Exploring Maternal Health and Mortality in Roman Egypt (50 – 350 CE): A case study from Kellis 2 (Dakhleh Oasis)

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Introduction

It is recognized that access to adequate and effective healthcare during the prenatal and postnatal periods has a critical impact on health outcomes of the mother, the infant, and the wider community [1, 2]. By extension, it is assumed that maternal mortality was likely significantly higher in the past, because of a supposed lack of access to skilled care [3, 4]. However, quantitative studies into historical maternal mortality ratios (MMR), and into maternal health more broadly, remain limited [3]. Located in the Dakhleh Oasis of Western Egypt, the Roman-Period cemetery of Kellis 2 provides a unique opportunity to investigate maternal mortality in the past, due to the excellent representation and preservation of individuals buried at the site [5].

Methodology

In order to investigate questions of maternal mortality in the past, several paleodemographic estimators [2, 6, 7, 8] were applied to the data from Kellis 2, in order to approximate maternal mortality, population increase, and fertility rates. Eight other Roman-Period sites with reasonably representative demographic profiles were identified and analyzed, to provide a comparative analysis. In addition, a comprehensive literature review into maternal mortality, and Roman and Egyptian obstetric care and birthing practices was undertaken, to provide contextual information.

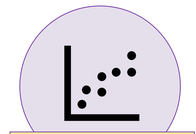
Maternal Mortality Ratios were **dramatically lower** at Kellis 2 than at other Roman-Period sites. Why is this?

Results

Site	Location	F:M Ratio	Estimated MMR	Data Source
Modern Estimate	Europe & N. America	-	13.0	WHO, 2023
Modern Estimate	Northern Africa	-	103.0	WHO, 2023
Kellis 2	**Egypt**	**1.43**	**171.2**	**Sharman 2007 + Authors**
Modern Estimate	Worldwide	-	223.0	WHO, 2023
East London	United Kingdom	0.59	278.9	Barber & Bowsher, 2009
Akraiphia	Greece	1.44	359.8	Nikita et al., 2019
Pontokomi-Vrysi	Greece	0.81	428.3	Vergidou et al., 2022
Wall of the Crow (Roman)	Egypt	0.34	451.2	Kaiser, 2018
Elaiussa Sebaste	Turkey	0.94	453.3	Paine et al., 2007
Collatina	Italy	1.27	489.3	Minozzi et al., 2012
Osteria del Curato	Italy	0.91	537.0	Minozzi et al., 2012
Modern Estimate	Sub-Saharan Africa	-	545.0	WHO, 2023
Zadar-Relja	Croatia	0.70	680.7	Novak et al., 2009



High Fertility (6.61)



High Population Growth (4.10%)

Discussion



Ancient Egyptians were comparatively skilled in medical interventions, compared to other contemporaneous cultures [9, 10]

There is evidence for 6-10 cases of birth trauma in individuals at Kellis 2. Many of these birth traumas are healed, indicating that the infant survived the immediate birth. More broadly, these birth traumas provide bioarchaeological evidence for midwives/birth attendants [9].

Care



Paleopathological analyses on individuals from Kellis 2 indicate improved health compared to earlier pre-Roman populations, including a decrease in the presence of cribra orbitalia – a skeletal indicator of anemia [11].

While not all sites had comparable data, rates of cribra orbitalia were lower at Kellis 2 than at Akraiphia, Pontokomi-Vrysi, or Zadar-Relja.

Health & Disease



Mortuary evidence of individuals from Kellis 2 suggests that individuals are buried oriented to the rising sun [12]. Through this, patterns of seasonal mortality can be reconstructed, and research indicates that higher numbers of perinates and women of child-bearing age were dying in the months of March and April [12, 9].

Society

Study Limitations

It is recognized that the paleodemographic estimators used likely represent underestimations [2]. Additionally, problems with non-standardization of age estimation methods and categories in bioarchaeology [13], and problems related to archaeological preservation and representation [14] mean that estimations may not be perfectly comparable.

Future Directions

The next research phase of this project will incorporate stable isotope, paleopathology, and mortuary data from Kellis 2 to investigate if these estimated paleodemographic rates are accurate or not. Further statistical analysis will also be carried out to see if other variables (e.g., rural/urban, high/low status) impact maternal mortality rates at different sites. Additionally, more comparative sites will be added, where possible.

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