OSAC 2022-S-0022
Standard for Disaster Victim Identification

Medicolegal Death Investigation Subcommittee
Medicine Scientific Area Committee (SAC)
Organization of Scientific Area Committees (OSAC) for Forensic Science

OSAC Proposed Standard

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Prepared by
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Foreword

Internationally, standards for disaster victim identification (DVI) are widely accepted, however mass fatality incident (MFI) operations in the U.S. have historically been conducted without such legal requirements or consensus review. The requirements herein establish a standard that shall be endorsed by medicolegal authorities responsible for approving official identifications in a mass fatality incident.

Accuracy of identification is a foundational principle of disaster victim identification operations. All scientific data and contextual information shall be reviewed prior to approving an official identification. This standard discusses the accepted data collection and quality assurance mechanisms used in the DVI process. This standard will prevent the premature release of a decedent's identification by the medicolegal death investigation authority.

This standard is put forth by the DVI Task Group within OSAC Medicolegal Death Investigation (MDI) Subcommittee. This document is intended to be the part of a series of standards and best practices developed by the DVI Task Group for medicolegal authorities involved in mass fatality incident response. This document originated from the Scientific Working Group on Disaster Victim Identification (SWGDVI).

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Standard for Disaster Victim Identification

1 Scope

The purpose of this document is to provide a standard for medicolegal death investigation authorities, practitioners, and planners to make accurate decedent identifications when responding to mass fatality incidents (MFI). This standard is applicable to any medicolegal jurisdiction, and incident scenario regardless of scale. The same basic processes are used worldwide; however, this document is intended for practitioners in the United States. This standard establishes protocols for a medicolegal authority to successfully conduct DVI operations but does not provide specific content that should be accounted for in individualized planning documents. This standard does not substitute for standards that will more specifically set forth minimum requirements or best practices for the protocols discussed herein.

2 Normative References

The following references are indispensable for the application of the standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ANSI/ASB Best Practice Recommendation 006, *Best Practices Recommendations for DNA Analysis for Human Identification in Mass Fatality Incidents*. 2019. 1st. Ed.

ANSI/ASB Best Practice Recommendation 007, *Postmortem Impression Submission Strategy for Comprehensive Searches of Essential Automated Fingerprint Identification System Databases.* 2018. 1st. Ed.

ANSI/ASB Best Practice Recommendation 008, *Mass Fatality Scene Processing: Best Practice Recommendations for the Medicolegal* Authority. 2021. 1st. Ed.

ANSI/ASB Best Practice Recommendation 009, *Best Practice Recommendations for the Examination of Human Remains by Forensic Pathologists in the Disaster Victim Identification Context*. 2019. 1st. Ed.

ANSI/ASB Best Practice Recommendation 010, *Forensic Anthropology in Disaster Victim Identification: Best Practice Recommendations for the Medicolegal Authority*. 2018. 1st. Ed.

ANSI/ASB Best Practice Recommendation 094, *Postmortem Impression Recovery: Guidance and Best Practices for Disaster Victim* Identification. 2021. 1st. Ed.

ANSI/ASB Best Practice Recommendation 108, *Forensic Odontology in Disaster Victim Identification: Best Practice Recommendations for the Medicolegal Authority*. 2021. 1st. Ed.

OSAC 2021-N-0008*, Victim Accounting: Best Practice Recommendations for Medicolegal Authorities in Mass Fatality Management*

3 Terms and Definitions

3.1
comprehensive identification

Name association resulting from a consensus review of all deconflicted information prior to official identification approved by the medicolegal authority; or the process of establishing it.

3.2
consensus

Substantial agreement among discipline specific experts after consideration of all available information, and reconciliation of conflicts.

3.3
closed population incident

An incident in which the number of victims and their names are known.

3.4
disaster victim identification
DVI

Associating a name with human remains through the application of scientific methods and statistics, as a component of mass fatality management.

3.5
discipline-specific preliminary identification

Name association established by a specific scientific modality (e.g., fingerprints, odontology, DNA) prior to reconciliation; or the process of establishing it.

3.6
group remains

Collection of biological tissue that is not identifiable nor associated with a particular decedent (also referred to as common tissue) that is commonly treated as a singular entity for the purpose of final disposition.

3.7
identification

Identification is a general term for a name associated with recovered human remains.

3.8
mass fatality incident
MFI

Any incident which produces fatalities of a sufficient number or complexity that special operations and organizations are required.

3.9
mass fatality management

The overarching operation for processing fatalities in a disaster incident, including scene, morgue, and family assistance (victim information) operations for which specific protocols are maintained within a medicolegal authority's mass fatality plans.

3.10
medicolegal death investigation authority

The person or persons whose legal or statutory authority it is to perform medicolegal death investigations for a designated jurisdiction and ensure certification of cause and manner of death. The term medicolegal authority is an abbreviation for medicolegal death investigation authority, and when used in this document, shall be construed as though it were written out in full.

3.11
official identification

Name association approved by the medicolegal authority and recorded on the death certificate.

3.12
open population incident

A disaster in which neither the number of victims nor their names are known.

3.13
reconciliation

The process of using information to resolve conflicts for the purpose of confirming or refuting an identification. Interpol defines this more broadly as the comparison of antemortem and postmortem data.

3.14
scientific identification

The collection and comparison of antemortem (AM) and discipline-specific postmortem (PM) data to establish an identification.

4 Requirements

4.1 General

Disaster Victim Identification (DVI) is a component of MFI operations utilizing personnel with specialized subject matter expertise. The objective of DVI operations is to accurately identify

human remains, often in high throughput morgue operations. Identification procedures have been developed over decades and vetted through experience and lessons learned from mass fatality incidents worldwide. Some stakeholders (e.g., politicians, Incident Commanders, media) may try to pressure a medicolegal authority into releasing victim identifications quickly, and often prematurely. Accordingly, the medicolegal authority shall assert their statutory responsibility to ensure the integrity of the identification process, free of external influence, and adhere to this standard.

Visual identification, without scientific confirmation, is insufficient for DVI operations. Identifications made by fingerprint, dental, or DNA comparisons shall be reviewed, and official approval provided by the medicolegal authority. When multiple scientific modalities are used, each shall be reviewed and approved independently. In incidents involving fragmentation, consideration shall also be given to the principles of victim accounting and re-association of human remains bearing the same identification.

The DVI process seeks to identify recovered human remains to the exclusion of all other individuals in the world. However, the ability of the forensic sciences to achieve “discernible uniqueness” has been challenged. Consequently, the Department of Justice has issued Uniform Language for fingerprint examiners, which does not allow examiners to claim “individualization” nor assert “100 percent level of certainty” or even “scientific certainty” when making an identification. In MFIs, the DVI team may be faced with fragmentation, partial incineration, and decomposition that can further complicate victim identification efforts.

Mistaken identities have occurred. Accordingly, the term “positive identification” shall not be used. Through discipline specific identifications and reconciliation, the DVI process shall confirm individual scientific identifications with as much accuracy and certainty as can be attained under the circumstance.

In mass fatality incidents the medicolegal authority shall use scientific methods of identification. Identification by families and friends, without scientific confirmation, is insufficient for disaster victim identification. Scientific identification shall require collection and comparison of antemortem (AM) and postmortem (PM) data to establish a discipline-specific preliminary identification. The consensus review process shall be used to reconcile conflicts, before recommending a comprehensive identification for approval by the medicolegal death investigation authority. This standard is applicable, and scalable to all mass fatality incidents.

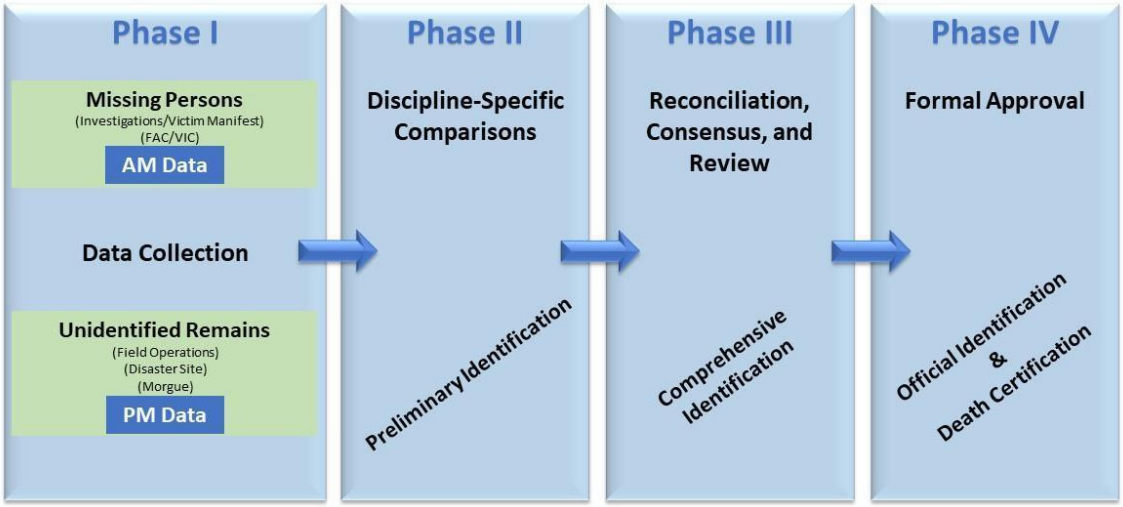

Figure 1 – Phases of Disaster Victim Identification

4.2 Phase 1: Data Collection

Antemortem data should be collected from families and friends in the Victim Information Center (VIC), a component of the Family Assistance Center (FAC). This shall include descriptive information about the deceased person, photographs, and familial DNA reference samples[15], in addition to information about the availability and location of medical, dental, and fingerprint records, antemortem x-rays, and the presence of implanted medical devices or prostheses. Postmortem data is collected by discipline-specific experts - odontologists, fingerprint specialists, DNA technicians, anthropologists, and pathologists - in the morgue. Specific data collection methods and morgue operations are set forth in other documents produced by the DVI task group.

4.3 Phase 2: Comparison and Discipline-Specific Preliminary Identification

The objective of comparing AM information of missing persons with PM data collected from unidentified human remains is a discipline-specific preliminary identification. DVI operations may require, or benefit from the use of, multiple scientific modalities to establish identifications. Therefore, the medicolegal authority shall determine which modalities are best suited to each specific incident. Discipline specific procedures and protocols are implied but will not be discussed in this standard. Quality control and assurance reviews, including technical and administrative reviews, shall be conducted as a part of the discipline-specific identification process. These procedures may vary by jurisdiction and shall be documented in the agency specific planning documents.

Specialized software programs and data management tools (e.g., databases, spreadsheets, whiteboards) can aid the comparison process. Identifying characteristics such as sex, ancestry, or height facilitate comparison efforts by sorting, filtering, or visualizing comparative data. Software generated identifications shall be reviewed and interpreted by discipline-specific experts. Additionally, non-scientific data such as personal effects, visual observations, or contextual information from the incident may produce name associations, which may further support the identification process and aid in re-associating remains. Alone, such circumstantial information shall not be considered conclusive for the purpose of establishing a comprehensive identification, nor approving an official identification.

4.4 Phase 3: Reconciliation and Consensus

Reconciliation and a consensus-based review are critical quality assurance components of a standard for identification. The medicolegal authority's response plan may direct the establishment of a committee responsible for performing the task of reconciliation. Through a consensus-based approach, the committee shall present their recommendations for or against an identification to the medicolegal authority.

Committee membership shall include all of the disciplines or scientific modalities involved in the identification process. Consideration may be given to include other response agencies and stakeholders (i.e., diplomatic personnel) as observers who are not directly involved in the consensus review and reconciliation of data.

Independent lines of evidence supporting the same conclusion of identification are important from a quality assurance perspective. The committee shall consider, and when necessary de-conflict, data and contextual information that do not align. This shall involve an evaluation of data from each of the scientific disciplines for consistency and strength of evidence. Consensus based deliberations seek to either refute or confirm the discipline-specific preliminary identification.

The committee shall recommend that the identification is: 1) rejected, 2) inconclusive pending additional data, or 3) accepted. When consensus cannot be achieved because of one or more conflicts, or evidence that is deemed inconclusive, further investigation shall be performed (e.g., DNA reference samples or additional dental records).

The work product of the committee is a comprehensive identification, which describes the modalities and contextual evidence supporting the identification. The identification report shall be rigorously and systematically reviewed to ensure that the information included is correct and complete. Committee members who sign the report shall attest that discipline-specific quality assurance mechanisms and standards were followed.

4.4.1 Open or Closed Population Incident

An MFI can either involve an open or closed victim population. Scientific modalities shall be utilized in the identification process regardless of which population type is involved. In a closed population incident where the victim population is known (i.e., airline manifest), the process of elimination is useful for identification when one has confidence in the unique attributes, characteristics, or demographics of the population. In an open population incident where the victim population is unknown (i.e., hurricane), an elimination process cannot be relied upon due to the possibility of random similarities in the general population. As a result, an open population increases the complexity of DVI operations.

4.4.2 Fragmented Remains

In addition to identification of intact remains, the medicolegal authority may be confronted with fragmented remains which can be re-associated using morphological or molecular methods. The criteria for how fragmented remains will be identified shall be periodically re-evaluated and may evolve throughout the DVI operation, as the population dynamics change. The complexity of victim accounting increases with fragmentation. After all probable victims are accounted for, the medicolegal authority should consider whether it is feasible to continue identification of individual fragments. This decision may be impacted by the perceived need to account for all victims, particularly in open populations.

Commingling of fragmented remains present additional challenges due to the need for sorting and subsequent identification by discipline specific modalities. The medicolegal authority shall establish a procedure for separating commingled remains prior to the discipline specific analysis. Concerns for potential contamination of DNA samples should be addressed and mitigated to the extent possible. Once officially identified, DNA profiles can be used as reference samples to scientifically re-associate, or exclude, other fragmented remains.

Some fragmented remains may not be identifiable, through either molecular or morphological techniques. The medicolegal authority shall develop a plan for managing the final disposition of these grouped remains.

4.4.3 Use of Statistics and Probabilities

The use of statistics and probabilities in disaster victim identification is inherent to discipline specific modalities of identification.

DNA identifications are now routinely expressed in statistical terms. Probabilistic statements for fingerprint identifications are used by the U.S. military, but not by the Department of Justice. There have been attempts to apply statistical analysis to anthropological identifications and dental identifications. The two primary statistical approaches used are the probability of a random match (a frequentist approach) and a likelihood ratio (a Bayesian approach). The

International Society of Forensic Genetics (ISFG) further recommends genetic testing, and the use of likelihood ratios when making identifications in DVI operations.

If statistical standards are used for disaster victim identifications, then the standards shall be specific to the MFI. For example, in the 9/11 World Trade Center disaster, a Kinship and DNA Analysis Panel (KADAP) was established to set a minimum statistical threshold for DNA-based identifications. Different thresholds were set based on the information present for a set of remains (e.g., known sex) and estimated demographics of the victim population. These thresholds were adjusted as estimates of the victim population were refined over time. If this threshold was met, then the identifications were automatically accepted based on statistical probabilities.

4.4.4 Minimization of Confirmation Bias

Disaster victim identification shall be conducted with an awareness for confirmation bias, and human tendency to seek information that either supports, or ignores that which is contrary to one's belief. Confirmation bias is greatest when a subjective determination is being made, therefore the identification process shall be engineered to avoid potentially false "positive" identifications. Steps to be taken to combat confirmation bias shall include:

- Separating AM and PM data collection.
- Evaluating discipline-specific data independent of other modalities or contextual data.
- Defining evaluation criteria in advance, utilizing metrics that are measurable and objective.
- Utilizing automated data matching methods, confirmed by discipline-specific experts.
- Blinding reviewers to the extent possible
- Sequential unmasking of domain relevant information

4.4.5 Phase 4: Formal Approval

The medicolegal authority is responsible for approving the official identification that will be recorded on the death certificate. The comprehensive identification report shall be presented to the medicolegal authority only after consensus is achieved and all conflicts resolved. The medicolegal authority shall approve or reject the identification, referring the latter for further investigation. Once the official identification is approved, next of kin notification, media release and transfer of the remains for final disposition can be completed.

Annex A
(informative)

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