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The role of Forensic Anthropology in identifying human commingled remains: a literature review

Ivo Lacerda [1,2,ǂ], Joaquim Rodrigues [1,2,ǂ,*], Inês Morais Caldas [1,2,3], Áurea Madureira-Carvalho[1,2] and Manuela Oliveira [1,2,4]

[1] Associate Laboratory i4HB - Institute for Health and Bioeconomy, University Institute of Health Sciences - CESPU, 4585-116 Gandra, Portugal
[2] UCIBIO - Research Unit on Applied Molecular Biosciences, Forensic Sciences Research Laboratory, University Institute of Health Sciences (1H-TOXRUN, IUCS-CESPU), 4585-116 Gandra, Portugal
[3] Faculdade de Medicina Dentária da Universidade do Porto, Rua Dr. Manuel Pereira da Silva 4200-393 Porto, Portugal
[4] OSI – Homeland Security Observatory, 4585-116 Gandra, Portugal
[ǂ] these authors contributed equally to this work

* Correspondence: a35358@alunos.cespu.pt

Abstract

Background: Forensic Anthropology is a critical tool in war crimes investigations, particularly in analyzing mass graves where human remains are often commingled and fragmented. It enables victims' identification while supporting human rights violations documentation [1-3]. This review focuses on the Minimum Number of Individuals (MNI), a central method for analyzing such remains. **Objective:** To examine the role of Forensic Anthropology in the investigation of mass graves, with a specific focus on MNI estimation, and to evaluate the methodologies applied to improve MNI accuracy and their implications for identification and legal outcomes. **Methods:** A systematic search was conducted from 2022 to 2025 in PubMed, Scopus, and Web of Science. Keywords included “war crimes”, “Forensic Anthropology”, “Bones”, “Mass disasters”, “Mass graves”, and “Minimum number of individuals”. Inclusion criteria were peer-reviewed research articles, full-text articles directly addressing the topic. Papers outside the timeframe or lacking methodological rigour were excluded. Sixteen studies were selected for review. **Results:** The 17 reviewed studies emphasized recurring challenges in estimating MNI in mass grave contexts. Most relied on traditional osteological methods—classifying bones by type, side, size, and morphology—to identify the minimum number of distinct individuals. Taphonomic factors such as decomposition and environmental exposure often hindered visual assessments. To increase precision, researchers used demographic indicators (e.g., age and sex) to differentiate remains. DNA analysis was applied as a complementary technique in complex cases involving damaged or incomplete bones. Though resource-intensive, molecular methods proved valuable in verifying or refining MNI estimates. The findings reflect the complexity of victim identification in mass graves and underscore the importance of integrating classical anthropological approaches with advanced technologies. **Conclusions:** MNI determination is essential for scientific and legal processes, since Forensic Anthropologists convert physical evidence into reliable documentation of atrocities, supporting justice and historical record.

Keywords: Forensic Anthropology; mass graves identification; minimal number of individuals

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References

1. Kovras, I. Technologies of justice: Forensics and the evolution of transitional justice. *Eur. J. Int. Relat* **2023**, *29(1)*, 29-52, doi: 10.1177/13540661221127700
2. Hanson, I., & Fenn, J. A review of the contributions of forensic archaeology and anthropology to the process of disaster victim identification. J Forensic Sci. **2024**, *69(5)*, 1637-1657, doi: 10.1111/1556-4029.15553
3. Vaswani, V. et al. Corpse identification in mass disasters and other violence: the ethical challenges of a humanitarian approach. *Forensic Sci. Res.* **2024**, *9(1)*, owad048, doi: 10.1093/fsr/owad048