

## Current Practices in Forensic Anthropology for Sex Estimation in Unidentified, Adult Individuals

Alexandra R. Klales, MS\*, University of Manitoba, Department of Anthropology, 435 Fletcher Argue Building, Winnipeg, MB R3M 2K4

This paper presents an analysis of the methods currently employed by forensic anthropologists to estimate the sex of an unknown, adult individual and the current practices for reporting results when multiple methods are employed. This research is part of a larger study analyzing the same information within all of physical anthropology, including skeletal biology and bioarchaeology, in addition to forensic anthropology.

This presentation will impact the forensic anthropology community by reporting the variation within the field for sex estimation from the human skeleton. The goal of this research is to disseminate the results of a questionnaire among practitioners to promote discussion and standardization. Understanding the degree or variability, method preference, and modes of reporting is the first step towards standardization within the field of forensic anthropology for sex estimation practices.

Estimation of sex is generally the first step when constructing the biological profile of an unidentified individual, primarily because most of the methods currently used for ancestry, stature, and age estimation are sex-specific. Current methods used to estimate sex consist of either quantitative measures of skeletal elements or qualitative observations of gross morphology, primarily of the pelvis and skull. Historically, morphological assessments dominated forensic anthropology, especially for sex and ancestry estimation; however, there has been a shift in the past several decades towards the development of quantitative approaches (1). Furthermore, attempts have been made to standardize the various methods used for biological profile estimation and the data collection process, including Buikstra and Ubelaker's (1994) work *Standards for Data Collection from Human Remains* (2), best practice recommendations for sex assessment by the Scientific Working Group for Forensic Anthropology (3), and more recently with the Osteoware Standardized Skeletal Documentation Software (4). Despite attempts for standardization, the methods employed and the way in which the results are reported for biological profile parameters varies considerably by practitioner. In many forensic cases, both metric and morphological methods are employed for sex estimation to generate the biological profile. Inconsistency within forensic anthropology for sex estimation method preferences, method applications, and subsequent result reporting is problematic in light of the *Daubert* decision (5) and raises questions of methodological protocol for sex estimation and consistency within the field.

An electronic questionnaire was created and participants were recruited via email through a bulk list server distribution from professional organizations that included forensic anthropologists or through announcement of the research on these organization's websites. The online questionnaire consisted of 32 questions concerning the participant's education, background, and their preferences and practices for sex estimation. Like Garvin and Passalacqua's (6) research on current age-at-death estimation practices, a multiple choice format was utilized when possible and for the methodological questions, a rank system was used and included an area for additional written comments. The survey software double-blinded all identification information, so that participation in the survey was anonymous on all accounts and participants were not compensated for taking part in this research.

Responses were received from 152 individuals; however, for this component of the research only the individuals who self identified as forensic anthropologists were analyzed (n=92). The pelvis was overwhelmingly preferred as the best indicator of sex (94.3% selected as first choice), followed next by use of the skull (64.8% selected as second choice), and then by the long bones as the third preferred area (65.1% selected as third choice). Using qualitative measures, traits listed in *Standards* were ranked highest for the skull and for the pelvis the three traits of Phenice (7) ranked highest. For metric assessment, *FORDISC* (8) was the preferred method for the skull and postcrania. Most practitioners (63.6%) prefer to use both qualitative and quantitative methods; however, when both are not used, qualitative methods (23.9%) were preferred nearly twice as much as metric methods (12.5%). Finally, when results from the multiple methods employed disagreed, 41.2% of practitioners presented the results of all methods, 20.0% gave preference to one skeletal area over the results from others, and 15.3% decided which assessment to assign the individual based on experience and the overall impression. These findings highlight the high degree of variability in the methods used for sex estimation and the need for standardization within the field.

Keywords: Sex Estimation, Biological Profile, Standardization

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