H11 Variation in Cremains Weight: Tennessee vs. Florida

William M. Bass, PhD, and Richard L. Jantz, PhD, University of Tennessee, Department of Anthropology, 250 South Stadium Hall, Knoxville, TN 37996-0720*

After attending this presentation, attendees will know that the weight of cremated human remains (cremains) exhibit considerable variation, and that weights derived from one sample cannot be extrapolated to other samples.

The presentation will emphasize to forensic anthropologists that cremation weights vary and that much more information is required if we are to understand the variation.

The weight of cremains is of interest in medico-legal situations where questions arise about whether commercial crematoria have returned appropriate remains to family members. We have only been able to identify one published study providing weights of cremated human remains on a statistically valid sample (Warren and Maples 1997), which reports weights from a Florida sample. Since cremains weight reflects bone mass, it is not unreasonable to expect that it will vary regionally, as other anthropometric features do.

A study of weights obtained from a commercial crematorium in East Tennessee was undertaken in order begin an investigation of variation in weight of cremated remains. Cremation was performed according to the standard procedure of the crematorium using standard equipment. Remains were weighed using an OHAUS digital scale,

model CS5000, to the nearest gram. Age, sex and race were recorded, but body weight or other anthropometric information was unavailable. Since races other than white were uncommon, the analysis was limited to whites. The sample consists of 151 males and 155 females, ranging in age from 18 to 99.

Summary statistics for cremains weights in grams are:

Sex	Mean	S.D.
Males	3379.77	634.98
Females	2350.17	536.43

These weights are about 500 grams greater than those reported by Warren and Maples, a highly significant difference. We also found that cremains weight decreases with age; the decrease begins earlier and proceeds more rapidly in females than in males. Weight loss with age is related to bone loss in older individuals. The relationship with age does not explain the difference between the Florida and Tennessee samples. Tennessee cremains are heavier when age is controlled.

There are two possible explanations for the difference in cremains weights: 1) difference in cremation technique or 2) difference in bone mass. Unfortunately, the question cannot be answered definitively with evidence available. Cremation techniques are fairly standard so the difference is more likely due to bone mass. Since premortem height and weight are unavailable on the Tennessee sample, this possibility cannot be addressed directly. Regardless of the cause, the results reported here make it clear that there is substantial variation, and cremation weights from one sample cannot be extrapolated to other areas. Whether variation is patterned regionally is not known and the answer to this question must await additional information.

Warren MW, Maples WR. The anthropometry of commercial cremation.
J Forensic Sciences 1997;42:417-423.

Cremation Weights, Bone Mass, Forensic Anthropology

 ** Presenting Author*