Cremains Weight: Sex and Age Variation in North Carolina

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Introduction

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 percent. This increase in commercial cremation will most likely increase litigation involving issues of identity, 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 minimum number of individuals 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 (3,4,5).

Purpose

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) between the years 2005 to 2013.

Materials and Methods

- 303 (♀ = 60; ♂ = 243) individuals with known demographics were weighed using a digital autopsy floor scale (Figure 1 )
- Cremains are stored in a plastic urn weighing 0.5 kg (Figure 2)
- Mean weights for males and females were calculated
- A logistic regression was conducted to examine sex classification parameters
- 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 by using a one-way ANOVA conducted separately for each sex

Results

- The mean weights for males and females are greater than published weights (Table 1)
- Results show that male and female cremains weights are significantly different (F (1, 301) = 67.46, p < 0.0001)
- Results show that age-at-death does not have an effect on cremains weight for either females (F (3, 53) = 2.69, p = 0.06) or males (F (3, 237) = 2.31, p = 0.08)

Prediction equation to estimate sex from an unknown set of cremains:

\[ \text{Sex} = 4.5938037 + (-0.0019079 \times \text{cremains weight}) \]

\[ SE = 0.8694189 \]

A positive value would indicate a female, while a negative value would indicate a male

Table 1

<table>
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<th></th>
<th>NC</th>
<th>Mean</th>
<th>SD</th>
<th>TN</th>
<th>Mean</th>
<th>SD</th>
<th>FL</th>
<th>Mean</th>
<th>SD</th>
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</table>

Table 1: Cremains Weight: Sex and Age Variation in North Carolina

Discussion and Conclusions

- The unclaimed bodies used in this study were medical examiner cases examined at the NC OCME and disposition was handled on behalf of their families, primarily for financial reasons.
- On average there are about 58 unclaimed medical examiner cases each year.
- The numbers of unclaimed individuals has been increasing each year.
- Mean cremains weights for NC are greater than TN, FL and CA cremains weights.
- These differences may be associated with the different disposition of the remains. The remains included in this study were retained by the OCME of unclaimed individuals associated generally with low socio-economic status. While the other comparative studies included data from crematoriums and funeral homes with individuals of various socio-economic levels.

References