

# NEW ESTIMATES OF GENDER INEQUALITY IN SOUTHWEST ASIA FROM CHALCOLITHIC TO IRON AGE: EVIDENCE FROM BIOARCHAEOLOGICAL SOURCES

Joerg Baten\*, Giacomo Benati\*\*, Luyuan Guan\*, Arkadiusz Szoltysiak\*\*\*

\*Univ. Tübingen, \*\* Univ. Barcelona \*\*\* Univ. Warsaw

## 1. RESEARCH QUESTION

- How did the rise of the world's first cities of substantial size in Ancient Southwest Asia transform relations between women and men?
- What were the socio-economic drivers behind the fluctuating patterns of gender inequality in the ancient Southwest Asia?

## 2. BACKGROUND

- The first city Uruk emerged as urbanization began in ancient Mesopotamia during the Chalcolithic Period (4300-3100 BCE). While tens of thousands of clay tablets record kings, harvests, and taxes, we still know little about prehistoric gender dynamics.
- Linear enamel hypoplasia (LEH), or fine grooves on teeth, serves as a sensitive marker of early childhood malnutrition and stress.
- By comparing the prevalence of LEH by gender, we can infer whether sons or daughters received better care long before widespread written records.

## 3. DATA AND VARIABLES

- Dataset compiled from 200+ published excavation reports.
- Covers six archaeological periods from the Neolithic (~10,000 BCE) to the Iron Age (590 BCE).
- ~ 2,712 skeletons from 37 archaeological sites across Mesopotamia, the Levant, Anatolia, and Iran.
- $GenderInequality = (\%Males\ with\ LEH) - (\%Females\ with\ LEH)$

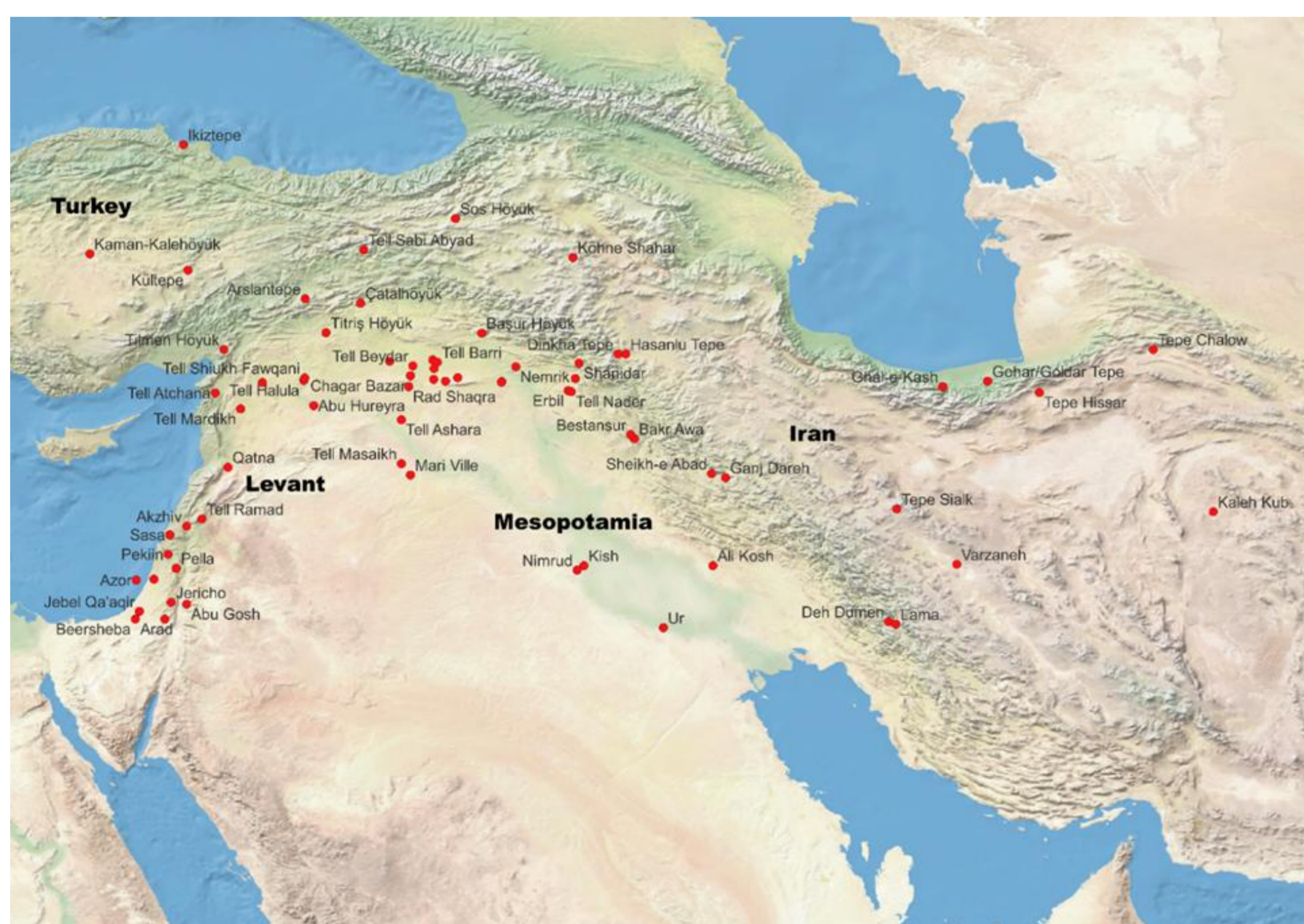


Figure 1: Distribution of Sites in Southwest Asia

## 4. HYPOTHESES

- Hypothesis I** - Production systems and gendered labor could have increased inequality through male-dominated ploughing while mixed economies with cattle supported more equitable outcomes.
- Hypothesis II** - Violence could have increased the gap between females and male. Periods of frequent conflict and insecurity may have disproportionately constrained women's economic and social participation.
- Hypothesis III** - Higher health/nutrition on average might have been relatively even better for women, whereas in crisis periods, less high-quality food and care allocated to girls

## 5. RESULTS

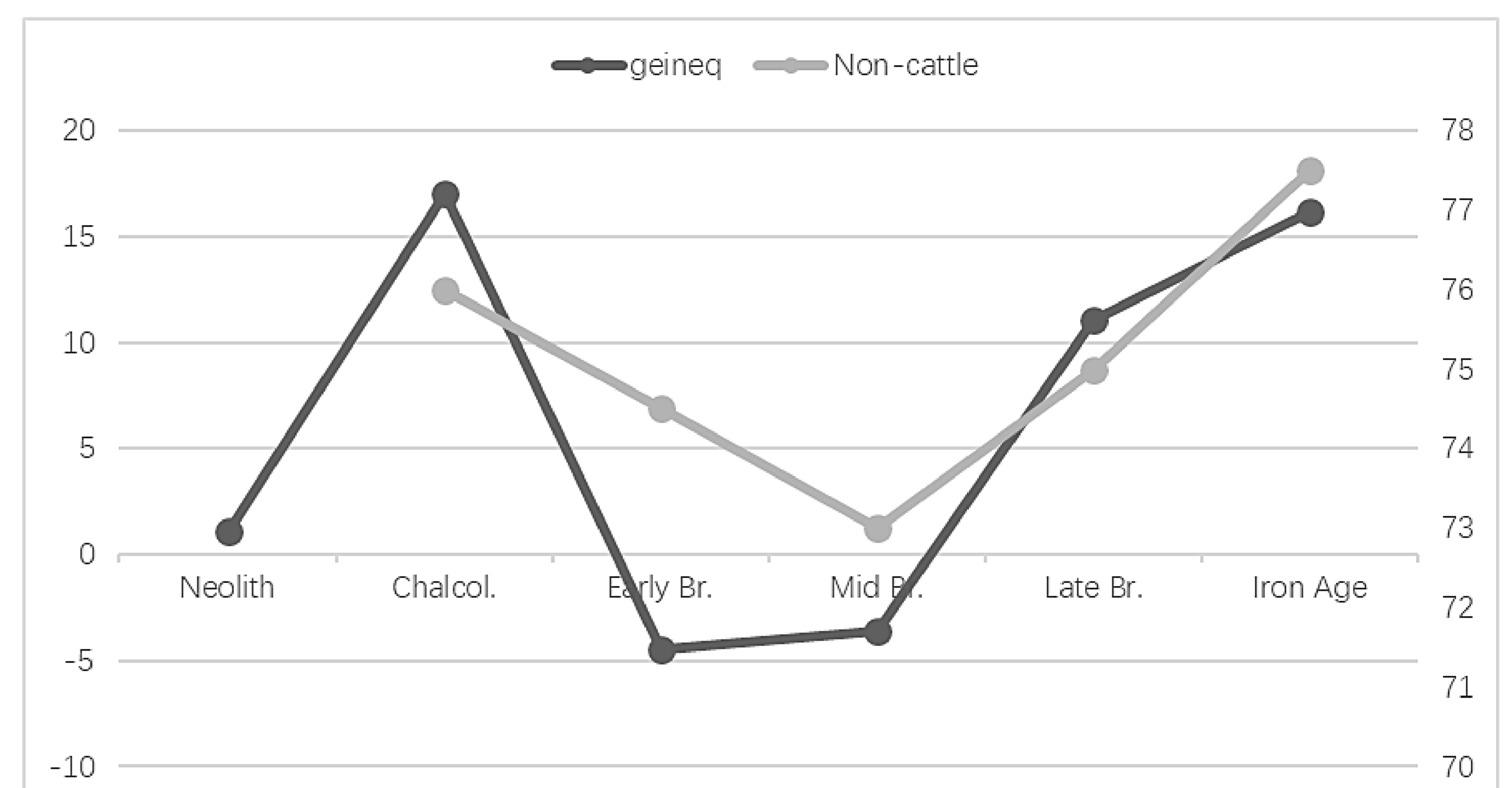


Figure 2: Gender Inequality and Cattle Share

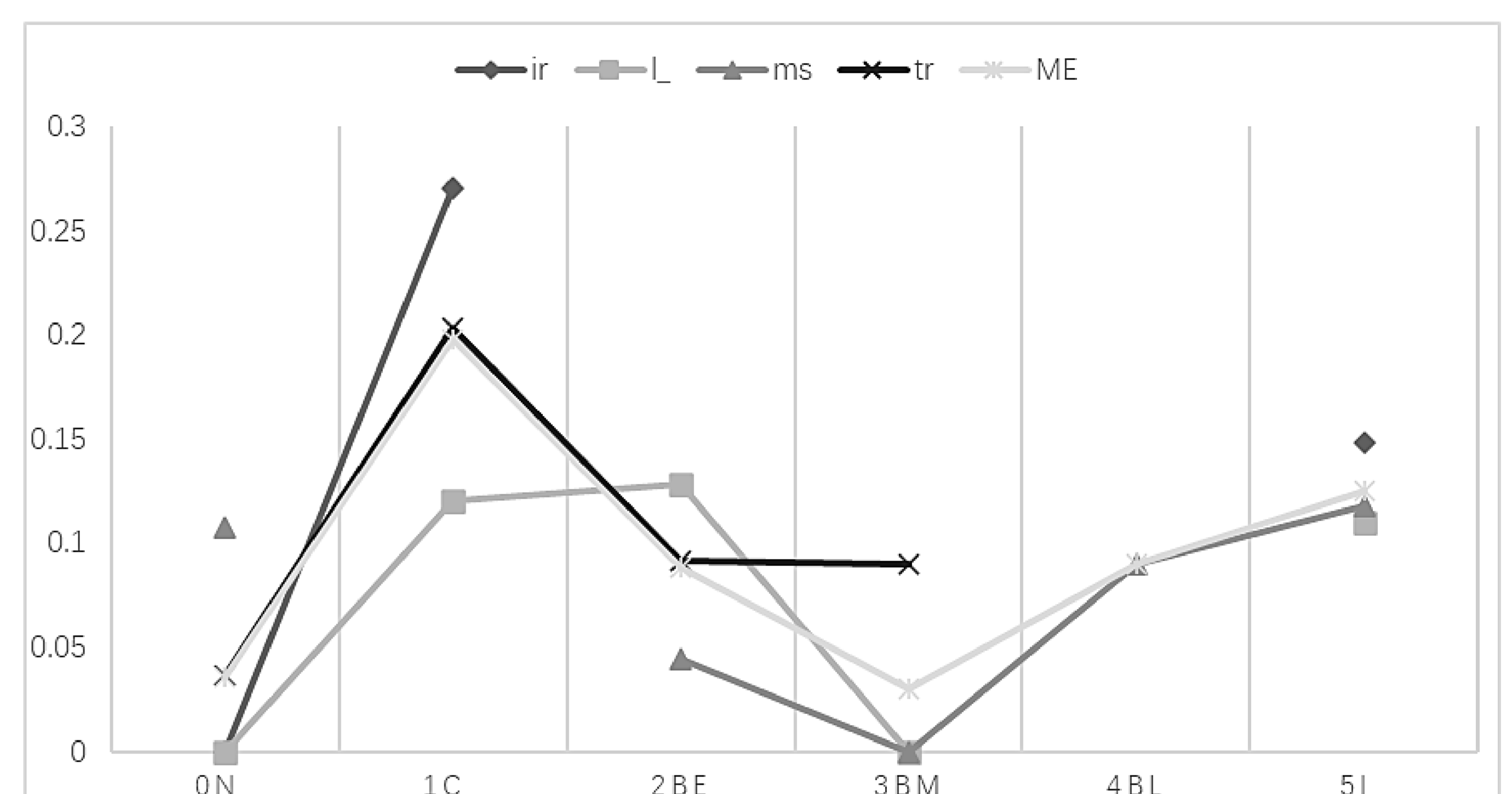


Figure 3: Interpersonal Violence Trends - measured by Cranial Trauma

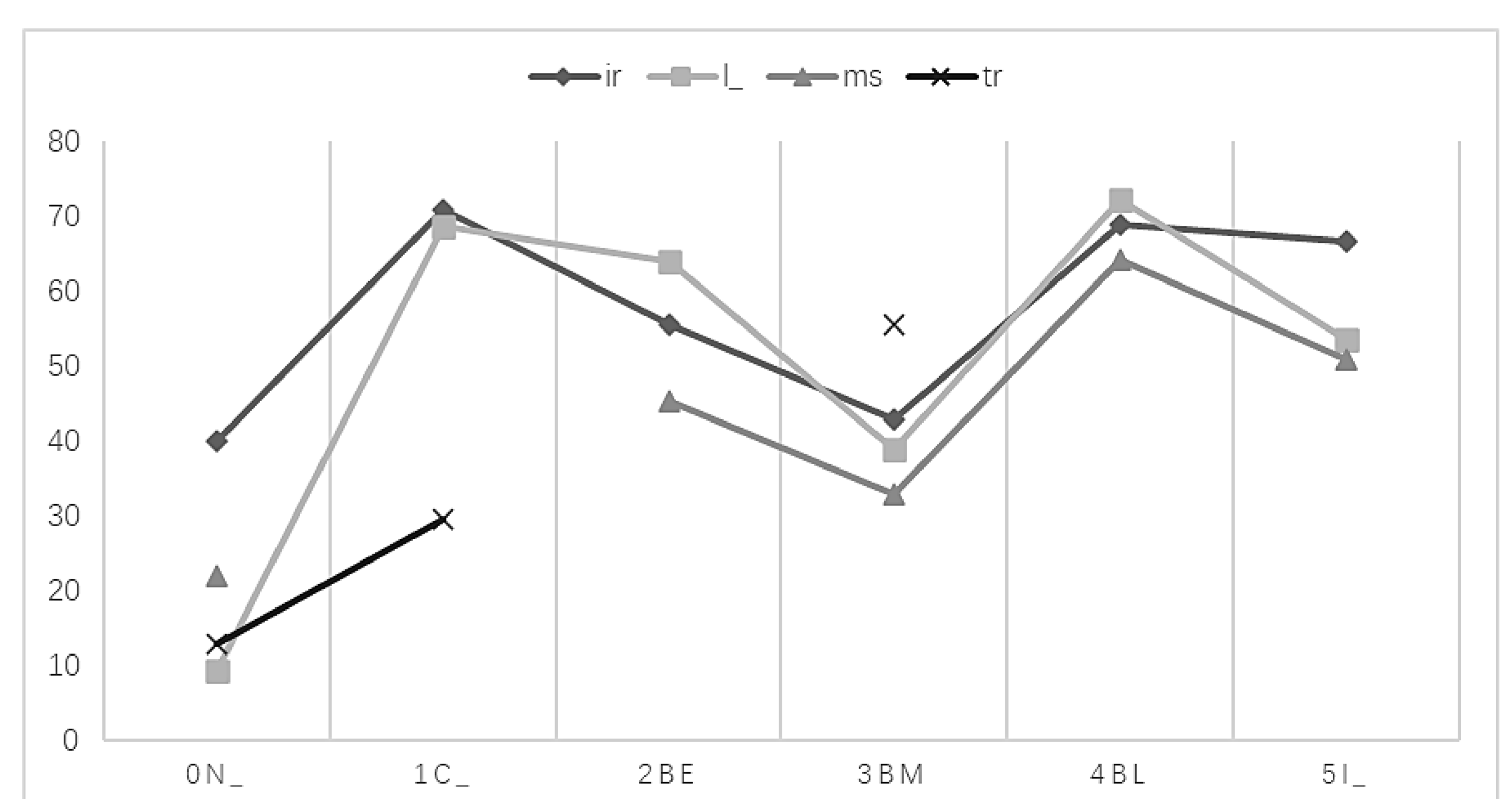


Figure 4: Overall Malnutrition Trends

## 6. CONCLUSION

- "Uruk moment"**: The rise of the first major cities in the Chalcolithic period coincided with the sharpest surge in gender inequality.
- Production Systems** changed gender roles in household income as plough agriculture marginalized female labor while cattle-inclusive economies promoted gender equality.
- Violence** peaks correlated with the most severe gender inequality as insecurity restricted female mobility and status.
- Overall Welfare** suffered when gender inequality peaked, consistent with resource scarcity pushing households to prioritize the survival of sons.

## REFERENCES

- Alesina, Alberto, Paola Giuliano, and Nathan Nunn. 2013. "On the Origins of Gender Roles: Women and the Plough." *Quarterly Journal of Economics* 128 (2): 469-530.
- Baten, Joerg, Giacomo Benati, and Arkadiusz Szoltysiak. 2023. "Violence Trends in the Ancient Middle East between 12,000 and 400 BCE." *Nature Human Behaviour* 7 (12): 2064-2073.
- Baten, Joerg, and Alexandra M. de Pleijt. 2022. "Female Autonomy Generated Successful Long-Term Human Capital Development: Evidence from 16th to 19th Century Europe." *World Development* 158: 105999.