



Humanitarian forensic action – Its origins and future



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ABSTRACT

Humanitarian forensic action is the application of the knowledge and skills of forensic medicine and science to humanitarian action, especially following conflicts or disasters. It has its early roots in the experience of the Argentine Forensic Anthropology Team and that of the Grandmothers of Plaza de Mayo in Argentina, is moulded by International Humanitarian and Human Rights Law and was developed by the International Committee of the Red Cross. Having demonstrated its worth, this new field of application of forensic medicine and science needs further development, integration and research.

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1. Introduction

This special edition of Forensic Science International is an important milestone in the development of humanitarian forensic action (HFA). The term HFA was first coined by the International Committee of the Red Cross (ICRC) [1]. It is defined as “the application of forensic science to humanitarian activities” (Humanitarian action itself is defined by the ICRC as a range of activities that seek to alleviate human suffering and protect the dignity of all victims of armed conflict and catastrophes, carried out in a neutral, impartial and independent manner, free of charge and framed under International Humanitarian Law).

The common conception of forensic medicine and related sciences is that they are crucial parts of the evidence for or against guilt. That is, they are focused on apportioning criminal responsibility. The very word forensic is derived from the ancient Roman ‘forum’ – the home of the law courts – and means ‘relating to the courts’ or more simply, ‘relating to the law’. As closely related to law and criminal trials as they are, there has always been a humanitarian character to forensic medicine and related sciences. Along the way to providing evidence in a murder trial, forensic pathology will have helped identify the deceased, thus ensuring the body is available to the family for a funeral. It will also have contributed to the understanding of what happened to the deceased, so that corrosive uncertainty about this is replaced by

something closer to the truth, as terrible as that might be. Along the way to providing evidence in a rape trial, forensic medicine may well have been involved in the early medical and other assistance provided to the victim which should ameliorate some of the physical and psychological sequelae of the assault. These examples are taken for granted in most domestic settings in the developed world.

The goal of humanitarian forensic action is to provide some of the same benefits in post conflict, post disaster settings as part of the overall humanitarian response. Managing the dead, including protecting their dignity but also helping to identify them to prevent and resolve the tragedy of people missing, is one of the three pillars of humanitarian response following conflicts or disasters, along with caring for survivors and restoring basic services [2]. Clearly forensic assistance is helpful in the first of these. Other areas where forensic skills can deliver humanitarian benefits include: the monitoring of places of detention; managing hunger strikes; estimating the age of living individuals; documenting injuries and torture especially in custodial settings; interaction with bereaved relatives; evaluating deaths in custody; managing very large numbers of dead following catastrophes; managing and identifying deceased migrants; dealing with mass graves; finding and identifying soldiers missing in action. These all have a profoundly humanitarian character and help relieve human suffering resulting from catastrophic events.

2. The history of humanitarian forensic action

While its connection to HFA is tenuous, the exhumation and examination of the victims of the Katyn Forest Massacre in World

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Table 1

Rights/obligations in international humanitarian law and human rights law related to those missing as a result of war or internal violence.

Right/obligation	Reference
Families have a right to know the fate of their relatives	Additional Protocol I to the Geneva Conventions: Article 32
Each party to the conflict must take all feasible measures to account for persons reported missing as a result of an armed conflict	Additional Protocol I to the Geneva Conventions: Article 32, 33; Fourth Geneva Convention: Articles 136–141
All protected persons have the right to respect for their family life	Regulations of the 1907 Hague Convention No IV; Universal Declaration of Human Rights: Article 12; European Convention for the protection of Human Rights and Fundamental Freedoms, 1950: Article 8; International Covenant on Political and Civil Rights: Articles 17, 23.
Each party to the conflict must take measures to identify the dead before disposing of their remains	First Geneva Convention: Articles 16,17

War II requires mention, as it represents the first comprehensive use of forensic pathology and science techniques to evaluate a mass killing in war. With regard to the identification of the victims, a technical commission of the Polish Red Cross was involved, overseen by the German authorities. Many of the remains were identified by documents or other items and were re-buried in a dignified manner in marked mass graves.

Organized HFA did not appear spontaneously. Its origins were ordained in two, largely unrelated, places. The first is now well known: a non-government forensic anthropology organization created in the aftermath of the regime which ruled Argentina between 1976 and 1983, to investigate the whereabouts of the 'disappeared'. The Argentine Forensic Anthropology Team (Equipo Argentino de Antropología Forense, EAAF) started in the early 1980s to use forensic skills, centered on forensic anthropology, to find and identify some of the thousands of victims of the regime. In this unprecedented humanitarian endeavor they were assisted by the American Association for the Advancement of Science, and in particular Dr Clyde Snow who provided the necessary forensic anthropology training. EAAF continues to this day in this work both locally and internationally, and has provided the model for similar developments throughout South America and beyond. EAAF provided the proof that forensic skills could indeed be used to provide answers to questions of importance to families and the surviving population at large. Such answers were previously blocked by the chaos and professional paralysis accompanying contexts racked by conflict, whether internal or international. It is salutary to recall that the original driving force for the creation of EAAF came, not from within the forensic sciences, but from the Grandmothers of the Plaza de Mayo. The organization was founded to find the kidnapped children of those who were imprisoned or who had disappeared (and were disappearing – the organization was founded in 1977) during the military regime which ruled Argentina between 1976 and 1983. The Grandmothers also famously pioneered the use of forensic haemogenetics to help identify their missing grandchildren [3] and helped create the world's first forensic genetic data-bank, established by national law in 1987 [4].

The second source of HFA is international law, specifically International Humanitarian Law and Human Rights Law. Table 1 sets out a tiny sample – relating to the dead and The Missing¹ from armed conflict – of the numerous rights and obligations created by such law, with examples relating as well to the other areas mentioned above. Whether consciously or unconsciously, when these rights and obligations were first articulated, they anticipated a role for forensic skills before they could be fully met.

Interestingly, a universal right to be identified after death is a relatively recent development, recognized in 1996 by INTERPOL's General Assembly [5].

During the late eighties and nineties, Physicians for Human Rights and Amnesty International, amongst others, rallied prominent forensic practitioners from around the world to operate in the field and at diplomatic levels, including at the UN, the Council of Europe and other Inter Governmental Organizations. They helped develop best practice forensic approaches to human rights investigations. The adoption by the UN in 1989 of its *Manual on the Effective Prevention and Investigation of Extra-Legal, Arbitrary and Summary Executions*, also known as the *Minnesota Protocol* is a good example of this [6]. That Manual has since served as a blueprint for other UN documents on forensic sciences, including the *Guideline for the conduct of United Nations inquiries into allegations of massacres* [7], and the *UN Manual for the investigation and documentation of torture*, known as the *Istanbul Protocol* [8]. The Minnesota Protocol was revised recently by a group of forensic and legal specialists convened by the United Nations for this purpose [9]. The new edition, titled "*The Minnesota Protocol on the Investigation of Potentially Unlawful Death (2016)*", was published in 2017 [10].

The first UN Resolution on human rights and forensic sciences, adopted by the UN Commission on Human Rights in 1992, recognized the value and role of forensic sciences for human rights and humanitarian investigations [11].

It called on the community of States to support their development and implementation, and inspired the UN to set up a standing list of forensic scientists and institutions from around the world, available to participate in UN-led investigations. Developments at the United Nations recognizing the value of forensic sciences have since been mirrored by other intergovernmental bodies, for example the Organization of American States [12].

In 1993, the UN Security Council (by resolution 827 on May 25) established the International Criminal Tribunal for the Former Yugoslavia (ICTY), which was later expanded to include Rwanda. It was the first international criminal tribunal since the Nuremberg and Tokyo Tribunals at the end of World War II. Obviously such a tribunal would need evidence, and some of the evidence would be that provided by the field of forensic medicine, principally forensic anthropology, and related sciences. While this is a criminal law purpose, rather than humanitarian, the development helped clarify the distinction. The Deputy Prosecutor of the ICTY explained the purpose of the exhumation program auspiced by the Tribunal as follows:

"Following the exhumations . . . all the bodies underwent autopsies . . . to determine the cause and manner of death and the demographic profile of the victims [13]."

It took a short time for realization to dawn: identifying the dead was not included. This was not necessary for the ICTY. Convictions for murder and genocide do not need names attached to the dead. This meant there was a huge unmet humanitarian need: the families needed news of their missing to replace the terrible uncertainty of not knowing; and they needed the remains, to mourn and put to rest.

¹ The Missing: those missing, often dead, following internal violence or war and whose families have no news of them.

To help meet the Tribunal's needs in the former Yugoslavia, as well as the humanitarian ones, in 1996 the international community created the International Commission of Missing Persons (ICMP). ICMP formally achieved intergovernmental organization status in 2014 when a number of countries signed an Agreement on the Status and Functions of the ICMP [14]. At the same time, ICMP moved its headquarters from Sarajevo to The Hague. It has 172 staff, and has recently established co-operation agreements with the International Criminal Court and INTERPOL [15,16].

Its signal achievement has been that of contributing to the identification of approximately 70% of the 40,000 believed to be missing and dead in the Former Yugoslavia as a result of its implosion in 1980s and 1990s [17]. In doing so, it pioneered the use of high-through-put DNA-analysis for large-scale identifications.

During the implosion of the Former Yugoslavia, the ICRC, as it has historically, was focusing closely on the humanitarian aspects of resolving the missing from that conflict. As part of its 2003 Conference on The Missing and their families, the ICRC clearly articulated a fundamental lesson learned from that conflict and also an ethical cornerstone of forensic practice: that it is wrong to investigate the dead from armed conflicts or disasters if this investigation focuses exclusively on the cause and manner of deaths of victims (i.e. for accountability purposes) and it does not also include efforts to identify the remains (for humanitarian purposes):

“6.11 Forensic specialists working in contexts involving missing persons must . . . go beyond simply assuring standards of practice . . .

B. They have an ethical obligation actively to advocate an identification process.

C. When examining remains, they have an ethical duty to observe and record all information potentially relevant to identification . . .

E. They must consider the families' rights and needs before, during and after exhumation . . .

G. They must be familiar with the pertinent provisions of international humanitarian and human rights law, and should promote the incorporation of those provisions in the basic training of forensic specialists” [18].

This call from the ICRC is a reminder to everyone involved in forensic work: you are also involved in an activity with ethical obligations towards the deceased and the bereaved, and you are on the front line of human rights protection and humanitarian service.

The 2003 Conference also agreed on technical and other recommendations of best practice which have been valuable generally, not only in circumstances with ill-defined or non-existent regulatory frameworks. For example, in 2007, Colombia incorporated the recommendations into its legislation, as part of the National Plan for the Search of Missing Persons (Plan Nacional de Búsqueda de Personas Desaparecidas).

The recommendations include advice and guidelines on multidisciplinary team efforts for the recovery, management and identification of the dead in armed conflicts and other challenging contexts, including:

- The roles, duties, responsibilities and applicable ethical standards for forensic practitioners and teams;
- Guidelines for documentation and storage of human remains and associated evidence;
- The use of different forensic disciplines, methods and criteria for forensic human identification;
- Principles for ethical, effective and efficient information management, including the collection and comparison of ante mortem and post mortem data; and

- Advice on the relationship between forensic practitioners and bereaved families and communities

It was the history sketched above, together with its broad duties under the Geneva Conventions, which led the ICRC in 2003 to establish its forensic unit, the only existing forensic structure focused purely on humanitarian forensic action. The ICRC now has more than 50 forensic specialists in positions around the globe. They come from the fields of medicine, pathology, anthropology, odontology, archaeology and criminalistics. Broadly, their role is to advise, educate, train and generally improve the forensic medicine and related sciences capacity of the countries they are in, to develop standards of forensic best practice to be applied to humanitarian activities and to assist in their implementation.

Although they were developed arising from situations of armed conflict, the same humanitarian forensic skills are needed following natural disasters. Thus the ICRC and the International Federation of the Red Cross and Red Crescent Societies accepted the invitation of the Pan American Health Organisation and the WHO to help fill an important gap that became evident following the 2004 Indian Ocean Tsunami. The gap that was identified was the need for guidance to help manage very large numbers of deaths in events overwhelming the response capacities of the authorities. The outcome was the 'Management of Dead Bodies after Disasters: A Field Manual for First Responders' recently issued as a second edition [19]. This guidance complements the INTERPOL Disaster Victim Identification Guide which has been, and is, the international standard for human identification generally, focused as it is on small and medium sized disasters [20]. The Manual, on the other hand, sets out the means by which very large numbers of bodies can be respectfully handled as part of a more graduated approach to their identification.

The ICRC has understood that, in any particular country or region, the best way to improve forensic skills in the areas of humanitarian need is to improve forensic services generally, instead of replacing them with international forensic teams. A good example of this approach in the Mediterranean region, for example, is the work of the Committee on Missing Persons (CMP) in Cyprus. Since re-launching its activities in 2004, Cyprus sought the assistance of the ICRC in re-engineering the approach of the CMP in line with the recommendations of the 2003 Conference. Support was also forthcoming from forensic experts of different countries (eg Canada, US, Colombia, Argentina, UK and Ireland). The educative approach now means that the CMP and its all-Cypriot forensic team runs an exemplary integrated approach to the forensic recovery and identification of those who died during the conflict of the 1960s and 1970s.

It was precisely the experience gained by the ICRC over the last 14 years in using its own forensic expertise worldwide to help fulfill obligations under the Geneva Conventions which led to the development of humanitarian forensic action.

In parallel with its origins in Argentina, it is salutary to recognise that in further developing HFA, ICRC, an organization with no previous forensic background or experience, took the lead. Some of the work of the ICRC's forensic unit, together with the work of others, is set out in the articles in this issue and describes something of the present state of humanitarian forensic action. But what of its future?

3. The future

Its steady development over the past 40 years, particularly over the past 14 years since the 2003 International Conference on The Missing and Their Families, is one measure of the need for HFA. To improve its impact, this development must accelerate. More work is needed to understand how best to facilitate this. We need to take

account of emerging challenges in the humanitarian field requiring forensic science (e.g. unprecedented migration flows), and to be aware of the trends influencing the acquisition of capacity and capability in HFA.

3.1. Preparing for an unpredictable future

“Unpredictability is more than ever the rule in the humanitarian field, and there can be no question either of predicting or of preventing future crises but rather of preparing for them . . . The ability of humanitarian actors to aid the victim of tomorrow will depend on their ability to improve their tools of preparation and rapid response” [21].

The requirement to prepare for an unpredictable future underscores the wisdom of the educative, capacity building approach adopted by the ICRC’s Forensic Unit. The volatility of this future has also been evident in the years since 2003.

- Post invasion Iraq (2003–2015, approximately 175,000 civilian deaths from violence)
- Darfur genocide (2003 on-going, approximately 300,000 dead²)
- Earthquake, south eastern Iran, (2003, approximately 30,000 dead)
- Earthquake in Northern Algeria (2003, approximately 2300 dead)
- European heatwave (2003, approximately 70,000 dead)
- Indian Ocean Tsunami (2004, approximately 230,000 dead)
- Hurricane Katrina, United States (2005, 1836 dead)
- Earthquake, Kashmir, Pakistan (2005, approximately 80,000 dead)
- European heatwave (2006, approximately 3400 dead)
- Earthquake, Indonesia (2006, approximately 6000 dead)
- Cyclone Nargis, Myanmar (2008, approximately 130,000 dead),
- Earthquake, Eastern Sichuan, China (2008, approximately 88,000 dead or missing)
- Russian heatwave (2010, approximately 56,000 dead)
- Earthquake in Haiti (2010, approximately 316,000 dead)
- Floods, Pakistan (2010, approximately 2000 dead)
- Earthquake and Tsunami, Japan (2011, 15,550 dead)
- Typhoon Haiyan, Philippines (2013, approximately 9000 dead or missing)
- Ebola epidemic, West Africa (2014/15, 11,308 deaths)
- Heatwave, India and Pakistan (2015, approximately 2500 dead in each country)
- Syrian conflict (2011–2016, approximately 400,000 dead)
- Nepal earthquake (2015, approximately 9000 dead)
- Mass deaths associated with migrations in Africa, from the Middle East to Europe and elsewhere, within Asia and from Asia to Australasia

This is a sample of the huge, largely unmet needs for humanitarian forensic action simply in relation to properly managing the dead. There is growing recognition of the importance of this for fulfilling the right of families to know the fate of their dead, and this will help to ensure that efforts continue to improve in this area.

There is no consideration in this list of the increasing recognition of the pandemic scale of sexual and gender based violence around the world, or of the need for other humanitarian forensic contributions set out earlier.

Climate change has already resulted in an increased frequency and intensity of natural disasters [22–24]. This is a trend set to increase even further as some countries abrogate their obligations

to prevent global warming. Also, the magnitude of the consequences of catastrophic events has increased because of increasing population and population density, especially when affecting fragile urban areas. Conflicts are increasing in complexity – viz Syria – and their effects on countries and communities are aggravated by other trends such as population growth, increasing numbers of older people, more urbanization, increasing economic inequality within populations and increasing ecological fragility. This fragility, increasing frequency and intensity of natural disasters and population growth adversely interact with each other [25]. Overall, it is clear that we need to concentrate on resilience.

“This means that the humanitarian world and the community of development professionals have to come closer together” [26].

The need for greater resilience was also foreshadowed by the work of the UN Commission on Human Security, co-chaired by Sadako Ogata and Amartya Sen, which issued its report in 2003 [27]. The Cold War had fashioned the concept of security into one identified very strongly with the security of national borders. There are many other threats to security and well-being: extreme poverty and deprivation; inequality; violence and conflict; humanitarian crises; and weak governance. Many of these threats are interactive and compound each other. It is no accident that Ebola virus disease emerged on an epidemic scale in post conflict countries in West Africa [28]. By Resolution 2177 (2014), the UN Security Council declared the Ebola epidemic a threat to international peace and security. The outcomes of history and poor human security in West Africa led to a further worsening – the epidemic – which in turn had the capacity to adversely affect the region, if not the wider world.

All of the above serve to remind us of the likely complexity of the future, and it is one which will make deeper demands on humanitarian forensic action. In such circumstances, innovative approaches to preparation will be key. There are some signs of a shift in thinking, and examples of action which may help to define and strengthen the future of humanitarian forensic action.

3.2. Not “capacity development”, but co-development instead

Nigel Crisp, one time Head of Britain’s National Health Service (NHS), has written a powerful book entitled: *Turning the world upside down: The search for global health in the 21st century* [29]. In it he explores the thought that instead of talking about international development, where the richer help the poorer, it is more correct to think in terms of co-development: each learning from the other. He describes, in countries where health care resources were short, seeing passionate local people innovating, finding solutions and working out how to use the materials to hand, to do the best they could for their patients. They were training people differently, creating new types of organizations, involving families and communities and concentrating on promoting health and independence rather than on just tackling disease.

Crisp himself observed that people from the British NHS exposed to this returned home with a better grasp of innovation and thinking outside the square, with greater respect for resources, with improved leadership ability, and better at solving problems – all things vital for a sustainable NHS future. Crisp introduced into the NHS a strategic approach to getting its staff out and about in the world based precisely on this premise: that exposure to issues in resource poor settings was win–win – improved NHS staff with benefits to the NHS, and improved services in resource poor settings. There is no reason to suppose that this thesis is not generalizable to forensic medicine and related sciences. Anyone involved in humanitarian forensic work will attest to its truth.

² Commenced prior to 2003.

3.3. Research (and co-development)

A recent and welcome development in this space is the launch of the American Academy of Forensic Science's (AAFS) Humanitarian and Human Rights Resource Center (HHRRC) [30].

The HHRRC uses the assets of the AAFS (which include people, funds and access to equipment) to promote the application of forensic science and forensic medicine principles to global humanitarian and/or human rights projects identified locally as requiring assistance. Some projects funded or assisted in other ways in the first round were as follows:

- i. Technical assistance in establishing a forensic laboratory within the commission on human rights of the Philippines dedicated to the investigation of human rights violations.
- ii. Preserving evidence of the Khmer Rouge Genocide.
- iii. Application of stable isotope forensics to the identification of unidentified border crossers from the Texas-Mexico border.
- iv. A fully computerized method of osteometric sorting for pairwise comparison in large assemblages.
- v. Detection of nerve agent exposure from human bone tissue.
- vi. Strengthening training in the Human Identification Department in Tlaxcala, Mexico.
- vii. Forensic identification of deceased migrants from the Mediterranean region.

The Center also provides support to AAFS members engaged in human rights and/or humanitarian forensic applications and encourages AAFS members to increase their involvement in such matters. As well as the assistance provided, AAFS members are likely to develop their own personal and professional skills in undertaking this work. This, of course, represents recognition of Crisp's co-development principle set out above.

A related issue is the access of forensic practitioners globally to the relevant literature. Much of this literature is locked up behind paywalls. The weak institutional arrangements within which forensic medicine and related sciences are practised around the world means that main stream journals are out of reach for practitioners in less developed settings. This is a major impediment to co-development.

3.4. Regional arrangements in forensic medicine

Forensic science has been doing better in this field than forensic medicine. The United Nations Office on Drugs and Crime (UNODC) has assisted the development of the International Forensic Strategic Alliance (IFSA), a grouping of six regional forensic science organizations bound together by a Memorandum of Understanding:

- American Society of Crime Laboratory Directors.
- European Network of Forensic Science Institutes.
- Senior Managers of Australian and New Zealand Forensic Laboratories.
- AICEF (Ibero-American Network of Medico-Legal Institutes).
- Asian Forensic Science Network.
- Southern Africa Regional Forensic Science Network.

IFSA is one way UNODC works to influence forensic science globally. For example, in June, 2016, UNODC built on this network, holding a meeting in Vienna to combat the rapidly increasing, unregulated and easy availability of new psychoactive substances. This is obviously a very serious and important problem which can only be effectively addressed if there is good international forensic co-operation — in this case in toxicology. Another example of how well forensic science has managed internationally is in relation to

DNA — setting standards and agreeing their approach to profiling to enable real international interoperability in identifying profiles of criminal significance. While this is not yet working to help with the increasing demands posed by the large number of deaths of informal migrants and asylum seekers in all parts of the world, we should applaud these co-operative developments in forensic science.

On this same line, the ICRC has identified the need for improved communication, coordination and communication among forensic practitioners and institutions worldwide as a necessary stepping stone for meeting global needs in humanitarian forensic action. With the committed participation of forensic institutes such as the Victorian Institute of Forensic Medicine and Universities, such as the University of Coimbra, Portugal; and support from academic organizations such as the International Association of Forensic Sciences the ICRC is promoting and helping develop networks of like-minded forensic practitioners and institutions in all regions. So, for example, the African Society of Forensic Medicine (ASFM) has now held seven annual meetings in different cities of that continent — Gaborone, Kampala, Johannesburg, Abuja, Nairobi, Yamoussoukro (the first meeting in Francophone Africa) and Bloemfontein [31]. And the last six of those meetings have been held in either the first or second week of March. ASFM published its "*Minimum Standards for Forensic Medicine Practice in Africa*" in 2015. This 78 page booklet deals with: Autopsy Practice, Mortuary Management, Disaster Victim Identification and Sexual Violence Management.

In 2007 the ICRC helped launch the Ibero-American Network of Medico Legal and Forensic Services [32], which has held yearly meetings (except in 2012) ever since. The Network has developed into a go-to regional platform for exchange and cooperation in forensic activities, ranging from training to cross-border collaboration in mass-fatality events and disasters.

In Asia, arising out of the membership of the Indo Pacific Association of Law, Medicine and Science, is the Asia Pacific Medico Legal Agencies network (APMLA) [33]. It is in the process of generating a set of standards, for example in the area of disaster management.

- The management of fragmentary human remains in mass disasters and catastrophes.
- The management of international assistance teams in mass disasters.
- Training in dead body management for first responders.
- Planning for temporary body storage.

The APMLA has had tangible outcomes in specific operations. For example, in 2015 Dr Anton Castilani, Indonesia's Head of DVI, sent one of the authors: "*In this last few months I would say we have had a great cooperation between Korea (Dr Nak Eun-Cheung, Head of Korea DVI) and Indonesian DVI during Oryong 501 and Air Asia QZ 8501 DVI Operation*" [34]. Dr Cheung and Dr Castilani did not know each other until they met through APMLA — and they each agree that this led directly to effective collaboration in these disasters. The ICRC has strongly supported the creation and development of the above three networks, and hopes to have the same success with the recently established Middle Eastern Network of Medico Legal Institutes, launched in Dubai in 2016.

In South America, the Latin American Forensic Anthropology Association has been developing since 2003 [35]. Following the 2014 earthquake in Chile, ALAF organized a roster of members to attend and assist in the management and identification of the dead. This is precisely the support and improved efficiency, beyond the ability of the authorities, which collaborations across borders and within disciplines can achieve.

3.5. Teaching and training

The number of forensic medicine practitioners belies the size of its public presence. The small size of the discipline means that most countries have difficulty building adequate training into forensic service provision, the usual method of post graduate medical training around the world. (The small needs for forensic anthropology in most settings means that similar issues confront that related specialty in generating qualified and sufficiently skilled experts). There is quite a strong tradition in forensic medicine of welcoming trainees from other countries on a philanthropic basis. This ad hoc approach has its flaws. The experience that may be gained in one setting may have little or no applicability to another. So, for example, forensic pathology training in Melbourne, Australia, where there is a high incidence of diseases of affluence, a low homicide rate and all the trappings of first world investigative technology, may not be the best experience for a trainee from a setting where infectious disease, including HIV and tuberculosis, is very common, there are hundreds of unidentified bodies a year, and the homicide rate is such that there are multiple cases in the mortuary every day. And in addition, the ability to require further testing of any sort is very limited. In Melbourne, the trainee will be exposed sufficiently to gain some understanding of principles, but these will be difficult to apply in the trainee's domestic setting. There needs to be more ability for the training to be provided where it needs to have its effects. We need to think in terms of training hubs within regions, where trainers go; and not trainees simply going to settings where it is convenient for the trainers. This principle is easy to enunciate, and there are many hurdles to overcome, not the least of which is the world-wide shortage of forensic doctors and related scientists making it difficult to find, and generally expensive to re-locate, trainers.

One example of a model, in relation to the management of the dead following disasters, is being developed by the ICRC. A Centre of Excellence for Dead Body Management (DBM) is being established in Pakistan. It has already run 12 courses for 340 emergency responders since 2010. This has included participants from Nepal, Afghanistan and Sri Lanka as well as many others – Ecuador, Indonesia, Iran, Lebanon, Philippines, Vietnam. Teaching is the best form of learning, and this approach can be expected to improve Pakistan's ability to deal with its numerous disasters [36]. A similar centre was established by the ICRC in 2016 in partnership with the University of Pretoria and the Argentine Forensic Anthropology Team (EAAF): the African School of Humanitarian Forensic Action held its first regional training for African forensic practitioners in Pretoria, South Africa in August 2016 [37]. The participants of such training are from the host country as well as from countries in the region. The ICRC covers the whole cost of the attendance of the participants. This puts a heavy burden on careful selection of the participants in order to ensure the use and sustainability of the training received.

Similarly, the EAAF have also run their unique and innovative Forensic Anthropology course in different regions and countries where such training is required to meet emerging needs:

- South Africa: 2012, 2013, 2014 2015
- Ivory Coast: 2016
- Lebanon: 2015
- Vietnam: 2012 2013 2014 2015
- Thailand: 2014 2015

In 2015, a \$CAD2 million donation was announced to establish the *G. Raymond Chang Forensic Pathology Fellowship* at the University of Toronto, in partnership with the Ontario Forensic Pathology Service [38]. Focused initially on the Caribbean, the

fellowship will enable young physicians to strengthen forensic capacity in their own countries, especially those in resource constrained circumstances. From first principles, strengthening forensic services will improve respect for law (and the rule of law), which in turn should contribute ultimately to stability and prosperity. There is no reason to suppose that such philanthropy cannot be replicated elsewhere.

4. Conclusion

Forensic practice has always had a humanitarian aspect. This has grown sufficiently now to be identified separately: Humanitarian Forensic Action (HFA), a new field of forensic science applied to humanitarian activities. It emerged thanks to the visionary contribution of the Grand Mothers of Plaza de Mayo and the early work of the Argentine Forensic Anthropology Team on the one hand, and from universal obligations under International Humanitarian Law and International Human Rights Law on the other. The creation by the ICRC of its Forensic Unit helped define and further consolidate HFA as an innovative and valued contribution from forensic science to humanitarian endeavors worldwide. Further development of HFA, underpinned by research, will improve the humanitarian response to the consequences of armed conflicts and catastrophes worldwide. Innovative approaches to this development are also required to ensure that the outcomes meet evolving needs in the years to come. The present special edition of *Forensic Science International*, dedicated to Humanitarian Forensic Science, hopes to contribute to this necessary development.

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