H99 Forensic Anthropology and Age-at-Death Estimation: Current Trends in Adult Age Estimation

Heather M. Garvin, MS, Johns Hopkins University, 1830 East Monument Street, Room 302, Baltimore, MD 21205; and Nicholas V. Passalacqua, MS, 3518 Hagadorn Road, Okemos, MI 48864-4200*

The goal of this presentation is to summarize the preferred skeletal age-at-death estimation methods across the field of forensic anthropology by analyzing forensic practitioner responses to a questionnaire.

This presentation will impact the forensic science community by familiarizing attendees with the high degree of variation present in methods used to generate adult skeletal age-estimates, providing an opportunity to unite the field and discuss future improvements in standardization.

Determining an accurate estimation of age-at-death from unknown adult skeletal remains continues to be a challenging responsibility of skeletal biologists. As the discipline of forensic anthropology continues to advance as a science it is crucial to be aware not only of one's own methodological decisions, but how these decisions are being made throughout the field. This is a difficult task when different skeletal regions may be used to estimate age, and numerous aging methods for the same skeletal region/s are available. Each method may provide different forms of phases, mean ages, age ranges, standard deviations and/or standard errors which may be used to produce an age estimate. Many of these methods have been developed or tested on distinct temporal and/or geographic skeletal samples, resulting in inconsistent reports of accuracy and reliability. Furthermore, there is no standardized way of combining information from multiple age-estimation methods. These are all questions that could be raised in a court of law, especially in light of the *Daubert* Challenge.

Given the variation of preferred skeletal aging methods and the lack of standardization to the age-estimation process, the authors were interested in understanding how forensic practitioners actually determine which age estimation method to use. A questionnaire was devised to determine if there is a universal set of methods used by all forensic anthropologists, or if methodological preferences are unique to each practitioner. The study investigated whether the accuracy and reliability of the techniques when applied to various age, sex, or ancestries of the individuals are considered? How much does personal experience weigh into these decisions? How are the results from multiple methods incorporated into a final age-estimate for the unknown set of remains and how discrepancies between two methods are resolved? Are the standard deviations, standard errors, age ranges, or means used when considering the possible age-estimate of the decedent? Is there pressure from officials to present unrealistically narrow age ranges and if so, how is this issue approached?

An anonymous questionnaire was sent to members of the Physical Anthropology section of the American Association of Forensic Sciences as well as other skeletal biologists. Information regarding experience, preferred aging techniques, and methods used in producing a final age- estimate were blindly collected through the use of an online survey application. The results of more than 125 questionnaires were then analyzed, producing descriptive statistics to be used to inform the forensic society of the variation in currently practiced aging methods. From this knowledge, areas necessitating future advancements in age- estimation techniques can be identified, and improvements suggested.

Preliminary results suggest that personal experience weighs very highly both in determining an age range within a single method and when combining results from multiple methods to obtain a final age-at- death estimate. The Suchey-Brooks pubic symphysis method remains the most highly favored age-estimation technique, with cranial sutures and dental wear being reported as the least preferred, regardless of experience. The majority of respondents stated that they vary their skeletal age-estimation process case-by-case and ultimately present to officials both a narrow and broad possible age-range. Overall, however, respondents displayed a very high degree of variation in skeletal regions preferred, the methods chosen to age those regions, age information extracted from the methods, and ways in which information from multiple sources is pooled and contribute to a final reported age-at-death estimate.

To maintain the reputation of forensic anthropology as a science, there should be standardized methods in determining accurate age estimates, which have been validated, and proven reliable and replicable. The first step of this process must be awareness of the current state of the discipline.

Age-at-Death, Biological Profile, Standards

 ** Presenting Author*