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# MNI and Sex Estimation in Two Umm an-Nar Tombs from the UAE



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## Introduction

Commingled tombs are often overlooked in bioarchaeological studies because of the difficult nature of osteological analysis, despite their prevalence across the ancient world. Heavily fragmented and commingled remains recovered from Tombs Unar 1 (U1) and Unar 2 (U2) in the UAE date to the Umm an-Nar period (2700-2000 BCE), when people witnessed shifts in mortuary practices likely reflective of broader changes in subsistence and social organization. A collaborative project that trains undergraduates in anthropological research (REU Site: *Bioarchaeology of Bronze Age Social Systems*) has examined tomb membership for U1 and U2 by estimating MNI and sex.

## Background

Tombs U1 and U2 from the Shimal Necropolis in Ras al-Khaimah (UAE) are monumental, above-ground structures with multiple chambers. After interment, people were intentionally commingled inside of the tomb, and many were cremated. When the tombs were excavated nearly 30 years ago, early estimates of MNI indicated that they held similar numbers of individuals, despite a significant difference in size. This project sought to examine MNI systematically using landmark and zonation techniques. In addition, sex estimation techniques were employed to address tomb membership.

## Methods

1. MNI – zonation technique

- Talus, mandible

2. MNI – landmark technique

- Talus, mandible, temporal

For MNI estimates, over 50% of the landmark or zone had to be visible in order to be scored as present (Knüsel & Outram 2004; Lambacher et al. 2016). All landmark and zone MNIs are reported in Arellano and colleagues (2020) for the mandible and McGrath and colleagues (2020) for the talus. Temporal MNI data are presented here for the first time.

3. Sex estimation – metric

- Humerus

Four distal measurements were taken: maximum and minimum diameters of the trochlea, maximum diameter of the capitulum, and epicondylar breadth. In order to be measured, a feature had to be complete and undamaged. These were analyzed by a variety of techniques (Downey et al. 2020); sex estimates presented here follow Albanese and colleagues (2005) as it is sample-specific.

4. Sex estimation – morphological

- Temporal


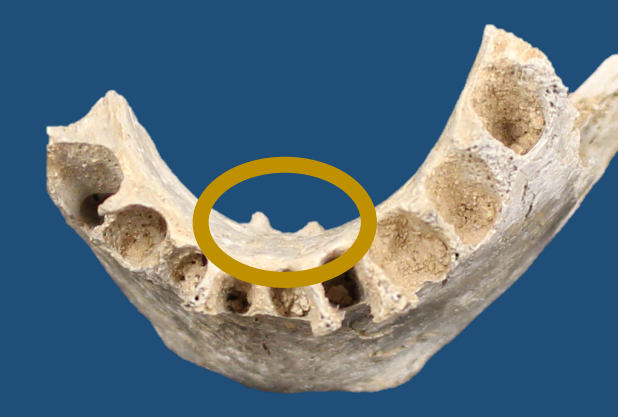

Mastoid process size was scored (1-5) following Buikstra & Ubelaker (1994). Sex was also estimated on the temporal bone using the anterior and posterior lateral angle, although not presented here (Calvin et al. 2020).

## Discussion & Conclusions


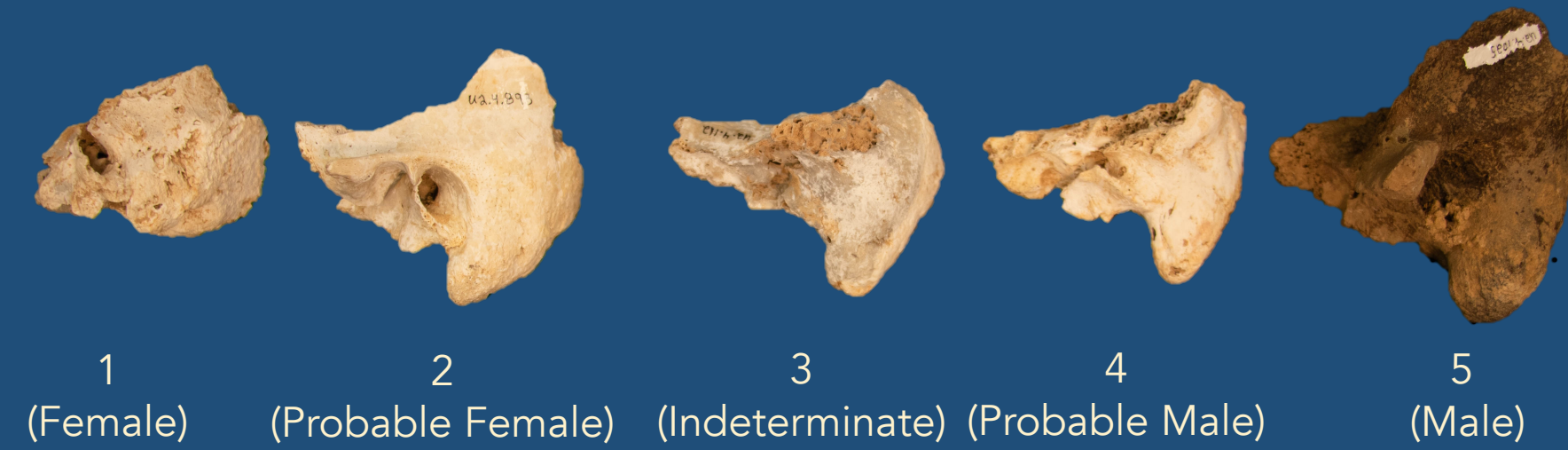
The petrous portion of the temporal bone provided the largest MNI estimate. Although bones were chosen based on likelihood to survive taphonomic factors, the petrous portion fared better than others. Regardless of technique, U2 had a consistently larger MNI. This was both expected (Tomb U2 is larger than U1) and unexpected [early estimates by others indicated roughly 400 people interred in each tomb (Blau 1998)]. The similar discrepancies between right and left sided bones are interesting; more left-sided bones were counted for both the temporal and talus. Further examination of other bones is warranted to assess whether this is coincidental or a real pattern. Sex estimation proved more complicated. Cremated bone may shrink, which could lead to more bones being identified as smaller and therefore more “female.” However, most metric techniques estimated more males than females (based on comparison to reference populations), suggesting that Umm an-Nar peoples may have been relatively large individuals. However, they may not have been as robust as others, given the large number of mastoid processes identified as belonging to women. Again, further research is warranted on other skeletal elements in order to assess broader patterns of sexual dimorphism.

## Results

MNI – The landmark technique produced a larger MNI for the temporal bone and the mandible. The talus had similar MNI estimates using the landmark and zonation techniques; the zonation technique estimated one more individual within each tomb.

	MNI – U1	MNI – U2
 Temporal (Left; U2.4.1214) Landmark – Internal Auditory Meatus	L – 194 R – 160	L – 410 R – 363
 Mandible (U2.7.137) Landmark - Mental Spines	107	306
 Talus (Left; U2.42.141) Zone 2 – Lateral half of the trochlea	L – 88 R – 75	L – 228 R – 188

Sex Estimation – Metric techniques on the humerus estimated the presence of more males than females, while the gracile nature of many mastoid processes indicated that more women were interred in the tombs.

	Unar 1	Unar 2
 Mastoid Score Range (1-5)	Male – 8 Female – 6 Indet – 3	Male – 40 Female – 31 Indet – 8
 1 (Female) 2 (Probable Female) 3 (Indeterminate) 4 (Probable Male) 5 (Male)	Male – 3 Female – 13 Indet – 4	Male – 8 Female – 35 Indet – 7

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