G110 Cremation Weight: Sex and Age Variation in North Carolina

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After attending this presentation, attendees will better understand the utility of cremains weight for the estimation of biological profile parameters such as sex. This presentation will illustrate the necessity for a better understanding of the limitations faced by forensic scientists when analyzing cremated human skeletal remains.

This presentation will impact the forensic science community by developing standards for cremation weights in North Carolina.

As commercial cremation is becoming more widely chosen over burial, this presentation will impact the forensic community by increasing the regional data available to the forensic investigator.

The Cremation Association of North America (CANA) projected that by 2010 the number of people choosing cremation over burial would increase to close to 36%. This increase in commercial cremation will most likely increase litigation involving issues of identity and negligent cremation practices such as the high-profile case of the Tri-State Crematory in Georgia.[1]

Cremation weights are important sources of data in that they can be used to estimate the minimum number of individuals present in situations where commingling may be a possibility.[2] Regional mean cremation weights have been established for males and females for Florida, Tennessee, and California.[3-5] The purpose of this study was to develop standards for North Carolina using a large sample of unclaimed cremains held at the North Carolina Office of the Chief Medical Examiner (NC OCME) from the years 2005 to 2013. The sample totals 303 (♀ = 60; ♂ = 243) individuals with known demographics (e.g., age-at-death, forensic weight, biological sex, and stature). The cremains are stored in a plastic urn weighing 0.5kg. Cremains were weighed using an autopsy digital floor scale and the box weight was accounted for by calibrating the scale to include the weight of the urn. Interestingly, the mean weights for males and females are greater than published weights (mean ♀ weight=2,766.96g, SD=623.29; mean ♂ weight=3,531.73g, SD=651.27). Results show that male and female cremains weights are significantly different (F (1, 301) = 67.46, p=<0.0001). A logistic regression was conducted to examine sex classification parameters. The following equation can be used to estimate sex from an unknown set of cremains: Sex=4.5938037 + -0.0019079* (cremains weight), SE=0.8694189. A positive value would indicate a female, while a negative value would indicate a male. Individuals were also grouped into the following age categories (1 = 19-30, 2 = 31-50, 3 = 51-65, 4 = 66+) in order to examine if age had an effect on cremains weight. This was examined with a one-way Analysis of Variance (ANOVA) conducted on each sex separately. Results show that age-at-death does not have an effect on cremains weight for either females (F (3, 55) = 2.69, p = 0.06) or males (F (3,237) = 2.31, p=0.08).

References:

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