

# Paramedic and Emergency Medical Technician Reflections on the Ongoing Impact of the 9/11 Terrorist Attacks

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#### Abbreviations:

ALS: Advanced Life Support  
BLS: Basic Life Support  
CDC: Centers for Disease Control and Prevention  
EMS: Emergency Medical Services  
EMT: emergency medical technician  
FDNY: Fire Department of New York  
PTSD: posttraumatic stress disorder  
WTC: World Trade Center

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#### Abstract

**Introduction:** In the years following the September 11, 2001 terrorist attacks in New York City (New York USA), otherwise known as 9/11, first responders began experiencing a range of health and psychosocial impacts. Publications documenting these largely focus on firefighters. This research explores paramedic and emergency medical technician (EMT) reflections on the long-term impact of responding to the 9/11 terrorist attacks.

**Methods:** Qualitative methods were used to conduct interviews with 54 paramedics and EMTs on the 15-year anniversary of 9/11.

**Results:** Research participants reported a range of long-term psychosocial issues including posttraumatic stress disorder (PTSD), anxiety, depression, insomnia, relationship breakdowns and impact on family support systems, and addictive and risk-taking behaviors. Ongoing physical health issues included respiratory disorders, eye problems, and cancers.

**Discussion:** These findings will go some way to filling the current gap in the 9/11 evidence-base regarding the understanding of the long-term impact on paramedics and EMTs. The testimony of this qualitative research is to ensure that an important voice is not lost, and that the deeply personal and richly descriptive experiences of the 9/11 paramedics and EMTs are not forgotten.

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#### Introduction

The September 11, 2001 terrorist attacks, otherwise known as 9/11, on the World Trade Center (WTC) in New York City (New York USA) killed 2,753 people, including approximately 413 first responders. The attacks caused profound human suffering, physical destruction, and economic loss.<sup>1,2</sup> In the years following 9/11, first responders have experienced ongoing death, disability, and devastation due to their involvement in the 9/11 response. Over 1,000 emergency (police, fire, Emergency Medical Services [EMS]) and non-emergency (ironworkers, engineers, heavy machinery operators, construction professionals, and others) responders have died due to causes related to their exposure to the 9/11 WTC site.<sup>3</sup> Over 7,000 responders are registered with the World Trade Center Health Program (Centers for Disease Control and Prevention [CDC]; Atlanta, Georgia USA) and over 2,000 emergency first responders have had to retire on disability due to causes linked to 9/11.<sup>3</sup> Doctors with the World Trade Center Health Program, which was created by the United States federal government in the aftermath of the attacks, have linked nearly 70 types of cancer to Ground Zero – cancers that are rare, aggressive, and particularly hard to treat.<sup>4</sup> They have also identified a 15% higher cancer rate among 9/11 responders than those who were not exposed to the toxic cloud that belled out from Ground Zero.<sup>5</sup>

While New York City rebounded strongly, one of the painful legacies of the disaster is the lasting impact on the physical and psychosocial health of thousands of individuals who survived the attacks – including the first responders. Early health and psychosocial assessments following 9/11 tended to focus on firefighters and indicated that sleep issues, mood changes, feelings of detachment, and flashbacks were common problems for Fire Department of New York (FDNY; New York USA) first responders.<sup>6</sup>

Published reports on the health and psychosocial impact of 9/11 on other first responders, including paramedics and emergency medical technicians (EMTs), are scarce; however, one study published nine years after 9/11 identified that WTC rescue and recovery workers continued to have a substantial burden of physical and mental health problems. These included respiratory illness, gastro-esophageal reflux disease, depression, and panic disorders.<sup>7</sup> Incidence of most disorders was highest in workers with the greatest WTC exposure and extensive comorbidity was reported within and between physical and mental health disorders.<sup>7</sup> One study that focused on 9/11 paramedics and EMTs reported ongoing psychosocial impact 10 years after the disaster.<sup>8</sup> Research participants reported problems sleeping, anxiety and depression, extreme moods, addictive behavior (including gambling, smoking, and drinking), and negative impact on relationships.

#### *EMS Response to the 9/11 Terrorist Attacks*

The primary EMS provider for New York City is the FDNY-EMS Division. In addition to the FDNY-EMS, there are approximately 30 hospital-based EMS systems contracted by the city to provide emergency medical response. These agencies deliver full-time, professional Basic Life Support (BLS) and Advanced Life Support (ALS) services to New York City. In 2001, approximately 950 daily ambulance tours responded to a city with more than eight million residents and an immeasurable number of tourists. On 9/11, 24 EMS supervisors were involved in the WTC incident, along with the crews from 29 ALS and 58 BLS units. Assuming each ambulance unit had a minimum two-member crew on board, there were nearly 200 paramedics and EMTs present at the WTC precinct when the towers fell. By evening, an estimated 400 additional paramedics and EMTs had made their way to the WTC.<sup>9</sup>

The first paramedics and EMTs began to arrive at the WTC within minutes of American Airlines Flight 11 crashing into the North Tower of the WTC at 8:46AM. They began to establish staging areas and were triaging patients who were exiting the North Tower after a massive fire-ball had raced down the elevator shaft of the building, exploding into the lobby of the WTC, killing many instantly and critically injuring many others.

For many paramedics and EMTs, September 11, 2001 was just the first day of a long and exhausting timeframe in which their lives were changed forever. The experiences of paramedics and EMTs on 9/11, and in the years following, need to be shared to ensure that an important voice is not lost, and that the deeply personal and richly descriptive experiences of the 9/11 paramedics and EMTs are not forgotten. Furthermore, these lessons learned need to be shared with the international EMS community so that steps can be taken to help build a resilient EMS workforce worldwide.

#### **Methodology**

Participants were recruited through a mix of purposive and snowball sampling. Invitations to participate in a qualitative research study exploring paramedic and EMT reflections on the long-term impact of responding to the 9/11 terrorist attacks were sent to paramedics and EMTs known by the authors to have responded to the WTC site on September 11, 2001, or during the eight months of recovery efforts. Invitations were also sent to a number of 9/11 responder-focused groups on social media sites. Responders were then invited to share the invitation to participate

with their extended networks. All participants provided written consent prior to participation in the research study. Written consent was provided in paper format during face-to-face interviews and electronically prior to Skype (Skype Technologies; Palo Alto, California USA/Luxembourg City, Luxembourg) and telephone interviews. Additional written consent approving the use of quotations was provided electronically.

The interviews were unscripted; however, several key prompts were utilized, including: physical health; mental health; relationships; access to support; and general well-being. Interviews were conducted either face-to-face or via telephone or electronic communication and ranged in length from 60 to 90 minutes.

A total of 54 paramedics and EMTs (18 paramedics and 36 EMTs) self-reported that they responded to the WTC precinct on 9/11, or during the eight months of recovery that followed, and they consented to share their reflections on the ongoing impact of the terrorist attacks. These paramedics and EMTs ranged in age from 39–68 years (age at the time of interview); 42 (78%) were male and 12 (22%) were female.

Physical and mental health issues reported by participants were not confirmed by medical record review. The views and experiences reported in this research are those of the individual participants and do not reflect any views of the emergency services with whom they were employed. Interview recordings were transcribed and thematic analysis was undertaken using NVivo (QSR International; Melbourne, Australia). Ethics approval was provided by the Human Research Ethics Committee at Edith Cowan University in Joondalup, Australia. Funding for this study was provided by the School of Medical and Health Sciences by Edith Cowan University. The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.

#### **Results/Discussion**

##### *Psychosocial Reflections*

When research participants reflect on their response to 9/11, the words come slowly:

It was horrible. The smells...and what we had to do. I remember the first day, we were finding whole bodies. Then as the days went on, the stench started to tell us where to look. Soon, we were only finding pieces. Every day you'd be down there digging and if we found a bone, well, that was good day (Male EMT).

Recollections bring back a range of emotions. Mass atrocity can overwhelm the ability of language to fully describe the devastation that has been witnessed. Many recall sights, sounds, and smells, but often pause, apologizing mid-sentence, as memories flood back and they find themselves right back there, in a pile of dust and debris:

I remember seeing John\* and we just hugged. He told me to be careful, and then ran off in the other direction. I never saw him again (Male EMT).

Fifteen years after 9/11, participants remain haunted by quirks of fate that day and have ongoing issues with survivor's guilt. Many of the participants who survived didn't feel worthy of seeking care. The fact that they had survived, they felt, should have been enough. There are certain historical events that take place in a person's lifetime that leave a permanent imprint on them; 9/11 was that event for many of the research participants. The deaths of

colleagues and friends were so violent and so unexpected, they left the paramedics and EMTs stunned and overwhelmed by cumulative and ongoing grief. Many suffer residual psychological effects from their ordeal, and most live with survivor's guilt. Those interviewed reflected on their gratefulness for being alive and how they strive to make the best of their 'second chance.'

Feelings of guilt are persistent:

I just, you know... I feel guilty.... (pause).... [Interviewer: 'Why do you feel guilty?'] Because I didn't find anyone alive...(crying) (Male Paramedic).

Three key themes emerged within the context of guilt. Firstly, there was the guilt that the participants felt about surviving while so many of their colleagues and thousands of civilians died. Secondly, there was guilt about the things participants failed to do. Those experiencing this type of guilt tended to replay the event over and over again in their minds, trying to find ways they could have done things differently and ended up with a better outcome. Thirdly, some participants reflected on feelings of guilt about what they did do, such as leaving people behind or scrambling over others to escape. Those experiencing this type of guilt were less likely to want to think about the events of 9/11 or to discuss their experiences at Ground Zero in as much detail.

The majority of participants continue to be plagued by nightmares, vivid recollections of Ground Zero, anxiety, depression, and posttraumatic stress disorder (PTSD):

It's been quite a long time, but last night I woke up drenched with sweat and shaking. I had a dream of being buried in the rubble. It seemed so real, my heart was pounding out of my chest. The reason I woke up was because my dog was licking my face, he must have sensed I was having a problem (Male EMT).

Research participants all tended to have an underlying sense of anxiety, stress, and insecurity, which are the three major building blocks for nightmares. When asked what the key theme of the recurring nightmares was, most participants dreamed about their dead colleagues or something devastating happening to their family; some felt like the dreams were warnings of impending tragedy. In a study investigating dreams following 9/11, the authors find support for the Contemporary Theory of Dreaming. The theory states that dreams are guided by the emotion of the dreamer and that the central imagery of the dream depicts the dreamer's emotion. This would explain why few of the research participants dreams depicted specific scenes of the terrorist attacks or Ground Zero. This supports the view that dreams are new, emotional creations rather than a replay of waking events.<sup>10</sup>

In every instance, the paramedics and EMTs voluntarily reported ongoing loss of emotional capacity and capability that impacted their work and private lives:

At the end of 2007, I was diagnosed with PTSD. The main reason that I have PTSD is not from what I saw down there, but because three of my friends were killed on that day, three guys that were like brothers to me (Male paramedic).

Approximately 80% of study participants recounted that they were examined and diagnosed with PTSD following 9/11. Despite their willingness to disclose their mental health diagnoses, approximately 50% of paramedics and EMTs interviewed were not seeking support. When asked why they weren't accessing freely available support services, responses included concerns of

being seen as 'weak;' not wanting to 'worry loved ones;' fear of being deemed 'unfit to work;' and the concern of being seen as 'not coping.' Six paramedics and 18 EMTs noted that they had not been asked by their respective EMS about what type of support service would be of most assistance. If the EMS had engaged with staff to identify the most appropriate forms of support, the uptake of these services may have been higher. Of note, all of the female paramedics and EMTs were actively seeking support, compared to only 36% of males.

This high prevalence of PTSD among participants is particularly concerning given that mental health disorders rarely occur by themselves. A diagnosis of PTSD often brings additional diagnoses along with it. One-third of all first responders (including firefighters, police, paramedics, and EMTs) enrolled in the World Trade Center Health Registry with chronic PTSD symptoms also reported a diagnosis of depression.<sup>11</sup> First responders with probable PTSD had an almost 14-times higher chance of developing depression and nearly 10-times higher chance of developing a panic disorder than those without PTSD; comorbid responders were 40-86-times more likely to have emotional disruption of function than were those without PTSD.<sup>11</sup>

Of the 54 paramedics and EMTs interviewed, 15% reported ongoing issues with anxiety (one paramedic and seven EMTs). Many participants reported feeling jittery and fearful, even 15 years after the attacks. On 9/11, terrorists did more than destroy buildings; they scarred the American psyche. And perhaps no group was quite as scarred as the emergency first responders. Some of the medics involved in this research talk about ongoing anxiety and describe having difficulty grappling sudden changes in their life. Almost one-half of all paramedics and EMTs felt their sense of safety and security had been shaken and approximately 40% said they had ongoing difficulty sleeping (three paramedics and 19 EMTs). Many of the paramedics and EMTs who self-reported as having anxiety reported taking precautions when entering high-rise buildings, and when opening mail, and also often avoided public events. Over time, the general level of anxiety should ease. But some long-lasting effects will remain, and a few things will never be the same.

Approximately 10% of research participants had definite evidence of cognitive impairment (all were EMTs) and one male EMT had been diagnosed with dementia; he was only 58. Cognitive impairment refers to poor memory and concentration - an inability to learn new information. Many people with cognitive impairment have difficulty performing the routine activities of daily living. Given the age range of the participants in this research (39-68 years), these paramedics and EMTs are exceptionally young for having signs of cognitive impairment, which is most often diagnosed in old age. These findings echo those from a research study from the Stony Brook WTC Wellness Program (Commack, New York USA) where the average age of first responders with cognitive impairment was 53.<sup>12</sup> The Stony Brook team found the impairment to be most evident among first responders who suffered PTSD. Of note, all of the first responders involved in this research who had been diagnosed with cognitive disorders had also previously been diagnosed with PTSD. However, PTSD is not the only risk factor for cognitive impairment; first responders who had a history of major depressive disorder were also at-risk of being cognitively impaired.<sup>12</sup>

Another key theme identified from the interviews was trepidation and feelings of anxiety regarding the anniversary of 9/11:

I can feel the anniversary looming and I start getting really anxious. Just the other day, I started crying because I broke a glass – you know, like ridiculous, sobbing. And I just kind of remembered, oh yeah, the anniversary is coming up (Male EMT).

Some participants reported a frustration with the way that major anniversaries were managed and felt that:

Come anniversary time, all of the politicians will be front and center at a 9/11 event, saying 'we'll never forget,' but you know, well that's just bull...they have already forgotten (Male paramedic).

The need to find more appropriate and sensitive ways to reflect and remember on the anniversary was also a common theme. It is time to start commemorating and remembering without replaying graphic images of the planes flying into the WTC and the towers collapsing. Each time media replay these, the families of the 2,753 victims at the WTC site see their loved ones murdered over and over.

Just under one-third of research participants reported on their ongoing participation in 9/11 health registries and research, but the general consensus was that this was not always a positive experience for them. A number of paramedics and EMTs reported that they felt rushed and unheard when they participated in some research studies, with one being ushered out of a counselor's office in tears, as the counselor's next appointment had arrived and the responder was 'out of time.' These experiences are harmful to 9/11 paramedics and EMTs and decrease their trust in support services and research bodies.

Approximately one-half of the research participants no longer work in EMS 15 years post-9/11 (four paramedics and 20 EMTs). While some indicated that they would have retired regardless of their role during 9/11, some have retired from work due to 9/11-related disability. Others have moved into other roles within emergency response agencies, educational institutions, and training agencies, while others have moved into entirely different lines of work. Participants also highlighted the ongoing impact on significant relationships. Marriages and family cohesiveness have been significantly strained and sometimes broken in the aftermath of 9/11. While there is no official record, anecdotal reports suggest that the divorce rate is high among 9/11 first responders. Research participants suggest that part of the problem may have been that spouses felt left out of the counseling loop and neglected by their spouses who were busy caring for the widows of their fallen colleagues. Counseling was offered to first responders through their employers and from a range of free peer-support services, and many children impacted by 9/11 had access to support through their school. However, there was no organized effort to assist the wives, husbands, and significant others who inherited the emotional impact of their spouses who suddenly became quiet, silent, or different inside.<sup>9</sup>

#### *Physical Health Reflections*

When the WTC twin towers collapsed on 9/11, they converted much of the towers structure and contents into dense dust clouds of particles that settled on the streets and within buildings throughout Lower Manhattan. Around 90% of the settled WTC dust was a highly alkaline mixture of toxins that was readily resuspendable by physical disturbance and low-velocity air currents. High concentrations of this toxic WTC dust were inhaled and

deposited in the conductive airways in the head and lungs, and subsequently swallowed, causing both physical and chemical irritation to the respiratory and gastro-esophageal epithelia of the thousands of emergency and non-emergency responders and to tens of thousands of people living and working in downtown Manhattan. Exposure to this dust caused both acute and chronic adverse health effects, especially in those who were lacking effective personal respiratory protective equipment.<sup>13</sup>

Many WTC-related health effects have been reported in a number of research studies and highlight an increased incidence of health effects in the respiratory and gastro-esophageal tracts, low birth weight and birth defects in children exposed in-utero,<sup>14,15</sup> PTSD,<sup>16–21</sup> as well as a growing concern about excess cancer incidence that may become further evident in future years.

Research participants reported a number of physical health impacts, which echo the results of these previous research studies. All reported persistent respiratory and breathing problems and 82% of participants also have new allergies following 9/11. Paramedics and EMTs in this research also reported long-term health effects in the gastro-esophageal tract (24% - three paramedics [all male] and 10 EMTs [nine male and one female]) and with their eyes (44% - five paramedics [all male] and 19 EMTs [11 male and eight female]). All medics interviewed in 2016 identified that they were taking new medications following 9/11. Of note, just over one-half (55% - two paramedics [both male] and 28 EMTs [19 male and nine female]) reported that they were taking more than five medications per day that were directly related to 9/11 illnesses. Participants also reported new diagnoses of illnesses including sinusitis, asthma, and sleep apnea.

Paramedics and EMTs also reported a growing concern about developing cancer. As of June 30, 2016, the CDC World Trade Center Health Program enrolled more than 5,400 people who have been diagnosed with cancers linked to the 9/11 attacks. That's triple the number of people enrolled with cancer diagnoses since January 2014, when 1,822 had signed up.<sup>22</sup> When cancer rates for emergency first responders are compared to the general United States population, cancer rates are about 10% higher for the 15,700 firefighters and EMS workers whose health is being tracked by World Trade Center Health Programs. New research confirms that this toxic cocktail caused heightened rates of cancer. When compared to pre-9/11 data, the cancer rates range from 19% to 30% higher for firefighters after the data are adjusted for age, exposure, and other factors.<sup>4</sup> Of the paramedics and EMTs involved in this research, 14 out of 54 (26% - one paramedic [male] and 13 EMTs [10 male and two female]) have been diagnosed with 9/11-associated cancer. The age range for age of diagnosis was 39–52 years. The main cancers reported include: thyroid (n = 3); leukemia (n = 4); prostate (n = 3); melanoma (n = 1); multiple myeloma (n = 2); and colon cancer (n = 1).

#### **Limitations**

This research has been subject to a number of limitations.

#### *Influence of Assumptions*

This research assumes that people can provide meaningful answers and respond appropriately to questions of a sensitive nature. This type of research typically investigates largely subjective, affective feelings and values, rather than objective 'actual' behaviors. Therefore, while these findings are reflective of the paramedics and EMTs who participated in this research project, they may not necessarily be generalizable to other 9/11 first responders. Thus,

the findings reported in this study are reflective of the individual experiences of the responders involved in this research and are not necessarily reflective of other responders or the EMS with whom they were employed during 9/11.

#### *Impact of Researcher Bias*

Although every attempt has been made throughout this research to maintain a Modified Grounded Theory approach to qualitative research, this was at times difficult to maintain. Having a history of employment within the emergency services, in addition to the experience garnered by 15 years of work in prehospital and disaster research, made it somewhat difficult to have no pre-conceived ideas about the types of answers that this research was going to identify.

#### *Sampling Bias*

Sampling for this research was largely purposive, with subsequent snowballing techniques resulting in a very selective study sample that was skewed towards EMTs and male participants. In addition, many of the research participants were known to each other and may have discussed the interview process and the answers they provided. This may have had some impact on the feelings that were expressed during the interviews. The number of paramedics and EMTs that participated ( $n = 54$ ) was a small sample of the actual numbers of medics who responded to 9/11; therefore, while the results reported in this paper are representative of the responders who participated in this study, they may not be representative of the larger medical responder population in New York.

#### *Self-Reported Data*

Self-reported data, such as the information provided by the medics in this research, can contain several potential sources of bias. These biases include selective memory (remembering or not remembering experiences or events), telescoping (recalling events that occurred at one time as if they occurred at another time), attribu-

tion (the act of attributing positive events and outcomes to oneself but attributing negative events and outcomes to external forces), and exaggeration (the act of representing outcomes or embellishing events as more significant than is actually suggested from other data). The information provided by participants in this research was not verified from any other sources, which could potentially result in some bias in the reported findings.

#### **Implications**

This research has made an important new contribution of knowledge to a little-researched field – being the reflections of paramedics and EMTs on the long-term impact of responding to 9/11. Therefore, in spite of any limitations associated with the research study design, the novelty of these results should not be overlooked. Despite the contribution of this research to the existing 9/11 evidence-base, there remains an urgent need to continue monitoring a larger cohort of 9/11 paramedics and EMTs to ensure their stories are told and key lessons are learned. Future research should also include exploration of the impact of 9/11 on the surviving first responders' family members, including spouses, partners, and children.

#### **Conclusion**

The paramedics and EMTs who responded to 9/11 are still impacted by ongoing physical and psychosocial consequences of that day. Responders continue to be traumatized by 9/11, because what they experienced has not ended. The trauma of that day continues to affect the health of many paramedics and EMTs, with new cases of 9/11-related illness diagnosed regularly. In many cases, the ongoing impact of 9/11 has shattered families and destroyed lives in a never-ending reverberation of pain and suffering. The reality is that the death toll from the terrorist attacks grows larger each year, and while the physical wounds may have healed, the emotional scars remain for many responders 15 years after 9/11.

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