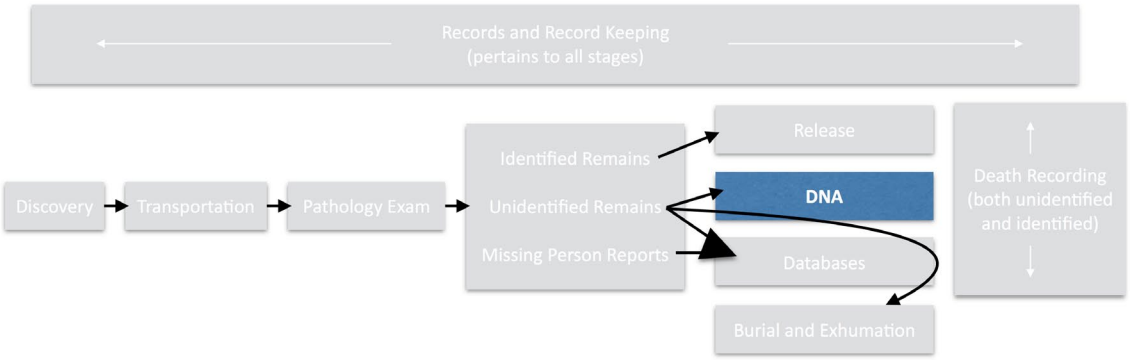
Section 7: DNA



INTRODUCTION

Identification through DNA is one of the most rigorous forms of positive identification, and is highly recommended. To use DNA for identification, at least two sets of DNA are necessary, a sample from the unidentified decedent and at least one from a biologically related family member (a biological mother or father, siblings who share a mother *and* father, and biological children), or a spouse *and* a shared biological child [37]. However, postmortem investigation practices on the border do not always include taking a DNA sample from each unidentified UBC. At the same time, numerous obstacles limit family members' submission of family reference samples for DNA comparison. Although Mexico has made progress organizing the taking of biological samples from families, as have several Central American countries, lax attention to the plight of UBC missing and unidentified does not encourage family participation. Non-governmental organizations such as the Argentine Anthropology Forensic Team also organize the collection of family reference samples.

Proper taking of samples is merely the first part of the process that includes the collection, preservation, recording, analysis and comparison, if DNA is to help identify human remains. Comparisons require the existence of databases that archive reports of UBC unidentified deaths. As such, the collection of missing persons reports in appropriate databases is the second part of the equation needed for DNA identification. At a national level, the National Institute of justice manages NamUs (National Missing and Unidentified Persons System) and the FBI maintains CODIS (Combined DNA Index System) (see Databases section for more details).

ISSUES

DNA is not systematically sampled for unidentified UBCs

1. Not all border jurisdictions responsible for postmortem investigations obtain a tissue sample for DNA comparison. Often lack of county funds is the principle factor (see Appendix B for a discussion of statistical estimations of social vulnerability in border counties). During survey, only 50 percent of officials could confirm that DNA was always taken on unidentified remains before release.

2. Other times, county officials have not received adequate training and simply do not know which services are available at the state and federal levels.

Families may be hesitant to provide DNA reference samples

Potential family members are often hesitant to provide DNA samples because they do not trust either their own government or that of the U.S. Fear of providing information for deportation or possible criminal investigations is widespread. But, without a sample for comparison, identification using DNA is not possible [40][41] (see section on Databases for an expanded discussion on privacy rights).

Informed Consent

Considering the high risk UBC families may have in providing DNA reference samples, informed consent is of primary importance. However, it is not routinely obtained as reference samples are entered into databases which do not protect their identities.

The federal law that regulates the use of humans in scientific research is called the Common Rule (45 CFR 46), the Federal Policy for Protection of Human Subjects, which lists stipulations for parental consent and requirements for informed consent. Common Rule provisions for informed consent do not apply for research involving only "the collection or study of existing data, documents, records, pathological specimens, or diagnostic specimens". It also does not apply to data that is "recorded by the investigator in such a manner that subjects cannot be identified" [42]. Unless DNA is compared in databases that do not record identities of subjects beyond the investigator searching for a match, informed consent is legally mandated.

DNA samples are costly and/or not possible

1. The basic analysis of DNA material is costly, and consequently, families, county governments, or foreign governments often cannot afford this procedure.

2. Ultimately, with the exception of the Center for Human Identification at the University of North Texas (UNT), costs are an obstacle (see Figure 13). However, many county officials were not aware that UNT would process DNA samples without cost to the submitting agency (see Figure 14).

3. Currently, there is no convenient means for family reference samples from outside the United States to be analyzed by UNT.

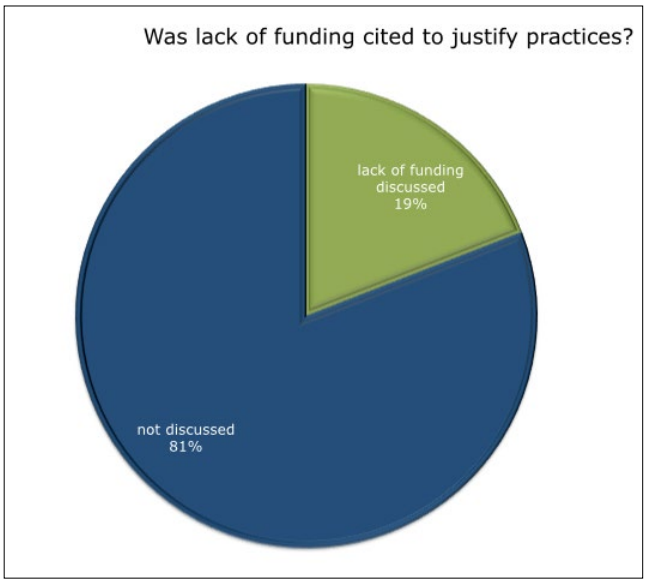


Figure 13: Even without asking, 20 percent of respondents cited lack of funding as a concern when deciding what protocol to follow to identify remains.

Both MtDNA and Nuclear DNA should not be required for samples to be compared in national databases

1. Currently, both MtDNA and nuclear DNA are required for entry into a federally-managed database. However, it is not always possible to obtain both types of DNA, given the decomposition of many recovered UBC remains.

2. The type of analysis needed to identify the highest number of unidentified UBCs is nuclear DNA with the CODIS markers. A compelling argument exists for the purpose of comparison, nuclear DNA is of greater instructive value than mtDNA (see Appendix C where this is discussed).

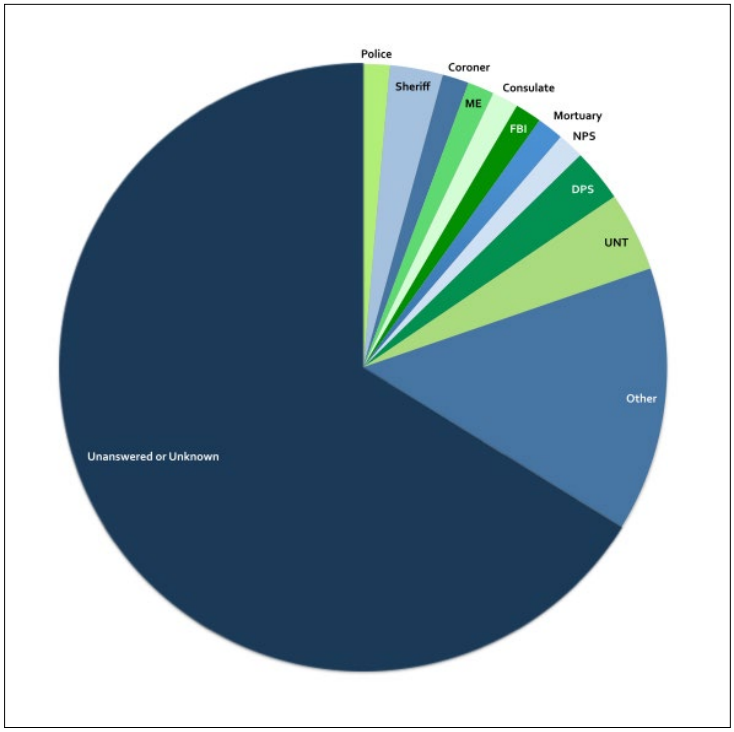


Figure 14: Based on survey responses, 68 percent of respondees did not know the answer or otherwise did not answer what agency most often paid for DNA sampling. Fourteen percent reported that the agency was not among federal or county agencies.

BEST PRACTICES

A DNA sample should be taken for all unidentified remains before burial or cremation

A sample may be tissue, blood, hair, bone or tooth. Multiple samples should be taken in the event that one sample is lost or destroyed.

Method for sampling

Please refer to the following professional manuals for established best practices regarding DNA sampling: National Institute of Justice Guide to Human Forensic Identification; the Interpol Disaster Victim Identification Guide [15]; and the National Center for Forensic Science Final Report on using technology to assist medical examiners and coroners in the identification of human remains [18].

Centralization

1. For DNA identification and comparisons, a central point should be designated where all stakeholders, county officials, foreign consulates, NGOs, and families can enter and access data on unidentified and missing individuals. Thereupon, as potential matches are identified, respective DNA samples are targeted for analysis.

2. Analysis should be referred to the proper authority as well as the family with whom the sample was compared. In the case of a match, the remains should be released to the family and/or the corresponding consulate.

Informed Consent

To protect privacy rights in the case of family reference samples, in the absence of informed consent, the DNA database cannot include information that would identify the source of the non-consent DNA [42][43].