Paleodemography of Highland Beach: Reexamining the Demographic Parameters of a Native American Population from Southeastern Florida

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Introduction

The field of paleodemography has long been debated by those who wish to discredit the field and those who practice it. In 1999 and again in 2000, researchers who perform paleodemographic analysis met in Rostock, Germany to fix the present issues and change the way research is conducted in the future (Hoppa and Vaupel 2002). The product of these meetings resulted in what is now known as the Rostock Manifesto. While many scholars accept the change in the suite of methodologies carried out under the new guidance, little has been said on the effectiveness of the manifesto. To test the effectiveness of the Rostock Manifesto is meaningful as it will either further discredit the field of paleodemography or validate its current research.

Goal

The goal for this research is to test the effectiveness of the Rostock Manifesto through the analysis of the reestablished demographic parameters of the Highland Beach Collection, curated at Florida Atlantic University in the department of Anthropology, and comparing the results to a previous study, (Winland 1993). To do this, the sample in question must be reevaluated to correct the mortality distributions using the approved methods according to the Manifesto.

Methodology

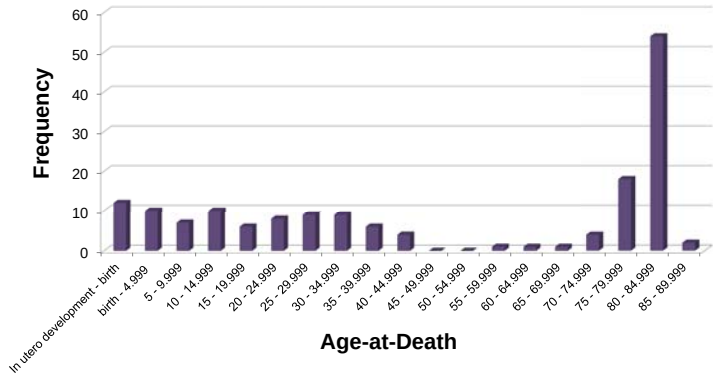
Age: In compliance with the Rostock Manifesto all age-at-death estimations were performed using the approved transition analysis method published by Boldsen *et al*. (2002). Age was estimated using the three skeletal features presented in table 2. On juvenile skeletal materials age was estimated using varying methods described by Scheuer and Black (2000).

Sex: To estimate the sex of the deceased individuals, methods described by Buikstra and Ubelaker (1994) were implored. Although these methods vary in degree of masculinity and femininity, the lacking presence of intact pubic bones made it nearly impossible to use more precise sex estimation methodologies. In cases where there was an intact pubis, sex was estimated using the Phenice Method—however this was limited to only 9 of the 162 individuals analyzed in this sample.

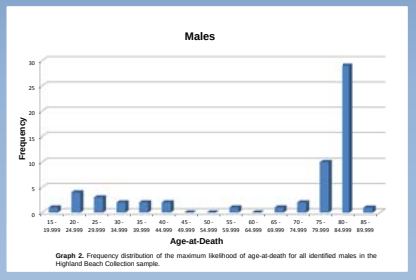
Age Distribution: To distribute the mortality of the sample, the frequency of the maximum likelihood of an age-at-death for the represented individuals were plotted into a histogram as seen in graphs 1-4.

Sex Specific Mortality: Lastly the male and female distributions were compared using a Mann-Whitney *U*-test as seen in table 3.

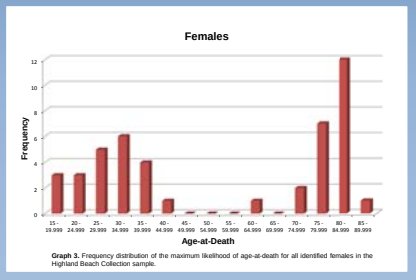
Highland Beach Collection



Graph 1. The frequency distribution of age-at-death, by proxy of the maximum likelihood of a given age-at-death, of the Highland Beach Collection sample. A frequency distribution is used to illustrate the variance of age-at-death in this collection to form preliminary conclusions concerning the mortality rate of the pre-Columbian population.



Graph 2. Frequency distribution of the maximum likelihood of age-at-death for all identified males in the Highland Beach Collection sample.



Graph 3. Frequency distribution of the maximum likelihood of age-at-death for all identified females in the Highland Beach Collection sample.

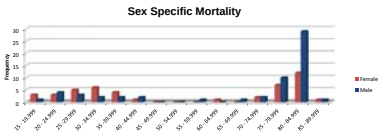
	MNI	
Sex Estimation	Number of Individuals Identified	Number of Individuals with a Maximum Likelihood Age Estimate
Male	65	58
Female	52	45
Ambiguous	13	13
Unknown	86	46
Total	216	162

*25% of individuals identified were rejected from study due to inability to estimate age-at-death.

Table 1. The minimum number of individuals was estimated to 216 for the Highland Beach Collection. However, of the 216 only 162 of these individuals were possible to identify the maximum likelihood of an age-at-death resulting in the rejection of 25% of the sample. The rejection was due to the strict limits for completing an age estimate using transition analysis.

Presence of Skeletal Features	
	Number of individuals
Crania	98
Pubis	9
Auricular Surface	52

Table 2. The high presence of crania as a means of age estimation might cause a slight right skew to the frequency distributions presented above. The high degree of variance between skeletal features is likely caused by taphonomic processes.



Graph 4. Frequency distribution illustrating the variation between age-at-death specific to each males and females.

Test for Equal Medians		
	Male	Female
Number of Individuals	58	45
Mean Rank	33.383	18.617
p (same med.)		0.0050133

Table 3. The results of a Mann-Whitney *U*-test. The p value indicates a statistically significant difference between males and females for age-at-death estimates.

Results

The mortality of the Highland Beach sample has a high frequency skewed toward older individuals. The highest frequency occurring in the age-at-death cohort of 80-84.999 years. However, there seems to be a significant difference between male and female mortality. The results of the Mann-Whitney *U*-test (p=0.0050133) illustrates a statistical difference between the two sexes.

The male mortality distribution heavily highlights older individuals represented in the burial site. Females, however, differ greatly as the mortality appears to have a bimodal distribution highlighting child bearing ages and older individuals.

Discussion

Contrary to the previous publication by Winland (1993), the mortality distribution of the Highland Beach sample provides demographic evidence that emphasize a higher mortality rate for the entire sample. This assertion can thus prove the effectiveness of the Rostock Manifesto in its ability to change the results of paleodemographic research. All three distributions illustrated, graphs 1-3, prove a significant difference between this current research and Winland's, however the overall trends are similar with males having a higher frequency of older individuals and females having a bimodal distribution.

However, it is possible that the higher frequency of older individuals could be a miscalculation caused by the high prevalence of cranial material, table 2. Cranial suture stenosis is notorious to be unreliable as an age indicator due to the variance of suture closure from individual to individual. Arguably, the higher ages an be the result of having to rely on unreliable age indicators.

Unfortunately due to the taphonomic processes involved with all South Florida burials, it is common to find heavily fragmented materials like the Highland Beach collection. This causes great difficulty as some skeletal materials that are necessary for analysis may not be present. This was the case with this sample leading to the rejection of 25% of the sample, as shown in table 1. For samples such as this, transition analysis may not be the best fit but is at least the best age-at-death method for paleodemographic research.

References

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