



The  
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**Dealing with disaster: a qualitative exploration of the experiences of healthcare and emergency services staff following a mass casualty incident.**

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## Abstract

**Background** – Globally there has been an increase in mass casualty incidents, which have a detrimental impact on the environment, community, and human life. Research following the 9/11 attacks identified the psychological toll on front line emergency workers and there has been an increased awareness of the prevalence of PTSD within this group. However, research to date has not focused on the UK perspective, nor used qualitative methods to explore the impact on front line emergency workers of being involved in mass casualty incidents (MCIs).

**Methods** – This qualitative study was undertaken using semi-structured interviews with ten UK front line health care professionals (HCPs), who worked at the scene or in the accident and emergency department during an MCI. These participants were selected via purposive and snowball sampling between January 2020 to August 2021. Braun and Clarke’s six stage thematic analysis were used to analyse the data.

**Findings** – Eight key themes were identified with three involving external factors, namely training, operational environment and media and these four were associated with both positive and negative perceived outcomes). Three further themes around job satisfaction, scrutiny and support involved both internal and external factors. Job satisfaction was protective for wellbeing, however scrutiny caused decreased motivation to work in the medical profession. In terms of support, most interviewees favoured informal approaches, due to formal support being associated with stigma or judgement. The final theme psychological effects were perceived negatively and involved burnout, insecurity, delayed emotions, avoidance, and difficulties with re-experiencing reminders within the community and during anniversaries of MCIs. These eight themes could be further organised across different aspects of time, place and organisation or agent.

**Discussion and Conclusion** – This exploratory research has revealed unique new insights into experiences of HCPs involved in MCIs in the UK. Policy and practice implications relate to three key areas: tailoring ongoing HCP MCI training/preparedness, enhancing organisational support for staff involved in an MCI and finally reviewing the role of the media. Participant experiences of an MCI varied but revealed significant negative, but some rewarding, aspects which could be linked to different times, locations, and agencies.

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## Chapter 1 – Introduction

### 1.1 Background

This proposed research explores a topic that has attracted an increasing amount of media and public attention in recent years and has often been described in a highly emotive way, drawing on political, cultural and ideological concerns. This topic involves what are termed ‘mass casualty incidents’ (MCI), which range from natural disasters to terrorist-related incidents. A particular focus has been on the impact such events have on those affected, for example, communities and countries. However, whilst there is expansive literature on the impact on the public, less is known about the impact on those who provide immediate, or close, assistance in such events. More specifically, even less is known from an academic perspective of the emergency health care service staff involved in an MCI. This study seeks to explore the impact of MCI from the perspective of health care emergency services staff, using a qualitative methodology, which will incorporate semi-structured interviews and Braun and Clarke’s (1) six-stage thematic analysis. This introductory chapter will provide an overview of the rationale for the study and its importance in both a national and international context. In this chapter, and particularly the literature review chapter that follows, it will be argued that relatively little is known about the experiences of health care emergency service staff in a UK context. This is especially noteworthy given the relatively recent well documented high-profile events such as the Grenfell Tower fire and the terrorist attacks in London and Manchester. The methods chapter provides a description of the methods used to answer the research question, which is:

How are UK front line healthcare emergency services staff affected by being involved in a mass casualty incident?

Front line healthcare emergency services staff have a duty to respond to critical situations which require specialist interventions, to ensure that the public remains safe. There are multiple agencies that provide different roles within an emergency, including: emergency health care staff, police, the fire service, and emergency department staff, such as doctors, nurses, and health care assistants. These roles require highly skilled professionals who are used to working in unpredictable and sometimes hostile settings, all carrying out different tasks daily. Front line emergency health care workers routinely provide help, support, and care to victims of trauma and life-changing events. In many situations these might result in the professionals’ witnessing deaths, traumatic and highly serious injury, and even risks to their own lives (2). However, as Moran (3) notes, such effects may still be relatively unrecognised and unsupported:

*“Perhaps the clearest lesson to emerge from [recent UK] mass casualty events is that the physical and psychological effects on healthcare staff at receiving hospitals are severe, under-reported, and underappreciated.” (3).*

In addition to research on the direct impact of these MCIs on victims and relatives (4), (5), there has been some initial research into the impact of such incidents on health care professionals working in the emergency service departments. Research has investigated the effect of these incidents on those personnel that respond to victims affected by catastrophic events, such as natural disaster, war, and terrorism – all of which have been identified in research, and particularly with respect to mental health (6). Insights have been gained mainly in developing countries where such occurrences are more common, due to climatic or political instability, and support is limited for rescue staff (7). However, since the 1990s, the recent rise in terrorist activity in many developed nations has led to new concerns about the impact of this on health care professionals (HCPs) (8). The 9/11 terror attacks marked a new threat, larger in scale, and new technological advancements mean that terrorists can now use different forms of violence. However, research is limited in these settings, especially given the current political and social climate in many areas of the world. It is an area for further examination; for example, following the 9/11 attacks in the USA, several adverse outcomes and unmet needs were identified, including: post-traumatic stress disorder (PTSD), anxiety, depression, and risky behaviour such as drug and alcohol abuse and risky sexual behaviour (9). Similar problems have also been identified after terrorist attacks in Nairobi and Oklahoma (10).

## 1.2 Front Line Health Care Workers

The work of frontline emergency health care workers is well recognised as a stressful occupation(11). These professionals encounter frequently challenging and unpleasant events in their duties. Further pressures within the health services worldwide have been recognised due to staff shortages, a heavy workload, shift patterns, poor sleeping patterns, poor work and home life balance, dealing with the public, lack of communication between management and front-line staff, inadequate resources, and recently, COVID-19 pandemic (12) (13). These known pressures are termed chronic stressors, as they are continuously present within these job roles. Furthermore, added to these may be additional acute stressors which might involve traumatic events such as threat to life, witnessing murder, being informed of a major threat to the country’s security, large fires, man-made or natural disasters, and death, or serious harm, to children (14). Consequences of chronic stressors can lead to a decrease in productivity, job satisfaction, reduced morale, and further staff shortages due to sickness and

personnel leaving (12) (15). Evidence suggests that working in a highly pressured job and witnessing traumatic events can leave personnel vulnerable to both mental and physical health problems (6).

There is growing concern in public service occupations regarding job stressors. Cost cuts and staffing have caused considerable stress in the National Health Service (NHS) (16). The nature of health care work is physically and often emotionally demanding, and cost and staffing cuts put the service under great strain and make it hard for nurses and doctors to meet expectations with few resources (17) (18). The charity 'Mind' conducted a survey regarding the mental health of emergency personnel in the UK, revealing that 9 in 10 emergency service workers have suffered from stress or poor mental health at some time during their career (16). The research found that emergency personnel are twice as likely to identify work issues as causes of their reduced mental health, in comparison to the general workforce (16). Added to work pressures is the nature of the job and the risk of having to work in highly traumatic and dangerous environments. Consequences of working in such environments are burnout and reduced mental health, and stress on the individual can lead to physical health problems, further mental health problems, poor social interaction, and detrimental effects on family life. This unfavourable environment produces a negative cycle for the individual and the organisation, and therefore, when further pressures are put onto the service, there is an elevated risk of producing mental and physical health problems, poor patient care, medical errors and staff turnover within the institution (19).

The NHS Long Term Plan has identified that staff shortages are putting unnecessary demand on the current workforce, and it includes a strategic plan to increase staffing by increasing training positions and decreasing vacancy rates from 11.5% to 5% by 2028 (20). The plan also recognises that leadership needs to be improved to better support staff (20). Poor leadership and lack of recognition of burnout or stress in staff has been highlighted as a contributor to individuals feeling helpless and stressed. A qualitative study undertaken in the UK showed that lack of organisational structure, poor managerial direction and the behaviour of managers were directly related to increases in stress in nurses (21). The NHS Staff Survey reported that almost half of the staff in England had stated that they had been unwell due to work, with 44% of staff reporting being off with work related stress (22). These results will have come about due to working during the pandemic, which would have caused staff extra concern (12).

### 1.3 Mass Casualty Incidents - the wider impact on service delivery

Disaster in health is defined as an incident which causes catastrophic disruption to a community or society, making normal daily functioning difficult due to human, material, and economic losses (23).

A disaster can overburden health and social care resources and capabilities to control the situation, often meaning an MCI is declared. The resources available and preparedness of the organisations attending to help can determine the outcome of such events. A traumatic event is defined as an incident which has provoked fear, shock, horror, loss, and injury to an individual or society, through a threat to life or serious injury (24). These events have little to no impact on the functioning of a community or society and although distressing to the individual they put little strain on a health care or social organisation. The next few paragraphs aim to discuss MCI, which cause trauma on a national and international scale due to their consequences.

#### 1.4 Terrorism

Arguably the most frequently reported of man-made disaster globally involves terrorist activity. Terrorism has been defined as “*an act of violence undertaken to provoke chaos, fear and harm to a group of people - often civilians - in the pursuit of political, financial or religious aims*” (25). There has been a recent decline in the number of deaths related to terrorist activity. In 2020 there was a reduction of terrorism when compared to 2016, perhaps due to improved security but also the COVID-19 pandemic as shown in figure 1(26). Nevertheless, more countries were experiencing terror attacks pre COVID-19. In 2015, 65 countries reported terrorism, compared with 2016 when 77 countries reported experiencing at least one death caused by a terror attack (27). This is the highest number of countries to report terrorist attacks in the last 17 years, with 67% of the 106 nations experiencing at least one terrorist attack (27). Iraq, Afghanistan, Nigeria, Syria, Pakistan, Yemen, Somalia, India, Turkey, and Libya were the ten countries most impacted by terrorism in 2016 (27). Data recently published in 2019 by the *National Consortium for the Study of Terrorism and Responses to Terrorism* state a decrease in terror attacks in 2019 compared to 2014 (28). Terrorism has fluctuated over the years (28). However, countries such as Kenya, Somalia and the UK witnessed an increase in terror attacks and the number of deaths incurred by such violence (29). In 2019 there was a decline of MCI terrorist attacks in Europe as seen in figure 1 (26), although the largest attack took place in Sri Lanka, where more than 250 people were killed, acting as a reminder that these attacks are still occurring outside of Europe (26).

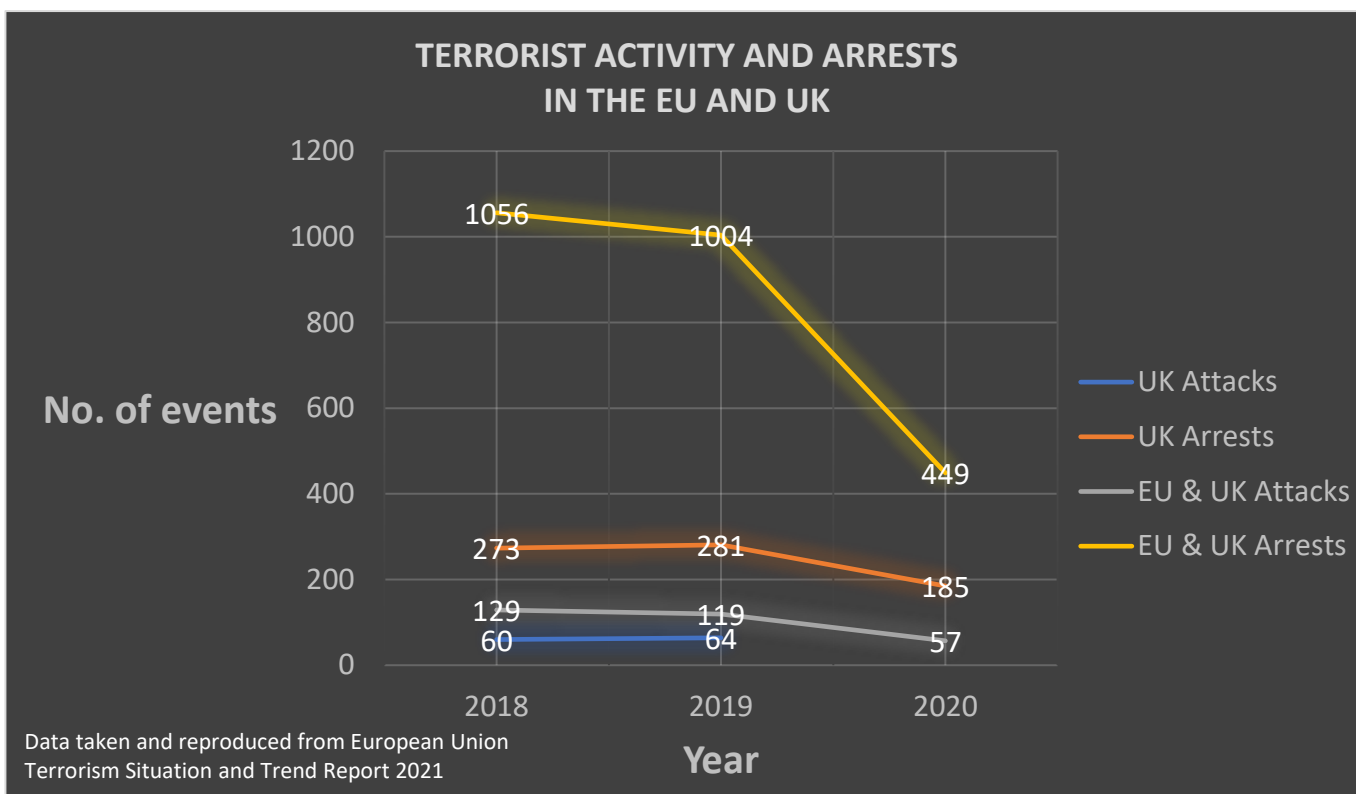


Figure 1: Attacks and Arrests in Europe and UK – Data taken from and reproduced from European Union Terrorism Situations and Trend Report 2021 (25).

This rise in acts of terrorism is multifactorial and is in part due to factors such as increasing internal conflict and destabilisation of a government, or foreign invasion, which in turn has also facilitated acts of human violence globally, with terrorist organisations and lone actors. (27). These acts of violence can involve bombs, small arms fire, hostage taking, chemical or biological hazards, radiation, or secondary explosive devices. The latter are bombs activated after the main incident has occurred, and such devices are specifically designed to cause injury or death to emergency responders (30) (31).

The UK threat level remains at 'severe', meaning an attack is predicted as being highly likely, as judged by the MI5 Security Service (32). The Global Terrorism Index (2017) ranked the UK third in Europe for experiencing the burden of unexpected attacks, resulting in the killing of 126 people between 2000 and 2017 (27). Of note, within the United Kingdom in 2017 there were an unprecedented number of MCIs - five of which were a direct cause of terrorist attacks, as opposed to other man-made disaster. These attacks were at: Westminster Bridge (22<sup>nd</sup> March 2017, ISIL); Manchester Arena Bombing (22<sup>nd</sup>

May 2017, ISIL); London Bridge (3<sup>rd</sup> June 2017, ISIL); Finsbury Park Mosque (19<sup>th</sup> June 2017, ISIL); and Parsons Green underground station (15<sup>th</sup> September 2017 ISIL) (Table 1).

**TABLE 1: TERRORIST ATTACKS IN THE UK**

Terrorist Group Responsible	Place (UK)	Year
Irish Republican Army (IRA,	Large cities such as Birmingham and London	1939 – 1990s
The Real Irish Republican Army	Omagh bombing and the BBC Television Centre car bomb	1997 – 2012
Islamic State of Iraq and Levant (ISIL)	7/7 London bombings, Westminster attack, London Bridge, Manchester Arena bombing  Finsbury Park Mosque  Parsons Green underground station	2005 – 2017
Al Qaida	Planned attack on Heathrow Airport – The attack was successfully prevented	2003

Terrorist attacks have a wide range of consequences, ranging not only from harm to those directly involved but also to those who witness such incidents, the families of those affected, and those who provide help and support for those affected (33). Quantitative studies reveal that incidents caused by human intent are more psychologically harmful than natural disasters (34) – a theme that will be explored further in the next chapter.

### 1.5 Man-made Disaster

Disasters can be differentiated based on several criteria, most notably through their origin and whether they are natural or ‘man-made’ [sic] disasters. The former relates to often unpredictable aspects of the natural environment such as earthquakes and extreme climactic events, for example storms and flooding. In contrast, man-made disasters are catastrophic events caused by human activity, such as train and aeroplane crashes, explosions from nuclear plants, or building fires. Table 2 gives examples of man-made disasters (35). These incidents, which include consequences such as

explosions, fires, or the release of chemicals or radiation, can have detrimental physical and mental health effects, both in the short and long-term, for those involved (36). The Chernobyl nuclear power plant incident in 1986 in the Ukraine, caused many fatalities and health problems, not only at the time, but for years following the incident - due to radiation sickness, cancer, and infant mortality (37). Emergency workers would also have been exposed to the radiation, and a study observing the wellbeing of clean-up workers found significant long term mental health problems (37). Those living in the area had to relocate and therefore the area has seen economic poverty, and this has also led to an increase in mental health problems (36). The World Health Organization (WHO) has confirmed that man-made disasters are increasing worldwide, and that this trend may be linked to increasing urbanisation, technological advancement, and political instability ((38). The WHO has also noted the need for health security due to the increase in disasters and conflict situations (36). Health security ensures that during a mass casualty incident, policy and procedures are put into place to prevent and minimise harm to the population (39).



**TABLE 2: EXAMPLES OF GLOBAL MAN-MADE DISASTER**

<b>Country</b>	<b>Disaster</b>	<b>Date</b>
India	The Bhopal Gas Leak	1984
Ukraine	Chernobyl	1986
UK	Piper Alpha Oil Rig Explosion	1988
UK	Hillsborough Disaster	1989
UK	Dunblane Mass Shooting	1996
Spain	Oil Tanker	2002
China	The Jilin Chemical Explosion	2005
Gulf of Mexico	Deepwater Horizon	2010
New Zealand	PIKE River Mine Disaster	2010
UK	Cumbria Shooting	2010
UK	England Riots	2011
USA	Orlando Nightclub Shooting	2016
UK	Grenfell Fire	2017

Due to the potentially large number of casualties and fatalities, these events may be more traumatic than routine work, for front line emergency personnel, both in the field and in the accident and emergency departments (40). This is due to the potential destruction of infrastructure, making sites unsafe or harmful to the rescuers and potentially threatening their lives. Incidents which have caused mass casualties and death, or which involve children as victims, are potentially more distressing when compared to incidents with fewer casualties (41). Large scale disasters can create considerable disruption, as seen post 9/11, when researchers noted that poor disaster planning, and inexperienced staff taking a lead role, caused high levels of stress (42) (43). If the outcome post-disaster is undesirable, then this can cause feelings of anguish and guilt (44).

Gun shootings are common in the USA, with a reported 45,000 deaths in 2020 caused by either suicide or homicide (45). Health care personnel who attend these incidents are at risk of being harmed themselves and therefore can suffer psychological effects after the event (46).

One of the most catastrophic incidents in the UK in recent years was the Grenfell fire (47). In 2017 a fire started at the Grenfell Tower in West London. After the incident, 72 people were confirmed dead, with a further 109 non-fatal casualties; 67 of these casualties had severe injuries which required urgent medical interventions and treatment (48) (49). The scale of the fire meant that paramedics and health care workers needed to work long hours and endure distressing scenes (49). In addition to the

Grenfell fire, there were 167,150 fires in the UK between 2017 and 2018, which shows a 3% increase in fires compared to recent years, and there has been a 27% increase in fatalities due to fire (48). This puts tremendous strain on the fire service and the health service which already has overstretched resources.

## 1.6 Trauma, Mental Health and Wellbeing

A catastrophic event which causes an individual to feel as if their life has been threatened, or an experience where the individual witnesses' terror or trauma, can lead to psychological changes. These include personality changes that can lead to behaviour outside of the norm (6). Examples of behavioural dysfunction or mental health problems that arise following a catastrophic event can include increased intake of alcohol, risky sexual behaviour, drug use, depression, or anxiety, and most reported, post-traumatic stress disorder (PTSD) (50).

These symptoms have been documented historically after conflicts, previous wars, by victims of rape or torture, the holocaust, natural disasters, and during the industrial revolution. Events in the First and Second World Wars led to the recognition of such mental health problems and documented symptoms such as anxiety, depression, disturbing memories, and the suppression of emotion (51). These symptoms were termed: 'soldiers' heart', 'shell shock' and 'war neurosis' (52). Research has demonstrated significant associations between trauma in war zones and poor mental health (53) and therefore the need for associated support and formalised coping mechanisms for such individuals (54). The term PTSD was defined in psychiatry after its inclusion in 1980 by the American Psychiatric Association in the third edition of the Diagnostic and Statistical Manual of Mental Health Disorders (DMS – III) (55). This medical term or diagnosis originated in the accumulation of symptoms and reports from soldiers returning from Vietnam (55). The disorder is characterised by a person re-experiencing the trauma in a harrowing manner through; flashbacks, nightmares, emotional numbness, closing themselves off from the world, refusing to allow any emotion or reminders from the event to enter their surroundings, increased arousal, inability to sleep, concentrate and engage, or feeling tense, irritated, and easily angered (56). PTSD usually manifests itself approximately one month after the event, but it can take several months or even several years to truly manifest.

However, not all traumatic events cause PTSD. Some individuals can be left with apparently less severe symptoms following such an event. Nevertheless, these can still be troublesome, and they do not always progress in a predictable manner, with possible sudden declines in a person's mental health or well-being (57). Depression, anxiety, and stress can still be harmful to an individual's health and wellbeing, in some cases causing hospitalisation, medical dependency, social problems and often a negative impact on their work and home life (58). Serious depression can lead to suicide, which affects

703,000 people each year worldwide, and causes vary from living in a place of conflict, experiencing violence or being part of a vulnerable group (59). However, there is debate as to whether mental illness can be predisposed, because of biological or genetic factors (60). Barriers to help and support have also been identified, for example: a lack of support from health care systems, stigma from society, fear of losing employment, misdiagnosis, and unwillingness to seek help (61) (62). To the individual, a traumatic event can affect their psychological well-being, whilst the organisation's morale, staffing and overall team performance can also be negatively impacted (58). Consequently, this is a crucial area for research and possible intervention.

Several research studies have identified psychopathology among emergency and humanitarian workers responding to both the effects of war or natural disaster (63). Deployment of humanitarian aid workers to complex and dangerous incidents, where there are multiple casualties and highly risky environments, can also result in multiple psychological stress factors. This, added to inadequate or little psychological support, may contribute to complex mental health problems (64). The frequency of MCIs - or the likelihood of primary or secondary traumatic stress, is heightened within the role of humanitarian workers, due to the increased or enduring threat of danger. This can manifest from murder, the death of a co-worker, kidnap, rape and witnessing violence (65). A longitudinal study found that humanitarian aid workers are at risk of developing mental health problems such as depression, anxiety, or burnout (63). Cardozo *et al* (63) identified the precursors of mental health problems. These included: staff with a heightened risk of psychological morbidity, those with a previous history of mental health, and those who have suffered a serious illness, or who have had a stressful life event before deployment. Healthy lifestyle habits and a strong support network have been seen to have protective factors on mental health (63). This is perhaps due to maintaining a good diet, a regular sleep pattern, being physically fit and emotionally prepared, which prevents burnout. Gender has also been reported as a factor for mental health and women have been found to have a higher PTSD score than their male co-workers (66), although other studies did not report a significant difference between genders (63). This could be due to different populations, geographical locations, and culture. Those who enjoyed their work, were highly motivated and had good job satisfaction, were less likely to suffer from burnout (63). This cannot be applied to emergency healthcare workers in the UK, because the threat of danger is not consistent, and health care workers are not having to work abroad, away from family and friends therefore their needs and external stressors are somewhat different.

## 1.7 Extreme work and Edgework

As already discussed healthcare staff have been recognised as suffering from burnout due to their physically and emotionally intense workload. Montgomery *et al* (19) highlight that burnout is concerning and unfortunately becoming more prevalent. Emergency health care staff are subjected to a number of different stressors, even during day-to-day routine activities. Stressors can include working in various intense and unpleasant environments, witnessing and dealing with trauma and unpleasant stimuli, working under pressure and organisational stress (19). Emergency workers are expected to work long hours and various shift patterns which, as already discussed, can lead to physical and mental health problems (67). Burnout has been associated with mental health issues, sleep deprivation, drug errors and poor patient care (68), (69). This is not only problematic to the individual but wider healthcare teams and institutions due to staffing shortages and high turnover of staff; and these problems have been argued to be worsened both during and following an MCI (19). Sociological theory can help explain the unique work pressure and experiences these individuals endure and one example of this involves extreme work.; this has been historically linked to military roles, due to the nature of the work involving conflict and war. These personnel are often subjected to harsh environments, witness or sustain violent injuries or death and often spend long periods of time working away from home in hostile situations. They also face organisational control through intense training and behavioural conditioning coupled with a strong expectation that each individual conforms to the institution's standards and ideas (70). However it is increasingly argued that other occupations can be defined as extreme.

Definitions of extreme work can vary, and in the literature it has been argued to arise in relation to gender differences (71), long working hours (71) (72), working without a break or under pressure, tough decision making which is often considered 'life or death' (73), performing with the risk to one's own life, or working with few or overstretched resources (73). Different occupations experience various stressors or extremities: lawyers, for example, work long unsociable hours, and have tight deadlines, making their work temporally pressures, whilst other occupations demand physical and emotional intensity such as nursing (74). Nurses attend to patients' personal care which can add physical strain to their work and also require them to demonstrate empathy to support their patients, which can also be emotionally challenging (74,75). Lastly organisational challenges can add to work intensity if institutions are under-resourced, expect jobs to be completed in a tight time frame and control certain behaviours of its workforce (76). This can be demoralising for individuals and lead to job dis-satisfaction and poor health and welfare outcomes such as burnout (76).

Extremity and the concept of 'edgework' was developed by Lyng (77,78) in his work which examined risk taking behaviour in extreme sports, such as skydiving and parkour. He explored why certain individuals took part in high-risk sport in order to escape what they deemed normal mundane life, and enjoyed the element of risk between life and death, or the edge which is seen as the boundary between being safe or not, and work is the skill involved to ensure that harm does not result (78). This sociological concept has now been expanded to incorporate occupational choices (76), with the suggestion that individuals seek their job in favour of the risky elements involved. In seeking to understand this in the context of health care more specifically, Granter *et al* (76) observed ambulance workers in their routine environment and found that their work could be described as extreme work and demonstrate edgework. Healthcare work is physical, emotionally, temporally and organisationally intense and many healthcare professionals describe their work as stressful but pleasurable, something which relates to edgework.

### 1.8 Ontological Security

Another concept which is argued to be of relevance to healthcare professional's experiences of MCIs involves the altered sense of safety and security. Warner (79) argues that disaster research should consider the concept of ontological security as those involved often encounter an existential experience due to a life-changing incident. Laing (80) noted that ontological security is the self-assurance an individual holds in their self-identity and their environment. It relies on individuals knowing their place within their social environment and feeling secure (80). For writers such as Giddens (81) this worldview is argued to be present in everyone and is supported by routines which protect individuals from anxiety. Modern society has increasingly tried to protect individuals from threats to ontological security, but this is not always possible:

*'There are many unsought-after events which may puncture the protective mantle of ontological security and cause alarm [...] The most challenging situations for the individual to master, however, are those where alarms coincide with consequential changes – fateful moments.'* p 131 (81)

It is argued that MCIs represent such 'fateful moments' as Giddens (81) refers to unexpected and significant events which have profound consequence. Following an MCI it is noted that individuals experience an altered sense of security, causing them worry or experience anxiety (79). Although

health care staff have a duty to treat and help patients during an emergency, certain MCIs can threaten an individual's sense of a safe reality.

### 1.9 Policy Context

Unsurprisingly given the previously described scale and effects of mass incidents, there have been several governmental and organisational policy responses. Many countries have disaster and emergency management plans in place, to systematically detail procedures which need to be followed to reduce the effects of a disaster, whilst maintaining safety for the public and staff involved (82). Each country and agency will hold their own guidelines, which should help educate staff on what is expected of them and when. The UK government also issue mandatory requirements which organisations need to incorporate into their policies and procedures, reflecting good practice. The Cabinet Office issued the "Expectations and Indicators of Good Practice Set for Category 1 and 2 Responders" (83) which is directed at emergency personnel. They state that it is mandatory that emergency personnel are trained and equipped to deal with an emergency such as a terror attack. Knowing one's role and capabilities is important, and each organisation should run emergency drills. Reflecting on actions including debriefing and updating staff knowledge, is seen as good practice (83).

Government legislation as provided specific guidance and support for healthcare emergency staff has been published. In the UK for example, the NHS developed a document to aid personnel when responding to an MCI. The NHS England "Concept of Operations for Managing Mass Casualties and the NHS England Emergency Preparedness, Resilience and Response" (EPRR) Incident Response Plan (84) provides key detailed advice on how best to coordinate staff and resources to ensure that casualties are treated, and specialist assistance is acquired if required. These policies also highlight the need for psychosocial support for staff and patients. During an MCI, emergency staff are put under extreme pressure to help and rescue victims of such events. They also witness death and unpleasant injuries, whilst emotionally supporting victims and their families. Long working hours and a demanding workload can be exhausting. The NHS England Concept of Operations for Managing Mass Casualties (84) recognises this and suggests that staff are made aware of signs and symptoms that are deemed normal after an MCI, such as exhaustion, feeling low or worried. It signposts staff to an information leaflet and helpful websites, which provide further support and services. The document also outlines three categories of support, ranging from immediate, medium, and long term. It is recommended that all responding staff are given adequate mental health support and access to resources immediately following the incident (67). The policy recognises that individuals may seek outside support from their family or friends; however, it highlights that this should not be assumed,

and therefore recommends signposting those who are displaying signs of reduced mental health to agencies who are able to give psychosocial support. Arguably, this can be difficult, as people can be seen to be managing, even though they are not; they also may be fearful of asking for help due to stigma. The policy suggests that commissioners work with mental health services to develop a referral process and work out how to identify those who require further long-term support (84).

The NHS England EPRR Incident Response Plan (84) recommends debriefing within 48 hours of stand down of an event and then a further structured debrief within 28 days post-event. A recommended structure is identified in the policy and includes discussions around the nature of the event, agencies which responded to the event, actions which needed to be taken by the NHS, future risks, and chronology of the event (84). There is no mention of psychosocial support within this debriefing setting. However, this policy advises on the importance of shift planning, ensuring the rotation of staff to prevent burnout (84). The literature has identified that prolonged working hours can be a risk factor for PTSD and poor psychosocial outcomes (42) (43). Commissioners and policy makers need to ensure that staff are given the right support, at the correct time, and be allowed time to adjust back to a normal state of well-being (3). Each trust should adopt their own local policy, incorporating the recommendations within both documents discussed, and all staff should be aware of the incident response plan. Within these two documents, there is little emphasis placed on the wellbeing of staff; the documents propose signposting, but the notion is vague. To the knowledge of the researcher, these are the two main documents used by hospital trusts to inform local policy; therefore, it can be argued that more emphasis needs to be placed on post mass-casualty wellbeing for staff. This has been noted by clinicians, who have emphasised the need for physical and psychological support, including time for recovery, before elective services restart (3). Moran *et al* (3) criticise the NHS England EPRR Incident Response Plan for giving priority to the first response of an emergency. Although this is important, the emergency journey continues far after the first 24 hours (3). More than 350 hours of extra clinical care was needed after the Manchester MCI, as patients required surgery, blood products, intensive care, multidisciplinary input, and specialist intervention to name just a few types of clinical care (3). This exhausts staff and resources, and therefore emergency plans need to incorporate recovery periods.

### 1.10 Current Support

In the UK, legislation exists to protect the health and safety of staff; the Health and Safety at Work Act etc. (1974) (85) and the Management of Health and Safety at Work Regulations (1999) (86) represent key legal approaches that define employee and employers' responsibilities and the duty of care of the

latter for the former. This duty is to ensure that their employees are aware of the risks involved in their roles and have gained the necessary training to carry out their duties in a safe manner. Furthermore, they should be offered support following a traumatic event (85). Critical incident stress management (CISM) was a process used to debrief military and front-line emergency workers post major incident (87).

It is of note is that there is currently only one main form of support available, which is in the form of psychological debriefing. This aims to reduce unwanted psychological distress and the development of PTSD following a traumatic event, using counselling and information sharing (88). It originates from a military setting, in which it was hoped that debriefing soldiers would prevent psychiatric distress, maintain optimism, and return soldiers to effective combat (89). Mitchell created the guide, Critical Incident Stress Management, which is a 7-stage tool incorporating critical incident stress debriefing at stage four. The other stages are: 1) introduction; 2) facts; 3) thoughts; 4) reactions; 5) symptoms; 6) teaching, and 7 re-entry (90). However, such single session debriefing tools have been under scrutiny, and the British Army no longer uses debriefing of this nature, nor is it supported by the Department of Health (DoH), who argue that it is counterproductive (91). Research has demonstrated that critical incident debriefing is ineffective and, in some cases, dangerous (92).

A Cochrane systematic review deemed single session psychological debriefing to be ineffective and similarly to have the potential to cause further harm (89). It also highlights that debriefing is not always delivered by a highly trained professional. Such interventions also made assumptions that events and an individual's experience were homogeneous, whereas individuals are far more complex. Front line emergency workers will have often experienced other traumas, they may be suffering from burnout caused by regular duties or having troubles at home (89). These added events can cause a break in an individual's resilience, hence causing psychological distress, and therefore focusing on the distress of the incident may not uncover the deeper underlying issues. Interventions such as debriefing may also interfere with the individual's natural coping mechanisms. Some people defensively forget or interpret the scenario differently to protect themselves from psychological trauma, and therefore engaging in recalling events can therefore bring on distress (89). Single sessions also fail to allow for follow up and therefore may leave some vulnerable. The NICE guidelines (93) recommend early diagnosis and detection of PTSD in individuals, followed by guidance and psychological interventions. Following the Manchester and London attacks, hot (immediately after the event) and cold (carried out a few days later) debriefing were conducted; however, this seems to be aimed at reflecting on practice, rather than psychological debriefing, which has been shown to be harmful (94) (8). Although there is no compulsory standard, many agencies have their own wellbeing service and policies on referring staff for appropriate support (95). However, if an individual does not come forward and managers do not



notice psychological distress, many individuals may go unsupported or untreated. The absence of strict guidelines allows for employees to feel disengaged and neglected and sends the message that those who are suffering are weak and poor at their job (96). Hampton and Wilson (97) further support this claim, arguing that more needs to be done, including offering interventions such as better working patterns, time off after an MCI, and managerial support for those who are struggling. The president of the Royal College of Emergency Medicine has called for implementation of methods to improve the working lives of health care staff in the wake of terrorist attacks (8). This has included the suggestion that annual leave would be appropriate after such events. Emergency personnel often give up their free time to help when an MCI happens, therefore, to help psychological and physical recovery, and to demonstrate gratitude, time in lieu should be given (8).

### 1.11 Summary

In summary, this introduction has described the role of front-line emergency health care staff in an MCI. It has discussed the burden of global and UK terrorism, and the effect of trauma on the mental health and wellbeing of those whose job it is to help rescue and support victims. It has also given some insight into policy and the support that is currently available, and argued that it may be limited in its effectiveness. The following chapter provides a more detailed review and analysis of the existing empirical research literature relating to this topic. This will be shown to be dominated by research conducted in the USA following the 9/11 attacks, with very little corresponding literature on the effects of terrorism or other mass casualty incidents on UK emergency staff.

## Chapter 2 – Literature Review

### 2.1 Introduction

This chapter provides a summary and critique of the relevant literature relating to mass casualty incidents (MCI) and uses a narrative thematic approach to explore this topic. It builds on the introduction and overview offered in the first chapter by providing a more structured and detailed review of empirical research. The literature search aim was to identify, characterise and describe evidence from existing empirical research relating to man-made mass casualty incidents involving health and emergency care staff. Firstly, the chapter describes the approach used to search the literature. Following that, the chapter is organised in terms of four key emerging themes from the identified existing research, which relate to:

- Types of mass casualty incident
- Effects of a major incident on health care emergency staff
- Characteristics of health and emergency care staff
- Coping and support mechanisms

The majority of literature identified relates to the second theme, and in particular, to the mental health impact on those who respond to major incidents. Specifically, the theme examines the ubiquity of PTSD and how it is the focus of many study outcomes. It also addresses the dominance of US-specific research, particularly that involving the World Trade Centre (9/11) terrorist incident.

### 2.2 Method of Literature Search

This literature review adopts a narrative approach. A narrative review was chosen to enable a broad search of the literature to be undertaken (98). The term broad refers to a narrative review incorporating various methodologies and allowing for the evidence base to be driven by the literature, rather than a predetermined idea of what is relevant. Consequently, this provides a comprehensive view of the topic by using evidence from a wide range of literature. Using a narrative approach allows for a range of evidence to be collected and critiqued to produce a balanced view of the theory and context of a topic (99). An initial scoping search of literature involving only *terrorist-related* attacks and the effect of these on front line emergency workers, revealed limited research in this area, and as noted above, a predominance of literature relating to the 9/11 event and PTSD outcomes. A decision was made to widen the scope to provide a more thorough and comprehensive insight into the broader

topic and to include man-made mass casualty incidents or disasters. A mass casualty incident can be defined as:

*“An event in which there is a serious threat to the health of a community, large numbers of casualties which require specialist lifesaving interventions, or a disruption to normal services”* (100).

An MCI can be a natural disaster such as an earthquake, or a non-natural disaster, for example, a mass shooting, terror attack, road traffic accident or chemical fire. Natural disasters were excluded from the scope as previous research has found the man-made incident to have a more profound effect on an individuals’ psychological wellbeing than natural disasters, or large-scale disasters which were unintentional, as table 3 illustrates using a previous review of 160 samples of disaster victims (101).

**TABLE 3: TYPES OF DISASTER AND IMPAIRMENT**

Type of disaster	% Minimal impairment	% Moderate impairment	% Severe impairment	% Very severe impairment	Number of samples and empirical studies.
Natural	10.2	55.7	21.6	12.5	88
Technological	14.8	46.3	18.5	20.4	54
Mass Violence	0.0	33.3	27.8	38.9	18

Adapted from Norris *et al* (102)

Natural disaster is also much less common in the UK (103) and therefore studies concentrating on natural disaster were considered less likely to be relevant. This could be due to the more discriminant and violent nature of man-made incidents, and what Norris *et al* ((102) p.207) describe as *“the additional element of intention”* and the shock they induce. A natural disaster can be catastrophic, causing death to human life and injury; but in many cases it is a known risk. The shocking nature of a man-made incident can be unsettling, and therefore an individual’s perceptions of safety and controllability can be lost (104).

Narrative literature reviews have been criticised as lacking empirical evidence, and concerns have also been noted regarding the interpretive bias of the literature (105). To prevent bias and add more robustness to the literature review, a systematic search of the literature was conducted which allowed for transparency and ensured rigour. After identifying the papers, the data extraction process focused on the following: the specific purpose of the study; the study population; the geographical location of the study; the design of the methods used and a brief overview of the key themes or messages. A mind map then helped to identify commonly occurring themes, which thus forms the structure of the narrative literature review (99).

### 2.2.1 Data Sources

Three databases were used to search for literature. These were Medline via OvidSP, PsycInfo via OvidSP, and Web of Science (all databases) using the University of Sheffield's library online search engine StarPlus. The reference lists from the final extracted articles were also manually screened to ensure that no literature was missed. The search was conducted between May and August 2018 and updated when new literature had been sourced.

### 2.2.2 Search Terms

To ensure that the search was conducted systematically and with rigour, the PECO (Population Exposure Comparison Outcome) framework was used (106). The population included an extensive list of health professionals, paramedics, allied health professionals and health care military personnel, but emergency occupational roles such as the police, fire service and army personnel were excluded (Table 4 and Appendix A). Exposure was defined in terms of the categories of major incidents (Table 4), there was no comparison group, and the outcomes were defined in terms of psychological symptoms, positive teamwork outcomes, or deviant risk behaviours (Table 4).

TABLE 4: LITERATURE SEARCH INCLUSION AND EXCLUSION CRITERIA.

<b>Facet</b>	<b>Included</b>	<b>Excluded</b>
<b>Population</b>	Hospital Emergency Department staff Paramedics Military medical staff	Civilians Military who are not health professionals (including ex-military) Fire services Police service Staff working in the wider Emergency Care system Aid Organisations/Humanitarian Papers which did not state an occupation
<b>Exposure</b>	Terror incidents Mass Shootings Fire Bomb Chemical attacks Riots War Road accident Disaster Major Incident	Natural disaster Disaster management Logistics or interventions to better prepare for a major incident Surgical or medical interventions Non-specific incidents (the paper did not mention a particular event)
<b>Comparator</b>	N/A	N/A
<b>Outcome</b>	Mental health PTSD Depression Anxiety Sleep disturbance Nightmares Low mood Binge drinking Drugs Sexual risk behaviour Team work Pride Narrative Experiences Stories	Papers that do not report outcomes (either quantitative or qualitative) Mental health with no association with a major incident
<b>Other</b>	English language only Original research	Papers that only contained an abstract and the full text was unavailable News reports Systematic reviews Papers on preparedness and operational set up

### 2.2.3 Analysis and synthesis of literature

Once the inclusion and exclusion criteria had been finalised and applied to the references identified through the search, the final included papers (see figure 1 and the subsequent findings for more details) were analysed thematically. This approach, which was also used to synthesise the identified empirical literature, involved identifying key themes present in the studies. Despite a PECO framework being used to facilitate the overall search, a thematic analysis and more inductive approach was used to generate themes. The aim was also to provide a coherent narrative, and what Ferrari (90) terms 'crafting the text'. (107)

Following Ferrari's (90) evaluation criteria, each article was critically assessed for method suitability, interpretation of results, ensuring the authors had presented key results, limitations of the study, and clear conclusions. Those articles which met the criteria were included. Ferrari (90) states that writing a narrative review is not a linear process, but rather a process in which the writer is required to revisit texts to ensure themes are suited to the research question and do not divert from the original aim. (107)

## 2.3 Literature Review Findings

### 2.3.1 Overview and Characteristics of Identified Studies

Conducting a search for relevant literature via three databases yielded 1522 articles initially. These articles were then screened at title level which reduced the number of articles to 248. After reading the abstracts, further studies were removed, and 74 articles which met the inclusion criteria were retained. The next step was to read the full articles and examine them against the inclusion and exclusion criteria as described in table 3. Figure 1 shows the search as a PRISMA flow diagram. Thirteen additional publications were found from reference checks and from systematic reviews (which were excluded from the thematic analysis and synthesis to avoid double counting.) The final total of relevant literature was 39 original research articles.

The studies represented 16 countries and a broad range of MCIs, such as lone actor shootings, fires, a stampede, and terror attacks. Of note was that only two studies were identified which were related to a UK based incident; the London terror attack and Manchester Arena terror attack (108) (109). Most studies were quantitative research, and only five qualitative papers were identified (9) (110) (111) (112) (113); of the 34 quantitative studies, 20 were cross-sectional studies, 12 cohort studies, and one longitudinal (Appendix B and Table 4). Of the relatively small number of qualitative studies identified,

two reported on 9/11(44) (110), one on the psychological impact of nursing in a war zone (111), another explored the impact of a multitude of different disasters world-wide on accident and emergency nurses (112) and lastly, a paper understanding the experiences of doctors caring for patients during a mass shooting (114). There was one mixed method study reporting on health care staff experiences working during various MCIs in Manchester and London (108). Due to the nature of the incidents being researched it would be difficult, and often unethical, to conduct a randomised controlled trial (115), and therefore the studies are observational. The prospective cohort studies arguably represented the highest quality of design identified within this review, and more caution is needed when interpreting the retrospective cohort studies' findings, which could be potentially disadvantaged by confounding factors and bias.

TABLE 5: SUMMARY OF INCLUDED PAPERS

Setting	UK	2
	USA	14
	France	3
	Pakistan	1
	Puerto Rico	1
	Netherlands	1
	Gaza	2
	Ethiopia	1
	Norway	4
	Northern Ireland	1
	Italy	1
	Afghanistan	1
	Taiwan	1
	Netherlands	1
	Israel	2
	Afghanistan and Iraq	1
	Judea and Samaria	1
	Worldwide	1
Unknown location	1	
Types of incidents	Terrorism	24
	War	5
	Man-made disaster	10
Population	Health care professionals	All papers contained a health care population (See Appendix B)
Study design	Cross- sectional	20
	Cohort	12
	Longitudinal	5
	Qualitative studies	1
	Mixed Methods	1



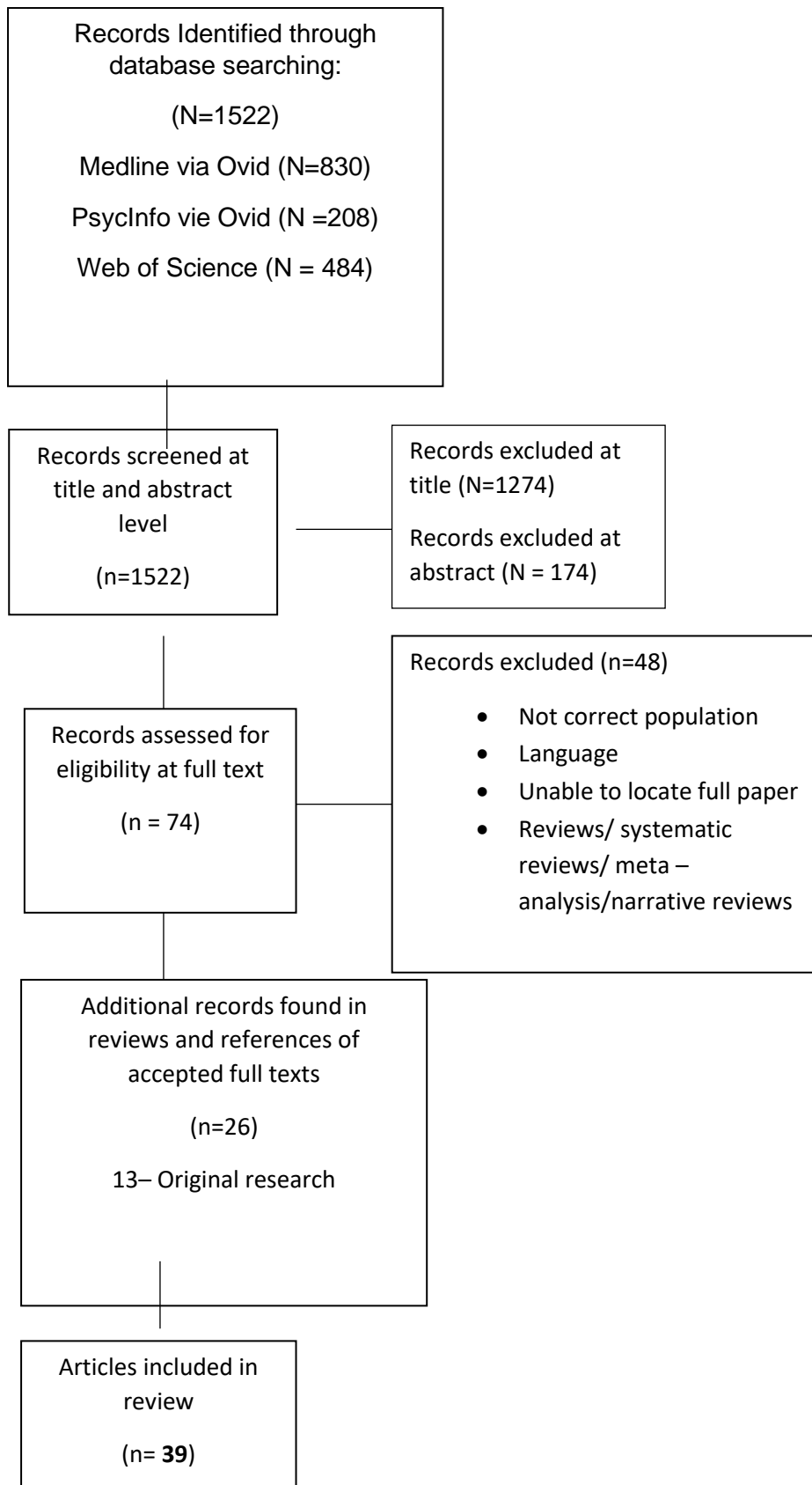


FIGURE 2: PRISMA FLOW DIAGRAM OF THE SEARCH AND SCREENING RESULTS

Four key themes were identified following the literature search and data extraction.

- Types of mass casualty incident
- Effects of a major incident on health care emergency staff.
- Characteristics of health care emergency staff.
- Coping and support.

These are now considered in turn. It should be noted that the literature was dominated by the second theme relating to the effects of incidents; however, the *types* of incidents are discussed as the first theme, to provide the context to inform the later themes. As will become clear, there is a definite emphasis on very specific outcomes (particularly mental health and PTSD) which were in turn related to the dominance in the literature of over-represented single events (9/11 in the USA), which in turn reflected the dominance of terrorist-related incidents.

### 2.3.2 Types of mass casualty incident

The first main theme relates to the different types of man-made MCIs identified in the literature search. The routine work of health care professional means that they are often subjected to unpleasant situations, such as witnessing the aftermath of distressing incidents including domestic abuse, sexual assaults, road traffic incidents or fires. However, MCIs such as terror attacks, airplane crashes or large-scale building fires may provoke trauma, even in a resilient workforce (101). Three types of MCIs were identified in this narrative review, namely terror attacks, other man-made incidents, and war settings where emergency healthcare staff are involved. The chapter will now consider each of these in turn, beginning with the most frequently reported type in the literature: terror attacks.

#### 2.3.2.1 Terror Attacks

Terror attacks can cause similar effects to other man-made incidents (as will be described later), however, the purpose of a terror attack is to cause harm to human life in a violent manner, for political gain. It has been noted that a sense of national fear can follow such events, and this is often linked with political, cultural, and social unease (44). Terror attacks are a growing threat worldwide (116) and can cause mass disaster, loss, fear, chaos, disruption, psychological or physical health problems, and death. They tend to impact not only the community affected but also have a global effect, spreading fear (5). Unlike in war zones, at the time the attack takes place the attacker is unknown (not marked by a uniform and conforming in civilian society) and aims to attack civilians to gain publicity for political gain. During such events, health care emergency responders have lost their lives in trying to protect and care for the victims (44) (117). Terror attacks can present in different ways: car

bombings, hijacking aircrafts, concert bombs, shopping centre bombs, small arms fire in public places, and chemical or biological hazards. Health care emergency workers attend these incidents with little knowledge as to what, or why, something has happened. With little comprehension of what is safe, they risk their own lives to save those involved, jeopardising their first training rule, which is to check that their area is safe before proceeding (44).

Of the thirty-nine papers included in this review, twenty-four were related to terror attacks, and of these papers, nine reported on the aftermath of the attacks on the 9/11 World Trade Centre (WTC). The papers on the 9/11 terror attacks covered mostly the WTC site. The predominance of studies and literature related to the 9/11 incidents in the US may be attributable to the enormity of the destruction and co-ordinated attacks. Thousands of emergency personnel, alongside health care professionals, helped in the rescue efforts and many of their lives were lost trying to help others. 2,977 people lost their lives, including 343 firefighters (the USA train firefighters to be dual trained as a paramedic) and 60 police officers (66) (118). Post 9/11 reports described the horror personnel witnessed, and that they had no concept of what they were entering, with dust and debris making visibility poor (44). Health care staff and other responders reported seeing dismembered body parts and seriously injured members of the public. Many experienced the loss of their own co-workers (44). There were reports from ex-military personnel stating that the scenes were worse than military events in Vietnam (44) Furthermore, significant numbers of emergency personnel lost their lives, or were seriously injured during the rescue efforts (117). This was the largest MCI on the USA since Pearl Harbour in 1941 and the enormity of human, environmental and economic loss have perhaps drawn researchers' attention to the incident. However, it was not only the acute environment which made 9/11 unique; many emergency personnel helping at the scene, including health care staff, developed chronic conditions both physically and psychologically, ensuring the need for cohort studies which follow the impact of the incident on these staff.

Research has shown that witnessing death or knowing someone who had died or who was seriously injured in the incident was a significant variable in causing full or sub-syndromal PTSD (43). Similarly, in Oslo, Norway, in 2011 a lone perpetrator detonated a car bomb which killed eight civilians and injured many more; he later shot and killed 69 teenagers on Utoya Island (119). No health care personnel were killed at Utoya; however, medical staff were recovering victims before the area was deemed safe, hence putting themselves at risk of harm. This caused personnel not only to fear for their own safety, but also to describe the incident as stressful, due to witnessing dead, or seriously injured, children (119). Death of children is often deemed more traumatic than the death of an older adult. However, further research on the Norway attack contradicts this by demonstrating a low prevalence of possible PTSD and post-traumatic stress symptoms, compared to other attacks such as

9/11 (PTSS) (120) (119). In contrast, 9/11 was unusual in its size of devastation, and although there was destruction to infrastructure following the car bomb, small arms fire and the death of sixty-nine children in Norway, the attack took place over a small duration of time, the perpetrator was arrested, and no emergency personnel lost their lives (121). Researchers believe this to be the reason for the lower rates of psychological illness amongst the Norway emergency personnel cohort (119) (121). The direct risk to one's own safety is a predictor of PTSD (117). This is similar to nursing in war zones, where there is a constant risk to personal safety, plus a consistent flow of casualties to care for; but staff may not come to any physical harm (122). Small arms fire or weapon attacks in western countries are becoming more frequent, as evidenced in the recent incidents in Paris (2015), Orlando, Florida (2016) and London (2017), (123) (124)(125). Personnel and especially medical personnel often do not have the personal protective equipment (PPE) needed to aid their safety, such as bulletproof vests. Following a sniper attack in Maryland, Virginia in 2002, health care staff felt an increased level of perceived threat despite not being present at the time of the attack (126). This demonstrates the national fear of terrorism, which reaches far beyond the area in which the incident occurred.

The magnitude of 9/11, plus the hazardous conditions, amplified fear (118). Added to this was poor organisational direction from managers, inadequate evacuation procedures, and inadequate training. These causes heightened PTSD scores and physical health problems. Similarly, in 2017 Manchester, there were 23 deaths including the perpetrator, and multiple casualties who sustained life changing injuries, this was the largest terror attack since London 7/7 in the UK (108). Whilst no emergency staff died, they did notably endure some psychological harm, and gaps in training were mentioned as an area of improvement, and training was highlighted as a possible source of resilience (108). Terror attacks vary in magnitude, and this can make it difficult to ensure that staff are prepared. Perpetrators of terror attacks aim to achieve chaos and disorganisation and therefore these tend to be characteristics of such events, testing the most robust disaster plans. The intent to do harm, arouse confusion and disorganisation, which can cause much emotional distress amongst emergency personnel, makes terror attacks more psychologically harmful than natural disasters, due to the interpersonal trauma (127).

In summary, the literature search identified studies which reported different terror attacks, and their impact, from all around the world. The distinguishing factor of terror attacks is the extensive fear on an international scale, bereavement of lives lost in a violent and chaotic environment, and an altered level of safety. The literature from Europe and importantly the UK is still limited (128) and the question of why some attacks cause a greater burden to emergency responders' mental health than others is still not fully understood.

### 2.3.2.2 Health care staff in war settings

A considerable amount of research has investigated the impact of war on military personnel and identified strong correlations between war and poor psychological health. Such literature was beyond the scope of the present review, but a smaller body of literature was identified which considered the role of *civilian* nurses and doctors working in war zones, which may arise due to their country being occupied by war, or such personnel offering their service to areas which are in conflict. Six papers were identified which included research conducted in war zones, one of which was qualitative, while the remaining five papers used a cross-sectional design, with the dominance of the latter being potentially attributable to feasibility of collecting PTSD prevalence in a war zone (115).

The extreme conditions of war mean that additional pressures may be encountered, such as witnessing and caring for patients with serious injuries and dealing with fatalities (111). War threatens the safety of the whole community for a long period of time, meaning that family members, friends and co-workers could all face a threat to life, due to bomb blasts or missiles targeting residential areas, or even the hospital itself. This has been recognised as placing additional stress on healthcare staff (111) (129). The literature suggests that a combination of the continual fear, repeated exposure to victims of war and threat to one's own life can be psychologically harmful (122). Surprisingly there was a stronger association between home exposure and PTSD than work exposure (122). Normal functioning of the emergency department can also be significantly disrupted after a bomb blast, or mass casualty incident within a war setting, with a sudden influx of victims and family members searching for loved ones. This can be overwhelming, especially for inexperienced personnel, particularly when treatment and triage decisions need to be made more quickly, with an associated physical and emotional burden (111). However, Ben-Ezra *et al's* study found that nurses working in the exposed hospital, which was subjected to a consistent threat of safety and intake of casualties, had raised somatization (experiencing physical symptoms from a psychological problem, for example experiencing headaches due to stress) and psychological distress compared with doctors and nurses who did not work in the exposed group (129). This could be anticipated, due to the consistent threat to one's own safety and the emotional toll of caring for those in critical conditions. However, six months after the war ended the somatization symptoms had reduced in the exposed nurses compared to the unexposed. Theories show that when subjected to consistent threat and stress, the symptoms which are related to biological factors will reduce with time. However, due to the complexities of the brain, psychiatric symptoms may persist and manifest as more serious conditions (129). This paper used two cross-sectional studies instead of a longitudinal design due to difficulties in recruitment, and had a small sample size; however, it demonstrates the need to understand resilience and how staff

members can protect themselves when subjected to prolonged stress. Lubin *et al* (130) did not concur with these findings, and report a low prevalence of PTSD, which they suggest this is due to rigorous recruitment ensuring personnel are resilient to witnessing scenes of violence, but also to senior medical staff who are able to support those who are junior.

In summary, the chaotic and relentless war environment is unique compared to other man-made disasters. It is characterised by prolonged violent activity, unpredictability, constant threat, distressing scenes, an altered sense of safety, bereavement, and often an overwhelming amount of pressure to care for the victims of war. The evidence reviewed in this section has demonstrated that recruiting resilient staff and ensuring supervision buffers psychological wellbeing.

### 2.3.2.3 Man-made Disaster

The third main theme reported in this narrative review of non-natural disasters related to events that were not associated with war or terror attacks, and usually involved accidents such as transport crashes or fires. These types of events can cause an altered level of safety, and are unpredictable, often because community bereavement and disruption overwhelm a health care system but tend not to cause international concern due to their localised geographical location. They are not usually targeted to destroying a societal infrastructure and often are tragic isolated incidents, causing local but not international fear. Ten papers observed the effects of man-made disasters in this review, which three used a cross-sectional design, four used a cohort design, one used a longitudinal design, and two used qualitative method.

Fires are a type of man-made disaster, which can cause large damage to infrastructure, the environment, and potentially cause serious injury or death to victims. Fires make rescue work challenging and unsafe; there is significant risk of injury or death to those rescuing or caring for victims of a fire disaster. Added to this is panic and chaos from victims, family members, the public and, if emergency plans fail, from the rescue team themselves. From the limited number of studies identified in this review, a study from Ethiopia demonstrated that urbanisation has led to an increase in fires, road traffic accidents and industrial accidents; therefore, emergency workers are witnessing events they have never seen before, and more of them (131). Later in this chapter, risk factors for PTSD in these incidents will be discussed, but recurring exposure is known to affect PTSD prevalence. Lack of training or correct equipment can also lead to longer times working at the site, which also has a significant effect on PTSD (131). As identified in terror attacks, proximity to the injured or deceased casualties and the perceived threat to the rescuer's life is psychologically harmful (131) (114).

A qualitative study exploring several different disaster responses of accident and emergency nurses found that any disaster which was unexpected was not normal for those working during the incident (132). Nurses described the feeling of shock, fear, and disbelief, whilst having to work in an environment which quickly gets depleted of its resources (132). Hospital settings must adjust to the influx of patients, meaning health care professionals must care for critically ill patients in an unfamiliar environment, causing extra stress and chaos (132). Following a chemical spillage, concerns regarding protective clothing and its availability can also provoke concern (133). Nurses rarely work in such equipment, and this can make the environment difficult. Normal working policies and procedures are often abandoned due to work overload. This can make staff members concerned around the legalities of their practice (133). Another qualitative study sought to understand doctors' experiences following a mass casualty shooting in which they noted that doctors endured negative psychological consequences from witnessing upsetting stimuli and that some did not possess the necessary skills to be able to cope with such injuries, which caused more stress (114). Qualitative work is extremely useful for understanding why the prevalence of stress, PTSD and PTSS is high among these occupations.

Air disasters are another type of non-natural disaster which feature within the literature. These events often cause mass devastation to those involved. Land crashes cause damage to infrastructure, killing or seriously injuring those at and near the crash site, as well as those on the aircraft. Time spent on the site can be extensive due to the search for and rescue of victims, and the scale of recovery can be dangerous. Such work can also be physically demanding, which has been shown to have a significant association with avoidance scores. In common with other incidents, the release of toxic chemicals and dust clouds inhibits work and leads to physical and mental health problems. Air disasters are relatively infrequent, making them more shocking to all involved (134). One paper found that repeated similar exposure had no bearing on stress. However, it recognised that the event studied was an air disaster, which was not often a reoccurring MCI, making it hard to report such a finding (134). This study did find that repeated exposure to different mass casualty incidents was associated with self-reported distress and possible burnout (134). A stampede in Italy caused an MCI resulting in several serious injuries but no fatalities. The researchers noted that there were no deaths, and therefore staff had a more positive experience leading to less psychological distress (135).

A final category of man-made incidents identified in the literature involved road traffic incidents. One of the papers identified in the literature search compared voluntary and professional disaster workers responding to a bus crash in Norway in which 12 children and four adults died. It took rescue workers six hours to clear the site (40). This incident involved children; something which is known to be more distressing to rescue workers. Another attack involving children occurred when a female entered an

elementary school and shot six children, killing one child, and injuring the others. The attacker also tried to set fire to two schools and mailed poisoned food. This incident was shocking, unprovoked, and affected a whole community (this was not deemed a terrorist incident in the literature) (136). Although emergency personnel are trained to expect the unexpected, it can still cause stress and psychological trauma. Media intrusion was also seen to have a negative psychological impact on those involved in the rescue efforts, again adding to secondary PTSD (40). This is a common theme within disaster work as large-scale disasters often draw significant media attention.

In summary, this section has analysed the three types of incidents to which emergency personnel respond. The unpredictability and the devastation to human life but also to the environment seems to provoke shock and fear among health care emergency staff. The next section will evaluate the effects these incidents have on different occupational groups.

### 2.3.3 Effects of major incidents on health care emergency staff

The second main theme identified from the narrative literature review concerns the effect that mass casualty incidents have on individuals who have provided support and assistance to the victims. As suggested briefly in the previous section, effects vary depending on the type of incident and the exposure and role of the person providing support. These can be categorised as: harm linked to the physical environment, repeat incidents (for example secondary bombs) and the most widely reported group of effects, mental health effects, such as PTSD, PTSS, anxiety, and depression.



### 2.3.3.1 Harms linked to the physical environment

The previous section suggested that workers may be involved either directly or indirectly in mass casualty incidents, and that for the former there are risks. In the key example of the 9/11 terror attack, due to the collapse of the twin towers and nearby buildings, the site was extremely hazardous with unstable infrastructure, fire and dust which caused physical and psychological health problems after the incident (117) (44) (137).

Some harms linked to the physical environment were immediate, but others were more long-term; the prevalence of respiratory illnesses, such as chronic obstructive pulmonary disease and asthma, increased amongst emergency personnel post 9/11 and were thought to have been caused by the toxic air particles in the dust cloud (138). Psychological concern and worry after a traumatic event can also affect physical health (129). Similar concerns were seen post 9/11 regarding the dust cloud. Rescue workers (including health care staff) were noted to have developed respiratory conditions as a result of the toxic chemicals in the air (44) (66) (137). Physical illness can also lead to a decline in psychological health due to the restrictions poor health has on a person (loss of normal function, loss of job, having to depend on others). Other reasons could be related to the activity in which they became injured or sustained a health problem. If traumatic, this could have altered their sense of safety, and therefore they may experience flashbacks or disturbed sleep. A cohort study observed this finding in 9/11 personnel who had sustained physical health problems, and noted these participants' health condition were also associated with symptomatic PTSD (66). PTSD prevalence following 9/11 has been reported among 7% - 12.4% of rescue staff. This is varied due to the time at which the studies collected data. PTSD is a condition which is not linear to time and is not fully understood (117) (137). There are multiple trajectories to the development of PTSD, and the nature in which disaster research is conducted makes it difficult to report a definite result. Most studies are cross-sectional by design and rely heavily on the recall of the participant, leading to selection and recall bias.

The scale of loss, unpleasant working conditions and the length of time spent at the 9/11 site, may be the cause of the high PTSD prevalence noted amongst 9/11 rescue personnel. However, PTSD prevalence was much lower in ambulance personnel following the London bombings – 6% (109) and even lower (1.3%) following the Norway terror attack (119). However, no personnel were killed in the London or Norway attacks and infrastructures were less damaged, meaning that the job of clearing up was shorter in duration and less hazardous (119). A paper reported a prevalence of PTSD following a fire in the capital city of Ethiopia. The authors gave no specific description of the event, although, they did comment on the disparity of geographical location, advancement in technology and growth in urbanisation compared with high income countries (131). Their study found the prevalence of PTSD to be similar to those who worked at the WTC. The overall prevalence amongst emergency responders

at the Ethiopian fire was 19.9%. Ambulance staff and nurses had an overall prevalence of 11.5% (131), which is slightly higher than that found amongst paramedics in London (109). Sociocultural differences can alter perceptions towards an incident, making individuals either vulnerable or protected against their surroundings (131). Previous experiences, cultural beliefs, occupational knowledge, an understanding of technological advancements, and a sense of obligation to the local community can all factor into how different nations perceive disaster and define risk. In a western culture, urbanisation is developed whereas in other nations it is only just developing, increasing the risk of technological disasters.

### 2.3.3.2 Trauma, Mental Health and Wellbeing

A variety of mental health issues have been reported and studied in the literature, with the most commonly identified being PTSD. The effects of PTSD vary, but have been summarised as including re-experiencing symptoms, which include flashbacks and bad dreams, avoidance and emotional numbing, insomnia, hyperarousal with hypervigilance, an enhanced startle reaction, and cognition and mood symptoms. These include trouble recalling the traumatic event, negative thoughts, feelings of blame, distorted guilt, and the loss of enjoyment. PTSD has been reported across the different incident types and amongst all the health and emergency workers. Research measuring its prevalence varies between studies. The estimated prevalence of PTSD following terror attacks ranges from 0.2%-21.2%, depending on the study (117) (119) (109) (139) (140) (123) (127). Of the papers included in this review on man-made disaster, only one reported on the prevalence of PTSD. This was in a similar range to prevalence reported following 9/11; 19.9% (131). Emergency responders attending the Addis Ababa fire in Ethiopia had a combined prevalence of 19.9%, however, the prevalence in paramedics and nurses was 11.5% (131). Disparities in PTSD prevalence can be accounted for by the time duration after the incident when data was collected, geographical location, the magnitude of the major incident, different personnel, and training across identified studies. The variation in the instruments used to measure the prevalence of such conditions is also important. Most of these studies used self-reported questionnaires and a cross-sectional study design (127) (121) (109) (126) (131) which observe variables but do not identify the causality of responding to a terror attack and the development of mental health problems. Assessment tools have also been varied and not standardised, meaning validity and reliability may be questionable in some studies. Most studies used self-reported questionnaires, rather than formal diagnosis of PTSD and other mental health problems. Although these questionnaires have been verified to score and give results of mental health problems, they cannot be as conclusive as a medical diagnosis. For this reason, many studies refer to rates of

PTSD as “probable” PTSD. Questionnaires are also open to recall bias because pre-existing conditions were not assessed for (126) (127).

The course of PTSD is also conflicting, and time scales of when PTSD prevalence has been recorded also varied across different studies. At one extreme, the study by Grieger *et al* (126) attempted to reduce recall bias by recording probable PTSD scores only one week after the incident. Other studies have observed scores up to 12 years after an incident (117), however among studies involving health and emergency care staff there are no longitudinal studies demonstrating how PTSD may occur or change over time. Differential PTSD scores in studies may vary due to different measuring scales, but recognised life stressors may also explain why some individuals develop late onset PTSD. A further secondary effect identified in the literature was that some individuals lost their job through physical health problems post 9/11, adding to financial stress and difficult home lives (141). The loss of a co-worker and bereavement time may also add to the instability of the onset of PTSD symptoms (141). However, some authors have blamed definitions of PTSD, and stated the limitations within their own studies admitting that, survey-based estimates may miss possible cases of PTSD, hence defining their outcome measurement as probable PTSD (137) (109) (117). Man-made disasters and terror attacks also have a much broader impact on the community, not only with regard to the economy, but also in terms of effects on the rescue workers themselves. Research has linked PTSD to functional limitation and advanced ageing. Poor physical or mental health can mean the loss of their job or early retirement. This can affect an individual’s personal life with regard to relationship breakdowns, or their financial situation, and add to other life stressors (141). Mental health problems caused by the terror attacks can be bi-directional with life stressors, and this is generally consistent with terror attack literature. Terror attacks can impact international communities also, threatening safety, and the sense of loss is felt worldwide.

The 9/11 attacks caused significant mental health problems for rescuers due to the impact of the event, witnessing distress, observing dead bodies, body parts, and working amongst hazardous material (44). Those who developed PTSD were found to struggle with general life stressors post-disaster, compounding chronic PTSD (141) (142). The complexities of mental health mean that life stressors also have an effect, either making an individual vulnerable before a traumatic event or adding to the problem after the event. Research on emergency medical service (EMS) workers post 9/11 has demonstrated that both long-term physical health conditions and poor psychological health have caused a reduction in health-related quality of life, which refers to a persons’ ability to function in everyday life and their wellbeing (142). At present partial PTSD scores are not recognised as

problematic and therefore are not highlighted in screening. This suggests that occupational health services need to be aware that low PTSD scores can still have detrimental health and wellbeing effects, and that organisations should be aware of this, to offer the correct support (137). There has been debate over delayed onset of PTSD in other literature but the known effects on health care staff is not known.

In a war setting or hostile environment the constant threat and repeated exposure of witnessing distress, fatalities, and experiencing a threat to their own safety is in keeping with the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) (2013) definition of a traumatic event, which is known to impact the prevalence of PTSD. Ben-Ezra *et al* (129) investigated somatization and psychiatric symptoms amongst nurses exposed to conflict, and identified increased levels of PTSD, psychosomatic symptoms and depression among nurses who had been exposed to war, compared with nurses who had not. In contrast, another study found that one in five nurses working in a health care setting in the Gaza Strip self-reported experiencing symptoms of PTSD two years after the conflict (122). Ben-Ezra *et al* (129) also discussed the association between a traumatic event and positive psychological change, such as increased personal strength, improved relationships, and an appreciation for life (122). PTSD prevalence in health care staff returning from Iraq and Afghanistan was 9%, and 5% met the criteria for depression (143). This was lower than the prevalence seen in a previous study, which was 19.7% (122). This could be due to the relatively small sample size, and therefore generalizability of the findings is difficult, as the prevalence could be higher or lower. Consistent with the findings from the nurses working at the Gaza Strip (122) was the lack of association between PTSD and treating patients with serious injuries or seeing the deceased (143). Reasons for this may be due to adequate training and previous experiences of witnessing traumatic injuries. These experiences may act as protective factors against psychological trauma. Direct personal threat to life, and witnessing gunfire, were associated with PTSD (143).

The identified studies about mass casualty incidents are dominated by PTSD outcomes, and few studies have focused on other outcomes, such as stress, depression, anxiety disorders, addiction, substance misuse, or physical health. It is important to note that whilst many staff will not develop PTSD, they may still suffer mild temporary distress. This may cause sleep disturbance, mild anxiety, negative thoughts, and risky behaviour. Post-traumatic stress symptoms (PTSS) have not been the focus of much research attention, especially in comparison to PTSD after terror attacks (119). There are only limited studies that have looked at it in relation to occupational groups. Following the Paris terror attacks, 6% of physicians taking part in the research were found to demonstrate a probable

diagnosis of anxiety and 2.4% were found to show probable diagnosis of depression (127). However, a study following the 2011 Norwegian terror attack found low levels of PTSS, alcohol and drug use amongst rescue workers (120). Where PTSS was problematic, it was associated with the use of medical drugs and alcohol (120), which was consistent with other studies (126) (137). Lu *et al's* (144) study observed preserved stress levels and noticed that individuals' length of service was related to stress, fatigue, and burnout. Others also noted experience to be an important variable for resilience (114) (125).

In summary, PTSD prevalence is not stable, and seems to fluctuate between different studies. As discussed, this could be due to the heterogeneous incidents studied, geographical location, the different methodologies and instruments used to collect the data, and the difference in incidents. The literature heavily focuses on PTSD and less is known in regard to stress, anxiety, and depression disorders. The literature lacks any experiential, emotional or social impact and has concentrated more on environmental health and adverse outcomes. Recovering dead bodies or witnessing horrific injuries has been shown to produce somatization and intrusive and avoidant symptoms, especially if the deceased was known to them, or they had reported the bad news to family members.

### 2.3.4 Characteristics of health and emergency staff

The third main theme identified in the literature relates to the characteristics of the populations studied. This study aims to look at a population of health care staff which include paramedics, nurses, health care assistants, and physicians. Within each of these occupations there are differences in training, focus of tasks, and personalities. These differences accumulate into characteristics of personnel within an occupation. It has been argued that these characteristics influence the various effects upon the health of the emergency health care workers who have been involved in dealing with mass casualty incidents (43) (129). The next section will discuss this in more detail.

#### 2.3.4.1 Occupational Differences and Working Culture

Health care staff tend to have a strong sense of duty to help and care for others when they are sick, injured, or vulnerable. They are often the first to arrive at the scene and enter unknown environments to rescue casualties. Skogstad, Fjetland and Ekeberg's study (119) observed perceived peri-traumatic strain within ambulance personnel following the Norway terror attack, of which 13% reported of ambulance personnel reported the Norway terror attack as either very or extremely straining (119). 70% of the participants within the three groups reported fear of being shot or injured at the time of

the incidents (119). However, PTSD scores were similar across all three occupations; 1.3% PTSD prevalence in police officers, 1.4% prevalence in firefighters, and 3.4% for ambulance personnel (119). There was not much variation between the firefighters and police, and the study reasoned that this was due to fewer occupational differences during a terror attack. Distressing scenes and the threat to life is the same for all occupational groups working during such an event (119). Ambulance personnel had the highest prevalence of PTSD in this particular study. This is perhaps attributed to the risk of attending to casualties whilst the environment was still deemed unsafe. These higher scores are thought to be due to added pressure in the occupation; a caring profession with constant exposure to witnessing trauma, illness, or death (145). Health professionals also have closer and prolonged time with victims compared to other rescue occupations (119). Following the London bombing, only 6% of ambulance workers had PTSD, lower than reports of rescue workers following 9/11 attacks; however, these comparisons need to be taken with caution, due to the difference in incidents and the potential for confounders. Most studies are cross-sectional by design and so it is impossible to determine if it is the exposure of the incident or a previous exposure which has caused the outcome. Previous known exposures which put someone at a higher risk of developing PTSD are: abuse, burnout or stress from the regular day to day job demands, gender, and previous trauma (145). Health professionals also have closer and more prolonged time with victims compared to other rescue occupations (119).

Nurses in Israel reported high levels of burnout and stress and medium to high levels of intrusive memories when compared to the average nursing population (145). Repeated exposure to terror attacks can increase symptoms of stress, burnout and PTSD, and is later discussed in the section on risk factors (145). Doctors also have been found to develop symptoms of PTSD if their patient died and they had to inform family members (146). Nurses are five times more likely to develop PTSD than physicians (147). This could be due to differences in job roles, as nurses spend far more time with the patient than doctors and therefore are more likely to form an attachment, which could cause secondary PTSD. Conflicting evidence has shown that surgical physicians who were exposed to terror attack victims had a PTSD score of 16%. The control (surgical physicians who had not treated terror attack victims) had PTSD scores of 15%. Thus, there was no significant difference in reaction to trauma, burnout, or stress. However, staff who had PTSD were found to have sustained it through witnessing terror at home. Therefore, this supports ideas of this unique population developing resilience through consistent exposure to trauma (140). Another explanation may be that secondary PTSD is not as problematic, as there is no threat to the individual's life. Observing or experiencing terror attacks is far more threatening to the individual than caring for those who have been victims (140). This evidence suggests that staff working at the hospital are offered a protective buffer if the hospital has not been a target.

Health care professionals working in war zones are subjected to treating various traumatic injuries in their professional lives and therefore have a heightened level of resilience (143). A paper observing a community of hospital nurses in Israel reported high levels of resilience which was linked to personal, professional, and societal variables (145). Due to prolonged war and conflict in Israel, communities have become used to ongoing violence and may have developed a cultural resilience or functional denial (145). Due to the nature of disaster research, it is impossible to gain baseline data to determine causality. Working as part of team also appears to buffer negative emotions due to social support mechanisms (148). Having a strong duty of care may also protect health workers from PTSD (145), as they want to be strong for their patients. If this duty of care is taken too seriously though, it can become problematic, causing burnout. Nurses, doctors, and ambulance staff have chosen a caring profession, they strive to preserve life and therefore it can be stressful and anxiety-provoking when this does not occur (145).

Many of these studies (109), (121), (139), (146), (145), use self-reporting, and although they are validated instruments, caution needs to be given to the interpretation of these results as they are open to reporting bias. In addition, retrospective studies are also limited, due to recall bias; nevertheless, research of this nature can only be carried out after such event. Results in these studies may be conservative. It is arguable that if those involved have undertaken rigorous training, they may be better prepared for such events and therefore protected against psychological illness. Training differences may also have had an impact when comparing the effects on professional rescue workers, as opposed to unaffiliated volunteers. It can be noted that the prevalence of PTSS and PTSD is lower in professional front line emergency workers than volunteers (121). Training is one example of a protective factor. Differences in occupational groups and training may also be a reason for different prevalence factors amongst rescue workers themselves.

In summary, there are recognised occupational differences within health care which either protect individuals or expose them to the risk of negative wellbeing. Nurses seem most vulnerable compared with physicians and paramedics. Research surrounding the characteristics of health care staff is still very underreported with regard to working in MCIs (137), and is much needed due to the frequency of mental health symptoms experienced post events.

#### 2.3.4.2 Risk Factors

The literature indicated a number of factors that appeared to influence health and well-being during and after an event. These include the time of arrival at the incident, proximity to the incident site,

dealing with the loss of a co-worker, perception of work performance, pride in work, disability, and gender. These will now be discussed in further depth.

#### 2.3.4.2.1 Temporal Factors

Timing of exposure to the incident emerged as a key risk factor. The research identified in this review indicated that those who arrived at the scene first were more likely to develop long term psychological problems such as PTSD (138)(128) (142) (43). The associations between arrival times and the development of mental health trauma have not been fully acknowledged or understood, although it has been suggested that the risk of trauma or threat to life is greater at the start of the incident (43). In the 9/11 WTC literature, time of arrival at the site has been considered an important variable, although one which requires further research to understand how negative effects occur and can be minimised. During the 9/11 attacks the emergency workers who arrived first on scene (including paramedics, firefighters, and police) were subjected to the falling towers (117). Those who spent long periods of time at the disaster site were more susceptible to getting PTSD (117) (137). In contrast, the findings of Pietrzak *et al* (66) disagreed with early arrival increasing the risk of PTSD among non-traditional responders, which included health care personnel. They found that early arrival time within this group did not affect PTSD symptomatic trajectories (66), although the non-traditional group was heterogeneous and therefore it is impossible to know if this result was true of just health care workers. Proximity to the disaster had a significant effect on psychological wellbeing (109). Responders who were close to the devastation and witnessed dead bodies or victims who were seriously injured, worked in unsafe environments, posing a risk to their own life. Being close to burning material and high temperatures and being exposed to hazardous materials were mentioned in studies as having an impact on both the physical and mental health of rescue workers in several studies (44) (119) (137). 50% of PTSD in ambulance personnel after the London Underground terror attack in 2005 was accounted for by location C. Location C had the highest number of victims, fatalities and was highly dangerous, putting rescuers at risk (109). For nurses working in nearby hospitals during 9/11 the distress was that there were no patients. Disaster plans were in place and no patients arrived. This is a haunting image. It demonstrated the magnitude of loss caused at the WTC (110). Feelings of frustration and helplessness were voiced in the qualitative study (110). Health workers who attended the WTC site during the morning of the incidents had seven times the risk for a positive probable PTSD diagnosis and twice the risk of depression compared with those who had never worked at the WTC site (137). Although this study used probable diagnosis, due to not having the past medical history of participants, there is still a high-risk factor demonstrated by the time of arrival. These staff members



require close monitoring after a mass casualty incident and perhaps a referral to a health professional for a wellbeing assessment.

Proximity is also an important variable and can mean a threat to an individual's safety. Following the 2005 London bombings, the ambulance workers who attended location C (one of the locations bombed on the London Underground Circle Line) contributed to half of the probable PTSD diagnoses (109). Location C had the highest number of dead civilians and was the most hazardous for rescuers to enter (109).

Duration of time at the 9/11 WTC site was a significant variable in potentially causing PTSD and other psychological problems (110). The magnitude of destruction at the 9/11 site meant that rescue workers worked for long periods of time, often staying at the site for days without a break. The site took 10 months to clear of human remains, and those working regular shifts endured hazardous working conditions which affected their mental and physical health (44) (142). Those who worked for more than 3 months had a high risk of developing PTSD (43). This makes the 9/11 attacks unique, as most terror events have a shorter duration and the areas are often deemed safe after a few hours (119). Added to the duration is the constant threat of terror attacks; Ireland, France, the UK, and Israel, to name a few, have seen unprecedented attacks over the last few decades by The Real Irish Republican Army (IRA), Provisional IRA, ISIL, Islamic State of Iraq (ISIS), Al Qaida, and Palestinian militant groups. In Israel, the constant threat of attacks has been known to cause burnout, intrusive memories, and heightened levels of stress among hospital staff (145). There is also a growing raise in militant right wing extremist groups within Europe and America (119–121). The constant influx of victims of terror attacks and the potential of recognising someone, can be distressing regardless of how the incident occurred (145).

#### 2.3.4.2.2 Emotional Factors

The frustration and helplessness of not being able to perform their role can manifest into negative emotions for health care professionals (110). Being able to feel useful in a hostile and traumatic environment lowered the risk of PTSD in health care workers helping victims of the Omagh bomb (146). A sense of being needed and providing care can elevate negative emotion. However, those who were dissatisfied with their job and took less pride over their work were more inclined to develop PTSD. Job satisfaction and being able to deliver positive outcomes and demonstrate the skills they had

trained for, were seen to be a protective factor (145) (136). Many individuals who have worked hard, trained, and gained competencies want to put these skills into practice. They understand the risk and are aware of how to maintain their own safety; therefore, they trust the skills they have and relish putting them into practice (136). Therefore, they are more resilient to negative psychological consequences. Failure to attain certain outcomes, and constant traumatic events occurring, have been shown to cause burnout amongst nurses (145). Other research concurs with these findings, stating that if disaster workers struggle to complete tasks due to a heavy workload and time pressures, they are at risk of higher avoidance scores which are inherent in PTSD (136). Sloan *et al* (136) also found that although professional health-care workers were equipped with skills for their role in a disaster, if they were unable to fulfil their role due to being confronted with an unknown situation, they were at risk of intrusive and avoidance thoughts at the time of the incident and 6 months post incident. It is vital that individuals work within their scope of practice in order to maintain safe standards; working without the normal safeguards or performing activities which an individual is not trained for, adds pressure, vulnerability and the potential to do further harm. This caused fear and stress among emergency department nurses working in different disasters world-wide (132). Those who took on extra responsibilities during 9/11 felt over-stretched and stressed, increasing their risk of post disaster PTSD (117). Due to the magnitude of 9/11, rescue workers felt the need to take on tasks they had no experience in. For example, medical workers helped firefighters, which increased their risk of PTSD, due to exposure to dangerous conditions with no prior training (117). Alongside this is a lack of equipment or resources. There are also feelings of being overwhelmed or under supported, and poor organisation and communication between services (110).

#### 2.3.4.2.3 Experiential Factors

Some studies found experience to be a risk factor; those who had attended previous major incidents were less likely to develop PTSD compared to those with less experience of working in a disaster (117). However not all studies concurred; Dougall *et al* (134) observed participants who had worked at an airplane crash site, and used both self-reported and physiological data to identify whether experience of working in a similar disaster helped protect individuals. Their findings demonstrated that previous experience of working in a similar incident did not reduce stress levels, and exposure to another traumatic incident that was dissimilar to an airline disaster was associated with distress. These results should be taken with caution because the study observed participants after an airline disaster; these are very infrequent, and it is therefore hard to interpret what incident would be comparable. The physiological data was also small due to the sample size being low. Some of the laboratory testing of blood and urine samples was inadequate and therefore discarded. Other studies noted that those

with vast experience, and those who had previous military experience, had resilience against psychological illness (114) (150). Ron *et al* (145) did not find any association between experience and resilience; they only found that personal resilience helped lower the risk of any psychological harm. Furthermore, in places of consistent violence and terror attacks, nurses had more resilience to work exposure and had a greater risk of PTSD from personal exposure (122). Similar effects were seen in hospital staff after the Omagh bomb; they found that being involved in the terror attack personally and professionally increased the risk of psychological distress (146). Of note was job satisfaction; those that took pride in their work and could identify positive outcomes, maintained resilience despite their level of experience (150). However, those that were less experienced, unable to see past the unpleasant stimuli, or who lacked support, experienced fatigue, stress, and psychosomatic symptoms (150). The evidence is therefore mixed in terms of whether previous experience in disasters is beneficial to reducing psychological harm, and more research is required within this area.

#### 2.3.4.2.4 Media Reporting Factors

Media attention can provoke both positive and negative emotions post disaster. In Norway, following the 2011 attacks, the media praised firefighters and ambulance and nursing personnel; however, criticism was levelled at the police. In the light of this, it is possible that the police working at the site felt undervalued and potentially guilty, and although this does not observe the impact of MCI on the police, media coverage is still a risk factor which organisations need to be aware of (119). The media can have detrimental effects on front line emergency workers, causing anger due to lack of respect for their work, sensationalising stories, and inaccurate reporting, but staff also reported that the media were intrusive not only with them but the victims too (114) (125). This was a reported finding after a bus crash that killed children and adults (40). The media has a sense of duty to inform the public of disasters, but unfortunately, this can add stress to individuals who are living in the area (114). It may also affect those who work within the hospitals treating casualties, causing secondary or tertiary PTSD (145) (114) (125).

Dealing with the loss of a co-worker has the potential to cause work related stress. Due to the mass of devastation at the WTC, many front-line emergency workers lost friends, co-workers, and family members (117). However, this finding tended to affect non-traditional rescue workers, and healthcare workers if they sustained an injury experienced a higher risk of PTSD. A perceived threat to life is a key factor in causing psychological distress, so it is understandable that sustaining an injury during 9/11 would cause a higher risk of PTSD (117). Long term disability, physical injury caused by the incident, or loss of job through ill-health, all increased the risk of PTSD (66). The reasons for this are thought to

be a lack of social support from co-workers or unmet mental health needs (141). Loss of employment may also cause relationship and home life stress, further adding to problems (141). When individuals are not working, there is not the daily routine or support from colleagues who know what the individual has been through. These emergency workers can sometimes feel isolated. Having a previous mental health diagnosis or life stressors post 9/11 was also a risk factor for developing further psychological illness (141) (66). This suggests the need for good psychological screening before recruitment and after mass casualty incidents.

#### 2.3.4.2.5 Gender-related Factors

Numerous studies reported gender as a risk factor. Female front line emergency workers had higher prevalence scores of stress, compared with men (121) (137) (127). PTSD has also been found to persist longer in women, particularly following a traumatic event which is caused by humans themselves rather than a natural disaster. This is known as inter-personal trauma (127) (117).

In summary, this section has discussed the identified risk factors for the possible development of psychological damage because of exposure to an MCI. These included: time of arrival at the scene, proximity to the disaster site, training, and the importance of working within the scope of practice, perception of work performance, pride in work, dealing with the loss of a co-worker, disability, and gender. Factors that may reduce the psychological harm include clear shift rotations and time off from the incident site (43). Another risk factor is previous mental health illness. Staff members need to be safeguarded; as reported, trauma can cause chronic mental health problems. Poor physical health following the incident can also add to physiological decline; studies have proven that there is a relationship between health-related quality of life and disaster (142). Those who believe the disaster has affected their health-related quality of life often experience a decline in psychological wellbeing. Therefore, policy needs to be focused on ensuring that emergency personnel have access to adequate medical care, to improve their physical health, for example through access to physiotherapy or reduced working hours to aid recovery (142). Understanding these risk factors will help policy makers to target care and know what care is required; however, the use of mostly descriptive studies and low sample size makes it difficult to generalise results, therefore further research is required. The next section will now discuss the potential coping mechanisms, as identified in the literature.

### 2.3.5 Coping and Support Mechanisms

So far, this chapter has presented themes relating to the types of events that health and emergency care staff have been involved in, considered what harms may arise and whether there are any characteristics of the individual that may influence outcomes. This section describes the final emerging theme and explores any coping mechanisms health care staff have used following MCIs. It also summarises any examples of support identified in the literature for health and emergency service staff after an MCI. The former aspect links to the previous theme related to characteristics, and the latter indicates which types of support have been used to try to address the various harms reported so far in this chapter. As will be shown, despite the range of harms for many groups over different settings internationally, relatively few specific forms of support and help were reported in the identified literature, and more frequently described were examples in which individual coping mechanisms were identified.

However, with all these studies, there is a time difference between when the event happened and when data were collected. This means that results may be subject to recall bias, and participants may have forgotten feelings of stress and anxiety. Other arguments are that rescue staff wish to be perceived as heroic or strong. If this is indeed a factor, front line emergency workers may not want to discuss feelings of psychological distress because of the fear that co-workers will perceive them as weak (151).

#### 2.3.5.1 Debriefing

Research has identified that staff have reported that they are aware of possible psychological support if they should require help (109). A few studies stated that debriefing was an important element in their post-incident recovery (110) (40) (125). Nurses working in the casualty department during 9/11 saw it as important to have the time to discuss the incident using reflection. They felt that this type of debriefing would help them learn and be prepared should a mass casualty event like a terror attack reoccur (110). Current evidence states that single debriefing interventions are more harmful than good. Positive affirmations were identified as helpful, as, post 9/11, many emergency personnel felt devalued by the lack of discussion from senior staff (44). Debriefing was given after two weeks of the Orlando, Florida nightclub shooting, followed by further counselling which staff found useful, although it was noted that support should not just stop, as some individuals experienced prolonged psychological impact. This study also noted that support should have been given sooner, demonstrating that timing of help and support is crucial (125). Other research highlighted that

debriefing was good for training but did not allow staff the opportunity to discuss their psychological wellbeing (108).

Many emergency personnel have chosen not to use professional services, but rather seek support from informal sources, even though they had sustained psychological trauma (109). These informal sources included family members and colleagues and tend to be robust buffers to reducing psychological harm. Nurses felt colleagues could give the best support, as they had shared the experience, rather than using family members who possibly could only offer empathy (110). Military medical staff reported low PTSD rates due to good supervision from senior staff and rigorous recruitment, ensuring personnel have good personal resilience (130). Nurses in Israel demonstrated high levels of resilience which the authors of the study explain in terms of the culture, but also because of the social support and respect that nurses have from the community (145). Good community resilience can be helpful in the self-healing process. Stigma and job security are factors which prevent front line emergency workers from seeking help and support and so often go unseen. Concerns were identified in the literature about stigma and mental health (109) (111) which may be a barrier to emergency staff seeking help in a timely way. More support and recognition from senior and teaching staff about the psychological effects that mass casualty events, such as terror attacks, have on emergency personnel, may help to reduce barriers and stigmatization (129). Studies identifying low levels of mental health have praised emergency teams for good organisational skills, training, leadership, and peer support (119). The literature identified lacks insights into what interventions are best suited to the emergency personnel population, which are cost-effective and have undergone rigorous methodology studies (such as randomised controlled trials), which are needed to aid policy and make guidelines clear. Furthermore, barriers to professional assistance need to be recognised and removed. Consideration also needs to be given to staff when returning to routine work to prevent burnout and ensure that their wellbeing has been attended to. In some cases, staff were expected to continue with elective surgery, and this was overwhelming (108). Instead, the workforce needed support and time off to recover (108).

Substance misuse often is associated with poor coping mechanisms; within this review one paper combined medically prescribed drugs and alcohol usage (120). Another paper observed smoking (152) and one final paper evaluated alcohol intake after an MCI. These papers will now be discussed, but it is hard to draw conclusions from only two papers which observed substance usage post trauma. Those who had sought alcohol to numb emotion had an altered level of safety, higher perceived threat to life, were depressed, or had higher levels of peri-traumatic dissociation (126). Alcohol affects the central nervous system, giving the feeling of relaxation, and inhibits memory in the short term. However, it can cause more damage and for that reason it is a negative coping mechanism and often

makes psychological distress worse. Medical drugs and alcohol usage were associated with raised levels of PTSS in rescue workers following the Norwegian terror attacks (120); however, usage was higher among voluntary rescue workers - suggesting less resilience within this group. None of the papers discuss the consequences of alcohol or drug usage, only that it heightens psychological distress in the long term (120). A cohort study explored whether smoking can predict PTSD following a firework disaster (152). Their paper, although observational by design, did demonstrate that smoking could be an independent variable that could determine potential PTSD (152). It is something which should be screened for by occupational health, as it could be a useful marker for poor psychological functioning and useful for guiding tailored interventions.

In summary, individual coping mechanisms have been used to help prevent psychological harm; however, some can be more harmful than others, such as engaging in smoking or alcohol use. However, the papers do not discuss the full extent of the consequences of substance misuse. Social interaction has been noted as a buffer against psychological harm, but for some individuals socialising and discussing feelings can be difficult, and therefore organisations need to intervene. The literature suggests that a sense of duty, extensive training, and good teamwork, buffers against the distressing environment and can offer fulfilment, which acts as a psychologically protective barrier. Organisations should be aware of ensuring staff have regular breaks following a disaster. They should also note harmful coping mechanisms such as smoking and increased alcohol intake. This could not only impede employees future work but also be a sign of psychological distress. Further research is required within this area. No health care papers discussed intervention, and perhaps this is due to the lack of understanding of psychological distress within this occupational group.

#### 2.4 Limitations of the Narrative Review method

A narrative thematic analysis was used to ensure a broad overview of the topic and allow for a range of literature and research methodologies to be captured and represented. However, literature was only included if it was written in English, meaning important findings may have been lost if it was written and published in another language. Meta-analysis and systematic reviews were not included in order to prevent duplicate counting of literature, and therefore this review does not include their conclusions and findings, although any relevant papers included in systematic reviews but not identified via the literature search were included. A systematic review was not undertaken and therefore a quality assessment of the literature was not completed, which would have ensured lower quality studies were excluded from the review. UK studies were limited in number and only one study observed PTSD in healthcare workers (prevalence post the 2005 London bombings). The studies are

all descriptive and do not report interventions delivered to healthcare workers following exposure to MCIs. The overall evidence base lacked clear conclusions and did not adequately consider issues of bias or confounding factors.

## 2.6 Conclusion and Justification for Proposed Research

This chapter has provided a detailed narrative review of the literature relating to man-made MCIs and identified four main themes. It has shown that the majority of evidence relating to this consists of studies that explore the impact of terror attacks. There were also incidents where non-military health staff were involved in conflict and other man-made disasters, such as fires and transport crashes. Research has explored incidents globally, but with a significant focus on the US and particularly the 9/11 attacks. Notably, relatively little research has focused on the UK. The second main thematic finding was that mental health effects, particularly PTSD, are most commonly reported but that there is considerable variation in the prevalence of this. PTSS, depression, anxiety and increased substance misuse were also measured but have not been reported as much as PTSD in the literature. The third theme concerned the characteristics and risk factors associated with health and emergency staff, and that occupation may increase the harmful effects of being involved in an MCI. It indicated that health personnel may be most at risk of psychological distress, especially if they are personally surrounded by violence, had a past medical history of mental health, or had worked previously in a traumatic environment. Understanding what occupational vulnerabilities and protective factors are encountered within each profession would direct the intervention or support required post disaster. A range of risk factors and coping strategies were also associated with this theme. Positive affirmations and informal support from friends and family may help if it is after the event but not during, and worryingly most health care professionals are not seeking timely support.

Based on this review of the literature, the proposed research question to be explored in this thesis is as follows:

How are emergency healthcare staff in England affected by being involved in a mass casualty incident?

This research will explore the experiences of emergency service staff in the United Kingdom who have been involved in responding to MCIs such as the terrorist-related events in London and Manchester. As this chapter has shown, research to date has been relatively limited and focused on specific events such as the 9/11 attacks in the USA, and few studies have explored UK perspectives. There has been



some research around specific groups of healthcare professionals such as nurses (110), (111), (129), (144), (145), (122) doctors (127), (125), (114), (140) and paramedics (109), (152), (138), (137,142), (119), (44). A decision was made to explore the experiences of multiple professional health care groups, as it was thought that given the lack of UK data this would give a valuable insight into how different professionals respond to an MCI. It was also noted in the literature that during an MCI healthcare professionals have to work outside their normal duties (153) and therefore often take the role of other health care providers or work outside their scope of practice, hence their experiences are similar despite their job role being different. There has been increased media attention in relation to terror attacks in the UK and emergency staff, and recognition from professional bodies. Whilst anecdotal reports in the media suggest that trauma exposure generates distress and often mental health problems within emergency workers (154), empirical findings have been inconsistent, reporting varied prevalence of mental health issues mostly through quantitative reporting. This proposed research is argued to be necessary to better understand the effects of terror attacks which cause mass casualties, and how emergency staff may be affected by responding to them.

## Chapter 3 – Methodology

### 3.1 Introduction

In this chapter, the research methodology and methods considered most appropriate to answer the research question set out at the end of the last chapter will be defended and described. It will be argued that a qualitative, exploratory methodology is the most appropriate to explore this topic, given the lack of previous knowledge surrounding this population and infrequent use of such a methodology in this research area. In addition, semi-structured interviews will be argued to be the most appropriate method of data collection, involving a purposive sample of health care professionals, with subsequent thematic analysis (1). The chapter also includes consideration of the ethical issues associated with this research and gives a detailed and transparent description of the proposed methods, including sampling, recruitment, data collection and analysis. Throughout this chapter and the research more generally, Lincoln and Guba's (155) model of trustworthiness will be used, to ensure that the research is conducted in a credible, transferable, dependable, confirmable, and reflexive way.

### 3.2 Research paradigm

As noted in the previous chapter, previous research within the context of MCIs has been associated with quantitative design methodologies and methods. The literature review identified mostly studies which used a cross-sectional or longitudinal design. These approaches are important and can provide data to explore, for example, risk factors, or the effectiveness of therapies relating to mental health, physical health, and unmet needs of populations. These are founded on a positivist paradigm, which values quantifiable observations, and has been a dominant approach to research traditionally. However, a positivist epistemological viewpoint assumes that there is one reality with objective knowledge constructs such as PTSD that can be operationalised and assessed through quantitative data collection and statistical analysis (1). Positivist research is also often deductive, proceeds from existing theories or hypotheses, and seeks to test them in individual cases. Positivist quantitative designs also fail to consider other dimensions of the social world and are arguably not well suited to understanding and exploring phenomena in-depth. Mishler (156) highlights the importance of social and behavioural science in order not to lose contextual insight. Humans are complex, consisting of many meaning frames and realities, which when rated, for example on a scale, lose their ability to answer deeper, insightful questions (156). Discourses can be conflicting, depending on the context, the environment in which they occur, and the recall ability of the individual (157). The research

question being addressed in this study seeks to understand more of the richness and potential variety of experiences of UK frontline healthcare staff who are involved in responding to a mass casualty incident. It is argued that a positivist methodology may not capture such accounts adequately and would prioritise either hypothesis testing, or the generalisability of objective operationalised variables related to this topic. In contrast, a qualitative methodology is argued to offer more advantages and be more suitable to explore this topic and to answer the research question. In the next section, a more detailed account is provided of a qualitative methodology and particularly the epistemological and ontological claims that are associated with it and assumed in this study.

### 3.2.1 Ontology and epistemology of proposed research

In contrast to the dominant positivistic paradigm in much previous research, this research will be grounded upon an alternative (and what has often been considered a competing) interpretive constructivist epistemology and associated ontology. An interpretive constructivist paradigm recognises that there may be multiple realities and suggests that individuals' understanding, and interpretation of the social world is important and crucially gives order and meaning to the environment in which they socially interact (158) (159). Using such a paradigm has implications related to epistemology and ontology - about knowledge and existence respectively – which it is important to set out before considering the methodology and methods in more detail. From an epistemological perspective - of what is known or how knowledge can be gained (1) - interpretivism is associated with the view that there is not one objective and knowable truth, and that truth is individually and socially constructed (160). The epistemological implications of interpretivism are that the researcher and research subject have an interchangeable impact on the social world, with knowledge being considered as subjective. However, it is only by studying the lived experience of an individual that knowledge can be gained from the social world (161). Ontology is concerned with human existence and the characteristics of social entities (160); theorists of social construction acknowledge that understanding of the world is constructed and grounded upon the individual's interpretation, which they have conceived from gaining knowledge from their social environment (162) (163) (164). This means that one person's views of reality may be different to another's, depending on their culture, religion, past experiences, or education. Social construction theory consists of a broad framework that rejects single truth and argues that there are multiple ways of seeing the world (multiple realities). Constructivist theory asserts that truth about the world is constructed through people themselves, via language, culture, representation, and social interaction rather than being discovered (160). The two theoretical standpoints of constructivism and interpretivism are argued to offer a theoretical

framework within which to explore the research and best answer the research question of this thesis.

### 3.3 Methodology

To gain an understanding of how MCIs may affect front line emergency health workers, an approach to exploring this topic is needed which captures the depth and richness of the experiences of those involved. As set out above, the research adopted a constructivist approach to knowledge and reality and valued an interpretivist position, which accepted that there may be multiple interpretations of social phenomena, such as those under investigation in this study. A qualitative methodology was argued to be most appropriate to this to gain an understanding of the richness and complexity of phenomena. A deeper understanding of the individual's meaning frame was gained with a degree of complexity that is not usually offered within other methodology, such as a quantitative methodology (160). Qualitative research allowed for further probing to ensure the correct understanding of the individual's experience was gained, and enabled individuals to represent themselves, in their own voice, expressing their viewpoint without being subjected to predetermined or biased observations (165) (160). The defining characteristics of qualitative research emphasise a more inductive approach, giving priority to individual accounts (and possible theory building) and greater emphasis on the depth of individual experiences and views, in contrast to quantification and enumeration of social phenomena. Qualitative research emerged and associated with key approaches such as ethnography.

Having argued that a qualitative methodology is important in trying to answer the proposed research question, it was then necessary to explore which of the various qualitative methods of data collection was most appropriate for this research, and in the following section, several key methods are considered in turn.

### 3.4 Methods

Qualitative methodologies are associated with a range of different methods and forms of data collection. Indeed, some such as ethnography, which is considered later, are arguably considered to be a combination of methodology and method. In this section, three common methods were considered: focus groups, ethnography and participant observations, narratives, and finally the method considered most relevant; semi-structured interviews.

Focus groups are a commonly used approach in qualitative research. They capitalise on group interaction and offer a quick and convenient method for collecting data (166). They suit an exploratory study and are effective in gaining knowledge surrounding attitudes and experiences (166). Group interaction often encourages discussions to flow between the group, thereby yielding rich data (166). However, this method would not have been appropriate for this topic, due to concerns regarding confidentiality of this approach and the potential for some staff members to opt out of sharing their experiences due to fear of being stigmatised, or of feeling uncomfortable sharing emotion in front of colleagues. Furthermore, focus groups would have required several staff to be available at the same time, which would probably not have been possible, due to working patterns of frontline healthcare workers and the COVID-19 pandemic.

A second common data collection method used in health-related research is ethnography, and particularly the use of different forms of participant observation. This involves the collection of qualitative data through the study of people and culture, following naturalistic assumptions (163). It requires the researcher to immerse themselves in the environment and observe and interact with the surroundings, either as a participant or non-participant observer (160). This can involve living alongside the group that is being studied. By being a part of something, the researcher can better understand the problem. This research approach also involves investigating the views of individuals and skilled researchers and should be empathic, ask open ended questions, use spontaneous conversations, and evolve a deep understanding of the world through lived experiences (163). It has strong connections with anthropology. However, there are also disadvantages to using this method. Ethnography is time consuming and can be costly due to the long periods of data collection. It can also be difficult to gain access to certain groups (160). This method can only study one group at a time, and therefore was deemed not appropriate for cross-site populations. This research aimed to explore the effects which mass casualty incidents have had on a population of emergency health care workers, which included nurses, doctors, paramedics, and non-qualified staff members. It would also have also been difficult to gain access, in an observational sense, due to the nature of their work, which is often confidential and highly dangerous. In addition, the extent to which an ethnographic approach offers

potential to explore the impact of MCIs in the absence of such an event happening during the research was an issue.

Finally, the use of narrative interviewing (and associated story telling) was considered as a possible method as it is beneficial due to the natural form of communication as a form of data collection. Individuals often communicate in narratives when socialising (157). When storytelling, the individual gives the narrative a start, a middle and an ending, and they are also able to emphasise and explain their meaning frame (167), thus giving the researcher greater insight. A more recent and specific type of narrative interview relates to free association narrative interviews. These emerged as a method for exploring sensitive topics when defended accounts may be anticipated, and draws heavily on Freudian psychological concepts (157). These were potentially suited to this sensitive topic, but several factors led to it being rejected. Firstly, narrative interviews are time consuming, often requiring participants to be interviewed for a few hours, to gain in-depth content. Narrative methods are focused on the individual; therefore, the sample size is kept small, which can lead to the risk of data being interpreted as lacking saturation and substance (168). It also relies on the individual being able to express what they have experienced in an articulate manner, which the researcher is able to make sense of. However, if the subject area is somewhat difficult or traumatic to discuss, important information may be lost due to the participant being reluctant or unable to articulate their thoughts and feelings. Emergency health care personnel are busy and consequently narrative interviews were thought to be too time consuming, and this itself may have led to the participants being less willing to participate.

Ultimately semi-structured interviews were selected as the most appropriate method to collect data. They were compatible with the study's social constructionist paradigm, which believes meaning is constructed through social interaction. The theoretical perspective is interpretivism, and consistent with this perspective, semi-structured interviews were used to collect data, as this method of data collection is flexible and sensitive to researching a potentially sensitive subject. These interviews involved pre-designed questions and topics. This type of interview has the flexibility for questions to be asked in a different order, and gives the researcher the discretion to probe the interviewee further when more depth is required in order to thoroughly understand the answer provided. It was recognised that the topic matter is sensitive and health professionals may have been defended subjects (157). Therefore, to ensure that rich data was obtained for analysis without being overly intrusive, there was an emphasis on ensuring questions were open rather than closed. It was recognised that there might have been some conflict between the interviewer and interviewee as they both brought their own feelings and attitudes to the emerging data and themes (161). However, reflexivity was used to aid this potential conflict by the researcher reflecting on their own motives,

preconceptions, and emotions, which enabled them to be transparent in the research and identify how conclusions had been made.

So far, this chapter has set out the reasons why a qualitative approach was considered most appropriate and has described the use of a specific method; semi-structured interviews, which are particularly suited to this topic and research question. In adopting this approach and method, an associated set of methods, namely, multiple semi-structured interviews, was necessary. The chapter will now continue with an introduction to the research strategy, including sampling and recruitment, and a discussion of thematic data analysis. It will then conclude with the consideration of three key further issues: how quality and trustworthiness in qualitative research was achieved, research ethics issues, and reflexivity.

### 3.5 Researching a Sensitive Topic

Although health care workers are not perceived as a vulnerable population, their work is often sensitive and confidential. Media intrusion and sensationalism can lead to health professionals not wanting to discuss their work or the experiences of working in such events, due to fears of being stigmatised, losing work due to ill health, or the fear of being shunned or blamed (109) (111). Qualitative methods are receptive to the study of sensitive topics or research involving vulnerable populations (169), due to the flexibility and fluidity of qualitative research, which is intended to gather meaning and subjective experiences from the lived world (170), offering a place for an individual to share their perception of the world which they inhabit. This can be therapeutic for some individuals, as it gives them a voice to discuss their perspective without stigma or marginalisation by the organisation in which they work (165). The feeling of being listened to can be very emotive as qualitative work goes deeper than just asking 'why?' but rather ask the interviewee to share their experiences and its significance to them (165). This can go further than quantitative methods, providing an opportunity for health care staff to express their experiences in their own voice.

Due to the potentially sensitive nature of the topic, it is vital that the researcher gains trust and rapport with the interviewee (165). To gain trust, the researcher was respectful of the interviewee, which was deemed essential to aiding a positive relationship. A positive relationship assisted in the transfer of information, by enabling the interviewee to feel comfortable and at ease. The interviewer ensured the participant was comfortable by making them aware that they could stop the interview at any time, ensuring the participant was comfortable in their surroundings during the interview, and lastly, making sure the participant knew that no one else could hear them and that the interview was being

conducted in private area. Signposting to services was available should the participant request information on formal support, and this helped build trust. The latter was especially important and ensured that the interviewee knew that the researcher had considered their welfare (165).

The emotional burden that the research could potential have on the researcher was also considered. The data included some upsetting descriptions of certain incidents and although the researcher had a background in health care, the research team were aware of the emotional burden this research could potentially have on the researcher. Gubrium and Holstein (171) found that the emotional weight of conducting research is often not discussed or written about. It is thought that the lack of discussion surrounding this is due to researchers being concerned about bias (172). It is also recognised that when researching a sensitive topic, the researcher can be subjected to emotional labour or become distressed themselves (172), (173) due to the nature of the data collected. Researchers can be affected personally, which can cause distress in other parts of their lives or feel a sense of responsibility to perhaps help the participants (174), therefore researching sensitive and emotional subjects can be mentally draining.

To prevent any psychological harm to the researcher in this study it was decided that during data collection supervision would be given after each interview in order to discuss anything traumatic or difficult but also release any emotions. Secondly the researcher had good peer support and although not required the researcher was aware of the University counselling service. During any of these discussions confidentiality of the participants information was always maintained. Another protecting factor encountered by the researcher and noted in the literature is the position of privilege. To feel that the research may bring about positive change and the knowledge that individuals are entrusting you with their accounts to improve their lives and give themselves a voice. This can be empowering for the participants and give the researcher immense gratitude. This is also further discussed in the section reflexivity.

### 3.6 Sampling and Recruitment

Purposive sampling was used to ensure that the appropriate participants were recruited. Participants were continued to be sampled and recruited until theoretical saturation was achieved - following concurrent analysis. Purposive sampling is a typical sampling strategy in qualitative research, as it allows for in-depth understanding and awareness of the population of interest (175). A sequential approach was used to start with, as two different sites were used as case studies; London and Manchester (both of which had recently experienced MCIs). This was an evolving process of adding



more participants to answer the research question fairly (160). Two geographical sites had been chosen to ensure theoretical saturation was achieved. Difficulty in recruitment was considered before the study commenced, as it was noted that there may have been difficulty due to migration of staff or unwillingness to participate due to the sensitivity of the topic and work commitments. It was also thought that different events may have demonstrated different experiences, and this was deemed important to note should it occur. Snowball sampling was also used, which involved the researcher asking participants who met the eligibility criteria to pass on the research information to others that they thought may be interested in taking part. The researcher did not approach any participants personally but rather handed their contact details to be passed on. This method is used frequently with hard-to-reach populations, when the feasibility of purposive sampling is difficult (160). It was known that the health services population may be difficult to recruit, due to the nature of their work, migration, shift patterns, and concerns of being stigmatised following discussion surrounding an emotional topic. Asking participants to introduce the researcher to others gave access to otherwise unknown networks (176) and allowed for barriers to be diminished between participants and the research team. Confidence in the researcher was gained through knowledge that others have participated and recommended the process.

Using more than one sampling approach is common within studies, it is deemed to strengthen the study and enable a larger sample size (160). Liamputtong (165) recommends using one or more sampling methods when researching hard to reach populations, and suggests snowball sampling as a good method to utilise. Snowball sampling helped identify staff who had migrated to other hospitals or departments since the mass casualty incidents occurred.

The eligibility criteria for study participants were defined as a minimum of one shift working at the site of one of the incidents (Westminster Bridge, 22<sup>nd</sup> March 2017; Manchester Arena Bombing, 22<sup>nd</sup> May 2017; London Bridge, 3<sup>rd</sup> June 2017; Finsbury Park Mosque, 19<sup>th</sup> June 2017; and Parsons Green underground station, 15<sup>th</sup> September 2017) or the hospital in which casualties were cared for (see Table 6). Hospital participants must have worked in the emergency department and have cared for at least one casualty attending the department during their shift. Those who attended the scene must have been employed by the North-west Ambulance Service or the London Ambulance Service. Participation was encouraged from a diverse range of occupations. It was deemed important also to include both junior and senior staff members to ensure that different levels of training were incorporated into the research. Additionally, the study set out to explore different occupational groups within the health service, including nurses, doctors, paramedics, newly qualified staff, junior doctors, surgeons, A&E consultants, Nurse in Charge, Matron, and unqualified staff members, such as

health care assistants, cleaners, and reception staff. The two geographical locations were Manchester and London, as it was thought that these may offer different perspectives due to the differences in events. These were chosen due to the events above taking place within these locations. Hospitals and the ambulance services were located via the news reports naming these sites as the responding teams or treatment centres. These are clearly listed in table 6.

**TABLE 6: RECRUITMENT SITES**

<b>Location</b>	<b>Site</b>
Manchester	Royal Manchester Children’s Hospital
Manchester	Manchester Royal Infirmary
Manchester	Stockport NHS Foundation Trust - Stepping Hill
Manchester	North West Ambulance Service NHS Trust
London	St Mary’s Hospital – Imperial College Health Care NHS Trust
London	Kings College London Hospital
London	London Ambulance Service

Firstly, to aid recruitment, managers from the selected hospitals and ambulance stations were approached, informing them about the proposed research and asking if they would act as gatekeepers by identifying staff who had been involved in the recent mass casualty incidents in London and Manchester. Once identified, personnel who attended the site of these incidents or cared for people involved in hospitals, were invited to participate. They were then asked to identify others who may wish to be involved, by passing on the researcher’s contact details. Posters advertising the research were sent to managers and displayed in staffrooms or staff common areas to encourage staff to come forward, this had helped recruitment in similar studies (110). Participants were encouraged to take part by highlighting that this research may help other health care emergency services personnel in the future. However, during recruitment, several problems arose; these, alongside the amendments made to the ethics and recruitment process, will now be discussed.

### 3.7 The sensitivity of the topic

There was a known sensitivity surrounding the topic, and the research team was aware that this could make recruitment difficult. The research question was carefully framed so as not to misdirect social conception or sensationalise the topic (177). Appropriate methods were also chosen to ensure that participants could share their experiences in their own voice and be in control of what they wanted to share with the researcher. As discussed already, qualitative methods are receptive to the study of sensitive topics or research involving vulnerable populations (169), due to the flexibility and fluidity of qualitative research, which is intended to gather meaning and subjective experiences from the lived world (170), offering a place for an individual to share their perception of the world in which they live. The sampling method was purposive and was later widened to include multiple geographical locations, and staff from both the NHS and private health care services. Snowball sampling was useful as participants passed on the details of the study to others and encouraged them to participate. Liamputtong (165) explains that the benefit of snowball sampling is that researchers can recruit hard to reach populations through a familiar source, where trust has already been built. This strategy helped generate further participants.

#### 3.7.1 COVID-19 Pandemic

The COVID-19 pandemic caused several interruptions to the data collection. Firstly, recruitment was paused due to the NHS and other funding bodies suspending research to prioritise COVID-19 clinical trials, redeploy staff, and ensure staff on the front line were able to focus on their patients (Please see appendix G for email) (178). The second challenge, once recruitment could commence again in August 2020, was logistical because face to face contact was not allowed, and perceptions and willingness of staff to talk about mass casualty events after working relentlessly during the pandemic. Telephone interviews had already been planned as there was the notion that these could be preferable to busy health care staff rather than face to face especially in view of recruiting from a large geographical area (Manchester and London). However, COVID-19 had impacted the willingness of participants to be involved in the study, and therefore amendments were made, and ethical approval granted. Firstly, the inclusion criteria were widened to include any relevant healthcare professional who had experienced any type of mass casualty incident. Previously the study referred only to seven specific incidents in England, where high profile MCIs had occurred (Manchester Arena bombing, London bridge terrorist event, Grenfell Tower etc.) but this had not resulted in sufficient participants. The inclusion criteria was therefore extended, for the study to sample from private healthcare providers as well as the NHS (for example, private ambulance services), and lastly the research team widened the promotion of the research and invitations to prospective participants to include social media sources

(for example Twitter, Facebook) and personal networks and contacts of the researcher team (Please see appendix H for Twitter message).

### 3.7.2 A public enquiry in Manchester

During the recruitment stage, Manchester held a public enquiry into the arena terror attack. This meant that some organisations and staff declined to participate in the study due to associated sensitivity surrounding the research (appendix G for email). As stated above, to increase the sample size and overcome this, the study inclusion criteria were widened to include different locations and participants who had been involved in any MCI. A website was created to advertise the study (appendix I) Participants were recruited from Manchester, London, and Nottinghamshire.

The literature review identified that there had been minimal qualitative research surrounding this topic. The sample sizes of the studies varied between 13 to 419 participants (44) (110) (132). This study aimed to sample between 15-20 across occupational groups to enable the research question to be answered. However, for the reasons above, recruitment was extremely difficult despite the amendments made. The sample size needed to be large enough to ensure the data collected was sufficient and detailed enough to answer the research question with confidence and trustworthiness (179). Ten in-depth interviews were achieved, and saturation of the data was noted.

### 3.8 Data Collection

Following on from the sampling and recruitment methods, participants were identified, and the interview was scheduled at a time convenient for them personally, to aid participation. The first interview was conducted face to face at the participant's home, a place they chose and felt comfortable in, and took place before the COVID-19 lockdown. Braun and Clarke (1) state that face to face interviews lend themselves well to exploratory studies, which seek understanding or construction of ideas. The remainder of the interviews were conducted via the telephone once research could recommence. Telephone interviews were used due to the pandemic, and to appeal to participants with busy shift patterns. All participants filled out a consent form before taking part in the study (see appendix D for the information for participants and appendix E for a blank consent form). Semi-structured interviews were used and on average interviews lasted 45-90 minutes (Please see appendix F for the interview guide). All interviews were audio recorded and transcribed by a transcriber after the interview. Field notes were also made during the interviews, and a research diary was maintained. Braun and Clarke (1) identify several key principles when undertaking a semi-structured interview, which were followed to collect rich data these were:

- 1) Opening the interview. The researcher welcomed the participant by introducing themselves and thanking them for their time and participation. At this stage the researcher reiterated some of the ethical principles, such as why the research is considered necessary, and that the participant can stop the interview at any time. This was also documented in the participant information leaflets. They were also made aware that there was no wrong or right answer, and were given the opportunity to ask any questions during and at the end of the interview.
- 2) The use of open-ended questions. The opening question was broad, to put the participant at ease and prevent the participant from responding in the manner that they perceived to be the one expected. Careful consideration was given when designing the questions, and the first few interviews acted as a pilot to ensure that the question were robust. Questions were semi-structured, and allowed for some spontaneity with regard to adding questions to probe the interviewee further without leading (1). Having had a less structured opening question enabled the participants to speak freely, giving a richer, more detailed answer.
- 3) Elicit speech. People's ability to tell a story differed, and some were happy to talk whilst others were not as comfortable. They may have felt guarded or worried about not answering the question correctly, or worried they had nothing of worth to say, seeing the researcher as someone who only wants to collect interesting information (157). However, the way in which they told their story, the pauses, the non-verbal communication, the language used, and any inconsistencies, were all clues to the individual's experiences. When the questions were planned, thought was given as to how best to ask them, to gain a rich detailed answer, rather than a short response. The researcher showed empathy to enable a rapport to be built between the researcher and participant but, the researcher was aware too much could be leading. Caution was employed when giving encouraging responses, to prevent leading or interrupting the interviewee's natural flow. Silence was also a useful tool to encourage the participant to continue talking, without having to probe with another question (1).
- 4) Avoid 'why' questions. 'Why' questions were avoided to prevent short responses. They can also be seen as probing and therefore encourage the participant to say what they think the researcher is looking for. Braun and Clarke (1) recommend the use of silence, to generate a gap which, the participant has permission to fill, or asking for examples or classification.
- 5) Follow up using the interviewee's ordering and phrases. Active listening was used as a method to ask follow up questions in the order of the narrative and language of the participant. Precise notes on the order of what was being said were made to aid this (180) (1). This prevents deviation from the participants' meaning frame, ensuring consistency and the prevention of

misinterpretation. It also aids the continuation of the participant's trail of thought so that they are not cut off (180).

- 6) Ending the interview. Participants were welcome to ask any further questions and thanked for their time, which ensured that the participant was aware that the interview had ended and prevented them adding any information after the digital recorder was turned off (1). It also showed the interviewee that the researcher was interested in their opinion or concerns, therefore demonstrating respect and a working partnership in the exchange of knowledge (165).

Reflexivity and subjectivity were noted as important concepts when producing the data, as the researcher them-self brought their own needs and unconscious thoughts to the interview; they unintentionally hold judgements. The way the interviewee observes the researcher will have influence on the information they presented, so it was important to be mindful of this during data collection and the analysis (157). Reflecting on this shared dynamic is important. Both the participant and researcher will have projected and interjected feelings or thoughts about each other in a non-verbal manner (157). A research diary was therefore maintained throughout to note these personal reflections, potential tensions, non-verbal cues, and discomfort which may have occurred during the interview.

In addition, although formal piloting using participants was not subsequently included in the study (as occurs in quantitative research), two processes were used instead. Firstly, previous hospital work colleagues with similar experience were asked to respond to the proposed interview questions and to give feedback on their suitability; secondly, as is common with most qualitative research, the first few interviews were used to further refine the questions. Coupled with on-going analysis, this ensured that the interview questions were relevant and appropriate. The interview questions were modified after the first two interviews as the inclusion criteria was also updated.

### 3.9 Interpretation and Analysis of Data: Thematic Analysis

There are many possible approaches to the analysis of qualitative data. Some of these are more specifically associated with particular methodologies, such as interpretative phenomenological analysis (IPA), structural narrative analysis and grounded theory. These were not considered appropriate for this research, due to their more specific theoretical or epistemological assumptions. The analysis considered most appropriate was Braun and Clarke's (1) six stage thematic analysis. This is an influential and commonly used technique, which enables the researcher to analyse data by

examining, interpreting and evoking themes from across many different data sources, including interviews (181). It also allows for patterns to be formulated using an inductive approach, to gain knowledge surrounding frontline emergency healthcare workers' experiences during a mass casualty incident. It is described as a method, rather than a methodology, due to its flexibility in theoretical and epistemological approaches (181). Thematic analysis remains independent of either theory, or an epistemological position; hence not restricting the research to an ideal and allowing for a sample size which enables saturation of the data (1). Thematic analysis offers a foundation for learning qualitative methods and allows the novice researcher to gain key skills to build upon (182). It has a systematic, six staged approach to data analysis, but offers no restrictions to data collection, or theoretical interpretation.

Limited research has been conducted in the UK exploring the experiences of health care professionals responding to mass casualty incidents. Only minimal qualitative studies have been identified in the literature review; therefore, it was important to allow the data to guide the theory, rather than allowing analytical preconception to determine the data (1). To ensure that data analysis is more than just a description of the data itself, a latent level of analysis was incorporated; this involved interpretative work, which generated meaning, underlying ideas, and potential psycho-social theories.

Thematic analysis has a systematic six steps to interpretation and analysis of the data (1).

- 1) **Transcription and familiarisation with the data:** The interview audios were transcribed using a transcriber, although the audio was played back a few times as this aided the researcher to think about what the interviewee was communicating. It is seen as a vital phase in interpretive qualitative research (1). Listening to the audio recorder of an interview can allow the thought processes needed to gain meaning from the data, and notes were taken where there were pauses, avoidances, hesitations, or changes in tone (157). The verbal account was documented word for word, exactly as the participant has vocalised it. Punctuation, language, style, and grammar was not changed, as this could have altered the meaning frame. Once transcription was completed, the content was read and re-read, alongside the field notes. Breaks were taken for the researcher to gather their thoughts. The process of re-reading the data allows for immersion, as it is important that the researcher is familiar with the content, to gain an in-depth insight into the data. This assisted with the next phase of generating codes and themes.
- 2) **Generating initial codes:** This research was data driven, therefore it involved semantic coding, as no interpretation was made at this early stage; but rather a reflection of the explicit content

of the data. This aided the development of themes later. The computer software NVivo was used to aid the analytical process, and paper diagrams to help visualise the codes. All pieces of information deemed important for answering the research question were coded.

- 3) **Searching for themes:** Once the initial codes had been generated across the whole data set, the codes were sorted into broader patterns of data, known as themes. This stage involved a latent level of analysis, of interpretative work and the construction of configurations within the data (1).
- 4) **Reviewing themes:** This stage involved a process of checking the themes against the full data set, ensuring they made sense and were refined. A thematic map was created at this stage to aid the process of refining. The full data set was re-read to ascertain that there were no more new codes and that the themes fit well within the data. This process aided credibility and ensured that the findings were correct.
- 5) **Defining and naming themes:** At this stage the themes were refined, and produced an informative story of the data. A detailed analysis was performed, to demonstrate how each theme fits into the overall story. Themes were titled in a way which was deemed informative to the narrative.
- 6) **Producing a report:** This stage involved the revised and finalised themes. They were written-up and included a completed story of what the data found in relation to the research question. Existing literature was later used in the discussion to help contextualise the narrative and demonstrate how it has added to the existing knowledge.

Although Braun and Clarke (1) describe thematic analysis in six stages, it is not linear, and the process of analysis can be recursive. Therefore, some stages were repetitive, and re-reading the transcripts and reconsidering themes was undertaken to produce credible themes.

### 3.10 Ethical aspects of proposed research

Ethical approval was sought from the School of Health and Related Research (SchARR) ethics committee at the University of Sheffield (appendix C). As the study did not involve NHS patients or their un-anonymised data, NHS research ethics committee approval was not required. However, as this is human participant research, ethical approval was required, and this was obtained via the departmental University of Sheffield research ethics committee in SchARR. A data management plan was also produced to ensure that personal data in the form of contact details and audio recordings were processed and stored appropriately. In accordance with Health Research Authority procedures,



approval was sought from them for local R&D governance approval because NHS staff were being sampled. This was done via the Integrated Research Application System (IRAS) online system. A risk assessment form was also completed to ensure safety of the researcher and participants whilst carrying out the interviews. Amendments when needed were created and again approval was gained University of Sheffield research ethics committee in SCHARR, and IRAS were also updated (appendix C).

Having a suitable understanding of the ethics methods safeguards both participants and researchers against harm during the process (183). Guidance on questions was sought and carefully considered, with the ethics committee's approval. A participant information sheet and consent form were issued, ensuring the participants were aware why the research was being conducted and how the data would be used. Participants were made aware that they did not have to take part in the study and that they could withdraw at any point before anonymisation, and that their information would be withdrawn from the data. They were also aware that they could stop the interview if they were upset and that they would be signposted to occupational health for support. No transcripts were identifiable, as no personal information such as names, date of birth or email addresses were stored on the transcripts. Instead, each participant was given a unique number code. All information has been kept secure and confidential, via an encrypted device.

Anonymity and confidentiality were discussed with the participant before any information was collected, so that they could ask questions. The limits of confidentiality were explained, since the research will be part of a thesis and may be published. Participant were notified that if any illegal activity was disclosed it may also need to be reported to the appropriate channels. Holloway and Jefferson (180) advised against making audios public: all names and locations were removed in the transcripts to preserve confidentiality. The use of multi locations (Manchester, Nottinghamshire, and London) helped safeguard against individuals being recognised in the text (Write up Stage). No names or sites have been documented. However, some family members or close friends may be able to recognise certain individuals through the narratives they have shared. Holloway and Jefferson (180) state that if the research is of public interest, it is in the best interest for the 'greater good' to share the information.

### 3.11 Ensuring quality and trustworthiness

Qualitative research has historically been deemed poor quality due to its lack of scientific rigour and validity (184). This is particularly notable when judged using criteria such as objectivity, reliability, and

validity, which are often associated with a positivist position. This section argues that alternative measures of quality can be used to support good qualitative research, which allow generalisations to be made beyond the sample. Lincoln and Guba (1985) suggest the use of trustworthiness and authenticity to ensure the quality of the research; these criteria have been used in this study. Trustworthiness is accessed using four concepts: credibility, transferability, dependability, and confirmability.

Credibility, similar to validity, aims to ensure that the data produced is correct. This research adopts a constructivist approach to knowledge and reality, and values an interpretivist position. The approach accepts that there may be multiple interpretations of social phenomena and therefore it is important to ensure that the information interpreted is a correct representation of what the participant was conveying. Triangulation was used to ensure credibility; this involved using different sources of data in the research process (Lincoln and Guba, 1985). Data were collected using open questions and semi-structured interviewing, which permitted the flexibility to ask follow on questions, to gain clarity and further insight. Field notes also added another source of information to clarify findings from the interviews. Recording transcripts, and ensuring transparency by allowing participants to validate the interview transcripts and themes found, will firmly validate correct interpretation, although unfortunately due to the timing of the PhD and COVID-19 respondent validation was not used (Lincoln and Guba, 1985) (1984). A second researcher (supervision team) however did look over the themes, and findings were discussed (Lincoln and Guba, 1985).

The second criteria for trustworthiness is transferability. This entails determining the likelihood of the findings being suitable to other populations (Lincoln and Guba, 1985). Qualitative research tends not to have a large sample size compared to quantitative research, making it important to consider the generalisability of the results. However, it can be argued that the in-depth nature of qualitative work and the richness of the data enables the reader to reflect on the ability to transfer the information (Lincoln and Guba, 1985). Information regarding the context of the data collection requires transparency for the reader, to aid their considerations as to whether the findings would be suitable for their own concept (Lincoln and Guba, 1985). Field notes, interview transcripts, sample size and demographics are transparent in this research.

Qualitative research uses interpretative styles, which make it harder to defend its reliability. Qualitative research cannot escape the premise of the influence which the researcher brings to the data. It also believes in multiple realities; therefore, it recognises that there is never a single interpretation (Lincoln and Guba, 1985). Dependability is the third concept in which Lincoln and Guba (1985) use in parallel to reliability. It is seen as a method of auditing. Lincoln and Guba (1985) recommend that the researcher keeps an audit trail, which demands that a record of all the research process is maintained. It is vital that the researcher uses theory to guide the collection of data and maintains transparency.

Demonstrating subjectivity to the reader, being reflexive and making the accounts present for the reader, will enable the reader to understand how the interpretation was produced (155). Supervisors have been used as auditors, to ensure that proper procedures have been followed throughout the research process. Transparency of data and the analysis is key to aiding dependability in qualitative research, although it does not prevent the possibility that the reader may have a different viewpoint concerning to the results produced (157).

Confirmability is the fourth criteria of trustworthiness and is parallel to objectivity in quantitative work. Qualitative research values subjectivity, as it is impossible to remove the researcher from having an influence on the data collected. Braun and Clark (1) explain that the qualitative research methods and the research paradigm accepts that the process is subjective; the researcher brings their own experiences, emotions, morals, views, and judgements to the research. This influence is applied to the data during the collection process and the analysis, but it is also two dimensional as the participant also brings their life experiences, morals, values, and emotions to the research (157). Subjectivity used correctly can aid the research, and this is achieved using reflexivity. Reflexivity aids the construction of trustworthy knowledge, allowing for transparency of both the research tools and the researchers perspective (155). Reflexivity will be discussed in the following section.

### 3.12 Reflexivity

As noted at the start of this chapter, a further aspect of qualitative research that will underpin this study involves reflexivity. This is considered to be an important part of qualitative research, and as knowledge is generated from formulating questions and listening to and analysing the data collected, reflexivity recognises that there is an interchange of influence between the researcher and the research subject (1). Qualitative research is often considered to be subjective as it is impossible to remove either the researcher's vision of the world from the data, or the interchange of influence between the participant and the researcher. Subjectivity used correctly can aid the research, and this is achieved using reflexivity. Reflexivity aids the construction of trustworthy knowledge, allowing for transparency of both the research tools and the researcher's perspective (155). By reflecting on their own motives, preconceptions, and emotions the researcher is able to be transparent in the research. This is known as personal reflexivity (1). One interview was conducted face-to-face; therefore, it was noted before the interview that our own presence and embodiment can influence what data is collected. Facial expression and body language will be exchanged between the researcher and the research subject, and this will shape the data. Functional reflexivity involves reflecting and being aware of how the research method, tools, setting and process may influence the data (1). During the

whole process, a research diary was maintained to record thoughts, feelings, and a description of the process, to assist the process of reflexivity. To maintain transparency of who I am as a researcher, I will now explain my background and my feelings and motivation before and during the data collection. During the data collection process, a diary was maintained to make note of reflective thoughts and to aid both personal and functional reflexivity. This account therefore will also give a reflective account of the data collection incorporating my positionality, my feelings and motivation.

I have ten years nursing experience in the National Health Service, predominantly in critical care. I have cared for patients who have suffered from trauma during car accidents and burns, but I have not been involved in a mass casualty incident. However, I have friends who have worked in accident and emergency during the Grenfell Tower fire and the London terror attacks in 2016. I am aware of their feelings during these shifts, due to conversations with them. My friends described the emotional tiredness, witnessing upsetting injuries, fears for friends working at the scene, stress, and personal anxiety for their own safety. Knowledge of this information had already given me insight as to what may be discussed during the interviews. I was therefore mindful not to use this insight to lead the interviewee in any way; Holloway and Jefferson (180) advise caution with such insight. I anticipated that I would be comfortable talking to health care personnel, due to my experience of working and communicating in a multidisciplinary health care setting. I had hypothesised before the interviews that some staff in front line emergency roles would be closed to talking about personal feelings and emotions, due to their image of wanting to be seen as being tough and resilient. I therefore believed that semi-structured questions would aid this, as the participant would be able to answer an open question and use their own narrative (functional reflexivity).

Starting the process of conducting interviews was a daunting prospect as I was aware this was only my second time conducting qualitative interviews, I was apprehensive about whether the semi-structured questions would generate rich data, and lastly, I knew the topic matter was of a sensitive nature and I did not want any of the participants to feel uncomfortable. I did inform each participant that I am a nurse, and I did this to reassure them that I was trustworthy and that I had some insight into their work. Chew-Graham *et al* (185) recommend such strategies, noting the importance of divulging the professional identity of the researcher. They noted that health care professionals were more open when being interviewed by someone in the same or similar profession. However, they warned that the researcher should be honest in the discussion, as this knowledge could result in richer data collection through the participants having more trust in the researcher, or they may have wanted to show off their knowledge or experience to seek approval, equally they could have been concerned regarding scrutiny, hence holding back on the truth. Also, because of their similar professions and common language, the participants may not fully explain circumstances due to an assumption that

the researcher will understand; equally the researcher may assume certain interchanges to be how they view the world (185). I had anticipated that I would be most nervous interviewing senior personnel, such as consultants and managers, as I recognised them as people of authority, who are busy and may have had restricted time. I was concerned that this could make me rush the interview in order not to inconvenience them. However, all the participants were happy to give me their time and wanted to discuss the MCIs they had been involved in. There were also concerns that certain topics of discussion may be uncomfortable not only for the participant but also myself. Therefore I always caught up with my supervisor after each interview to discuss any concerns and this helped me take the time to deal with the emotions which the interviews had evoked in myself. I was also able to talk to my peers without breaking confidentiality about anything that was troubling me, this was helpful. . After the first few interviews I did begin to feel more comfortable and relaxed asking the questions.

The first interview took place just before COVID-19 and involved someone I had once worked with. As we both knew each other well, I am sure this made Penelope less guarded and therefore the data obtained was rich. As it was before the national lockdown this interview took place face to face at the participant's home, which provided a comfortable and relaxed environment in we were able to enjoy a cup of tea whilst undertaking the interview. Face to face interviewing can be comforting when discussing sensitive information and can aid rapport (165). Although they discussed uncomfortable situations and graphic detail, I did not feel alarmed as I also share a nursing background and have cared for patients with traumatic injuries. However, when the participant became emotional and cried, I was surprised. I had never seen the vulnerable side of this person, and seeing them upset made me feel that perhaps I had not realised how much the work had affected them. The interview was paused at this point, and we had a fifteen-minute break in which I offered comfort; the participant agreed she was happy to continue.

The rest of the interviews had to take place via the telephone due to COVID-19, and the lack of face-to-face interviewing provided moments of feeling uncomfortable. I believe this feeling to have come from a place where I was aware of the sensitivity of data I was collecting and the impersonal disconnect of a telephone conversation. I found the telephone to be a block as I was unable to identify body language, and unspoken cues. This was also a worrying time due to the difficulty already discussed with recruitment. I wanted the participant to be aware that I really did appreciate the time and the information they were sharing with me. I wanted them to know that I understood that they were sharing potentially traumatic memories with me, and therefore occasionally felt like a counsellor, offering phrases of reassurance such as 'I have heard you', 'thank you for telling me that' and 'that must have been hard'. To be silent after they had described the personal reflections of MCI seemed

insensitive and arguably unethical. I felt grateful and in a privileged position to hear each one of the accounts given. This research gave these individuals a chance to discuss their feelings and emotions which some participants explained was cathartic. Knowing that they deemed the research needed and worthwhile was uplifting and made me feel helpful. As discussed before under 'Researching a sensitive topic' this feeling of helpfulness and gratitude acted as a protective barrier to some of the sensitive and emotional information gathered.

After the first few interviews, the interview scripts were updated, after we noticed that there was some very rich data emerging and that maybe we required more insight into these areas. This added further depth to the findings. We also added some follow up questions, since interviews were conducted on the telephone it was deemed harder to gauge non-verbal cues, and so at times more verbal information was required. This also aided understanding and allowed me to confirm with the participant that I had understood.

At times I recognised the situation they were discussing due to my own experience of being a nurse. I understood the frustrations around the lack of support, the blame culture, and the pressure of working in the NHS; the very reasons that lead to me deciding to leave the front-line and which actually motivated me to conduct this research. This could have led me to decide that this was a key theme and that there are multiple pressures within the NHS which led to burnout even before an MCI.

### 3.13 Summary

This chapter has defended and described the methodology and methods for this research. It has explored the epistemological and ontological assumptions and defended how the research proceeded to answer the research question. Previous research has predominantly used positivistic epistemology, valuing quantifiable data; this however fails to consider other aspects of the social world, and may not give access to the richness and depth of experiences of frontline healthcare personnel. Therefore, this study used a qualitative, exploratory method incorporating an interpretative epistemology with social constructivist theory as its ontological viewpoint. Semi-structured interviews were deemed the most appropriate method of data collection as they allow for questions to be adjusted and ordered in a different manner, and the researcher was able to use probing questions to gain a more insightful answer without leading the participant. Following data collecting, thematic analysis was used to analyse the data. This is a method rather than a methodology as it is not theoretically informed and allows for an inductive approach to this research. This is well suited to the study, due to the lack of previous qualitative research within the field and the experimental nature of the study. The topic is sensitive, and thought has been given and discussed within this chapter to ensure the research was conducted in an ethical manner which prevented further harm to both the participants and the

researcher, and allowed knowledge to be produced which was beneficial to both parties. A mixture of sampling methods was used; purposive, quota and snowballing. These have been discussed and were deemed best to aid recruitment, amendments were made to the inclusion criteria, recruitment, and sampling methods, and this has been disclosed. Careful consideration has been given to the ethics of the project and the importance of collecting and analysing data which is both trustworthy, and quality assessment has been defended.

## Chapter 4 – Findings

### 4.1 Introduction and overview

Eight key themes were identified which form the analysis of the ten interviews undertaken between January 2020 and August 2021. Of these eight themes, training, operational practice, and environment were linked and appeared to either improve a situation or make it more challenging, hence linking it to psychological impact. Institutions have a responsibility to ensure all staff members are trained and equipped with the skills they require to respond to their work. They require the operational expertise to ensure policies and procedures are correct and followed and, if done correctly, this will enable them to respond to the environment in an effective and controlled manner. Three further themes, job satisfaction, scrutiny, and support, can be seen to fall under the domain of human resources, which will be discussed within the discussion. Media relations however stands as its own theme, and finally psychological impact is a theme which is a by-product of the seven themes not providing the support which is required for staff to have a healthy mindset post disaster. The table below clearly lists the themes and displays the time scale when these themes took effect. This is important to note as interventions to support staff and aid resilience need to be established or introduced at certain time points. It also differentiates between internal and external mechanisms that are in force within the themes. The time scale of when these themes took place also aided the chronological approach to presenting the findings. Whilst interpreting the findings a pattern emerged related to time, before, during and after the MCI. This therefore naturally aided the chronological ordering of the themes. Some themes did overlap on time scale such as operational and job satisfaction and these therefore were written up in the order in which they systematically followed the previous theme. For example 'Operational' comes before the incident due to policy making and preparedness. The theme continues into during the incident when the procedures and policies are being followed and implemented and after the MCI when policies are updated. This theme followed training as training is a part of operational practice and preparedness. The following discussion will inform the reader of the findings. These findings have been formulated from the participants' narratives, and throughout the discussion, quotes have been used to clarify the interpretation.



TABLE 7: SUMMARY OF THEMES

Themes	Sub-themes	Type	Time
Training	<ul style="list-style-type: none"> <li>• Training and experience</li> <li>• Working with a team</li> <li>• Improvements to training</li> <li>• Reflection</li> </ul>	<ul style="list-style-type: none"> <li>• External</li> </ul>	<ul style="list-style-type: none"> <li>• Before</li> </ul>
Operational	<ul style="list-style-type: none"> <li>• Importance of plans and policy</li> <li>• Preparation and commencing the incident plan</li> <li>• Communication</li> <li>• Poor communication</li> </ul>	<ul style="list-style-type: none"> <li>• External</li> </ul>	<ul style="list-style-type: none"> <li>• Before/during/after</li> </ul>
Environment	<ul style="list-style-type: none"> <li>• Enormity of the event</li> <li>• The unexpected</li> <li>• Environment controlled</li> <li>• Importance of equipment</li> <li>• Safety and violence</li> </ul>	<ul style="list-style-type: none"> <li>• External</li> </ul>	<ul style="list-style-type: none"> <li>• During</li> </ul>
Job satisfaction	<ul style="list-style-type: none"> <li>• Duty and pride</li> <li>• Pride in helping</li> <li>• Vocation</li> <li>• Back to normal routine</li> </ul>	<ul style="list-style-type: none"> <li>• Internal</li> </ul>	<ul style="list-style-type: none"> <li>• Before/during/after</li> </ul>
Scrutiny	<ul style="list-style-type: none"> <li>• Blame</li> <li>• Fear of doing wrong</li> </ul>	<ul style="list-style-type: none"> <li>• Internal</li> </ul>	<ul style="list-style-type: none"> <li>• During/after</li> </ul>
Media	<ul style="list-style-type: none"> <li>• Humanity</li> <li>• Media negativity, intimidation, and intrusion</li> </ul>	<ul style="list-style-type: none"> <li>• External/internal</li> </ul>	<ul style="list-style-type: none"> <li>• During/after</li> </ul>
Psychological Impact	<ul style="list-style-type: none"> <li>• Living within the community of the MCI</li> <li>• Insecurity</li> <li>• Anniversary effect</li> <li>• Avoidance</li> <li>• Burnout</li> <li>• Delayed emotions</li> <li>• Trauma effects</li> <li>• The inquiry</li> </ul>	<ul style="list-style-type: none"> <li>• Internal – effect</li> </ul>	<ul style="list-style-type: none"> <li>• During/after</li> </ul>
Support	<ul style="list-style-type: none"> <li>• Getting the right support</li> <li>• Support for staff – Formal</li> <li>• Informal support</li> <li>• Gaps in support</li> <li>• Strained relationship</li> <li>• Making peace</li> </ul>	<ul style="list-style-type: none"> <li>• External</li> </ul>	<ul style="list-style-type: none"> <li>• After</li> </ul>

## 4.2 Recruitment and participant characteristics

A total of ten interviews were completed and data saturation was noted after the ninth interview, however recruitment was difficult for a multitude of reasons; sensitivity of the topic, COVID-19 and The Manchester public enquiry, which were discussed in Chapter 3. Recruitment and data collection took over one year (January 2020-August 2021) to collect ten interviews. Responses came mainly from snowball sampling and gate keepers. To ensure confidentiality and anonymity pseudonyms have been used at the end of participant quotations and in the table below. Where possible identifying information has also been removed for this purpose.

**TABLE 8: PARTICIPANTS**

Names	Occupation	Incident	Involvement with media directly	Hospital based or at scene
Penelope	Nurse	Terror attacks, stabbings and building fire	Yes	Hospital A&E
Meg	Consultant	Terror attack	No	Hospital – A&E
Edward	Consultant	Terror attack	Yes	Scene of the event
Mike	Emergency response Doctor	Multiple gang stabbing in inner city	No	Scene of the event
James	Ambulance Tech	Overcrowding at a concert	No	Scene of the event
Oscar	Consultant	Terror attack	No	Hospital A &E
Henry	Consultant	Terror attack	Yes	Hospital
Mary	Doctor	Terror attack	Yes	Scene of the event
Albert	GP	Terror attack	Yes	Scene of the event
William	Consultant	Terror attack	Yes	Hospital

## 4.3 Training

The first main theme to be described represents one of several external features of dealing with an MCI for health professionals. It was mentioned across all interviews and, although in one sense this was expected as it was a topic that was explicitly asked about in questions, it did appear to have significance for many. As will be shown, it represented a broadly positive influence, but it was also recognised that in and of itself, it was not sufficient and required important experiential learning, to *apply* training and skills; there was also perceived to be an inherent limitation to prior training in that it could not prepare people for every scenario and, in particular, the unexpected and unpredictable

nature of many MCIs experienced by participants. As will also be shown, training was also linked to aspects of roles, and the involvement of teams and others, and a sense of preparedness.

#### 4.3.1 Training and Experience

There was recognition among the participants that certain skills and attributes were needed in their chosen emergency medicines careers, such as quick decision making, remaining calm under pressure, flexibility, the ability to adjust to different work pressures, communication skills, teamwork skills, and resilience. In this respect, training offered a form of protection and a mechanism for helping participants manage the unpredictable. However, as this and the subsequent themes will illustrate, this could only prepare individuals so much for the unexpected, and experience and application of training and skills was recognised as being important also.

As individual accounts noted, responding to a mass casualty incident was often chaotic and difficult, as later themes about the emotional aspects will consider in more detail; recognising basic skills in how to assess a patient and having awareness of specific algorithms were argued to help create some sense of control within what were perceived to be often uncontrolled and difficult environments. Some participants explained that both their training and experience enabled them to navigate, help and manage their work during such rare but dramatic incidents. It made the environment more manageable but also gave a sense of satisfaction that they were able to carry out the duties for which they had been trained:

*'[...] when I got onto [site 1] I was so shocked, honestly it was the weirdest thing, it's like my medical brain had kicked in and it was like right 'am I going be fine?' but thankfully I wasn't that long out of clinical practice that I was equipped well enough that I could deal with it.'* Mary

Mary attended the scene of the MCI, whilst she was off-duty and, therefore, lacked equipment and the usual resources that would often be found in the hospital; for Mary, her basic training was considered invaluable to enable her to 'deal' with the situation. As some participants explained, training ensured that they had the processes or formula which enable them to assess casualties systematically and safely, no matter how chaotic the environment, hence making the work manageable and safe.

*'I think the training certainly helped with that and running through previous scenarios with the ambulance service at their training headquarters certainly helped to guide you into that mind-set of right this is happening, I need to do A, B, C, X, Y, Z in that order sort of thing.'* James

Training and scenario practice was deemed valuable by most of the participants, as during the MCI, individuals were able to be organised and have a clear mind set in order to prepare the hospital environment with the required equipment to perform lifesaving treatments. Training also gave staff members algorithms to follow, which can be helpful in stressful situations and ensure nothing is missed.

*'So, you kind of have to think, you have to go back to your training basically and think: 'what am I going to need? Who's around me? What's the process?' We do training on like P1, P2 [priority one and priority two – categorisation of urgency] casualties [...] And I think that the preparation that I have had and the training that we had, definitely made that really controlled, so it never felt chaotic in the major incidents.'* Penelope

Training also appeared to provide a protective element; however, participants acknowledged that training needed to be specific to emergency medicine, incorporating aspects of dealing with the unexpected, and working with little equipment in a variety of environments, which may be unpredictable. However, it should also be noted that experience linked back to training and was considered valuable. The health care staff, who were highly trained and had extensive experience, tended to speak in a positive and rational way about the incidents that they had been involved in, as Oscar notes in this brief quote:

*'I felt very much supported from previous experience of stuff to mentally process that whole incident.'*  
Oscar

The more experience a participant had (and also typically years of practice) meant that they were more likely to have undertaken specialised training. The more experienced participants, who were senior members of the emergency medicine team, tended to describe an increased resilience to MCI and appeared to have adapted their skill set to dealing with the unexpected, as there was little suggestion of panic or uneasiness. Some stated that they would have moved speciality if they had not become resilient, almost suggesting that their personality was suited to the type of work; they

reflected that many do leave after a few years, strengthening the idea that experience is a protective element.

*'It's a long time since I've actually felt an adrenalin surge from working in A & E. I think you learn to expect the unexpected and you train to cope with the unexpected.'* Meg

In trusts where MCI had unfortunately occurred more frequently, MCI training was considered paramount and even delivered to staff on their first day, with a perception that this helped staff understand their role and responsibilities during such events. This was very much the case for Penelope, who noted that:

*'I was quite fortunate in that sense that we had a lot of drills. So, we had a lot of simulation like practice like if a train station collapsed or something, we all had to like act that out in real time in the department in a couple of mornings and things'* Penelope.

Desk top exercises and simulation training, where staff were given a made-up incident and had to respond in real time, was a useful exercise. Participants felt that whilst nothing fully prepares staff for a MCI, there was a certain amount of resilience that could be gained by training, simulations, and experience of seeing trauma. Having knowledge of the environment and the team was also seen as a supportive protective element; however, this cannot always be granted to those working at the scene of incidents. Staff who were more junior who had not received adequate training or had not yet gained enough experience seemed to suffer psychologically after the incident.

*'I think when you see things first time, they are a bit more shocking. That's definitely true and then when you've seen things a few more times, it doesn't bother you so much.'* Mike

Senior staff noticed that their junior staff required the most support during and after the MCI. Participants stated that inexperienced staff lacked the confidence and knowledge to know what to do in the chaotic environment of the MCI. They then could not comprehend if they had done a good job, and as discussed in the theme scrutiny, this leads to internalised anxiety of the potential that they could have caused harm and may be blamed or punished. Participants stated that some junior staff struggled in understanding that they could not save everyone and therefore felt anguish over those that had perished. Therefore, training and experience were seen as beneficial and were a protective element to ensuring resilience.

*'My experience and things in very much in the immediate aftermath felt, that people most at risk and who seemed to be most struggling, and stuff were actually the lesser trained members of staff. I thought other members of staff and you could tell they were struggling because I think they just felt so unsure, so ill-prepared and so um, that they didn't really have a fear of influence and stuff and therefore they just seemed to really get battered by it erm, so I think definitely the training stuff made, makes a huge difference in order that you can walk away with a sense that you'd done your job, you'd done it well and there might, bad stuff might have happened but, you, you'd been there, you'd stepped up, done what you could do' Oscar.*

There seems to be the sense of gratitude within this quote that this type of training was vital. This sense of gratitude was also shared by others, as it enabled them to have the skills they required in order to help others and complete their job, but also equipped them with resilience and the skill set to ensure their mental health remained robust. This feeling of gratitude was captured by Henry,

*'I think it is, it is you know testament a little bit to the type of training that you get and err, and you know the, the roles that you play in emergency medicine that this type, you know, dealing with unexpected events that can on occasion be quite tragic you know does seem to give you some level of preparation for them. HR (yeah, definitely). So, thank you to all the people who trained me!' Henry*

In this quote, Henry refers to how the specific training he had received helped him deal with the unexpected and especially when dealing with highly emotive – and for him 'quite tragic' - events. What emerges is a sense that training gives health professionals the ability to be prepared for the unexpected and provides protection. However, limitations to training were noted, and later in her interview Penelope qualified her view on training and noted that:

*'[...] I don't think any sort of training prepares you for your actual feeling of the time that it is declared [the MCI]'. Penelope*

As Penelope conveyed, the experience of working in a real-life MCI was overwhelming to junior, less exposed staff members, and as she herself stated training is not robust enough to fully prepare inexperienced staff members. Other participants agreed, and believed that training and experience helped, however John added that personality is important to resilience. As he states;

*'Yeah, so there's two things there. Training and experience does help because you're not in- certainly in major incident land, if you're seen lots of trauma before, that is part of, that reduces the sudden impact of the major incident itself. So, you've seen that category of injuries and those type of things and you've been trained in them, and you feel competent in managing that group of patients, then you're less likely I think to suffer a significant emotional erm effect of it. But not to the same degree and you're less likely to get damaged by it I think [...] The second thing is that seniority itself is also erm closely linked with resilience because in ED, which is a consistently, persistently difficult area to work in, the only people who last for 20 or 30 years are the ones who have higher levels of resilience. The ones who are normal, so the normal people who look at emergency medicine and go this is insane why am I working here what the hell's going on, they've left. So, the people who are senior are actually quite a strange subset of individuals'* John

John summarises with three key attributes which he felt help resilience in an MCI. These were training specific to trauma care and MCI; understanding and having knowledge of incident plans and procedures, secondly, experience, as this enables individuals to consolidate their training and gain real life insight, and thirdly individuals need to enjoy trauma medicine and be suited to its unpredictable and unpleasant stimuli. In contrast, health care workers who were experienced and senior noted that when they worked in an area they were unfamiliar with during a MCI, they struggled emotionally.

*'We had trained with the ambulance service. So, I knew what the ambulance service capability was, but I never responded in the same way. I have done a load of exercises, major incident exercises, but never actually responded in such a big way with the ambulance service. So, I think it is an environmental thing.'* Edward

An unfamiliarity and a lack of training within the area they were made to work caused emotional strain. Edward suggests that even despite training the lack of experience with responding to the scene, rather than working in a hospital, caused distress. He states the unfamiliar environment in which he had not trained to work in was the cause of his distress. He had been used to working in the emergency department, where the environment is set up for treating casualties. This therefore highlights what many of the participants felt; that training needs to be tailored to the potential environment in which the individual will be expected to work.

In summary, training did help staff to be prepared and be able to work in a chaotic environment if they had trained in a similar situation. Experience enhanced training and enabled staff to deal with the environment in a manner which aided resilience. Personality was also deemed important, and if

individuals were suited to trauma medicine it was noted that they were then more resilient. Staff noted that junior members of the team struggled and required both support during the MCI and afterwards. Overall, staff deemed training to be an essential element to preparedness, aiding positive outcomes both for themselves and their patients, and they were therefore grateful for it. Participants also felt that training was important in ensuring that they understood their own role, capabilities and limitations within the wider team and stated that simulation training and routine work helped strengthen teamwork, which will now be discussed further.

#### 4.3.2 Working within a Team

As well as training being a protective factor for participants, understanding their role and capabilities within a wider team also appeared to be important. Simulations, policies and procedures, experience of working in emergencies situations, and an awareness of the team skill mix, appeared to be important factors in helping create and maintain a controlled environment at an MCI. Although simulations were recognised as being artificial, they were viewed positively in allowing health professionals to practice their skills in a safer environment and were linked to benefits such as increased resilience (which is considered in more detail later). As Oscar noted:

*'I felt highly trained; I felt I'd been involved in simulated cases and stuff. I felt that I therefore had a fairly defined role and had defined purpose and defined skill-set and that I'd done all of that and that all worked, erm, and we'd done things and I'd been involved in some cases when um smaller, much smaller level be it being one patient killed or whatever, I'd been involved in that and that had built up my resilience to incidents and stuff and knowing that we can only do what was within my power and what I could do. Oscar*

Participants felt team skill mix, which refers to the diversity of skills within a team, had an impact on the individual's sense of security. Within a hospital setting, participants shared experiences of understanding their role and responsibilities within the team, but also a strong understanding of the hierarchy. Knowing that senior team members were there to support junior members gave reassurance. It was also reassuring to have formulated good working connections within the team.

*'Was sort of like one minute. It was like just me and my colleagues who were allocated to where they were at the start of the shift and then suddenly, we had like ten or fifteen consultants. So, it wasn't like we felt in that sense it was quite reassuring because you had too much experience and I was quite*



*fortunate with my team that we had a really good working relationship because the team was very strong'. Penelope*

Working with an experienced team, and knowing what everyone's role was within that team, enabled a controlled and systematic work environment, which felt safe and supportive even in a highly challenging environment. Staff allocation and shift planning was seen as crucial in order to ensure there was a varied skill mix within the team. Participants also stated that every day working in the emergency department, in combination with training aided the team's relationships and inspired confidence in one another.

*'So, you knew that you had that support there, and you wouldn't be in a situation where like you know you wouldn't know what to do or you wouldn't know how to handle a situation' Penelope*

However, at the scene of the event things can be different, and crews are often working with people they have never met before. Participants who worked at the scene stated they had to be adaptable and have clear communication skills. Participants that had worked in both settings explained that the sense of familiarity described in a hospital setting can be lost at the scene and therefore these staff members strongly relied on their own capabilities and skills.

*'Of course, that's when you have got a team all practised and rehearsed, which of course you can't do when you have a team thrown together at the last minute in situations like this. It also means if there was an experienced crew there and they were student paramedics or ambulance techs there, they may actually at that point, go right, ok. I would like you to stand over there, or I would like you to come and help here because they would have not got a clue as to what would be happening. And then of course, we just keep that communication string going so that everyone knows what to expect what their role would be from the outset really.' Mike*

Mike emphasises that if teams are inexperienced or unfamiliar with one another, the team lead really needs to have strong communication skills with those individuals, to ensure they proceed in the correct manner. Here Mike also states that understanding not only your own limitations, but the limitation of the team can also be important, so further support can be called for; again, these skills come with both training and experience. The need for strong communication is, for Mike, vital in gaining that insight quickly into his teams' capabilities, especially when they are unknown to him. Reassurance and support seemed to be a key element in individuals' functioning well within a team.

When put in an unfamiliar environment with little knowledge of what had happened and little awareness of their role within that team, individuals felt vulnerable. This vulnerability can lead to feelings of frustration and later anger, due to the individual feeling unprepared. Edward was sent to the scene of the incident (an environment he had not worked in previously, as he usually worked at the hospital) when he was meant to be at the control room, coordinating staff. He therefore felt as if he was unable to work at his usual capable standard, as he was used to working in a controlled environment with equipment and a familiar team. His role had not been utilised effectively and he found himself unsupported and helpless, which later led to resentment of the team, and as he stated, impacted his own personal response to the incident. This statement amplifies the distress individuals can feel when put in situation in which they are not prepared for, supported in or trained.

*'It wasn't clarified exactly what had happened. And I waited to be collected by one of the ambulance officers who took me to the scene of the incident, and at the scene I took up the role of patient management basically. Now that was a different role to what I should have been doing. [Ok] So I should have been in the sort of the control room, the tactical control room giving clinical advice. So, there were a number of issues I had with the response, particularly in the use of the merit of team and the use of my role. And that had quite a substantial impact on my own personal response to the incident.'*

Edward

Working with a known, supportive team with a clear leader enabled a positive experience during an MCI. This structure was easier within the hospital as there were clear well-rehearsed protocols and staff were used to working with one another. At the scene this was more difficult, and staff needed to be confident in their own capabilities and ensure they used clear communication skills. Staff who worked at the scene accepted that they never worked within the same team, however some participants had been put in an unfamiliar setting as a result of protocols not being followed correctly, which led to them being extremely uncomfortable. This later caused them psychological distress. The next sub-theme will discuss the ideas participants shared with regard to improving training.

#### 4.3.3 Improvements to training

Participants discussed how training could be improved; they felt training should include discussion on what they may witness or what they may have to deal with emotionally. Alongside this, health care staff felt training should incorporate the normalisation of emotions and psychological well-being; if included in pre-incident training it would empower staff to put in place their own safeguarding. Participants wanted it to be noted that training needed to go beyond external measures of

preparedness, and had to address internal measures such as psychological awareness, to aid resilience.

*'But in that major incident training no-one ever said, 'if you feel really sad after this event, this is what you can do'. I mean at any point in my training, no-one has ever said 'oh you might see this', or 'this is a good way to deal with this', or 'you know what to do if you see this presentation' or how to manage it. No-one's ever told you about that.'* Penelope

Another factor was the expense of training; it was noted that although training was valued it was not budgeted for, and therefore was not delivered as often or effectively as it should have been. Oscar states the value of training and understands that it can help prepare staff mentally but that unfortunately it is an area that is neglected within the pre-emergency plans.

*'The training side as well because of that and with capacity issues and running clinical services are just so drawn, we don't then have the resources to put into training but then we don't budget to put into training -laughs- as well erm, so I think they're the kind of the big things that I feel we probably don't help erm with err mental, mental health wellbeing and stuff (yeah) with acute events.'* Oscar

There was also concern from senior staff regarding the current standard of training and the opinion that junior staff tend to lack the expertise and in house training that was taught previously. There were also concerns that simulations were almost a 'tick box exercise' but were vital for those staff members who were on the shop floor. It seems the training is highly valued and beneficial, but it not always prioritised due to lack of funding, or time and work pressures within the NHS.

*'I think they are good because it means people know what to expect. Far too often major incident management, although under certain contingencies people must exercise their plans. It is too often a tick-box on a Friday afternoon desk-top operation. And that may satisfy the act and it may mean that the managers know what they are going to do, but it means the people on the ground have no idea and aren't involved anyway. So, for them, the first they know is when it is for real. [Yeah] And then they haven't got time to think.'* Albert

Training was valued by health care staff interviewed, and therefore it needs to be considered in emergency planning budgets to better facilitate staff and enable them to feel mentally prepared. It is linked both externally, aiding skills, and internally, ensuring mental resilience. Another aspect of training and learning is reflection, which will now be discussed.

#### 4.3.4 Reflection

Allowing staff to reflect on the event and their involvement was seen as therapeutic, but also another chance to learn, train and develop. Reflective practice for the individual allows for individuals to learn from real life events, communicate their thoughts and feelings, and for individuals to gain a new perspective. Institutions can also use reflection to improve practice, policies and procedures. This sub-theme will now be explored.

Reflection was perceived to be a positive and healthy intervention to comprehend an MCI. Health care staff found its purpose enabled them to make sense of an MCI, but also to justify and authenticate participation and the individual's role in such events. Reflection was recognised as being both a public and a private activity; the latter being considered by some participants to be more helpful. Participants described public reflection as sharing experiences through formal methods, such as teaching or reporting findings after the event, which was seen to be cathartic. This was done in multiple ways, including debriefs, seminars, conferences, and the public inquest. It was also encouraged that staff who had not attended the event were also welcomed at debriefs to aid learning in case an event should reoccur. Participants also stated that private reflection done by themselves or discussed with a friend or colleague was perhaps more helpful, as they could be open and honest

*'People who hadn't been there who were work colleagues who were looking to learn lessons, be it the ambulance staff and things. So lots of different discussions and I think they all served different purposes in terms of helping drive that reflection. I thought it was quite helpful erm for me certainly.'* Oscar

Formal group reflection within the institution often took place during debriefs and offered personal learning, reassurance, and operational discussion within a supportive environment; more of this will be discussed within the theme 'support'. Reflection on an organisational level also helps develop and improve policy and practice, as Oscar explains below.

*'All plans are based on what's happened previously and if it is that there are unanticipated things then maybe we actually need to change the plan, so there'd be a bit of learning (yeah) yeah.'* Oscar

Not all reflection was deemed helpful, and especially in a group debrief session. Some found this intrusive and did not feel comfortable speaking up in a group situation, whilst others found that they had had enough of thinking about the event and wanted to move on. They wished to continue working, and to look forward instead of continually discussing the MCI.

*'There were two separate debriefs, one amongst the team and then one with the whole ambulance service. And I guess it was just a complete, really, I think what shaped my mood was the realisation that everything we had done prior to the incident in terms of planning, the senior level people who had behaved you know in a way that I felt was inappropriate in terms of being in the wrong place. They weren't going to change their minds and from their perspective they thought they had done wonderful. And they had. You know I was made basically to feel like that my opinion as to how things had gone was irrelevant. And that really hit me hard.'* Edward

For Edward the team debriefs provoked more upset and frustration that he was not listened to and that his experience had been made negative due to the incorrect placement of his skills. This later resulted in him taking time off work and requiring formal support.

Many institutions attend conferences to learn from previous incidents. It takes an incident to learn what is needed, as not all situations can be accounted for and pre-planned, therefore reflection aids training and further learning, and for this reason it was included in the theme dealing with training.

*'I think more afterwards if it's gonna happen but then the, the times I've felt like that and reflected after and start thinking did I do the right thing or did I not? You systematically break it down and work it through and it's like yeah, no, actually you did, you couldn't have done anything different.'* James

Reflection was mentioned a few times by participants, and often was linked to questioning their ability to have carried out the right action. To methodically look back on the incident and rationally consider what had gone well seemed to offer peace and reassurance, even if the outcome had not been a successful one. This type of reflexion was sometimes done less formally, and for some participants this took place privately.

Reflection was an internal factor that in many cases aided learning, both at an organisational and individual level, aiding the development of incident plans, identifying areas that required change, improving training methods, and allowing individuals to identify their own learning needs whilst also making sense of the situation. However, group debriefs were not also seen to be favourable, and for some participants these provoked further anger and distress.

To summarise this theme, training represents a generally positive influence and was implicitly linked to both external aspects (such as by being provided to participants as part of their work from employers) but also internal ones related to experience, mental health and how participants chose to apply their training in an MCI. The next theme Operational, will consider what the institutions had done to ensure staff were prepared and safe during the MCI, and the importance of good communication during such incidents.

#### 4.4 Operational

A further emerging theme which, in common with training was predominantly external in nature, related to the perceived role of different organisations, particularly in relation to procedures, policies, actions, or other processes for dealing with an MCI. This theme illustrates the value and importance placed on such operational preparedness and also how they were perceived to have impacted on health care staff. A further aspect of this theme, which will be described, related to views about how such preparedness planning was delivered during the incident and linked to aspects such as communication within the teams.

##### 4.4.1 Importance of plans and policy

Emergency plans and procedures were discussed by some participants, mainly because they themselves had been involved in the creation of such plans. These plans are constantly updated following other incidents, to ensure that all staff are safe and prepared. A few of the participants explained that they had attended conferences to aid the develop of such plans, mainly one delivered by those who had been involved in the Paris terrorist attacks. They stated that information was shared with other health institutions to ensure their emergency plans were updated to deal with sudden and violent terrorist activity. These plans and policies contain various information and guidance on calling in extra staff, opening communication lines, equipment that may be needed, ensuring robust triage systems are in place so patients can be prioritised depending on their injuries, knowing which hospitals are specialised with trauma, ensuring staff are trained, and knowing what space is required to see the influx of casualties.

*'so I had been involved in some strategic planning prior to the incident, probably most critically from um, as a result of the [other incident 00:03:27] and suddenly the threat level went up in the UK and there was a coordinated response erm through the major trauma networks and that was coordinated by [name1 omitted 00:03:45] to raise awareness of you know, potential challenges raised by ballistic*

*type terrorist activity erm in the er, you know, in, in, set against the background and the changes that were being made to the major trauma networks. So, I've been involved in some of the pre- pre-event thinking, the strategic planning'* Henry

Participants explained that these plans could then be rehearsed during simulations to ensure all staff know what they were required to do. Some participants did mention that they were aware of the MCI policy and had trained in executing the plans, and stated that the MCI policy was given to them within the first week of commencing their role. Henry implied plans, policies and procedures are systemic but are always evolving and being updated. Henry stated that policies are updated post-incident, when information is shared within the trauma network both nationally and internationally.

*'One of the things we come away with was the need to think about the distribution of casualties and we'd done that bit of work [here] and it was about whether that bit of work had done what it should've done.'* Henry.

Henry gave a sense that the process can be trial and error, due to the information being gathered from another country and incident, but that, it was still valid. Henry stated his anxiety concerning whether he and the department had implemented the correct strategy to ensure patients had been sent to the correct hospitals for their trauma. The report from a previous attack had reported that patients need to be distributed to multiple hospitals which are able to meet their needs in a timely manner. He explained that this was an outcome from a previous terror attack and therefore it had been implemented into the MCI policy. However, it is only when an event occurs that the success can be measured, making Henry anxious. Policies and procedures are also there to safeguard, as James explains;

*Very good structure and system set in place for all the big events to sort [...] at every point of the Marathon there's certain points where they've got a secondary, like a diversion route for the Marathon, so if there is something happens, a bomb alert, gas leak; something major, they can divert the Marathon and keep it going on (yes) which in its, you don't realise that that sort of planning goes off when you're just watching it on the TV.'* James

As James explains, emergency plans are developed to safeguard the public from a catastrophic event, but also to aid emergency staff and enable them to maintain their own safety and wellbeing. These plans take time to develop and incorporate a large team of professionals, so when they do not work



or there are failings it can be distressing to those who have been involved, as Edward's following statement amplifies:

*'I will tell you I was angry really because I put a lot of work prior to the incident into the planning and how we would respond, and the real anger was at people who had basically not done what they were supposed to do. So, we had very senior people turn up at the wrong place...For instance we had very senior people turn up at the scene when they should have gone to silver or gold command and be a presence and actually a very negative impact on the plan, on the response to the plan. Does that make sense? [Yeah] So it was, I just had probably a little bit too much knowledge of how it should have gone and then I was looking at a situation which wasn't going the way it should have gone. It went well but it didn't go as well as people think it went. Edward*

Plans and procedures are not always adhered to, for multiple reasons. Some of the participants mentioned communication issues, lack of leadership, inexperience, or a general failure to follow pre-organised plans. Some participants stated that this made them vulnerable to psychological harm post-incident. Feelings of anger and frustration amongst participants were felt when individuals had worked hard to make plans and procedures to ensure preparedness, but they had not been obeyed, hence resources were not used effectively. Edward himself had worked hard to help the emergency team plan and design a robust incident plan. He was aware that these plans were not followed during the MCI he attended. He himself was put in a situation he should not have been in, and therefore he felt angry and upset that his skills had not been used correctly. These plans are time consuming to make but also, they are there to ensure everyone remains safe, and when they are implemented incorrectly this can be both harmful and frustrating.

Preparedness was an important aspect of ensuring safety and organisation during MCI, which often happen without warning. Those participants involved in developing these policies and plans expressed anguish too if they had made the correct action plans following guidance from previous incidents. When followed correctly, participants praised their training, which had enabled them to follow the policies and procedures correctly, but when such plans fell short or were not attained participants expressed frustration and anger, feeling they had been put in danger. The next sub-theme discusses the moments when the MCI took place and individuals acted following the operational protocol.

#### 4.4.2 Preparation and commencing the incident plan

Following from the sub-theme plans and policy, participants gave an insight into the moments when they were notified of an MCI. The majority of participants answered by describing their clinical duties and responsibilities. As they articulated their responsibilities it was notable that they were well rehearsed in escalating the situation appropriately.

*'And you are also on a night shift, and when you get a call from [Service name 06:44] and you are stood up for a major incident, obviously people are sort of aware of their roles and that gets escalated appropriately [...] And then we basically started the major incident plan and prepared for mass casualties to come into Resus basically. So, the way that we did that, we allocated different roles to different people in the department.'* Penelope

Participants described a strong sense of calmness within the hospital environment, due to good robust pre-incident plans. Staff felt they knew what their role was within the team, allowing them to prepare the department ready for the casualties. Part of the preparation was to clear the emergency department of other patients, set up theatre and call in extra staff.

*'I think it's the planning and stuff that we'd done beforehand and had come to fruition that had worked really well for patients.'* Oscar

In one geographical location there had been a traffic light system to ensure patients arrived at the most appropriate hospital to ensure their injuries could be cared for correctly, and this seemed to work well and stopped any inappropriate admissions, and it also ensured that the hospitals were well resourced for what the patients would require. Senior staff members were allocated to oversee the department, ensuring that no patient had to wait long for theatres or CT scanners, and ensuring staff were well supported. This had all been pre-planned and Oscar felt happy that this had gone to plan.

Those staff members who worked in the hospital seemed to describe a very organised process of preparing the department and following the incident plans. However, at the scene opinions were split, and whilst some participants discussed setting up an organised triage system to ensure patients received correct and timely treatments, others described a more chaotic scene with a disregard for protocols. Edward had been sent to the scene of the incident, when he should have been directing from the ambulance control room. Edward was extremely frustrated that the emergency plans he had

help produce were not followed, and that this had ultimately left him in a difficult situation of working in an environment he was not prepared for.

*'I think the way that stuff really hit me probably a number of weeks later after the ambulance debrief had taken place. There were two separate debriefs, one amongst the team and then one with the whole ambulance service. And I guess it was just a complete, really, I think what shaped my mood was the realisation that everything we had done prior to the incident in terms of planning, the senior level people who had behaved you know in a way that I felt was inappropriate in terms of being in the wrong place.'* Edward

Two other participants were not on duty when they happened to come across the MCI, and both helped immediately. With knowledge of protocols, they were able to safely attend the incident and take control. Albert had vast experience in emergency planning and therefore was able to quickly assess the situation and set up a temporary treatment area, which was safe and away from the incident zone. His experience and knowledge of incident procedures ensured the environment remained calm and controlled until more formal help arrived.

*'So, the first thing to do was to start moving people in there. And basically, at the back of the courtyard were two large groups, probably what ooh twenty metres by twelve or thirteen. Two large reception rooms and we chose to make one of those our clearing station. And the reason for doing that, it was big, it was free, it was empty, it was warm, it was well-lit. And actually, was right by the back entrance to [building name] which was never normally used but it was still openable, I had established that. And so essentially, I got folks to move people into there and I sort of briefed everybody this is to do the most for the most, you've just got to do the simple things.'* Albert

The consensus therefore is that pre-emergency plans are important and help maintain safety and ensure staff know what their responsibilities are. When policies and procedures are not followed, individuals can be left vulnerable and underprepared.

#### 4.4.3 Communication

Communication is a fundamental aspect in any health care setting, but it is especially important during an MCI. When executed well it can ensure efficient, safe, and timely emergency treatment. Participants discussed the importance of clear communication networks that were robust enough to deal with such events. Channels of communication can become blocked, and therefore they discussed

the importance of less formal mechanisms which allowed for paramedics and those on scene to communicate with the hospitals. Modern day apps seem to have worked well, and there was a clear comparison with the MCIs in 2007 and those that took place in 2017, proving that problems in communication had been addressed in the last ten years.

*'We couldn't call each other because the lines were down.'* Mary

Participants stressed the importance of telecommunication between all emergency services, and explained that these are paramount and contained in all emergency plans. These telecommunications have even been integrated between emergency services, ensuring that messages can be passed between services.

*'So, we'd send messages early stages on WhatsApp to colleagues in terms of getting other doctors to scene.'* Oscar

Participants felt the informal services such as WhatsApp had been extremely useful, allowing for communication between those at the scene, at home and those at the hospital. It also ensured that extra staff could be called into work and the emergency activation plan could be initiated.

*'I mean we often had like BBC news on our TV screen in our doctor's office anyway, so we already were aware that there was an incident happening [...] I mean they don't always say like what's happened or what's coming, and obviously you can sort of use your common sense as to what's on the news and stuff.'* Penelope

Other resources of communication were the television news channels, and Penelope stated that this is when the media during such events can be extremely useful, as it allows accident and emergency staff to be aware of the mechanism of the incident and therefore plan for the potential patients they may receive.

Participants were aware that preparation relies heavily on clear and early communication. Sometimes this comes from informal channels which have already been discussed, such as word of mouth from other emergency services personnel, the television, or telecommunications apps. However, the formal mechanisms within the incident plan were revealed by senior participants. Firstly, the clear communication which is delivered by switch board to state that the emergency department is on

standby for an emergency incident this enables preparedness, which relies heavily on effective predetermined plans.

*'So, we then opened up our major incident room, command, got it established, started allocating roles and getting out the action cards and tabards and things and implemented the plan and made sure that switchboard had activated, done the ring round to pull extra staff in. Erm, then we started looking at the logistics of cleaning the department and getting prepared, getting all the mass casualty equipment out, preparing resus' and things, preparing staff and then receiving other members of staff as it were coming in from other, especially from home, and allocating their roles; making sure the log had been started erm and yeah, just looking at what we needed at the hospital to open up in order to err, be able to allocate clinical areas and capacity. Err, clearing all the existing patients from the emergency department up to the wards, but actually getting medical plans in place for all of them as well, um yeah (ok and-) and yeah, further on towards starting to look at next phases and the planning for the next day.'* Oscar

Similarly, communication from the ambulance control room can ensure those in transit to the scene are kept up to date to correspond with the team and ensure patient care is delivered effectively. The communication between team members was also discussed, and emphasised the importance of clear instructions of what resources were needed or what tasks needed to be performed. Mike articulated the importance of this, with a sense of well-rehearsed dialogue, which demonstrated calmness and preparedness.

*'So, if for example if that was the situation I would probably know before I actually opened my car door that they were in cardiac arrest [...] And then I will be saying, is the airway secure? Are we ventilating the patient? Where's the biggest problem? And then I will be saying have we got intravenous access? The plan is I am going to do a pulse check and just stop CPR. See what the situation is and then if we are not making any progress, I am going to put two holes in the chest, depress hemothorax. And if that doesn't work, we are going to be looking at opening the chest. So, everybody there knows that within sort of fifteen to thirty seconds of my arrival, we've got a bit of a plan and it could progress really quite quickly in that sort of a direction. So, everybody's got quite a bit of a heads up about that'* Mike

Mike describes how communication can be beneficial to not only the patient but the team as well, providing a plan which aids confidence. Mike and Oscar demonstrate the extensive strategic planning, which is involved in MCI, and both these statements exhibit the complexity involved in preparing for

an MCI in real time. This validates the importance of organisational planning with regard to communication systems, so staff are fully aware of the incident plan and know their role in such an event.

Messages of communication to state that there were no more casualties offered a sense of reprieve and allowed for health care workers to begin to stand down without the guilt of leaving colleagues with unpleasant work. It also gave reassurance that no one else would have been harmed. The word 'anxiety' provokes the feeling of knowing emergency staff remain in a heightened state until the event is stepped down.

*'It was that bit that we were able to sort of link into the pre-hospital services and receive a sort of comment back- 'no, we think we've found all casualties and we don't think we'll be sending any more to you' and that was a you know, that was helpful to relieve that anxiety.'* Henry

Communication was noted to be important in ensuring safety and aiding effective care delivery. Participants noted that telecommunication often suffered due to heavy traffic. Others noted that they effectively used non-formal channels such as WhatsApp, although these channels cannot be formally monitored. The media provided a good resource to keeping hospital staff informed about the site of the MCI. Communication between team members at the site were vital due to them not having an established relationship, clear instruction and assertiveness also aided confidence. The next theme will discuss the detrimental effects of poor communication and the areas that require improvement.

#### 4.4.4 Poor Communication

As discussed, communication is fundamental to any mitigation of a disaster plan, and when constructed poorly it has detrimental effects on an organisation, rescue efforts, victims and those individuals who are there to help. This was an area of much scrutiny amongst some of the participants, and one which added to much distress after the incident.

*'I was unaware of exactly what had happened. So, it would be quite a while for me to work out what had happened. I was unaware that there had been a bombing [...] Completely blind until after a short while after I arrived on scene [...] People often find it hard to believe that you can be on scene and not realise what was going on, but we knew not getting a formal handover on arrival and I was registrar on that but not getting a formal handover made it very difficult.'* Edward

The lack of communication from the team meant Edward was totally unaware of what had happened at the site, and therefore was completely unprepared with no resources or official understanding of what he was now involved in. Handovers, as Edward states, are crucial in order for health care staff to equip themselves with what they might need to do or what they may require to help casualties.

Technology also hindered communication, with phone lines failing to connect, which meant staff were historically unable to relay messages to one another. This has been improved upon and has already been discussed in the sub-theme 'communication', however communication between agencies is still problematic and has resulted in delayed help or support.

*'Communication with the other agencies so the Police, the City Council themselves was a bit more difficult because obviously the radio traffic was being caught, everyone was just using the one radio channel so we couldn't always get through to who we needed to speak to on the Council. So, in the end we ended up just a couple of people just running up and down in between people, to pass messages across.'* James

Some staff, as mentioned previously, had used WhatsApp to send messages of communication to one another. This application does not get blocked like traditional phone lines and therefore seemed an appropriate method to use. However, John criticises the informal method, as the correct protocol for calling in staff was not followed and therefore the correct skill mix was not made available. The importance of skill mix has already been discussed in the theme training.

*'Yeah, so when I heard about the incident, I was really annoyed had called me the night before. \*laughs\* [I: \*laughs\*] Erm and that was a common erm feeling for people who weren't called the night before. So, in our department the, the, the call in had taken place erm via private WhatsApp messages. Erm and there was a feeling that people had just phoned their friends as opposed to actually just following the cascade call in system. So, the first thing if I'm being absolutely honest and I know it's important for the project to be honest I'm sure is that I was really annoyed. As were a number of other people in the same sort of situation that I was in.'* John

Using an informal method of communication led to errors being made in ensuring that the correct senior staff were called in to help manage and treat patients. This was frustrating to John, but also could have potentially caused errors in clinical decision making due to the lack of experienced leadership.

In summary, communication is important to keep all emergency teams updated, and therefore telecommunications need to be robust enough to endure the traffic of interference from others using phone lines. Health care professionals also need to know how to communicate effectively with one another, as well as with the multi-disciplinary team. It is also important that the telecommunication plans and policies are adhered to, in order to ensure the correct staff are called in to support and lead the clinical teams.

This theme as discussed pre incident planning and its importance. Participants felt these plans enable both themselves and the public to be safe. Good planning and the following of such procedures enabled appropriate and timely care to be given, and communication was key to the organisational aspect. However, when plans were not followed or there were faults in communication, health care staff were left feeling vulnerable and angry. The next theme will focus on the various MCI environments that participants experienced.

#### 4.5 Environment

The next theme involving different aspects of the environment of an MCI (both at the scene and at the hospital) and how this impacted on the health care staff that were interviewed in this study and directly involved in MCI. The participants in this study had attended the scene or treated casualties from various UK incidents, such as terror attacks, a large building fire, an overcrowded pop concert, and a multi casualty stabbing. Table 8, illustrates the various MCI the participants were involved in and the sites they were working at.

Health care staff described scenes of both chaos and unusual calm during these extraordinary incidents. Chaos due to people fleeing the scene, relatives searching for family and friends, unstable infrastructure, and the enormity of the event. There was calm at the scene at times, due to casualties being severely injured or dead and therefore there was no sound noted. Hospitals however were found to have a contrasting environment also, and although they experienced high volumes of patients, participants described a more controlled environment due the environment being conducive to the work that needed to take place. There are five sub-themes within this section, which aim to capture the unique characteristics of the MCI which manifest in terms of enormity scale and also a sense of the unexpected and the lack of correct equipment at the scene. In contrast however, there was a sense of control in such situations. For some their final concern was around safety.



#### 4.5.1 Enormity of the event

This first subtheme gives a broad insight in the environment in which the health care staff interviewed worked. It incorporates descriptions from the scene of the incident and the receiving hospitals. Both the site of the MCI and hospitals experienced large scale disruption, and at the scene participants dealt with multiple casualties in a challenging and dangerous infrastructure. In the hospital, staff were dealing with a large influx of casualties and the anxiety of coping with such an influx. Some felt overwhelmed by the nature of the incident and the trauma. The context of the environment links to emotion as the environment invoked strong feelings, as discussed in this theme. MCIs are incidents with multiple casualties, which can often overwhelm resources. The scale of these incidents, and the catastrophic damage they cause to infrastructure and human life became apparent. Health care workers at the site of such events are in an environment which is unstable and dangerous, with poor lighting, and are witnessing scenes of loss or serious injuries. This section also discusses the pressured and overwhelming environment in the hospital's accident and emergency department, as staff prepared for an influx of casualties and dealt with overstretched resources, which made these events unprecedented.

Participants reported that they attended sites with no prior knowledge as to what had happened, and therefore had little knowledge about whether the site was safe. Edward described disbelief and shock in what he witnessed; the site of multiple casualties, requiring urgent medical assistance. His usual workplace was a hospital setting, which meant he was also in an environment that was completely out of his comfort zone and one which he described as shocking, due to a normal street being transformed into what was normally seen in the hospital.

*'It was a very difficult scene because you can imagine the chaos. [Yeah] Obviously you can't, unless you have experienced it, you can't really imagine the chaos. It was completely chaotic. And it was difficult to get a grasp as to what had happened... It was shortly after I had arrived. I was looking at a train station number, patients had moved to hospital already and there was blood and there was empty packaging from clinical stuff and there was bandaging. It was just all over the concourse and I just thought to myself, this is absolutely just totally profound to look at what you would see in a resus room but to see it twenty, thirty times over on a you know a concourse, is just you know crazy.'* Edward

He repeatedly states the word 'chaos,' which describes the disorder at the scene. Edward found it difficult to comprehend what was happening, and it was difficult for him to get a grasp of what was happening, since it was an unprecedented incident. Edward reports juxtaposition, as it is contradictory

in terms of 'clinical' things being found in a 'non-clinical' setting. Despite his experience in the medical profession, the incident was so profound he found it difficult to comprehend and his thoughts were shared by other participants.

*'[...] when you're there, there's no lighting so I could hardly see anything; I had a raging headache because there was this really pungent smell of what I think was just chemicals and you know burning plastic and you know, can only imagine what it threw up into the atmosphere from a bomb explosion like that. Um so this absolutely pounding headache, couldn't see anything, was terrified about kneeling down on the floor because I thought there's all shards of glass everywhere covered in people's blood, the risk of blood-borne diseases obviously is huge in a situation like that, still had to crouch down on the floor to, to see to people who were um, who needed my help there.'* Mary

Similar scenes and multiple casualties were also recalled during the terror attack by Mary. Her description captured the devastation caused by the MCI, with multiple deaths and many severely injured. The environment at the scene was reported to be chaotic in terms of multiple casualties with severe injuries, however it was also difficult to reach victims due to poor lightening and damaged infrastructure. Mary described how it was difficult to see, and reported her concern of the dangers within the environment which could affect her. She describes scenes of extensive blood loss which was covering the floor, and stated that she needed assistance to climb into the carriage to help those still alive. This report demonstrates the difficult and dangerous nature of the environment following a bomb. Surprisingly though, silence was noted by a few participants,

*'I guess it was odd because when I got onto [site1] they were, people were either dead or so severely injured or shocked that there was, it was, as I remember it, it was pretty well, silent on there, there was no um, screaming or crying or anything like that. I don't remember if there was err whimpering or anything like that, I, I really don't remember that but I do remember that it wasn't like there were, all the people who I perhaps think could've panicked or become tearful or all the normal things that you would expect, I think all those people were in that first wave that came out [00:15:00] that I saw when I first arrived, and it was only the only people who were so severely injured or dead who were left [there] when I got there.'* Mary

In Mary's description of the environment, she noted that there was no sound and no sense of panic or movement, which gave a sense of something very different and unexpected. Silence in the city goes

against all the usual norms associated with a city. Other participants also commented on remembering silence at the site of the MCI:

*'What did hit me was you went out into the courtyard after everything had settled down, bearing in mind there was no traffic moving then. There was no sound of anything. No aircraft because they had all been diverted and no birds singing, and normally you could hear that. That was eerie.'* Albert.

The environment here is described simplistically; quiet, still and calm, even though it was filled with chaos and destruction. This adds to the enormity of the incident.

*'It was completely chaotic. And it was difficult to get a grasp as to what had happened. People often find it hard to believe that you can be on scene and not realise what was going on, but we knew not getting a formal handover on arrival and I was registrar on that but not getting a formal handover made it very difficult. Everything from penetrating neck injuries to penetrating abdominal injuries, to limb injuries which required tourniquets because they were bleeding so heavily. So pretty much the gamut of everything you can think of. [Yeah] Head injuries as well. [...] This look on my face which was just complete disbelief. [Yeah] But I had just found out what had actually gone on.'* Edward

The description that the participants gave of the environment at the scene of a terror attack seems alarmingly different and shocking compared to other incidents they have attended. Other participants also described shocking scenes and descriptions of dead individuals who had suffered catastrophic injuries. These types of events do not occur all the time, and therefore those who attended had probably never witnessed anything like it before. Edward describes a disordered and difficult environment in which he had had no handover on what had happened, which added to the chaos, and he witnessed mass trauma to multiple casualties who were mostly children. His description echoes an overwhelming environment of large scale which was difficult to navigate.

*'The atmosphere changed from being quite enjoyable and relaxed to, I don't know, almost a bit tense or quite tense and thinking oh dear, how am I going to get out of this; how are we going to overcome all these patients?'* James.

Not all the participants interviewed had been involved in terror attacks but had attended the scene of other MCI, such as a stabbing, music festival and a building fire. Again, participants described the

environment as overwhelming and chaotic, with a depletion of resources and the need for further assistance.

The hospital environment also echoed a large-scale incident. Participants who worked at the hospital were shocked to hear what had happened, and there were descriptions of a heightened atmosphere within the hospital environment. Participants stated their awareness of the enormity of the event which they stated caused an element of shock, stress, and anxiety amongst those working in the department, creating a tense environment. Oscar remembers being made aware of '*reports of lots of people dead*' which demonstrates the scale of the incident. Those working at the hospitals stated that extra staff were called in to ensure the department was well staffed and had a skilled workforce to deliver the treatments that were required. There was description of immediacy, staff rushing to the hospital to help, and feelings of anticipation about what may have occurred.

*'I remember management coming in and you could tell that they were, um he pretty much said 'I think I've probably just lost my license, the speed I've just come along the motorway' type of thing, I've probably just gone through every single speed camera and I'm probably going to lose my license' you know, there was that kind of err, a degree of erm -sighs- anxiety, well no, I suppose stress I guess about what was happening and what was going to happen (yeah) yeah.'* Oscar.

Staff discussed the feeling of being in an overwhelming environment, due to the prospect of multiple casualties but also the circumstances which had caused them to be in the emergency department. Meg compared an MCI to her other work for example, dealing with accidents, and not deliberate harm to innocent children who had gone to see a pop concert. This made the environment within the accident and emergency department overwhelming, but there was also the need to remain focused to care for those casualties coming in.

*'So, it is the volume of severe injury which is a shock to the system as well as the circumstances that most of the severe injury that you see is accidental.'* Meg

As noted by Meg, the environment contained a tense atmosphere and there was an influx of multiple trauma patients. This caused resources to deplete quickly, with regard to bed space, staffing and equipment, and therefore participants stated that they were having to work out of different spaces and stretch themselves to help the influx of casualties, making these incidents very different to the

hospital's normal workload, and the environment stressful. In Penelope's quote below there is a sense of working out of her norm and feeling overloaded, making the environment challenging:

*'But again, being a nurse, you get a patient in trauma, so again, if you have three or four it's like I wasn't prepared for that. So, when you train you have one to two nurses and a lot of the time in major haemorrhage you have to have nurses because of the roles that are involved. Say like rapid transfusion you need two nurses for like when you have four patients in front of you and you are just like, you are not really prepared for that.'* Penelope

Staff were also seeing and treating injuries that they had not experienced before. Added to this was in some cases the nature of the population they were treating and the injuries this population had sustained, and this made for further stress both emotionally and clinically. Children with bomb blast injuries was unusual, as John explains:

*'Erm more serious injuries, so it was a more effective erm device that was deployed erm in this incident. Erm there was a higher number of paediatric casualties which people found difficult to deal with. Erm and in comparison, to incidents that we- that sort of individual patients that we deal with.'* John

Participants noted that these injuries therefore required the expertise of army surgeons in order to advise on how to clinically manage shrapnel trauma, again demonstrating the scale of the incident and requirement of outside assistance. Added to this was the presence of army and police personnel within the department, which was different and raised concern amongst staff.

Staff also needed to support relatives and friends who were entering the hospital trying to find their loved one. Participants explained that this created an emotional and distressing environment, due to the event happening within their own community and affecting so many young people. Health care staff had therefore another added pressure of having to not only deliver care to those that needed it physically, but also help relatives and friends find and come to terms with the outcomes for their family member. This also made the environment more chaotic and stressful.

*'And so, the nursing staff were having to try and help him, not only to come to terms with the death, but the fact that his wife was on intensive care but also that his daughter was dead.'* Meg

The involvement of the relatives and family attending the hospital or the scene can cause chaos and a more stressful environment, as it distracts health care workers from their work. Although this is understandable, it can bring another added pressure to the environment in which the health care

member is working. Due to the scale of the incident and the almost immediate media coverage, relatives can quickly make their way to the scene. There can also be aggression, which will be covered in another sub theme – ‘safety and violence’, and as Edward states, this makes health care staff jobs extremely difficult and often hinders the care of those that need it.

*‘You know and of course we had to triage patients and obviously relatives had to turn up and relatives where shouting at us to move the patients and to get them to hospital. And obviously it was very difficult because obviously we had to follow the triage and obviously send the P1’s [Priority one – requiring life – saving treatment/ emergency first etc.]. That was quite difficult to deal with as well.’*

Edward

Overall, MCI are found to be large scale, overwhelming, and are shocking in their nature, as often there are multiple casualties and fatalities. They differ from the everyday incidents due to their large-scale devastation to infrastructure and human life. Being at the scene and in proximity of instable infrastructure, debris and potential danger caused concern and anxiety for staff. At the hospital, staff experienced working out of their normal routine, seeing injuries they do not usually see and working in a heightened atmosphere. This makes for an emotional and physically draining environment which is stressful and unprecedented. Many of these incidents are unexpected, adding to the shock; this will be discussed in the next theme

#### 4.5.2 The Unexpected

Many of these incidents are unexpected and are either accidental (building fires) or deliberate (terror attack). Due to the nature of an MCI, there is often unexpected chaos, testing the most experienced health care staff. This section will discuss from the accounts of participants at the scene of such events how the ‘unexpected’ also helped in the creation of chaos. These rare incidents collectively provoked shock and uncertainty amongst the health professionals interviewed. It will also discuss some of the unexpected incidents that participants witnessed in the accident and emergency department. Participants attending the scene of an MCI reported that often they are blind to the cause and therefore are uncertain of what trauma they may be dealing with, as Mike explains:

*‘Well, a doctor far more experienced than I in this area, who teaches this subject, says that the very nature of these situations is, his turn of phrase is you are going sliding by the seat of your pants because you don’t know what to expect.’* Mike

Mike's colleague suggests that at times no one knows what is happening in these situations and there is an element of unorthodox practice due to the unpredictable environment and the situation that health professionals are put in. Participants described having to think and make decisions quickly, alongside being resourceful with the supplies they had, as Albert explains:

*'Well by the time I got downstairs, people were already being brought into the courtyard on collapsible table-tops. And we were using curtains from the state rooms that were being cut up into bandages because it is an office you know. It is not a hospital.'* Albert

Albert was responding off duty and therefore was one of the first medical professionals on the scene. He and his colleagues used non-clinical items to administer first aid. Alongside being practical and pragmatic, participants discussed a strong sense of shock at the realisation that the incident was caused by a terrorist. The realisation that the incident had been caused deliberately, and an awareness of a threat to their own lives, was anxiety provoking. This again demonstrates the link between the environment and emotion. Safety will also be discussed further under the subtheme 'safety and violence,' however it is discussed interchangeably here due to there being an unexpected risk to the health professionals' safety.

*'[...] I've got two there that I think are priority four [no treatment or transportation], and it's the only time in civilian practice that priority four has been declared. And I declared priority four on them, and you know everybody said where was your clearance? I said there was no clearance, I was up against it, back to the wall, that's leadership and I've got to live with that.'* Albert

In the statement above Albert reports how these events are unexpected and therefore decisions must be made promptly, sometimes without being able to go through the official channels, and as he states, these are judgement decisions which he has had to live with after the MCI. However, the environment of MCI does not always allow for controlled decisions. Edward in contrast was familiar to the controlled setting of the hospital; at the scene things were unpredictable, chaotic, and unfamiliar.

*'And I became aware of the issue, I became aware of exactly what had happened when I was assessing patients and I noticed that there was a police dog sniffing around for explosives. That was the first time I became aware of the incident, of what the true incident was. So, I had responded but I don't think any of the previous incidents came close to being you know as significant as the bombing. [...]*  
*The difference between the [Venue 31:07] bombing and those other incidents was in the [Venue 31:09]*

*bombing I was responding in an environment which I don't normally work in. Whereas in the other ones, I was responding in an environment that I am very well used to. And I think my ability to go is much better when I have more control over the environment. That's the fundamental difference between the two. And it's the ability to control the situation because you have no control when you are in a big response in an environment that you don't normally work in.'* Edward

Participants also agreed that although they worked in an emergency setting and were used to seeing trauma, nothing prepared them to see young adults or children badly injured after an evening of entertainment. This was unexpected not only in the accident and emergency department but for the wider community, and made for a distressing environment.

*'I think it was really bad to see it all. You just, yeah, obviously you are used to seeing sick and badly injured people on a daily basis from you know the occasional road traffic collision, or falling down the stairs, or people having heart attacks or strokes. You expect that every day. What you don't expect is to see you know parents and families. And we didn't get children in our emergency department. You don't expect them, when they just come to see a concert in the city, to end up in your emergency department full of shrapnel from a bomb you know with parts of their limbs blown off.'* Meg

Although there is some control at the hospital, the environment can remain unpredictable; Penelope gave an example of this, stating that violence commenced between two gangs in the waiting area of the accident and emergency department, resulting in a mass stabbing.

*'So obviously if you have got someone running round with a machete, stabbing everybody, and you have like nine or ten people that have been stabbed by a machete, it's obviously more traumatic than dealing with that one person because you have got all these resources going into that one person.'*

Penelope

This happened quickly and took the department completely by surprise; Penelope described the chaos and sudden shock of having multiple victims requiring help and depleting resources, meaning she and her colleagues had to act quickly and be resourceful with the materials they had available to them. This can mean doctors have to make difficult decisions, and be aware that they cannot save everyone, which can also add to a distressing environment.



In summary, this adds to the previous theme, 'the enormity of the event,' by introducing the unpredictable nature of an MCI and how staff members must react quickly and be aware of the potential for danger as a result. It demonstrates how the environment can cause feelings of shock from the unpredictable nature of an MCI. The next theme will discuss the contrast of the two sites, the incident site and the hospital, with regard to control.

#### 4.5.3 Environment – controlled

Following on from the sub-theme 'Enormity of the event,' which gave a broad view of the environment in which the participants were working is a refined sub theme which discusses a controlled environment within a very chaotic incident. Those health professionals who worked in the hospital emergency department describe an environment which contrasted with that experienced at the site of the incident. Some also reported contradictions, stating that the department was chaotic but also controlled, adding that whilst there was a heightened atmosphere, the environment was conducive to catering for major traumas and therefore medically controlled, which enabled them to maintain focus and keep calm to carry out their duties. Hospitals have time to prepare and set up the department ready for patients to attend. Participants explained that this was beneficial to the organisation of the department, prevents anything being missed, and ensures all staff know where everything is, to prevent chaos. Communication between the site and the accident and emergency department further allows for preparation of the environment and allows staff to be mentally ready to receive the patients. There is less risk to personal safety within the hospital environment, although as discussed in the previous sub-theme, this is not always true, however compared to the scene of an MCI staff were often safe, which further allows staff to focus and be less concerned with themselves. Oscar shared the contrast of the two environments;

*'I, I think it's all so you know, environment- you're undoubtedly, you're in a nice, warm, dry, well-lit area with IT; we had, we could put the TV on, we could look at Twitter, we could pull information from lots of sources. We weren't rapidly responding into the [site1 00:23:34] where you know, there was no infrastructure for healthcare, there is no, it was cold, it was dark, there's no control type thing so, that was helpful but we also then had erm, stuff already set so we'd pre-planned the environment you know, we've got allocated areas that we know and things because it is a constant, you know, it's always our department, we're not having to go with different teams.'* Oscar.

A warm, safe, and well-lit environment allows for much more controlled work. Hospital staff also have a team (which they are familiar with) working alongside them and do not work in isolation, unlike

those who attended the scene of such incidents. This again lends itself to a supportive and calmer atmosphere even when strained, and the participants described a heightened atmosphere but nothing overwhelming within the hospital. Participants at another location stated that the hospital did not even become overwhelmed, as patients were triaged at the scene using a traffic light system, and were then sent to the most appropriate hospital for their injuries. As Oscar noted, there was:

*'[...] A degree of like intensity about the whole thing, but actually there was that um, it was heightened you know, there was heightened awareness and heightened activity and a positive energy. We fortunately didn't get overwhelmed, the patient numbers didn't tip us so actually everyone was geared up ready to go, but at no point did we, did people become overwhelmed, and I'd say it was of a controlled but stressed -laughs- environment (yeah) as it were. With the [main incident] there was a much more feel, it was a nicer feel in terms of well yeah, we're having to get ready and stuff, but the patients aren't here yet, that's not our responsibility; so, we've got the opportunity to really get on top of things before they arrive.'* Oscar.

Participants also mentioned that there was access to a television and radio within the hospital, giving more information to the hospital staff as to what casualties they may receive; again, this aided in the preparation of the environment and allowed a sense of control.

*'When I was on shift and a major incident got declared, I mean we often had like BBC news on our TV screen in our doctor's office anyway, so we already were aware that there was an incident happening. And you get a call from [Service name 11:04] who basically put you on kind of standby to a major incident. So obviously, you're really anxious. There's a lot of adrenalin especially like when you are put into Resus, because you know that you are going to get all the patients. So, you are kind of thinking you know, oh god what's going to come in? You are sort of aware of what's happened kind of on the news because you can see it. I mean they don't always say like what's happened or what's coming, and obviously you can sort of use your common sense as to what's on the news and stuff. And I think, quite despite having working lots of Friday and Saturday nights in a major trauma centre in [place name], you see a lot of things, but I don't think it's ever quite the same as when there's a major incident, obviously because you don't know what. You are expecting mass casualty, and you don't know what you are kind of going to get.'* Penelope

However, more junior staff still felt anxious within the environment when a major incident had been declared, and no amount of preparation helped alleviate the anxiety about what patient they may

have to care for. Penelope used terms such as ‘anxious’ and ‘adrenalin’ which demonstrate her extreme feelings about working in the accident and emergency department during an MCI. Time acted as an interesting variable and is noted here by John

*‘My involvement in that is I was the consultant coming on the next day, so this happened around 11 o clock at night, I came in at 6 o clock in the morning to erm take over from the night team and to deal with the casualties who were still currently in department. So, I came in the latter phases [...] there was still a handful of patients in the emergency department but there were ones who were awaiting surgery. So, the patients who were P1 who required immediate surgery had obviously gone through to immediate surgery, so we were left with a number of patients who were erm, er had \*clears throat\* sort of limb injuries erm and soft tissue injuries from the shrapnel.’ John*

Some participants attended their shift after the MCI had already started. This meant they had missed the preparation and initial intake of casualties and instead attended when the incident plans had been established and therefore the environment was noted to be controlled. Time scale therefore acted as a buffer to the control of the environment, hence staff attending later were removed from the initial stressors.

In summary, in terms of the sense of control, key contrasts were experienced between the incident site and the hospital environment. The hospital is set up to deal with trauma and casualties, therefore it provides a more controlled atmosphere which is safe and set up to help and treat those that require medical assistance. Although it is still an unpleasant and heightened environment there is the right equipment ready to be used, in a clean, warm, and well-lit room, with a team of personal that are familiar with one another. Time was also noted as a buffer to control, hence staff attending after the initial intake of patients, attended a more controlled environment. The next theme will discuss the lack of equipment which was mainly noted by those that were off duty at the scene.

#### 4.5.4 Importance of equipment

Those that attended the scene of an MCI described a lack of equipment to help patients. Some of these health professionals were attending off duty or were caught up amongst the incident and stayed to help. However, even those attending on duty described some concerns about the lack of adequate resources for such overwhelming incidents. Mary who had been familiar to working in a hospital setting noted,

*'It is so drastically different when you are on the coalface of it, that it was just, you honestly feel like little more than just a first aider, even though you've got all this medical training [...] So I don't think I started putting lines in until the ambulance crews arrived or the EMS [Emergency Medical Service] team arrived but um, when you're there, there's no lighting so I could hardly see anything;'* Mary

Both Mary and Albert attended the incident off – duty. Both immediately helped however Mary identified that even though she was a qualified medical professional, she felt inadequate without the advanced equipment of the hospital, she expresses a sense of helplessness. Mary stated she could use her clinical knowledge to triage casualties and identify those that were still alive to direct paramedics to those who required help when they arrived, however by not having any medical equipment or being in the normal environment of the hospital, she felt her skills were limited. The environment also made it difficult for her to see clearly, with no lighting, and Mary had no torch, making her job even harder and more dangerous.

*'Do the simple things well, which meant maintain an airway with a chin lift and a jaw thrust [...] The total assets were for the incident, that's conference tabletops, some curtains, four standard office first aid boxes, one pocket face mask, one pair of latex gloves, one large safe building with rear access, three security staff, one conference manager, fifteen brackets, sixteen doctors, the sixteenth was a bogus (A member of the public pretending to be a doctor), one ambulance identity card. We had a broken stethoscope and a broken ophthalmoscope from marketing that was purely used for photographic shots apart from that's it.'* Albert

Whilst Mary felt helpless at times due to only having her basic medical skills and no proper equipment, others were more confident that they could help, and did not worry about not being able to use more advanced equipment. In his account, Albert quickly took control of the situation with assertive leadership; he quickly recognised that he could only implement simple methods and used what he had available to him, for example curtains to be used as bandages, office desks became stretchers, and a basic medical first aid kit with pocket masks and gloves. Due to his experience, he was not afraid to make a judgement call that some people could not be helped with limited equipment.

*'People often find it hard to believe that you can be on scene and not realise what was going on, but we knew not getting a formal handover on arrival and I was registrar on that but not getting a formal handover made it very difficult. Plus, I was put in a role that I was uncomfortable with because I didn't have any, I didn't have the proper medical equipment to properly see patients.'* Edward

Unlike Mary and Albert, Edward attended the scene on duty and stated he had had no formal handover and lacked medical equipment, adding to safety issues, and preventing or making it difficult for him to carry out the job to their full potential. Not only can this make the working atmosphere distressing which Edward expresses by saying that *'there were a number of issues I had with the response'* but also it can cause psychological consequences post-incident which will be discussed further in a later theme. Edward states that it is difficult to believe that staff would be put in this type of situation, because pre-incident planning should be robust enough to prevent this.

*'It just really overwhelmed all the medical providers there because people were getting crushed in the front, getting pulled over. We were, forget how many people we were seeing but we were getting through hundreds in the end, just getting pulled over, hyperventilating, crush injuries, broken arms [...] Staff-wise there was, obviously with only being planned for a few thousand people there, there was only a handful of first aiders, and one ambulance crew from [Service name]. We ended up classing it as a major incident for us, so we called in other staff from other events.'* James

James stated that resources were depleted quickly, requiring the need for outside assistance to regain control and aid patients correctly. Again, this appeared to add to the stress and chaos of the environment.

In summary, those who helped at the scene off duty had to rely on their basic medical skills, and some were resourceful and made good use of materials around them to help assist patients until the paramedics arrived. There were mistakes at the scene, such as sending staff to the wrong area, not supplying them with sufficient equipment and not planning for enough staff to be on duty. Despite pre-existing incident plans there were still failures in ensuring that resources were robust enough to withstand an MCI and also a failure to ensure the correct medical equipment was at the scene. The next sub-theme will discuss the safety and violence encountered during an MCI.

#### 4.5.5 Safety and Violence

Safety and violence were discussed by all participants and was often something they felt was jeopardised, either by the environment which had become unstable due to an explosion, lack of knowledge to what they were entering or by patients themselves becoming aggressive at the scene or in hospital. Staff having to worry about their own safety or concerns for their team then distracts them from their work and can later have psychological consequences.

Those who attended the scene of MCI stated that conditions were unpleasant and often inadequate, due to factors such as, the weather, unstable infrastructure and populated conditions. During recent terror attacks, participants who attended the scene described the environment as unsafe, with glass and other materials on the floor, debris, chemicals in the air, poor lighting and the uncertainty of a potential secondary bomb. Mary was focused on helping those that needed it; however, she suffered a headache, what she considered to be from chemicals in the atmosphere.

*'I had a raging headache because there was this really pungent smell of what I think was just chemicals and you know burning plastic and you know, can only imagine what it threw up into the atmosphere from a bomb explosion like that. Um so this absolutely pounding headache, couldn't see anything, was terrified about kneeling down on the floor because I thought there's all these shards of glass everywhere covered in people's blood, the risk of blood-borne diseases obviously is huge in a situation like that.'* Mary

Using the term '*raging*' to describe her pain exemplifies how challenging and uncomfortable the environment was. She also expressed concerns about her own safety; Mary was worried she could contract a bloodborne virus, as being off duty, she had no protective clothing. Others described the fear of another attack, seeing sniffer dogs which heightened their suspicion of a possible secondary bomb, especially as they had entered a situation in which the cause was unknown, This can be distracting and cause fear, as Edward explained:

*'I was assessing patients and I noticed that there was a police dog sniffing around for explosives. [...] I will be honest, I was a bit scared because very shortly after that we had a controlled explosion for a package which had been found nearby, near the scene, which turned out to be nothing significant but obviously we were put on advice that there was going to be a controlled explosion.'* Edward

The lack of adequate light at the scene also jeopardised safety as health care staff could not properly see what they were doing, and it made it difficult to detect people who needed help.

*'I've helped at the roadside with several accidents over the years and actually in some ways it's easier because if you're outside at least you can see, I mean that's, that's, you can see, you can breathe because that was the thing down there, it was so, the air was just horrible, it was just so acrid, the sharp, sharp smell from chemicals and that combined with, there is an element of shock, combined with low-lighting and you're there and I just, that's why I couldn't tell you how long I was down there for, I down there for, I had no clue because your, all your senses switch off and you just, you're just literally focused on- who the hell can I help and in what way can I help them and that's it because all your other human sensibilities are just clouded, you're disorientated.'* Mary

Mary stated it was impossible to move anyone due to glass, debris, bodily fluids, and the fact that she was alone and did not have the strength. Mary discussed the contrast between the environment when attending a road traffic accident and the MCI she attended, highlighting the dangers she faced. Participants who attended the scene of an MCI stated they were in shock from what they were having to deal with, and again they gave a strong sense of being directly in a dangerous environment. These participants discussed visually emotional scenes, with casualties having sustained life-threatening injuries alongside those that had lost their lives. These injuries were discussed by participants in detail, and demonstrated the violence that had occurred in the environment in which the incident occurred. Some patients were too injured to survive the journey to hospital (priority four), whilst others had sustained serious blast injuries. Albert reports this in the statement below:

*'[...] I've got two there that I think are priority four, and it's the only time in civilian practice that priority four has been declared. [...] We triaged them and one of them was the bus driver who I re-triaged. And the other was a police officer who I upgraded because he was deaf and got abdominal tenderness and I thought you have quite a blast injury there.'* Albert

This statement demonstrates the deliberate violence that had taken place at the scene, which can provoke fear and feeling of insecurity. Although police have often got to the scene or the hospital department, the environment can remain hostile and dangerous. In incidents where there had been multiple stabbing and gang violence, participants expressed concerns regarding their own safety with regard to them being attacked or experiencing hostility from those standing around at the scene. Mike argued that it is important in such instances to stabilise the patient quickly and move them away from

the situation. Penelope also witnessed violence in the accident and emergency department when there was a mass stabbing, and explicitly described her concern for safety and the lack of resources to attend to multiple casualties. However, hospital staff did mention that there is often a lot of police presence at such events, which does offer both protection and reassurance.

*'The environment was a big situation, a big decision maker there. We were not going to stay and do a procedure on the road where I felt that the rest of the crew, we could be attacked by the opposing gang or come in the middle of them. We just needed to get out of there as quickly as possible..... There were policemen trying to protect me and my crew, but as I say there were things being thrown and lots of shouting and people, I did not know at night moving on from down the street. So, we went straight into the back of an ambulance. As I closed the ambulance door, I saw someone spread-eagled on the bonnet of my car. He just punched a policeman and I subsequently learned that he was the murderer and the policeman managed to restrain him. And I then had to get the scratches and blood off my car afterwards.'* Mike

Participants agreed that there were concerns for their own safety, although they acknowledged it was part of the job. Their overall concerns and emotion came from witnessing violence and the intent to harm another person. For most this was a distressing element to deal with, both in the moment and afterwards. Meg noted that this is the human part, and is nothing to do with being a medical professional, but rather knowing that deliberate harm has taken place within the community and environment in which she lived. Her quote below illustrates the cost to human life and the devastation a terror attack can cause.

*'Stabbings and shootings are really very occasional things that you would see in an emergency department. So, are far less used to seeing severe injury resulting from intent, it was a real shock to see the volume of severe injury that had occurred from somebody intentionally trying to you know cause harm you know is the other thing that was a shock. The intent and volume of severe injury. About a hundred and seventy survivors with physical injuries and about another three hundred with severe psychological trauma. And you can imagine if you were at the [Venue 29:28] that night and if you were anywhere near where the bomb went off, even if you weren't injured yourself, it must have been absolutely horrifying. I mean I think the trauma and the stress that you feel comes more from the understanding of the intent of somebody wanting to destroy people where you live, rather than having to come in and see these people as a doctor.'* Meg



In summary, threats to safety arose from both from the environment but also from more tangible human factors such as violent behaviour. Whilst the former was related to attending an MCI site, the latter could also arise in a hospital setting. Most participants, despite their unsafe environment, continued to help those that needed it. The witnessing of violence, threat to their own life and the intent to harm were the greatest concerns of the health professionals interviewed.

In conclusion, the environment relating to an MCI has been shown to have considerable importance for health care professionals, but key differences emerged in relation to whether this involved attending the site or being in a hospital; the former involved a more visible sense of disruption and change, and had considerable issues relating to the lack of equipment and immediate threats to safety due to proximity. The latter hospital setting was more controlled and prepared, and brought more advantages, but with some examples of threats to safety still. Common to both environments however, was the sense of scale and the unexpected. The next theme provides a more personal perspective and begins an exploration of more internal personal aspects.

#### 4.6 Job Satisfaction

Many of the participants discussed a sense of obligation to help others, and articulated pride that they could help, but also a sense of duty. Their occupation, although difficult, was a part of their identity and enabled them to be of help to their community during such awful events. There are further aspects related to this theme: firstly, a sense of duty which captures the pride and gratitude these individuals have that they were able to put their training to good use to help those that needed it. They also felt that it was their moral duty to be of assistance even when they were off duty. The second aspect was closely related to a sense of duty and involved being able to help, which captured participants' sense that they had been helpful and that they could do good in such demanding circumstances. The third aspect related to getting on with the job, and demonstrated the vocational aspect of their work. Participants returned to work and executed their jobs during and after the incident. The final theme discusses how getting back to a routine and the normality of their working lives was helpful to the recovery of some participants, either through enjoyment of their job or through a sense of defiance towards those responsible for the MCI.

#### 4.6.1 Duty and Pride

All the participants that were interviewed agreed that they had an interest in emergency medicine and had signed up to care for individuals who have suffered trauma. For this reason, they were aware that they would see distressing and often unpleasant injuries or illnesses and even death. These individuals have a keen interest in trauma and, therefore, have trained for a MCI, they are prepared and want to help those that need medical assistance, as was evident in Henry's statement.

*'I think so erm, you know because it's quite a you know, it forms a- trauma, emerging trauma and major incidents do form a big chunk of your training I suppose (yeah) and you know it's something that you're, you're, you have at the you know, in your mind certainly, I'm not gonna say at the forefront of your mind but you know it can and does happen I suppose (yeah) and you know that you will be part of the response to it (yeah); in the same way as I guess a pandemic you know, fully you know it's gonna affect the front door of the hospital and you know you're gonna need to be involved in it'* Henry

However, not all staff felt as comfortable within their role responding to a MCI, Penelope for example knew she had a duty but struggled with the overwhelming chaos of such an event. Despite this however, she did continue to work.

*'That's just what you turn up to. That's what you have signed up to because you are kind of aware that you are going to see and do that, because you've applied for that job, but nothing ever does prepare you for when you do see it.'* Penelope

Participants stated that they had to compartmentalise their feelings in order to continue working and carrying out their responsibility to care. There was an overriding sense of wanting to assist those that had sustained life changing injuries and aid them to recovery. The staff interviewed were passionate and proud of their occupation, speaking with pleasure that they were able to help and work during such unprecedented incidents. These events for some renewed their passion for their occupation, and there was a sense of belonging to something that not everyone had experienced. For some it enhanced their careers even though the events were extremely tragic, and participants had a sense of gratitude that they had been able to use the skills to do good and provide lifesaving treatments.

*'It was an awful day, but it boosted my career.'* Albert

Although MCI were devastating, these participants did not forget their ethical responsibility to help. They had a sense of duty to help their community but also assist their colleagues and ensure the team was not overloaded. Some participants attended the scene off duty because they happened to be passing or working close by. In their accounts they showed little hesitation to help even though there was potential danger. They knew their skill set would be useful and wanted to provide help to those that needed it. Participants like Meg knew that resources, including staffing, would quickly become overwhelmed and therefore they offered to assist. Meg recalled a colleague contacting her and saying:

*'We have still got patients from the [Place name: 06:41] that still need treatment and we have also got all the other patients, the normal emergencies coming through the door and we are short of consultants so we wondered if you could come in and attend.'* Meg

For Meg there was no doubt about helping, and she continued;

*'So, my response was yes of course, and I just turned my car round again.'* Meg

Some found it hard to step down from the event even though their shift had ended. There was a feeling of duty and responsibility to their colleagues to stay and support one another.

*'Yeah, so a few people stayed on from their previous shift. And mine like got stood down before the end of my shift. I know a few people didn't want to leave because they didn't want to leave their colleagues, or they stayed on from their previous shift. Like quite a few people stayed on for the night shifts into the day shifts..... And a lot of my colleagues are brilliant, brilliant emergency nurses, and that is what they wanted to do and that is what they live for.'* Penelope

Penelope highlights the dedication these staff members had to their occupation, and that in many ways it is a vocation and a way of life in some respects. Despite the fear and shock of an MCI, health care staff continued to try and save the lives of those affected. Some also expressed disappointment that they were not called in at the start of the MCI;

*'Yeah, I think so. Emergency medicine is weird it isn't that you don't want these events to happen, but if they do happen you kind of want to be involved because you think you've got something to offer. Erm from my perspective, you know, I've got a long history of major incident management, I co-wrote [course name] which is an international course that teaches major incident management erm with*

*[Name 1 omitted 07:33] who is my colleague and neither of us got called. \*laughs\* So you- which is a bit weird, so you've got two, erm and this is going to sound really pompous now, I don't mean it this way but you've got two people who are erm internationally published who run international courses in major incident management and we didn't get called. Erm and that was a bit annoying.'* John

John expressed disappointment and frustration that he had not be called in to work when the MCI was declared, as he felt his skills were needed during the first response. It is frustrating to have the experience and knowledge and not be given the opportunity to utilize them.

Despite the violence, the intent to harm and the devastation an MCI caused, none of the participants stood down, they were all determined to do their part to help the community and those that were severely injured. The staff put their own emotions aside to assist and put their training to good use. Participants also wanted to apply their knowledge and skill set. There was a definite sense of pride that they were able to be useful and had an ethical obligation to help. Following on from this sub-theme is 'Pride in helping', which will discuss the positives that participants got from being able to assist.

#### 4.6.2 Pride in helping

There was a gratitude amongst participants that they were able to use their clinical skills and help the individuals and families that had been affected by the MCI. Participants believed that they had the skill set to bring about order to a chaotic environment and this gave them satisfaction. They were aware that the public had invested in them through the NHS and therefore they welcomed the opportunity to help. Knowing that they had done everything possible to help another human being, even if that was being with them during death, gave the health care workers' peace of mind that they had been useful and had done their job to the best of their abilities.

*'You really felt in that first period where you were reflecting on your own doubt that, I was kind of able to square away in my head that really it was horrific but, we had done well, we had responded, and we'd given everybody that came to us the best chance possible.'* Oscar

In the depths of despair and sadness, health care professionals felt honoured that they had contributed to making the situation better. They had been able to do something for the public and they had worked as a team to support one another. Participants spoke positively of being able to work and do good. They experienced a mixture of emotions, but the ability to contribute was profound

enough to ensure they continued to work until the end. From all the interviews there was no hesitation as to whether they would help again should another incident occur.

*'Everybody was very subdued. But the other feeling that I had was that I was glad that I was there and able to contribute and able to help and to actually be in the emergency department and able to make some sort of contribution felt like a positive thing to do under the circumstances, given the distress the whole city was feeling at the time. I don't really remember sort of crying or breaking down at the time but just feeling very sad and despondent but also this mix of emotions of being glad to be able to be there and make a contribution.'* Meg

There were reflective thoughts from participants about why they continued working in emergency care, and as Mike summarises below, this included job satisfaction from being able to help others. For some participants it was too much and after the MCI they left this area of work, knowing they had done their part in helping but the situation had felt too emotionally draining. This will be explored in more depth in the theme 'psychological consequences'.

*'So, I am obviously getting something from it because I am continuing. And I think what I'm getting from it is a real sense of it being a worthwhile thing to do and somewhere in that, it must give me a buzz.'* Mike

Following public enquiries or a coroner's investigation, some participants were happy that their efforts had been noticed and that there was gratitude from family members, who had learnt that their loved one was not alone. The participants felt valued that they had done their best to try and save a person's life and that relief was brought to their families. A couple of participants discussed that families had given them their appreciation for being with their dying loved one, and for Mike and Mary this made everything worthwhile, and was the reason why they chose the profession.

*'Equally, a year later standing in the Coroner's Court explaining what we did when passing judgement for murder and the family are often very grateful to hear, and they often haven't heard until that point the extent to which the emergency crews tried everything that was possible to try and save the life of their loved ones. So, it's valuable on lots of different levels, I think.'* Mike

In summary, being able to help and respond to an MCI gave participants a sense of pride and importance within their community, to help bring back control and normality. They were able to

provide assistance to those who needed it, even if the outcome was death. This gave families comfort knowing their loved one was not alone. In the most awful situations, health care professionals felt as if they were able to give substantial assistance to those who required it, whilst also supporting one another within the team. The next sub-theme will discuss the resilience the participants demonstrated in order to persevere with their work.

#### 4.6.3 Vocation

There was a strong sense of determination to help during the incident, but also regarding returning to work. This sub-theme illustrates the willpower of these participants to get on with the job and help those who needed it, despite the difficult circumstances. It also reveals the dedication participants had towards helping and caring for their patients and team members, ensuring that they remained professional, attending work at short notice, helping off duty, and putting their own emotion to one side. There is however some discussion of the potential psychological harm that some health professionals may experience if they do not maintain their own wellbeing. This will be discussed in great depth during the theme 'psychological impact', however it is discussed here as a potential negative consequence, when health care professionals neglect their own wellbeing to help others.

All the participants agreed that despite their own fear of the MCI and shock at what they were experiencing they knew they had to help those that had been harmed or injured. Edward summarises this:

*'So, if I was to sum it up, I think the initial fear when I found out what was going on and then I think that was superseded by a kind of a resolution to try and you know we need to do the best we can and we need to try and help these people.'* Edward

Participants revealed their perseverance and used terms such as '*autopilot*' (James) to signify the lack of personal thought for themselves and express that they acted professionally to ensure the right treatment was given to those who required it, and in a timely manner. Penelope stated:

*'So, you just kind of get on with it really. That's the attitude basically, yeah, so you just have to do it and deal with it. I mean yeah, at the time like I say you just get on with it, or you don't turn up because you have to. Like you have to be there for your patient at the end of the day you know. You can't be not ok when you are dealing with your patient because it is your patient that you are there to look after.'* Penelope

Her statement suggested that the attitude of the emergency department is commitment to the patient and therefore it is almost impossible to then be self-centred during an MCI. There was unity among the health care professionals interviewed; that if you cannot put your emotions aside then it is time to leave, because the principle of emergency medicine is to be there for the patient.

*'Just to be aware of yourself with that and doctors are very good at saying they'll just carry on; we are absolutely horrendous at saying 'it's fine, I'll be fine' because you're expected to see the worst of the worst and just deal with it (yeah) because that's you know, what you're trained to do and actually underneath all of that is a human being and that's what I felt when I walked onto that [site1]. I was in real professional- I need to help these people mode- but at the back of my head I had these moments of utter shock at what I was seeing around me because I was also just a person on a [site1] which had been [omitted 00:14:31] and all these people around me with you know, their legs blown off (yeah) and it's this kind of dichotomy you know, this kind of professional mode and don't underestimate your subconscious, your subconscious is helpfully absorbing all of those things err, to potentially come back and haunt you.'* Mary

However, in the statement above Mary warned of the danger of forgetting the human element when professionally, medical staff do have to be pragmatic. She states that health professionals are made of two parts, the professional, and the human being witnessing awful catastrophic injuries. Mary warns that when 'getting on with the job' there is a danger of forgetting one's own needs and she states this can be psychologically harmful, which will be discussed further in the theme 'psychological impact'. In her statement she also leads with the notions of the expectation that health care staff must do their duty to be regarded as a professional. She suggests that there is an expectation upon health professionals to be fine and not to be affected by what they are witnessing and therefore to continue to show up at work.

In summary, several participants expressed that they view the health care profession as a vocation and that staff need to have ensured that emergency medicine was the career path for them. It was argued that it takes a certain commitment and understanding of the potential dangers and an ability to remain compartmentalised, to get the job done. The final sub-theme will discuss how work enabled participants to gain resilience and get back to normality through their work.

#### 4.6.4 Back to normal routine

Being able to get back to a normal working routine after the MCI helped some of the participants, and terms such as 'normality' and 'moving on' were used to express this. Not many immediately had the chance to take time off, and were very much expected to return to work. Post MCI there were still patients to take care in terms of recovery and rehabilitation, and for those in management there were reports to write and operational data collection. Henry described having no time immediately afterwards to process and seek help but instead devoted himself to his work and normal routines.

*'You know, given as I say, given the role I had in the you know, I was just incredibly busy because we just had so many um, you know teleconferences and data challenges and making sure that patients were relocating as you know to their home areas and you know it was, it was just you know sixteen, sixteen hour days erm and I just didn't, wouldn't have had time I don't think to then go and um avail myself of some support and then after all that calmed down, I then sort of just seemed to be getting back to my normal day job.'* Henry

For many, getting back to their normal routine and work life provided support and enabled them to develop more resilience over what had happened. There was no question of taking time off as they felt obliged to return to work and provide care for their patients. Some participants therefore did not take the time to recuperate or gain some external support to deal with any difficult emotions; despite this they found their job therapeutic and believed that this enabled them to move on from the MCI.

*'No, straight back, yeah -laughs- straight back doing it.... erm but that you know, I think that's in my nature and really, I think that is part of my coping mechanism is err to prove to myself that I've resilience erm, so erm, I think that would be normal for me.'* Oscar

Mary stated that she felt defiant, and suppressed any difficult emotion and wanted to instead demonstrate to the world that despite the MCI, she was continuing with life:

*'It was awful actually and I remember feeling like you know, there was this great sense of British defiance in that lots of people were like 'right, we're not gonna let the [perpetrators] get us down' and I love this about us Brits, you know we're great at stuff like that (yeah -laughs-) um yeah and it really is and it's good because I think it's absolutely what we should be doing and that's why you know, my husband and I we're both a bit like 'yeah, we're absolutely going back to work on Monday; we can't let these [perpetrators] think they've got the better of us' type of thing.'* Mary



For Mary this attitude helped both her and her husband to move forward, again taking pride and solace in their contribution towards helping those that needed it. It was felt that getting back to normal was in some way showing the terrorist that they had not won. However, despite a defiant attitude, willingness, or the pressure to return to work, some participants showed some hesitation over whether it was healthy or not to back working immediately after an MCI, as Oscar reflected on the immediate return being accompanied by the potential for delayed negative emotions.

*'I got straight back to work and then it didn't, it got back on an even keel as it were erm, there was no real consideration of taking time off at any stage, so (yeah) but yeah, I think (so-) I would anticipate two to four weeks down the line would be the biggest dip, erm chronic fatigue and stuff will kick in as well as err, erm, emotional side [00:45:00] I think.'* Oscar

Participants stated that they worked long hours, 'sixteen-hour days' (Henry) and working at this intensity put some individuals at risk of burnout, which will be discussed in the theme which deals with 'psychological impact'. However, for many their passion for their work motivated them to want to be ok for their patients.

In summary, routine and normality were helpful to the recovery of some participants, through enjoyment of their job or defiance towards those responsible for the MCI. Participants who felt well in themselves wanted to get back to work, and for some it was almost used to suppress any complicated emotions, for which they later would have appreciated some time off to prevent fatigue and burnout.

This fourth main theme of job satisfaction has explored several aspects of participants' work or job roles; in particular, the sense of duty to help and respond was a key defining feature. It was accompanied with a sense of pride and considerable satisfaction despite the significant negative demands of an MCI, and this was very much linked to a sense of vocation for participants; that their work was something they were good at and well suited to. A final feature of this cluster of themes related to a temporal aspect and the return of more routine work; this was questioned in terms of how immediate this was but the return to routine work was also viewed positively by many. The next theme, entitled scrutiny, will explore some of the participants' concerns towards clinical errors, blame and punishment.

## 4.7 Scrutiny

This theme relates to the scrutiny that the participants felt they were subjected to after the incident. Some believed that being scrutinised was part of the everyday culture of the job. There was also an element of fear noticed when participants were reflecting on their concerns during and after the incident, that they may have done something wrong. Many of the participants mentioned that there is always concern over whether their work will be judged, with some even stating that the NHS is a very negative environment and that there is not enough praise for staff, especially after an MCI. However, some felt if their work had been found to be wrong or bad practice than this did need highlighting to ensure it does not get repeated.

### 4.7.1 Blame

Some participants felt that they often received criticism despite their best efforts to help and treat those directly affected by an MCI. There was an anxiety that even when they are working, they are concerned that if things do not go right that they could be held accountable. Participants explained that there was a blame culture in normal everyday practice, which made them anxious.

*'I suppose the, a few of the routine jobs seeing the patients, you are always thinking about oh, if I get this, if I do something wrong could it, could there be an investigation, could I be found at fault?'* James

James emphasised that he is *'always thinking about'* the potential to being blamed if things that do not go right, and showed a strong sense of concern that he could face an investigation. Following an MCI there is often a public enquiry which some participants, such as Henry, empathised that this can be anxiety provoking:

*'Well certainly having, you know, again you know internal reviews are internal reviews, having an external, having external scrutiny on your, your practice or your performance is something that is I think anxiety provoking [...] and do you know what is interesting you know when these events happen, it's, it's you know, in your day to day care, you don't usually have an inquest you know, you might have a coroner's if it's a single case that went you know unfortunately the patient died but beyond that in medical care, you don't usually have a um, you know a dissection of what happened when and where, by who and what could've been done differently and that, that's different for this.'* Henry

External scrutiny for Henry was seen to be anxiety provoking and different to the norm. He expressed fear towards this type of investigation, and concern for staff members who had been called to give

evidence. However, some participants felt that it is only fair that incidents are investigated to ensure best practice is maintained.

*I think undoubtedly there is a bit about changing what we did and ultimately if we didn't, if we didn't do what was in the plan or what was accepted practice, then there is, you will be blamed and you need to be blamed.'* Oscar

Although they recognise that the process is not pleasant, they ultimately acknowledge that to learn and improve practice, both personal and organisational reflection and scrutiny is needed. If plans were not followed, the organisation needs to know why, and questions need to be answered. Oscar's attitude was very pragmatic about this, and he seemed to view it as a beneficial process to ensuring bad practice is not tolerated.

*'This is what you can do if you are not like coping, or this is a really good way to manage stress. It's never, like you never really get that. It's always just like more and more like we need to do this, we need to do this, we need this. Like it's a very sort of culture where if you don't do this, you are going to get an incident report [An incident report notifies the organisation about an unusual event in which harm could have been caused].'* Penelope

For others the culture of judgement and blame is institutional and starts during training. They felt it adds an unnecessary pressure on daily routine work and is then heightened during an MCI, making the job extremely stressful. It was also highlighted by Penelope that not enough praise or pastoral care is given to staff, and whilst she accepted that errors need to be reported, she rejected the notion of blame, stating that it was not helpful, and she would rather see a more positive outcome, such as training and further education to help those who may have made an unintentional error. She felt that there was only a negative message surrounding punishment should you do anything that does not end positively, adding to internal anxiety, which is discussed in the next sub-theme.

It was evident that some participants were concerned about receiving blame or scrutiny in their everyday work. An MCI added further concern due to the known possibility of an external enquiry. There were reports of a blame culture which participants believed to exist within the health care institutions. Some believed it to be anxiety provoking and demoralising, whilst other disagreed and argued there was a need for investigation to ensure high standards of care and best practice. The

next section of this theme will report upon the internal fear that participants experienced due to their worry that they had done something wrong.

#### 4.7.2 Fear of doing wrong

The previous sub-theme centred around concerns that there is a blame culture within the health care profession in the UK, and this section continues from this in relation to how individuals are fearful that they may not have done the right thing. Here the participants reported their concerns about causing accidental harm, experiencing blame, or being punished. Some like Mary regularly questioned their clinical judgement, and for her it became too stressful, and she later left emergency medicine.

*'I, you know I questioned whether I'd done the right thing and you know bear in mind I'd, you know I guess this depends on your personality as a medic as well, so part of I left, um, clinical medicine and went into pathology was because I found it incredibly stressful, always, I always used to second-guess myself- had I done the right thing with the patient, always; I was perpetually worried that I hadn't done the right thing and that was one of the things that led me to go into pathology.'* Mary

Constantly analysing and scrutinising their own practice was something a few health care professionals had experienced, and especially after an MCI. In common with Mary, Penelope reported a cycle of fear that she could have done something wrong, and this became too much, meaning she also left emergency medicine. This was not solely to do with the MCI but the general culture as a whole. Penelope had been involved in caring for patients following a multitude of different MCI which had taken place in only a few months.

*'They just tell you that you are going to go to prison because you've done this. Don't do this because you will go to prison. Don't do that because you are going to go to prison. It's all very like negative rather than you are doing an amazing job ... .. Like every shift is like a war zone. There are patients everywhere, all the time in A & E and you just get it from every angle. So, you get it from management. You get it from patients. You get it from relatives.'* Penelope

The repetition of being involved in multiple MCI for Penelope was overwhelming and this was partially due to her concern as to whether she had made the right clinical judgements. Her description of the accident and emergency department being like a 'war zone' captures the perception of a stressful environment in which clinical staff are having to make difficult decisions. As discussed earlier, the environment is unpleasant and therefore staff are making decisions in a challenging setting. Alongside

this is the anxiety of being judged and the worry of making the wrong decision. In the quote above, Penelope repeats the word 'prison' multiple times, illustrating the perceived gravity of making a mistake. Later she emphasises the pressure more by stating that there are multiple perceived sources of scrutiny from all groups of people; patients, relatives and management.

The element of self-doubt and concern about doing the right thing was evident in most participants' accounts, and for some it was fear of punishment or fear of doing harm to an individual. However, others stated that although they had these concerns, they were able to use processes to ensure their practice was safe and prevent feelings of self-doubt.

*'So that's why you try and go through everything obviously with that patient at the time err, do all your investigations so you get the information to make sure you get the right decision in the end. So, I think it's slightly different in a mass casualty event because you don't get as much time to think, but then you, you get on to autopilot which is, which you tend to do what you've been trained to do on autopilot automatically. 'I think more afterwards if it's gonna happen but then the, the times I've felt like that and reflected after and start thinking did I do the right thing or did I not? You systematically break it down and work it through and it's like yeah, no actually you did, you couldn't have done anything different.'* James

James noted that using a systematic process to ensure all his investigations were carried out prevent errors when working under pressure. It also aided him later when feelings of self-doubt set in, as James could use self-reflection to prevent any anxiety and was able to remember systematically what he had done.

In summary, overall emergency medicine was perceived by participants to be a stressful environment which led some to be concerned about making clinical errors under pressure and being blamed or punished. This constant fear that they could have done wrong led some participants to leave and find a career pathway outside emergency care. Others gave a helpful insight in to how they were able to manage this concern.

To conclude this theme, participants noted concerns of scrutiny in everyday practice but especially after an MCI due to the high demand to provide care in a chaotic environment. For some, this level of scrutiny and concerns about whether they had performed correctly was too much and they eventually found alternative work. However, although unpleasant, some argued that there needed to be an

element of investigation after any MCI to ensure emergency plans were followed and that they do what they set out to do. The concluding thoughts from participants were that this should be a healthy and welcomed process, to ensure patient safety and policies are updated and improved upon. However, participants found it stressful and not always helpful, and expressed the wish that there was more gratitude for their efforts.

## 4.8 Media

This theme concerns the media's involvement in MCI from the perspective of the health care professionals interviewed. The sections that will follow will relate to humanity, in which the media were perceived to show helpful communication systems as news reports kept the accident and emergency department and the public up to date. They also honoured those that helped and died. The second section will discuss media negativity, intimidation and intrusion which discusses the staff's perception of the aggressive nature of the press and how the media does not always respect boundaries and lastly the media negativity which shows the undesirable effects of the media.

### 4.8.1 Humanity

In some instances, participants felt that the media were empathetic to the situation and wanted to report on the hard work and bravery that health professionals had demonstrated during the MCI. There was a deep sense of community spirit and support which was led by the media at the initial stages of the MCI. A few participants stated that the media really highlighted the excellent work of the health care professionals during MCIs, and this enabled them to;

*'[...] realise they'd done quite a good job under an impossible set of circumstances.'* (Albert).

Henry stated that they wanted to demonstrate the assistance that health care staff had given and that they were not there to mislead or misrepresent the profession or incident.

*'Felt that the media were extremely positive and wanting to you know, to, to highlight contributions, health professionals and the, you know, the whole of the [area] first responders really, you know how well they'd done?'* Henry

Some noted that the media had printed stories of gratitude from the patients' relatives or patients themselves for the care they had received. The participants expressed appreciation that they had been able to help and that their hard work had provided something good in an otherwise difficult situation.

It was rewarding for them to see this approval and thanks in print, and this therefore gave solace. However, participants explained that with time this also meant the release of personal stories and information regarding some victims, which caused some distress to those that had cared for them. The identification of patients and stories associated with their lives, and often family, made for emotional reading for some of the participants. In an accident and emergency situation health care professionals often only had limited time with their patients, but as Oscar explains in the quote that follows,

*'It brought a huge amount of humanity to the whole thing. Started to see photos of [omitted casualties] and things [00:58:58] and it was err, it became personal, so rather than my involvement hadn't been that, hadn't been patient focused and stuff, so although I was much more um kind of, I wasn't that involved in an individual level but then all of a sudden with the press and stuff, for a week afterwards you suddenly, you were getting that, you were getting it, the patients, the patients were not becoming, they weren't patients any more the more they actually started to become people and stuff and that becomes a lot harder umm to deal with.'* Oscar

Oscar's statement above demonstrates that the media coverage had made the violence and loss more poignant, therefore making the incident even more traumatic to deal with. Other participants stated that they ignored all media reports for fear of this. As Oscar also conveyed, this demonstrated the humanity of the press, that they were sensitive in their reports but wanted the public to know the true depths of the devastation caused by the MCI. The media showed that real lives had been affected and, in some cases, (terror attacks) the extent of the violence and the intent to harm innocent individuals. Oscar also states that the stories continued for a long period of time and this also made for prolonged anguish. Whilst some participants wished to ignore the press, others wanted to use the media to offer relief to families. Mary decided to be interviewed by the media, in order to give comfort to families who had lost their loved ones during the MCI.

*'We did um an interview with the Daily Mail about it in, oh I don't know when that was, a couple of years after it happened, they approached us, I don't remember how and asked and actually the reason we did the interview was, because we debated for a while whether it was really what we wanted to do, particularly for a paper like the Mail which I'm not a fan of really, um, but um we felt that it would be a good way to- exactly what happened with the inquest- if there was any way that we could allay anyone's anxiety over what had happened, it might be comforting to know that their, you know their loved ones had had a doctor on the scene, you know they didn't you know, potentially they didn't die*

*alone or they weren't suffering or that feeling that there was anyone there to help type of thing and that's why eventually after some quite long and hard deliberating we did decide to do the article.'* Mary

Mary felt this was a good way of showing the public that health care professionals had been at the site giving comfort and assistance to those that required it. It also ensured that her voice and perspective was heard and not speculations, which gave Mary solace; that she was providing insight to those that had lost someone during the MCI, and also further explanation about what had been stated at the public enquiry. Her motivation to do the interview was not to sensationalise the events but rather to ensure humanity was portrayed.

For many participants the media gave a sense of belonging to a community who had experienced the MCI, and there was a spirit of getting back to normal and not allowing the incident, or the actual perpetrators, to bring about fear in society. There were also events to honour those that had perished, and these were promoted in the press; again, participants stated that this gave a sense of belonging. There was also international coverage, giving support to those who had been involved, with many famous images, which a few participants discussed, with regard to by-passers helping and demonstrating humanity. Mary again stated this sense of solidarity which for her and her husband was comforting and uplifting:

*'The BBC there was and, and I really liked the focus on sort of the British spirit of camaraderie and we're going to, you know, it's them against, it's us against them type of thing, we're all gonna stand up and show that we're not gonna be cowed by these people and then that's great and I think the media can be great for that... so I think BBC's coverage was pretty factual erm and you know that was kind of, it was kind of ok and I think the initial day or days erm, it was very much like 'this is where it happened, these are the number of casualties', it was very factual.'* Mary

There was praise from some participants that the media had kept the public and the emergency departments up to date with what was happening at the scene, and had given information about the safety of the area after such events. As previously noted (Environment – Controlled), the media enabled the emergency department to keep up to date with what was happening at the scene. This also kept the surrounding community up to date and safe, by notifying them about what had caused the incident and its location, as Meg explains:



*'Yeah, and I had sort of mixed feelings about that really. I mean the media were reporting on such a significant incident and I think everybody wanted to know was the attacker, was he acting on his own or did he have support? And was there anybody else out there who was an immediate threat? Being able to hear early on that they thought he was just acting alone and there was nobody else in the country that was you know part of the cell that he was working with was reassuring. A lot of support from the wider community that was disseminated through the media. So that was positive as well. Some of it did feel a bit sensationalist at times but most of it felt informative. Yeah, I mean they seemed to reflect on why the public concern about you know making sure that [City 27:33] was safe. And also reflecting in a positive way on the community support that was going on throughout the activities.'*

Meg

Most participants felt that it was the duty of the media to report on such unprecedented events, to ensure the public were aware of what was happening. However, as Meg stated in the previous quote, some of the reports were considered inaccurate and were felt to provoke public attention, which will again be considered in the next section on negative aspects of the media. The consensus was that the media tried to be informative, whilst maintaining sensitivity to maintain community and national positivity during a hostile and upsetting time.

Overall, there was praise for the media in presenting the stories in a humane and sensitive manner at the time of an MCI and years later. Some participants thought that the information was factual and honoured the victims and those who had stopped to help. However, there was criticism that would follow after the initial incident, and for some, the press was intimidating and intrusive; the next sub theme will expand on this.

#### 4.8.2 Media Negativity, Intimidation, and intrusion

This section gives a contrasting and contradicting view from the previous theme concerning humanity. Some participants felt the media added an extra challenge to their work, with reporters being distracting, intrusive and intimidating. Some appreciated they had a place to report news but found being interviewed anxiety-provoking and often felt that there was a lack of accuracy within the news reports. Penelope explained that the media had approached her on the way to her shift when an MCI had been reported:

*'I got stopped as I was trying to get to work by [News company 08:36] trying to talk to me as well. [...] And then you are sort of harassed by the media and the press. I couldn't get to work because all the roads were shut, so I had to walk. I was getting sort of harassed by people on the way in.'* Penelope

She used the word *'harassed'* to explain the intrusive behaviour of the media which she and others found intimidating, adding stress to what already was a traumatic shift. Participants stated they were very distrustful of the press and were aware that if they did speak to the media their words could be changed to make the story more sensational. For those that did not have any media training, such as Penelope, this was anxiety provoking and overwhelming. Even some of the senior staff who had received media training were apprehensive of being interviewed by the media. There was a fear of saying the wrong thing, which caused distress among a few of the participants. Some worried about their words being changed or misrepresented, facilitating some participant concerns that they could be scrutinised by the public or punished by their governing body. This also links back to the previous theme, *'scrutiny'*.

*'I suppose erm, I was fortunate in that I, in one of the previous roles I did I got quite a lot of media training erm, it's still however hugely terrifying and you are massively aware of saying the wrong thing. I think in some respects I knew it was part of the job but nevertheless it is still quite anxiety provoking.'*  
Henry

Others also felt that the press had been intrusive, and several reported having been contacted via their personal mobile phones, as Albert explains:

*'And it's the only time that we've never kept tally or a complete tally of press contacts. A hundred and seventy-seven interviews were conducted in the following week. I did sixty-nine, I did three including two television interviews walking to [station name] which was the nearest functional station for me to get out of town. And you learn the power of the press because somebody had taken a photograph of me leaving [venue]. By the time I'd got to [station name] the latest editions of the evening standard were there and that photograph was in it.'* Albert

Not only were the media intrusive in wanting interviews, they also took photos at the scene of the incident without the consent of the individuals. Edward reported the distress this caused him and subsequently his family. He felt completely powerless in maintaining his anonymity.

*'I think it's important that the media do reports, and I think it's important that it is you know, it is disseminated, what's happened because I think that's actually important for general society. I have real issues with photographers taking pictures of staff without their permission. It did upset a number of people at home, close to me, my parents particularly, to see pictures of me like that on a newspaper. And you know I should have been given the ability to say yay or nay, or at least prepare them for it, which I wasn't. [Yeah] So it's going to happen. I think there's this assumption because you are in a uniform that you are fair game to have pictures taken of you but this particular picture you know it went all round the world. It was in newspapers all over the world [...] I felt violated by that. I can't explain to you the number of phone calls I had the following day asking me if I was Ok and there were people that I hadn't spoken to in a number of years who were ringing me going are you ok, because of that picture and that photo. And you know part of it is I guess there is a curiosity on their behalf as to what really had happened and what did you see and etc., etc. And you know it annoys me that some photographer made money out of my misery.'* Edward

Some participants felt that the media have a lot of power and within minutes stories are sold internationally, which as Edward states can be harmful. There was a recognition of the need to report MCI in the media, however the harassment and intrusive nature of the media made a lot of the participants nervous and angry. There was also discussion surrounding the need for organisations to better protect their staff from this kind of intrusive behaviour, especially when photographs were taken, as Edward expressed in the quote above.

Such examples highlighted the considerable negativity from some of the participants towards the media and a mistrust of them publishing sensationalised stories which were felt to be inaccurate. Participants stated that they tried to avoid the press, that they did not want to communicate with them or watch the news reports after an MCI.

*'The training that we have done for dealing with the media, it's always being very, very cautious about what you say to them. It's almost like thinking what you're going to say, look at how they can turn it around or misunderstand it or misinterpretate [sic] it and then rewrite it again so they can't (yeah) and always try and avoid it, always try and avoid the media as much as possible, just so your name doesn't get printed out there or your picture plastered all over the place.'* James

As James expressed, there was a fear of being misrepresented and a fear of having to relive the events. Some also felt that MCI had been reported inaccurately, which was distressing and maddening to some.

*'The media just say stuff that is entirely not true. I mean I know a lot of the, this is why it's hard. From events that have happened that aren't major incidents, the media will report and say one person was stabbed and you've had fourteen people that were stabbed, and you are like well that's not true. That's why it's hard at the time. You are just going off like BBC News and obviously you know what they write is a load of rubbish sometimes and so misreported, that's why it's quite hard because you know some of the information you get isn't really true. Equally, it's really weird to read stuff that you've been involved in all over the news.'* Penelope

Penelope reports that some of the stories published are inaccurate and she conveyed that this was difficult for her to read. There is a strong suggestion that participants were upset that the events were not being portrayed as they felt they should be, and that it was surreal to realise that they were a part of newsworthy incidents. Inaccuracy in the press' reporting of an MCI was an important reoccurring theme with all participants and was arguably the main reason the press was viewed negatively. This appeared to lead to most of those interviewed stating that they had avoided the media, and that this was not always for self-preservation for fear of becoming upset, but rather because they knew the information was incorrect. There was anger towards the press dramatizing stories to gain public interest and make money. Oscar preferred to concentrate on the data analysis conducted by the hospital to learn what could be improved upon, rather than listen to speculation in media reports.

*'I think particularly of that is learning and I think that's what makes us better and stronger for them next time and so I really, I think I'm pretty used to largely ignoring what a journalist will say in order to sell papers and stuff and you see it all the time, patients come in with 'oh the paper said this' and you need to actually look at the science and the evidence behind it and stuff and things like the response from the Fire Service; you know when you actually get to know what planning for a major incident, you kind of understand why that's happened erm and so you kind of leave the journalist out of the equation (ok, yeah -laughs) to devalue them and go they're just trying to be sensationalist and feed the public and sell and make money, essentially, whereas we're not that, we're not about making money or being whatever. So just you have like a data analysis of actually what happened for yourself and ignore the sensationalists' opinion.'* Oscar

There was also a discussion around the longevity of these incidents being reported on; every anniversary is presented in the press, meaning that there is no reprieve and key health professionals are interviewed each time, or asked to be interviewed. This then becomes a consistent intrusion, but also does not allow those involved to move on.

*'With the Press, with it staying in the Press for a much longer period and a very public um annual err, anniversaries and stuff, that you bring things to the top more frequently.'* Oscar

The relationship between the media and health care professionals seemed fragile, with almost all participants agreeing that there is a lack of accuracy within their reporting. There was a sense that the media are relentless in their efforts to try and find out information to make money out of. There was respect towards the need for the media to keep the public up to date with current affairs; however, participants were only positive about this when details were accurate. There is a strong sense that health care professionals do require adequate training with dealing with the media and some protection with regard to their identity, so that it is not possible to make photographs public, without consent.

This section explored a further external aspect of being involved in a MCI, relating to media. This emerged in a polarised way for participants, some viewing media activities positively and as offering helpful reporting and respect for those involved. However, others considered the media to be much more negative and felt it was an intrusive and even an intimidatory pressure which was not beneficial, either during or after an MCI. The next theme explores how an MCI has affected the participants and how it has impacted on their daily lives following the MCI.

#### 4.9 Psychological Impact

This theme explores how MCIs' have affected participants mental health and wellbeing, considering both positive and negative effects. Living within the environment in which the incident took place meant there were frequent reminders; but conversely being a part of a community gave a feeling of solidarity, and for some, this helped them gain closure. However, there was a sense of fear that the incident could happen again and worry for the safety of friends and family, which caused anxiety for some participants. There was also discussion of how the anniversary of such events meant that there were always yearly reminders of being involved in a large and internationally recognised incident for which there were memorials. This for some meant that there was no way of moving forward, with the circulation of the same images in the newspapers or environmental reminders. This theme also

discusses some of the psychological aspects which participants felt, such as avoidance, burnout and delayed emotional response. Lastly the theme discusses the impact of public inquests which often take place post MCI and can cause added stress to health care staff, with the fear of judgement and blame.

#### 4.9.1 Living within the Community of the MCI

This was an important issue for participants' as they not only worked in the area of the MCI but also lived there, meaning that there was in some cases a personal emotional impact to the incident, both during and after, with regard to loss, personal safety, and reminders of the incident within the environment. For some being in a community gave solidarity and a sense of getting through the MCI and its aftermath together. The positive and negative aspects of community will now be considered further.

There was a strong sense of anxiety in relation to an MCI, as participants were still faced with the atrocities in several ways. Participants stated that MCIs' often change the landscape or infrastructure which they had to pass or see daily, meaning there were frequent reminders to themselves and others in the community. Participants described still seeing blood on the walls of buildings, or the belongings of victims, such as a child's homework, days after the incident. Participants explained that the buildings become graveyards or sites of the missing, which brought about unpleasant emotions, flashbacks or memories, and as Penelope states in the following quote, there is no way of forgetting or disengaging with work.

*'So yeah, that was quite hard in terms of, and you are living in the community as well where it's happened. So, it's always there. So, you are coming home and every time you go to work on the tube it's [Building name: 26:05]. So, it's not like you can just not think about it because it's there all the time. So, like every time I got on the tube it was there. And then for ages after it was just like a burnt down building and you sort of knew there were people in there still that they hadn't found yet.'* Penelope

The previous theme revealed how psychologically draining this can be for individuals, and there was a definite sense of this psychological burden during the interviews whilst discussing this. Penelope for example became tearful, and the interview was paused. MCI scenes are often not cleared for long periods of time after the incident due to it being under investigation by the police. This can cause disruption to the community as roads and buildings are closed for evidence collection. Albert in the

quote below describes the devastation following an MCI and how the community continues to be reminded:

*'And that's why it took so long to give us the building back. It was a forensic site. The whole of the pavement was covered in polythene. So, smells were there. I mean the building itself where is now the main entrance to the building, in those days was an unused entrance. But they were huge oak double doors about ten feet tall and about six to eight feet wide. And the whole of that door frame was blown back four inches... And my flat overlooked [Name of building] and I got some photographs. While I was taking them, what hit me was the smell of disinfectant afterwards. The whole front of the building was splattered in blood.'* Albert

As already mentioned, the environment than serves as a consistent reminder of what happened, and participants mentioned that this was distressing. Albert noted smells, blood, and damaged infrastructure, which as he stated were unpleasant and upsetting.

*'I lived literally probably; I mean you can see [Building name 21:53] from my flat. It's near where I lived. I remember waking up and the news, and I was staying with my boyfriend at the time, and he was a health professional too. He worked at the ambulance station next to [Building name 22:07]. So, I woke up and was like had missed calls on my phone from my work, trying to get hold of us to come in. So, I got up and obviously read the news, and I drove towards my flat to pick up some stuff and there was just this building on fire, like a huge inferno. And I knew that some of my very close colleagues, in terms of ambulance service, were at the scene. So, you've got a huge building on fire, and I don't want to sound selfish but obviously people that you know and care about are at the scene there, and then you are kind of like oh my god, oh my god. And then obviously at home I could see the fire at the time, sort of like brought it home, the gravity of the situation. And it was so many people that were injured and also so many people that didn't know their family were safe.'* Penelope

At the time of the incident, it can also be anxiety provoking knowing that colleagues, friends, and family members are at the scene, and potentially in danger. Living in the community means that participants were likely to have known someone who was either a victim or a member of staff responding to the scene, and this led participants to feel worried and anxious. As noted previously under the theme Media and Environment, they were able to get updates from news reports, and whilst this was useful for preparing for patients it did cause personal anxiety amongst staff. This made the MCI even more personal and concerning, whilst health care staff were also having to concentrate

on their work. Penelope's quote highlights the inability to detach from work or from the incident, as she was able to see the building in which the MCI occurred. It also illustrates how staff consider themselves members of the community, and as Penelope stated alongside others interviewed, it made the situation more surreal and was emotionally difficult.

However, being part of a community gave staff a sense of belonging to a group who all understood the harrowing situation and therefore created a supportive environment, as Meg discusses below:

*'You know the ward staff were offering help and the community outside helped. People kept coming in and dropping off foods you know which was, you know amazing really, but you just felt very much that the whole community just wanted to contribute to the response, I think. It was nice to see that and to feel that people wanted to support us in our work. That was reassuring and you know helped relieve some of the distress that we were all feeling at that time. It was also good to see the wider response in the city so that one of the squares got completely taken over by flowers.'* Meg

Members of the public donated food, and local businesses delivered gifts for staff which demonstrated a level of appreciation for their efforts. As Meg states this lifted spirits, and participants spoke with gratitude and delight to have received this expression of appreciation. There were also various memorials and concerts held within the community, which was met with mixed emotions; some participants chose to avoid them, whilst some found it mentally helpful to gain closure. The memorial events gave a sense of solidarity and a release of any difficult emotion, as Albert states in his quote below. It also enabled informal talk about the incident which again acted as a form of therapy for some and seemed to allow them to move forward with their lives.

*'[...] And the memorial service a fortnight later was actually a master stroke. I think it actually, I know it helped a lot of people lay a lot of ghosts to rest terribly quickly. And probably some of the tears were more to do with the overall burden of dealing with this and immediate care over a lifetime.'* Albert

Albert used the word *'burden'* which demonstrated the difficult emotions and trauma after working at the incident site. He uses the word *'lifetime'* which suggests that these feelings might never really leave someone, but being part of a community had helped.

In summary, participants who lived and worked within the community where an MCI had taken place often experienced a relentless emotional burden, caused by the exposure of seeing reminders of the



MCI within the environment they lived in. Some also experienced concerns surrounding the safety of loved ones, colleagues, and friends, who they knew were working at the site. However, there were some positives to living within the community, as for some, the memorials were a way of dealing with the emotional trauma sustained from either working or being involved in an MCI. Staff also received appreciation from the public in the form of gifts and thank you cards, which created relief and reassurance that staff had carried out their jobs well. The next subtheme will extend the negative consequences endured by the participants after the MCI, discussing the feeling of insecurity.

#### 4.9.2 Insecurity

Terror attacks often provoke a feeling of insecurity during and after the incident. This subtheme will explore the anxiety felt amongst participants during the MCI when considering the possibility of a secondary bomb, and the altered sense of security felt after such incidents. Participants discussed their anxiety over whether they were clinically prepared for another attack, but also anxiety about their own safety within the environment they lived in.

Participants who had worked during a terror attack had explained that there was a heightened concern that there could be a secondary bomb at the site or elsewhere in the city, as this had happened in previous attacks. Clinically as Henry explains below, there was a raised concern that if there was another attack there may not be enough resources, skills and ability to help victims.

*'Patients had already come in and the only um, ongoing anxiety in people's minds which was something I was hopefully able to do something positive about, was, was what, what else was coming and you know it was that anxiety I think because of recent events in [incident2's city 00:13:10], people were thinking well we've had one incident, are we now gonna see erm, you know a [type of incident 00:13:21] event happening elsewhere um, are we gonna get more casualties from another focus of [incident].'* Henry

At the scene of the incident there were concerns around safety and of the potential that they themselves could get injured or have their own life threatened. This served as an anxiety throughout the duration of participants working at the scene, which was emotionally draining. For some this perceived risk was not noticed until afterwards, causing a surge of emotion.

*'So, so and I took her, dropped her off at the, outside the venue, went off and had a um, a meal in a restaurant on my own and then went back to pick her and her friend up and I, it was the most horrible*

*meal I've ever eaten because I was just so nervous about you know, leaving her at an event on her own.'* Henry

This anxiety continued after the incident for Henry, who had a young daughter who wanted to attend a concert, and he stated that this usually would not have made him anxious, however following the MCI he was apprehensive, and held an altered perception of security within his community.

Multiple participants discussed that the perception of their safety had changed, due the incident occurring in their own community and the demographic of patients. This was shocking to the health care professionals, and they were able to identify themselves and their families with the victims. They also knew of people who had attended the site of the MCI and therefore this was not something they could ignore, as John explains:

*'Er well some of my daughter's friends were at the concert. So, on the morning that we were going in they were phoning their friends to find out whether they'd been affected or involved. Erm, and going in, I kind of knew that some of [Name 3 omitted 13:13] had been at the concert, so erm, well I didn't know at the time I was going in actually, but I found out when I was there on the day, during the day, this is a very close and personal thing. That's the thing I'm getting to with the demographic and stuff and things, is that this felt very close and personal to a lot of people who were involved. [...] One of the ways you can cope with seeing the horrible things which we do is think this is another, it's another world experience, this isn't what happens to me, this isn't part of my world. You can cope with it that way. Well, this was a massive, big slap-up reminder that it is part of your world and is, there's lots of different factors made that – the geography, the people, the demographics, the ages, all those kinds of things made a difference.'* John

This incident was difficult to remain detached from, and therefore caused participants to have an altered sense of security in their personal lives. Other participants described how both they and the public were concerned for their safety after such incidents, making small changes to how they went about their daily lives to avoid certain things that they now deemed risky. However, as mentioned previously, some participants believed it was important to show fortitude and stoicism, by getting back to normal.

*'Then the following week we obviously went back to work erm and there was definitely a feeling of everybody was really twitchy on the [omitted transport 00:33:17] and erm, really twitchy, they were sort of erm, you know everyone was looking at anyone who had a backpack.'* Mary

There was a perceived altered sense of security during and just after the MCI and participants were apprehensive about their own lives about the potential threat to their own and loved ones' safety in the community. There were, however, other threats and reminders which punctuated this sense of recovery over time. One example related to another temporal theme; anniversary effect.

#### 4.9.3 Anniversary Effect

This section has explored several aspects of an MCI that served as reminders for participants, such as the anniversary date, places, images in the media, or memorial events. Of note though was the anniversary date of the MCI they had been involved in. Participants felt that this always brought back memories, and for some was it was a date to remember those they had cared for and also those who had died. Mary particularly identified with a young woman who had died during the MCI that Mary had attended, and she stated during the interview this was probably because she felt they were of a similar age and shared a similar fashion style, noting her '*green cardigan*'. This visual has remained with Mary for over ten years.

*'Every [same date] I remember particularly the people from [site2] I always think about, I mean there isn't a [that date] that, bizarrely it's my sister-in-law's birthday, so I always you know, whatever we're doing for that, I will always take time in the day to think about those people particularly I mean all the people who died that day but particularly the ones at site2, particularly the girl with the green cardigan, she's always stuck with me (yeah) um and they released the photos afterwards and I'm pretty sure I could um, tell you which she was because you know, she was a pretty, young thing erm and yeah and I guess you know, you just kind of, you kind of live with it really.'* Mary

For others the constant reminders and especially the anniversary date were overwhelming, making them feel as though they could never move on with life. The magnitude of an MCI means that there is an element of public bereavement, and the anniversary is often mentioned in the media and there are often public memorials. There were concerns as to whether participants' memories of such events were changing, and an annoyance about the same questions always being asked by the media or various inquests. There was a feeling that there was no escape from the memories of being involved in such events and the fear of being consistently reminded of such events and being reinterviewed.

*'International radio stations want to talk to you, and you know it calmed down a bit and then on the first anniversary it will all go around again. And then on the fifth anniversary it will all go round again.'*

*And then six years later after the event, you actually get the coroner's inquest, so it goes round again. And then on the tenth anniversary, it goes around again. And so, we go on..... So yeah, it is difficult and an event like that will never go away. And yes, the annual anniversaries are always difficult because you are asked the same questions. And you just wonder if whether or not memory plays tricks on you as time goes on. It would be interesting to put questions. The response to the standard questions you get year one, year five, year ten, year fifteen, receive the same answer.'* Albert

Albert used the word 'difficult' to express the feeling of never being able to be free to move on and not be constantly reminded of the MCI. He also questions whether his memory is playing 'tricks,' which suggests that this constant reminder is traumatic. The media again play a role in this alongside the public who hold events to memorialise those who had died. Images in the media serve as powerful reminders to those who worked at such sites, and whilst they act as historical reminders for the public, they are potent and upsetting images for those that were there, once again preventing those individuals from moving on. Albert uses emotive language to portray his anguish over the image that the media printed from the scene of the MCI, and felt that it prevents any closure.

*'One of the things all of us found at [incident site], is because it was a major incident of national incidence and people know about it. But three of them were underground. Every time anyone wants to talk about [incident name], they show a picture of [scene of MCI]. And we never get closure. It's not the [incident name], it's the bus. It's a picture of that bus. You keep getting reminded of it. And for those of us there, you know, it is something we deal with all the time. And particularly as I've got a couple of pictures that were taken from above, straight down onto the bus from [Place name] when there were still people on it. It's, yeah, that does annoy us.'* Albert

However, some events to honour the deceased were seen to be helpful and aided recovery. They allowed for closure and the bringing together of a community that had undergone trauma. Some participants did shy away from attending such events, as they felt that was the best way to move on, but again Albert found some of them helpful, almost like a funeral to allow an emotional release. As previously stated though, the yearly memorial events were not viewed favourably among participants who wished to move on.

*'The [organisation] held an active remembrance at [place name] on the twenty-first of July, two thousand and five. There were eight hundred people in that courtyard. Secretary of State and Head of*

*the [Organisation] all turned up and that laid a lot of ghosts. A lot of ghosts that day for people and it enabled them to you know unwind.'* Albert

Environmental factors, such as having to return to or pass the incident site, were a difficult reminder of the MCI which had occurred there.

*'I couldn't get to work because all the roads were shut, so I had to walk. I was getting sort of harassed by people on the way in. And then obviously that homework that was on fire at the time sort of like brought it home, the gravity of the situation. And it was so many people that were injured and also so many people that didn't know their family were safe. It was just a very emotionally, you know high emotional time basically, because there were so many people involved. And it just seemed so unexpected. Not that anything's expected but like you prepare for mass casualty in terms of like a terrorist attack or a train station collapsing or a train crash, but you don't really expect you know like mass burns patients. So yeah, that was quite hard in terms of, and you are living in the community as well where it's happened. So, it's always there. So, you are coming home and every time you go to work on the tube it's [Building name: 26:05]. So, it's not like you can just not think about it because it's there all the time. So, like every time I got on the tube it was there. And then for ages after it was just like a burnt down building and you sort of knew there were people in there still that they hadn't found yet. There were people that were still missing their relatives and things and people still turning up to A & E months and months after who hadn't had like proper support from the council and stuff. And that was really hard because you felt personally like you know involved because you were sort of there.'* Penelope

Penelope refers to seeing a piece of a child's homework on fire as she walked to work after the MCI, which made the situation even more emotional and real. She also lived within the community and states the anguish of constantly seeing the destruction caused by the MCI. Infrastructure, even when damaged, can remain for a long time, serving as a consistent reminder and sometimes a graveyard. Having to return to normal life after these incidents can be anxiety provoking as they could occur again, and participants discussed the need for and importance of getting on with things. There was an element of resilience with this, however the constant reminders did evoke a trauma response in some participants, causing them to take some time off or change their job.

There are the initial reminders after any MCI, with regard to the environment and damaged infrastructure. This was particularly traumatic to participants who lived in the community and could

see the site of the incident from their home. In addition, there were longer term reminders, such as anniversary dates and media images which prevent those who were at such incidents from completely moving on. These images and discussions become historic and therefore are always brought back up, year after year. For some they almost felt that the event had defined them as a person and there was no escape. The next theme will discuss this further in terms of active attempts by participants to avoid things like anniversaries and other reminders.

#### 4.9.4 Avoidance

MCI's often provoke significant national and international attention, meaning there is also media attention, and it is often difficult to avoid reminders of the event. Some participants actively sought to avoid or ignore this attention. They stated that they tried not to discuss the MCI with colleagues or family members and instead made the conscious decision to focus on their routine work. Participants stated that there were numerous events to honour those who had died during such incidents, and to thank the emergency services, but many of them felt it was simply too overwhelming for them to attend.

*'I didn't, I didn't go to the consequential... there was a subsequent event wasn't there (yeah) I didn't go to that erm, I did go to the pre-hospital debrief which was um, which was a massive event in one of the Reebok stadiums, that was the you know, the Ambulance Service because there were so many of their personnel that were involved and that was a you know, I suppose a community event, wasn't open to the public per se erm, erm and I know one of my colleagues did go to the [place 1 00:36:09] to see the, all the donations people had left at the you know, at the statue there but again I, I actually didn't want to do that because I felt that would, you know I mentioned those couple of occasions where I've been making presentations and was emotionally quite labile and I thought it, you know if I went and confronted those type of erm, you know err, memorials I would've, I would've found that more distressing than trying to sort of keep a little bit at a distance and keep it as on a work, you know on a, on a work day to day basis (yeah). So, I didn't go along to any of those and yeah and so yes, I, you know.'* Henry

As Henry explained, he attended debriefs as these were important for reflection, learning and support (discussed in the first theme training) but avoided public events as it provoked intense emotion. This seemed a form of self-preservation rather than an unhealthy attribute, and many senior staff members like Henry were already having to give presentations for learning purposes, which he admitted caused him to become emotional, and as a result he limited his exposure to such events.

Henry was not the only participant to avoid public events and memorials, instead preferring to return to work and just continue with routine. Establishing a distance from the incident was deemed important by some participants to ensure they could continue working. This contrasts with other experiences, and as previously discussed some felt the incident was something that could not be avoided due to them passing the site on the way to work. They appeared to need that community spirit and collective mentality to return to normality.

*'But I mean I wouldn't read something now and you know feel upset. I would just avoid it. I don't read the news to be honest because it is just a load of rubbish and I don't want to read the news and just constantly be reading stuff. Like I can't watch the twenty-four hours in A & E. I don't want to watch my work whilst I am at work. Equally, I don't want to read about something that I've just been doing on my way home, and it's a load of rubbish because it's just like I just don't want to read it. So yeah, I don't really engage with the news.'* Penelope

However, many of the participants did mention the avoidance of the media in order to prevent ill feeling from misreporting and unwanted emotions. As discussed under the theme 'media', participants were aware that incidents were not always reported factually, which led to anger, or they simply did not want to read or watch events that they were involved in daily. This type of avoidance was therefore not specific to MCI but emergency medicine in general.

In summary, participants discussed the need to avoid certain events, such as public memorials, to spare unwanted and difficult emotions. Some wished to concentrate on their routine work rather than dwell on the MCI, and they used professional debriefs to aid their learning and development but avoided public events which acted as memorials. Some also chose to avoid media due to fears of misreporting and not wanting to be reminded of the MCI. However, it should be noted that this varied among participants, and in contrast some attended memorials and saw them as a way of gaining closure. Following an MCI there was a burden of stress and exhaustion, and although many of the participants returned to their routine work, they described signs of burnout, which will now be discussed

#### 4.9.5 Burnout

Another psychological aspect of an MCI related to perceived emotional and physical strain that participants had experienced after an MCI. Participants felt that they were already exhausted from working in the emergency department due to staffing shortages and the departments being run at full

capacity. When an MCI occurs, staff are then put under even greater pressure, including working overtime. As Oscar states in the following quote, the working environment would be better if there were plenty of staff, well equipped resources, and established training with simulations. The lack of this put staff under strain, which becomes physically and mentally draining and over time leads to a lack of passion for the job, which Oscar identified:

*'I dunno –[sighs]- because in the NHS here I guess, because undoubtedly with the, with all these things there's a preparing, practice makes perfect and things so undoubtedly if we made sure that we practiced loads, we had plenty of resources, we had plenty of staff and the day to day that we weren't running at capacity I think in the NHS over winter and stuff we run at 110% capacity (yeah) and obviously there's chronic fatigue there and that then means when you get something like this there falls a huge amount of physical energy and emotional energy and involvement that actually your resilience is just not there.'* Oscar

Some of the staff interviewed stated that prior to the MCI they had worked a full shift and they were called back in to help during the incident. This caused exhaustion, and as several mentioned, this further contributes to burnout. The majority of staff interviewed also stated that they took no annual leave after such incidents and returned to their normal clinical duties, and although some found this helpful to avoid unwelcomed emotion, others found it exhausting and overwhelming, meaning they had to take sick leave. Edward stressed that he was completely exhausted both mentally and physically, exemplifying the serious nature of burnout following such complexed incidents.

*'I could cope but the predominant symptom was complete exhaustion. Mental and physical exhaustion. And it was a couple of days afterwards when I was back in on clinical shifts. I had been back two or three days when it kind of hit, and it was pure exhaustion.'* Edward

Penelope shared similar feelings to a few participants in feeling overworked, overwhelmed by prolonged and recurrent MCIs', but also felt underappreciated by colleagues and the public.

*'I was quite burnt out towards the end of my time in my last job. So, I felt, I don't know if it was just the stuff like all the major incidents and the mass casualty or if it was just the relentlessness of you know, the department and your job role. It never really let up. And then I think there was a sort of, towards the end of my time there, erm there was, obviously I was involved in sort of incidents and things and erm I think it was kind of like, it became quite burnt out I'd say, and it was time for me to*



*go to another department and do something else... I'd say like most nights is a mass casualty event technically because you would be getting trauma after trauma, after trauma and like I say, that was that. And I think for me it manifested in a way that I was very passionate when I first started, and I was so willing to learn. I wanted to learn everything and do everything, and practice everything. Just absorb everything and then towards the end I was just thinking, oh we've got like this coming in. I know that I am going to have to go through this again and then you just lose that.'* Penelope

She noted that it was a constant cycle of MCIs' (four MCIs had occurred in a short space of time, and Penelope had been on shift for each one) for a few months, which alongside routine trauma became tiresome, making her lose job satisfaction and therefore she began to feel despondent. This led her to leave the emergency department to maintain her own wellbeing. There was a deep sense of sadness that Penelope had been passionate about emergency medicine and wanted to make a career in this area, but sadly had just become demoralised to the point of finding alternative employment. As stated in a previous theme 'job satisfaction', emergency workers have an almost devoted attitude towards work, acknowledging that they need to be there for the patient and cannot afford to be self-indulgent.

The environment also added to burnout due to participants working and living in the community of the MCI which added to the stress and toll of seeing the devastation these events had on staff and the public. From the description of all participants these events were harrowing in nature and had an emotional impact on staff, especially when children are involved. As Edward stated previously, the emotional side can be incredibly impactful and can happen several days later. Some participants discussed needing time off after such events and certain managers suggesting they seek support; this will be further discussed in the theme 'support'. Participants noted that many victims or by-standers still required after care, and due to an overstretched health care system, the care was not always given in a timely manner. Penelope stated she and her team were then seeing patients with mental health problems related to the MCI. This again overstretched resources and those health professionals working in the department. Penelope states, *'you work at this one hundred miles per hour all the time. There's never really any let up.'* This illustrates the intense working environment and the relentless nature of the work. The relentless nature was draining, un motivating and ultimately caused some staff to become burnt out, as Penelope goes on to note:

*'So yeah, I think that again, so you know with [Incident 13:51] although I personally didn't see the worst injuries, but for like months and months after, like I had a few patients that came in with*

*attempted suicide following [Incident 14:06]. So, it's just that constant you know, you work at this one hundred miles per hour all the time. There's never really any let up.'* Penelope

In summary, burnout was mentioned by some participants and was a by-product of long working hours, the emotional and physical strain of the MCI, the relentless nature of seeing patients for aftercare alongside routine trauma, and the continuation of further MCI, all of which drained staff and reduced resilience. Some staff required time off work and a couple decided to change speciality to improve their mental wellbeing. However, some recognised that the time off they required came much later, and that they experienced a delay in emotions, which will be discussed next.

#### 4.9.6 Delayed Emotions

As with many emerging themes, there was a distinct temporal ordering, and one that was manifested after the MCI was the delayed onset of emotion. Some participants acknowledged that during the incident they remained focused on the patients who required their help, and their own emotions were not considered even though there was a heightened sense of anxiety during the incident. They remained professionals focusing on the incident plan and their duty to care. It was only after the event that the true enormity of the incident set in, leading to exhaustion, anxiety, stress, and emotions. Some of these emotions were anger about the situation they had been put in, or at the person responsible for the MCI. Some felt an altered sense of security within their community, and some felt deeply saddened by the loss of life that had occurred.

*"[...] you know you just dealt with them in a systematic way and you know you treat them in the same way as you'd treat a car accident. It was only you know sort of a later stage when you, and as you say- both of the patients that I saw were relatively you know um, err, how can I phrase it? Erm, you know, their outward appearance was relatively unchanged from their norm. So you didn't think oh my, you know, oh my god, um this is something that should be happening on a battlefield, not in [city] (yeah), it was only later that that sort of picked through your consciousness and then you paused and reflected and thought oh my goodness you know this is, this is an [incident] in the streets of [the city]. I think the reflection afterwards was greatest erm, rather than during the event you know the immediate clinical response to the event, because that's when I think you start to process the thoughts that I've just shared with you about you know, the target and the method used and the place it was delivered.'*

Henry

Henry states after reflecting on the incident, he realised that the injuries patients had sustained were those usually seen at war, not the usual trauma seen in the department. This reflection brought a certain magnitude to the event but also shock that this had occurred within his community and to innocent children. Other participants also highlighted this, and stated that it was not until a few days after the event that the shock of the violence became apparent.

*'I didn't, if I am being honest, I was probably mostly not. At the actual incident it didn't, you know the real significance didn't hit in until afterwards, until the day after and you know the weeks after. And then a numbness I guess I didn't give myself the opportunity to think any further, if that makes sense? [Yeah] The last time the following day it really hit me actually. So, I had been up all night, so I was quite tired and it really hit me the following morning when I started getting phone calls from home. So, I am obviously Irish from the accent. [Yeah] So I was getting phone calls from family members who were looking at newspapers going are you ok? And then you know when you realise that it's the newspapers in Ireland are actually publishing pictures of you, you realise Christ this is actually much bigger than you know. The initial couple of days that I took off were probably tiredness more than kind of anxiety or depression..... And you know exhaustion as well in terms of tiredness... I think the way that stuff really hit me probably a number of weeks later. So about eight or ten weeks later I had to take some time off work and I think I was off for about eight to ten weeks. And that was kind of a depressive state. For that I needed to obviously see the GP and sort my head and stuff.'* Edward

From Edward's statement a timeline is evident, and he did not seek time off until about eight to ten weeks later. His emotions had intensified during that time and culminated in a more significant depressive state. Multiple aspects, such as his exhaustion, realisation of the magnitude of the event, international coverage of the MCI, and multiple deaths within the community all contributed to the sense that this was extremely distressing.

Across several interviews participants mentioned that it was only after the actual incident and when they had gone home, that emotions began to appear; some mentioned in their interviews that they thought that the adrenaline from working during the incident had acted as a protective barrier or that their intense focus during the MCI had numbed their emotional response.

*'So, I know lot my colleagues who were working erm [place name]. It was just like adrenalin, adrenalin, keep going, keep going. And then it's like weeks after that we were sort of felt the effects from it. And it's the same with stuff like the mass casualties in, which wasn't a major incident, in reception. You*

*just get on with it at the time because you have to. And you have got so much adrenalin going that you kind of just go back to your absolute basics of what you have been taught. And then it is only after that you think like that was pretty insane having four people just randomly stabbed in front of you.'*

Penelope

However once home, sleep deprivation along with processing what had happened led some participants to feel extremely low in mood. Edward in the above statement mentioned pure exhaustion and acknowledged a delayed emotional response. Phone calls from family and friends and the media also heightened the significance of the incident for some and therefore caused an emotional response. Seeing photos or images of themselves or of the incident site provoked anger and upset amongst participants. The media also made participants reflect on what had happened, and aided some in processing their emotions, as discussed in the theme 'media'.

*'We just spent the entire rest of the day just watching everything unfold on the news. We were just totally shocked, I mean literally I think the rest of that, it was a Thursday, the rest of that day and the whole of Friday we were just, I just, I don't think the enormity actually hit either of us until the weekend of even early that following week.... Um, you know, had enough, we phoned our parents to say that we were ok, erm and that you know we were ok, and we were able to function and everything erm but just like we were so, you know so shocked at what had happened.'* Mary

Some participants described spending days after the incident in a 'daze' feeling shocked about what had occurred and trying to process what had happened, by watching events unfold through the media. Mary and her husband had both worked at the site of the MCI and therefore supported each other during this time; but they both required time off work to recuperate.

However, as time passed, and the emotional turmoil of being involved in the MCI became apparent, a couple of participants required professional support, significant time off and a change in career. For some it took the acknowledgement or advice of their manager or family member to suggest they needed professional support, in the form of the GP support or counselling. Some also needed to reduce their working hours, and this caused financial strain, requiring lifestyle changes, and adding further stress. Albert stated during the interview that being involved in an MCI is life changing and never leaves you.

*'To the point where my partner said you know we think you need to do less. You know keep what you learned in [place name], we don't want it, but we think you should go half-time in the practice. I had to, in order to keep my job, which peed me off no end because it meant I missed the full highest earning years by a country mile of my life.'* Albert

In summary, participants noted that they did not acknowledge any serious emotional response during the incident, however the magnitude of the incident and feelings of being either exhausted or low in mood set in a few days later once participants had been able to process what had happened. The media and recognition from family and friends also provoked the onset of complex emotions, such as depression, anger, and shock. This for some required the need for formal professional support and some time off work. The next theme will broadly explore how the MCI caused some psychological impact amongst those who worked at the scene and at the hospital receiving patients.

#### 4.9.7 Trauma effects

The previous sub-theme described the phenomenon of delayed emotions and several negative aspects, but this was only one part of the wider set of negative psychological effects for participants and will be explored further in this section. This ranges from embedded memories of certain patients who resonated with participants, feelings of distraction, broken sleep, and anger.

*I think, oh gosh, I think I walked on and I can remember, I'll never forget there was one girl and she's always stuck with me and like every [same date] I always think about her, she was, I think she was on my left and she was lying on her back um, I think she had sort of curly-ish, reddish sort of hair and her legs had been blown off from the knees and so her knees were kind, the stumps erm and it's always stuck with me because she had this green Dorothy Perkins' cardigan and I don't know why that, just has always stuck with me and I just remember she was such a young girl, she couldn't, I mean she looked to be in her mid-twenties which is how old I was, I was maybe [omitted] I think when it happened but, no, I think I was a bit older, whatever, it doesn't matter but erm, no, I was a bit older I think but she was in her, she had to have been in her twenties, that really, really, that was a moment in time where I paused and actually was like in my own head, just hugely shocked by what I had seen because this is a young woman in the prime of her life who's, who's you know, was fine half an hour before (yeah) and you know, this has happened.'* Mary

Mary identified with one of the deceased victims as they were of similar age, and even fifteen years later, she still remembers her on the anniversary of the incident. The previous sub-theme 'anniversary

effect', has already discussed how certain reminders can bring back difficult emotional trauma. Alongside this there was an element of Mary recognising her own mortality, which is also perhaps why this young girl is still in her thoughts. Mary described the girl's appearance vividly, showing how deeply ingrained the person had become in her memory. She also described the shock of seeing a healthy individual mutilated and dead when half an hour before she was living her life. This is shocking and it demonstrated to Mary how fragile life is, which provoked an element of anxiety and disbelief.

*'I may have treated a third person? I can't remember now um, and I think, honestly it's kind of a bit, the rest of it's a bit foggy but there was definitely the two ladies, there was the chap and there may have been a third person with leg wounds, but no amputated injuries of living people and then the paramedic was right by the [omitted 00:22:08] and he was seeing to somebody over there and that's as far as I remember and then actually I just suddenly thought, there was another [part] to the side of it, sorry this is, this is all coming out in a higgledy piggedy (that's ok) fashion, it's crazy..... then the other thing I forgot was, and again I, I'm so sorry to the person that I'm saying this about because it's the last thing that I mean to forget.'* Mary

Participants also described that certain patient demographics were upsetting, such as children, especially when they had been intentionally injured. However, the team's usual coping mechanism is that they share no similarities with their patients and therefore although any trauma is unpleasant, health care professionals are able to keep an emotional detachment, but as John explains:

*'So erm I think people found that- and one of the reasons that, one of the things that happened with that is there was a greater staff identification with the victims and their families. So, one of the coping mechanisms that people have in emergency medicine is that these people aren't like us [...] But on this, these people were like us, so it was middle class families who were affected.'* John

During the MCI John and many of his colleagues identified themselves with the families of injured children, as they had similar lifestyles and lived within the same community. Identification of themselves in patients made the incident more personal and distressing.

Some participants experienced forgetfulness or difficulty in recounting the events, perhaps due to the time that had passed, but it was interesting that certain memories remained more poignant than others, as was the order in which individuals recounted events. Some conveyed their experience systematically by time and what tasks they completed, whilst others focused on the patients, their injuries and appearance. Mary wanted to talk about the young girl in the cardigan in great depth

because her memory of her was so vivid. However, she recognised this and apologised for forgetting some of her patients. There was an attached guilt to forgetting certain people as though this was invalidating their life. She wanted to hold on to those memories to ensure that each person had mattered.

*'But I know that for me, personally, it's definitely like I remember walking round and thinking oh I've just seen someone's chest being opened in Tesco's. I'd be like yeah; you've just bought your salad and I've just seen someone's chest being opened. It's bizarre. Things like that, that doesn't happen to people every day.'* Penelope

Alongside recognising one's own mortality was a difficulty in ensuring thoughts and images were not brought into their personal lives. However, some of the injuries seen at MCI were extremely shocking and some staff members found it hard to forget, meaning that even when carrying out menial tasks they experienced flashbacks or thoughts of certain patients. Some had trouble in knowing that they could not save everyone and expressed feelings of guilt in having to make some difficult decisions at the scene. Albert had no time to discuss his decision and made a humane choice for the individuals who he declared priority four (not for treatment or transfer). This was a decision that he still thinks back to today and is reminded of when he passes the site of the incident.

*'[...] and I had to live with it because I walk past that point twice a day, two days a week ever since. And they were so seriously injured they were going nowhere and weren't going to do anything. They were just going to die with a human being with them. And actually, the hardest bit was debriefing the doctors afterwards.'* Albert

Albert stated that individuals in his team required support in comprehending these decisions and understanding that they had done their best. However, some participants reported feelings of guilt or concern that they could have done more to help. Albert went on to report that some of his team developed PTSD;

*'[...] One was the head porter and he suffered badly with PTSD afterwards. But it is interesting that they struggled later with PTSD, and I said to them, 'what's going on, we've all been through it?' 'Oh, we went back and looked while we were staying overnight.' I said, 'I told you don't.' They said, 'yeah we found the head of the bomber on the stairs.'* Albert

Staff had seen injuries usually sustained at war and such images were extremely distressing and hard to remove from their memories, leading to flashbacks and diagnosis of PTSD. Psychological trauma was also manifested by realising the magnitude of the incident and feelings of grievances with plans and policies not being followed, as Edward expresses in the quote below:

*'You realise Christ this is actually much bigger than you know. And then that's when it really hit me, what I'd been through. And at that stage I was really cross because obviously I had been put in a situation and I knew that I'd have to write a report and I'd have to you know go to the debriefing etc. So, I guess it was anger, it was predominantly anger for a number of weeks afterwards.'* Edward

Staff were intentionally put in the wrong place, meaning their skills were not used appropriately and they were out of their comfort zone. This caused distress, anger and worry knowing there would be debriefs and an investigation into the incident. This was discussed within the theme 'scrutiny', which staff were fearful of facing blame. Edward later had to take time off work and seek professional support to aid his wellbeing. The stress, worry and distracting thoughts following the MCI meant that some participants needed time off work but also struggled with everyday tasks and sleep.

*'But then I, at work I felt erm, I felt distracted, so I could work, but I felt you know, it was in the back of my mind. I don't know how well we slept the first day or two because I don't think I dreamt about it, I just think, I didn't have flashbacks or anything I just thought about it a lot, I'd wake up, it'd be the first thing I'd think about but that sort of subsided after a few weeks I think.'* Mary

Lack of sleep also added to feeling of exhaustion; some found it hard to sleep without intrusive thoughts although work served as a distraction or a way of avoiding difficult emotions. For some thoughts entered their minds during the night, causing broken sleep patterns. In contrast to Edward, most participants recovered, and these emotions passed without the need for formal support.

In summary, this section has focused on wider issues which had a negative psychological effect on participants and their team. It has discussed issues with addressing one's own mortality, ordering of certain events, feelings of guilt and anger about not being able to conduct their role effectively, and has addressed diagnoses of PTSD after witnessing significant injuries. The concluding sub-theme will discuss the stress experienced when attending a public inquiry.



#### 4.9.8 The inquiry

As discussed in the theme 'scrutiny' there was concern surrounding the public inquiries which follow many months or years after an MCI. Some of the participants had given evidence and some were apprehensive about being called upon. This section again relates back to the theme 'scrutiny' but is discussed here due to the psychological stress, which is endured from having to give evidence, report events and listen to criticism.

*'I think it'll be bringing back some of the stress and I think it'll be creating new stress, yeah. I think it'll be, people will learn things about what happened that night that they hadn't been aware of and that will change their understanding and question, make them question with that new evidence what they did and stuff erm, and so yeah I think there will be opening of old scars but there will potentially be new scars as well erm, and err, yeah, err, other problems as a result.'* Oscar

There were shared concerns that a public enquiry would bring back past difficult and emotional memories, but also bring about new stresses. As stated in the previous theme, 'scrutiny', staff were concerned about being blamed and there were fears of punishment. If staff were to find out they had done the wrong thing, this could cause stress, anxiety and other difficult complex psychology. There seemed to be little to no support with regard to giving evidence at the enquiry and Mary had to seek her own. However, for Mary it was an opportunity to give closure to families, and this gave her a sense of relief to know she had helped and done her part. She sympathised that for some this would be difficult and may cause further psychological distress.

*'But um, but yeah, the same thing with the inquest, it was just such a relief to know that we'd given some sense of peace to this family. I mean I am pretty sure that people, some people would find that very difficult to have to um go through and re-talk about it again and you know, I didn't and again I found it cathartic and the thought I might help someone I found good.'* Mary

This arose only in some accounts, as many participants had not experienced a public enquiry, however, it was acknowledged that these are difficult and could cause further stress or the exacerbation of psychological distress already apparent from the MCI. For some it was a helpful and cathartic moment in which they were glad that they could offer closure to the victims' families.

This theme 'psychological impact' has discussed some of the mental burdens placed on staff during and following an MCI. It has discussed the burden of living in the environment in which the incident

took place, but also the importance of the community to help bring about wellbeing and closure. However, for some this was not helpful, and they tried to avoid any public memorials or reminders of the MCI. There was fear of a public enquiry and for some this caused more stress, however other participants found it cathartic to help give closure to the victim's families. Some suffered from burnout and delayed emotion, meaning they required time off work and professional help, and this will now be discussed in depth through the final theme, 'support'.

#### 4.10 Support

The eighth and final theme will consider the types of support individuals accessed and why. Support was seen as personal choice, with some participants seeking formal methods, and others preferring informal methods due to fear of stigma. Not all participants felt they required support, but did choose to discuss the MCI with family or friends. Participants discussed how the MCI had put strain on their relationships as not all informal channels were supportive. Finally, it will conclude with the sub-theme of 'healing' which will explore some of the concepts that were needed for individuals to move forwards.

##### 4.10.1 Getting the right support

Support was a personal choice and for those who wanted it, gaining the correct type of help was important, as they wanted to feel heard, valued and supported. Most participants either stated that they did not feel they required any formal support in terms of counselling or seeing their GP, or they felt it was nonsense and would not be beneficial. However, the interviews revealed that this was very personal and what was right for one person was not right for all. Opinions varied with regard to the nature of the support that each wanted, and there were aspects of mistrust or feelings that due to their profession they should be immune from needing formal support. Only a few of the participants noted that they saw their GP or accessed a service which gave counselling to NHS staff. For some they felt they had not sustained any psychological consequences and felt they could manage their emotions either by themselves or by informally talking to colleagues, friends, or family. There was a sense for some that counselling was not something health care staff did, because it was their job to care for others and that they should therefore be unaffected by an MCI.

*'I don't know you know, you've got that classic thing of it's just not the done thing for you know medical teams to do that, I don't know you know, why didn't you know I suppose, erm, yeah I suppose personally I err, yeah I, whether I didn't recognise my um, the benefit it would give to me or, I just didn't*

*feel that I sort of, it was something I needed to do um, and I don't know whether that was true therefore for other people -laughs- (yeah) does that make sense?' Henry*

Henry hints at a culture of health care professionals not accessing support, and suggests he is not sure if it would have been beneficial to him. Albert concurred with Henry, speaking strongly of his disapproval of counselling:

*'I remember somebody saying, have you had any counselling? And I said what do I need counselling for? If you talk to somebody like [name], who is a Professor of Psychiatry. He is an unusual guy, he is a professor of psychiatry, the only psychiatrist that any of us know that has made [a specific grade of] instructor because he is ex-military [...] And as he said, the last bloody thing you want is counsellors, because they don't know what they are talking about. They are counselling from a position of dealing with somebody in a fairly normal domestic situation when you are not in that situation at all. You are in a war zone. It is a different game. I get very angry because they have never been there. They have never done it. They have never had to teach it. They are just a bunch of theoreticians.'* Albert

Albert gave a compelling argument that counsellors are not skilled in supporting those that have been involved in MCI. He uses strong emotive language to really demonstrate his disdain for counselling. However, this statement demonstrates a disregard of the counselling profession and perhaps a distrust in their work, or that they simply are unable to empathise due to them not working in emergency care. Albert's thoughts perhaps also match those of Henry that health professionals do not require psychological support, as they themselves are medical professionals and therefore should be resilient. There was also distrust amongst participants to share their feelings with formal services.

The type of support wanted was varied, and while some had strong feelings against accessing formal support channels, others felt its value and stated that formal support was needed. However, there was a view that a counsellor was needed that the individual could trust. They appreciated that opening up was difficult and not what they wanted to do, but understood it was required in order to help their psychological well-being. Edward's quote below summed this up well and emphasises the importance of trust and a good relationship with a counsellor.

*'I don't know that official counselling is for everybody. If that makes sense? [Yeah] But I think you know I wouldn't recommend official counselling for everybody. I think for people who are struggling or are having difficulties and obviously you know clearly, I was. I think it is excellent but it's about finding the*

*right counsellor for you. So, it has to be the right individual, somebody who you can speak to and I was just very lucky that the counsellor that I went to, turned out to be somebody I could really speak to.'*

Edward

These are personal and hard discussions to have, and therefore a good rapport is required and was deemed important by participants who had decided to get formal support.

*'I wouldn't speak to her. I mean I had a really good relationship with my matron, but I think there's an aspect for me where I wouldn't really want to share that with a senior colleague really. Not because I don't trust them, just because I think it's very personal. I probably would prefer to either speak to someone that was totally removed from the organisation. But even then, it's kind of that you know, it's really hard to talk about stuff and be candid and honest because you don't, I think it's one of those that's affected me is I have become hyper aware of what I say and I will constantly say something and then think they will discuss and say that [Name 25:10] is really sad about this and said this. So, it's kind of like I wouldn't really want to open up to someone like that because it's a trust thing, I think, and you don't know what they are going to think.'* Penelope

Others would not even discuss their feelings with their managers or colleagues and even expressed concerns about gaining help from external agencies. There was a strong feeling of fear that information would not remain confidential, and of an element of judgement. This form of judgement included fears that managers would not deem them fit to work or would judge their capabilities. There was a fear that the counsellor may think their practice was incorrect and report them. Again, this was linked to the theme of 'scrutiny', and demonstrates the profound effects this fear had, as it prevented some participants from gaining support. Some participants did not seem keen to invest in formal support, and some struggled with the idea of informing their manager.

John concurred with the other participants that it was difficult to share experiences with councillors as they do not understand the profession. To empathise and offer reasonable solution there needs to be knowledge of what the job entails, which would also ensure that staff respected and trusted the person they were talking to. He also acknowledged that individuals do not want to speak to managers and may have concerns regarding confidentiality when talking to work colleagues. He therefore suggested peer support could be used more formally, as it is already used during disciplinarys.

*'Yeah so, the perfect person to speak to I think would probably be, and the same sort of person I erm, - to say a doctor's made a terrible error at something, they generally need to speak to somebody who is- knows what they're talking about, so they've got domain knowledge. That's the problem with speaking to psychiatrists because they don't have domain knowledge of what works in ED. Erm, ideally actually it's probably best if you don't know them that well, but you can trust them to be confident. So, I can speak to [Name 7 omitted 26:09] because I've got our absolute confidence so, lots and lots of positives there cause I can say anything to her and it's not gonna go any further. [I: Yeah] So the confidentiality is really important. But it, there's another flip side of actually it would actually be better to speak to another emergency physician but somebody who I don't actually know that well who can be entirely honest with about how it felt and what it was like. But- and would be able to talk to me from a domain knowledge perspective but would also maintain confidentiality. And that's difficult, so- with the analogy of the doctor who makes a terrible error we'll send them off to go and speak to somebody often in another region and say look you go and speak to this person, it's completely confidential, and all I want you to do is go away and be absolutely honest with them so that you can have that experience of just telling it truthfully as it was, it's never gonna come back to us, and we find that's quite an effective way of helping people deal with these situations.'* John

Participants agreed that they needed to gain the support of someone who they could trust but also who could empathise with the trauma they had experienced. A more formal peer support programme therefore may be advantageous.

Informal support was welcomed by many and will be discussed further in a subsequent sub theme. This type of support came naturally to many, as they worked within a team and felt comfortable to confide in their colleagues. Others preferred to speak to family and friends outside of the organisation but warned they needed some medical understanding to empathise. However again this was not for everyone, and some participants held concerns of judgement from colleagues and risk of broken confidentiality.

*'Like you can't even go up to someone because you feel you can't talk about it because obviously it is a sensitive issue, it's an issue that involves peoples' lives. Like you wouldn't just go up to your friend in the pub and be like oh yeah this is what I had to deal with today, or this is what happened because you know it's like a terrorist incident or [Incident 15:10] you are worried about data protection. You are worried like obviously you would never breach confidentiality, but you are worried about expressing your experiences to people that weren't involved in case you... I always have this irrational fear that I*

*should accidentally say something that I shouldn't say. Also, you can't really say it to people because they don't understand and they don't want to talk about it, because that's the culture that we live in.'*

Penelope

Gaining the right type of support was deemed vital to recovery and wellbeing. Formal support was not something that many of the participants accessed; perhaps it was not needed, but from the interviews there was a strong sense of mistrust and a belief that they did not require it and should be resilient. Linked to this was the fear of judgement which deterred participants from accessing counselling or discussing their well-being with managers, peers or family and friends. Formal peer support was offered as a suggestion that may be helpful and popular amongst this group of health care professionals. This theme has shown that gaining support and help is personal and complex. The next theme will explore formal channels of support, such as debriefing and in-house support.

#### 4.10.2 Support for Staff- Formal

Participants described that there were multiple debriefs following an MCI which involved discussion around performance, operational issues, communication and signposting for psychological support. These debriefs were done in-house by lead consultants and nationally involving other agencies. Staff stated that there was a lot of useful material to help signpost staff to support services and also information about what symptoms to be aware of, with regard to psychological problems. As participants explained, this ensured that individuals were aware of their own wellbeing but also were able to notice members of their team who could be struggling. Henry illustrates perceived complexities of the debriefs following an MCI, as there are multiple agencies, departments and staff involved, and there are therefore many different types of debriefs. For some this was overwhelming and difficult to navigate; some participants just wanted to move on whilst others stated the debriefs were good educationally and enabled staff to meet one another. This then was an opportunity to ensure staff had peer support.

*'We have hundreds [laughs] so the, the initial one was about, I reckon it was within two weeks, probably yeah, it was probably about two weeks, so it was after um, and again it was coordinated by the national team, [Name1] came up to do the you know to do that one, but there have been multiple other small you know, so we have a departmental one on the night erm, we, we have a sort of network one probably at three to four days, as I say the official was, was two weeks erm but we also have erm an official regional debrief probably a month err and then we have a further cold debrief arranged through the national team probably about three or four months later err you know for, for a a review*

*of the, the subsequent management challenges. So yeah, they did rumble on a lot and they did cross over into different specialisms and regions and, and areas of the patient pathway. So it was quite a complex, you know it wasn't like a, you know you quite often sometimes run a debrief after you know, a cardiac arrest or something like that, whereas just you know, it just concerns the team that were involved in that cardiac arrest, it was far more complicated than that because of the pre-hospital network and erm multiple sort of agencies that were involved in the response. It was more of the, the operational review. There were, there was really good support for the psychological elements of the teams that were involved, involving you know both the pre-hospital teams and our team in ED and that was provided by the [area] hub which is run out of one of the mental health um, trusts who you know have got, had you know, had great access to their psychologists and made themselves, availed themselves to the hospital teams and to the pre-hospital teams erm, they provided initial leaflet support, you know highlighting sort of key, key symptoms and behaviours to look out for.'* Henry

Debriefs did not help all the participants interviewed and instead seemed to amplify feelings of anger and frustration. Edward felt he had been put in a difficult situation due to emergency plans not being executed correctly, and therefore found the educational debrief emotionally provoking.

*'So, there's two debriefings. The first debriefing was by the ambulance service which was a team debrief for the teams and that was just, to be honest with you it turned out to be predominantly just a means to let the other members of the team who hadn't been at the scene. It gives them an idea of what had gone on. So, it was just a recollection what went on. I didn't feel that was particularly helpful. In fact at the time, I was really angry. So, you know I felt that there was a bit, particularly amongst the full-time ambulance staff, that by the time they had asked there would have been some managers etc. that they were a little bit dismissive of my criticism of what had gone on.'* Edward

He also felt his thoughts towards the incident were disregarded by senior members of staff, and he was not given the opportunity to be heard. Having his voice silenced was upsetting and made Edward feel devalued, and this therefore was a lost opportunity by the organisation to support Edward. Not many of the participants wanted to use the in-house counselling service for reasons already discussed, such as stigma and mistrust in services. However, some participants did gain insight from the departments' counselling team as John explains:

*'Erm, and again I didn't, I didn't think of this, but it was pointed out by our rehab teams, erm particularly on the paediatric side is that a lot of children who suffer serious injury are also associated*

*with markers of erm socioeconomic deprivation. Erm so they tend not to live in environments that are as secure, which are as safe, which are as well supervised erm as er more, er less disadvantaged children. And what we saw in the [Place Name 1 omitted 10:58] bombing is that there were large numbers of kids, you know cause being able to sort of afford a ticket to go and see [Name 2 omitted 11:05] mid-week erm, have somebody to go and pick you up and take you home and stuff, there was a big shift in the population. So, the rehab teams and the trauma teams were dealing with a slightly different demographic of patients that they're normally expecting [...] And that made it more, you know, if it's children like yours and if it's you know, from the same places that you live and the same people that you know, there's a closer bond, particularly with an event like this which is so emotive. That perhaps made that even more so.'* John

By realising that his emotional response arose because he identified personally with the population, John was able to understand what was causing him distress and gain the reassurance he required. Some participants stated that their professional governing bodies helped them to find outside agencies which offered support and education surrounding psychological wellbeing. The doctors and ambulance staff discussed these services positively and recognised that they were beneficial in supporting staff. However, Penelope, who was a nurse, did not seek similar support and felt there was no time for her to indulge in her own psychological wellbeing, and also felt that the organisation could not afford her to take time off.

*'I also find that you know in terms of like formal support at work, the NHS is so swamped, and you know so pressurised, there just isn't that support there. There just isn't, so you deal with it and you get on with it, or you don't deal with it and you leave.'* Penelope

There was recognition of observing others within the team and ensuring they were supported, and acknowledgement to how best to proceed with supporting an individual. This mainly came from senior staff. The more senior staff interviewed stated they had recognised that some staff were struggling, and they therefore wanted to support them.

*'I think we were aware of, that though you can sit at the top of the tree as it were, that as consultants we're in a leadership roles from clinical viewpoint and so we certainly touch base and but also the recognise other specialties where other people were, the juniors were in the hospital when the consultants were at home and so actually we recognised there was a lot of vulnerable other staff and then the nursing staff and things that we don't necessarily have leadership for but, equally, I feel quite responsible for and so very much trying to welfare checks.'* Oscar



There was admiration amongst them, that junior staff were more front line and therefore had dealt with some very unpleasant incidents. Managers and consultants had set up support/mentorship groups to aid those that wished to talk. Oscar explained that he felt a sense of responsibility for the whole department and wanted to ensure that those that were struggling could access the correct support. He discussed how his department ensured that staff who were struggling had time off or had a phased return to work. He also stated that he approached those he thought may have been feeling low or not themselves, and signposted them to the services that could help.

When recognising that an individual was struggling at work after an MCI, a few participants noted that it was unhelpful for others to just state that they needed support, and that this often made them uncomfortable. However, they thought it better if the person signposted them to a service as this was deemed more helpful, supportive, and caring. Gratitude was given to managers who had helped and guided some participants to access help. Some participants had to leave their position or reduce their hours, and although this was met with sadness and contempt towards the incident, these participants stated they had felt supported by their managers.

*'Being able to sort of say you know, guide your, your employee to you know, maybe arrange a session for them or guide them to, you know, you have to be careful because some people might be very anti counselling, I mean it's a very personal thing but at least give them practical help towards getting it sorted rather than an off the cuff comment um and I guess like being understanding about you know, certain things at work that might trigger you like for me the autopsy. I mean obviously that's a very specific situation to be in but if you work in A&E and you've seen a mass casualty incident come through the doors you might struggle with the next few traumas coming through.'* Mary

In summary debriefs were not seen as helpful with regard to psychological support but as more of an operational and educational instrument. Gaining formal support was very personal, and for those who did not wish to access formal services their reasons surrounded fear of judgement, and lack of empathy or experience of the therapist surrounding MCI. Others felt they did not require formal support or that they should be more resilient as a health professional. Some professional governing bodies and managers were helpful in signposting staff to formal channels of support and when done correctly, participants found this helpful. The next sub theme will explore informal channels of support, such as peer, friends and family support.

### 4.10.3 Informal Support

As well as formal support being identified (with mixed feelings), several forms of informal support emerged. These arose through existing relationships such as with family, friends and work colleagues/peers, and again attitudes to this were mixed, and whilst being generally positive there were negative thoughts around gaining support from managers due to fear of stigma. This type of informal support could also be given immediately when the individual returns home, which a few participants stated that there was trust between them and family members in which they felt they could be open and honest.

*'I spoke to family erm, err immediately in the aftermath and a lot of just that kind of description about events and stuff which helps process the order and what you actually did and things and just err, square away the chronology as it were and then continue chatting to family. The many different support networks I have in terms of social and professional just kind of all came together in a way that helped process the experience in different aspects and stuff (yeah) and so yeah, and, and that was enough [..]With family like my wife is fortunately, she's a [omitted job] so she's medical so there can be a bit about the medical stuff with her, but it's much easier to be totally honest and expose you know, not to have to worry about appearing vulnerable or like, you can just be totally honest with someone, with a close family member.'* Oscar

Having their work and feelings acknowledged by friends and family was also important and helped participants accept that it was normal to feel the way that they did, and to confront difficult emotions. Meg explained that her friend reaching out to her demonstrated that she had support there should she need it and that she was more than a health care worker, thereby humanising her and giving her the permission required to grieve. It also demonstrated the international impact MCIs have; her friend had heard about the incident in Australia and had still offered her support.

*'I think just having the recognition from friends and family that are not in the nursing or medical profession was reassuring that people.... I think the one that sticks out really, my best friend who went to school and lives in Australia and her message was saying what a thing to go through, and I hope you are ok. And I think having that recognition from people in your life is not an easy thing to go through is important I think in sort of validating your own feelings.'* Meg

In common with others, Mary confided in her husband who had also helped at the site of the MCI. She did seek formal support but after one session was discharged due to the open communication that she and her husband had shared since the MCI. She stated that from the day of the MCI until a year

later they had spoken regularly about the incident, and that this was of great value. Unlike formal, support her husband was able to support her at any time which she felt aided her recovery.

*'I went to the first session and the counsellor, I can't even remember if it was a man or a woman, but I sat there and spoke about it and they said to me 'look, it doesn't seem as though you need counselling, it feels like you've got a good grasp on your feelings towards what happened and you're able to talk about it. I think it's just going to take time for you to sort of in your mind, you know, come to terms with seeing such you know, a horrible fall-out of what one man has done to another' erm, and I agreed with the counsellor I said 'look I don't think I need counselling, I'm able to talk about it' and he said 'well keep talking about it with your husband if he's happy' because both of us talked about it and we talked about it a lot I mean I'm talking for a good year afterwards, we talked about it; it came up in conversation all the time and both of us found that a real catharsis erm and then I guess we just kind of, you know, back to normal.'* Mary

However, support from friends was not always received positively, and Penelope had experienced a negative interaction which had made her more cautious about who she confided in, in the future. She also expresses concern that she is offloading on to others who could also then become affected. She again expresses a fear of judgement with regard to being seen as someone seeking attention; it therefore seems that even with friends and family there needs to be a rapport and trust to allow the individuals to express their emotion or feelings. Participants therefore valued their work friends and colleagues, as they had experienced similar or the same incident.

*'I remember I spoke to a family friend about it, and he started to cry. So, I was like ooooh. So, then it's like I don't want to tell people and upset people and I don't want them to take home stuff that I've had to cope with. So, it's not for me, that. No, no, no [...] I think it's hard to speak to people who don't have that perspective because they just don't want to talk about it and why would you? I wouldn't want to. It's a bit heavy isn't it? And you don't want to upset people. (Pause) And they just think you are just being gross or saying stuff for a reaction. I have had that before like, oh you are just trying to get a reaction. I am like no. I have that support network, but only by chance.'* Penelope

Alongside family and friends was the valued support from colleagues or work friends. There was a sense of respect that participants discussed their problems and entrusted their teammates with personal information. This meant they were able to have frank lines of communication and discuss some of the difficult emotions they were feeling. Being able to speak to others who had attended the

MCI was cathartic for some participants like Albert, as he found comfort in knowing his friends knew what he had been through. He also highlights the importance of not being alone, and being able to talk and gain comfort from others immediately after the incident. He emphasises the importance of timely support and thought this aided him to have a healthy perspective on what he had witnessed.

*'I think if I'd had to stay in [place name] in a hotel on my own that night, I'd have been in trouble. But I didn't. I was able to go and stay with good friends, close friends, and therefore in that sense you know people understood. Once more they were friends who were also involved in immediate care, so they knew what I had been through. So, in that sense, it was not too bad.'* Albert

Participants also discussed a strong sense of the institutions in which they worked promoting this informal channel of support, which also allowed for a deeper connection and improved teamwork. Senior staff explained that they encouraged informal open channels of communication throughout the department and made staff aware of the support available. Some participants felt this was done well and allowed for good peer support throughout the department. Doctors and participants in the ambulance service discussed formal channels of a designated mentor, and also a communications app which a few of them were part of, in which they could just message the group should they be struggling in any way. Participants found this useful and a timely means of support. However, others found this intrusive and opted only to talk to a private professional councillor.

*'But again, one of the strong things was just the, you know, the peer support mechanisms and making sure that they, people availed themselves of their own colleagues to you know, to share and debrief and discuss (yeah) how they were feeling. The latter one as I say, definitely you know, peer support, talking to people who were involved was, was I think the most effective [...]. Yes and you've also got a mix, so, so you've got people who are five or six years ahead of you in that journey and you've got people who are five or six years behind you and you've got that ability to share erm, you know feelings about, about issues and I think also the thing that emergency medicine does very well is that key um, you know so peer support isn't just doctor to doctor, it is across all of the um, you know all of the team.'* Henry.

Humour among staff was stated as a useful mechanism to process the events of an MCI, and socialising outside of work with those who had worked and experienced the same event proved therapeutic. Participants described this type of humour as *'strange'* but needed. Many enjoyed going to the pub or out for a meal with friends who had experienced the same or similar MCI to unwind and process

the incident. Due to members being part of a team, there is trust and individuals know one another well, therefore they can notice when someone is not coping. There is also an openness between team members, which as Albert states, comes from being part of a team.

*'So, it proved not to be true but yeah the doctors shaken is one word but not stirred. And it is interesting, we all went out together for a meal, the eight of us that worked regularly, the following day, the following week. And you know chattering away, no great problems [...] and so once you put their anxieties to rest about had they made an adequate response, things settled down. What I need is to go out with those I was with on the day for a pint and we'd talk it through. It was made a lot easier by the fact so too had eight of my friends. And that we were and still are close friends. And we were part of a team, so it was shared. [...] We've got informal coping mechanisms there and that's really I think how it all manages.'* Albert.

Even those who had received formal support spoke of the merits of the support gained from their team. Again, recognition from colleagues that they had worked during a distressing incident helped normalise some of the emotions, stress, and anxiety they had been experiencing. Again, there was trust and respect for one another which was also described as a comfort.

*'A lot of support from colleagues, a lot of understanding, a lot of kind of you know recognition that actually you know it had been a rough time and I needed probably I needed to take some time off. So, colleagues were very supportive. There was a lot of email traffic of pointing me in directions for support. Peers were very, very, very supportive. So although the ambulance service was trying to help us you know most of the support I received was actually from my colleagues here in the emergency department who had obviously gone through a similar stressful night, obviously different to the stress I had, but obviously had an impact on them as well.'* Edward

Participants found informal channels of support helpful. There was a sense of trust in family and friends which allowed them to be open with their feelings. However there seemed to be some difficulty in communicating these emotions to family or friends who were not in the medical profession. Similarly, participants described excellent support from their colleagues, with senior staff encouraging informal channels of peer support. Humour and socialising outside of the workspace were also deemed as cathartic.

#### 4.10.4 Gaps in Support

Participants discussed some of the reasons they did not access either formal or informal channels of support after the MCI, or the reasons why the support offered was not adequate. Participants agreed that mental health and wellbeing within the health care profession had become more acceptable and mental health services had started to improve, although it was still not adequate, and as Penelope notes there is still a stigma surrounding psychological health.

*'And there's definitely, I mean recently there's been more stuff like oh no, it's ok. Let's talk about stuff. It's ok to do this. I mean you can, but you also can't because I do think people see it as a sign of sort of weakness if you, especially when it's like, I mean whether it's spoken or not, it's definitely there. [...] I have that support network, but only by chance.'* Penelope

This stigma which Penelope mentions makes people feel weaker in comparison to their colleagues, or ashamed, making it difficult for individuals to access either formal services or support informally. Penelope also explains that her support network, which was informal, came only by chance, which is concerning and demonstrates a dangerous gap in support, in which some individuals may go unnoticed and have no one to talk too.

*'Because you are, especially when you are in a senior role, you're supporting your junior colleagues. You're trying to support your senior colleagues by in your job role and it's like there's nobody really there to support you, other than your close colleagues and your close friends.'* Penelope

Penelope went further and argued that there were gaps in support for staff that were not junior and but in a senior role. She stated that she had not received any formal support but rather just support from close friends that she worked with. There is a feeling of isolation here and if she was someone without close friends at work she may have struggled. Some participants stated they preferred not to burden family, friends, or workmates and therefore they could be lost within the system without formal structures of support.

When questioned further about support from the NHS, participants seemed vague and unsure about how to access it. Edward criticised the support offered from occupational health, as it was only an online programme, and many believed that one to one support was much more beneficial and programmed around the individual's needs. He gained external private counselling and lost confidence in the internal mechanisms of support. As already discussed, there was a fear of judgement

when gaining internal support, whether that be formal or informal, which deterred many participants from accessing psychological help and support. They were worried about being seen as weak or unprofessional or having some aspect of their work criticised. There was also a lack of clear support when the inquest of an MCI occurred; again, participants who had to attend the inquests stated that they gained support from their professional governing body rather than from their workplace. Participants were at a loss as to whether their department had any support mechanisms to help them prepare for the inquest. There is also a danger when preparing for the inquest that difficult feelings and emotions can reappear, yet participants felt there was a lack of empathy or awareness that this could occur on the part of the organisation for which they worked.

*'I don't know, and obviously it went on for a number of weeks, so it went on for about nine weeks, eight or nine weeks. Whereas I don't know that you'd get the same support if you go through occy health. So, my understanding from occy health is that you just get referred to as CBD online you know course that you do yourself which I am not sure is the best way to go.'* Edward

Participants expressed anger towards their managers for not being sensitive or empathetic towards staff. Again, this caused bad relationships and not aiding an open line of communication and support to the individual. Albert sustained financial losses which impacted on his personal life, and although he felt that he needed to take a step back after the MCI for his own wellbeing, he felt neglected by his team who failed to empathise or address what he had endured. There was a strong desire to be heard and listened to, something which all participants agree was important. The sensitivity of the topic was very apparent when participants discussed this, and those that had opened up to someone and had had their feelings dismissed were then guarded and cautious about who they trusted.

*'But equally it makes me, I think the thing that made me most angry was actually the response of my professional partners. They just didn't see it. They didn't realise what I'd been through that day and took a very business-like approach which cost me hundreds of thousands of lost income, because I am still only part-time. You know I can't demand my job back. [Yeah] Well I have actually calculated the losses. If I was to live to ninety, including my pension, loss is three point one million.'* Albert

Debriefs were criticised for not being useful, and lacked any concerns for the welfare of staff. Instead, they were an operational or education review, with only leaflets on psychological wellbeing and signposting to services. Some participants found this frustrating and upsetting as they were not able to express their feelings on the matter. Again, this demonstrates that individuals want the space and

opportunity to discuss their feelings and emotions surrounding the incident. Participants who found it easy to talk explained that they had found opportunities such as the inquest cathartic as they were able to express their view on the events. However, those who were more guarded wished for better interventions to enable them to speak up and be actively listened to.

*'The second debrief was an ambulance service wide debrief. So, it was pretty much everybody that had been involved in the response, got an opportunity to go and give feedback to part of the official [Name of work] debrief and feedback for the incident. And that took place at the [Venue 27:37] and that covered every aspect of the actual incident. Again, that's not a proper debrief. That's a review of how the service responded. [Ok] But they felt it was a debrief.'* Edward

There is a complexity with support, as it is very personal, and individuals require different forms of support in order to aid a good sense of wellbeing. However, participants raised important issues which caused a shortfall in the services and provisions which are there to support staff. There remains a stigma surrounding health professionals gaining psychological support, which organisations still need to work on to break this barrier down. Participants lacked a clear understanding of how to access support within their organisation, and felt that the occupational health service was not adequate with only online support mechanisms. There was also concern surrounding support during the public inquests which often follow an MCI. Anger was expressed when individuals were not actively listened to and when they felt their opinions or emotions were not validated. The next sub-theme will discuss strained relationships arising from informal support.

#### 4.10.5 Strained relationships

As already discussed, some participants engaged in informal pathways of support. This often came from family, friends, or workmates. Some participants found this mechanism extremely helpful, but others experienced negativity which put strain upon their relationships. Whilst some wanted to prevent their loved ones from worry or fear, they felt they had experienced enough, and it was not fair to place the burden on their friends or family.

Being short tempered or having feelings of anger and frustration were mentioned by several participants, and they had noticed that they had been *'grumpy'* around family, friends, patients and work colleagues. This seemed to be a sign of individuals not coping and requiring support, but it obviously put a strain on their relationships with others.



*'It makes all of us get, it can be difficult for all of us. And even when you are in a senior position, it gets difficult. I mean I didn't see it at the time, but I was noticeably more grumpy with my partners and with patients in the six months following [MCI incident].'* Albert

Penelope discussed a strain that arose from her frustration of her friends not realising or understanding the responsibility and stresses of her job:

*'And also, it was quite hard with relationships. So quite a few of mine became quite strained because I'd come home, and my friend would ring me and be like oh god I've had the worst day ever. Like you know I had this email at work and this woman was really rude to me on the email. And I'd just be like oh shut up, you've no idea what's going on in the world. Like I can't even speak to you. And that would make it that you didn't want to speak to your friends who weren't in that environment, which then made your sort of circle who you talked to quite small because they would want you to go oh really! [...] I have tried to have relationships with people that are not in that area of work. It just doesn't work because they just don't understand you. So, I think it makes you quite far removed sometimes from normal life.'* Penelope

Her friends outside of work lacked empathy about what she had been through or just did not comprehend the seriousness of her job. She equally was unable to sympathise with their concerns due to the life and death situations she had witnessed at work. As she states, *'it makes you quite far removed sometimes from normal life.'* She also expressed that she had found it difficult to make new friendships or even date outside her work circle, making her isolated. Whilst some participants did engage with friends and family and relationships were strained from negative emotions, others became insular and guarded to protect their loved ones.

*'I tried to protect my family from it so I didn't speak to them in detail about it. I just didn't want to. They are all non-medical, so they had no background in medicine at all. So, I didn't speak to my family, that was a protective thing I wanted to do for them. [Yeah] So I preferred to speak to colleagues and friends who had gone through it, rather than speak to family.'* Edward

In summary, some participants struggled to contain their anger and frustration and stated that they often became short tempered with those around them, putting strain on relationships with family, friends, and partners. They struggled to empathise with friends who they deemed to be living a 'normal life' and found it frustrating when their friends or family were unable to empathise or actively

listen to them, meaning they became isolated. Others decided not to discuss their feelings with their loved ones to shield them from worry or concern, meaning their family and friends became ostracised. The final theme will conclude with how participants found peace to allow them to move on with their lives and daily routine without the burden of negative feeling associated with the MCI.

#### 4.10.6 Making Peace

This theme explores some of the ways participants began to come to terms with what had happened, and how they gained closure in a healthy manner. Some had to make changes in their work life to maintain their wellbeing, whilst others gained closure by reflecting and understanding that they had done their best during the MCI.

*'Obviously the emotional side was where people had been killed but, it wasn't something we could've done, it wasn't within our remit to change that, if that makes sense? I think the volume, I think there was the volume of, of you know, there was many hours, it was a longer, protracted incident, there was a lot more patients and stuff, so I think there was bits there that just took, because of volume took longer. I think that was just something more to be endured, like just kind of, had to get processed, having processed the bigger, the incident.'* Oscar

Some participants were able to rationalise that some of the victims could not be saved and despite their best efforts there was nothing that could be done. They gained closure by accepting that they had been with that person and had offered them comfort in their remaining time. For some they also gained peace from talking to the victim's family and offering them support and reassuring them that their loved one was not alone. There was also an acceptance that time was a great healer and the anguish over such events had to be endured and slowly processed to aid their own psychological wellbeing. Talking about the incident was also seen to be extremely helpful for many and enabled them to find peace.

*'I wouldn't say 'not recovery' because definitely, I know why you've said it, there is definitely an element of moving past it, so although I wasn't sort of, I wouldn't say I was traumatised by it, you know I didn't have trouble sleeping or eating or anything like that though there was definitely an element of it doesn't affect your every waking thought and there is, you have to move past that stage, and it took an amount of time.'* Mary

Mary realised that there was no recovery but rather that with time the incident was no longer present in her mind every day but is perhaps something that returns to her during the anniversary of the MCI, which was discussed in the sub-theme, 'anniversary effect'. Participants stated that counselling had helped and allowed them to return back to work, although some reduced their hours, changed profession or departments in order to gain a fresh start and recover from burnout. Some participants had to come to terms with failures in the incident plans and understood that mistakes can happen during an MCI and not everyone can be saved. These were extremely difficult issues for certain participants to come to terms with.

*'And the other thing I did was I left the ambulance service. So, I am no longer working with them because I didn't want to be put in a similar situation in the future because I had resolved that it would be the personnel and the way that they respond was never going to change. [...] No, it has been cathartic to actually talk through it again. I just think as I said earlier, I just think it's important that as clinicians we recognise you know that these things can affect you. [Yeah] And you need to be able to speak up and you know acknowledge that they can affect you and that you may need to take time off and you know the best thing for you and for your patients is actually to step back for a little while. It is very, very positive. But I do think it helps with people speaking up and actually saying, yeah you know I was off for ten weeks, but you know depression and anxiety after my experience and yeah it did have a profoundly bad effect on me. And no I wasn't expecting it and you know it just happened. And actually, there by the Grace of God do any of us go and you know we just have to be aware of it.'*

Edward

As stated, some participants changed jobs, and Edward felt that this had to be done to ensure he was never put in a similar situation. This was a way of him taking control and it ensured he could move forwards. He has also taken positive steps to speak up about mental health in the profession to break the stigma and ensure staff in the future feel comfortable to speak up when they are struggling and need time off. Coming to terms with the incident, the emotions experienced, and understanding that depression and anxiety are not weakness but instead a by-product of the trauma, all helped participants move forwards. Time, good support channels, changes in lifestyle, and acceptance, were seen as mechanisms to aid recovery, and although participants felt that the memories of such events would never leave them, they had become manageable and no longer distressing.

This final theme has described the range of support including formal support, which was mostly perceived negatively, and informal channels which were viewed more positively. However, it has also

considered that support is a personal matter and is driven by the individual. Debriefs were noted as being poor with regard to psychological support but positive in an educational and operational manner. Individuals wanted to be heard and actively listened to, to ensure they were valued and that their emotions were normal in relation to the trauma that they had witnessed. Relationship could become strained, and individuals were noted to be at risk of isolation when they did not have a support channel. Lastly, healing was seen to be something that was time dependent and not linear, with anniversaries or the inquiry having the potential to bring back difficult emotions. Many participants had to reduce their hours or change department or profession to move forwards.

#### 4.11 Summary of Findings

In conclusion, this section provides an overview and summary of the eight key themes that emerged from the data. As previously discussed, training, operational practice and environment were all external factors which were linked and either had a positive or negative impact on the participants' psychological wellbeing. These factors had different timeline effects. Training and preparedness came before the incident and was deemed to be a positive influence if conducted correctly. It was further enhanced by internal factors such as experience, mental health, and how participants and organisations decided to incorporate their training. The theme 'operational' was similar to training but concentrated on an organisational level, regarding policies, plans and procedures, and was influential, before, during and after the MCI. Policies and procedures ensured the safety of both health care staff and the public. When not followed correctly there were negative consequences for the participants' wellbeing. The environment highlighted some very important risk factors. The scale of the MCI, time of response, proximity to the incident site and threat to personal safety all had negative consequences, whilst working in the hospital was seen as a more controlled and prepared environment with participants knowing their job roles and their team. There were, however, some similarities to both environments; both experienced issues with safety and dealing with the unexpected, and the scale of the MCI also impacted on both locations. Job satisfaction, scrutiny and support could all be seen to be under a larger domain of human resources as they are factors that help retention of staff, and support or undermine staff wellbeing. Job satisfaction was a protective element to mental wellbeing, as when participants felt valued and could use their skills to provide positive outcomes for patients, they felt valued and appreciated. This aided them to take pride in the work, and many saw their occupation as a vocation. Lastly there was a discussion about the immediacy with which they returned to their routine work; for some this was too soon, and they required time off work, but for others routine work was seen as a protective element and something which they enjoyed. Participants realised that there must be an element of scrutiny following an MCI to ensure

patient safety has been maintained, update incident plans, and maintain or improve the quality of care given. Some, however, felt that the level of scrutiny could be unjust, and it was something which provoked anxiety. This in turn made some participants dissatisfied with their work and undervalued.

The theme 'support' was deemed vital for recovery and considered different methods; formal support was mostly viewed negatively, with fears of stigma and further scrutiny. Informal support was viewed mostly positively with some reservations regarding potential for strained relationships. The theme concluded that support was something which was personal and not a prescribed method for all. There were contrasting views surrounding the theme 'media', with participants acknowledging that there is a need for its involvement during an MCI to communicate what is happening; however, some deemed it intrusive and questioned the level of accuracy in the reporting of an MCI. Alongside this, staff felt they had little training to deal with the media and often felt intimidated. Lastly, psychological impact, which is a by-product of all seven of the themes, considered both positive and negative effects. Living within the community in which the incident took place had a profound effect on participants. Whilst some found the community spirit supportive, others struggled with living close to the incident site, as there were constant reminders, identification of themselves within patients, and feelings of insecurity. Other factors were also discussed within this theme, such as avoidance, burnout, delayed emotions, anniversary effect and other psychological consequences. The next section will discuss these themes in more detail and integrate them with current literature.

## Chapter 5 – Discussion

The overall aim of this thesis is to explore how emergency healthcare staff in England have been affected by being involved in an MCI, which for the participants sampled included terrorist attacks, building fires, stabbings, and an overcrowded concert. This chapter will integrate the findings discussed in the previous chapter with the existing literature presented in chapter two, and with theory, to enable the reader to understand the outcomes and implications of this research. Firstly, a summary of the findings will be presented, followed by the integration of the findings to current literature and theory. The aim of the discussion is to summarise the findings, but it will also highlight the key findings that were perceived important, and these will be related to the literature. To complete the task new literature and theory will be introduced. The strengths and limitations of the study will be presented, alongside a discussion of reflexivity and finally recommendation for further study and practice will be offered.

### 5.1 Summary of Key Findings

Eight main themes were identified in this research which reflected many different aspects of the impact of an MCI for these healthcare participants. Of note is that these did not appear consistently across the participants, and different emphases and impacts were reported. In particular, the degree to which these were perceived to be positive or negative influences or outcomes was very much apparent in the findings. This is summarised in Figure 3: , which indicates the degree to which themes and sub-themes were perceived to be positive (in bold) or negative (in italics) overall. As noted, these were the dominant normative weightings for the themes, but this did not mean unanimity, and some participants presented contrasting views linked to the themes. As such, these findings suggest there is not a unified or consensus view of how an MCI affects a healthcare worker, and this will be revisited in the implications for practice. These themes will now be briefly summarised to provide a reminder of the key emerging aspects of this research.

Training was argued to be an important aspect in preparedness. If carried out correctly before the MCI, training aided individuals to carry out their job effectively. An awareness of policies and procedures were noted to be essential, and this knowledge was grounded in simulation exercises. Pre-incident training allowed staff to remain calm and organised during the MCI, it also seemed to help resilience and enabled staff to process what had happened in a healthy manner. Training was related to other themes such as teamwork for example, and contributed to participants' understanding of

their responsibilities and limitations, but also how to work within the multidisciplinary team. There was discussion surrounding improvements to training, not all the participants had experienced simulation training and felt the need for drills and desktop exercises to experience a mock atmosphere and run through the procedures. Others wished for specialised training on treating ballistic trauma patients and information on how to deal with distressing stimuli, to better prepare staff for the emotional trauma they may experience during an MCI. The value of training to preparedness was further highlighted by participants who had not received sufficient training, especially those with less experience, as they were left vulnerable during the response, and reported experiencing more negative psychological consequences afterwards. Alongside training was experience, and this was also seen as an asset to resilience, with participants reporting that to gain experience, their personality, and coping mechanisms must be well suited to trauma care. Experience allowed for further depth in knowledge and therefore was seen as a positive influence.

Organisational aspects such as policies and procedures were mentioned by participants and aided the safety of responders whilst ensuring care was given correctly and in a timely manner. They were therefore an important aspect and were relevant before, during, and after being involved in an MCI. However, it is important that organisations ensure that their staff are equipped with the knowledge and understanding of policies and procedures before an MCI, hence again highlighting the need for robust training methods. These plans are strategic and are there to safeguard but participants noted that procedures that were not always adhered to, due to lack of leadership, poor communication, failure in pre-incident plans and inexperience. This did have negative psychological outcomes for some participants.

The environment also affected participants physically and psychologically. Although the participants' experiences in this research did reflect a variety of different MCIs, there were two main scenarios or locations that front line emergency workers attended: the scene of an MCI or a hospital which received casualties of an MCI. The scene of an MCI was viewed more negatively than the hospital due to the uncontrollability, damaged infrastructure, chaos, potential hazardous materials, and sometimes a lack of knowledge of what had caused the MCI. In contrast, the hospital setting was considered to be more clinically controlled and prepared for casualties, although the atmosphere was heightened compared to usual. There were however reports of violence and hostility along with at times depletion of resources and feelings of anxiety and shock to the cause over the MCI.

Job satisfaction during an MCI was a positive theme within this study, as most of the participants really enjoyed their occupation within accident and emergency and saw it as a vocation, for which they had trained and worked hard. Most had trained for an MCI and therefore were prepared and capable to

respond. Related to this, some participants appeared to enjoy the challenge of working during an MCI and took pride in helping those who needed it. Job satisfaction was a protective element against negative outcomes, and those who enjoyed the challenge of responding to an MCI were confident in their skill set and remained optimistic even in negative outcomes. This overall allowed these participants to understand that not everyone can be saved, and that a negative outcome was not necessarily a reflection of their work. However, when individuals were put in situations during the MCI which they were not confident, or they questioned their own decisions, this led to concerns about scrutiny or potential blame. Participants mentioned that there was a blame culture within healthcare, and this for some provoked anxiety and led to feelings of demotivation.

The psychological impact of an MCI reflected several negative outcomes, which incorporated the mental burden of having to live in the community in which the incident took place, surrounded by reminders, especially during anniversaries. Some participants also discussed feelings of avoidance, burnout, and delayed emotions which for some resulted in time being taken off work, a change in occupation, or needing to gain formal support. The media, although deemed necessary in keeping the public up to date regarding current affairs, were a negative factor due to misreporting stories and being intrusive. For some participants the media caused further stress and upset, especially when printing pictures for which consent had not been given. These pictures are served as constant reminders in the media during anniversaries of the MCI. Lastly, support was a key finding within the data, and it was found that support is a very personal and important factor to an individual's recovery from working in an MCI. Many chose informal methods due to fear of stigma associated with more formal methods.



FIGURE 3: THEMES OVER TIME AND LOCATION

Time Location	Before	During	After
<b>At MCI</b>	<b>Past experience of other MCIs</b>  <b>Training &amp; preparedness</b>	<i>Lack of safety</i>  <i>Scale</i>  <i>Chaos</i>	<i>Reminders</i>  <b>Job satisfaction</b>
<b>Hospital</b>	<b>Training &amp; preparedness</b>	<i>Lack of resource</i>  <i>Anxiety</i>	<b>Support from peers</b>  <b>Job satisfaction</b>
<b>Operational</b>		<i>Policy and procedure</i>	<i>Debriefs</i>  <i>Formal support</i>
<b>Media</b>		<b>Updates</b>  <i>Intrusion</i>	<i>Intrusion</i>  <i>Anniversary effect</i>
<b>Inquest</b>			<i>Scrutiny</i>

*Italics* = negative overall

**Bold** = positive overall

## 5.2 Integration of main findings with current literature

The emerging key findings from this study will be considered in the context of the previously identified and described literature from chapter 2. It will be argued that there were some similarities in themes from this research and the research conducted previously (such as the significance of the first responders attending at the scene and issues of risk and danger for example). It should be noted, however, that these findings were markedly different from many aspects of the previous literature, and this is not unexpected since there was no attempt to consider health care professionals who had been involved in war zones or ongoing conflict, as this was the UK and there was obviously no domestic war or military threat compared to some previous research study settings. Due to discussions around preparedness in the findings, preparedness literature on training will be introduced.

### 5.2.1 Training

Training, and particularly preparedness, was noted as an integral part of MCI disaster plans. MCI specialist training, which is focused on procedures, policies and clinical skills should be given to all staff to aid their response but also to aid resilience both physically and mentally (186). Participants felt that it ensured that all staff had the knowledge and skill set to ensure their own safety when helping others but also an awareness of their responsibilities, limitations, placement within the team, policies, and protocols. Participants' expressed gratitude for the training they had received and valued the skills they had developed, therefore labelling training as a protective factor for maintaining safety and positive outcomes following an MCI. Skryabina *et al* (124) shared similar findings, noticing that training was valued and advantageous to staff when responding to an MCI, allowing for an effective and timely response. Participants who reported a positive experience during the MCI understood their role and responsibility, they also had awareness to ensure their own safety and the safety of others around them, this finding is echoed in quantitative data demonstrating lower PTSD scores in trained staff, suggesting a relationship between training and resilience (131)(102,104) (166) . Training inherently reduces stress, as staff are better prepared, aware of their responsibilities and limitations, and have a clearly defined plan of what the team should be doing.

There is clear guidance regarding training, and different learning methods to ensure individuals and teams are trained to deal with MCI in the Emergency, Preparedness, Resilience and Response Framework in England (187). This document highlights important concepts such as preparedness, communication, understanding their response role and working within multidisciplinary teams, using a mixture of learning aids, from desktop exercises to simulations. This mixture of exercises has been proven to be successful in meeting health care professionals' learning needs to coordinate a timely response, maintain good practice, work within the multidisciplinary team with good communication skills, and carry out tasks with confidence (188). It was noted that simulation training had been beneficial and ensured staff were aware of the local MCI protocol. This has been acknowledged in other literature, further emphasising the importance of staff knowing where extra equipment and supplies are, as well as what agencies or other departments can be called upon to help (189) (190). However, some health care professionals who were interviewed criticised training for not preparing them for the real exposure of working during an MCI which meant that they did not feel equipped for the unexpected nature of the event. This led to some feeling anxious over outcomes or feeling worried and stressed that they would face scrutiny. Although in this study no participants disclosed a diagnosis of PTSD, Sloan *et al* (136) noted that there was a risk of health care staff experiencing intrusive and avoidance thoughts at the time of the incident and up to 6 months afterwards if they felt they were unable to fulfil their role due working in a situation that was unfamiliar. Working in an unfamiliar

setting for one participant did evoke distress for which they later gained formal help and took time off work. Literature in the USA has concluded that training is vital to ensuring that staff do not become overwhelmed and are confident in their clinical decisions during periods of high demand (114).

Participants also noted that junior members of their team struggled and required substantial support during and after the MCI, especially when making clinical decisions. Other studies also reported this finding, and that staff who were less trained in an MCI response relied heavily on support from others and felt unable to be productive members of the team, struggling with making clinical decisions and lacking confidence (186) (188) (127). Without adequate pre-incident training, junior members of staff may be left vulnerable, and are at an increased risk of psychological effects (127). Reasons for inadequate or gaps in training were voiced by participants who stated that current shortfalls in budgeting and lack of resources were reasons for which training had not been efficiently given. Participants acknowledged an awareness of the value and importance of training, and those in senior positions were grateful for the training they had received. Other authors concurred, deeming training a vital element in preparedness to ensure staff understood their role and clinical responsibilities, they found training, leadership, and adherence to incident plans to aid prevention of stressors (186) (191) (192) (188) (114).

Linked to training was experience, which had a significant temporal link to the past; this was perceived as promoting psychological resilience and more senior participants noted that they had felt confident and capable when responding to the MCI. They expressed pride and satisfaction that they were able to utilise their skills, again this has been noted by another author (192). More important however was the perceived connection between experience of similar previous incidents and the theme of training which senior staff argued had given them the skill set to endure the chaotic environment and effectively treat patients. Similarly, another study identified this connection and its importance, noting that retired military staff were more prepared and able to cope with more upsetting stimuli and the overwhelming environment due to their past experience (114). However repeated exposure in a short time frame was detrimental to some participants, resulting in what they termed burnout. The literature is cautious to make the association between disaster experience and psychological resilience, but quantitative reports have noted differences in PTSD and acute stress disorder prevalence amongst those that have repeatedly been exposed to MCI (193). Therefore, results cannot be generalised, but organisations need to be mindful that experience can be detrimental to some if they have had previous exposure to MCIs or traumatic incidents. These staff members may require time off work or professional support.

Added to this was the notion that it is important to work within one's own personal scope of practice, and participants had highlighted that training ensured that they understood their own role and capabilities but also gained knowledge of the wider team and what their roles were. Sloan *et al* (136) noted that health care professionals who were not able to carry out their skills or were made to work outside their known skill set suffered from intrusive and avoidance thoughts 6 months after the incident. Other studies concurred with these findings, noting that those who worked outside their remit during 9/11 and other MCIs felt overstretched and stressed increasing their risk of PTSD (43) (133). Participants collectively acknowledged that teamwork aided productivity and the safe dissemination of care. Teamwork was aided by everyday working, simulation training and senior support. Skryabina *et al* (124) found that strong connections were formulated during shifts, training, and also socially, aiding collaboration between disciplines, improving communication skills, trust and an awareness of limitations and strengths. This ensured care was given in a timely and safe manner and prevented any duplication of tasks or errors, although those working at the scene expressed concerns about not knowing the team they were working alongside, and therefore communication and leadership was a vital skill. In another study, viewing staff opinions on MCI preparedness, communication and knowing their role within the team were thought to be vital to the success of the response and improved upon during simulations and training (189). Strengthening communication skills within the multidisciplinary team and understanding the team and wider teams' responsibilities and the individual's own role needs to be highlighted and noted during training to ensure emergency plans and a successful response are adhered to (186) (189). Working in an unknown and chaotic environment and lacking a supportive team can make individuals feel vulnerable and unsure, as was voiced in this study.

Participants did give their view on how training could be improved, highlighting the need for training surrounding what they may witness and emotions they may endure during and after an MCI. They believed this may normalise mental ill-health within the profession, and ensure staff know how to look after their own wellbeing, but also notice signs of not coping in others. Studies have found staff who have had psychological risk training to be more resilient (123) (121). The literature also recommends that MCI training is completed by all staff members yearly as a minimum, as repetition is seen to be beneficial and aids memory (186), although some feel creating standardised training for all occupational groups can be difficult due to differences in educational background, occupational culture, and ability (194). However, working in a multidisciplinary team is important and can be an opportunity for staff to appreciate these differences and help one another, which will be the reality in an MCI.

Other external aspects to preparedness were operational, ensuring plans and policies were set to enable an effective response. Some of the participants were involved in such planning and therefore they expressed anxieties to if plans had been robust, however there had been extensive strategic planning after the Paris 2015 MCI and the role out of the Emergency, Preparedness, Resilience and Response Framework (187) (195). It was noted that plans can only be improved upon by learning and reflecting upon the outcomes of previous MCIs, and participants also noted that information sharing both nationally and internationally was important (195). At the hospital participants felt prepared and able to set up the environment ready for patients. However, despite extensive planning, simulation training and good preparedness policies and procedures, errors still arose, such as deployment of the wrong staff to the scene, and this caused frustration and emotional distress months after the incident.

Teamwork was praised by participants and aided the response; this was consistent with the literature which noted that effective teamwork and aid from outside health care teams including the military was vital to the success of the response (195). As already mentioned, senior support was welcomed and aided teams to have good positive outcomes, preventing feelings of self-doubt during the response. Participants also noted that being supported prevented negative feelings after the incident. Communication is one area that is often deemed inadequate during an MCI (188), and participants explained there was a lack of a handover at the scene which meant staff were not aware of what they were entering, which provoked fear and anxiety regarding personal safety. Telecommunications were noted to be especially difficult, with some participants opting to use WhatsApp, however the literature highlights concern with using such methods with regard to confidentiality (192). Private messaging on apps was a concern as it was not the hospital's policy and meant some communication could be missed or unregulated (114). Craigie *et al* (195) disagree, stating that this service was a safe, secure, and effective mechanism to use to improve telecommunication between teams. This highlights that communication channels still need improving and regulating, with clear guidance in the disaster and emergency policies. Once policies and procedures are in place, training can then strengthen these guidelines and ensure all staff are aware of the protocol. Communication skills were seen to be strengthened through simulation training (189,190).

### 5.2.2 Environment

Participants identified the environment to be a key area, which made MCIs different to other trauma calls. Despite there being multiple MCIs discussed by participants, they worked in two areas, the scene of the MCI or the accident and emergency department. These two areas mostly contrasted with one another but at times there were similarities.

Firstly, the enormity of an MCIs made these incidents unique; participants who attended the scene of the incident described witnessing dead bodies and multiple casualties with serious injuries and alongside this they had to navigate around unstable and damaged infrastructure and were exposed to bodily fluids and hazardous material such as glass, chemicals, and debris. The literature concurred with these findings, noting scale of the incident, proximity arrival time to the scene, and level of threat to one's own life as risk factors to developing poor psychological outcomes (43) (109) (137) (123) (44). The scale of most of the MCIs discussed was large and required staff to be called in off duty, as well as the need for outside assistance from the army to give clinical knowledge regarding shrapnel wounds (195). Furthermore, police presence also added to the heightened atmosphere both at the scene and the hospital.

Participants who arrived first to the incident described chaos, mass trauma and little information about the cause. Temporal factors were noted in the literature, identifying that arrival time to the scene did have an association with PTSD (142) (138) (43). However, it is also noted in the literature that arrival time and the development of trauma related mental health problems is not fully understood, and from the accounts in this study it may be noted that participants who arrived first at the scene experienced feelings of shock, disbelief, and an overwhelming chaotic environment in which they had little information to what had happen. Those first onto the scene have been perceived to have a high risk of injury or threat to their own life due to the environment not being secured at this time (43). Not all research has agreed to arrival time being a factor for PTSD and Pietzak *et al* (66) found no significant association. In the data collected, a physician who attended the hospital much later described a controlled atmosphere in which he helped support relatives and junior staff members, hence those that arrived later and especially at the hospital were greeted with less unpleasant stimuli which could have acted as a protective barrier to their wellbeing.

Proximity to hazards at the site were discussed by participants, they described having to work in potentially dangerous environments due to unstable infrastructure, lack of knowledge of the cause, potential for a secondary bomb or further violence, chemicals, debris, poor lighting, and bodily fluids, which threatened their lives and safety. They witnessed dead, dismembered and victims with catastrophic injuries, which meant they were having to make quick and challenging clinical decisions in less than advantageous environments. Misra *et al* (109) stated that proximity to one of the main sites during the 2005 London bombing was a factor for increased risk of probable PTSD due to the hazardous environment which gave health care staff a perceived threat to their own life and unpleasant stimuli. Proximity and safety were two risk factors for both physical and mental health problems during 9/11 and the Paris terror attacks (43) (123). This study therefore builds on the known knowledge that proximity to an MCI affects health care staff negatively.

The hospital environment was noted to be more controlled and prepared for carrying out health care procedures, however the hospital had its own stressors, which participants described as overwhelming due to the influx of patients and the depletion of resources. The data was consistent with the literature which reported an overwhelming amount of trauma patients attending the hospital in the first hour of the MCI being declared in Manchester (196). However, most catastrophic injuries were not seen at the hospital site due to patients dying at the scene, hence staff who were in close proximity of the site were subjected to more distressing images (196). A hospital can also face insecurity, and the data in this study noted a challenging environment where some participants experienced violence and hostility, however much of the literature focuses on the emergency workers who attended the site and were challenged by an insecure environment and potential crime scene (123).

None of the participants were physically hurt at the scene or at the hospital during any of the MCIs discussed in this study, and this could be a reason to why none of the participants disclosed any serious mental health problems compared with other MCIs such as 9/11. The MCIs discussed in this study were vastly different to 9/11, or the scale of which was far larger with a death toll that included front line emergency workers. Many who did survive developed chronic physical and mental health problems due to them being exposed to chemicals, instable infrastructure and upsetting stimuli (119) (44) (137) (142) (141). For some, knowing that their colleges had died or witnessing their death or perceiving a threat to their own life led to a deterioration in their mental wellbeing, and development of PTSD, anxiety and depression (44) (142) (137) (119) (123). Lower PTSD scores were noted in Norway following a terror attack that killed children, however no health care professional was killed, and the perpetrator was arrested, hence the environment was distressing but deemed secure, therefore the threat to life was reduced (121). Safety is therefore an important concept in aiding confidence to enter these sites, especially when the cause is unknown, and the area is still a crime scene. Unlike other emergency workers, health care professionals are not equipped with PPE to enter these hostile environments, and as the literature noted, small arms fire and weapon attacks are becoming more prevalent as seen in Paris and London (123) (126). Duration at the site was not noted in this study and none of the participants mentioned working days over their shift, however another unique aspect to 9/11 was the duration of time front line emergency workers spent at the site, which is thought to have added to the large prevalence of PTSD, stress and depression associated with this MCI (110).

### 5.2.3 Job satisfaction

A positive emerging theme was related to the sense of job satisfaction in the context of an MCI. Most of the participants appeared to enjoy their work and found pride in being able to help others, support their team and aid their community. They noted a sense of ethical obligation, even attending off duty to assist at the scene of the MCI. This has also been previously described among health care professionals in the UK after the Manchester and London bombings, where it was noted that health care professionals welcomed the opportunity to utilise their skills and experienced feelings of accomplishment and pride (191) (192). Some participants in this study went as far as to argue that the MCI had furthered their careers, and again this is reported in the literature, with job satisfaction emerging as a protective element against psychological illness (145) (136). The health care profession is seen as a vocation and many of the participants noted that their job was part of their identity and therefore, they expressed pride in being able to help and felt a sense of belonging to an unprecedented incident. However, those who were unable to use their skills due to being put in the wrong environment or not being called in at the start of the MCI felt frustrated and devalued. Alongside this were those who felt they could have done better, or struggled with the decisions they had made, especially if there was a negative outcome.

Participants discussed being fearful of scrutiny after the MCI and were aware that after such events, investigations into the response were current practice and vital to further aid training and preparedness for future MCI. Whilst there was an agreed need for reflection and criticality, there was also an internal chronic anxiety in most participants that they could have made a mistake or error, which seems common in health care professionals (114). This seemed to make participants feel devalued and fearful, and they expressed that it was institutional and not relevant only to MCIs' but day to day, hence causing extra stress and worry. The blame culture which was expressed seemed to make certain participants feel under-supported and therefore disengaged. Tallentire and Smith (197) noted that it is vital that senior staff normalise honest reporting and promote open channels of communication in which staff are not judged but rather supported and encouraged to learn from their mistakes. The Emergency, Preparedness, Resilience and Response Framework in England promotes accurate record keeping from staff who have been involved in MCIs, and states that there is a high chance of a public inquiry, coroner's inquest, or legal action (198). There is some guidance within the document to what information should be recorded in case health care professionals are called upon to give evidence; however, although potential scrutiny is recognised in this document, there is no guidance of specific psychological support to help staff through this process; this was a gap identified by this study and an area in which participants felt could be improve upon.



#### 5.2.4 Psychological impact

This study did not set out to diagnose or evaluate participants' mental health, however it did seek to explore their perceptions of the impact of an MCI on them, and this included psychological impact and wellbeing. Once again, findings suggested a negative impact, and examples of psychological distress were reported by participants, including aspects such as working and living within the community in which the MCI took place. Although Moran *et al* (3) described concerns regarding patients, family and friends suffering from mental health problems after an MCI, they argued that this concern should also be extended to front line health care staff who live within the community. Indeed, this emerging theme of health care professionals being affected not just because they responded, but also because they are part of a community, is a recognised issue. Previous literature reporting on civilian health care staff working in a war setting noted increased PTSD from home exposure rather than work exposure (122). However, this is difficult to compare as war is sustained violence whereas the MCIs discussed in this research were one-off incidents. Common to this research and previous examples however, was that the effects of MCIs could continue for weeks or months after the site had been cleared of casualties. Participants stated that there were multiple reminders of the MCI within their home environment which made it difficult to forget. Patients also needed to reattend for further treatments or mental health support, and this also acted as a long-term reminder. Anniversaries, memorials, and media reports were also constant reminders of the MCI and gave individuals the feeling of never being able to be mentally freed.

This study identified the strain of patients from the MCI returning for follow up treatments and long-term care putting further demands on the staff and health service. An editorial by Moran *et al* (3) raised concerns for staff after the initial response of the MCI, and warned that the effects of an MCI have long-term demands on the health care system. This study noted that some staff had suffered burnout, especially those who worked in an area where there had been multiple MCIs in a short space of time. Repeated exposure to MCI has been noted to be a risk factor of burnout (134) but in addition participants were feeling stressed from the continuation of patients suffering with mental health issues and some being suicidal following the MCI, which was also distressing and took its toll on front line staff. A few participants changed their job or needed time off from work to aid their recovery. Other literature noted burnout amongst nurses who felt that they had not been able to attain a positive outcome for their patients (145). Witnessing suicidal patients may also enforce the feeling of failure.

Not all staff noted an emotional response during or just after the MCI but rather a few weeks later. It is worth noting that this study identified delayed emotions in health care professionals which later required them to take time off work and access counselling. Participants listed emotions such as feeling low, depression and anger. An American study reporting an MCI shooting noted that although they did not screen for mental health, participants noted symptoms of PTSD, depression or anger in themselves or others (114).

A final point about the psychological impact of an MCI was that those involving children were particularly challenging emotionally, and this arose in both this study and previous research in the literature (119) (40) (11), especially when children had been targeted victims. This also highlighted an interesting concept of patient demographics; some participants were able to identify themselves with the victims' families, as they had children of a similar age, and this caused not only an emotional response but a sense of personal insecurity for their own families.

### 5.2.5 Media

The media was mostly noted to be a negative aspect of the MCI due to its intrusive nature, however there were some positives with regards to communication of current affairs. This next section will now discuss the relationship between health care professionals and the media and how the media can cause further stressors.

MCIs often attract international media attention, and they provide a source of information for the public. Media in the modern world is considered an important channel of communication to keep the public notified of public affairs. Some participants within this study concurred with this, deeming the media to be a positive factor in reporting incidents, acknowledging that they also have an obligation to keeping the public notified on current affairs. The media kept the accident and emergency department up to date about what was occurring at the site, which was helpful and highlighted in another study to be useful (199). However, the majority of the participants had negative opinions of the media with many of the participants stating that the media sensationalise stories communicating inaccurate accounts (114) (199). Staff also reported that the media were intimidating and intrusive adding to further stressors. The literature noted similarities, stating that the media are distracting and do not respect boundaries (114) (199). It was commonly reported within the literature that the media are intrusive and can hinder rescue missions (40). Although not mentioned in the current literature, this study highlighted the intrusive nature of the media with regard to taking and publishing photographs without the permission of the individual, causing significant distress to the individual and their family. There was a strong sense of the media having no boundaries and being relentless in

getting their story or photograph. These images then served as a constant reminder of the MCI, and are republished each anniversary, meaning there is no respite to allow those involved to move on with their lives. Participants spoke of being reinterviewed each anniversary of certain MCIs, which was also seen as intrusive, although others spoke more positively and found being interviewed cathartic, as they were able to tell their story and offer insight to bereaved families. Literature has noted that local communities have deemed the media intrusive, often spending long periods of time camped out near the site of the MCI or hospital (199). They also commented on the psychological dangers of reinterviewing those involved each anniversary and displaying the MCI for television viewing (200) (199). Concerning the latter a few participants stated they avoided newspapers and television reports, although one participant stated that she and her husband spent the weekend absorbed in the media's portrayal, suggesting that they found it interesting and helpful to their recovery. There seems to be little literature surrounding the effects of media reporting on health care staff, however this study highlighted the need for all staff to have media training to prevent the internal stress experienced when the media stopped staff or rang the department. There also need to be strict protocols on where the media can attend and the access they are allowed, which could safeguard both staff and patients' privacy.

### 5.2.6 Support

Support remains inadequate and although multiple studies have noted this, there is still little evidence on how to improve support for health care professionals (188) (109) (111). Support was deemed a very personal decision, and preferences of participants were divided between formal and informal mechanisms. However, it was agreed that gaining the right support was fundamental to an individual's recovery and wellbeing. Some of the participants felt that they did not want to access formal support, due to fear of judgement or disregard for counselling services, which seemed common within the literature; Misra *et al* (109) found that staff who felt distressed preferred to gain support informally due to fear of scrutiny or stigma. It was stated that organisations had signposted counselling services, and mental health teams attended the department shortly after the MCIs offering support, however for some this was not welcomed, and they found it intrusive. Debriefs were also undertaken as part of the Emergency, Preparedness, Resilience and Response Framework in England (187). They aim to aid team reflection on the incident, thereby providing an educational opportunity to update and improve response plans, improve safety and patient care. Consistent with other reports Craigie *et al* (195) noted that both 'hot' and 'cold' debriefs were useful to learn lessons and improve response. However, debriefs should also be used to offer staff support, both with professional development and welfare, but this was not experienced and therefore some participants were left feeling ignored and devalued, which ultimately caused further distress and anger in some individuals.

Accessing informal mechanisms of support was common amongst participants and there was a sense of security that they had confided in a friend, work colleague or partner. Confiding in a friend or family member who worked within the health care profession was popular, as health care professionals believed that they can be empathic and understanding about the experienced they had endured (85). There was also the element of trust; that the information would remain confidential. There was suggestion of using informal channels more formally and pairing health care professionals from another organisation to an individual, to aid conversations about their concerns, fears, or anxiety regarding the MCI. This could be a potentially helpful enterprise, which is already used during a professional disciplinary. This method ensures that, unlike counsellors, the mentor has insight into health care work. Social support has been deemed a vital factor in protecting an individual's wellbeing following an MCI (201). Team members were also deemed positive outlets, but with the exception of managers due to the fear of being judged and stigmatised for not coping. The literature supports this finding, stating that peer support is of value and has been noted to decrease negative emotion and stress (201). Humour with peers was also deemed helpful, especially in a social setting, and helped

elevate difficult emotions (40). However, informal support can put strain on certain relationships, which can leave individuals feeling isolated.

It has been noted that organisations need to work hard to provide the support that staff require (114), both formally and informally. Organisations should also be sensitive to the fact that mental health is not linear, and that individuals can sustain a delayed emotional response to trauma, and therefore support should be offered at different time points (188). There also needs to be understanding about the cultural barriers in respect of mental health and wellbeing, which can prevent staff from accessing support (202). Studies have identified the importance of MCI training during medical school (114), normalising reflection and the discussion of emotion that students experienced during the simulation (190). This study found that the simulation aided reflexivity within the students and supported them to learn about themselves and how they may react and feel during an MCI. It proved that mistakes can be made and gave them the opportunity to consider how they may deal with errors and scrutiny, hence aiding resilience in this work (190). This is linked to training and support, but is discussed here to emphasise the importance of acquiring robust systems to aid resilience and normalise reflexivity and the discussion of emotions before an MCI.

### 5.3 Further literature and theoretical insight

The last section has shown how the findings from the current study are related to the previous empirical literature introduced in chapter 2. It is argued, however, that a further task is to introduce additional literature and even theory to provide more context and understanding of the findings. This body of literature was not identified during the original literature review, however following data analysis and identification of emerging themes these additional insights were found to be important. In this section then, further concepts relating to extreme work, edgework, emotional labour, and ontological security will be introduced, and it will be shown how they relate to the emerging findings of this study.

#### 5.3.1 Extreme and edgework

A key emerging theme in this study involved the environment, and particularly the sense of danger and harm which was perceived to be present at an MCI. For participants who had been at the scene of an MCI in particular, their descriptions referred to unstable structures, risks due to substances such as glass, bodily fluids, and hazardous materials in the atmosphere. In several MCIs there was an

ongoing heightened sense of risk, both at the scene but also at the accident and emergency department. For staff, both as first responders or in a hospital, there was further potential danger, risk and on occasions a threat to their own life. These are classic examples of threats that typify what have been termed extreme work or edgework, and occupations where there are recognised dangers which would not be encountered in most occupations. Coupled to these explicit risks, participants in this study also perceived there to be additional concerns such as the emotional and physical strain of MCI participation, the relentless nature of seeing patients for aftercare alongside routine trauma, and feelings of burnout and despondence. As discussed in chapter one, sociologists are now defining healthcare work as extreme work (76,203) and this study further supports this connection. The emerging findings offer descriptions of participants' work which is arguably extreme due to it being intense, dangerous, and often in a challenging environment with a perceived impact on physical and mental health<sup>1</sup>. Granter *et al* (76) explored ambulance work as extreme work or edgework and similarities can be seen in this study, as participants stated that they did gain pleasure from their work, and enjoyed the unpredictability and the 'life and death' decisions that they had to make, but experienced negative side effects such as scrutiny, physical and emotional stress.

Health care work is both physically and emotionally intense, and participants demonstrated this with narrative around the environment at the site being physically challenging. Some participants described having to manoeuvre around damaged infrastructure, climbing into damaged transport systems to rescue casualties, and using their initiative to make clinical equipment out of everyday objects, such as desks as beds and curtains as bandages, when there were no resources. Other examples of physical intensity were hostility, when a violent fight broke out in the accident and emergency department, meaning staff were put at potential risk of being harmed themselves. Whilst some of the participants stated that working at this physical intensity became too much, others recognised that they enjoyed this type of work which was why they were now working in senior positions. They described their personality as fitting the job and enjoyed what it involved. Their work gave them an identity, a sense of purpose and was deemed challenging, which is fitting with edgework.

There were multiple examples of emotional intensity, with participants describing having to witness death, traumatic injuries, and the knowledge of the cause of such incidents, which can provoke fear, anger, and sadness. Linked to emotional intensity is the knowledge that health care is a job which requires emotional labour. A plethora of work has been conducted with regard to emotional labour in health care, especially regarding the occupation of nursing. 'Emotional labour' originates from

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Although beyond the scope of this study, it is arguable that participants represented occupations which experience many other aspects of work intensification linked to workload and litigation for example.

Hochschild (204) who expanded upon the literature regarding emotional work which focused on women's role within the home.

Emotional intensity is linked to the wider concept of emotional labour and requires employees to control their emotions in a certain manner to achieve positive outcomes or obligations of the job (76). Healthcare staff are expected to put their patients first and this means forgetting their personal emotions to concentrate on the patient's needs. The organisation also expects health care staff to be empathic, caring, and supportive to the patient, and to do this successfully employees are required to regulate their emotions to ensure the patients feel safe and cared for (76). There were examples of this within the findings; it was noted in most participants, not just in Penelope who was a nurse. A few of the participants noted that they put their personal emotions of fear during the MCI to one side to help victims. Those who attended the scene entered dangerous situations and remained with patients until they could be removed from the site. They discussed how they neglected their personal needs to help others. Following the incident many of the participants discussed returning to work and continuing with their normal routine, again putting their own emotions to one side. There was a strong sense of emotion when caring for and helping children who had sustained life threatening injuries, and some participants could also identify themselves and their own families with the victims which was also traumatic.

Emotional labour contains three key attributes: firstly, it involves face to face contact with the client (patient), an exchange in emotions with the client, not necessarily positive, and lastly the effect the organisation has on ensuring the employee contains their emotion and presents an agreed outward-facing persona and emotion (204) (75,205). The latter is brought about through training and supervision and exerts control over the employee. Participants did not discuss their training with regard to emotional labour, but they did demonstrate that emotional labour was present and that for some it caused psychological harm through complex emotions after the MCI, such as anger, feeling low, and burnout. Emotional labour can take two forms; as discussed in chapter one, the first is surface acting which takes place when the employee conveys an emotion to the patient but does not actually feel this emotion internally (204) (75,205). The second form is deep acting, in which the individual's outward emotion matches the emotion they feel inside (204). This has been noted to be a healthier and more natural display of emotion. It is difficult to say which methods participants used, however some stated that they avoided certain public events and memorials to maintain a professional barrier to allow them to continue with work and not dwell on unpleasant stimuli.

A study by Granter *et al* (76) noted that there was a third type of intensity, titled 'organisational intensity;' This study noted that the organisation does play an important role in making emergency

responses either easier or more stressful. Organisations have a responsibility to ensure policies and procedures are created and followed by staff, therefore they are there to ensure staff are trained and safety is maintained. Those who had not received adequate training struggled during and after the MCI and participants discussed the importance of varied training including simulations. Equipment was also discussed, and its importance highlighted; a lack of resources again caused staff to struggle and made the work more traumatic. One participant sent to the site of the MCI was not trained for it. This caused unwanted stress, causing him to struggle with difficult emotions after the MCI. Here the organisation is in control of the risk rather than the individual. However, it should be noted that in Lyng's (77) definition of edgework states that the individuals choose the risk and use considerable skills to avoid harm or even death. It is therefore questionable whether edgework can be applied to employees and to occupations where risks are known and are part of the work. This was also explored by Granter *et al* (76) who argued that ambulance work is different to Lyng's (77) original definition of edgework in extreme sport; ultimately though they argue that the concept is still applicable due to the thrill health care staff experience from helping patients. This thrill was key to the participants' willingness to work in accident and emergency and it gave them great satisfaction.

Temporal intensity was discussed in relation to being at the site, in particular the proximity to unpleasant stimuli or to perceived danger. Some participants stated that they did get a rush from being at the scene, and took pride in their ability to help and provide some closure for families. However, this study and the literature confirms that proximity to the site, early arrival time, and risk to life, aid psychological illness (76). Hospital staff felt overwhelmed and anxious about the sudden influx of patients and at times experienced some violent hostility in the department. There were also discussions around blame culture, which put staff under pressure and caused anxiety after the MCI. Many questioned whether they had made the right clinical decisions or if they could have done more. In contrast to this however, when there were positive outcomes or if they were able to help relatives gain closure that their family member or friend was not alone in death, participants felt fulfilled and proud that they could use their skills to do good. There was a strong sense of job satisfaction from some, and this was also seen by Granter *et al* (76) study who noted the importance of professional identity within ambulance staff.

MCI have been considered the more extreme end of accident and emergency work, due to them often being high risk incidents, unexpected, overwhelming resources, the organisation, and the individual. They require special management, different policies and procedures to the norm and meticulous preparation (189). Participants did state that many staff leave but those who stay tend to be more resilient, perhaps due to their personality of seeking risk. They acknowledge that the work could be stressful, but the unpredictability was something they enjoyed and gained a thrill from. This type of



work also does pose a risk to their own lives and although MCIs do not occur every day, accident and emergency work is perhaps a form of edgework. Whilst some participants enjoyed their work and relished the high intensity and unpredictable nature of the job, others found it too much and felt burnout, requiring a change in job or time off.

In summary, it is argued that the participants in this study were involved in extreme work; that despite being employees in occupations that have to a certain extent accepted certain risks and activities that the public might not witness, they were nonetheless drawn into providing assistance for MCIs which challenged accepted limits of emergency care in many cases. This study further supports the four components of extreme work linked to the temporal, emotional, physical, and organisational. In the next section another concept is introduced, which is also argued to be relevant to this study, involving the management of risk and security in the modern world.

### 5.3.2 Ontological Security

In addition to edgework and work intensity, a further concept that is argued to be relevant to these findings relates to the broader sense of security and safety and one's very sense of being. In this study, there were several references to participants feeling insecure following the MCI, especially following a terror attack. Some participants could identify with the victims, and this made some feel uncomfortable out of the work environment, adding to anxiety and emotional distress. Some of this may be related to the environment and previously considered immediate risks, but it also appeared to be wider and to suggest a deeper concern about one's safety and sense of being which is argued to align with the concept of ontological security. As discussed in chapter one, this concept relates to individuals feeling safe and secure in the world in which they live, experiencing daily life without fear or threat to their lives. When an incident occurs to challenge this view, feeling, or perception, individuals may question the safety of the reality in which they live and the social frameworks to which they contribute. Giddens (81) argues that individuals are protected by their normal routines and in the modern world are often shielded from unpleasant stimuli, however it is not always possible to protect individuals from threats to ontological security. MCIs are an example of Giddens (81) 'fateful moments' in which the participants in this study identified that these incidents are often unexpected and had profound consequences on themselves, the community and the surrounding environment. In particular those that had been involved in terrorist incidents communicated their anxiety towards using public transport or attending large concerts. As Giddens (81) noted these 'fateful moments' challenge an individual's sense of safety and can cause existential anxiety.

Hawkins and Maurer (206) noted that communities following disaster struggled with the loss of people they knew and the change to a landscape which had aided feelings of security due to familiarity. Health care professionals in this study noted that there were constant reminders in the environment of the MCI, causing difficult emotions and feelings of insecurity. The literature has noted that when individuals lose confidence in their surroundings, fear surrounds them, and they are unable to control existential anxiety (206). This is another element that organisations need to be aware of to ensure that the support given to staff post MCIs reconstitute trust and security, not only in their work environment but their home environment. Literature suggests that staff have experienced more anxiety, stress, and PTSD at home than at work, implying that employers need to be sensitive to this (122). The increase in terror attacks and shootings within Europe, may have increased ontological insecurity (207,208) and therefore staff may be experiencing anxiety within their home life which can be exacerbated further at work.

In this section, a further theoretical construct relating to ontological security and more specifically threats to it in terms of fateful moments such as MCIs have been suggested as being relevant to how participants described their experiences and the impact of the MCI. In the final sections of this chapter, strengths and limitations to the study are presented, followed by further reflexive thoughts and then implications for both further research and practice. The chapter and thesis will then end by providing a brief conclusion and further reminder of the importance of the topic, why the work was undertaken, and concluding remarks.

#### 5.4 Strengths and Limitations

It is important when conducting research that both relevant strengths and limitations are considered, to enable the reader to understand the findings in the appropriate context. In this section, several strengths will be considered, namely the benefits of using an exploratory qualitative approach to gain new and unique insights in the context of UK MCIs, together with the use of reflexivity (also considered in more detail later in this chapter). Several limitations will also be presented, including undertaking the research in a pandemic when prospective participants were particularly busy and whilst there was an ongoing and high-profile public inquiry into one of the MCIs that several participants were involved in. The implications of this for the sample size, and the need to use data collection approaches using telephone calls and not in-person interviews, are reflected on.

### 5.4.1 Strengths

This study is one of a limited number to have explored MCIs in the context of the UK, and moreover, to do so using qualitative approaches. As chapter two illustrated, research to date has focused disproportionately on specific events such as the 9/11 attacks in America, and few studies have explored UK perspectives. Even fewer studies have used qualitative methods to understand the effect MCIs have on emergency health care workers. This research addresses such trends in the extant literature and has revealed novel findings which have complemented but also added to the existing literature. The chosen methodology allowed for the collection of rich data in which the complexity of the phenomena could be understood.

#### 5.4.1.1 Sampling

Using three approaches to sampling and recruitment is also argued to have been beneficial, namely using purposive and snowball sampling alongside the use of gatekeepers. Although these healthcare professionals are arguably not a hard-to-reach population in the classic sense, the pandemic and sensitive nature of the topic meant that there may have been considerable reluctance to participate. It is recommended that snowball sampling and gate keepers are used to identify and recruit participants, especially when the topic area is of a sensitive nature, and this was a strength in this study (165).

#### 5.4.1.2 Sensitivity

Semi-structured interviews gave each participant their own voice to convey their experience of working on the front line during an MCI, which for many appeared to be a cathartic experience. Some participants had noted that they felt devalued after the MCI and unable to express their concerns during debriefs and therefore this experience allowed them an opportunity to be heard, for which the researcher was thanked. This seemed important and demonstrated rapport. It was recognised that this research involved a sensitive topic and therefore strategies were put into place to ensure participants were put at ease and were happy to share their experiences. The rapport the researcher had with the participants is thought to have helped obtain rich data, despite the small sample size. The methods already discussed are thought to have aided this rapport, especially when being on the telephone and not face to face. The researcher was honest and open about their professional background and their passion for the topic, which prevented participants thinking that the interviewer was probing through morbid curiosity, which Liamputtong (165) stated can lead hard to reach

populations to be suspicious. These authors also noted the need for researchers to be generous and adaptable with their time. As interviews were being conducted via the telephone this was easy to do.

#### 5.4.2 Limitations

As was stated in the methods section, Lincoln and Guba's (155) four stages of trustworthiness were used to ensure rigour and validity. However due to time constraints of a PhD and being a single researcher, multiple coding was not used, although the themes created were discussed and examples of codes were seen (209). It was also not possible to ask participants to validate their transcripts due to work constraints in the NHS, confidentiality issues with working online, and having to send the transcript via email.

##### 5.4.2.1 Sampling and external factors

This research involved a relatively small sample of participants which was influenced by multiple recruitment factors including the COVID-19 pandemic, a public inquiry and the prospective participants being hard to reach. However, the inclusion criteria were widened, and the study was advertised on social media, generating further participation. Qualitative methods are not so concerned with results being generalised but rather that the data is rich so the phenomenon can be understood (210). It can also be argued that the in-depth nature of qualitative work and the richness of the data enables the reader to reflect on the ability to transfer the information (160). To aid transparency and strengthen this argument, the researcher has added a section on reflexivity to acknowledge the role they had in the production of the data. It is recognised that both the participant and the researcher bring their own beliefs, judgements, and knowledge of the world as they perceive it to the study (165). Added to the small sample size was the disparateness between the occupational groups; there was only one nurse, ambulance technician, and emergency response doctor, and seven emergency/trauma doctors. The current literature is still underreported regarding different medical professions working in MCIs and its effects; however, some studies have found nurses to be more at risk of psychological issues than doctors or paramedics. Unfortunately, this study was unable to add to this data due to the small sample. Alongside this is the awareness that certain perspectives may have been missed due to individuals who may have been severely impacted by an MCI not wanting to participate for fear that it could cause further harm to their psychological wellbeing, and this will have led to missing data.

#### 5.4.2.2 Subjectivity

Qualitative methods are known to be subject to bias and potential misinterpretation due to the subjective nature of the method. Braun and Clarke (1) note that qualitative work cannot escape the claim of subjectivity but argue that its presence should be acknowledged; qualitative research should incorporate the researcher's experiences, judgements, and beliefs, which can then be shared for transparency (see later section on reflexivity). Moreover, this study has been subject to recall bias due to the retrospective nature of some MCIs occurring over ten years ago. This type of bias may have led to inaccurate reports or omission of experiences due to forgetfulness, especially if an individual does not want to recall some events due to risk to their psychological wellbeing.

#### 5.4.2.3 Data collection

Most of the data collection in this research was undertaken using telephone interviews, with only one being conducted face-to-face pre-pandemic. Whilst telephone interviews were a pragmatic (as well as safe and legal) way to undertake data collection they may have stopped a good rapport being built between the researcher and participant. This will be discussed under reflexivity, as the researcher felt more comfortable doing face to face interviews. Telephone interviews also prevented body language and other non-verbal forms of communication from being observed, and the quality of the audio was also sometimes lost due to poor telephone signal. However, the data did remain rich, with interviews being 50-90 minutes long. A rapport was gained using other methods, as discussed in the strengths of the study.

#### 5.5 Recommendation for further research

This study has identified some of the areas in which MCI affect front line emergency workers, however a multitude of different occupational groups were included, and the literature has noted that certain groups such as nurses are more at risk of mental health problems following an MCI. Unfortunately, due to the disparateness in occupational groups, this study could not draw any conclusion on this. Therefore, it is suggested that further research focuses on certain occupational groups, to gain a deeper understanding of the culture within one single occupational group. Focus groups may be beneficial and help with recruitment issues, as multiple participants can be interviewed at once. Focus groups also aid the development of discussion which means further in-depth understanding can be gained (211). A mixed methods study on a single occupational group would also be beneficial to capture prevalence and deep understanding of why certain occupational groups are at risk, as limited studies have been conducted in the UK. Further study is also needed into support services to better understand what support is required, when, and for how long after the MCI. With more understanding

of support mechanisms following MCI, policies can be produced confidently making clear recommendations.

## 5.6 Recommendation for Practice

This research has identified three key implications for practice which are listed and discussed in this section

- Tailoring ongoing health care professionals MCI training and preparedness
- Enhancing organisational support for staff involved in MCIs
- Media training

Training needs to be prioritised and funded appropriately, whilst allowing information to be shared both nationally and internationally to ensure staff can benefit from the experience of others. Training should also move beyond external measures of preparedness and include internal measures such as psychological awareness to aid resilience. The findings demonstrated that staff were uncomfortable with gaining support or discussing mental health and there is a known stigma/culture within the NHS that health care professionals cannot be seen to not be coping. This is an unhealthy practice and therefore organisations could integrate mental health and wellbeing into teaching at Universities. Job stressors, unpleasant stimuli and the effects this can have on individuals' mental health could be integrated into medical, paramedic and nursing school. Linked to this could be discussions around selfcare, wellbeing and support systems available. These early discussions surrounding psychological wellbeing within the health care professions, may help break down the historical occupational stigma within the NHS in the future. Organisations should be mindful of staff who have been repeatedly exposed to MCIs as their wellbeing may be negatively impacted. Prioritising psychosocial care of staff may aid retention and improve well-being, however any new guidance needs to be mindful that staff vary in how they react and perceive support; as noted in this study, support was a personal journey and therefore perhaps signposting to a variety of options would be more beneficial. Teaching could also be given in hospitals to ensure staff are aware of the findings from this research. Whilst publishing the data will be beneficial it may not reach those who would benefit most due to their busy work schedules. Mandatory training surrounding how an MCI may make an individual feel and discussing the signs and symptoms of anxiety, depression, PTSD and poor psychological wellbeing could also be beneficial and help break down the stigma. These training sessions could also help individuals identify their own personal support network should they require it and help detect what they would be comfortable with before an MCI takes place. Media training would also be beneficial in giving staff confidence in dealing with the media. This again could be given during early medical and nursing training to ensure all staff have an understanding on how to liaise with the media. This would help

prevent anxiety especially if training is given regularly, this would also ensure staff are kept up to date with any new media policies.

## 5.7 Conclusion

This study aimed to explore how responding to a MCI affected front line health care staff in England. The key drivers for this were twofold: firstly, MCIs are increasing globally and placing additional demands not only on society but specific groups like health care staff. Secondly, existing research is dominated by high profile events such as the terror attacks of 9/11 in the USA, and often quantitative attempts to explore specific health outcomes such as PTSD, depression, and anxiety.

This study used qualitative exploratory methods and a sample of different healthcare professionals who had experienced a variety of different MCIs over differing periods of time. Key emerging findings were training and organisational aspects such as policies and procedures were important in safeguarding their own safety and in ensuring that the response to the MCI was timely and effective. Training was also seen as a protective factor against psychological burden after the MCI, reflecting similar findings in other, MCI research.

The environment of an MCI was described as chaotic and overwhelming, which made responding to an MCI even for experienced staff challenging and intense. The environment in the hospital was more controlled and set up for clinical work, however staff faced other challenges such as hostility, violence, and the burden of an influx of patients with severe injuries. MCIs are known to challenge well formulated plans and procedures, and staff often had to use their initiative to help members of the public, being resourceful with everyday objects and using them clinically. For some this gave a sense of accomplishment and pride that they were able to help those affected, and these staff members experienced the MCI positively, however not all health care staff had positive outcomes. There was a strong sense of fear of blame and scrutiny and due to the nature of an MCI and the need for quick clinical decision making, some staff felt overwhelmed and anxious, later leading them to make the decision to leave the occupation of emergency health care or requiring professional support and time off work.

The psychological burden of working during the MCI was discussed by the participants who had experienced burnout, delayed emotions, anger, frustrations, and avoidance. For those who had experienced burnout or mental health problems a change in occupation was required or time off work. Living within the community in which the incident took place was difficult for many of the participants due to the constant reminders of the landscape. Anniversaries and memorials were also seen as



unpleasant reminders of the incident, however for some this allowed them to make peace with what happened.

The media was seen as a negative aspect of MCIs due to the demeanour of the media in being relentless and not respecting boundaries, this caused participants to view the media less favourably. Some avoided the media both professionally and personally due to their view of inaccurate reporting and sensationalistic writing. There were also concerns regarding privacy and consent, as participants stated their pictures were printed without permission.

Support was seen to be a personal decision and there were mixed feelings about what was best. Some had engaged with formal mechanisms but had warned it was important that they had trust and confidence in the counsellor. For others there was fear of judgement and a mistrust of counsellors, and these participants preferred informal methods of discussing their feeling with friends, colleagues, or family. Humour was also a popular mechanism for coping and processing painful stimuli.

This study has also explored theory to help make sense of the findings, noting that emergency health care is perhaps chosen and suited to those who enjoy the extreme intensity of the role, favouring edgework. Emotional labour was also discussed and seen as an area that could make staff at risk of mental health problems due to them hiding their own emotions to support others, which has been noted to be harmful. Lastly it was noted that post MCI there may be an element of ontological insecurity, especially within an individual's home life, if they live in the same community as the MCI, and it is worth employees being aware that this can increase anxiety and fear in an individual.

Ultimately, emergency healthcare professionals identified several positive aspects of responding to an MCI in relation to prior training, some aspects of work rewards, and informal support mechanisms; however, this was countered by multiple negative aspects such as perceived threats to safety, subsequent effects of health and well-being, and typically poor experiences of subsequent support. These emerging findings were not consistent, and it is argued that the effects on emergency health care professionals of responding to an MCI are variable but also more negative than positive. Being involved in an MCI was a challenge, even for emergency health care professionals who are used to witnessing more extreme events compared to the public; this suggests that those involved were undertaking extreme work and that the MCI intensified their work also. MCIs were also arguably a type of fateful moment which threatened healthcare professionals' ontological security. To better support emergency health care professionals, greater understanding of the impact beyond traditional clinical measures is needed, to ensure training and support are better aligned with the ways individuals may be affected differently.

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## Appendix A Search Terms

Facet	
Population	<p>nurse* or nursing.</p> <p>Nursing Staff/ or Nurse's Role/ or Nursing Care</p> <p>emergency service* emergency department or emergency medicine or medical staff</p> <p>ED consultant or ED doctor</p> <p>Anaesthetist or intensivist*</p> <p>Physician*</p> <p>Doctor*</p> <p>Practitioner</p> <p>Therapist.mp.</p> <p>Health care provider*. emergency responder* or first responder</p> <p>Ambulance*</p> <p>Paramedic*.</p> <p>Allied health personnel or medical assistant</p> <p>EMT or emergency medical technician</p> <p>Police</p> <p>Detective</p> <p>Constable or constabulary</p> <p>Officer</p> <p>Armed</p> <p>Law enforcement</p> <p>Homicide</p> <p>Fire service</p> <p>Firefighter</p> <p>Relief work</p> <p>Military Med*</p> <p>Military Health staff</p> <p>Army Nurs* or Doc*</p>
Exposure	Hostage



	<p>Counter terrorism</p> <p>Public safety</p> <p>Terror incidents</p> <p>Mass shooting</p> <p>Fire</p> <p>Bomb</p> <p>Chemical attacks</p> <p>Riots</p> <p>War</p> <p>Road accident</p> <p>Disaster</p> <p>Major incident or mass casualty incident</p> <p>Man-made violence</p> <p>Bioterrorism</p> <p>Warfare</p> <p>Lone actor</p> <p>Nuclear bomb</p> <p>Biological warfare</p> <p>War</p> <p>Massacre</p> <p>School shooting</p> <p>Gunfire</p> <p>Hostility</p> <p>Riots</p> <p>Civil unrest</p> <p>Road accidents</p> <p>Disaster</p> <p>Rescue</p>
Comparator	N/A
Outcome	<p>Mental health</p> <p>PTSD</p> <p>Depression</p>

	<p>Anxiety</p> <p>Sleep disturbance</p> <p>Nightmares</p> <p>Low mood</p> <p>Binge drinking</p> <p>Drugs</p> <p>Sexual risk behaviour</p> <p>Teamwork</p> <p>Pride</p> <p>Narrative</p> <p>Experiences</p> <p>Stories</p>
Other	<p>English language only</p> <p>Primary research</p> <p>Systematic reviews and meta-analyses</p> <p>Narrative or experiences or story or perspective</p>

## Appendix B – Matrix of studies included in the narrative review

First author and year	Design	Population	Country <sup>1</sup>	Outcomes <sup>2</sup>	Terror	Man-made	War
Aubert <i>et al</i> (2017)	Cohort	Rescue workers including health care staff	France	Increased frequency of mental health problems in those exposed.	Yes		
Ben-Ezra <i>et al</i> (2013)	Cross-sectional	Nurses	Gaza	Somatization and psychiatric symptoms among nurses who were exposed to war stressors. Study 1 – Found nurses who were in the exposed group had high levels of PTSD and burnout compared to those who were not exposed. Study 2- Six months after the war nurses in the unexposed group had similar levels of PTSD symptoms and depressive symptoms.			Yes
Bezabh <i>et al</i> (2017)	Cross-sectional	Fire firefighters, ambulance staff, nurses and rescue workers	Ethiopia	19.9% prevalence rate of PTSD. Family history of mental illness, length of service, duration of exposure and type of exposure were found to be associated with PTSD.		Yes	
Bills <i>et al</i> (2009)	Narrative interviews	Rescue and recovery workers	USA	Themes were: Ground zero roles, grotesque experiences, the surreal nature, rituals to cope after leaving ground zero	Yes		
Bogstrand <i>et al</i> (2016)	Cross-sectional	Rescue Workers including nurses, nursing assistants, paramedics, other health care providers and doctors	Norway	Few rescue workers reported drug or alcohol usage. Of those who did, the study demonstrated that medical drug use or alcohol usage was associated with elevated PTSS.	Yes		
Caramello <i>et al</i> (2019)	Cross-sectional	Emergency department staff	Italy	Low psychological consequences noted due to small number of casualties and the MCI being considered as non life-threatening to		Yes	

First author and year	Design	Population	Country <sup>1</sup>	Outcomes <sup>2</sup>	Terror	Man-made	War
				the emergency workers. Health care staff responded well to the influx of casualties.			
Dickerson <i>et al</i> (2002)	Qualitative Interpretive phenomenological approach	Nurses	USA	Six themes: Loss of symbol and regaining new meaning, disaster without patients, coordinating with and without organisations, rediscovering the pride of nursing, traumatic stress and preparing for the future	Yes		
Dougall <i>et al</i> (2000)	Cohort	Emergency workers and hospital workers	USA	Past trauma experience increased sensitivity to psychological distress following working at the crash site.		Yes	
Dyregrov <i>et al</i> (1996)	Cohort	Voluntary and professional helpers, including healthcare staff	Norway	Voluntary helpers experienced significantly more intrusion and avoidance symptoms at time point 1 and significantly higher avoidance symptoms at time point 2 (13 months) compared to professional helpers.		Yes	
Farfel <i>et al</i> (2008)	Cohort	9/11 Health registry, includes health care worker	USA	Physical and psychological conditions found in 9/11 disaster response workers. 16% screened for probable PTSD and 8% for serious psychological distress.	Yes		
Finnegan <i>et al</i> (2016)	Qualitative Constructivist grounded theory	Nurses	Afghanistan	Clinical training, good command structure, restful periods, good diet and exercise were all seen as factors which reduced psychological harm. No debriefing model was advocated by clinical staff – adding to stigma of psychological problems.			Yes
Gregory <i>et al</i> (2019)	Cross-sectional	Physicians	Paris	12.4% PTSD, 11.2% Anxiety and 2.4% Depression.	Yes		
Grieger <i>et al</i> (2003)	Cross-sectional	Civilian and military physicians, nurses and other hospital staff	USA	Perceptions of safety, post traumatic symptoms and alcohol usage.	Yes		

First author and year	Design	Population	Country <sup>1</sup>	Outcomes <sup>2</sup>	Terror	Man-made	War
Hammand <i>et al</i> (2017)	Qualitative Hermeneutic Phenomenology	13 nurses participated who worked in the ED during a disaster	World wide	Themes included changes in space and working practice in the emergency department, feelings around shock and disbelief and the need for enhanced training in order to better prepare staff.		Yes	
Havron <i>et al</i> (2017)	Cohort	Surgeons	USA	High prevalence of PTSD especially in junior staff. Media response found to be intrusive and overwhelming. Support was identified as an area for improvement.	Yes		
Kolkow <i>et al</i> (2007)	Cross-sectional	Hospital workers	Iraq and Afghanistan	9% met the criteria for PTSD, 5% met the criteria for depression Threat to life or potential to be harmed were risk factors for PTSD, whilst witnessing trauma or the deceased was not a significant risk factor. Those who had PTSD sought help whilst deployed but once home did not.			Yes
Lu <i>et al</i> (2020)	Cross-sectional	Nurses	Taiwan	Length of service and stress level were predictors of compassion satisfaction. Age and stress level were found to be predictors of compassion fatigue and burnout. Institutions need to improve nurses' stress level in order to improve their working lives.		Yes	
Lubin <i>et al</i> (2007)	Cross-sectional	Medical personnel (excluding paramedics)	Judea and Samaria	The prevalence of PTSD within the study population was very low, only one member of medical personnel had PTSD. Good post-trauma treatment was given a few hours after the events and the staff were adequately trained to deal with such events, hence low PTSD.			Yes
Luce <i>et al</i> (2002)	Cross-sectional	Health professionals	Ireland	The levels of PTSD symptomology in different hospital health care staff. Staff with previous history of trauma or those who witnessed the current event had the highest level of PTSD	Yes		

First author and year	Design	Population	Country <sup>1</sup>	Outcomes <sup>2</sup>	Terror	Man-made	War
				symptoms. Only a few staff members sought support.			
Maslow <i>et al</i> (2015)	Cohort	Rescue and recovery workers (including emergency medical workers)	USA	Higher PTSD scores were observed in participants with lower social support, divorced, separated, widowed or unemployed. This study found that exposure related and contextual influences affected the course of PTSD	Yes		
Misra <i>et al</i> (2009)	Cross-sectional	Ambulance personnel	UK	Low PTSD and psychological distress. Higher PTSD was found in those who were more proximal to the incident and witnessed more distressing scenes	Yes		
Motreff <i>et al</i> (2017)	Cross-sectional	First responders, including healthcare staff	France	Low prevalence of PTSD – under 5%	Yes		
O'Neill <i>et al</i> (2020)	Qualitative	Doctors	USA	Doctors expressed negative psychological outcomes when caring for patients during the MCI (Shooting). They stated they either had PTSD or knew someone with it. The paper identified the need for improved MCI guidelines, training to help performance during the MCI and reduce stress afterwards. Those with military experience were found to be more resilient. Media intrusion and fear over liability were also noted.		Yes	
Perrin <i>et al</i> (2007)	Cohort	Rescue and recovery workers. Included Healthcare workers	USA	Overall prevalence of PTSD among rescue and recovery workers was 12.4%. Health care workers had a PTSD prevalence of 14.2%. Risk factors included early start date and length of stay at the site. PTSD was also higher in those who undertook duties out of their normal remit.	Yes		
Pietrzak <i>et al</i> (2014)	Cohort	Police	USA	Trajectories of PTSD risk and resilience	Yes		

First author and year	Design	Population	Country <sup>1</sup>	Outcomes <sup>2</sup>	Terror	Man-made	War
		Non-traditional responders which included healthcare staff					
Razik <i>et al</i> (2013)	Cross-sectional	Male emergency workers, including medical staff	Pakistan	15% of the sample showed clinical relevant levels of PTSD. 11- 16% of participants reported heightened levels of anxiety or depression. Symptom levels were associated with subjectivity to threat, peritraumatic dissociation, past traumas, ruminations and avoidant coping.	Yes		
Ron <i>et al</i> (2014)	Cross-sectional	Nurses	Israel	Nurses reported very high levels of burnout, high levels of stress and medium to high levels of intrusive memories.	Yes		
Shamia <i>et al</i> (2015)	Cross-sectional	Nurses	Gaza	19.7 % reported full PTSD. PTSD and post-traumatic growth were heavily associated with community trauma rather than work related trauma. Nursing professionals experienced high levels of psychological distress 2 years following the acute period of conflict both as a civilian and in a professional capacity.			Yes
Skogstad <i>et al</i> (2015)	Cross-sectional	Police officers Ambulance workers Firefighters	Norway	The degree of PTSS experienced by those who attended the scene.	Yes		
Skogstad <i>et al</i> (2016)	Cross-sectional	Police officers Doctors Nurses Ambulance workers Unaffiliated volunteers Firefighters	Norway	PTSS and PTSD prevalence.	Yes		

First author and year	Design	Population	Country <sup>1</sup>	Outcomes <sup>2</sup>	Terror	Man-made	War
Skryabina <i>et al</i> (2021)	Mixed methods	Front line healthcare staff	UK	Staff who had attended one of the three MCIs in the UK reported that training, which included the importance of teamwork and good communication was vital to the response. Practice needs to improve upon communication skills, training surrounding ballistic injuries and support for staff following MCIs.	Yes		
Sloan <i>et al</i> (1994)	Cohort	Police Firefighters Medical personnel Mental health personnel	Unknown	Intrusive and avoidance symptoms were present after and 6 months later. Medical and mental health personnel had more intrusive thoughts than public safety personnel.		Yes	
Thomas <i>et al</i> (2003)	Cross-sectional	Hospital staff	USA	6% prevalence of Acute Stress Disorder 3% met the criteria for increased alcohol intake and 8% met the criteria for depression.	Yes		
Ursano <i>et al</i> (1999)	Cohort	Disaster workers	Puerto Rico	Identification with the deceased is seen as a risk factor to PTSD and post-traumatic distress. Knowing the deceased was the biggest factor causing potential psychological harm.		Yes	
Van der Velden <i>et al</i> (2008)	Prospective longitudinal	Ambulance personnel	Netherlands	Smoking soon after a disaster predicts PTSD symptoms. Smoking is a relevant risk factor.		Yes	
Webber <i>et al</i> (2011)	Cross-sectional	Firefighters EMS workers	USA	7% had probable PTSD and 19.4% had probable depression. Early arrival to the WTC site caused the most physical and mental health burden on workers.	Yes		
Weiniger <i>et al</i> (2006)	Cohort	Doctors	Jerusalem	Doctors exposed to victims of terror did not demonstrate higher incidence of PTSD than their less exposed colleagues.	Yes		
Yip <i>et al</i> (2017) (212)	Cohort	EMS workers Firefighters	USA	Health burden post 9/11.	Yes		



First author and year	Design	Population	Country <sup>1</sup>	Outcomes <sup>2</sup>	Terror	Man-made	War
				Prevalence of probable PTSD up to 12 years. Prevalence of probable depression and probable harmful alcohol intake also noted.			
Yip <i>et al</i> (2016)	Cross-sectional	Firefighters and EMS workers	USA	Poor physical health and mental health were directly related to attending the WTC.	Yes		

## Appendix C – Ethics Approval Letters



Downloaded: 02/08/2019  
Approved: 01/08/2019

Helen Radford  
Registration number: 170256948  
School of Health and Related Research  
Programme: Public Health

Dear Helen

**PROJECT TITLE:** Dealing with disaster: a qualitative exploration of the experiences of front line emergency healthcare staff following a mass casualty incident.

**APPLICATION:** Reference Number 028778

On behalf of the University ethics reviewers who reviewed your project, I am pleased to inform you that on 01/08/2019 the above-named project was **approved** on ethics grounds, on the basis that you will adhere to the following documentation that you submitted for ethics review:

- University research ethics application form 028778 (dated 31/07/2019).
- Participant information sheet 1068238 version 1 (06/07/2019).
- Participant information sheet 1068240 version 2 (31/07/2019).
- Participant consent form 1068249 version 2 (31/07/2019).

If during the course of the project you need to [deviate significantly from the above-approved documentation](#) please inform me since written approval will be required.

Yours sincerely

Jennifer Burr  
Ethics Administrator  
School of Health and Related Research

## Amended research project approval letter



The  
University  
Of  
Sheffield.

School Of  
Health  
And  
Related  
Research.

SchARR

Charlotte Claxton  
Ethics Committee Administrator  
Regent Court  
30 Regent Street  
Sheffield S1 4DA

11 September 2020

Telephone: +44 (0) 114 222 5446  
Email: c.claxton@sheffield.ac.uk

**Project title:** Dealing with disaster: a qualitative exploration of the experiences of front-line emergency healthcare staff following a mass casualty incident.

**Reference Number:** 028778

Dear,

Thank you for submitting the above amended research project for approval by the SchARR Research Ethics Committee. On behalf of the University, I am pleased to inform you that the project with changes was approved.

If during the course of the project you need to deviate significantly from the documents you submitted for review, please inform me since written approval will be required.

Yours sincerely

Handwritten signature of Charlotte Claxton in black ink.

**Charlotte Claxton**  
On behalf of the SchARR Research Ethics Committee

HRA approval letter



Doctor Richard Cooper  
School of Health and Related Research  
30 Regent Street  
University of Sheffield  
S1 4DA

Email: [hra.approval@nhs.net](mailto:hra.approval@nhs.net)  
[HCRW.approvals@wales.nhs.uk](mailto:HCRW.approvals@wales.nhs.uk)

09 January 2020

Dear Doctor Cooper

**HRA and Health and Care  
Research Wales (HCRW)  
Approval Letter**

<b>Study title:</b>	<b>Dealing with disaster: a qualitative exploration of the experiences of front line emergency healthcare staff following a mass casualty incident.</b>
<b>IRAS project ID:</b>	<b>271321</b>
<b>Protocol number:</b>	<b>163049</b>
<b>REC reference:</b>	<b>19/HRA/5530</b>
<b>Sponsor</b>	<b>Sheffield University</b>

I am pleased to confirm that [HRA and Health and Care Research Wales \(HCRW\) Approval](#) has been given for the above referenced study, on the basis described in the application form, protocol, supporting documentation and any clarifications received. You should not expect to receive anything further relating to this application.

Please now work with participating NHS organisations to confirm capacity and capability, in line with the instructions provided in the "Information to support study set up" section towards the end of this letter.

**How should I work with participating NHS/HSC organisations in Northern Ireland and Scotland?**

HRA and HCRW Approval does not apply to NHS/HSC organisations within Northern Ireland and Scotland.

If you indicated in your IRAS form that you do have participating organisations in either of these devolved administrations, the final document set and the study wide governance report (including this letter) have been sent to the coordinating centre of each participating nation. The relevant national coordinating function/s will contact you as appropriate.

Please see [IRAS Help](#) for information on working with NHS/HSC organisations in Northern Ireland and Scotland.

**How should I work with participating non-NHS organisations?**

HRA and HCRW Approval does not apply to non-NHS organisations. You should work with your non-NHS organisations to [obtain local agreement](#) in accordance with their procedures.

**What are my notification responsibilities during the study?**

The "[After HRA Approval – guidance for sponsors and investigators](#)" document on the HRA website gives detailed guidance on reporting expectations for studies with HRA and HCRW Approval, including:

- Registration of Research
- Notifying amendments
- Notifying the end of the study

The [HRA website](#) also provides guidance on these topics and is updated in the light of changes in reporting expectations or procedures.

**Who should I contact for further information?**

Please do not hesitate to contact me for assistance with this application. My contact details are below.

Your IRAS project ID is **271321**. Please quote this on all correspondence.

Yours sincerely,  
Nicole Curtis

Approvals Specialist

Email: [hra.approval@nhs.net](mailto:hra.approval@nhs.net)

## Appendix D – Information for Participants

IRAS 271321

Version 3 20/11/19



### Information for Participants

#### **Dealing with disaster: a qualitative exploration of the experiences of front line emergency healthcare staff following a mass casualty incident.**

You have been invited to take part in a PhD research project. It is important for you to understand why the research is being conducted and what it will involve. Please take time to read the following information carefully. Please ask me if there is anything that is unclear or if you would like more information. Take time to decide whether or not you wish to take part. Please feel free to discuss this with other people. Thank you for taking the time to read this.

**What is the project's purpose?** The primary aim of this study is to understand the experiences and views of a range of different health care staff when responding to a mass casualty incident. Previous research has explored perspectives in other countries such as the United States but little is known about how health care staff in England are affected by such events and particularly recent terrorist attacks. The aim is to enhance understanding of how staff are affected to inform policy, services and support.

**Why have I been chosen?** You have been invited to take part in this study as you represent an occupational group which work in a health care emergency setting and you may have responded to a mass casualty incident in recent years. It is anticipated that there will be around 25-30 participants in total taking part in this project.

**Do I have to take part?** It is up to you to decide whether or not to take part. You can withdraw at any time without giving a reason, but once the data has been anonymised and included within a large dataset then it will be impossible to remove your data. There will be no negative consequences should you wish to withdraw. If you do decide to take part, you will be given this information sheet to keep and will be asked to sign a consent form.

**What will happen to me if I take part?** If you give consent to participate, you will be invited to participate in a single one-to-one interview, either in person or by telephone depending on your preference. You will be asked a number of initial questions that confirm your suitability for the study (this includes having worked at least one shift during a mass casualty incident in which you came into contact with patients). You will be asked to complete a consent form confirming your participation and then a convenient date and time will be arranged to undertake an interview. This will be with the main researcher and is anticipated to last between 30-60 minutes. Interview questions will include asking about your job role, what participation you had during the mass casualty event, and associated experiences and views about it. We also want to explore if you have sought any support following your involvement and any impact on yourself or others. These will be open questions to allow you the freedom to tell your story and you can give as much or a little detail as you want.

**Will I be recorded, and how will the recorded media be used?** With your permission, an audio recording of the interview will be made along with written notes. These will be used to produce a fully anonymised written transcript for analysis. The transcripts may be used for illustration in conference presentations, journal publications and lectures. No other use will be made of them without your written permission, and no one outside the project will be allowed access to the original recordings. In order to participate in this research an audio recording is required.

**What are the possible disadvantages and risks of taking part?** It is not anticipated that you will be disadvantaged by taking part in the research. During the interview, it is possible that due to the subject matter you may become distressed. We can stop the interview at any time and take a break, re – schedule, or cancel it all together. You can withdraw at any point up until the point of anonymisation of the data. Services for support will be signposted should you feel you wish to continue discussing any thoughts or feeling with a qualified health professional after the interview.

**Will my taking part in this project be kept confidential?** All the information that we collect about you during the course of the research will be kept strictly confidential and will only be accessible to members of the research team. You will not be able to be identified in any reports or publications by name, however there is a risk that you may become identifiable due to context e.g. job role, gender and location. Where, due to the nature of the research, it may not be possible to safeguard the confidentiality of the data, for example if your disclose information which puts yourself in danger, is deemed criminal activity or risk to public safety, the researcher will need to disclose this to the relevant authorities.

**What is the legal basis for processing my personal data?** According to data protection legislation, we are required to inform you that the legal basis we are applying in order to process your personal data is that 'processing is necessary for the performance of a task carried out in the public interest' (Article 6(1)(e)). Further information can be found in the University's Privacy Notice <https://www.sheffield.ac.uk/govern/data-protection/privacy/general>. Data will be anonymised after it has been transcribed.

**How will we use information about you?** We will need to use information provided by you during the interview for this research project. This information will include your contact details (name, contact details, age and job role) and anonymised data from the interview. People who do not need to know who you are will not be able to see your name or contact details. Your interview data will have a code allocated instead. We will keep all your information safe and secure. Once we have finished the study, we will keep some of the data so we can check the results. We will write our reports in a way no-one can work out that you took part in the study.

**What will happen to the data collected, and the results of the research project?** Audio recordings will be made initially on an encrypted audio-recorder. Following this the content will be transcribed and transferred to an access restricted folder on the University's Shared Network Filestore. The transcripts will be anonymised (name or other identifying details removed). Consent forms will be stored in a locked filing cabinet at the University of Sheffield, in a coded locked office. Only the main researcher and the supervision team, including a School of health and Related Research (SchARR) authorised transcribers will have access to data. The transcriber will have completed an information governance and data protection training required by the University of Sheffield. The anonymised data will be kept indefinitely.

There is a possibility of future usage of the data, should the study extend into another project at the University. The data may also be used in publications, conferences and lectures but none of your personal or identifiable information will be shared in these circumstances due to the anonymisation process.

**What are your choices about how your information is used?** You can stop being part of the study at any time, without giving a reason, but we will keep information about you that we already have. If you agree to take part in this study, you will have the option to take part in future research using your anonymised data saved from this study.

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**Where can you find out more about how your information is used?** You can find out more about how we use your information by:

- asking the research team (see full contact details below)
- visiting the project webpage (<https://scharr.dept.shef.ac.uk/dealing-with-disaster/>)
- sending an email ([hmrادford1@sheffield.ac.uk](mailto:hmrادford1@sheffield.ac.uk))
- ringing us on 0114 2220768.

**Who is organising and funding the research?** This study is being undertaken by the University of Sheffield and has received no source of external funding.

**Who is the Data Controller?** The University of Sheffield will act as the Data Controller for this study. This means that the University of Sheffield is responsible for looking after your information and using it properly.

**Who has ethically reviewed the project?** This project has been reviewed and approved by the University of Sheffield's Ethics Review Procedure, as administered by the School of Health and Related Research department. Research governance has been approved by the Health Research Authority.

**What if something goes wrong and I wish to complain about the research?** If you wish to make a complaint about this research please contact the project supervisors: Doctor R. Cooper – [Richard.cooper@sheffield.ac.uk](mailto:Richard.cooper@sheffield.ac.uk) or Doctor L. Preston [l.r.preston@sheffield.ac.uk](mailto:l.r.preston@sheffield.ac.uk) or Professor S. Goodacre [s.goodacre@sheffield.ac.uk](mailto:s.goodacre@sheffield.ac.uk)

If the complaint relates to how your personal data has been handled, you should contact Anne Cutler, The University of Sheffield Data Protection Officer [dataprotection@sheffield.ac.uk](mailto:dataprotection@sheffield.ac.uk). Further information about how to raise a complaint can be found in the University's Privacy Notice: <https://www.sheffield.ac.uk/govern/data-protection/privacy/general>. If you feel your complaint has not been handled to their satisfaction, you may contact the University of Sheffield SchARR Dean Professor John Brazier on 0114 222 5446

**Contact for further information** Please contact me if you have any questions about this research

Helen Radford (PhD Student)  
[Hmrادford1@sheffield.ac.uk](mailto:Hmrادford1@sheffield.ac.uk)  
Address: School of Health and Related Research (SchARR)  
University of Sheffield  
Regent Court  
Sheffield  
S1 4DA

**Lastly, we wish to thank you for taking part in this PhD research project**  
**Please take a copy of the information leaflet and if you wish to take part**  
**please sign the consent form and keep a copy for yourself**



## Appendix E – Consent form



Version 2 31/07/19  
IRAS Project ID: 271321

**Dealing with disaster: a qualitative exploration of the experiences of front line emergency  
healthcare staff following a mass casualty incident.**

**Consent Form**

<b><i>Please add your initial to the box</i></b>	<b>Yes</b>	<b>No</b>
<b>Taking Part in the Project</b>		
I have read and understood the project information sheet dated 31/7/19 or the project has been fully explained to me. (If you will answer No to this question please do not proceed with this consent form until you are fully aware of what your participation in the project will mean.)	<input type="checkbox"/>	<input type="checkbox"/>
I have been given the opportunity to ask questions about the project.	<input type="checkbox"/>	<input type="checkbox"/>
I agree to take part in the project. I understand that taking part in the project will include being interviewed face to face. This interview will also be recorded via an encrypted audio recorder	<input type="checkbox"/>	<input type="checkbox"/>
I understand that my taking part is voluntary and that I can withdraw from the study, before the audio has been transcribed and anonymised. I do not have to give any reasons for why I no longer want to take part and there will be no adverse consequences if I choose to withdraw.	<input type="checkbox"/>	<input type="checkbox"/>
<b>How my information will be used during and after the project</b>		
I understand my personal details such as name, phone number, address and email address etc. will not be revealed to people outside the project.	<input type="checkbox"/>	<input type="checkbox"/>
I understand and agree that my words may be quoted in publications, reports, web pages, and other research outputs. I understand that I will not be named but there is a risk that you may become identifiable due to context e.g. job role, gender and location'. Efforts will be made to prevent this	<input type="checkbox"/>	<input type="checkbox"/>
I understand and agree that other authorised researchers will have access to this data only if they agree to preserve the confidentiality of the information as requested in this form.	<input type="checkbox"/>	<input type="checkbox"/>
I understand and agree that other authorised researchers may use my data in publications, reports, web pages, and other research outputs, only if they agree to preserve the confidentiality of the information as requested in this form.	<input type="checkbox"/>	<input type="checkbox"/>
I give permission for the transcript of the audio recording that I provide to be deposited in Sheffield University (ScHARR) so it can be used for future research and learning. The transcript will be fully anonymised and any potentially identifiable information will be removed.	<input type="checkbox"/>	<input type="checkbox"/>
<b>So that the information you provide can be used legally by the researchers</b>		
I agree to assign the copyright I hold in any materials generated as part of this project to The University of Sheffield.	<input type="checkbox"/>	<input type="checkbox"/>

Name of participant [printed]

Signature

Date

Name of Researcher [printed]

Signature

Date

## Appendix F – Interview Guide



Version1 6/7/19  
IRAS Project ID: 271321

### Interview Guide

Script of an introduction to the interview

Thank you for agreeing to take part in this study, you will have already received the participant information leaflet informing you of the purpose of this study and explaining why you have been chosen. Can I now ask you to confirm that you are still happy to go ahead with today's interview and you are happy for it to be audio recorded?

- 1 Please could you briefly describe your career trajectory and end on your current role or roles and daily duties?
- 2 You were invited because you had been involved as a clinician in a mass casualty incident. Could you confirm what the incident was and how you were involved?
- 3 *[if not covered in 2]* Can you describe your shift(s) and what your specific role(s) and involvement was during the MCI?
- 4 *[if not covered in 2]* Were you on duty or did you respond, 'off call'?
- 5 *[if not covered in 2]* Do you recall how you and other staff were made aware of this, and the role you were expected to play?
- 6 Were there any particular aspects of your involvement in the incident *[but use these preferred wording]* that you can recall?
- 7 *[if not covered in 6]* Were there aspects of the presentation of casualties (or others such as bystanders, other HCPs) that you especially recall? *[prompt for details about the presentation, in terms of how they arrived? The demography? The type of injuries? Their sense of what was happening? What was the atmosphere like? Time spent at the location or how long the shift was? What was the mood in the location?*
- 8 *[if not covered in 6 or 7]* Can I ask more specifically about not just the mood but also more emotional aspects, for you or others? For example, in terms of fear, panic uncertainty or shock?
- 9 Have you been involved in previous MCIs?



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- 10 *[if yes to 9]* How was this incident different to others you have been involved in, in the past?
- 10 *[if no to 9]* Are there comparisons or differences you would make to other aspects of your job?
- 10 *[if not covered in 9 or 10]* Was it the type of patient or the incident that made the incidents different? *[prompt - or anything else?]*
- 11 Do you mind me asking, in what way you feel you may have been affected by having been directly involved in the incident?
- 12 *[if not covered in 11]* Can I ask more specifically if this was emotional, physical or psychological in nature? If so, please say in what way.
- 13 Linked to the above, can you give a sense of the timing of how you were affected (for example immediately, or over a longer period of time). And do you mind me asking about currently how you feel you may be affected?
- 14 I would also like to get a sense of how you felt others were affected and previous questions have partly explored this. Thinking back to the main incident, can you recall how others may have been affected by being involved, and if this might have varied over time also?
- 15 How have you reflected on the situation: both during, in the immediate aftermath and later?
- 16 Would you say that you have reflected similarly to other significant incidents in the past? *[for either response, prompt to explore why?]*
- 16 Have you talked to others about the incident?
- 17 *[if not covered in 16]* Talking to other work colleagues?
- 18 *[if not covered in 16 or 17]* Talking to friends or family beyond the work setting?
- 19 I'd like to move on the ask more specifically about any support or help related to the incident. Could you say more about this?
- 20 *[if not covered in 19]* Was this support that was spontaneously offered to you, or did you need to seek for, and actively look for support?
- 21 *[if not covered in 19 or 20]* Did support involve talking to other work colleagues?



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- 22 *[if not covered in 19, 20 or 21]* Did your employer do anything specific, or other colleagues?
- 23 *[if support was mentioned in 19-22]* How helpful was the support?
- 24 We have covered this partly already, but I'd like to know about any other aspects about you have communicated about the incident.
- 25 Is there anything more than could be done to support healthcare staff who respond to MCIs such as the one you were involved in?
- 26 *[if not covered in 25]* What types of activities or support, and from whom?
- 27 I'd like to broaden the focus slightly and ask what you think of the role of the media (news, social) in reporting about such events?
- 28 *[prompt if not covered in 27]* About the MCI itself, but also the role and representation of health care professionals?
- 29 Do you have anything that you feel has not been covered, that you thought I'd ask, or want to mention relating to this?

Thank you very for your time. If you wish to contact me regarding anything you may have forgotten, my contact details are on the information sheet.

A final quick request, is that we are anticipating a relatively small sample for these interviews and we are hoping to use snowball sampling; if you know of anyone else who you think might be willing to participate, who obviously has experience of such as incident I'd be grateful if you could forward my contact details.

## Appendix G – Evidence to why research was paused



Dear Dr Cooper

**Re. IRAS 271321 Dealing with disaster: a qualitative exploration of the experiences of front line emergency healthcare staff following a mass casualty incident**

In light of the current COVID-19 public health crisis and in line with the [NIHR guidance](#) issued on 19 March 2020, [REDACTED] Service NHS Trust would like to request a temporary pause to the incoming application and set-up for the above named research study based on our local risk and capacity assessment.

We sincerely apologise for the disruption this causes to you as Chief Investigator and also to the sponsor, and for removing the opportunity for potential participants to take part in this very important and worthy NIHR study. This is an unprecedented scenario which clearly significantly affects the resource capacity of all NHS organisations, including us as an **ambulance** service.

We would very much like to resume support of your study at a time when we may successfully facilitate recruitment.

Please may I ask that you and/or the study sponsor authorise our request to implement a temporary pause to your study with a view to resume in the future should this be possible?

Kind regards

[REDACTED]

Letter stating the start of a public Inquiry



Hi Helen

I've sought the input of our Research Lead and Exec responsible for research at the Trust. Although we acknowledge the value of your proposed study, due to the recent opening of the Manchester Arena **Inquiry**, we regret to inform you that we are unable to support your research at this time due to the associated sensitivities surrounding your chosen topic.



Kind regards



## Appendix H – Social media message



**richard cooper**  
@Richard\_Cooper

Joined December 2013

72 Following 177 Followers

**Tweets**   Tweets & replies   Media   Likes

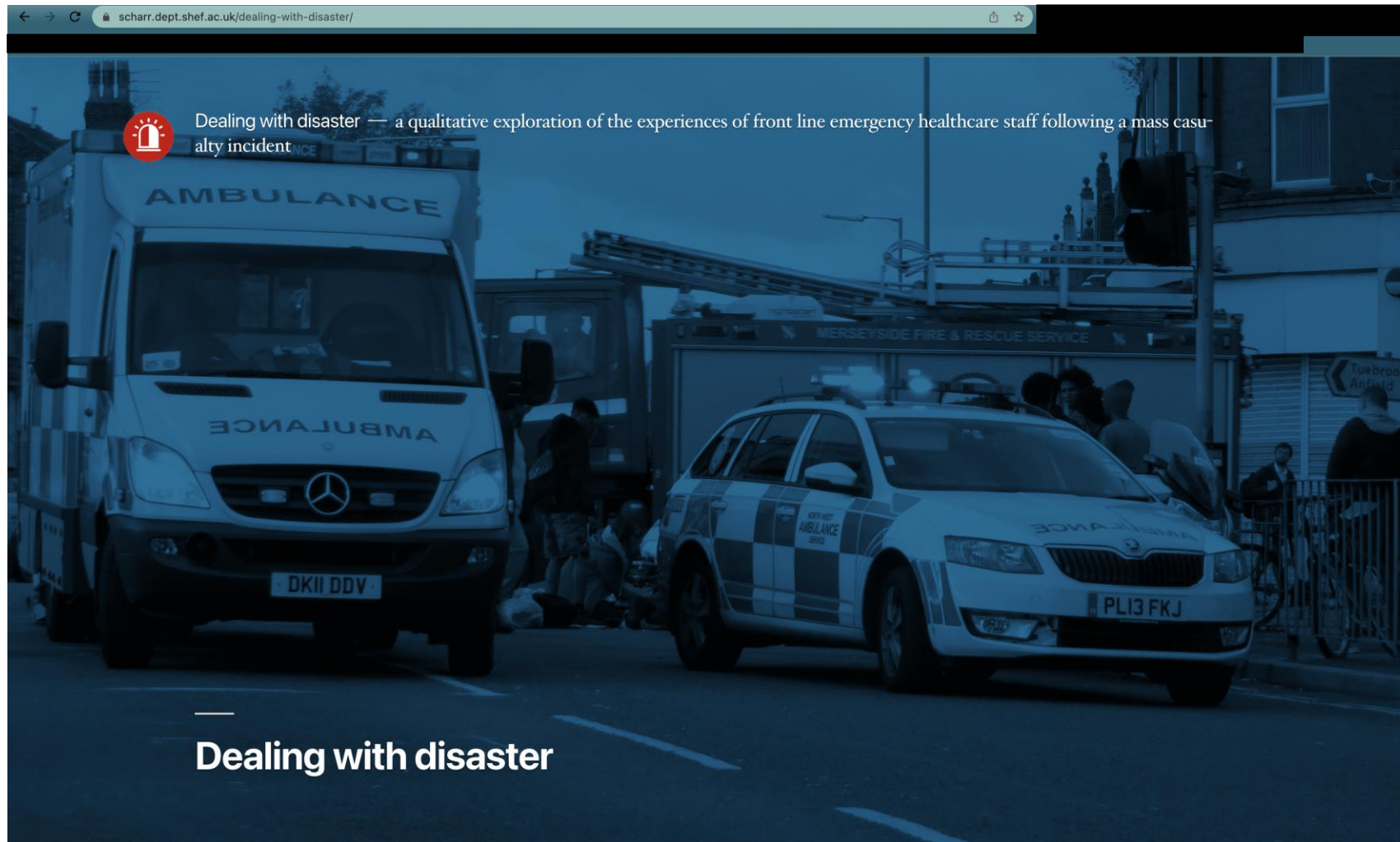
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 **richard cooper** @Richard\_Cooper · Oct 6, 2020

One of my PhD students, Helen Radford, is seeking health care professionals who have been involved in a mass casualty incident, to participate in a phone interview. Do get in touch with her if you can help, or forward info on: [scharr.dept.shef.ac.uk/dealing-with-d...](http://scharr.dept.shef.ac.uk/dealing-with-d...)  
hmrادford1@sheffield.ac.uk

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## Appendix I – Internet site





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## PARTICIPANTS NEEDED

The primary aim of this study is to understand the experiences and views of different health care staff when responding to a mass casualty incident. Previous research has explored perspectives in other countries such as the United States but little is known about how health care staff in England are affected by such events. The aim is to enhance understanding of how staff are affected to inform policy, services and support.

- Are you a health care professional?
- Have you worked at least one shift during a mass casualty incident in which you came into contact with patients. This can include clerking patients, attending the incident site, treating or talking to casualties.
- Are you happy to discuss your experiences with a researcher? The interview will take between 30 – 60 minutes. Due to COVID – 19 these interviews will take place over the phone and be recorded.

If you are interested in taking part in the study or would like further information please contact the lead researcher [Helen Radford](#) via:

