the area which is directly affected by the incident, including those trapped in the wreckage.

In Figure 1, the 'scene' would be the area excluding the hospitals. The source of this taxonomy is the Major Incident Plan of the British Transport Police – the Metropolitan Police and City of London Police have the same system. It is particularly useful in distinguishing between those who have essentially administrative roles – silver – and those who engage in search, rescue and treatment – bronze. In terms of the health-related response, the Medical Incident Officer occupies a silver position. It is his or her job to adopt an administrative role, and not to become involved with the actual delivery of medical care (Hines, 1985). The generally accepted role of the Medical Incident

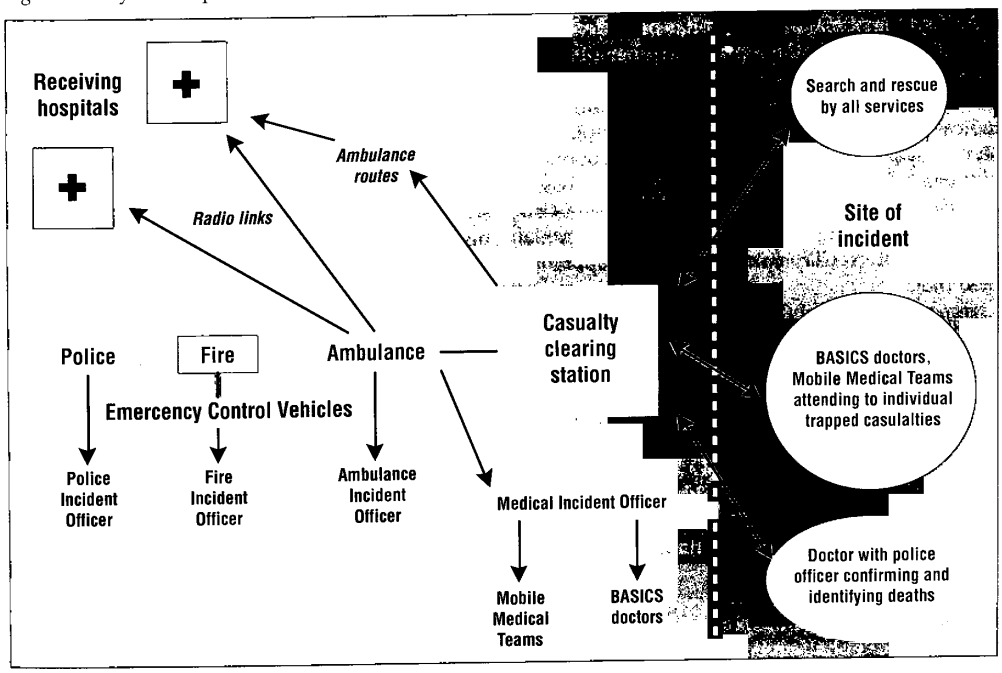
Figure 1 Interservice communications at a major incident



Source: Adapted from Hines (1985)

Note: Figures 1 and 2 only show the senior incident officers, although each service will have other officers with particular tasks. For example, the ambulance communications officer is based in the Emergency Control Vehicle and is responsible for all medical/NHS communications.

Figure 2 Stylised representation of the scene at a major incident



Source: Adapted from Hines (1985)

Officer is described in some detail in Box 5. This detail is not because the officer is more important than the other incident officers, but, on the contrary, because there is rather less consensus about the need for such an individual. The 'job description' represents the views of those who support the role.

Four issues relating to the response at the scene are analysed:

- the utilisation of medical personnel;
- the role of the Medical Incident Officer;
- the possibilities offered by ambulance-based paramedic care;
- the standardisation of equipment and triage systems.

The utilisation of medical personnel

In each of the five incidents analysed in the previous chapter at least one Mobile Medical Team was called out to the scene. This also appears to be true of incidents in general. The Ambulance Service Operational Arrangements for Civil Emergencies (Regional Ambulance Officers Group, 1990) outline the alerting procedure for receiving hospitals undertaken by Central Ambulance Control. They include the following:

> *Requesting the attendance of a mobile medical/nursing team where the initial reports suggest that this is desirable and providing transport for the team if necessary* (Regional Ambulance Officers Group, 1990, Section 6, paragraph (h)).

In practice, therefore, the first receiving hospital to be notified that a major incident has been declared will send out a medical team. Often, other receiving hospitals do the same.

However, a close analysis of the utilisation of medical personnel reveals that, in the examples cited in the previous chapter, there was, at one point or another, an oversupply. At King's Cross it is not clear what part medical teams played, but no mention is made of them, or BASICS doctors, in the Fennel Report. At Clapham, the Hidden Report noted that:

> *it was impossible for him [the Medical Incident Officer] to tell at any one moment the number and nature of medical staff on site. At one stage he was aware that there were more medical personnel on site than was required and despatched some staff back to their hospitals where they could be used more effectively* (Hidden, 1989, p. 45).

At Purley two medical teams were at the scene for less than an hour, during which time only one casualty was trapped and six BASICS doctors were also in attendance. Furthermore, up to 10 ambulances had been transporting patients from the scene for over half an hour before the medical teams arrived. It is not clear what the teams were doing while they were at the scene, and it might be that their personnel could have been utilised more effectively at the receiving hospitals.

At the Marchioness Incident, according to the LAS Emergency Control Vehicle log, the medical teams arrived after the majority of casualties had been transported to hospital, and spent much of their time acting as look-outs for survivors in the River. They returned to St Thomas' within 50 minutes of their arrival. Again, they might have been better employed at the hospital from the outset.

The lack of a formal investigation into the Cannon Street incident makes it hard to assess the appropriateness of the medical response. However, the LAS noted that five Medical Teams and four BASICS doctors were present. In an internal report the LAS claimed that there had been 'an excess of medical staff' (Lloyd, 1991).

All this is not to suggest that a medical presence is never required at the scene, but that the protocols for requesting such a presence should be more rigorously thought out and applied. As one senior consultant puts it:

> *The need for a mobile team is entirely dependent on the presence of trapped casualties. If they are not trapped, casualties can be given skilled help most rapidly by transferring them to hospital immediately* (Nancekievill, 1989, p. 477).

This opinion is backed by experience outside London. Cope and colleagues (1991) described the results of evaluations of Accident Flying Squads in Lincoln and Edinburgh. These squads consist of personnel from A&E departments who respond to emergencies in their own vehicles; the situation is thus comparable to that facing a Mobile Medical Team. In surgical emergencies (again, those relevant to a major incident), expected mortality was not improved in either study. Brown and Marshall (1988) described experience of the Enniskillen bomb in 1987 where medical staff were sent out 'primarily to warn the hospital of the number of casualties'. It is also clear that the procedures undertaken on these occasions were appropriate to paramedics:

> *The other main task at the scene (apart from warning hospitals) is to give analgesia and to set up intravenous infusions, but this can easily be carried out by trained paramedical staff* (Brown and Marshall, 1988, p. 1115).

The opportunities provided by paramedic training are discussed below, but it should be noted that these are by no means recently developed opinions (Tucker and Lettin, 1975; Rutherford, 1975).

London can also, to a limited extent, call on the services of BASICS, an organisation whose members are expert in just those procedures described above. It is often suggested that due to the voluntary nature of BASICS they cannot

guarantee a medical presence. This criticism is justified, and it is acknowledged by BASICS themselves. Nevertheless, their availability has in practice meant that they have been able to attend each of the incidents reviewed in this report, and make a significant medical contribution at the three rail incidents. It may be that an accreditation scheme is required, whereby an independent body – a Royal College, for instance – lays down standards of coverage, availability and expertise. Local BASICS schemes which did not fulfil the accreditation standards would not be part of local alerting procedures. Alternatively a purchasing authority might contract their services if they could guarantee certain quality standards – this possibility is discussed further below.

Notwithstanding the patchy coverage of BASICS many of their members are experienced in the conditions associated with a major incident. These conditions constitute a further issue in the utilisation of hospital-based medical personnel. It has long been a concern of planners for major incidents that:

> *the arrival of an untrained, inexperienced, ill-equipped group of hospital doctors and nurses at the disaster site contributes little if anything to disaster management, and that their skills would be better employed in a familiar environment within the hospital* (Savage, 1979, p. 10).

On the other hand, the official report to the Purley incident noted that:

> *the incident again illustrated the value of using a small number of highly trained doctors (ie BASICS), experienced in dealing with large scale multiple casualty situations supporting locally based mobile medical teams who are unlikely to have had previous experience of such incidents* (Cooksey, 1990, p. 14).

The point these authors are making is not that hospital medical staff are not capable of treating the injuries with which they are presented, but that they may not be able to deal with them in the context of the incident itself, outside the controlled environment of the hospital. Dealing with casualties while they are still trapped in wreckage is something of which firemen, ambulancemen and many BASICS doctors have experience; most hospital doctors do not. There are exceptions: the South Manchester Accident Rescue Team (SMART) is hospital-based but takes part in regular drills with the emergency services, and also acts as a 'flying squad' in attending individual victims outside hospital (Redmond, 1989). There are other examples, including the helicopter team based at the Royal London Hospital, but they are few relative to the number hospitals which might need to respond to a major incident.

Official inquiries are often reticent about identifying individuals as examples of bad conduct, but a personal account of the experience of one medical team's experience is instructive. Fletcher (1986) describes how she was part of the response to the bandstand bombing in Regent's Park in 1982 as a member of a medical team based at St Mary's, Paddington. The team was not well prepared and the membership included a doctor with limited experience. But the key point is that they were entirely unprepared for the scene which greeted them – one of their number became quite shocked at the sight of mutilated bodies. The remainder spent most of the duration of the incident sitting on the grass until they were told to return to their hospital. The only medical role they played was to certify the dead. Cannon Street provides a further example. The internal LAS report noted that 'some medical staff attended the scene in wholly inappropriate attire giving rise to some concern over their personal identification and protection'. This criticism was also directed at ambulancemen's uniforms due to the 'very difficult and hazardous conditions in the wreckage whilst cutting equipment was in use' (Lloyd, 1991).

These two examples display the twin problems of emotional shock and hazardous working conditions of which hospital staff are unlikely to have much experience. Even if well-trained, the 'real-life' experience will be missing, and the practice gained by those who regularly attend these incidents as a matter of course will almost certainly be lacking.

The role of the Medical Incident Officer

The second element in the response at the scene is the role of the Medical Incident Officer. The discussion so far has highlighted the difficulties involved in utilising hospital-based mobile teams. It must be made clear that it is not being suggested that these teams are no longer necessary, only that the circumstances in which they are needed should be more tightly defined than hitherto. This will be particularly important in the context of a developing system of paramedic care amongst ambulance personnel. This is discussed further below.

But for the immediate future, mobile teams are likely to continue to be an essential part of the response, particularly when trapped casualties are involved, as indicated by Nancekievill above. Notwithstanding the existence of BASICS, hospitals will remain the key source of advanced medical expertise. Given the novelty of the environment in which they will be asked to work, however, it is important that they are well managed and given the assistance they need. This is the role of the Medical Incident Officer.

In the incidents described above, only the three train crashes displayed a *prima facie* case for the assistance of medical teams and therefore medical management, but in only one was the role

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THE MEDICAL INCIDENT OFFICER

The Medical Incident Officer manages the work of medical personnel at the scene of a major incident. He or she should not normally become involved with the treatment of the injured, but play an administrative role. The following constitutes the main areas of responsibility.

- The supervision of Mobile Medical Teams, ensuring they are deployed appropriately, that proper triage and labelling of casualties is carried out, and that they are provided with advice on immediate care procedures.
- To make himself known to, and liaise with, the incident officers of the other emergency services.
- Work closely with the Ambulance Incident Officer in the evacuation and distribution of casualties to receiving hospitals, and with communicating information to and from the scene.
- Arrange for further medical assistance if required, stand down those teams showing signs of fatigue, and return to base those teams no longer required.
- Provide a continued medical presence when all the live casualties have been removed, but whilst rescue workers are still employed at the site. Liaise with the Ambulance Incident Officer about standing down receiving hospitals.
- Take part in debriefing sessions after the incident.

Due to the infrequency with which major incidents occur, particularly within a given region, the individual concerned is unlikely to have experience of the duties involved. It is therefore important for all those who may be called upon to have had appropriate training. Current good practice suggests the following elements constitute a basic training programme.

- All aspects of the practice of immediate care techniques (see Box 6).
- The workings of the other emergency services, of their command structure, communication systems and roles and responsibilities.
- A good knowledge of all the local hospitals and the specialist departments and units.
- Familiarisation with all local major incident plans, and involvement with full-scale and table-top exercises.

Source: Hines, 1985 and personal communication, 1992

6

TRAINING FOR IMMEDIATE CARE

Training for the specialist techniques required for immediate care at the scene of an incident is now provided at a number of regular courses. The courses are designed for all those who are likely to be involved in the medical response, but include certain elements which are particularly appropriate for those nominated to be Medical Incident Officers. The following represents a selection of elements from two recently run courses: the 'Cambridge Immediate Care Course' at Madingley Hall (11–15th May 1992), and 'The Medical Management of Major Incidents' at the Royal Postgraduate Medical School, Hammersmith (14–16th February 1991).

- Medical procedures relating to burns, head injury, thoracic trauma, spinal injury, airway and ventilation, intravenous infusion, venous access and skeletal injury.
- The special problems posed by chemical, aircraft and immersion incidents; blast and gunshot injuries; burns; and paediatric resuscitation.
- The treatment of shock; the provision of emergency anaesthesia and analgesia.
- The management of the trapped patient; extrication exercises; medical causes of collapse after extrication and its treatment.
- The roles of the ambulance, police and fire services; the role of the immediate care doctor; the hospital response; appropriate use of helicopter support.
- Psychological aspects.
- Communication equipment and procedures; the ambulance Emergency Control Vehicle.
- Triage and documentation; forensic considerations.
- Major incident exercise.

of Medical Incident Officer clearly filled at all times. Indeed, it could be argued that the perceived need for a separate manager of the medical response is in fact mistaken, given the fact that this individual works closely with the Ambulance Incident Officer in all important regards. Insofar as it is a managerial role which requires no clinical work, a properly trained Ambulance Incident Officer could fulfil 'both' roles. However, there are problems with this line of argument.

The most important concern about such an arrangement is that the Ambulance Incident Officer would lack sufficient authority and/or knowledge of medical matters to administer the response. When mobile hospital teams are required, individuals from one profession are unlikely to take kindly to being managed by those from another. For this reason, as soon as hospital-

based medical teams become necessary, a Medical Incident Officer from within the medical profession will also be necessary. This individual will be able to act with authority over those in the team; a member of the ambulance service might find this more difficult. However, simply being a member of the same profession will not be sufficient – the individual will need to be trained in the particular skills of immediate care, and in the circumstances and protocols of a major incident. BASICS are involved with a number of training courses, including an annual course at the Royal Postgraduate Medical School, Hammersmith, and one at Madingley Hall, Cambridge – see Box 6.

It is likely that any senior clinician with the appropriate training will be appropriate, although precisely who this should be and where they should come from will be the subject of the next section – **Links between the scene and receiving hospitals.** At any rate, it seems clear that when a medical team is required they need to be managed, and from within their own profession.

However, as discussed above, the particular circumstances when these arrangements – for hospital-based support – become necessary are not common to every incident. Train and plane crashes are good examples of situations when mobile teams are likely to be needed, due to the likelihood of trapped casualties. Incidents involving terrorist bombs, fires and shootings are less likely to need such a response. However, even where trapped casualties are involved, developments within the ambulance service may reduce the need for hospital teams further.

Ambulance-based paramedic care

Until the 1970s, the ambulance service in the UK had a tradition of 'scoop-and-run' in relation to patient transportation. In other words, patient transport lacked a significant medical element, relying instead on speed of transfer of patients to hospital where they could receive definitive care. This tradition stemmed from the fact that up until 1974 ambulance services were run by local authorities, and that 'resuscitative' medicine – in the shape of the A&E services – had only been recognised as a specialty in its own right for three years prior to that date.

These UK ambulance practices contrast sharply with some other European and North American systems (Royal College of Surgeons, 1988) – see Box 7. The UK is currently developing a 'paramedic' system along the lines of the system which operates in the USA. The first paramedics were introduced in the 1970s, and the 'scoop-and-run' policy was abandoned and replaced by one of 'stay-and-stabilise'. However, it was not until 1986 that a substantive commitment to this policy was implemented, when the Department of Health endorsed the launch of the paramedic training programme for ambulance personnel. The goals are for all ambulance crew members to be trained in defibrillation by 1991, and to have one paramedic on each front line ambulance within six years of that date (Working Group to Chief Executive NHSME, 1990). The standards to be met are those currently offered on the National Health Service Training Authority 'extended training' syllabus, which include the skills of cardiac monitoring, cannulation of veins (infusion), drug administration, airway management, intubation and the use of manual defibrillation (Weston *et al.*, 1990).

This syllabus bears a striking similarity to the basic tenets of immediate care which have long been promoted by members of BASICS – the

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PRE-HOSPITAL CARE IN EUROPE AND THE USA

In Germany, a variety of ambulances are used, some of which are stationed at hospitals and manned by medical practitioners. When a call comes through to a central control the decision is made at that point as to whether a doctor is needed or not and the appropriate ambulance is then despatched. The decision involves a rigorous set of questions to those at the scene to ensure that wasted journeys are minimised. This system is complemented by 35 helicopter stations. The helicopters are only despatched if the response is likely to be quicker, and the patients collected are transferred direct to specialised trauma centres.

In France a similar system operates: each *departement* (one of 95 administrative districts) must by law provide a SAMU *(Service d'Aide Medicale Urgente)* which involves an emergency medical department based at the principal hospital in the district. Calls come through to this department and the controller decides whether it is appropriate to send a doctor – if so a resuscitation ambulance is despatched which will contain an driver, a doctor and a nurse. Although coverage is not as wide as in Germany, there is also a helicopter arm to this service.

France and Germany both have fully qualified medical personnel involved. In the USA there is a paramedic system which has its origins in the Vietnam War (Stewart and Notovitz, 1981). It was during this period that non-medically qualified personnel were found to be capable of performing certain medical procedures as competently as qualified physicians. Currently in the USA training courses are standard in most states and local areas, consisting of invasive and non-invasive measures to stabilise critically ill patients *en route*. The emergency ambulance service is highly integrated with the fire service, and typically both are called out in tandem.

maintenance of airway, control of haemorrhage, pain relief, and stabilisation of fractures (Winch *et al.*, 1976). Given that BASICS have been able to use these skills successfully at major incidents in the past, there appears to be some scope for paramedics to do the same in the future. That is, paramedics may be able to fulfil many of the immediate care procedures currently undertaken by medical teams. The potential for reducing the administratively complicating factor of hospital-based medical personnel working at the scene is considerable.

The medical efficacy of immediate care procedures is extremely difficult to establish scientifically due to the ethical problems of conducting controlled trials (Wright, 1984). The best evidence of benefit is for cardio-pulmonary survival, but this is the least common condition at a major incident (whilst acknowledging that it is not unknown, as evidenced by the crush injuries sustained at the Hillsborough football stadium incident). Nevertheless, the weight of international experience and the accepted practice of other developed nations, such as those described above, suggest that pre-hospital ambulance-based care is of benefit.

It may be argued that paramedics will simply not be sufficiently qualified to treat trapped and badly injured casualties. But as experience is gained, and with adequate training, it should be clear to them, and to the Ambulance Incident Officer, when fully-qualified medical personnel become necessary. At Cannon Street, for example, paramedics tended trapped casualties for some time using airway management, drips and stabilising techniques (Lloyd, 1991). Research from the USA has suggested that paramedics can perform certain manual techniques such as intubation better than medically trained personnel, possibly because they have the benefit of regular practice (Stewart and Notovitz, 1981).

The development of paramedic skills amongst ambulance personnel is an important development for the response to a major incident at the scene. It could significantly simplify the complex communication and inter-service relations which currently characterise such incidents.

Paramedics are also likely to form an important element in the development of comprehensive trauma services – see Box 8. Such services do not currently play a part in the response to major incidents. But if a fully developed nationwide system is implemented, casualties will require comprehensive paramedic support at the scene and *en route* to ensure that the relatively long distances involved do not jeopardise their chances of survival.

All of this will require that Ambulance Incident Officers are given rather more training specific to their role. It may be worthwhile involving those likely to be involved in a managerial role in courses such as those described in Box 6. This will enable a better assessment of when medical support is likely, of the limits of paramedic care, and of how to manage medical teams in circumstances when a Medical Incident Officer is unavailable. They will also need to be more aware of their 'command' responsibility in relation to the call-up, or non-call-up, of hospital-based care or of Medical Incident Officers, and so avoid the situation experienced at Cannon Street.

In summary, although medically trained hospital-based teams will remain necessary, their assistance, and that of the Medical Incident Officer, should be requested by the Ambulance Incident Officer only when his or her experience deems it necessary. This latter individual is likely to assume greater importance in the response to major incidents in the future, and BASICS doctors, medical teams and the Medical Incident Officer should respond only to ambulance service requests. In particular, hospital personnel must be aware that they may be of greater benefit operating within the hospital environment with which they are familiar. Some suggestions in relation to these issues are made later in this report when discussing central guidelines. Over time, the existence of an increasingly experienced paramedic force may mean that the occasions on which the complication of hospital-based support are needed become less common.

Standardisation

The final theme relating to the response at the scene is standardisation, in particular the identification of medical and emergency service personnel, and the use of triage labels. HC(90)25 sidesteps the issue:

> *The Department (of Health) intends to consider whether the NHS response to major incidents would be improved by the introduction of nationally applied standards of protective clothing (including identification markings), communication systems and casualty labelling* (Department of Health, 1990, Ch. 2, Para. 5).

At least in terms of clothing and casualty labelling, the evidence now clearly supports some degree of standardisation. The M1 crash at Kegworth occurred at the junction of three districts and caused considerable confusion over triage labelling (Staff of A&E Departments, 1989). Similarly, Hidden drew attention to the confused identification of those attending the Clapham incident:

> *Local authority workers wore green tabards; the ambulance service green; BR staff orange; the fire brigade yellow day-glo surcoats. The Police were in normal uniform or wearing yellow jackets with POLICE printed on them. The medical teams were*

8

TRAUMA CENTRES

The development of Trauma Centres is chiefly associated with the USA. They had their origins in the Maryland Shock Trauma Unit which was developed by Dr RA Cowley in the early 1960s (Davies, 1990). He had noticed that people he saw dying in emergency rooms could have been saved if they had had definitive care within the so-called 'golden hour' – the period within which patients who are otherwise treatable can die if not given the best possible clinical intervention (Nolan *et al.*, 1992). In the late 1970s units which could provide 24-hour definitive care were designated 'Trauma Centres' if they satisfied certain criteria published by the American College of Surgeons' Committee on Trauma.

Only two States – Maryland and Virginia – have a full statewide trauma system at the time of writing. Under these systems, the central Trauma Centre admits at least 1000 patients a year. There is a general surgeon in charge of the team who is resident at the centre while on call – other specialists can be on-site within five minutes. Round-the-clock definitive care by an experienced team is therefore provided. In a given state there will be one such 'level I' centre which will be complemented by 'level II' and 'level III' centres which deal with less serious cases and without the constant availability of specialist care.

The key rationale behind Trauma Centres is to match the needs of very seriously injured patients with the scarce resource of highly qualified specialists, experienced in trauma. This requires centralisation of these services if they are to be economically viable. In turn, this entails greater distances being travelled by these casualties and so trauma systems inevitably have advanced paramedic support 'in the field', and often helicopter systems. Initial resuscitation and stabilisation is achieved off-site, and definitive surgical treatment is delivered within the 'golden hour'. This form of pre-hospital care often involves transfer straight from ambulance or helicopter to a surgical theatre.

One study of the effectiveness of Trauma Centres has shown that they can reduce from 73 per cent to 9 per cent the proportion of those who die but could have been saved given the best possible clinical intervention (Cales, 1984); another has reported this proportion being reduced to under 1 per cent (West *et al.*, 1983). Trauma centres are inevitably very expensive, however: somewhere between £4,000,000 and £8,500,000 per centre per year depending on the size and catchment area (O'Kelly and Westaby, 1990). But analysis in terms of QALYs (Quality Adjusted Life Years) – or final health outcomes – has estimated that Trauma Centres represent relatively good value given the effectiveness of the treatment and the relatively high number of 'life-years' which can be gained for the typically young casualties.

In the UK an influential report has recommended the establishment of Trauma Centres (Royal College of Surgeons, 1988). Others agree that a further concentration of Accident and Emergency Services is necessary, but doubt the practicality of Trauma Centres. One alternative suggestion is to reduce the number of 24-hour Accident and Emergency Departments per Regional Health Authority to three or four (Warren, 1989). These two options are different in the sense that a Trauma Centre is not simply a large A&E department, it is chiefly a definitive surgical service. Nevertheless, common to both is the need for highly trained nationwide paramedic pre-hospital care to ensure that longer travelling distances do not jeopardise treatment.

A pilot project is currently being funded by the Department of Health at the North Staffordshire Hospital Centre to evaluate the effectiveness of 24-hour on-site consultant cover.

> *either wearing different colours or no tabards at all. BASICS doctors, however, wore clearly identifiable protective clothing* (Hidden, 1989, p. 46).

Three of Hidden's recommendations refer to the clothing of the emergency services. In particular he notes that the name of the service should be clearly marked on 'high visibility vests', and that 'each service shall be easily identified by the colour of its emergency clothing' (Hidden, 1989). Similarly, there is no nationally agreed system of triage labelling. Occasionally casualties have been removed from the site without triage labels at all, as happened at Purley (Cooksey, 1990). The difficulties are particularly acute in London with over 40 listed hospitals in a relatively small area, each deciding largely autonomously how to equip its teams.

The solution to problems of this sort require some degree of central direction. The latest Health Circular does not attempt such direction. Neither is it clear that the administrative structure exists to enable future direction to succeed. For example, these matters are currently being addressed by a multi-disciplinary working party under the Ambulance Policy Advisory Group. Recommendations will soon be published for all NHS ambulance and hospital-based staff (Thornley, 1992). However, unless the findings of such working parties are backed by sufficient organisational authority they are unlikely to be implemented. The NHS reforms, brought into effect in April 1991, offer scope for 'contractual muscle' to be brought to bear on these issues. The clear implication, though, is that it will be the responsibility of purchasing authorities to ensure that agencies' plans reflect agreed guidelines. This issue is returned to below.

Summary

This analysis of the response at the scene has isolated the provision of medical care as the key

source of the concerns raised in the literature. Medical personnel are occasionally in over-supply; hospital doctors can be inexperienced in working in inhospitable conditions; and systems of identification and triage are not standardised from one area to another. The analysis of this section has not suggested wholesale change, but instead the recognition that over time the medical response can increasingly be achieved without the need for hospital-based support at the scene.

Links between the scene and receiving hospitals

As the analysis of events of major incidents revealed, the communication and movement of patients between the scene and hospitals is a key element in a successful response. Experience suggests, however, that there are three areas of concern.

- The source of Medical Incident Officers.
- The radio communications systems.
- The efficient distribution of patients.

Irrespective of the preceding discussion, and whether or not hospital-based staff are necessary, good communication with receiving hospitals and the effective distribution of casualties will continue to be essential.

Source of the Medical Incident Officer

This has been a vexed question for many years. It is chiefly due to the difficulty of clearly identifying who should occupy the role of Medical Incident Officer for any given incident, whilst simultaneously not wanting to deplete medical resources at receiving hospitals. There has in the past been a certain degree of divergence amongst the opinions of A&E consultants. One has argued that:

> *traditionally (the role) has been allocated to physicians as they are not required at the hospital to treat casualties and, lacking surgical expertise, are less likely to concern themselves with treating patients at the scene. Unfortunately these doctors are likely to be completely at sea when confronted with the horrors of a major accident, and may lack the authority to deal effectively with the emergency services. The members of BASICS specialise in rescue work and regularly participate in practice exercises. If there is a BASICS organisation close to the hospital it may be appropriate to enlist its services* (Miles, 1990, p. 921)

Others have felt that BASICS doctors are unlikely to have the requisite local knowledge:

> *They do not know the designated hospital's capability and seem to fail in the Medical Incident Officer's responsibility for providing that hospital with information about potential numbers of casualties and the degree to which they are injured* (Skinner, 1991)

The Department of Health guidance now suggests that the Medical Incident Officer should be provided by the first receiving hospital to be alerted after the incident. The relevant section of HC(90)25 is as follows:

> *6. The Hospital Major Incident Plan should provide for:*
>
> *a the designation of a MEDICAL INCIDENT OFFICER (MIO), ensuring that only senior clinicians with appropriate experience and training undertake this role, and that the MIO is not part of a mobile medical team;*
>
> *b immediate notification to the MIO of activation of the Hospital Major Incident Plan;*
>
> *c from the first receiving hospital only, the immediate dispatch, via the ambulance service, of the MIO to the scene of the incident* (Department of Health, 1990, Ch. 6, Para. 6).

One thing upon which all the agencies, HEPOs and the Department of Health agree is that these guidelines do not require the slavish adoption of its recommendations verbatim. Indeed, generally speaking, Health Circulars do not have statutory force, but rather serve as an indication of the policy of a minister and his or her department. Nevertheless, such guidance can be very detailed, as in this example. In an attempt to resolve a long standing issue, the guidance quoted above is clear: it suggests that each hospital should at all times be able to call on a trained individual to act as a Medical Incident Officer, and that this individual should be despatched from that hospital, if it is the first one to be alerted.

There is a serious point to be made about this arrangement. If it is genuinely guidance, can it be appropriate to be quite so detailed? Local arrangements vary – a point accepted by the Department of Health – which in London often involves the LAS contacting BASICS to fill the role. But, on the other hand, an individual hospital could be excused for interpreting such guidance as operational policy. Indeed, a review of the hospital plans in London written after the recent guidance, often revealed instructions such as 'the first available experienced doctor is to be automatically despatched on receipt of alert message.'

HC(90)25 has made an attempt to please everyone. But by being sufficiently detailed so as to avoid confusion, and retaining its 'guidance status' so as to allow flexibility, there is a danger that it will do neither. Further consideration of the how HC(90)25 might be revised is discussed below. But some initial comments regarding a suitable set of arrangements for the future can be made here.

In order that the individual can be trained to the standards outlined earlier, it would seem likely

that a relatively small pool of individuals – say, twenty or twenty-five members – should be involved. Their names and contact numbers would be held at Central Ambulance Control. This would be a more efficient use of resources than to require every hospital to individually arrange its own training, and would allow the involvement of BASICS doctors. It would also entail the responsibility for the assessing the need for a Medical Incident Officer, and the choice of who to call out, to be squarely placed with the ambulance service, and with the Ambulance Incident Officer in particular. Hospitals would contribute membership for such a scheme, but their chief responsibility on the day of an incident would be to supply mobile medical teams if this were necessary and if requested by the ambulance service. The Medical Incident Officer might therefore be called from a hospital not expecting to receive casualties, or directly if he or she was a member of BASICS. A&E consultants from receiving hospitals should be avoided.

The possibility of arrangements not dissimilar to this have, at the time of writing, been under discussion for some time in London. But if such a scheme were implemented, those involved should be aware of the contrast with central guidelines – the first alerted hospital would not in general provide the Medical Incident Officer. At any rate, every listed hospital must be kept abreast of developments. And over time, as discussed earlier, certain incidents – particularly those without trapped casualties – might be manageable without the need for a Medical Incident Officer at all.

Communications

Central guidelines clearly state that the ambulance service has the responsibility for all radio communications. The ambulance service should convey aerials to receiving hospitals, if they are needed (most have their own fixed aerials), and provide the on-scene communications for health personnel which is compatible with the other emergency services.

These guidelines are a clear response to the experience at Clapham when communication between the scene and St George's was limited by the lack of an aerial at St George's. However, another serious issue is the evidence of medical personnel bypassing the ambulance Emergency Control Vehicle and speaking directly to the hospitals during the Cannon Street incident. It has often been made clear by those who work in hospitals that they place great value on having a good source of information as to the extent and nature of casualties they are likely to receive (Staff of A&E departments, 1989; Thornley, 1987; Skinner, 1991). However, it is also true that at Cannon Street such communication led to confusion as to the number of medical personnel on scene, and to duplication of equipment. There is another potentially serious consequence of using personal radio equipment, and that is the possibility of interfering with the Emergency Reserve Channel used by the ambulance service. It seems clear that all communications should be undertaken via the Emergency Control Vehicle of the ambulance service, and that Ambulance Incident Officers should be specifically trained about the importance receiving hospitals place on up-to-date information.

Casualty distribution

In one sense, London is fortunate to have a legacy of major hospitals within a relatively small area. At least two or three will always be in striking distance if a major incident occurs anywhere within the old Greater London Council boundary. It is clear from experience, and from the literature, that hospitals can easily become overloaded (Bliss, 1984). During the Marchioness Incident, St Thomas' twice requested to the Ambulance Incident Officer that casualties should be taken to the Westminster because they were 'full up', according to the LAS emergency control vehicle log. Such a strain on an A&E department is not likely to be life-threatening when minor injuries are involved, and the department is simply running out of room; however, there is good evidence that surgical throughput is often slower than anticipated (Savage, 1984; Garb and Eng, 1969). Under these circumstances it is often necessary to transfer patients once initial resuscitation has been achieved, or simply because definitive treatment is not possible at the first hospital, and specialist units are necessary (Brown and Marshall, 1988). A further complication could be the need for large-scale interventions. One example would be the 'intubation and ventilation of large numbers of patients simultaneously; no single hospital in the UK could cope with that type of eventuality' (Edwards, 1989).

For all these reasons, it seems beyond question that the initial distribution of patients can ease these difficulties. London is particularly well-placed in this respect, and indeed with the exception of Clapham, all the incidents analysed have displayed a good distribution. At Clapham the A&E department at St George's had recently been opened, and the Medical Incident Officer and Ambulance Incident Officer clearly felt that it would be able to cope, considering that the majority of the injuries were relatively minor. Ambulance Incident Officers and Medical Incident Officers are, between them, in the best position to assess which hospital should receive which patients. They have a combination of good local geographical knowledge and a sense of the needs of hospitals. However, the ambulance service undertakes most of the communication with

hospitals, and may, as discussed above, deal with certain incidents on its own. Training for the role of Ambulance Incident Officer must emphasise the importance of distributing patients evenly between hospitals.

Advance planning and liaison

At the beginning of this chapter it was argued that a 'bottom up' approach was appropriate to looking at the response to major incidents. To resolve the problems associated with that response, emphasis should be given to analysing how agencies work together in practice. Policy recommendations should be devised with this in mind, and some suggestions have been made in this report: for example, making more use of paramedics, and playing down the role of hospital-based medical personnel and the Medical Incident Officer. This is instead of taking as one's starting point a reformulation of 'top-down' directives such as the Health Circulars. Such guidance does, nevertheless, have an important role, and that is to clearly set the context in which the response is conducted, as well as to specify roles and procedures where this is possible. It is important that the agencies involved discuss together the implications of these guidelines, both to clarify the practical aspects, and to 'fill in the gaps' where it is necessary for the agencies to decide policy themselves.

Issues relating to exercises and debriefing are not specifically analysed here, mainly due to there being little disagreement as to their value. Full-scale exercises are now recommended for all agencies every two years by central guidelines. Debriefings involving all the agencies were held after the Cannon Street and City of London bombing incidents. The important point is that these practices should continue, and that the contracting process is used to ensure that they do.

Much of the discussion in chapter three highlighted agencies' actions in the practical context of a major incident. This section will concentrate on those areas which, in the light of this experience, particularly require central guidance and central planning. There are two bodies which in part, and in substantially different ways, are concerned with planning the response of health-related agencies in London – the Department of Health, including the planning arms of the NHS, and the London Emergency Services Liaison Panel. The roles of these two bodies are discussed in turn.

The Department of Health

The Department of Health is the key planning agency with ultimate responsibility for the medical response. In this section the various issues relating to the Department, and the NHS where appropriate, are summarised.

HC(90)25 – the NHS guidelines

Much of this report has already referred to HC(90)25 and its guidance. We are now in a position to summarise three specific areas where HC(90)25 is still lacking. In two of these areas insufficiently clear guidance is provided; in the third it is argued that the guidance offered is overly prescriptive. In each of these some suggestions for future editions are included.

First, the role of BASICS. The Hidden Report states that 'in revising the Circular the Department of Health shall consider the role of BASICS in emergency planning and review BASICS' funding arrangements' (Hidden, 1989). HC(90)25 only states that the Medical Incident Officer:

> *might request assistance from local general practitioners. This should be done through (central) Ambulance Control in accordance with pre-agreed procedures. Where Immediate Medical Care Schemes are established, they may form part of the initial service call-out* (Department of Health, 1990, Ch. 4, Para. 5)

This adds little to understanding of the role of BASICS and makes no reference at all to their funding arrangements. It has been argued in this report that BASICS' members are often highly experienced in the particular circumstances of a major incident, but suffer from their voluntary status and patchy coverage. It seems clear that the inclusion of a representative on co-ordination and liaison bodies, such as the London Emergency Services Liaison Panel, would be useful. It would also help the development of BASICS if professional standards could be devised, such that local schemes could be formally accredited if they reach such standards. BASICS are currently discussing with Royal Colleges the possibility of such a scheme. However, the new contracting system within the NHS offers further scope for establishing standards and addressing their funding; these issues are discussed below.

Second, the issue of standardisation. As discussed above, the Clapham and Purley investigations drew attention to the need for standardising clothing and triage systems to allow for the unambiguous identification of the various agencies involved. In particular, it was considered important to distinguish clearly those who are medically qualified. HC(90)25 only states that the 'Department intends to consider' whether these proposals are necessary. It is clear from the review of major incidents that this is essential for effective co-ordination.

Third, there remains the question of the source of the Medical Incident Officer. It was mentioned earlier that the necessity for this individual may, over time, diminish. However, it was also argued that under certain circumstances, particularly these involving trapped casualties,

hospital-based support will continue to be necessary. A Medical Incident Officer with the requisite authority to manage hospital doctors and nurses will also be needed under such circumstances.

The position of this report is that instead of attempting precise guidance, responsibility for appointing an MIO should be firmly vested in the ambulance service, and more particularly the Ambulance Incident Officer. Hospitals within a purchasing authority's area must co-operate with the ambulance service to ensure that the Central Ambulance Control has a list of Medical Incident Officers which they can call if such an individual is required. This arrangement allows flexibility for local agencies to decide which individuals would be on such a list, but a clear responsibility for hospitals and ambulance services to co-operate in so doing. The mechanism for ensuring that these agencies' plans are in accordance with such a system will be the contract between commissioner and provider. HEPOs are likely to have an important role, located as they are on the side of the purchaser.

It has been suggested that some aspects of guidance should be backed by statute in order to encourage compliance. However, it is not clear that this is necessary at present given that the contracting system has only just been implemented, and may prove a more adequate mechanism than simple hierarchical control. However, it is nevertheless likely that 'guidance' may not always be the appropriate status for central policy, particularly if standardisation is the goal. One cannot both have local flexibility and standardised procedures and equipment. Some consideration, therefore, might be given to making a clearer distinction in the future between what constitutes 'illustrative' guidance and general information on the one hand, and what is expected to be implemented without variation on the other. But before examining the possibilities offered by contracting, further evidence of the 'implementation gap' is presented.

Hospital plans

In the three areas discussed above central guidance is lacking. There remains, however, the problem of the 'implementation gap'. Even if the guidance is appropriate in every degree, it is by no means clear that implementing agencies will heed its advice. Certainly previous incidents have demonstrated that the actual course of events can depart quite radically from what might have been expected.

The most important manifestation of the central guidelines is the individual hospital plan. HC(90)25 states that District Health Authorities:

> *are required to ensure that ... all appropriate units and ambulance services have up-to-date, coherent and comprehensive plans for dealing with major incidents which are monitored and that exercises and reviews take place regularly* (Department of Health, 1990).

One way, therefore, of establishing the effectiveness of central guidance in influencing implementing agencies is to see what effect it has had on the plans of London's hospitals. A survey was conducted of the 46 listed hospitals served by the LAS. Unfortunately, at the time of writing, only fifteen of those who replied had so far updated their plans in the light of HC(90)25. Nevertheless, these updated versions give an early indication of the degree of compliance with central guidelines, and thus of the co-ordination between the hospitals themselves.

Hospital plans are necessarily complex and detailed documents. They include many sections which are beyond the scope of this report. For current purposes the important elements are those which involve a degree of co-ordination between the hospitals and the ambulance service, since the LAS has a single plan and set of procedures and operates in an area within which all the hospitals studied are situated. The following three are central:

- alerting procedures;
- supply of Medical Incident Officers and Mobile Medical Teams;
- communication with the scene.

Each of these elements has reasonably detailed direction in HC(90)25 and it is possible to accurately compare one hospital's plan with another's.

First, alerting procedures. As described earlier in this report, the key changes from earlier guidance have been terminological. 'Designated' and 'supporting' hospitals are now categorised as 'receiving' hospitals, and colour coding in the initial alert for the LAS has been replaced with major incident 'Standby' and 'Declared'. A dedicated incoming-only line should be provided for the LAS's initial alert.

Only four of the fifteen hospitals had revised their plans fully in line with the guidelines. Five of the plans had not altered the terminology at all. Others made a distinction between 'receiving' and 'supporting' hospitals – guidelines only refer to receiving hospitals. It appears as though the old 'designated/supporting' terminology is proving resistant to change. The dedicated, incoming-only telephone line is not in general mentioned since it is not strictly necessary to do so in the plan. One hospital still suggested that the LAS would use a 'Green, Amber, Red' code depending on the severity of the incident.

Second, the supply of Medical Incident Officers and Mobile Medical Teams. The key points here are that the name of the Site Medical Officer

has been changed to Medical Incident Officer; that this individual should be provided by the first alerted hospital and be despatched immediately; and Mobile Medical Teams must be available and despatched only if requested by the Medical Incident Officer or ambulance service. Mobile Medical Teams should be instructed to report to the ambulance Emergency Control Vehicle.

Only three of the fifteen plans had updated all these aspects in line with guidance. Eight of the fifteen were inaccurate on at least two counts, with three failing on every point. Most had accurately changed the title of the Site Medical Officer (although one made no mention of the Medical Incident Officer at all), but almost all failed to make specific reference to the *first* alerted hospital having responsibility for his or her provision. Furthermore, although Mobile Medical Teams were generally instructed to respond only on request from the Medical Incident Officer or LAS, they were not all clearly instructed to report to the ambulance Emergency Control Vehicle.

Third, communication with the scene. The single key element in terms of the hospital plan is that communication should be via the ambulance Emergency Control Vehicle and not individually by members of the Mobile Medical Team direct to the hospital.

Eleven of the fifteen plans make reference to communication being undertaken between the ambulance liaison officer at the hospital and the ambulance Emergency Control Vehicle at the scene, but none makes a reference to discouraging the use of personal radio-telephones, and one recommended their inclusion in the equipment for the Mobile Medical Team.

This analysis suggests that the 'implementation gap' persists with regard to the revised guidelines. Even in the areas in which central guidance is clearest, there is significant divergence between the actual plans of the listed hospitals, and those of the Department of Health. At the time of this analysis, an up-to-date LAS Major Incident Plan was not available as it was being revised. However, the national ambulance service 'Operational Arrangements for Civil Emergencies' was available. Generally more closely in accordance with Department of Health guidelines – which also make specific recommendations for ambulance services – this document also displays slight discrepancies. First, it also makes use of the term 'supporting' hospitals, and second, it assumes that the Medical Incident Officer will be sent out 'by the appropriate hospital as part of the standard procedure for major incidents'. These ambulance arrangements were produced just prior to HC(90)25; the discrepancies may have been ironed out subsequently. The important point is that the LAS' plan, when revised, should accord with all the hospitals in its area – which would not currently be possible given the current state of hospital plans.

The reasons for these discrepancies are likely to be partly as a result of the guidance status of HC(90)25, and partly due to the difficulties involved in ensuring that a multitude of implementing agencies actually carry out what they have been asked to do. It is to be welcomed that one of the duties of the LAS's Emergency Planning Officers is to assist in the co-ordination of hospital plans on a pan-London basis. The concern persists, however, that these individuals lack the authority to overcome implementation problems. It seems likely that under the purchaser-provider split, the contractual purchasing of services will offer a new mechanism for exercising 'leverage' over the content of hospital (and ambulance) plans, in particular to ensure that all agencies use the same terminology, and have the same systems for alerting and utilising medical personnel at the scene. The impact of the NHS reforms, and the need for future reform, is discussed in the next section.

Health Authorities

The final element under the control of the Department of Health is the structure and membership of Health Authorities. Each Regional Health Authority appoints a Health Emergency Planning Officer (HEPO). Historically this individual has been concerned to a significant degree with civil defence arrangements. More recently, however, this function has become less important and the focus has shifted toward arrangements for civil emergencies – in effect, major incidents. These officers should advise on, co-ordinate and monitor the districts' major incident plans. They should review them regularly and take account of the possibility of incidents being spread over large areas and across boundaries.

The structure of London's four Regional Health Authorities does not make this an easy task. The city is divided into four Regions, each with its own HEPO (although at various times one individual has taken on the responsibility for more than one Region). This means no single individual is responsible for the whole of the Greater London area: each looks both outwards to relatively sparsely populated counties, and inwards to crowded inner-city areas. It may be that the HEPOs have more success in co-ordinating hospital plans within the Regional boundaries than across them; there is insufficient evidence to judge. However, arbitrary administrative boundaries cannot make that co-ordination any easier, particularly when the ambulance services with which they work are organised on an entirely separate geographical basis. However, two developments, one already in place, may serve to ease the difficulties.

The first development has not yet been implemented, but has generated a great deal of interest amongst health service professionals. The suggestion – and it is one which would be part of a larger strategy for London's health delivery – is to create a more logical structure within the framework of the purchaser-provider split. In a recent publication from the King's Fund Commission on the Future of Acute Services in London it was reported that the majority view from managers supported the option of two regions, one north and one south of the Thames (Halpern and Rowbottom, 1992). An alternative is the 'doughnut' strategy which would create one inner London region with the boundary drawn anywhere from the old Inner London Education Authority to the area bordered by the M25 motorway.

This latter reform would have the advantage of offering the possibility of one individual having responsibility for co-ordination across the entire area covered by the LAS. There would seem to be *prima facie* evidence that this would substantially ease problems of co-ordination between London's hospitals. This proposition is founded on the assumption that the key geographical area from an co-ordinating point of view is that of an ambulance service. At the very least, it would help the job of the HEPO if he were liaising and contracting with a single ambulance service – the LAS in this case – and thus with a single ambulance major incident plan and set of procedures.

A second development for health authorities, and one which is already implemented, is that of the purchaser-provider split. The implications are important for the provision of major incident services whether or not London's Regional Health Authorities are reorganised. The relevant passage of HC(90)25 reads as follows:

> *From April 1991, all major incident plans are to be secured by contractual arrangements. It will be for purchasing authorities to contract with providers, whether directly-managed units or NHS Trusts, to secure major incident plans which are in accordance with this guidance* (Department of Health, 1990).

The claimed benefits of purchasing on a contractual basis relate in large measure to how contracts work in the private sector. The emphasis is not necessarily on competition as a spur to greater efficiency, but on the effect of having a contract rather than a hierarchical arrangement for obtaining services. David Chambers (1989) of the London Business School has outlined the elements which may have particular significance in the public sector. Two points are most relevant to this discussion.

- A contract makes for explicitness about the entity being bought and sold, and for the removal of ambiguities as to where responsibility lies.
- Contracts are often long-term, combining elements of hierarchies with those of markets. The process becomes one of discontinuous planning, interrupted by renegotiation of the terms of the contract.

In short, contracts can promote clarity of objectives and responsibility without losing the iterative qualities of hierarchical planning. In relation to the formulation of major incident plans by provider agencies, these elements of the contracting process would give 'leverage' or 'contractual muscle' to purchasers or commissioners, without losing sight of the need to work together with providers over a long period of time. For example, a specific requirement could be written in to contracts that all hospital and ambulance plans must be vetted by the regional HEPO before going to print. Certain elements of the plans, such as alerting procedures, may be specified in the contract rigidly and without scope for local flexibility; these elements could then be audited in an iterative manner by the HEPO. The HEPO is likely to adopt a more important role under these arrangements in the future, with the commissioning function most clearly in his domain as an emergency planner. It may be that the Regional Health Authority is the appropriate tier for establishing contracts for major incident planning. In any event, contracting offers many avenues for addressing the problem of the implementation gap.

The opportunities for contracting do not end with service explicitness, however. *Working for Patients* (Department of Health, 1989) envisages health authorities commissioning services from 'its own hospitals, from other authorities' hospitals, from self-governing hospitals or from the private sector'. The latter category includes the voluntary, or not-for-profit sector, thus raising the possibility that contracts could be made with voluntary groups such as BASICS. Such a contract might involve a financial arrangement, whereby in exchange for a yearly sum BASICS would guarantee a level of service within a certain area. It could both make them financially secure as well as stipulating quality thresholds in terms of coverage, availability and proficiency.

These are significant developments which would alter substantially the arrangements for providing the response to a major incident in London. In these circumstances the London Emergency Services Liaison Panel would essentially become a provider organisation, with a clearer remit to implement policies for which they are contracted. After the Department of Health this is the most important co-ordinating and liaison body in London.

The London Emergency Services Liaison Panel
The London Emergency Services Liaison Panel (LESLP) will remain, under new administrative arrangements, the key body for:

- analysing and mutually understanding the distribution of responsibilities indicated by central guidelines;
- 'filling the gaps' in policy where appropriate;
- sharing information on day-to-day matters.

This report has emphasised the multi-agency nature of the response, with the potential for six separate and largely autonomous organisations operating at one time and in one place: the Metropolitan, City or British Transport Police; the LAS; the London Fire Brigade; the NHS hospitals; BASICS doctors; and local authorities. This list is not exhaustive: other organisations such as the Salvation Army and other voluntary groups, as well as members of the general public, local schools and so on, are also likely to become involved. In view of this it is surprising that there is no single forum where representatives from each can meet to establish the roles, expectations and responsibilities of their respective organisations.

The LESLP is currently the closest such forum in existence. Whereas it is undoubtedly true that the 'uniformed' emergency services (the fire, police and ambulance) are pivotal in any co-ordinated response, it is also true that many of the problems which still consistently occur relate to the interface between the medical response, including hospital-based teams and BASICS, and the other services, in particular the LAS. It may be no accident that the two specifically medical agencies (NHS hospitals and BASICS doctors) are not represented on this panel. The far less contentious issue of the (under) utilisation of local authority support has recently been remedied by appointing two representatives of London boroughs to this panel (one each from the Association of London Authorities and the London Boroughs Association, the two political amalgams). It seems sensible to appoint at least two more representatives (one each from the NHS hospital sector and BASICS), thus ensuring that a wider range of key players are included.

There are three main criticisms of expanding the panel in this way. That its increased size will make it unwieldy; that the LAS already represents the medical viewpoint; and that it will be difficult to find a suitable hospital representative who will not simply articulate the vested interests of his or her own hospital. These are not idle debating points, but the price of increasing the size of the panel by no more than 10 per cent seems a small one for the benefit of having the full range of organisations present.

Furthermore, it is clear that if the LAS 'speaks' for the whole medical response, it is not likely to articulate the problems related to tensions within that response. In other words, there are inter-organisational issues to be discussed which, at present, occur, in the LESLP at least, without two of the organisations present. The last objection is probably the most difficult to resolve. Finding a suitable representative who both has authority and lacks special interests is awkward. However, the London A&E Consultants Group currently operates as a forum for that profession, and nominated individuals from this agency would be as likely as any to speak for the hospital sector in a disinterested fashion.

This last point applies less to the BASICS representative. Here the problem seems to be a matter of convincing current members of the panel that a BASICS representative is a necessary addition. But the wealth of experience specific to operating at major incidents means that any debate concerning the medical response would suffer from not drawing on the expertise of BASICS doctors.

Summary

This chapter has sought to draw out the underlying themes and controversies surrounding the response to a major incident. It has adopted a bottom-up approach by analysing the issues of the agencies at the scene of an incident before those involving central bodies. It has become apparent that the delivery of medical care and the interface between the various health-related agencies were key areas of difficulty in the response.

With regards to central planning there is some evidence of an implementation gap. Central guidelines have had difficulty in eliciting the type of response which guidelines envisaged. A bottom-up analysis emphasises the need for a number of initiatives, particularly by the Department of Health but also relating to the LESLP.

The final chapter summarises the issues and makes recommendations.

Concluding comments and recommendations

A major incident is a high profile event which places the emergency services in the spotlight of public attention at a time of great strain. It typically involves a large number of autonomous agencies working together in hostile conditions. Some of the individuals involved will be working in an unfamiliar environment for the first time. Many lives are at stake. For these reasons it is important that the response is well planned and co-ordinated, thus retaining the public's confidence in the emergency services whilst efficiently responding to those in need.

The problems of effective planning and liaison have been compounded by the number of agencies involved in the response, and the lack of a single London-wide health agency looking at the capital's health and health care as a whole. Furthermore, the only body concerned with co-ordinating the response of the emergency services – the London Emergency Services Liaison Panel – has until now neglected to include members of two key agencies: London's A&E departments and BASICS doctors.

It may be no coincidence, therefore, that the analysis of experience of major incidents in chapter 3 revealed that many of the issues related to the organisation and delivery of medical care at the scene. Whilst the tradition of the UK ambulance service has moved from one of 'scoop-and-run' to 'stay-and-stabilise', the hospital has continued to be seen as the appropriate site for all medical interventions. If transfer to hospital proved to be impossible – due to the extent of the casualty load, for example – then mobile hospital teams were expected to undertake the work. The existence of BASICS has sat uneasily with this tradition, and the development of a paramedic-based ambulance service will also require a degree of readjustment. But there are also real possibilities for a simplified response.

Over time, the Ambulance Incident Officer will become increasingly experienced in the possibilities and limitations of paramedic care. If the initial assessment of the need for further on-scene hospital-based medical care (and thus also of the need for a Medical Incident Officer) is firmly located in this individual, then the possibility of the unnecessary utilisation of hospital-based medical staff at the scene will be limited. Hospital personnel will tend to remain in the environment to which they are most accustomed and in which they are most effective. By integrating BASICS into the planning process such that they will only respond to the ambulance service (or Medical Incident Officer), they could provide a first line of supplementary medical support, if needed.

Given the fact that the central guidelines have recently been revised (in October 1990), recommendations are split into two categories: those for the short-term within the context of the guidelines, and those for the long-term which include changes to the guidelines themselves.

Short-term recommendations

- The LESLP should be expanded to include representatives of all the key agencies involved in the response to a major incident. In particular, BASICS and the hospital sector should be represented. The members representing the hospital sector might be delegated from the London A&E Consultants Group (p. 38).
- Hospital Major Incident Plans are not consistent in their approach to major incident planning. In areas such as terminology, the utilisation of Medical Incident Officers and Mobile Medical Teams, and communications, those hospitals which have updated their plans since HC(90)25 have in many cases not done so in line with these guidelines. The Department of Health needs to take steps to monitor the implementation of its recommendations, and the Health Emergency Planning Officers (HEPOs) should be aware of the unco-ordinated nature of hospital planning (pp. 35-36).
- Under the new administrative arrangements in the NHS, all major incident plans are to be secured by contractual agreements. The commissioner of such plans should utilise the 'contractual leverage' which the explicit statement of objectives offers. Certain elements of plans which urgently need standardising, such as alerting procedures, can be specified clearly in contracts. It is worth considering whether the Regional Health Authority might be the appropriate organisational tier to enter into contracts for these plans, particularly under arrangements described below for a London-wide authority. In any event, the HEPO should adopt a more central role in the future, auditing the formulation and implementation of the plans from a commissioning perspective (pp. 36-37).
- In the light of the extremely precise guidance in HC(90)25 as to the source of the Medical Incident Officer, local plans which deviate substantially from this guidance are ill-advised.

Two sets of procedures, even when one set is merely guidance, could cause confusion in the context of a major incident (pp. 32-33).

Long-term recommendations

- Over time, many of the less serious incidents, particularly those not involving trapped casualties, could be dealt with solely by the ambulance service. BASICS could provide a first line of supplementary medical support if needed, a possibility recognised by many hospital plans as they stand at the time of writing. Central guidance should emphasise more clearly the responsibility of the Ambulance Incident Officer for calling-up the Medical Incident Officer when further medical assistance is considered necessary (pp. 27-30).
- When necessary, the Medical Incident Officer should be called from a small group of trained individuals whose names are held at Central Ambulance Control. Training must emphasise that the Medical Incident Officer only reacts to requests from the ambulance service (pp. 32-33).
- Central guidelines need to resolve clearly those issues of particular concern highlighted by official inquiries. First, the financial status and operational role of BASICS, a voluntary body who have developed good practice and expertise in immediate care, but who suffer from patchy coverage. Second, the standardisation of clothing and triage labels to allow for the unambiguous indentification of the various agencies involved in the medical response, and in particular to distinguish those who are medically qualified (pp. 30 & 34).
- Future guidance should also consider making a distinction between those of its recommendations which are 'illustrative' and allow a degree of local flexibility, and those which require a 'standard' response and therefore preclude flexibility. An example of the former would be the precise system for calling up a Medical Incident Officer, and of the latter the particular colour of the outer clothing to be worn by medically qualified personnel (p. 35).
- The findings of this report would support the reorganisation of London's health authority structure so as to facilitate the work of co-ordinating the plans of London's hospitals and the London Ambulance Service. A London-wide Regional Health Authority would facilitate co-ordination with the LAS, and would offer the possibility for a single individual to be given the responsibility for ensuring coherent planning on a pan-London basis (p. 37).

A major incident will always involve a degree of tension and anxiety, not to mention desperation, among the individuals responding to those in need. That is only to be expected. In such circumstances the number of agencies involved at the scene should be no more than is necessary, so as to simplify the environment in which rescue workers operate. If hospital medical staff are not required their services are better utilised in hospital. Nevertheless, all those agencies who regularly respond to a major incident must be indepedently represented in the planning process. This is the very least that is required for roles and responsibilities to be properly understood.

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