BONAPARTE

SMART RESEARCH BV

Netherlands Forensic Institute
Ministry of Security and Justice

Is your country prepared for a prompt and reliable identification of victims after a mass disaster?

In the case of a mass disaster many important issues have to be addressed. An airplane crash, a tsunami or terrorist attack puts public directors and law enforcement into the spotlight where they have to restore public order and ensure public safety, investigate the causes and if applicable punish the offenders.

A task of large public value is the recovery and identification of the remains of the victims. This importance is emphasized due to legal as well as humanitarian reasons. Families yearn to know whether the victims are their loved ones. They demand from the government that it will do its utmost effort to identify and hand over the remains so they can start the mourning process and give the unfortunate loss a place in their lives.

Disaster victim identification (DVI) is greatly facilitated by the advent of modern DNA technology. Forensic laboratories worldwide are able to extract and record DNA samples from the tiniest samples. DNA has made it possible for matches to be made and victims to be identified.

Linking victims with their closest relatives instead of their own DNA is much more difficult since they share some of their DNA but not all. In the case of mass disaster this is complicated further because complete families sharing their DNA can be involved.

Given the expected large number of casualties the puzzle to match the victims grows exponentially. In the case of a few victims this can be done easily by the hand of a DNA professional. In the case of mass disaster with over 100 victims or maybe an even larger number of body remains, matching by hand is an unfeasible task. It is not possible to check for all the combinations in a timely manner, let alone do a check for consistency and errors. Failing to do so will lead to dissatisfaction by the public.

Enhancing disaster victim identification: the Dutch experience

Facilitating this task will put the attention of public officers and law enforcement where it should be: to the victims and their families. As this problem was promptly recognized by the Dutch Ministry of Security and Justice, The Netherlands Forensic Institute (NFI) was given the task to develop a computer assisted disaster victim identification system. The system had to meet stringent requirements. It had to be designed for large scale incidents. Large numbers of samples would have to be matched promptly and reliably. Samples from very different sources had to be used: e.g. bodily remains as well as data from (inter)national DNA databases. The time for uncertainty had to be minimized and the chances for wrong matches had to be brought back to a minimum.

That led to the development of a unique piece of software, Bonaparte, which does the matchmaking in minutes instead of weeks. Bonaparte was developed by Smart Research BV, a subsidiary of SNN at the University of Nijmegen. By using an automated system human error has been eliminated. Bonaparte uses state-of-the-art mathematical probabilistic methods by which not only direct matches can be made but also the much more difficult family matches, hence giving speediness and certainty. Bonaparte is a transparent and flexible software tool.

The software has been rigorously tested and validated, but came to the real test with the airplane crash of Afriqiyah Airways on 12 May 2010 in Tripoli, Libya. 103 people were killed in this accident leaving little of the plane and its occupants. A

full, proper identification of the victims took less than 3 weeks, whereas without the new system with the same amount of personnel it was expected to last over 3 months. This was mainly due to the new matching software.

Information

For more information on the Bonaparte software, please contact:

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