



THE MISSING
the right to know



ICRC

Missing People, DNA Analysis and Identification of Human Remains

A Guide to Best Practice in Armed Conflicts and Other Situations of Armed Violence

The Missing:

Action to resolve the problem of people unaccounted for as a result of armed conflict or internal violence and to assist their families

Mission statement

The aim is to heighten awareness among governments, the military, international and national organizations – including the worldwide Red Cross and Red Crescent network – and the general public about the tragedy of people unaccounted for as a result of armed conflict or internal violence and about the anguish of their families

by creating and making available tools for action and communication

in order to ensure accountability on the part of the authorities responsible for resolving the problem of missing people, to better assist the families and to prevent further disappearances.

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Foreword

One of the most tragic things about any armed conflict, whether a war or widespread political violence, is that large numbers of people go missing and cannot be accounted for. There are many reasons for this: people may be forcibly displaced; they may be arrested and denied contact with family or friends; they may be military personnel "missing in action"; or they may be victims of massacres. Whatever the reason, the combination of lack of news and uncertainty about the missing people's fate can be unbearable for the families concerned.

More often than not, the missing people are dead, and the only way of easing the families' pain is to provide them with credible confirmation of death and the assurance that their relatives' remains have been or can be disposed of in a dignified manner in keeping with their culture. Identifying remains is therefore an important part of the healing process for families and even whole communities.

This obvious fact was highlighted in a process conducted by the ICRC on the missing and their families in 2002 and 2003.¹ The process involved a series of meetings attended by international experts with experience of many different contexts. Two of the meetings focused specifically on the role of forensic science in respect of people who are missing as a result of an armed conflict or other situation of armed violence. This document builds on the work done in those meetings.

In recent years, the ability to recover and analyze human deoxyribonucleic acid (DNA) from minute biological samples has revolutionized forensic science. A DNA sample taken from a crime scene can be compared with one from a suspected perpetrator. The same technological advances have also greatly facilitated identification of the remains, for example, of disaster fatalities who cannot be identified by other means. Now, that technology can also easily be used to settle questions of biological affiliation (e.g., testing for the paternity of a given child).

However, the complexity of DNA technology is matched by the legal and ethical ramifications of its use, which are growing steadily more intricate as the technology develops. The technology is also becoming faster and cheaper, and

¹ *ICRC Report: The Missing and their Families – Summary of the Conclusions arising from Events held prior to the International Conference of Governmental and Non-Governmental Experts (19-21 February 2003)* (ICRC/TheMissing/01.2003/EN/10; [http://www.icrc.org/Web/eng/siteeng0.nsf/htmlall/5JAHR8/\\$File/ICRC_TheMissing_012003_EN_10.pdf](http://www.icrc.org/Web/eng/siteeng0.nsf/htmlall/5JAHR8/$File/ICRC_TheMissing_012003_EN_10.pdf)).

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its potential impact is heightened because the information revealed by DNA analysis is contained in large databanks. It is becoming critical to have standards of practice. The situation is even more complex when DNA analysis is used to identify remains in contexts where many people are missing. Finally, DNA technology is developing much more rapidly than the law or regulatory bodies.

This publication is intended to help anyone, whether a forensic scientist, a humanitarian aid worker, a member of a military peace support mission or a human rights advocate, to navigate some of the complexities of using DNA analysis to identify human remains. It stops at the laboratory door; that is, there is little detailed reference to analytical laboratory techniques.

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1. Introduction

The move towards large-scale identification of human remains in armed conflicts or other situations of armed violence² has gathered momentum in the last thirty years, with the post-conflict work of forensic scientists in Argentina and the former Yugoslavia constituting a milestone in this sphere. The identification of remains in the wake of conflicts involves complex scientific, technical, legal, ethical and cultural issues.³ In recent years, the possibilities for identification have been expanded, improved and rendered more complex by the emergence of technologies based on DNA analysis. DNA in human remains can be recovered, analysed, compared and eventually matched with that of relatives, thus proving the remains' identity with scientific certainty. DNA analysis has the equally important potential to exclude kinship.

However, the process of identifying human remains in the wake of a conflict may be subject to multiple constraints, security and lack of resources being the two most common and important of many. Such constraints may limit or even preclude the use of more sophisticated technologies. This document sets down guidelines for achieving best practice in the face of constraints. In some situations, lower standards may have to be applied, but this does not render what is being done unethical. Most importantly, there are certain principles relating to standards of laboratory practice and to the protection of personal and genetic data which should be adhered to under all circumstances.

The ICRC's 2002 workshops of experts examined practical, legal and ethical issues relating to the role of forensic science in conflicts.⁴ The experts agreed that the forensic investigation of human remains in such contexts has two possible objectives. The first is to recover and examine the remains as in the context of a criminal investigation (e.g. establishing the cause and manner of death); the second is to identify the remains and, if possible, return them to the family. Fulfillment of the second objective helps the family by ascertaining the

² The term "armed conflicts and other situations of armed violence" (simply "conflicts" in the rest of the text) covers events during or after:

- ☑ **international armed conflicts** and **non-international armed conflicts** as defined in the 1949 Geneva Conventions and their 1977 Additional Protocols; and
- ☑ **internal violence**, meaning internal disturbances (internal strife) and situations requiring a specifically neutral and independent institution and intermediary, in conformity with Article 5(2)(d) and (3) of the Statutes of the International Red Cross and Red Crescent Movement, adopted by the 25th International Conference of the Red Cross at Geneva in October 1986 and amended by the 26th International Conference of the Red Cross and Red Crescent at Geneva in December 1995.

³See: *Missing People and Human Remains: A Guide for Forensic Specialists Working in Contexts of Armed Conflict or Other Situations of Armed Violence*, ICRC, Geneva (publication forthcoming).

⁴See: *Human remains & forensic sciences, Electronic Workshop, 02.2002 - 03.2002; Human remains: Law, politics & ethics, 23.05.2002 - 24.05.2002 and Human remains: management of remains and of information on the dead, 10.07.2002 - 12.07.2002, Workshops. Ecogia ICRC Training Centre - Geneva - Switzerland: Final report and outcome* (ICRC/TheMissing/10.2002/EN/3; [http://www.icrc.org/Web/eng/siteeng0.nsf/htmlall/5CALR3/\\$File/ICRC_TheMissing_102002_EN_3.pdf](http://www.icrc.org/Web/eng/siteeng0.nsf/htmlall/5CALR3/$File/ICRC_TheMissing_102002_EN_3.pdf)).

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fate of a relative and permits the remains to be disposed of in a culturally appropriate manner; this in turn allows the grieving process to start. Neither objective has priority over the other and forensic specialists have a duty to try to fulfil both; nor should there be any tension between them. This general principle of practice encompasses the use of DNA analysis for identification of remains.

Identification is defined as "individualization by attribution of birth name or other appropriate name to human remains". Identification is a process which includes one or more of the following means.

1. Visual or normal or customary means (relatives or acquaintances viewing the remains, identity documents or discs). A number of important points need to be borne in mind:

- ❑ visual identification may be the only pragmatic option;
- ❑ it carries a significant risk of misidentification;
- ❑ the risk of misidentification is substantially greater when numerous corpses are collected in one place and exposed to relatives in various states of shock;
- ❑ visual identification should be used as the sole means of identification only when the bodies are not decomposed or mutilated and it is fairly certain who the victims are;
- ❑ where visual identification is used, it may be possible to collect samples from both relatives and the body; this may be very difficult to do in the field.

2. Means which assess the weight of circumstantial evidence (i.e., matching of ante mortem data with information collected during the post mortem examination). Event documentation may lead to a presumptive identification which may then be confirmed by additional "hard features" such as previous medical conditions, fractures and frontal sinus radiology. Such an identification may be just as certain as one confirmed by scientific means (see below). How many "softer" findings such as gender, height, age, etc., are required in a particular case to conclude an identification is a matter of judgement. Without "hard" identifiers, there is a significant risk of false identification, i.e., a presumptive identification is declared to be an identification. The "softer" findings are important as a check of scientific / objective means (see below).

3. Scientific / objective means. The following can conclude an identification with scientific certainty:

- ❑ matching post-mortem dental findings with dental records;
- ❑ matching fingerprints taken from the remains with records;
- ❑ matching DNA samples from the remains with reference samples;⁵
- ❑ matching other unique identifiers such as numbered surgical implants or prostheses.

⁵ *Ibid.*

The above three means of making an identification do not necessarily follow on from one another, but normal practice is that, as identification becomes more difficult, the emphasis moves from 1 to 2 to 3. The means used should be combined according to the situation and applied consistently.

The rest of this guide pertains specifically to the use of DNA analysis in the identification of human remains. Section 2 introduces some basic technical information about DNA and its use in the identification of remains. Section 3 addresses considerations in the field. Sections 4 and 5 pertain to the collection, storage and analysis of DNA samples. Section 6 outlines legal principles relating to the protection of personal and genetic data. Those principles serve as minimum acceptable standards whatever the circumstances in which DNA samples and genetic data are obtained, stored, transported, transmitted or analysed.

2. DNA and the identification of human remains⁶

Certain factors make DNA especially useful in identifying human remains and in criminal investigations. First, DNA is unique to the individual and remains constant throughout life. Second, DNA follows the laws of inheritance. Third, DNA can be analysed and "read" for comparison and matching with scientific reliability. Fourth, DNA can be recovered and analysed from minute biological samples, such as bloodstains or even a single hair. Fifth, relative to proteins, DNA is a resilient molecule and so degrades slowly. It can thus be recovered from old biological samples, including skeletal remains.

Using DNA analysis to identify remains is a five-step process that involves:

- ❑ retrieval (collection, storage and extraction) of DNA from the remains;
- ❑ retrieval of DNA for comparison from either the putative relatives of the missing person *or* from sources such as hair, saliva stains or other biological material known to be from the missing person and predating his or her disappearance;
- ❑ analysing the DNA (amplification and "reading") from both sources;
- ❑ comparing the results of the analysis;
- ❑ deciding on the degree of matching that is compatible with the claimed relationship between the person (the remains) and the putative family member, in the light of other evidence.

Two sorts of DNA are used for the purposes of identification: nuclear DNA and mitochondrial DNA. Human nuclear DNA exists in very long chains constituting 23 pairs of chromosomes, including two sex chromosomes. One set of nuclear DNA can be found in each of a person's cells except the sperm and ova, which contain half a set. (Red blood cells contain no nuclear DNA.) Mitochondrial DNA is a much smaller chain; there may be thousands of such chains in the mitochondria of a given cell.

⁶ *Ibid.*

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Nuclear DNA extracted from fresh blood or tissue can be analysed easily and quickly. It deteriorates, however, if the samples are not correctly stored. Although it has proven difficult to extract suitable nuclear DNA from bones in the past, the technology has advanced rapidly in recent years. The most accurate matching is done *either* when quality nuclear DNA can be harvested from sources such as hair or saliva left prior to death, which allows for direct comparison with a set of remains, *or* when both parents of the presumed missing person can give a blood sample. Nuclear DNA cannot be reliably used for matching with relatives other than the immediate family.

Most nuclear DNA analysis for the identification of human remains is based on the study of variations of "short tandem repeats" (STR) of independent portions of DNA, contained in specific non-encoding sequences or *loci* of the DNA molecule. Some of the standard *loci* used for DNA typing are also coding genes (e.g. amelogenin).

Each DNA *locus* used for DNA typing has between 4 and 30 variables or "alleles", the frequency of which is known for a given population (or should be known before undertaking analysis for forensic purposes). Each person's nuclear DNA takes the form of a double helix of 23 pairs of chromosomes. Each allele in a pair may differ from the other in accordance with the laws of inheritance. Because alleles are inherited - one from the mother and the other from the father - they are useful for establishing the affiliation of an individual or of human remains.

The sum of allelic variability of the *loci* typed for DNA analysis is unique for each individual (except for identical twins, who share the same DNA). If sufficient *loci* are studied in a DNA sample (usually between 9 and 13 well-defined *loci*), and their allelic variation is multiplied following established mathematical rules, the likelihood that that particular DNA profile will be randomly duplicated in the general population is negligible.

This uniqueness is what allows for the identification of a given sample or set of remains within criminal standards of proof i.e., beyond reasonable doubt. (This assumes the analysis adheres to accepted standards of quality control and assurance.)

The process of analysing mitochondrial DNA is slower and more expensive, largely because it involves meticulous sequencing of the DNA base by base. However, the advantage is that it is present in more copies than the nuclear equivalent and is therefore more likely to be recovered intact from degraded tissue or weathered bones and teeth. This makes identification of old remains more feasible using mitochondrial rather than nuclear DNA.

Mitochondrial DNA is passed to a person only through the maternal line. This means a person's remains can be matched to a sibling, the mother, maternal grandmother or maternal aunts or uncles and even to more distant relatives as long as they belong to the maternal line of inheritance. This also means that mitochondrial DNA is not unique to any one person. Furthermore, certain specific sequences of mitochondrial DNA may be shared to a greater or lesser extent with other, apparently unrelated people in the same population. Two sections of

mitochondrial DNA are variable, and it is these sections which are sequenced. The sequence of any one person's mitochondrial DNA is recorded in terms of how it differs from a reference sequence (the Anderson sequence).⁷

Rapid developments in the field of DNA analysis are expanding the scope of and possibilities for identification. For example, minisequencing of single nucleotide polymorphisms (SNPs) can be used to analyse degraded and minuscule traces of DNA. Unlike STR analysis, the use of SNPs, whereby genes are literally "read", can potentially be used to predict the phenotypic features (physical features) of the owner of a DNA sample, and this of course raises serious ethical and legal questions.

Although this and other novel systems are already available, it seems unlikely that they will displace STR analysis for forensic purposes any time soon.

The matching of analyses only requires specialized software when there are large numbers of analyses to be compared. In small numbers, the matching can be done on an individual basis, i.e., by directly viewing and statistically comparing the results of the analyses of the sample and the reference sample.

3. Using DNA analysis in a programme to identify multiple human remains in the wake of an armed conflict or other situation of armed violence

3.1 Preconditions

The decision to use DNA analysis to identify human remains in the wake of a conflict should not be made unless a number of prerequisites are met.

- ❑ The additional cost and complexity of a strategy using DNA analysis must be outweighed by the anticipated additional benefit to the programme.
- ❑ The DNA must be recoverable from the remains.
- ❑ The frequencies of pertinent STR or other alleles must be established for the population in question by taking an adequate number of samples from within that population.
- ❑ Adequate reference samples must be obtainable either from samples taken from the missing person prior to his or her disappearance or from close relatives (see section 5, on page 15).
- ❑ The programme must have access to an accredited laboratory.
- ❑ The DNA techniques employed must be feasible and practicable in the context.

⁷ By convention, an individual's mitochondrial DNA is described in terms of how its sequence varies in comparison to the first complete published sequence of mitochondrial DNA: the Anderson sequence.

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- The DNA techniques must be reliable and scientifically valid. (This is not the same as the validation of a technique *by a given laboratory*. Validation is a process by which a procedure is evaluated to determine its efficacy and reliability for forensic casework. It includes strict testing of the technique against known variables and determining the conditions and limitations of the technique for use on forensic samples.)
- The hardware and software used to analyse and match DNA samples must be reliable and valid.
- The financial costs must be considered; these vary depending on the number of analyses required and the cost of each analysis in whichever laboratory undertakes to do the work.
- The wishes of the missing person's family should be considered. Under certain circumstances they may prefer that unidentified remains be buried with others in a common grave. In such cases, the costs of analyzing DNA may be too high and the process too time-consuming for the additional benefit.
- In relation to resources and logistics:
 - there is an important distinction between samples taken for DNA analysis to be performed within the country and those taken for analysis abroad;
 - the logistical implications of handling samples (including collection, storage, transport and a chain of custody) should be agreed to by all concerned;
 - an overall coordinating body should be in charge of collecting, labelling, transporting and analysing the samples. In the absence of such a coordinating body, how those steps are taken and by whom should be stipulated in advance according to competencies and in a written contract.
- Strategies should be established for dealing with errors of identification and with partial, commingled or unidentified human remains.
- All parties must agree on a protocol for communication, information and counselling strategies for the individuals and communities concerned. The information must be realistic but should not discourage participation. The protocol should mention the following points with regard to DNA analysis:
 - DNA analysis is not always required for identification;
 - it is not always possible to extract DNA from remains;
 - positive results will not always be achieved;
 - the process will entail entering individual DNA analyses in a database for the sole purpose of identification.
- Appropriate mechanisms which take into account confidentiality, follow-up and services must be established for informing the families about the process.
- There should be an "exit strategy" by which the process can be brought to a close when the cost and complexity outweigh the social benefit.

- ❑ Prior consideration must be given to the unintended impact on pre-existing legal and forensic services. For example, implementing such a programme may drain existing forensic expertise from an under-resourced local service that is barely able to deal with everyday criminal matters.

3.2 Other operational considerations

Once the above preconditions have been met, there remain a number of other important considerations.

DNA analysis must not be considered as the only method available for making a positive identification, because:

- ❑ traditional methods may prove more practical and less costly;
- ❑ traditional methods are needed anyway to confirm an identification arrived at by matching DNA profiles;
- ❑ DNA analysis is not always feasible from an operational perspective;
- ❑ it may put relatives under duress to provide samples.

The decision to use DNA analysis to identify human remains in the wake of a conflict should be made on sound scientific grounds. In any given context, an expert evaluation can help ensure the right decision is made by incorporating the science into practical aspects of the whole identification process. This will, to some extent, determine the resources required.

The decision should not be based solely on requests for DNA analysis generated by individuals, families, communities, organizations or governments. Therefore laws must not be enacted that make DNA analysis for the purpose of identification mandatory.

Requests by governments, organizations or individuals for the re-exhumation of remains previously identified using traditional means for the purpose of DNA analysis should be decided on a case-by-case basis.

In the pre-investigation phase, the social, religious and cultural characteristics of the community concerned must be taken into consideration. The families and the community will accept the outcome more readily if they have confidence in the investigation.

Forensic specialists have a duty to ensure that the donors of reference samples are informed about the rules governing the protection of personal and genetic information (see section 6, on page 16).

When DNA analysis is deemed necessary for identification:

- ❑ it must be performed in laboratories that:
 - o are accredited, which includes use of validated methods;
 - o handle remains, samples and data in accordance with the rules governing the protection of personal data and human remains, which include the protection of ante mortem data and DNA samples and results (see section 6 on page 16).

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- ❑ the laboratory performing the analysis must not operate on the basis of maximum profit; commercial considerations should be minimized and the accounts must be externally audited;
- ❑ any contract with a laboratory must include a reference to the rules governing the protection of personal data and human remains;
- ❑ incidental information such as non-paternity - in individual cases and as a community statistic - should be subject to the rules governing the protection of genetic information;
- ❑ with the input of lawyers, population geneticists, ethicists and laboratory researchers, consideration may be given to the use of *anonymous* data for the purposes of research, for example to establish allele frequencies;
- ❑ it is the responsibility of the head of the forensic team to ensure the laboratory respects these rules;
- ❑ even if the laboratory is of the highest standard, it may not have the technical or personnel capacity to undertake an increased workload at short notice.

4. Technical aspects of collecting and storing DNA samples

There are a number of technical points that serve as a checklist when collecting samples for DNA analysis. Samples should be collected using equipment such as sterile gloves to limit the risk that the sample will be contaminated with extraneous DNA. Regarding human remains, the following samples can be collected for DNA analysis:

- ❑ bone (preferably shaft of femur); *
- ❑ a tooth (or preferably two teeth) in the following order of preference: molar, pre-molar, canine, anterior tooth;*
- ❑ blood aspirated by syringes from major blood vessels; *
- ❑ fingernail clippings;
- ❑ head hair pulled out by the roots;
- ❑ any piece of soft tissue if fresh (less than 48 hours since death in hot climates).

Regarding missing persons, the following can provide reference samples of DNA for the purpose of comparative analysis:

- ❑ hairbrushes;
- ❑ toothbrushes;
- ❑ nail clippings;
- ❑ previous blood tests or tissue samples taken in hospital.

* tasks that should be performed only by forensic specialists or health professionals

Regarding the reference population (the families), samples can be collected:

- ❑ by pricking the finger and collecting drops of blood on absorbent paper (if the right kind of paper is not available, paper tissues, blotting paper or coffee filter paper can be used); *
- ❑ by vigorously rubbing the tip of a cotton swab or, if available, a collector fitted with filter paper on the inside of the cheek (oral cavity or buccal swab).

Storing samples:

- ❑ As a general principle, samples are best stored in plastic bags at around 4°C. This means it is best to use the refrigerator and not the freezer.
- ❑ Blood samples collected on paper and buccal swabs should be allowed to dry before they are stored. When dry, they do not necessarily have to be stored in a refrigerator, and their transport therefore does not require a logistic chain which ensures that the samples are kept cool.
- ❑ Each sample must be carefully labelled with its origin, date of collection and unique reference.
- ❑ Multiple samples must be numbered and stored in such a way that they can be easily located.

5. Collecting reference samples for DNA analysis

The collection of ante-mortem data involves compiling information that is obtained from next-of-kin and other relevant sources and which may serve to identify the victim or missing person, in order to compare that information with data obtained from human remains. This might include taking samples for DNA analysis from relatives of the missing person but must also accommodate the existence of alternative sources for the missing person's DNA, such as hairbrushes or razors; if such reference samples are not readily available, they may be requested from the immediate family.

As with the collection of all other ante mortem data, how the family and the community should be involved is a complex affair.

The collection of ante mortem data and of samples for DNA analysis may not involve forensic specialists, but the data and samples collected will be of no value unless they can be compared to the findings of forensic specialists. In principle, therefore, before any samples are collected for DNA analysis, a framework for collecting other ante mortem data, the exhumation procedure and the identification process must be defined and agreed to by all those involved, in particular as concerns:

- ❑ the legal principles governing the protection of personal data and human remains, which include the protection of genetic data as outlined in section 6, on page 16;
- ❑ the collection and management of the DNA samples and results (see section 4 on page 14.)

* tasks that should be performed only by forensic specialists or health professionals

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In principle, DNA samples should not be collected from a reference population outside the framework of a planned process to collect ante mortem data and to collect, exhume and identify remains.⁸ The fact that DNA samples are being collected from a family suggests that the missing relative is dead and may give rise to unrealistic hopes that the remains will be found and returned.

Once the prerequisites outlined in section 3 on page 11 have been met, the collection process must be well prepared and coordinated with all those concerned. There are other important considerations.

- ❑ The staff in charge of the collection process must be identified, selected, trained and supported so as to avoid secondary trauma.
- ❑ Psychological support for the families or individuals must be systematically planned and provided as an integral part of the collection process in order to help avoid further trauma. In principle, the aim should be to avoid multiple interviews and uncoordinated requests for DNA samples.
- ❑ A communication strategy that is agreed to by all those concerned must be implemented. The communities and families must be realistically informed about the processes by which both ante mortem data and DNA samples are collected and remains exhumed and identified.
- ❑ The fact that the identification process does not comprise DNA analysis does not mean samples should not be collected. Samples can be collected and stored. It may be possible or necessary to analyse them at a later date. Samples that are not analysed are covered by the same rules governing the legal protection of personal data and human remains as those that are analysed. The decision to proceed with collection alone will depend on whether or not the samples can be safely stored and catalogued, and whether there is a realistic possibility that the samples will be analysed in the future.
- ❑ All parties should agree on how the samples are to be collected, stored and transported and on a chain of custody. The number of parties involved, including the number of laboratories, should be kept to a minimum.
- ❑ If there is no overall coordinating body responsible for taking and labelling the samples, how the samples are transported and stored should be defined in advance according to competencies and agreed in writing.

6. Existing international, regional and domestic legal principles relating to the protection of personal and genetic data

6.1 Overview

The information contained in a person's DNA is sensitive because it is a unique identifier and because it can provide data about the person's family and intimate associations. It must be scrupulously protected to ensure the right to privacy. The information derived from DNA can also point to the person's genetic

⁸ See footnote 3.

predisposition to certain diseases and this in turn can bias medical insurance premiums against him or her. For all these reasons, almost without exception, countries that use DNA analysis for criminal investigation purposes have adopted laws protecting the genetic data so gathered.

International law does not have any specific provisions on the protection of genetic data. International humanitarian law and international human rights law recognize the need to provide special protection to persons affected by armed conflict.⁹ They contain no provisions on the protection of genetic data, only general principles relating to confidentiality, privacy, non-discrimination and human dignity.

In October 2003, UNESCO adopted the International Declaration on Human Genetic Data.¹⁰ The text underscores the importance for any practice involving the collection, processing, use and storage of human genetic data to be consistent with both domestic legislation and international human rights law. The preamble is particularly farsighted:

"[...] human genetic data have a special status on account of their sensitive nature since they can be predictive of genetic predispositions concerning individuals and that the power of predictability can be stronger than assessed at the time of deriving the data; they may have a significant impact on the family, including offspring, extending over generations, and in some instances on the whole group; they may contain information the significance of which is not necessarily known at the time of the collection of biological samples; and they may have cultural significance for persons or groups, [...]"

Technical errors must be kept to an absolute minimum. Other international institutions have also recognized the need for strict technical standards.¹¹

6.2 Protection of personal and genetic information: commonly accepted principles

One of the ICRC's 2002 workshops examined international agreements and recommendations together with national legislation and compiled a list of legal principles relating to the protection of personal and genetic data to be respected in all circumstances.¹² These principles have been developed as a result of

⁹ This refers in particular to persons deprived of their liberty, the wounded, displaced persons, refugees, and persons without news of their relatives.

¹⁰ UNESCO, The International Declaration on Human Genetic Data, 16 October 2003: http://portal.unesco.org/shs/en/ev.php-URL_ID=3479&URL_DO=DO_TOPIC&URL_SECTION=201.html.

¹¹ International Organisation for Standardisation, *General requirements for the competence of testing and calibration laboratories* (ISO/IEC 17025: 1999(E)), Geneva, ISO/IEC 1999. See also: *Interpol Handbook on DNA Data Exchange and Practice - Recommendations from the Interpol DNA Monitoring Expert Group*, 1st ed, Interpol, Lyon, 2001 (<http://www.interpol.int/Public/Forensic/dna/handbook.asp>).

¹² See: *The legal protection of personal data & human remains – Electronic workshop 02.04.2002 – 06.05.2002 – Final report and outcome*, ICRC, Geneva, 2003: [http://www.icrc.org/Web/eng/siteeng0.nsf/htmlall/5CALLJ/\\$File/ICRC_TheMissing_072002_EN_1.pdf](http://www.icrc.org/Web/eng/siteeng0.nsf/htmlall/5CALLJ/$File/ICRC_TheMissing_072002_EN_1.pdf).

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further legal research and are summarized here.¹³

The following relate to the protection of *all* personal data, including genetic data.

1. "Personal data" means any information relating to an identified or identifiable individual.
2. Personal data shall be collected and processed fairly and lawfully.
3. The consent¹⁴ of the individual is required for the collection and use of personal data except if that data is needed for reasons of overriding public interest or for the protection of the vital interests of the person concerned.
4. The collection and processing of personal data shall be limited to that which is necessary for the purpose identified at the time of collection, or beforehand.
5. Sensitive data should only be collected and processed with appropriate safeguards.
6. Personal data should be accurate, complete and updated as is necessary for the purpose for which they are used.
7. Security safeguards, appropriate to the sensitivity of the information, should protect personal data.
8. Personal data may not be used, disclosed or transferred for purposes other than those for which they were collected without the consent of the person concerned, except if required by a substantial public interest or for the protection of the vital interests of the person concerned.
9. Personal data may only be transferred to third parties who respect the principles of personal data protection.
10. Personal data should be deleted as soon as the purpose of their collection has been fulfilled, or when no longer necessary. They may, however, be retained for a definite period if required for the benefit of the individual to whom they relate or if essential for the performance of the humanitarian tasks of the organization which collected the data.
11. Access to personal data should be granted to the individual to whom the data relate. Provision should also be made for the right to challenge the accuracy and completeness of the data and to have them amended as appropriate.

¹³ See: Coupland R., Martin S. and Dutli M.-T., "Protecting everybody's genetic data", *Lancet*, 2005, Vol. 365, pp. 1754-1756.

¹⁴ "Consent" in relation to genetic data means "any freely given specific, informed and express agreement of an individual to his or her genetic data being collected, processed, used and stored". Consent cannot be obtained through pressure or coercion and a reasonable effort must be made to ensure that the individual is advised of the purposes for which the information will be used. The purposes must be stated in such a manner that the individual can reasonably understand how the information will be used or disclosed. See footnote 10.

Missing People, DNA Analysis and Identification of Human Remains
A Guide to Best Practice in Armed Conflicts and Other Situations of Armed Violence

The following set of principles relate specifically to the use of biological samples and the resulting DNA profiles.

1. The collection, use and disclosure of DNA profiles are subject to the rules relative to the protection of personal data.
2. DNA samples may be collected and analysed for an identified specific purpose only.
3. Identification of human remains through DNA typing should be undertaken when other investigative techniques of identification are not adequate.
4. DNA samples may only be taken and analysed with the consent of the individual, except where an overriding public interest dictates otherwise. An overriding public interest should be limited to criminal investigations or public security and, in case of death, to the identification of remains. The specific purpose should only be direct individual identification.
5. Only appropriately qualified persons shall take DNA samples and carry out forensic procedures.
6. DNA information collected may only be used and disclosed for the purpose identified at the time of collection, or beforehand.
7. DNA samples and profiles should be destroyed or deleted after they have served the purpose for which they were collected, unless required for related purposes.
8. Only certified or accredited laboratories should perform DNA analysis.
9. DNA samples, profiles and records should be adequately protected from unauthorized access and use.
10. DNA profiles or samples should only be disclosed, transferred or compared in the context of international cooperation for the purpose identified at the time of collection, or beforehand, and only with the consent of the persons concerned, except in determined cases defined by law. DNA samples should not be transferred except where the analysis is to be performed abroad.

MISSION STATEMENT

THE INTERNATIONAL COMMITTEE OF THE RED CROSS (ICRC) IS AN IMPARTIAL, NEUTRAL AND INDEPENDENT ORGANIZATION WHOSE EXCLUSIVELY HUMANITARIAN MISSION IS TO PROTECT THE LIVES AND DIGNITY OF VICTIMS OF WAR AND INTERNAL VIOLENCE AND TO PROVIDE THEM WITH ASSISTANCE.

IT DIRECTS AND COORDINATES THE INTERNATIONAL RELIEF ACTIVITIES CONDUCTED BY THE MOVEMENT IN SITUATIONS OF CONFLICT. IT ALSO ENDEAVOURS TO PREVENT SUFFERING BY PROMOTING AND STRENGTHENING HUMANITARIAN LAW AND UNIVERSAL HUMANITARIAN PRINCIPLES.

ESTABLISHED IN 1863, THE ICRC IS AT THE ORIGIN OF THE INTERNATIONAL RED CROSS AND RED CRESCENT MOVEMENT.

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