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# Age and Inclusivity in Umm an-Nar Communal Tombs from Southeastern Arabia



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## Introduction

Umm an-Nar (2700-2000 BCE) tombs in the United Arab Emirates (UAE) contained the commingled remains of hundreds of individuals interred across multiple generations. Archaeologists working in the region commonly reference tomb demographics as being inclusive of all ages, but this assumption is based on a handful of decades-old studies that rarely distinguish age categories beyond “subadult” or “adult.” A collaborative project that trains undergraduates in anthropological research (REU Site: *Bioarchaeology of Bronze Age Social Systems*) sought to examine age distributions – and thus inclusivity in tomb membership – in greater detail, with a particular focus on fetal and older adult age categories.

## Background



Figure 1. Tombs Unar 1 (2400-2200 BCE; above) and Unar 2 (2300-2100 BCE; right), post-excavation.



The Umm an-Nar period witnessed the transformation of a previously nomadic population into semi-sedentary agro-pastoralists, evidenced by the appearance of settlements and monumental architecture. Mortuary practices also shifted dramatically as entire communities were interred within massive, above-ground communal tombs. Following interment and decomposition, skeletonized bodies became fragmentary and commingled as newer bodies were inserted into the tombs over a 200-300 year period. In some cases, skeletonized remains were later removed for cremation before being reinterred. Such intentional commingling may symbolize a transition of the individual dead into an ancestor collective, possibly to resist growing social hierarchies among the living (Gregoricka 2020).

Umm an-Nar tombs Unar 1 (U1) and Unar 2 (U2) (Figure 1) are located within the Shimal Necropolis in the Emirate of Ra's al-Khaimah (Figure 2). Recent analyses demonstrated a MNI of 194 for U1 and 410 for U2 (Ullinger et al. 2020).

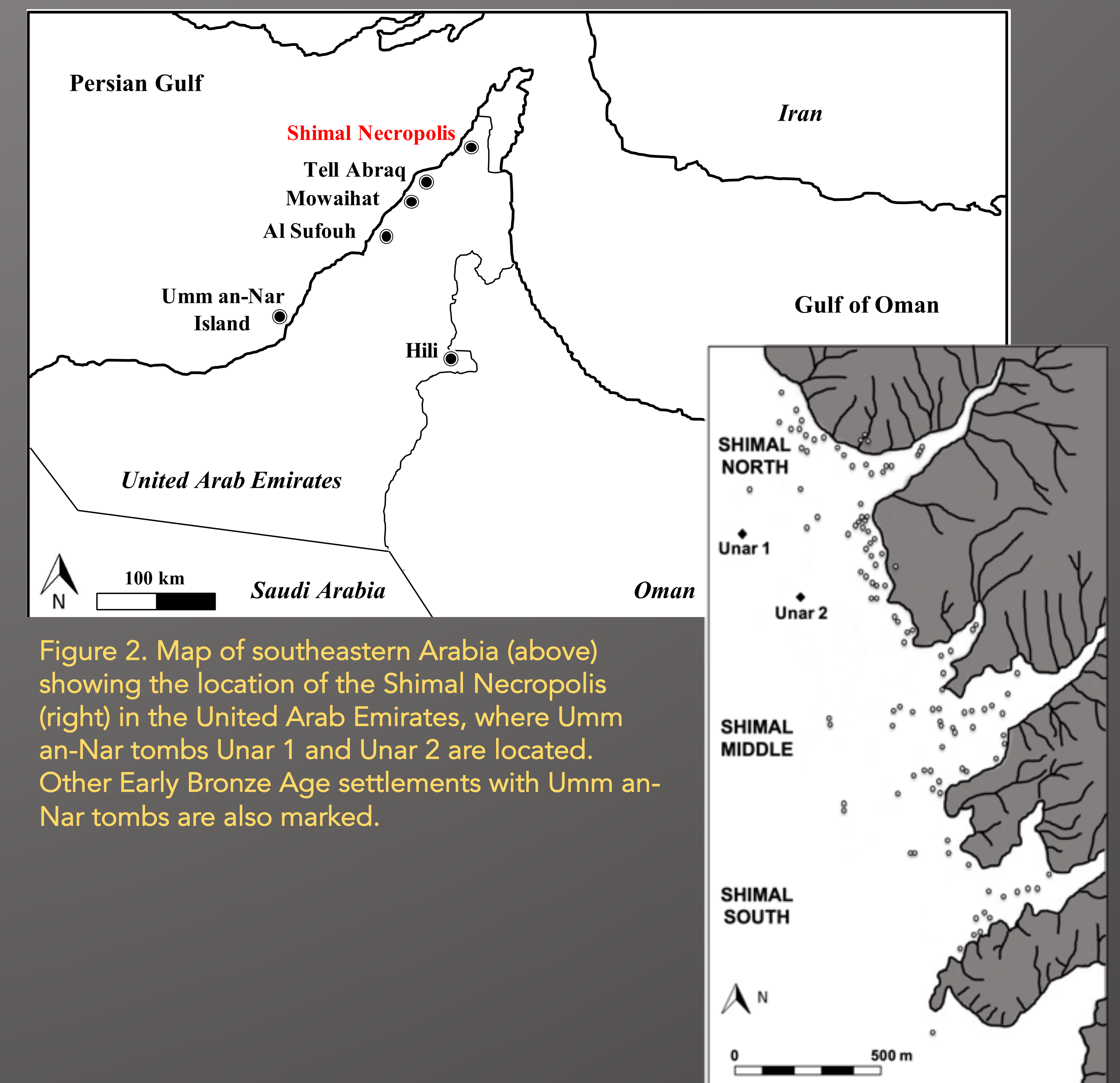


Figure 2. Map of southeastern Arabia (above) showing the location of the Shimal Necropolis (right) in the United Arab Emirates, where Umm an-Nar tombs Unar 1 and Unar 2 are located. Other Early Bronze Age settlements with Umm an-Nar tombs are also marked.

## Methods & Results

Traditional and novel aging techniques were applied to bones from both tombs in order to more accurately assess younger and older age categories:

- TRANSITION ANALYSIS (TA):** TA offers greater specificity in discerning adult age than traditional aging methods by incorporating probability distributions and Bayesian analysis into age estimation frameworks (Boldsen and Milner 2012). The current iteration, TA3, shows particular promise for fragmented skeletal remains (Getz, 2020) and so was applied here to commingled fragments from U1 and U2. For comparison, Suchey-Brooks (1990) was also utilized to estimate age for the pubic symphysis.
  - SAMPLE:** Adult pubic symphyses (n=51), proximal (n=18) and distal (n=67) humeri, and proximal femora (n=194; Figure 3) with at least two scorable features were selected for analysis.
  - RESULTS:** Average adult age estimates using TA3 ranged from 40.4 (pubic symphysis) to 47.8 (femur, prox. humerus) years. Suchey-Brooks estimates averaged only 31 years. There were no statistically significant age differences between the tombs.
- OSTEOMETRICS:** Measurements (Fazekas and Kósa 1978; Schaefer et al. 2009) of nonadult cranial and post-cranial elements were taken to estimate age-at-death among fetal, perinatal, and very young post-natal individuals.
  - SAMPLE:** Unfused basilar portions (n=15; Figure 4), unfused petrous portions (n=105), and femora assumed to be fetal/perinatal (n=26) were measured.
  - RESULTS:** Individuals as young as 20-22 fetal weeks to >40 weeks were identified from both tombs.
- BONE BIOEROSION:** Bacteria colonize the infant GI tract during the (vaginal) birthing process and breastfeeding (Kuperman et al. 2020). If a baby does not live to nurse, its microbiome is not populated; as a result, stillborn infants show no evidence of microstructural changes from bacterial bioerosion in their skeletons (Booth 2015).
  - SAMPLE:** Suspected fetal, perinatal, and young postnatal humeri (n=27) were assessed using microCT imaging (Figure 5).
  - RESULTS:** No individuals displayed signs of bioerosion. While this would typically indicate that all fetuses/perinates were stillborn and/or did not survive to breastfeed, individuals whose measurements indicated postnatal age also exhibited no bioerosion. Additional research is underway to determine whether aridity may be influencing these results.



Figure 3. Femora scored with TA3. Left: exostoses absent, Right: exostoses present.



Figure 4. Seriated basilar portions from youngest to oldest.

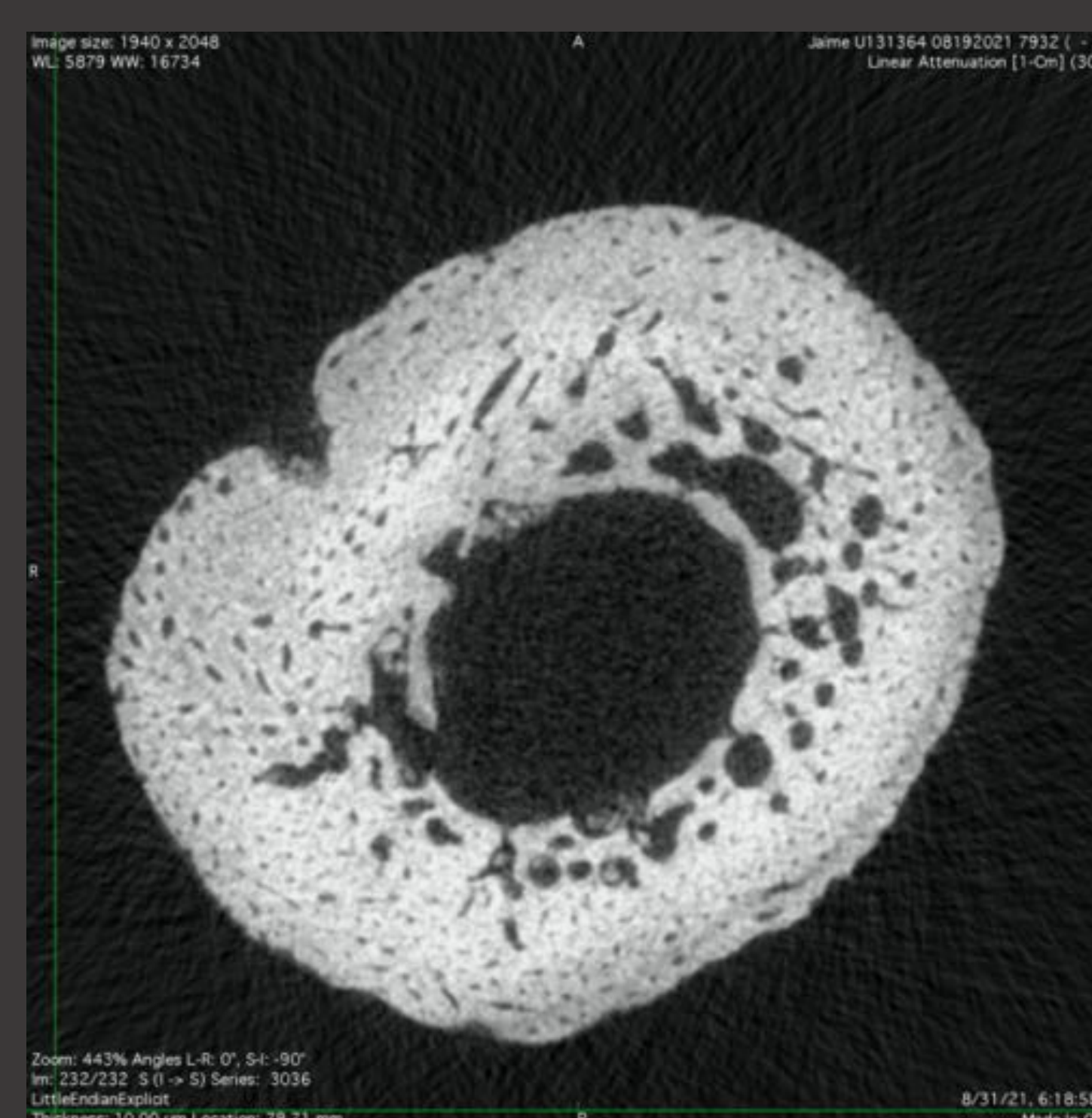


Figure 5. MicroCT scan of perinate humerus; no bioerosion present (OHI score = 5).

## Discussion & Conclusions

### YOUNG AGE CATEGORIES:

MicroCT scans of suspected fetal and perinatal humeri revealed a lack of bioerosion, potentially confirming the presence of stillborn infants in both tombs. Similarly, nonadult cranial and long bone measurements demonstrated the inclusion of very young fetuses in both U1 and U2; for instance, amongst petrous portions, most ranged in age from 24-30 (45%) and from 30-34 (36%) fetal weeks old. Together, these data confirm that fetal and perinatal infants were not segregated to different interment spaces during the Umm an-Nar period, but were instead permitted access to communal tombs alongside older nonadults and adults of all ages. This may suggest that they were viewed as members of the community despite their status as non-survivors.

### OLDER AGE CATEGORIES:

A higher prevalence of older adult individuals were revealed using TA3, including at least some individuals who appear to have lived into their 70s and 80s. For the pubic symphysis in particular, mean age estimates were around 10 years higher than those produced by Suchey-Brooks. These data highlight that the inhabitants of southeastern Arabia survived to older ages than previously believed, changing the ways in which we think about the structure of Umm an-Nar communities. Moreover, these results illustrate the potential utility of TA3 in identifying older age categories in commingled assemblages, greatly enhancing our understanding of tomb demographics in collections that otherwise remain challenging to study due to complex mortuary treatment.

In sum, these data substantiate the presence of very young nonadults as well as older adults in both tombs, and demonstrate that despite increasing sedentism and associated stratification that appear to characterize the Umm an-Nar period, no age group was separated from the larger community in death.

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