



A75 Forensic Anthropology Casework Performance: Assessing Accuracy and Trends for Biological Profile Estimates on a Comprehensive Sample of Identified Decedent Cases

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Learning Overview: After attending this presentation, attendees will better understand the utility of the Forensic Anthropology Database for Assessing Methods Accuracy (FADAMA) data for highlighting performance trends in forensic anthropology and how it can help target future method and sampling improvement.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by demonstrating the utility of FADAMA data for critically assessing performance trends in the field of forensic anthropology.

FADAMA (<https://www-app.igb.illinois.edu/sofadab/>) is an online repository for data from identified skeletal cases. The purpose of FADAMA was to establish a tool with which forensic anthropologists can ask, analyze, and answer questions of casework and method performance on a community-wide scale. Such work requires a large number of cases in which the biological profile of the decedent is confirmed. FADAMA provides the first free and virtual organized space to share approaches to casework and casework outcomes. FADAMA is sponsored and maintained by the Society of Forensic Anthropologists.

After attending this presentation, attendees will understand the accuracy rates and trends in forensic anthropology casework, specifically regarding the assessment of the biological profile. FADAMA cases ($n=359$) were analyzed to explore the following: (1) overall accuracy rates per biological profile component; (2) whether trends (e.g., demographic; reporting) exist related to inaccuracy rates; and (3) overall case-level performance in assessing the biological profile.

Accuracy rates for the four biological profile components ranged from 86% to 98%, with sex estimates performing the best and stature performing the poorest, with ancestry (94%) and age in the middle (92%). Age estimations are the most frequently reported biological profile component (340 out of 359), while stature is the least frequently reported component (101 out of 359).

Analyses of trends in accuracy rates per biological profile component yielded noteworthy results. For stature, cases with inaccurate ($n = 14$) estimates were more frequently a result of overestimating stature ($n = 12$) than underestimating ($n = 2$). Cases that overestimated stature tend to have smaller errors (0.14"–3.83") compared with those cases that underestimated (3"–6.3"). Univariate non-parametric tests revealed that identified sex, age, stature, and race did not yield a statistically significant relationship with stature accuracy. However, 8 of the 14 inaccurate stature estimates were Hispanic individuals.

For sex, the majority of the identified FADAMA cases were male (70%). While the overall sex estimation inaccuracies were the lowest of any biological profile component, females were missexed approximately ten times more often than males.

For ancestry, the majority of identified individuals were White (48%), with African American (23%) and Hispanic (23%) the next most-common categories. Regarding ancestry estimation performance, African Americans and Whites had the lowest inaccuracy rates (3.6% and 3.2%), while Hispanics (11.9%) and Asian/Pacific Islanders (22.2%) demonstrated substantial inaccuracy rates. Chi-squared tests confirmed the significance of these trends between identified race and ancestry estimation accuracy ($n = 248$, Pearson $p = 0.019$). Furthermore, identified sex was related to ancestry estimation accuracy ($n = 247$, Pearson $p = 0.047$), with females' ancestry more frequently inaccurately estimated.

For age estimates, inaccuracies did not occur more frequently in a particular age cohort (young/middle/older adults). For inaccurate cases, error rate was balanced between underestimating ($n = 15$) and overestimating ($n = 13$) identified age. However, cases that overestimated age tended to have greater errors. Reported age ranges appear to increase per age cohort, such that the older adults generally had the largest ranges (median = 39 years), while the young adults had the smallest age ranges (median = 10 years).

Regarding case-level performance trends, for the cases with submitted estimates for all four biological profile components ($n = 78$), 76% accurately estimated all four, while 20.5% got one component wrong, and 4% inaccurately estimated two components. When considering all cases that submitted estimates for at least one biological profile component ($n = 358$), it was found that as the number of components estimated increases, so does the number of inaccurate estimations.

This presentation impacts the forensic science community by demonstrating the utility of FADAMA data for highlighting performance trends in forensic anthropology and can help target future method and sampling improvement. As case data continue to be added to FADAMA, forensic anthropologists can gain a more comprehensive perspective on the state of casework.

This research was funded by the National Institute of Justice (NIJ; DOJ-DUBX-0213). Opinions, points of view expressed in this research, and products discussed represent a consensus of the authors and do not necessarily represent the official position, policies, or endorsement of the United States Department of Justice (DOJ) or NIJ.

Anthropology, Accuracy, Biological Profile