B57 A DNA-Led Identification Program for the Former Yugoslavia

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The development, implementation, and results of a high throughput DNA testing system designed to aid in the identification of thousands of skeletal remains and the understanding that has been gained by the operation of such a system will be detailed.

The International Commission on Missing Persons (ICMP) was created at the G-7 conference in Lyon, France, in 1996 with the mission of aiding in the identification of the missing from the former Yugoslavia. During the conflicts in the former Yugoslavia from 1991–1999, several hundreds of thousands of people were killed, and it is estimated that up to 40,000 individuals remain unaccounted for from these conflicts. The exhumation of bodies from the region continues and results in several thousand bodies being recovered annually. Due to the number of losses and the conditions of the recovered mortal remains, the use of 'classic' forensic identification techniques, i.e., those not utilizing DNA testing, frequently fail to establish the identity of mortal remains. By the end of spring of 2002, it was estimated that over 7,000 sets of human remains had been recovered but could not be identified without DNA testing. Further complicating the identification efforts are numerous secondary graves sites that contain severely commingled remains. As battle lines shifted during the conflicts, primary mass graves were often exhumed and the human remains transported farther behind the front lines. This exhumation process frequently resulted in bodies becoming fragmented and subsequent reburials often mixed bodies from various individuals together. Furthermore, multiple primary mass graves were often combined into one secondary mass grave. In the Podrinje region, which contains Srebrenica, many of the dead were never buried and were left exposed on the surface, resulting in many cases of scattered surface remains.

In order to help address the identification process of these most challenging of cases, the ICMP has developed a state-of-art DNA testing system within the former Yugoslavia. This system consists of four DNA laboratories located in Sarajevo, Tuzla, Banja Luka, and Belgrade with each having its own unique function as follows:

1. Sarajevo – Processes 45 bone samples a day, in duplicate, and has between a 90% - 95% success rate in obtaining STR profiles from bone samples.
2. Tuzla – Obtains STR profiles from an average of 352 blood samples per day.
3. Banja Luka – Responsible for the testing of presumptive cases as well as challenging cases, i.e., those that have been exposed to fire or other extreme assault. In addition, Banja Luka is ICMP's primary DNA research facility focused in improving DNA identification techniques.
4. Belgrade – Primarily focused on Y-chromosome and mitochondrial testing.

These four DNA laboratories must work together as a system in order to bring answers to the families of the missing. All data obtained from these four DNA laboratories is submitted to the central computer system in Tuzla, Bosnia, and Herzegovina. In addition, the ICMP has great support and cooperation from the DNA laboratories located in Croatia.

There are eight blood collection centers and a comprehensive, centralized computer system in which all data relating to the missing is stored. All blood and bone samples collected in Bosnia and Herzegovina as well as the Federal Republic of Yugoslavia, including Kosovo, are submitted to ICMP's central Identification Coordination Center (ICC) located in Tuzla. All samples are bar coded at the ICC and then distributed throughout the ICMP DNA laboratory system according to the type of DNA testing required. All DNA data obtained at any of these DNA laboratories is submitted to the ICC, where it is entered into the central DNA matching program. Once a DNA report has been generated, it is given to the pathologist in charge of the case, who is usually the person who submitted the bone sample. It is the legal responsibility of this pathologist to contact the family and officially close the case.

By the end of spring 2002, this system was generating between 200–300 DNA matching reports per month. Once a DNA match report has been returned to the pathologist, he/she will review antemortem records, articles of clothing and personal effects, and the body to ensure consistency between these 'classic' forms of evidence and the alleged identity of the individual as developed by DNA testing. The magnitude and success of this DNA testing system has altered the role of DNA testing in the former Yugoslavia where DNA testing is now frequently used to produce the initial lead with other identification methods assuming the confirmation role. As a result, names are being returned to thousands of missing.

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