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Large-scale forensic investigations into the missing: Challenges and considerations



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ABSTRACT

Large-scale forensic investigations may follow episodes of mass violence and disasters where hundreds or thousands of people have died or are missing. A number of unique challenges for forensic science, different from domestic investigations, arise in these contexts. The setting and situation of these investigations regularly force forensic scientists into practices not regularly encountered while working in a standard criminal justice system. These practices can entail activities not specific to a practitioner's particular field or necessarily be scientific in nature, but are still needed in order for the investigation to move forward. These activities can include (1) establishing the number of and who exactly is missing after mass violence and disaster, (2) the creation of working protocols to deal with the scale of the loss of life that often overwhelm domestic practices and institutions, (3) negotiating the form that the investigation will take with various stakeholders, (4) addressing cultural beliefs of the affected society regarding the dead and missing, and (5) working within prescribed economic, political, and time constraints, among others. Forensic scientific responses to these challenges have proven to be flexible, innovative, and continually evolving.

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1. Introduction

A burgeoning area of interest and use of forensic science has emerged in regions of the world affected by mass violence (used here to include armed conflict, interethnic violence, state sponsored disappearances, and other political violence) and disasters (both natural and man-made), which result in largescale loss of life and disappearances of people. While the need to collect evidence and to identify human remains has always been present in such occurrences, the capacity to effectively and consistently do so has been absent until recently. Over the past thirty years, the field of forensic science has evolved from expertise dedicated to working in domestic settings in support of a criminal justice system, to a discipline capable of dealing with large-scale, complex situations in unfamiliar contexts, societies, and cultures. These situations involve negotiating relationships with institutions and stakeholders not regularly encountered in domestic settings by the forensic practitioner. While the scale of forensic investigations in relation to mass violence and disaster situations is an obvious obstacle and has its own challenges, the context in which the investigations take place adds additional considerations that must be addressed. The aim of this article is not to test hypotheses or to provide a list of mass-casualty case studies (as such case studies are too site specific to be templated for use in other contexts), but to draw upon our combined experience to highlight broadly some of the challenges and considerations forensic practitioners may face in managing large-scale complex forensic investigations into missing persons as a result of mass violence and disasters.

The International Committee of the Red Cross (ICRC) defines a missing person as someone "whose whereabouts are unknown to his/her relatives and/or who, on the basis of reliable information, has been reported missing in accordance with the national legislation in connection with an international or non-international armed conflict, a situation of internal violence or disturbances, natural catastrophes or any other situation that may require the intervention of a competent State authority" [1,2]. In the context of this article, forensic investigations into the missing may entail the search and recovery of bodies, identification of unknown bodies, and the collection and analysis of possible criminal evidence related to cause and manner of death.

Loss of life from mass violence or disaster can overwhelm local medical-legal systems. Domestic systems are usually not equipped

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or staffed, or do not possess the expertise to handle the scale of the dead and missing associated with these situations. In some cases, the established forensic systems are themselves victims of the violence/disaster and have either ceased to exist altogether due to loss of staff, physical infrastructure, and/or governance. In other cases, the forensic institutions themselves may be part of a corrupted police/judicial system, culpable in victim deaths by turning a blind eye towards investigations or even assisting in the disappearances. In these situations, the judicial system renders itself untrustworthy in the eyes of stakeholders and incapable of carrying out unbiased investigations.

When domestic systems are overwhelmed, external forensic assistance may be offered by concerned governments, nongovernmental organizations, or other humanitarian agencies/ institutions. In cases where domestic institutions are culpable in the disappearances and deaths, forensic investigations may arrive after a change in government as occurred in Argentina after the human rights violations committed by military dictatorship (1970s through the mid-1980s), or come in the form of an imposed intervention on behalf of victims and their families, as the ICRC definition of a missing person suggests. Examples of such interventions include the United Nations mandated forensic investigations by the International Criminal Tribunal of the former Yugoslavia, and most recently the threat to conduct unilateral investigations into mass killings of civilians by the armed forces of the Central African Republic if its government fails to begin its own inquiries [3]. The forensic fields of archaeology, biological anthropology, pathology, and genetics have proven particularly useful in these contexts for resolving cases of missing persons and recovering evidence for criminal prosecutions, although other fields such as odontology, radiology, toxicology, and geology have made substantial contributions as well [4–7]. However, due to the circumstances and scale of death in these cases, forensic assistance regularly goes beyond simply supplementing or replacing stressed, incapable, incapacitated, or untrustworthy forensic institutions.

Mass violence and disasters affect more than individuals or a family: they can be community and society changing events [8,9]. Social and cultural mechanisms that mitigate day-to-day issues related to death, displacement, and loss of property are just as likely to be overwhelmed by the scale of loss, as a medical-legal system may be. Society itself may become incapable of coping with the situation in its regular manner because of the massive number of missing and dead, breakdown of infrastructure, and loss of cultural and social institutions that formed and maintained its processes.

For example, after the devastating 2010 earthquake in Haiti, tens of thousands of people were buried commingled in large pit and trench mass graves (as opposed to communal/multiple burial. See Ref. [10] for burial typology) because the regular social processes of managing and grieving for the dead ceased to exist [11]. Religious figures who would usually perform burial rituals, funeral homes and staff that prepared bodies and coffins, and institutions that documented deaths and burials were all themselves victims of the earthquake. Numerous news outlets reported that authorities dealing with desperate situation in Haiti felt they had no other choice but to bury the dead as quickly and efficiently as they could [11-13]. Many relief organizers incorrectly feared that dead bodies spread disease and posed a threat to survivors, despite the assurance of international experts that it was untrue [14–16]. Depositing bodies into large pits by dump trucks in the absence of funeral rituals was far from normal burial practices in Haiti, and the action inflicted additional trauma to the society: "Haiti is a nation where funeral rites are extremely sacred, but with priests gone and many people unable to identify and bury their family members, earthquake survivors worry about the spirits of the dead" [16]. A massive forensic investigation to identify the dead was deemed too complicated under the circumstances where the immediate needs of the living were the first concern.

Dealing with the dead and missing from mass violence and disaster contexts is only a small part of the challenges faced. What is destroyed must also be rebuilt, and may mean reimagining the structure of society. After all, a society that has just torn itself apart through interethnic violence, for example, has motivation to avoid repeating the same mistakes that lead up to the conflict.

It is within these challenging situations of social breakdown and reconstruction that forensic science increasingly finds itself working in, and could invariably become an actor in the reformation process. This is not a normal position for a discipline accustomed to being a part of an existing structure of society. Forensic science, situated within a stable domestic medical-legal system, is a part of the cultural and social regulatory system, not an architect of it. That is, it is a brick within the existing structure of society, helping to support it by evaluating evidence related to crime and death in accordance to law as prescribed by socialcultural practices, not an agent of social construction. Yet, in areas ravaged by mass violence or disaster, where thousands may be missing and dead and social breakdown has occurred, the manner in which forensic science is applied and the reasons for an investigation can become an integral part of social reconstruction [7]. In addition to trying to figure out what forensic services may be needed in a given mass violence/disaster context, survivors, cultural leaders, policy makers, and other stakeholders, including forensic practitioners, often end up grappling with the question of "How can the application of forensic science best help a society reform?" This question adds dimension to the more obvious challenges of dealing with scale, time, resources, and other logistical considerations of a forensic investigation.

Rebuilding institutions is a part of normalizing society after catastrophe, but a traumatized society needs more than physical infrastructure. Reforming society may be in order, but simply recreating or supporting the past systems may likely be rejected by portions of the population as a continuation of the problems that caused the violence or disaster in the first place [17,18]. Social breakdown from violence and disaster leaves survivors without a support system to address issues such as psychological trauma, reconciliation, reparations, and memorialization of the dead and missing. The application of forensic science in the aftermath of mass violence and disaster has played a role in addressing these issues, assisting communities by providing physical evidence to support witness testimony, by helping to establish a historic narrative of past events, and by identifying the dead and missing [19,20,7].

Collection of criminal evidence and human identification are done in domestic cases as well; however, as mentioned, these processes are nested within medical-legal systems. The character of the investigations change in contexts of disaster and mass violence. For example, in Argentina after the fall of the military government responsible for forced disappearances of thousands of political activists, amnesty was granted to most perpetrators for fear of rekindling violence, while the search for the missing and their subsequent identification of recovered remains was advocated. In contrast, the International Criminal Tribunal of the Former Yugoslavia, formed out of a UN Security Council resolution during the series of wars in the Balkans, concentrated its limited resources on the prosecution of perpetrators, forgoing the identification of recovered human remains, in an attempt to reestablish social order by demonstrating the return of the rule of law. It is in these modified applications of forensic science where science itself becomes a tool of social reconstruction.

Misconceptions and myths about forensic practice can affect the course of an investigation. Some misunderstandings about

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