

Forensic expertise and the exchange of forensic data is vital to international investigations.

At INTERPOL, we maintain [databases](#) of fingerprints and DNA profiles, allowing police across the world to make connections between criminals and crime scenes. We also provide training to police in our member countries, to ensure that frontline officers have the knowledge and skills necessary to assess, preserve and share evidence in line with best practices. **Our main areas of forensic expertise are:**

- Fingerprints
  - DNA
  - DVI
  - International Forensic Science Symposium
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### **Disaster Victim Identification (DVI)**

The process of identifying victims of major disasters such as terrorist attacks or earthquakes is rarely possible by visual recognition.

Comparison of fingerprints, dental records or DNA samples with ones stored in databases or taken from victims' personal effects are often required to obtain a conclusive identification.

As people are travelling more and more, there is also a high probability that a disaster will result in the deaths of nationals from many different countries.

### **International coordination**

When a major disaster occurs, one country alone may not have sufficient resources to deal with mass casualties. In some cases, the incident may have damaged or destroyed the country's existing emergency-response infrastructure, making the task of victim identification even more difficult.

A coordinated effort by the international community can significantly speed up the victim recovery and identification process, enabling victims' families to begin the healing process and societies to rebuild, and, in the event of a terrorism incident, assisting investigators to identify possible attackers.

### **A range of support**

Member countries can call on INTERPOL for assistance in disaster victim identification (DVI) immediately in the aftermath of a disaster. The services offered by INTERPOL include: A downloadable [DVI guide](#);

- Assistance from the [Command and Coordination Centre](#) at the INTERPOL General Secretariat in Lyon, France, to send messages between National Central Bureaus 24 hours a day in Arabic, English, French or Spanish;
- An [Incident Response Team](#) to provide further assistance upon request, such as on-site investigative support or connection to INTERPOL's databases.

## **Multi-dimensional approach**

INTERPOL's DVI activities are supported by a Steering Group and a Standing Committee on Disaster Victim Identification, both of which are made up of forensic and police experts. The Steering Group formulates INTERPOL DVI policy and strategic planning while the Standing Committee meets regularly to discuss improvements to procedures and standards in DVI matters. Policies and guidelines have been produced in the following areas and are backed up by training programmes:

- Victim care and family support;
- Occupational care for DVI teams;
- Compliance with international standards and forensic quality assurance controls;
- Information-sharing and exchange;
- Operational assistance to countries which lack DVI capacity.

## **2- <http://www.interpol.int/INTERPOL-expertise/Forensics/DVI-Pages/DVI-expertise-in-the-field>**

### **DVI expertise in the field**

Since 2004, a total of 12 disaster victim identification (DVI) teams have been deployed to disasters across the world. Some examples are below.

#### **Advising the Congolese authorities**

Following a plane crash which killed 23 people in March 2011, an INTERPOL team was dispatched to Pointe-Noire in the Republic of the Congo. The Congolese Government set up a joint committee to investigate the accident and INTERPOL was requested by the Congolese authorities to assist and advise the Scientific Police of the Congo with regard to the DVI procedure.

#### **Supporting Uganda after terrorist attacks**

In July 2010, an INTERPOL Response Team was sent to Kampala, Uganda, following bombing attacks on a restaurant and social club during the final match of the FIFA World Cup. The attacks left more than 70 people dead and at least 70 others seriously injured. DVI experts played a central role on the ground, supporting the work of national authorities with their identification efforts. In addition, two Black Notices featuring reconstructed photographs of the suspected suicide bombers were issued and an Orange Notice was published to inform law enforcement authorities worldwide of the modus operandi used by the terrorists.

#### **Assisting France and Brazil following an air tragedy**

An INTERPOL Incident Response Team (IRT) assisted the Brazilian and French police in identifying the victims of the Air France AF447 plane tragedy in June 2009, in which 228 people from 32 countries lost their lives. The IRT acted as a liaison point in collecting ante-mortem data (such as dental and medical records, fingerprints and DNA from the victims' homes or family member) and assisted experts leading the operation to collect post mortem

data from the remains of the recovered victims. The international co-ordinated effort led to the identification of all 50 recovered victims.

### **Helping the Philippines to identify ferry victims**

Some 1,000 people perished during Typhoon Frank in the Philippines in June 2008, with more than 800 victims from the capsized ferry the Princess of the Stars alone. Eight days later, an INTERPOL Incident Response Team arrived in Cebu City to support the local authorities in identifying the victims.

Comprising DNA and Disaster Victim Identification (DVI) experts and a representative from the [International Commission on Missing Persons](#) (ICMP), the team played a central role on the ground in supporting the work of the Philippines National Bureau of Investigation in their ongoing DVI efforts.

The IRT showed INTERPOL's capacity to support a country in a long-term, large-scale specialized operation. Practical requirements included:

- Refrigerated containers to preserve the bodies with dignity;
- Mobile forensic labs for swift and efficient DNA analysis;
- Victim Identification Information Centre for grieving relatives and friends;
- Close co-operation with the ICMP in Sarajevo, which has expertise in large-scale victim identification and the most up-to-date DNA matching techniques.

More than 3,000 DNA samples were collected from victims and from their relatives. Of the 567 bodies recovered from the vessels, 480 were identified using DNA analysis and other traditional methods such as examination of fingerprints and dental records.

3- <http://www.theforensicgroup.co.nz/forensic-news/disaster-victim-identification-dvi/>

### **Disaster Victim Identification (DVI)**

*Thursday, February 24th, 2011*

Sadly, it looks as though the recovery in Christchurch involves not only remarkable stories of the living but also devastating stories of the deceased.

In response to a phone call I had today, I just write briefly about what may happen in terms of identification of those who have been or are yet to be recovered. In the past few years, Disaster Victim Identification (DVI) and/or specialist Search and Rescue teams have had to deal with many significant tragedies, some of them caused by humans (such as 9/11, July 2005 London Tube and bus bombings) and some as the result of the forces of nature (Indonesian tsunami, Haiti earthquake, Victorian bushfires, Queensland floods...). Now I look at it, the list goes on for both natural events and human-related events...and there are more.

New Zealand has had its fair share, what with Pike River and now this year's Christchurch earthquake.

The issues now being managed in Christchurch, in part, relate to identifying the remains of those who died in the last few days. Some of the victims will have identification on them, which will aid the ID process. Some people may not. Depending on the individual situation, a combination of specialists may be required in order to confirm an identification.

Pathologists/coroners may determine, where possible, the cause of death and deal with certain issues around handling of the remains.

Forensic dentists may be required in situations where the individual is not easily recognisable for a visual identification to be undertaken but where the dental records may be able to assist.

The Biology team of ESR Forensic is likely to be involved with processing samples for determining DNA profiles. DNA analyses were well-used after the 9/11 Twin Tower events because sometimes this was the best way to attempt identification.

Let's hope that the recovery work can be quick and identification swift so that these people can be released to family and whanau so they can be laid to rest.

4-<http://www.vifm.org/forensics/medico-legal-death-investigation/disaster-victim-identification/>

### ***Disaster Victim Identification***

VIFM has a world class Disaster Victim Identification department. Many of its forensic experts have worked tirelessly in areas of international disaster and distress such as the former Yugoslavia, Iraq, Burma, East Timor, the West Bank, the Asian tsunami and closer to home, the [Black Saturday bushfires](#) of 2009 in Victoria.

As part of the Institute's strategic plan, the decision was made to develop these activities into an integrated specialist team rather than rely on the activities of a small number of medical and scientific specialists.

Forensic expertise from Australia and more specifically from this specialist team at the VIFM has now been expanded to include training and assistance for other nations in building local and regional capacity to respond to disasters.

This activity adds to the sustainability of the Institute services makes working at the VIFM more fulfilling. In particular it differentiates us from other forensic service employers in circumstances where there is a world wide shortage of forensic pathologists and forensic physicians.

Forensic medicine encompasses forensic pathology and clinical forensic medicine and is a very small medical specialty but a crucial one right at the heart of the criminal justice system.

### **DVI in Developing Countries**

Developed countries have difficulty providing forensic medicine training because of the tiny size of the specialty. It is unrealistic to think that these countries will be able to develop their own forensic medicine training without support.

Developing the capacity of forensic pathologists to meet the demands of their profession in developing countries is often associated with personal risk, as their work involves decision making which can be pivotal to the proper administration of justice.

VIFM was successful in being awarded funding by the Australian Federal Police to train eight African medical graduates over the next five years, through a [Masters of Forensic Medicine](#), each graduate doing two years study, one at home by distance education, and one in

Melbourne. The first two trainees are from Uganda and Kenya and will arrive in Melbourne in 2011.

In conjunction with this, The Australian Federal Police and the VIFM hosted the Inaugural Forum on Forensic Pathology in Botswana in May. This was the first time a meeting of this kind had been held in Africa and was well attended by international organisations such as the International Committee of the Red Cross and World Health Organisation, senior judicial experts from Canada and Australia as well as African delegates.

A key component of the forum was to begin the process of some continuing education for existing practitioners, to sensitise participants to the importance of developing networks, and to begin building competencies in the organisation of the forensic response to disasters, i.e. disaster victim identification (DVI).

The most significant outcomes of this forum include the development of an African Network of Forensic Medicine as well as a commitment of support from the AFP and the ICRC to support VIFM in hosting a Pan-African forum in Uganda in 2011.

### **International Partnerships**

The Institute in partnership with the ICRC and the Association of Southeast Asian Nations (ASEAN) Secretariat was also involved in developing a three day workshop in Jakarta, Indonesia in March 2010 for nine of the 10 member states to improve preparedness in disaster victim identification and human remains management. This was a very positive beginning and produced a number of recommendations which are being discussed with ICRC and the AFP in order to optimise the opportunities to provide capacity training in this area.

As a result of this the Institute will facilitate a first responders workshop with the Malaysian Civil Defence related to body management and disaster victim identification in partnership with the ICRC.

Other initiatives and support provided by the Institute include a sexual violence training workshop for police and medical practitioners in Africa in March 2011, in partnership with the AFP developing a four-five year post-graduate professional and academic forensic medicine training program in the UAE; and the awarding of the Director's Scholarship in post-graduate training to a medical practitioner from Sri Lanka.

In addition to the focus in Africa and Asia, there have been an increasing number of international organisations requesting training and/or information sessions at the Institute.

5- <http://newsinfo.inquirer.net/526473/nbi-sends-medico-legal-forensics-teams-to-identify-yolanda-victims>

[NBI sends medico-legal, forensics teams to identify 'Yolanda' victims](#)

By [Nancy C. Carvajal](#)

[Philippine Daily Inquirer](#)

MANILA, Philippines—The National Bureau of Investigation has sent medico legal and forensic experts to Tacloban City and other areas hit by supertyphoon “Yolanda” (international name: Haiyan) to help in identifying bodies of victims, its top official said. Medardo de Lemos, NBI officer in charge, said that Disaster Victims Identification (DVI) specialists from the International Police (Interpol) have also offered their assistance and would be deployed in various areas also affected by the super typhoon.

“The team will assess the needs for the DVI procedure to start as soon as possible,” De Lemos said.

The Intepol and NBI experts will meet Wednesday to further discuss the needs for the DVI procedure, according to De Lemos.

He explained that part of the process for DVI would be fingerprinting and dental comparison.”

The two, he said, would be the main source of information to obtain conclusive identifications.

According to a member of the team, DNA testing is used as a last resort if families are unable to produce dental records of their loved ones or fingerprint records from the NBI.

De Lemos said local and foreign forensics experts would work closely and would be deployed in various areas to help local authorities identify the victims.

He added that NBI was involved in the identification of the remains of victims in previous catastrophic typhoons such as Sendong and Pablo.

He also said that NBI forensic experts were also tapped to identify remains of the victims of the sinking of the Princess of the Stars.

The NBI will bring mobile forensic laboratories to areas affected by typhoon Yolanda, according to De Lemos.

He, however, admitted that the bureau’s limited resources and the sheer number of victims have posed the biggest challenges to NBI’s work in disaster response.

“With limited resources, the forensic teams will rely heavily on the availability of relevant evidence for proper and conclusive identifications for a very large number of victims,” De Lemos said.

He added that NBI offices in the devastated areas in Visayas were also destroyed.

“Our men on the ground were also victims, our offices were severely damaged and their homes were also ravaged by the typhoons,” the NBI official said.

He added that new set of agents would be deployed to affected areas.

6- <http://www.sciencedaily.com/releases/2005/03/050326005336.htm>

### Forensic Dentistry Key In Identifying Victims Of Tsunamis, Other Disasters

*Apr. 6, 2005* — Baltimore, Maryland (March 11, 2005) -- Disaster victim identification (DVI) is an intensive and demanding task involving experts from various disciplines. DVI interventions can be brought to a successful conclusion only if properly planned, involving well-trained key experts and selection of the appropriate forensic diagnostic tools.

Today, during the 83rd General Session of the International Association for Dental Research, convening at the Baltimore Convention Center, a symposium, entitled "Current Concepts in Diagnostic Forensic Odontology", will feature presentations, by experts from Canada and Belgium, on "Forensic identification of victims of mass casualty incidents", "The dentist as a member of the disaster victim identification team--The Interpol DVI interdisciplinary philosophy", and "Facial reconstruction based on 3-D craniofacial reconstruction and in vivo soft-tissue depth registration".

As a key member of the identification team, the forensic odontologist takes an active part in all phases of the identification process. Modern disaster scenarios may include more destruction, fragmentation, and mingling of the human bodies than ever before. This means that identification of the victims has become much more difficult. Forensic odontologists are responding to these new challenges with approaches to identification that embrace modern scientific methods. Since teeth and dental structures may survive post mortem, personal identification by means of dental data is still one of the most reliable methods of human identification.

Nevertheless, some disasters, including massive fires, may destroy most of the dentition, leaving little dental information for comparison with dental records. Therefore, other diagnostic approaches have been developed. Traces of saliva and fragments of teeth and bone may be a valuable source of DNA evidence, offering new probes to solve unanswered questions and clarify unusual cases. Craniofacial reconstruction is another tool, offering important potential for victim identification. Conventional techniques for craniofacial reconstruction are usually based on manual modeling and standard soft-tissue depth tables. More recent developments in computer-aided 3-D imaging and ultrasound applications for soft-tissue depth registrations may offer new diagnostic tools for craniofacial reconstruction. The symposium will conclude with a discussion of the state of the art and identifying the challenges facing forensic diagnostic research.

This is a summary of a symposium entitled "Current Concepts in Diagnostic Forensic Odontology", to be presented at 10:45 a.m. on Friday, March 11, 2005, in Room 339 of the Baltimore Convention Center, during the 83rd General Session of the International Association for Dental Research.

7- <http://dnaproject.co.za/blog/25th-world-congress-of-the-international-society-for-forensic-genetics-melbourne-2013>

### ***25th World Congress of the International Society for Forensic Genetics, Melbourne, 2013***

David in front of his Poster presentation entitled 'Joining the Ranks: South Africa on Track to Adopting DNA Legislation.'

The first two days were set aside for dual-track workshops, where in depth training and discussion on various forensic-related subject matters took place. Of the various topics being presented on, I opted to attend the sessions on Disaster Victim Identification for biologists and Wildlife Forensics. The other workshops that were presented included Basic Principles and Advanced Topics in Forensic DNA Evidence Interpretation, Genomics; Implementation of messenger RNA body fluid testing in forensic case work; Forensic DNA Phenotyping; Ancestry analysis as an investigative tool using autosomal binary markers; and DNA Lineage marker Interpretation.

David pictured here together with Bruce Budowle (exFBI and forensic science expert) and Prof. Sir Alec Jeffreys (the 'father' of forensic genetics, who first discovered the forensic application of DNA analysis in 1984).

The use of DNA profiling for human identification can extend beyond that for the sole purpose of criminal investigation and is often useful in identifying missing individuals or those who have been victims of mass or natural disasters as well. Disaster victim identification (DVI) is the application of forensic genetics in conjunction with other forms of personal identification (such as fingerprints, dental records, visual identification and personal effects) that may prove useful in identifying such individuals. The concept of 'relentless preparedness' was stressed at the workshop – it is vital that there are thoroughly developed procedures in place at both local and national levels to ensure that, if any disaster were to occur, the subsequent processes can be integrated as seamlessly as possible. This requires planning at all stages of the DVI processes, including those at the scene, the mortuary, the laboratory and the administrative processes linking these together.



Examples of previous disasters such as the 2004 Tsunami and the Bali bombings were discussed. Experiences from such disasters have led to a general consensus that DNA should not be used only after unsuccessful attempts at identifying individuals through other means has first taken place. ***Instead, DNA should be used as the primary driver of the investigations, allowing other details available to complement the DNA results.*** Although more expensive to conduct, DNA profiling can ensure that unnecessary re-identifications are avoided in the long run if misidentifications had occurred through e.g. incorrect visual identification or the wrong identification documents being found on a deceased individual. More information on disaster victim identification is available on the [INTERPOL DVI web page](#).

The illegal trafficking and trade in protected and endangered wildlife is estimated to be an operation worth approximately USD 53 billion a year. This applies to numerous species of animals, plants and protists. Identifying many of these species accurately is challenging, especially for those where juvenile individuals are involved, or where parts of an individual are trafficked (and not the whole organism), such as seeds of protected plants or the limbs of animals. These items may be mislabelled in order to deceive officials at ports of entry and can then not be accurately identified.

Wildlife forensics is another interesting application of DNA profiling or barcoding, in that it allows for the accurate identification of either an individual or the assignment of a species in cases where too little sample or too little visual information is available to identify it otherwise. This is still a developing discipline of forensic science, but is progressing rapidly. Attempts are being made to standardise processes across laboratories worldwide in order to ensure that best practices are written up and can be applied. Additional information can also be found at the [Society for Wildlife Forensic Science's website](#).

The plenary sessions of the Congress were structured around multiple themes, and included sessions on next-generation sequencing and rapid DNA analysis; genetic identification of body fluids; Y-STR analysis for ancestry and male or paternally-linked associations; wildlife forensics; complex mixture analyses and statistical considerations and SNP analysis in forensic phenotyping (including the prediction of eye colour, hair colour, skin colour and overall physical appearance). Various researchers, academics and forensic scientists presented the results of their studies and experiences and enabled discussions to take place on those topics which are currently at the forefront of forensic science research.

This Congress was a wonderful experience and it was an honour to have met and listened to international experts in various disciplines of forensic genetics. I left with a wealth of additional information and new contacts that I hope will be beneficial in helping move South African forensic genetics expertise and skill forwards in future.

**David Swanepoel**

**8- <http://www.science.org.au/events/conferences-and-workshops/australiaindonesia06/gidley.html>**

## **AUSTRALIA–INDONESIA JOINT SYMPOSIUM IN SCIENCE AND TECHNOLOGY**

***Jakarta, 13-17 September 2006***

***DVI (Disaster Victim Identification) and forensic science***

**Professor David Gidley, Managing Director Forensics WorldWide P/L, Indonesia**

Almost daily somewhere in the world we hear about disasters occurring with multiple lives lost, hazardous rescue efforts, the occasional miracle survival, but more normally the recovery and identification of victim's remains, all of which tends to fade quite quickly after the initial burst of 3–5 days news coverage.



Even today many people fail to recognise the critical role that forensics plays in these events, especially in the parallel roles of Disaster Victim Identification (DVI) and the important crime scene investigation that is essential to identifying the perpetrator(s).

While we all know that deceased and missing persons are identified from various techniques including; physical features, personal belongings, fingerprints, dental records, and DNA, what is frequently overlooked is the skills, the resources, and the practice that is necessary to have these activities readily plugged into the incident as soon as possible after the event.

Just as forensic science today can provide pro-active support (intelligence) to crime investigation, so too it can provide important support before the occurrence of terrorist incidents as an adjunct to investigative intelligence. Increasingly this aspect of forensic work is growing in importance and applies not just in the more traditional areas of forensic testing and analysis, but now across a much broader range of fields described as nuclear, biological and chemical (NCB). As an example, bio-crime or bio-terrorism, can deliver outcomes where the economic impact can be as devastating as the loss of life we see in more traditional terror attacks.

The importance of forming alliances, partnerships and MOU's is critical to dealing with these threats and incidents and forensics is no exception. No one forensic agency can cope with all possible scenarios, and efforts to establish such cooperative arrangements are essential now and for the future.

9- <http://www.afp.gov.au/about-the-afp/executive-structure/slater-julian.aspx>

### **Assistant Commissioner Julian Slater OAM**

#### ***National Manager Forensic and Data Centres***

Assistant Commissioner Slater joined the Australian Federal Police (AFP) in 1984 and has gained experience across a range of policing activities. Over his 26 years with the organisation he has worked extensively in forensic operations as well as general duties policing, human resource management, business analysis and dignitary protection. Assistant Commissioner Slater was promoted to Assistant Commissioner in March 2010 and appointed to the role of National Manager Forensic and Data Centres. This position is responsible for the delivery of the AFP's forensic capabilities through six facilities across Australia as well as the Australian Bomb Data Centre, Australian Chemical Biological and Radiological Data Centre and the Australian Illicit Drug Data Centre.

Assistant Commissioner Slater has been involved in a range of regional law enforcement capacity building initiatives in South East Asia and the Pacific. He was responsible for the development of the AFP's Forensic Counter Terrorism group, Forensic Rapid Response capability and the Regional Disaster Victim Identification Capacity Building project.

In 2002, Assistant Commissioner Slater led the AFP forensic and disaster victim identification (DVI) responses to the Bali bombings for which he was awarded the Medal of the Order of Australia (OAM). In 2003, he led the forensic response to the Marriott Hotel bombing in Jakarta and, in 2005, he undertook the role of Joint Chief of Staff (International) leading the international response to the tsunami in Thailand. Assistant Commissioner Slater was the AFP's DVI commander between 2003 and 2006 and the Chair of the Australasian DVI Committee and member of the Interpol DVI Steering Committee between 2004 and 2006. Assistant Commissioner Slater has a Bachelor of Management (Employment Relations), Diploma of Applied Science (Forensic Investigation) and a Graduate Certificate in Management.

10- <http://www.sunstar.com.ph/cagayan-de-oro/local-news/2011/12/21/nbi-conducts-forensic-exam-unclaimed-bodies-196827>

### NBI conducts forensic exam on unclaimed bodies

By [Annabelle L. Ricalde](#)

Wednesday, December 21, 2011

THE National Bureau of Investigation (NBI)-Manila is now conducting a Disaster Victim Identification (DVI) on unclaimed bodies that were placed at a dumpsite in Zayas, Barangay Carmen, Cagayan de Oro City.

Lawyer Jose Justo Yap, NBI-Northern Mindanao director, said the forensic examination is led by Dr. Wilfredo Tierra, Medico Legal Officer II.

Yap said the process aims to help identify the bodies more easily, citing at least two parties have claimed ownership of a woman who died in the flash floods.

“Hindi sila magkakilala pero silang dalawa ang nag-claim na relative daw nila ‘yung patay na babae kaya ipa-DNA muna ito,” Yap told Sun.Star Cagayan de Oro.

Earlier, Mayor Vicente Emano approved the dumping of unclaimed bodies that were already emanating odor at the dumpsite after funeral parlors in the city refused to accept more bodies. More than 50 unclaimed bodies were temporarily placed at the dumpsite for DVI.

Dr. Tierra said the DVI is a tedious process in identifying a person, being done in three major procedures -- DNA, fingerprints and dental – as well as minor procedures that include body markings, jewelry and tattoos.

“After makunan ng DNA, fingerprints, dental at malagyan ng tag, puwede nang ilagay sa cadaver bag at ilibing temporary para madali ring kunin kung sakaling may mag-claim na relative,” Tierra said.

He said unclaimed bodies could not be buried until it undergoes forensic examination.

The City Government is now preparing an apartment type of tomb for the unclaimed bodies

11- <http://www.policeassn.org.nz/newsroom/publications/featured-articles/day-life-of%E2%80%A6-disaster-victim-identification-unit>

### A DAY IN THE LIFE OF... THE DISASTER VICTIM IDENTIFICATION UNIT

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**Significant loss of life, at home and abroad, presents major challenges for the Police Disaster Victim Identification unit as the team aims to name every victim of our worst tragedies. Deb Stringer reports.**

In the aftermath of events such as earthquakes, tsunamis and aeroplane crashes, the Police Disaster Victim Identification (DVI) team is charged with identifying the often grisly remains of the people who have died. Importantly, they are acutely aware of the anguish of relatives and friends who are waiting for confirmation of a loved one’s death.

Most of us might view the job as harrowing, grim and incredibly depressing; however, police officers trained in DVI see it as a chance to provide closure to a victim’s family and friends.

At times the work is painstakingly slow, but getting it right remains their priority as any mistakes or misunderstandings can make a difficult situation even worse. For example, following the 2002 Bali bombings, Australian league player Craig Salvatori believed he could identify his wife and told media he was unable to get her back from officials. The following day the body was proven not to be that of his wife.

In New Zealand, 160 police officers are trained in DVI. The national team also includes civilian specialists – a pathologist, forensic dentist, forensic photographer and fingerprint and scene specialist.

Gore Area Commander Senior Sergeant Richard McPhail is a member of the national team and this year he received a Queen's Service Medal in recognition of the work he did following the 7.1 magnitude earthquake that struck Christchurch on February 22, 2011, in which 185 people died.

Richard headed the mortuary unit and at the height of the operation had 120 staff working in a makeshift morgue at Burnham Army Military Camp.

DVI staff from throughout the country helped out, along with international assistance from Australia, Japan, England, China, Thailand and Israel.

Like everywhere else in the city at the time, resources were scarce. Richard says the team had to use their "No 8 wire skills" and "can-do attitude" to ensure the process ran smoothly. "Like most other jobs we attend, we aren't often afforded the luxury of ideal working conditions and at times we were working off the back of the truck, and we had to do all we could to source a generator. However, we were very thankful to the army for allowing us the space and giving us further support."

Supporting the team is another important aspect of the work, he says. "Everyone wants to just keep working because they are so committed to getting it done, but it is important they take care of themselves too, because this job can be mentally tiring."

To get through the toughest times, a strong sense of "camaraderie" and plenty of "in-house banter" helps, he says. "Of course we have mandatory counselling to address these kinds of things, but I have always found that maintaining a good sense of humour with colleagues and staying positive is what gets you through in the end."

Having hobbies outside work and spending time with family and friends are other strategies that he uses to deal with the trauma of the job. "I live on a farm, so it's easy to get away from it all; motorbikes are one of my passions, so I spend a lot of time working on them during my time off."

Having plenty of experience in dealing with traumatic incidents also comes in handy. “This can really be said for all DVI staff, because most of the guys we are working with have been with Police for 25 years plus. We probably look at things a bit differently when we attend a disaster or accident as we’re not really looking at the wonderment of what has happened, but rather what do we need to get through it, to get things done.

“I think for most of us, there isn’t very much we haven’t seen, and as time goes on you get better at handling things anyway.”

Richard says his most memorable experiences have been working in Thailand following the 2004 Boxing Day tsunami and in Australia during the Victorian bush fires in 2009.

“Going to Thailand was a pretty eyeopening experience and it was a huge, huge operation that involved multiple agencies.

“We were working out of a temple, and one of the nicer aspects of the job was getting to identify some of the children who had been caught up in the disaster and returning them to their families.”

He says he learnt valuable skills in both countries that meant he was well prepared for the aftermath of the Christchurch earthquake. “In the end, the death toll reached 185, but we actually completed 280 separate examinations.”

The DVI process is split into five stages (see sidebar) and involves two separate phases that take place simultaneously. The first – the post-mortem phase – is rigorously scientific and clinical; the second – the ante-mortem phase – is about the more emotional, human side of the tragedy where staff collate a victim’s personal markers and belongings to assist with matching DNA sampling and fingerprinting.

Richard says the team members who worked in Christchurch should be proud of themselves. It would not have worked so well, he says, if it hadn’t been for all the wonderful people who worked so tirelessly for the cause. “That’s got to be one of the best parts of the job, the people you meet along the way, because after a while you realise how much the team becomes almost like family, because you work so closely together.”

Two other aspects of the work that have kept him in the job are the practical, hands-on problem-solving side of things and the communication skills he has picked up over the years.

“Planning how the operation is going to be run, then keeping the media and public informed are all things I have got used to doing after running a few operations and they are things I really enjoy.

“However, I think that if you take on this role you have to be competent and comfortable at what you’re doing, even if things aren’t quite up and running yet, because, during crisis situations, the public are fairly reliant on you for some sort of reassurance.”

12- [http://www.usask.ca/greenandwhite/issues/2011/spring2011/features/cover\\_story.php](http://www.usask.ca/greenandwhite/issues/2011/spring2011/features/cover_story.php)  
**When Disaster Strikes: Forensic Dentistry and Disaster Victim Identification by Beverly Fast**

**When Swissair flight 111 crashed into the ocean off the coast of Nova Scotia in 1998, the impact rattled windows, shook homes and woke residents in nearby communities. The shockwaves reached even further.**

It was just after 10:30 p.m. on September 2nd when the sirens in Peggy’s Cove went off. News that a jetliner had gone down had Coast Guard ships racing to the area and local fishermen taking to their boats to join the search for survivors. In shallow seas about 14 kilometres offshore, they were met with the grim evidence of disaster. Flight 111 was travelling at an estimated 550 kilometres an hour when it hit the water. The jet shattered on impact, killing all 229 passengers and crew.

When disaster strikes, the emergency rescue response is immediate. But an investigative process spanning federal, provincial, municipal and even international boundaries is also set in motion. One line of inquiry seeks to find out what happened and why. Another seeks to identify the victims—a task that requires the skills of a multidisciplinary team.

Major Richard Groves (DMD’90) remembers getting the call asking him to stand ready. A career military man, Major Groves graduated from the Royal Military College of Canada with a Bachelor of Science in Honours Mathematics and Physics in 1979. He served as a communications and electronics engineering officer around the world before switching his career focus to dentistry. As a member of the military, he was able to apply to schools across the country. The five-year program brought him to the University of Saskatchewan, where he graduated with his Doctor of Dental Medicine in 1990. Two years later, he took a training course in forensic odontology through the US Armed Forces Institute of Pathology.

“After I took the course, I was on the list of people who could be used for disaster victim identification (DVI) operations,” Major Groves says. Six years later, about to embark on his first mission as a member of the Canadian Forces Dental Services (CFDS) Forensic Team, he remembers being both nervous and excited. “I had no actual experience with dental forensics—it’s an essential military skill because we have to be able to identify soldiers lost in battle, but it’s not something you use frequently.”

Still, the desire to help was strong. He arrived in Halifax two weeks after the crash. By that time, a temporary morgue had been set up at CFB Shearwater outside Halifax. “We got off the plane at noon and by 2:00 p.m. we were busy in the morgue. It was surreal,” he says. “The process was well established so we just started working. There was so much to be done, and you want to be useful.”

Over the following weeks, Major Groves joined pathologists, nurses, radiologists, x-ray technicians, RCMP photographers and fingerprint technicians, DNA specialists and other dentists working to identify human remains recovered from the sea, the shore and the submerged wreckage. Only one victim was visually identifiable. The remaining 228 had to be identified through a combination of medical and dental detective work.

The forensic dentistry involved several tasks. The most difficult, both physically and emotionally, was the autopsy. The force of the impact meant Major Groves and his colleagues

were working with fragments. “They didn’t find every part of every person. At times, we were working with a single tooth attached to a bit of bone.”

In forensic dentistry, it’s the details that count. “Whether it’s the tilt of a tooth root, the length of a root or the grid pattern of a bone, every detail is important. Sometimes, using dental records we could be sure. When we weren’t sure, we shared what we had and let the others narrow the focus. It’s better to say you don’t know than to guess wrong. It’s absolutely essential that you don’t misidentify anyone,” Major Groves says.

After taking x-rays and charting dental remains, he and his colleagues would compare the results with existing dental records. “One of the most frustrating things was that we didn’t have dental records for everybody. By the time we closed down, we were only able to identify about half of the victims using dental records.”

In lieu of dental evidence, the RCMP contacted next of kin and police in 12 different countries to collect fingerprints and DNA samples from victims’ homes. By December, all of the victims had been identified—approximately 90 through dental records, another 30 through fingerprints and x-rays, and more than 100 through DNA analysis. The analysis remains one of the largest DNA identification projects ever undertaken in Canada.

In 1998, Major Groves was one of the junior forensic dentists on the team; today, he is one of the most senior. Currently the staff officer responsible for dental policy at National Defence Headquarters in Ottawa, he also holds the position of CFDS forensic odontologist.

In 2010, he organized the CFDS component of the DVI team that travelled to Haiti to identify Canadian victims of the earthquake. It was only the second time a CFDS DVI team had been pulled together. As in the Swissair flight 111 disaster, the efforts of Canadian Forces forensic dentists helped bring closure and a sense of peace to the families of victims.

The CFDS has approximately 25 personnel trained in DVI, either through the US program or the British Columbia Forensic Odontology Response Team in Vancouver.

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[http://www.lamoncloa.gob.es/IDIOMAS/9/Gobierno/News/2012/20120226\\_SpanishNatlPolice\\_SendsTeamToHonduras.htm](http://www.lamoncloa.gob.es/IDIOMAS/9/Gobierno/News/2012/20120226_SpanishNatlPolice_SendsTeamToHonduras.htm)

[Spanish National Police sends Disaster Victim Identification team to Honduras](#)

*Sunday 26 February 2012*

- Consisting of four officers from the General Commissariat of Forensic Police with expertise in dactyloscopy and necrology reporting, the team will help with the task of identifying the bodies.
- The DVI is being sent in response to a request from the Honduran authorities. It will leave on Tuesday 28 February and remain in Honduras for one week.

The Spanish National Police are sending a specialist Disaster Victim Identification team (DVI) to Honduras in order to help identify the bodies of more than 350 inmates who lost their lives in the Comayagua prison fire. The multidisciplinary team consists of four officers from the General Commissariat of Forensic Police with expertise in dactyloscopy and necrology reporting. The DVI is being sent in response to a request from the Honduran authorities. It will leave on Tuesday 28 February and remain in Honduras for one week.

The Spanish experts will join the international organisation set up in Honduras following the tragedy. Several other Ibero-American countries are also involved in this organisation, including Chile, El Salvador, Mexico, Guatemala and Peru. The work to be carried out by the officers from the Spanish National Police will focus on the fingerprint identification of the bodies using necrology reporting techniques given that other identification methods have already been tried by neighbouring countries.



### ***Ready to respond quickly and efficiently***

The General Commissariat of Forensic Police has a permanent Disaster Victim Identification team that is always ready and able to travel to the location of any major catastrophe in order to help other Forensic Police teams or officers from other countries in the work they do. This team consists of the specialists deemed most suited to the task according to the nature, circumstances and location of the event.

### ***International experience***

The Honduran authorities are fully aware of the extensive experience that the Spanish National Police has when it comes to working in such circumstances, both in Spain and abroad, and have requested this team be sent to Honduras from Spain.

Internationally-speaking, the Spanish Forensic Police has been requested in recent years to identify the victims of such disasters or conflicts as the war in Kosovo in 1999, the earthquake in Algeria in 2003 (which killed more than 2,200 people), the fire at a supermarket in Asunción (Paraguay) in 2004 (which killed more than 400 people) and the tsunami in Thailand in 2005 (which killed more than two thousand Europeans). The help provided by Spanish experts was decisive in all these cases due to the various identification techniques they employ: DNA, forensic anthropology, forensic odontology or dactyloscopy.

The DVI team may be made up of the following:

- A coordinator, with expertise in necroidentification, who will assume a leadership role regarding the work of the Forensic Police at the location
- A lothoscopist, with expertise in necroidentification
- A specialist in forensic medicine and necroidentification
- An expert in odontology and necroidentification
- An expert in photography
- An expert in video
- A specialist in the taking of biological samples
- A specialist in the taking of chemical samples
- A specialist in ocular inspection using police techniques
- A civil servant for support tasks and media relations
- A computer expert

14-<http://www.andrewlownie.co.uk/authors/christian-jennings/books/bosnias-million-bones-solving-the-worlds-greatest-forensic-science-puzzle>

*Bosnia's Million Bones : Solving the world's greatest forensic science puzzle*

What it would be like to be tasked with finding, exhuming from dozens of mass graves, and then identifying, using DNA technology, the intermingled human remains and mangled body-parts of the estimated 8,100 victims of the 1995 Srebrenica massacre in eastern Bosnia? One leading forensic scientist commented that it would be like “solving the world’s greatest forensic science puzzle.”

And in 1999 one DNA laboratory, run by one small international organisation in Sarajevo, the International Commission on Missing Persons, set themselves the task of doing just that. And this is the story of that laboratory, that technology, and that organisation.

Twelve years later, the ICMP are the world’s acknowledged leaders in the extraordinary, rarified world of using DNA-assisted technology and forensic science to assist in finding, and identifying, thousands and thousands of persons missing from wars, genocides, human-rights abuses and natural disasters. These range from Bosnia to Hurricane Katrina and the Asian



*tsunami*, to being INTERPOL's on-call agency for DVI, or Disaster Victim Identification, to identifying victims of Saddam Hussein in Iraq, and to providing advice in the aftermath of 9/11. ICMP have also identified victims of apartheid in South Africa and of war crimes committed in Chile in the 'seventies. They have helped scientists and governments from countries like the UK, Germany, Russia, Norway, Libya, Colombia and Iraq on improving their DNA identification skills and finding missing persons. Their forensic science techniques have, as a result, become the latest weapon in the armoury of international justice and human rights.

The ICMP sprung out of the massacre at Srebrenica. There are 206 bones in the human body post-puberty, and in 1995 an estimated 8,100 Bosnian Muslim men and boys were massacred at Srebrenica by Bosnian Serb forces lead by former General Ratko Mladic, now on trial for genocide and war-crimes at the UN Tribunal in The Hague. 206 multiplied by 8,100 makes 1,668,600, and this was the number of potential body-parts and bones, mangled and scattered across dozens of mass graves in the mountainous wilds of eastern Bosnia, that forensic investigators from the ICMP and the Hague Tribunal were looking for. This year, eighteen years after the massacre, the ICMP has found and identified, using DNA, more than 80% of the exhumed bodies and body-parts, their remains returned to their families for proper and dignified burial.

The story of how they did it, becoming in the process the world's leader in their field, is set against the story of the sixteen-year manhunt for Ratko Mladic, the most high-profile war-crimes suspect to stand trial since the Nazis, indicted on the first charges of genocide to have taken place in Europe since the Holocaust. Mladic vanished in 1997 in Bosnia after the end of the war, as British and NATO special forces started arresting his deputies. He was next seen in a tiny rural village in central Serbia in 2011, arrested by two dozen Serbian intelligence agents, and then transferred to face trial in The Hague. Where had one of the world's most-wanted men been for sixteen years? Despite a manhunt across south-eastern Europe involving investigators from the Hague Tribunal, police officers, special forces and intelligence operators from Britain, the United States, Canada and EU countries such as France and Germany, Mladic had evaded capture.

This book is the story of real-life CSI, and the anatomy of a manhunt. It draws on inside access to world-class forensic scientists from ICMP, war-crimes investigators from The Hague, as well as police officers, soldiers, intelligence agents, diplomats and humanitarians from sixteen different countries. It is written by an author who is a widely-published investigative foreign correspondent who has worked as a staffer for ICMP, and followed the hunt for Mladic across the Balkans for more than a decade, reporting for British publications ranging from *The Economist* and *The Scotsman* to *Wired* magazine.

5- <http://www.planetbiometrics.com/article-details/i/827/>

### ***Human Recognition Systems MForce Reduces Forensic Matching Delivery Time from Days to Seconds***

**16/09/11**

Human Recognition Systems (HRS) has announced the latest enhancement to its recently launched product, MForce. The 'lights out latent' module delivers real time results for police, military and humanitarian organisation in disaster victim identification, crime scene investigation and watch list identification.

MForce is a mobile ABIS platform designed for organisations that operate in remote, difficult or temporary environments and need to manage identities and gather intelligence. The system is designed with inter-agency cooperation in mind exporting data records based on the international EBTS standards. The combination of livescan and latent in a single mobile form

factor means police, military and humanitarian organisations can very quickly establish a complete identification platform wherever they are.

With its combination of fixed and portable components, MForce systems synchronise to share the latest databases and watch lists keeping data up to date across disparate teams. Already delivering multi-modal biometrics combining finger, face, iris, DNA, the addition of latent matching completes the biometric capability meaning users have all their identification processes in one place.

“We have integrated a key advancement in latent fingerprint identification so the MForce system implements a ‘lights out’ latent solution, which now means untrained personnel can carry out automatic forensic imaging and fingerprint enrolling there and then,” said Neil Norman, chief executive of HRS.

“This provides an excellent opportunity to allow forensic experts to continue working where they are most needed in the field without being called away but at the same time, it also empowers other individuals to perform latent matching – and on both accounts, this saves time and money.”

This is vital, for example, in disaster victim identification (DVI) following natural disasters where humanitarian organisations and NGOs assist in the identification and tracking of missing and displaced people. The ability to capture fingerprints – from individuals or latent prints – and to scan and digitise them, then run them against databases or watch lists at the scene of the event is a huge draw during such a crisis.

“For forensic science, this brings real savings,” continues Neil. “As well as improving operational efficiencies in gathering forensic evidence the 'Lights Out' module reduces the time delay from latent image capture to identification.

“It removes the need for latent images to be captured and physically sent back for central processing because the digitisation means that the fingerprint is checked on the local system in real-time and can be matched against watch lists or databases to identify or eliminate individuals from a crime.”