Supplementary Information for
An integrative skeletal and paleogenomic analysis of prehistoric stature variation suggests relatively reduced health for early European farmers

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- Figures S1 to S12
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- Legend for Dataset S1
- SI References

Other supplementary materials for this manuscript include the following:
- Dataset S1
**Fig S1.** Linear regressions and residuals of osteological height and genetic height score with sex as a co-variate without deamination filtering. **A)** The relationship between polygenic height score and estimated osteological stature (cm) for females and males. **B)** Residuals of the relationship between polygenic height score and osteological height with sex as a co-variate for all individuals, by cultural period. Mean and median are represented by the black and blue dashed lines, respectively. **C)** Residuals of the relationship between polygenic height score and osteological height with sex as a co-variate for females and males plotted separately. Mean is represented by a thin line and median by the rectangle. Females are represented by circles and males by squares. Full results in Table S3.
**Residuals of osteological height and genetic height score with sex, latitude and longitude as co-variates.**

A) For females and males combined, pre-Neolithic individuals (average residual = +1.94 ± 7.2 cm) were ~3.82 cm taller than expected relative to Neolithic individuals (average residual = -1.88 ± 7.1 cm; \( P=0.043 \)). The average osteological vs. genetic height score residual then increased steadily in the Copper Age (+2.03 cm relative to the Neolithic), Bronze Age (+2.59 cm), and Iron Age (+3.39 cm). Post-Neolithic individuals were +2.22 cm taller on average relative to Neolithic individuals (\( P=0.067 \)). Mean is in black and median is the blue dashed line.

B) Females and males represented separately across cultural periods. Latitude gradient (north to south) is indicated. Mean is represented by a thin line and median by the rectangle. Females are represented by circles and males by squares. Full results in Table S7.
Fig. S3. Residuals of osteological height and genetic height score with sex as a co-variate. Females (circles) and males (squares) are plotted side by side based on the residuals of the relationship between polygenic height score and osteological height with sex as a co-variate. Mean is represented by the thin line and median by the rectangle. Full results in Table S6.
Fig. S4. Replicability of the residuals of osteological height and genetic height score with sex as a co-variate using long bone lengths. Residuals of the relationship between polygenic height score and long bone lengths for the femur (A), tibia (B), humerus (C) and radius (D) with sex as a co-variate for all individuals, by cultural period. Mean is represented by the thin line and median by the rectangle. Females are represented by circles and males by squares. Full results in Table S8.
| Gender | Culture | Femur Length (cm) | Tibia Length (cm) | Humerus Length | Radius Length |
|--------|---------|-------------------|-------------------|----------------|--------------|
| Females | Upper Paleolithic | r²=0.065, P=0.092 | r²=0.066, P=0.035 | r²=0.119, P=0.040 | r²=-0.062, P=0.084 |
| Males   | Upper Paleolithic | r²=0.076, P=0.028 | r²=0.076, P=0.019 | r²=0.087, P=0.056 | r²=0.066, P=0.035 |

**Fig. S5.** Linear regressions of osteological height and genetic height score using long bone lengths. The relationship between polygenic height score and long bone length (cm) for females and males for the femur (A), tibia (B), humerus (C) and radius (D) by cultural period. Females are represented by circles and males by squares.
Fig. S6. Residuals of osteological height and genetic height score with sex and ancestries as co-variates. Genetic ancestries based on four MDS clusters are included as co-variates in the main linear model. A) Females and males combined, mean is in black and median is the blue dashed line. B) Females and males represented separately, with mean as the thin line and median as the rectangle. Females are represented by circles and males by squares. Full results in Table S9.
Fig. S7. Residuals of osteological height and genetic height score with sex as a co-variate for individuals with 1, 2, 3 paleopathological indicators of stress (n=58 individuals). Residuals of osteological height and genetic height score with sex as a co-variate for 58 individuals who could be assessed for all three non-specific stress indicators. Individuals with 1, 2, 3 paleopathological indicators of stress are represented for females (circles) and males (squares). The mean is represented by the black line and the median the blue dashed line. Full results in Table S11.
A. Presence/absence of paleopathological indicators of stress (healed) and the relationship between osteological height and polygenic height score across cultural periods (affected/observed).

B. Presence/absence of porotic hyperostosis and the relationship between osteological height and polygenic height score across cultural periods (affected/observed).

C. Presence/absence of cribra orbitalia and the relationship between osteological height and polygenic height score across cultural periods (affected/observed).

**Fig. S8.** Residuals of osteological height and genetic height score with sex as a co-variate for individuals with healed cribra orbitalia and healed porotic hyperostosis. A) Residuals of osteological height and genetic height score with sex as a co-variate are compared to individuals with healed cribra orbitalia and healed porotic hyperostosis. The data is also represented across cultural periods for porotic hyperostosis (B) and cribra orbitalia (C). Means are represented by the thin lines. Numbers above the bars indicate number of individuals. Full results in Tables S12 and S13.
Fig. S9. Residuals of osteological height and genetic height score with sex as a co-variate for individuals with linear enamel hypoplasia and porotic hyperostosis across cultural periods. Comparison of the residuals generated from the main linear model to individuals with paleopathological indicators across cultural periods for linear enamel hypoplasia (A) and porotic hyperostosis (B). Means are represented by the thin lines. Numbers above the bars indicate number of individuals. Full results in Table S14.
Fig. S10. Residuals of osteological height and genetic height score for UK Biobank GWAS cohort individuals and those excluded from the GWAS cohort. Predictive accuracy between phenotypic and predicted height ($r^2$) for two sample sets (n=361,182 GWAS and n=4,712 non-GWAS individuals), each stratified by sex and for both sexes combined. A set of 784,256 genotyped SNPs were subject to LD-clumping and 5,183 SNPs were retained at the genome-wide significance level. For females and males combined, the non-GWAS individuals (right panel) exhibit slightly lower variance relative to the GWAS cohort (left panel). Males are represented by orange squares and females by blue circles.
A. Diagnostic residual plots for deamination filtered data set

B. Diagnostic residual plots for non-deamination filtered data set

Fig. S11. Diagnostic residual plots for the linear model of osteological height and genetic height score with sex as a co-variate. Residual diagnostic plots generated using ‘ggResidpanel’ (v0.3.0) for the deamination filtered data set (A) and the non-deamination filtered data set (B).
Fig. S12. Residuals of osteological height and genetic height score with sex and ancestries (MDS axes 5 to 8) as co-variates. Genetic ancestries based on 5 (A), 6 (B), 7 (C) and 8 (D) MDS clusters are included as co-variates in the main linear model for females and males combined. Mean is in black and median is the blue dashed line. Females are represented by circles and males by squares. Full results in Table S21.
| Skeletal element | Region | Sex       | Equation               |
|------------------|--------|-----------|------------------------|
| **Femur**        | All    | Males     | 2.72(femur_length)+42.85 |
|                  |        | Females   | 2.69(femur_length)+43.56 |
| **Tibia**        | North  | Males     | 3.09(tibia_length)+52.04 |
|                  |        | Females   | 2.92(tibia_length)+56.94 |
|                  | South  | Males     | 2.78(tibia_length)+60.76 |
|                  |        | Females   | 3.05(tibia_length)+49.68 |
| **Humerus**      | All    | Males     | 3.83(humerus_length)+41.42 |
|                  |        | Females   | 3.38(humerus_length)+54.6 |
| **Radius**       | All    | Males     | 4.85(radius_length)+47.46 |
|                  |        | Females   | 4.2(radius_length)+83.08 |

Table S1. Average osteological heights (cm, with standard deviation) across cultural periods based on stature regression formula from Ruff et al. (2012)\(^1\).
| Cultural period comparisons       | P-value | df      | t     | 95% CI         |
|----------------------------------|---------|---------|-------|----------------|
| Pre-Neolithic - Neolithic        | 0.012   | 43.482  | 2.61  | 1.096 8.537    |
| Neolithic - Post-Neolithic       | 0.046   | 74.825  | 2.02  | 0.034 4.895    |

| Combined Comparisons             | Mean of residuals | Std. dev. |
|----------------------------------|-------------------|-----------|
| Pre-Neolithic                    | 2.636             | 7.244     |
| Upper Paleolithic                | 5.112             | 8.842     |
| Mesolithic                       | 1.316             | 6.163     |
| Neolithic                        | -2.18             | 7.195     |
| Copper Age                       | -0.19             | 5.765     |
| Bronze Age                       | 1.201             | 5.695     |
| Iron Age                         | 1.979             | 5.895     |
| Post-Neolithic                   | 0.284             | 5.748     |

**Table S2.** Comparisons of the residuals from a linear model of osteological stature and sex
### Combined Comparisons

|                          | P-value | df     | t       | 95% CI      |
|--------------------------|---------|--------|---------|-------------|
| Pre-Neolithic - Neolithic| 0.016   | 45.273 | 2.504   | 0.891 - 8.211|
| Neolithic - Post-Neolithic| 0.037   | 73.057 | -2.123  | -5.026 - 0.159 |

### Females: Comparisons

|                          | P-value | df     | t       | 95% CI      |
|--------------------------|---------|--------|---------|-------------|
| Pre-Neolithic - Neolithic| 0.053   | 17.348 | 2.072   | -0.104 - 12.477 |
| Neolithic - Post-Neolithic| 0.048   | 20.368 | -2.1    | -8.576 - -0.035 |

### Males: Comparisons

|                          | P-value | df     | t       | 95% CI      |
|--------------------------|---------|--------|---------|-------------|
| Pre-Neolithic - Neolithic| 0.1238  | 24.981 | 1.593   | -1.100 - 8.603 |
| Neolithic - Post-Neolithic| 0.266   | 52.785 | 1.125   | -1.353 - 4.810 |

### Combined Comparisons

|                          | Mean of residuals | Std. dev. |
|--------------------------|-------------------|-----------|
| Pre-Neolithic            | 2.337             | 7.047     |
| Upper Paleolithic        | 4.484             | 8.653     |
| Mesolithic               | 1.192             | 6.047     |
| Neolithic                | -2.214            | 7.254     |
| Copper Age               | 0.009             | 5.523     |
| Bronze Age               | 1.092             | 5.819     |
| Iron Age                 | 1.955             | 5.059     |
| Post-Neolithic           | 0.378             | 5.617     |

### Females: Comparisons

|                          | Mean of residuals | Std. dev. |
|--------------------------|-------------------|-----------|
| Pre-Neolithic            | 3.291             | 7.013     |
| Upper Paleolithic        | 8.334             | 10.396    |
| Mesolithic               | 0.694             | 5.694     |
| Neolithic                | -3.795            | 7.197     |
| Copper Age               | 0.451             | 5.774     |
| Bronze Age               | 0.643             | 4.682     |
| Iron Age                 | 3.88              | 5.807     |
| Post-Neolithic           | 0.51              | 5.4       |

### Males: Comparisons

|                          | Mean of residuals | Std. dev. |
|--------------------------|-------------------|-----------|
| Pre-Neolithic            | 2.302             | 7.334     |
| Upper Paleolithic        | 3.201             | 8.678     |
| Mesolithic               | 1.628             | 6.699     |
| Neolithic                | -1.449            | 7.274     |
| Copper Age               | -0.352            | 5.373     |
| Bronze Age               | 1.377             | 6.544     |
| Iron Age                 | -0.611            | 2.984     |
| Post-Neolithic           | 0.279             | 5.825     |

**Table S3.** Comparisons of the residuals from a linear model of osteological stature and polygenic height score with sex as a co-variate for data not filtered for deamination.
| Individual       | Deamination_filtered | No_deamination_filter |
|------------------|----------------------|-----------------------|
| Ajvide58         | -7.51E-05            | -0.000125735          |
| BDB001           | -4.30E-05            | 3.39E-05              |
| Bichon           | 1.44E-05             | -9.64E-06             |
| Brandysek26      | 1.89E-05             | -4.12E-05             |
| Brandysek71      | -0.000231567         | -0.00023012           |
| BUD4a            | -0.000207535         | -0.000161335          |
| Canes1           | 5.42E-05             | 2.36E-05              |
| Chan_Meso        | -9.58E-06            | 8.98E-06              |
| Cheddar man      | -7.87E-05            | -5.95E-05             |
| CSAT19a          | 1.36E-06             | 5.52E-05              |
| Donkalnis1       | 7.37E-05             | 5.19E-05              |
| Donkalnis4       | 0.000272809          | 2.54E-05              |
| Donkalnis6       | -2.57E-05            | -1.38E-05             |
| Dzielnica243     | 0.000195233          | 0.000188845           |
| ELMiron          | 4.15E-05             | 4.09E-05              |
| GB1_Eneo         | -0.000261064         | -0.000276753          |
| GEN15a           | 0.000140877          | 0.000246451           |
| GEN16a           | -0.000160559         | -0.000329706          |
| GEN58            | -0.000156011         | -8.13E-05             |
| GEN59            | -9.00E-05            | -0.000147259          |
| GEN62            | 2.29E-05             | -1.49E-05             |
| GEN71            | -0.000111029         | -9.34E-05             |
| GEN72            | 0.000164855          | 0.000106642           |
| Gyvakarai        | 8.82E-05             | 0.00013729            |
| HAJE7a           | -0.000234718         | -0.000229872          |
| Hume21           | 7.92E-05             | -8.60E-05             |
| Hume4            | 0.000183755          | 4.20E-05              |
| Hume5            | -0.000182867         | -0.000233154          |
| Hung127          | -3.35E-05            | -9.22E-05             |
| Hung130          | 0.0001407            | 6.15E-05              |
| Hung136          | -0.000147448         | -6.37E-05             |
| Hung137          | -0.000249027         | -0.000275379          |
| Hung148          | 0.000348272          | 0.000306409           |
| Hung149          | 0.000150221          | 5.48E-05              |
| Hung152          | 0.000316939          | 0.000306              |
| Hung154          | 1.41E-05             | -0.000119496          |
| Hung155          | -0.000196275         | -0.000132634          |
| Hung160          | -4.89E-05            | -0.000112089          |
| Hung162          | -0.000270412         | -0.000323389          |
| Hung331          | 0.000233155          | 0.000229946           |
| Hung849          | -0.000213957         | -0.000213362          |
| Hung969          | -0.000162083         | -7.11E-05             |
| Iwiny83          | -0.000179239         | -0.000224765          |
| JAG06            | -9.27E-05            | -0.000107996          |
| Location      | Value 1     | Value 2     |
|--------------|-------------|-------------|
| Jinonice59   | 0.000103694 | 0.000114679 |
| Jinonice84a  | -0.000103032 | 8.72E-05    |
| Jinonice88   | 0.000115584 | 7.13E-05    |
| Jinonice94   | 0.000170819 | 0.000217661 |
| Kivutkalns153| 0.000173614 | 0.000137455 |
| Kivutkalns19 | 3.70E-05    | 4.11E-05    |
| Kivutkalns25 | 2.25E-06    | -7.19E-05   |
| Kivutkalns42 | 0.000135495 | 5.85E-05    |
| KON2a        | -0.000135544 | -9.71E-05   |
| Kornice1561  | -9.25E-05   | -3.34E-05   |
| Kornice34    | 0.00014143  | 0.000153345 |
| Kostenki14   | 3.52E-05    | 0.000160783 |
| Kretuonas1   | 4.12E-05    | 0.000195008 |
| Kretuonas5   | -2.05E-05   | 0.000280834 |
| LaBrana1     | -3.58E-05   | -8.52E-05   |
| LBK1976      | -6.96E-05   | 5.86E-05    |
| LBK2155      | 9.66E-05    | 3.60E-05    |
| LEPI_54E     | 4.30E-05    | 8.77E-05    |
| LGCS1a       | -1.30E-05   | 1.91E-05    |
| Loschbour    | 3.52E-05    | 1.30E-06    |
| M9984        | -4.38E-05   | -0.000121324|
| MA110        | -6.51E-05   | 0.00016102  |
| MC337A       | -6.53E-05   | 0.000182958 |
| MEMO2b       | -0.000214316| -0.000233353|
| MG104        | 0.000286081 | 0.000140714 |
| MX191        | -4.59E-05   | 5.87E-05    |
| MX195        | 0.000190987 | 0.000204788 |
| MX196        | 0.000200022 | 0.000103785 |
| OC1          | 0.000150312 | 0.000201249 |
| OC32         | 4.52E-05    | 4.18E-05    |
| OHV6.1       | -9.02E-05   | -0.000134465|
| OHV7.1       | -0.000191489| -0.000269854|
| Ostuni       | 8.51E-05    | 1.65E-05    |
| PADN12       | 0.000115032 | -2.07E-05   |
| Pavlov       | 7.14E-05    | 0.00016532  |
| PULE1.13a    | 0.000133271 | 8.60E-05    |
| PULE1.18a    | -0.00017404 | -0.000120638|
| PULE1.23a    | 1.09E-05    | -8.15E-05   |
| PULE1.24     | 0.000220781 | 0.000239844 |
| PULE1.9a     | -2.41E-05   | 0.000158594 |
| Raciborze    | -2.57E-05   | -6.49E-05   |
| Rathlin1     | 0.000134032 | 0.000107336 |
| RDVS02       | 0.000145888 | 0.000261309 |
| RDVS116      | 2.63E-05    | 0.000126496 |
| RDVS117      | -1.73E-05   | 2.47E-05    |
| Location         | RDVS53 | RDVS59 | RDVS67 | RDVS68 | RISE154 | RISE480 | RISE483 | RISE486 | RISE489 | RISE586 | SCH011 | SCH016 | SCH018 | Smyadovo12 | Smyadovo21 | Smyadovo23 | Smyadovo26 | Smyadovo40 | Spiginas2 | Spiginas4 | Strachow | SunghirSI | Sushina28 | Sushina29 | Sushina32 | Thurston Mains sk 1 | TIDO2a | Turlojiške1 | Turlojiške3 | Tyrolean Iceman | Urzi10 | Urzi12 | Urzi13 | Urzi21 | Urzi26 | Urzi31 | Urzi37 | Urzi39 | Urzi41 | Urzi44 | Urzi48 | Urzi51 | Urzi60 | Urzi65a |
|------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------------|------------|------------|------------|------------|----------|----------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| RDVS53           | 0.000309311 | 0.00026497 |
| RDVS59           | 1.28E-05   | 0.000132088  |
| RDVS67           | -0.000240956 | -0.000286988  |
| RDVS68           | 3.42E-05   | 0.000124182   |
| RISE154          | -7.25E-05  | -0.00013318   |
| RISE480          | 0.000322747 | 0.000200215   |
| RISE483          | 3.05E-05   | 8.16E-05     |
| RISE486          | -0.000192781 | -0.000183235  |
| RISE489          | 5.82E-05   | 5.06E-05     |
| RISE586          | 0.000216884 | 0.000173996   |
| SCH011           | 3.96E-05   | 5.15E-05     |
| SCH016           | -0.000138607 | -8.36E-05    |
| SCH018           | 3.02E-05   | 1.04E-05     |
| Smyadovo12       | -0.000179991 | -0.000297124  |
| Smyadovo21       | 8.90E-05   | 0.000157171  |
| Smyadovo23       | -1.37E-05  | 7.97E-05     |
| Smyadovo26       | 3.93E-05   | 2.81E-05     |
| Smyadovo40       | -8.37E-05  | -0.000159608 |
| Spiginas2        | 5.29E-05   | 0.000184151  |
| Spiginas4        | 6.74E-05   | 4.77E-05     |
| Strachow         | 0.000277662 | 0.000103543  |
| SunghirSI        | 0.000288803 | 0.000282335  |
| Sushina28        | 9.60E-05   | 0.000121669  |
| Sushina29        | -5.15E-05  | -6.50E-06    |
| Sushina32        | -0.00014956 | -0.000180516 |
| Thurston Mains sk 1 | 0.000361401 | 0.000268465  |
| TIDO2a           | 0.000156977 | 5.83E-05     |
| Turlojiške1      | 8.16E-05   | 6.58E-05     |
| Turlojiške3      | -3.00E-05  | 2.05E-05     |
| Tyrolean Iceman  | -4.80E-05  | -0.000107601 |
| Urzi10           | -9.91E-05  | -6.85E-05    |
| Urzi12           | -7.00E-05  | -7.10E-06    |
| Urzi13           | -1.75E-05  | 7.61E-06     |
| Urzi21           | -0.000106645 | -2.17E-05    |
| Urzi26           | 0.000147851 | 4.08E-05     |
| Urzi31           | -0.000340407 | -0.00041114  |
| Urzi37           | -1.43E-05  | -7.90E-05    |
| Urzi39           | -0.00013508 | -0.000229477 |
| Urzi41           | -0.000107558 | -4.30E-05    |
| Urzi44           | -9.11E-05  | -0.00016093  |
| Urzi48           | -4.64E-05  | -7.45E-05    |
| Urzi51           | -0.000186477 | -0.000256737 |
| Urzi60           | -0.000131645 | -0.000140025 |
| Urzi65a          | -0.000108877 | -0.000117267 |
| Location     | Filtered Value | Not Filtered Value |
|--------------|----------------|-------------------|
| Urzi68       | -0.000196495   | -0.00015488       |
| Urzi70       | -0.00025477    | -0.000239259      |
| V228         | -0.000105479   | -0.000104364      |
| V229         | -0.000124943   | -0.000190834      |
| V242         | 0.000121595    | 1.51E-05          |
| V243         | -2.98E-05      | 7.19E-05          |
| V247         | 4.99E-05       | 2.01E-05          |
| V575         | 0.000263181    | 0.000263508       |
| VEJ5a        | -0.000299315   | -0.0001608        |
| Vestonice16  | -0.000120289   | -4.46E-05         |
| Villabruna1  | 8.73E-05       | 7.35E-05          |
| VLSC_80a     | -9.80E-05      | -9.03E-05         |
| XN164        | 5.23E-05       | 0.000119422       |
| XN167        | 9.83E-05       | 0.000196308       |
| XN168        | -6.33E-05      | 7.60E-05          |
| XN170        | 0.000156719    | 7.96E-05          |
| XN172        | 8.00E-05       | 0.000162877       |
| XN174        | -3.67E-05      | -6.12E-06         |
| XN175        | -2.25E-05      | 2.83E-05          |
| XN206        | 9.18E-05       | 0.000143401       |
| XN215        | 0.000117353    | 0.000276593       |
| YABA2        | 0.000198061    | 0.000172738       |
| YABA4        | 4.18E-05       | -3.89E-05         |
| ZEM7         | -0.000197509   | -0.000211304      |
| ZEM8         | -0.000195558   | -0.000232087      |
| ZEM13        | -0.000220359   | -0.000198162      |
| ZEM24        | -0.000192685   | -0.000216087      |
| ZEM33        | -0.000146501   | -0.000146876      |
| ZEM35        | -0.000106752   | -0.000115839      |
| Zerniki1     | 8.81E-05       | 9.19E-05          |
| ZVEJ21       | -2.50E-05      | -2.40E-05         |
| ZVEJ30       | 0.000269671    | 0.000128841       |
| ZVEJ31       | 6.42E-05       | 6.00E-05          |
| ZVEJ32       | -1.49E-05      | -3.07E-05         |

**Table S4.** Polygenic height scores for deamination filtered and not deamination filtered data
| Females: Comparisons       | P-value | df   | t    | 95% CI       |
|---------------------------|---------|------|------|--------------|
| Pre-Neolithic - Neolithic | 0.401   | 20.951 | 0.857 | -4.804e-05  1.153e-04 |
| Neolithic - Post-Neolithic | 0.587   | 31.574 | 0.549 | -6.374e-05  1.108e-04 |
| Males: Comparisons        |         |      |      |              |
| Pre-Neolithic - Neolithic | 0.022   | 26.263 | 2.441 | 1.646e-05    1.915e-04 |
| Neolithic - Post-Neolithic | 0.613   | 66.205 | 0.508 | -4.716e-05  7.934e-05 |

Table S5. Polygenic height score t-test results
| Combined Comparisons                           | P-value | df      | t       | 95% CI     |
|-----------------------------------------------|---------|---------|---------|------------|
| Pre-Neolithic - Neolithic                     | 0.040   | 44.207  | 2.118   | 0.186 7.461|
| Neolithic - Post-Neolithic                    | 0.068   | 73.042  | 1.852   | -0.168 4.581|

**Females: Comparisons**

| Pre-Neolithic - Neolithic                     | 0.067   | 17.774  | 1.952   | -0.500 12.072|
| Neolithic - Post-Neolithic                    | 0.087   | 19.834  | 1.799   | -0.594 8.031|

**Males: Comparisons**

| Pre-Neolithic - Neolithic                     | 0.246   | 23.856  | 1.188   | -2.050 7.614|
| Neolithic - Post-Neolithic                    | 0.326   | 53.608  | 0.991   | -1.501 4.436|

| Combined Comparisons                           | Mean of residuals | Std. dev. |
|-----------------------------------------------|-------------------|-----------|
| Pre-Neolithic                                 | 1.957             | 7.062     |
| Upper Paleolithic                             | 4.298             | 8.384     |
| Mesolithic                                    | 0.709             | 6.199     |
| Neolithic                                     | -1.866            | 7.079     |
| Copper Age                                    | 0.085             | 5.421     |
| Bronze Age                                    | 0.835             | 5.65      |
| Iron Age                                      | 1.402             | 4.965     |
| Post-Neolithic                                | 0.341             | 5.48      |

**Females: Comparisons**

| Pre-Neolithic                                 | 2.461             | 6.908     |
| Upper Paleolithic                             | 7.914             | 9.862     |
| Mesolithic                                    | 0.903             | 5.889     |
| Neolithic                                     | -3.35             | 7.309     |
| Copper Age                                    | 0.494             | 5.636     |
| Bronze Age                                    | 0.087             | 4.498     |
| Iron Age                                      | 3.428             | 4.772     |
| Post-Neolithic                                | 0.369             | 5.256     |

**Males: Comparisons**

| Pre-Neolithic                                 | 1.634             | 7.399     |
| Upper Paleolithic                             | 3.092             | 8.485     |
| Mesolithic                                    | 0.54              | 6.859     |
| Neolithic                                     | -1.148            | 6.972     |
| Copper Age                                    | -0.249            | 5.303     |
| Bronze Age                                    | 1.308             | 6.343     |
| Iron Age                                      | -1.298            | 4.543     |
| Post-Neolithic                                | 0.319             | 5.693     |

**Table S6.** Comparisons of the residuals from a linear model of osteological stature and polygenic height score with sex as a co-variate for deamination filtered data.
### Table S7. Comparisons of the residuals from a linear model of osteological stature and polygenic height score with sex, latitude and longitude as co-variates.

| Combined Comparisons               | P-value | df    | t     | 95% CI     |
|------------------------------------|---------|-------|-------|------------|
| *Pre-Neolithic - Neolithic*        | 0.043   | 43.755| 2.083 | 0.124 7.510|
| *Neolithic - Post-Neolithic*       | 0.067   | 71.565| 1.861 | -0.159 4.597|

#### Females: Comparisons

| *Pre-Neolithic - Neolithic*        | 0.065   | 17.375| 1.967 | -0.428 12.558|
| *Neolithic - Post-Neolithic*       | 0.077   | 19.352| -1.865| -8.262 0.471|

#### Males: Comparisons

| *Pre-Neolithic - Neolithic*        | 0.273   | 23.787| 1.122 | -2.209 7.470|
| *Neolithic - Post-Neolithic*       | 0.348   | 52.911| -0.947| -4.347 1.559|

| Combined Comparisons               | Mean of residuals | Std. dev |
|------------------------------------|-------------------|----------|
| *Pre-Neolithic*                    | 1.94              | 7.196    |
| *Upper Paleolithic*                | 4.424             | 8.474    |
| *Mesolithic*                       | 0.615             | 6.33     |
| *Neolithic*                        | -1.877            | 7.132    |
| *Copper Age*                       | 0.153             | 5.284    |
| *Bronze Age*                       | 0.709             | 5.606    |
| *Iron Age*                         | 1.51              | 4.958    |
| *Post-Neolithic*                   | 0.342             | 5.371    |

#### Females: Comparisons

| *Pre-Neolithic*                    | 2.564             | 7.233    |
| *Upper Paleolithic*                | 8.536             | 10.202   |
| *Mesolithic*                       | 0.858             | 6.094    |
| *Neolithic*                        | -3.5              | 7.438    |
| *Copper Age*                       | 0.604             | 5.494    |
| *Bronze Age*                       | -0.073            | 4.385    |
| *Iron Age*                         | 3.498             | 4.903    |
| *Post-Neolithic*                   | 0.395             | 5.130    |

#### Males: Comparisons

| *Pre-Neolithic*                    | 1.539             | 7.416    |
| *Upper Paleolithic*                | 3.053             | 8.408    |
| *Mesolithic*                       | 0.403             | 6.942    |
| *Neolithic*                        | -1.092            | 6.966    |
| *Copper Age*                       | -0.217            | 5.163    |
| *Bronze Age*                       | 1.204             | 6.321    |
| *Iron Age*                         | -1.139            | 4.389    |
| *Post-Neolithic*                   | 0.302             | 5.595    |
| Combined Comparisons | P-value | df  | t    | 95% CI     |
|----------------------|---------|-----|------|------------|
| **FEMUR**            |         |     |      |            |
| Pre-Neolithic - Neolithic | 0.164  | 34.147 | 1.423 | -0.525 - 2.980 |
| Neolithic - Post-Neolithic | 0.028  | 32.075 | -2.308 | -2.783 - 0.174 |
| **TIBIA**             |         |     |      |            |
| Pre-Neolithic - Neolithic | 0.024  | 18.599 | 2.535 | 0.418 - 4.406 |
| Neolithic - Post-Neolithic | 0.134  | 11.918 | -1.606 | -3.068 - 0.466 |
| **HUMERUS**           |         |     |      |            |
| Pre-Neolithic - Neolithic | 0.48   | 15.504 | 0.723 | -1.001 - 2.033 |
| Neolithic - Post-Neolithic | 0.277  | 45.084 | -1.1   | -1.117 - 0.328 |
| **RADIUS**            |         |     |      |            |
| Pre-Neolithic - Neolithic | 0.017  | 22.222 | 2.588 | 0.329 - 2.974 |
| Neolithic - Post-Neolithic | 0.015  | 33.779 | -2.572 | -1.624 - 0.190 |

| Combined Comparisons: FEMUR | Mean of residuals | Std. dev. |
|-----------------------------|-------------------|-----------|
| Pre-Neolithic               | 0.082             | 2.553     |
| Upper Paleolithic           | 1.537             | 2.914     |
| Mesolithic                  | -1.049            | 1.599     |
| Neolithic                   | -1.145            | 2.783     |
| Copper Age                  | 0.184             | 2.115     |
| Bronze Age                  | 0.752             | 2.129     |
| Iron Age                    | 1.171             | 0.963     |
| Post-Neolithic              | 0.333             | 2.116     |

| Combined Comparisons: TIBIA | Mean of residuals | Std. dev. |
|-----------------------------|-------------------|-----------|
| Pre-Neolithic               | 1.013             | 2.245     |
| Upper Paleolithic           | 0.922             | 2.732     |
| Mesolithic                  | 1.074             | 2.036     |
| Neolithic                   | -1.399            | 2.386     |
| Copper Age                  | -0.075            | 1.972     |
| Bronze Age                  | -0.141            | 1.806     |
| Iron Age                    | 0.928             | 2.779     |
| Post-Neolithic              | -0.097            | 1.894     |

| Combined Comparisons: HUMERUS | Mean of residuals | Std. dev. |
|-------------------------------|-------------------|-----------|
| Pre-Neolithic                 | 0.238             | 2.258     |
| Upper Paleolithic             | 1.244             | 2.813     |
| Mesolithic                    | -0.767            | 0.936     |
| Neolithic                     | -0.278            | 1.394     |
| Copper Age                    | 0.231             | 1.331     |
| Bronze Age                    | -0.184            | 1.715     |
| Iron Age                      | -0.975            | 0.374     |
| Post-Neolithic                | 0.117             | 1.44      |

| Combined Comparisons: RADIUS | Mean of residuals | Std. dev. |
|-------------------------------|-------------------|-----------|
| Pre-Neolithic                 | 0.822             | 2.17      |
| Upper Paleolithic             | 1.524             | 2.193     |
| Era            | t-value | p-value |
|----------------|---------|---------|
| Mesolithic     | 0.471   | 2.184   |
| Neolithic      | -0.83   | 1.403   |
| Copper Age     | -0.054  | 1.154   |
| Bronze Age     | 0.268   | 1.334   |
| Iron Age       | 0.649   | 0.658   |
| Post-Neolithic | 0.078   | 1.228   |

**Table S8.** Output of t-test results for comparisons of the residuals from a linear model of average long bone length and polygenic height score with sex as a co-variate for deamination-filtered data.
| Combined Comparisons          | P-value | df     | t      | 95% CI  |
|-------------------------------|---------|--------|--------|---------|
| *Pre-Neolithic - Neolithic*   | 0.12    | 43.671 | 1.587  | -0.762  | 6.400   |
| *Neolithic - Post-Neolithic*  | 0.74    | 71.153 | 0.333  | -1.914  | 2.682   |

**Females: Comparisons**

|                  | P-value | df     | t      | 95% CI  |
|------------------|---------|--------|--------|---------|
| *Pre-Neolithic - Neolithic* | 0.093  | 15.898 | 1.788  | -1.003  | 11.768  |
| *Neolithic - Post-Neolithic* | 0.244  | 21.299 | -1.198 | -6.407  | 1.720   |

**Males: Comparisons**

|                  | P-value | df     | t      | 95% CI  |
|------------------|---------|--------|--------|---------|
| *Pre-Neolithic - Neolithic* | 0.525  | 25.032 | 0.645  | -3.164  | 6.049   |
| *Neolithic - Post-Neolithic* | 0.659  | 48.702 | 0.443  | -2.228  | 3.488   |

| Combined Comparisons | Mean of residuals | Std. dev |
|----------------------|-------------------|----------|
| *Pre-Neolithic*      | 2.224             | 6.981    |
| *Upper Paleolithic*  | 4.798             | 8.646    |
| *Mesolithic*         | 0.852             | 5.78     |
| *Neolithic*          | -0.594            | 6.904    |
| *Copper Age*         | -0.267            | 5.249    |
| *Bronze Age*         | -0.1              | 5.063    |
| *Iron Age*           | -0.672            | 4.848    |
| *Post-Neolithic*     | -0.210            | 5.160    |

**Females: Comparisons**

|                  | Mean of residuals | Std. dev |
|------------------|-------------------|----------|
| *Pre-Neolithic*  | 3.079             | 7.346    |
| *Upper Paleolithic* | 9.508          | 11.4     |
| *Mesolithic*      | 1.242             | 5.708    |
| *Neolithic*       | -2.303            | 6.782    |
| *Copper Age*      | 0.427             | 5.66     |
| *Bronze Age*      | -0.831            | 5.021    |
| *Iron Age*        | 1.320             | 4.932    |
| *Post-Neolithic*  | 0.040             | 5.437    |

**Males: Comparisons**

|                  | Mean of residuals | Std. dev |
|------------------|-------------------|----------|
| *Pre-Neolithic*  | 1.675             | 6.96     |
| *Upper Paleolithic* | 3.228          | 8.175    |
| *Mesolithic*      | 0.51              | 6.214    |
| *Neolithic*       | 0.233             | 6.919    |
| *Copper Age*      | -0.835            | 4.903    |
| *Bronze Age*      | 0.362             | 5.17     |
| *Iron Age*        | -3.328            | 3.937    |
| *Post-Neolithic*  | -0.398            | 4.985    |

Table S9. Output of t-test results for comparisons of the residuals from a linear model of osteological stature and polygenic height score with sex and ancestries (four MDS components) as a co-variates.
| Individual       | Cribra orbitalia | Porotic hyperostosis | LEH | Cribra orbitalia (healed?) | Porotic hyperostosis (healed?) | Source of paleopathological data |
|-----------------|-----------------|----------------------|-----|---------------------------|-------------------------------|--------------------------------|
| Bichon          | FALSE           | FALSE                | TRUE| FALSE                     | FALSE                         | Werner Mueller (unpublished)   |
| Brandysek26     | TRUE            | FALSE                | NA  | TRUE                      | FALSE                         | New                            |
| Brandysek71     | FALSE           | TRUE                 | TRUE| FALSE                     | TRUE                          | New                            |
| Canes1          | NA              | FALSE                | NA  | NA                        | FALSE                         | Drak Hernández, F. & Sanin Matias, M. (2017). Forensic anthropological report of Elba. In: Cademos Lab. Xeolóxico de Laxe Coruña, vol. 39, pp. 35 - 72. |
| Chan_Meso (Elba)| TRUE            | TRUE                 | TRUE| NA                        | NA                            | Serrullia Rech, F. & Sanin Matias, M. (2017). Early Holocene populations in the Cantabrian region: environmental changes and human microevolution. [Thesis] |
| Donkalnis1      | TRUE            | NA                   | TRUE| TRUE                      | NA                            | New                            |
| Donkalnis6      | NA              | NA                   | FALSE| NA                        | NA                            | New                            |
| Dzielnica243    | FALSE           | FALSE                | TRUE| FALSE                     | FALSE                         | New                            |
| GB1_Eneo        | FALSE           | TRUE                 | NA  | FALSE                     | TRUE                          | New                            |
| GEN71           | FALSE           | TRUE                 | NA  | FALSE                     | TRUE                          | New                            |
| GEN72           | FALSE           | TRUE                 | FALSE| FALSE                     | TRUE                          | New                            |
| Gyvakarai       | NA              | NA                   | FALSE| NA                        | NA                            | New                            |
| Hume5           | NA              | NA                   | TRUE| NA                        | NA                            | New                            |
| Hung127         | FALSE           | FALSE                | TRUE| FALSE                     | FALSE                         | New                            |
| Hung130         | TRUE            | FALSE                | TRUE| TRUE                      | FALSE                         | New                            |
| Hung136         | NA              | FALSE                | TRUE| NA                        | FALSE                         | New                            |
| Hung137         | FALSE           | FALSE                | TRUE| FALSE                     | FALSE                         | New                            |
| Hung148         | FALSE           | FALSE                | FALSE| FALSE                     | FALSE                         | New                            |
| Hung149         | FALSE           | FALSE                | FALSE| FALSE                     | FALSE                         | New                            |
| Hung152         | NA              | FALSE                | TRUE| NA                        | FALSE                         | New                            |
| Hung154         | NA              | FALSE                | NA  | FALSE                     | NA                            | New                            |
| Hung155         | FALSE           | FALSE                | TRUE| FALSE                     | FALSE                         | New                            |
| Hung160         | TRUE            | FALSE                | TRUE| TRUE                      | FALSE                         | New                            |
| Hung162         | FALSE           | FALSE                | NA  | FALSE                     | FALSE                         | New                            |
| Hung331         | NA              | FALSE                | TRUE| NA                        | FALSE                         | New                            |
| Hung969         | FALSE           | FALSE                | FALSE| FALSE                     | FALSE                         | New                            |
| Iwiny83         | FALSE           | TRUE                 | TRUE| FALSE                     | TRUE                          | New                            |
| JAG06           | FALSE           | FALSE                | TRUE| FALSE                     | TRUE                          | New                            |
| Jinonice59      | FALSE           | FALSE                | NA  | FALSE                     | FALSE                         | New                            |
| Jinonice84a     | FALSE           | TRUE                 | TRUE| FALSE                     | TRUE                          | New                            |
| Jinonice88      | TRUE            | FALSE                | FALSE| TRUE                     | FALSE                         | New                            |
| Kivutkalns19    | TRUE            | FALSE                | TRUE| TRUE                      | FALSE                         | New                            |
| Kivutkalns25    | FALSE           | FALSE                | TRUE| FALSE                     | FALSE                         | New                            |
| Kornic1561      | FALSE           | TRUE                 | NA  | FALSE                     | TRUE                          | New                            |
| Kornic34        | FALSE           | TRUE                 | TRUE| FALSE                     | TRUE                          | New                            |
| Kretoonas1      | FALSE           | NA                   | TRUE| FALSE                     | NA                            | New                            |
| Kretoonas5      | FALSE           | NA                   | TRUE| FALSE                     | NA                            | New                            |
| MC337A          | FALSE           | FALSE                | FALSE| FALSE                     | FALSE                         | New                            |
| MG104           | NA              | FALSE                | FALSE| NA                        | FALSE                         | New                            |
| Location     | OC32 | OHV6.1 | OHV7.1 | Raciborza | RDVS02  | RDVS116 | RDVS117 | RDVS83  | RDVS59  | RDVS67  | RDVS68  | RISE154 | SCH011  | SCH016  | Spginas2 | Spginas4  | Strachow  | SunghirSI | Turlojiške3 | Urzi10  | Urzi12  | Urzi13  | Urzi21  | Urzi31  | Urzi37  | Urzi41  | Urzi48  | Urzi51  | Urzi60  | Urzi65a | Urzi68  | Urzi70  | V228  | V229  | V242  | V243  | V247  | V575  |
|--------------|------|--------|--------|----------|--------|---------|---------|---------|---------|---------|---------|--------|---------|---------|----------|----------|-----------|----------|----------|----------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Sample | Porotic | Hyperostosis | Pathology | Published in |
|--------|---------|--------------|-----------|--------------|
| Villabruna1 | TRUE | TRUE | FALSE | TRUE | Vercelliotti, G., Caramella, D., Formicola, V., Formaciari, G., & Larsen, C. S. (2010). Porotic Hyperostosis in a late upper Palaeolithic skeleton (Villabruna 1, Italy). International Journal of Osteoarchaeology, 20(3), 358-368. |
| XN164 | TRUE | TRUE | FALSE | TRUE | Ash, A., Francken, M., Pap, I., Tvrdý, Z., Wahl, J., & Pinhasi, R. (2016). Regional differences in health, diet and weaning patterns amongst the first Neolithic farmers of central Europe. Scientific reports, 6(1), 1-10. |
| XN167 | FALSE | TRUE | TRUE | FALSE | Ash, A., Francken, M., Pap, I., Tvrdý, Z., Wahl, J., & Pinhasi, R. (2016). Regional differences in health, diet and weaning patterns amongst the first Neolithic farmers of central Europe. Scientific reports, 6(1), 1-10. |
| XN168 | FALSE | TRUE | FALSE | FALSE | Ash, A., Francken, M., Pap, I., Tvrdý, Z., Wahl, J., & Pinhasi, R. (2016). Regional differences in health, diet and weaning patterns amongst the first Neolithic farmers of central Europe. Scientific reports, 6(1), 1-10. |
| XN170 | FALSE | TRUE | FALSE | FALSE | Ash, A., Francken, M., Pap, I., Tvrdý, Z., Wahl, J., & Pinhasi, R. (2016). Regional differences in health, diet and weaning patterns amongst the first Neolithic farmers of central Europe. Scientific reports, 6(1), 1-10. |
| XN172 | FALSE | TRUE | FALSE | FALSE | Ash, A., Francken, M., Pap, I., Tvrdý, Z., Wahl, J., & Pinhasi, R. (2016). Regional differences in health, diet and weaning patterns amongst the first Neolithic farmers of central Europe. Scientific reports, 6(1), 1-10. |
| XN174 | FALSE | TRUE | FALSE | FALSE | Ash, A., Francken, M., Pap, I., Tvrdý, Z., Wahl, J., & Pinhasi, R. (2016). Regional differences in health, diet and weaning patterns amongst the first Neolithic farmers of central Europe. Scientific reports, 6(1), 1-10. |
| XN175 | FALSE | TRUE | TRUE | FALSE | Ash, A., Francken, M., Pap, I., Tvrdý, Z., Wahl, J., & Pinhasi, R. (2016). Regional differences in health, diet and weaning patterns amongst the first Neolithic farmers of central Europe. Scientific reports, 6(1), 1-10. |
| XN206 | FALSE | TRUE | FALSE | FALSE | Ash, A., Francken, M., Pap, I., Tvrdý, Z., Wahl, J., & Pinhasi, R. (2016). Regional differences in health, diet and weaning patterns amongst the first Neolithic farmers of central Europe. Scientific reports, 6(1), 1-10. |
| XN215 | TRUE | TRUE | FALSE | TRUE | Ash, A., Francken, M., Pap, I., Tvrdý, Z., Wahl, J., & Pinhasi, R. (2016). Regional differences in health, diet and weaning patterns amongst the first Neolithic farmers of central Europe. Scientific reports, 6(1), 1-10. |
| ZEM7 | FALSE | FALSE | FALSE | FALSE | New |
| ZEM8 | FALSE | FALSE | FALSE | FALSE | New |
| ZEM13 | FALSE | FALSE | FALSE | FALSE | New |
| ZEM24 | FALSE | TRUE | NA | FALSE | New |
| ZEM33 | FALSE | TRUE | FALSE | FALSE | New |
| ZEM35 | FALSE | FALSE | NA | FALSE | New |
| Zemiki1 | NA | TRUE | TRUE | FALSE | New |
| ZVEJ21 | FALSE | FALSE | NA | FALSE | New |
| ZVEJ30 | FALSE | FALSE | FALSE | FALSE | New |
| ZVEJ32 | FALSE | FALSE | FALSE | FALSE | New |

**Table S10.** Paleopathological summary for 98 individuals.
Table S11. Comparison of residuals from the main linear model for individuals with 0, 1+ and 2+ indicators of paleopathological stress (n=58 individuals).

| # of indicators | Mean of residuals | Std. dev |
|-----------------|-------------------|----------|
| 0 indicators    | 1.943             | 4.872    |
| 1+ indicators   | 1.026             | 6.345    |
| 2+ indicators   | 0.768             | 6.846    |

| n=58 individuals | P-value | df | t  | 95% CI       |
|------------------|---------|----|----|--------------|
| 0 vs 1+ indicator| 0.555   | 38.753 | 0.595 | -2.202 4.037 |
| 0 vs 2+ indicator| 0.561   | 30.73  | 0.587 | -2.906 5.256 |
| Paleopathology                       | P-value | FDR  | df    | t     | 95% CI       |
|-------------------------------------|---------|------|-------|-------|--------------|
| Cribra orbitalia                    | 0.461   | 0.771| 33.253| -0.746| -4.587 - 2.126 |
| Linear enamel hypoplasia           | 0.838   | 0.838| 71.862| 0.205 | -2.523 - 3.101 |
| Porotic hyperostosis               | 0.514   | 0.771| 58.52 | -0.656| -3.707 - 1.876 |
| Paleopathology (healed)            |         |      |       |       |              |
| Cribra orbitalia                   | 0.584   | 0.584| 30.924| -0.553| -4.372 - 2.507 |
| Porotic hyperostosis               | 0.574   | 0.584| 55.769| -0.565| -3.650 - 2.044 |
| Linear enamel hypoplasia           | 0.838   | 0.838| 71.862| 0.205 | -2.523 - 3.101 |

| Paleopathology (all)               | Mean of residuals | Std. dev |
|------------------------------------|-------------------|----------|
| Cribra orbitalia_TRUE              | -0.372            | 6.607    |
| Cribra orbitalia_FALSE             | 0.859             | 6.221    |
| Porotic hyperostosis_TRUE         | 0.261             | 6.676    |
| Porotic hyperostosis_FALSE        | 1.177             | 5.29     |
| Linear enamel hypoplasia_TRUE     | 0.736             | 6.554    |
| Linear enamel hypoplasia_FALSE    | 0.447             | 5.988    |

Table S12. Comparisons for individuals with LEH and active/healed cribra orbitalia or porotic hyperostosis with the residuals from a linear model of osteological height and polygenic height score with sex as a covariate.
| Condition                      | Group 1             | Group 2             | P-value | FDR   | df   | t     | 95% CI      |
|-------------------------------|---------------------|---------------------|---------|-------|------|-------|-------------|
| Cribra orbitalia              |                     |                     |         |       |      |       |             |
| PreNeolithic-PreNeolithic     | 0.294               | 0.8225              | 5.27    | -1.164| -10.983| 4.065 |
| Upper Paleolithic-Upper Paleolithic | NA                 |                     |         |       |      |       |             |
| Mesolithic-Mesolithic         | NA                  |                     |         |       |      |       |             |
| Neolithic-Neolithic           | 0.329               | 0.8225              | 7.583   | -1.042| -13.339| 5.090 |
| Copper Age-Copper Age         | 0.973               | 0.973               | 18.977  | -0.034| -4.040 | 3.911 |
| Bronze Age-Bronze Age         | 0.901               | 0.973               | 2.829   | -0.136| -13.661| 12.580|
| Iron Age-Iron Age             | NA                  |                     |         |       |      |       |             |
| PostNeolithic-PostNeolithic   | 0.975               | 0.975               | 22.915  | -0.031| -3.461 | 3.358 |
| Porotic hyperostosis          |                     |                     |         |       |      |       |             |
| PreNeolithic-PreNeolithic     | 0.588               | 0.932               | 3.586   | -0.594| -16.614| 10.973|
| Upper Paleolithic-Upper Paleolithic | NA                 |                     |         |       |      |       |             |
| Mesolithic-Mesolithic         | 0.712               | 0.932               | 1.462   | -0.447| -49.395| 42.787|
| Neolithic-Neolithic           | 0.634               | 0.932               | 19.99   | 0.483 | -4.188 | 6.711 |
| Copper Age-Copper Age         | 0.932               | 0.932               | 23.85   | 0.086 | -3.881 | 4.220 |
| Bronze Age-Bronze Age         | 0.889               | 0.932               | 8.01    | -0.143| -6.290 | 5.552 |
| Iron Age-Iron Age             | NA                  |                     |         |       |      |       |             |
| PostNeolithic-PostNeolithic   | 0.974               | 0.974               | 37.091  | 0.032 | -3.026 | 3.124 |
| Linear enamel hypoplasia      |                     |                     |         |       |      |       |             |
| PreNeolithic-PreNeolithic     | 0.735               | 0.8901              | 4.022   | -0.362| -10.042| 7.718 |
| Upper Paleolithic-Upper Paleolithic | NA                 |                     |         |       |      |       |             |
| Mesolithic-Mesolithic         | 0.696               | 0.8901              | 1.26    | 0.49  | -16.086| 18.210|
| Neolithic-Neolithic           | 0.645               | 0.8901              | 8.911   | 0.476 | -7.418 | 11.367|
| Copper Age-Copper Age         | 0.343               | 0.8901              | 16.803  | 0.975 | -2.159 | 5.866 |
| Bronze Age-Bronze Age         | 0.071               | 0.497               | 13.38   | -1.958| -7.936 | 0.379 |
| Iron Age-Iron Age             | 0.763               | 0.8901              | 3.978   | 0.323 | -11.627| 14.684|
| PostNeolithic-PostNeolithic   | 0.891               | 0.891               | 40.454  | -0.138| -3.211 | 2.801 |
| Cribra orbitalia (healed)     |                     |                     |         |       |      |       |             |
| PreNeolithic-PreNeolithic     | 0.294               | 0.975               | 5.27    | -1.164| -10.983| 4.065 |
| Upper Paleolithic-Upper Paleolithic | NA                 |                     |         |       |      |       |             |
| Mesolithic-Mesolithic         | NA                  |                     |         |       |      |       |             |
| Neolithic-Neolithic           | 0.436               | 0.975               | 5.364   | -0.841| -15.730| 7.856 |
| Copper Age-Copper Age         | 0.973               | 0.975               | 18.977  | -0.034| -4.040 | 3.911 |
| Bronze Age-Bronze Age         | 0.901               | 0.975               | 2.829   | -0.136| -13.661| 12.580|
| Iron Age-Iron Age             | NA                  |                     |         |       |      |       |             |
| PostNeolithic-PostNeolithic   | 0.975               | 0.975               | 22.915  | -0.031| -3.461 | 3.358 |
| Porotic hyperostosis (healed) |                     |                     |         |       |      |       |             |
| PreNeolithic-PreNeolithic     | 0.451               | 0.974               | 1.532   | -0.993| -38.537| 27.341|
| Upper Paleolithic-Upper Paleolithic | NA                 |                     |         |       |      |       |             |
| Mesolithic-Mesolithic         | NA                  |                     |         |       |      |       |             |
| Neolithic-Neolithic           | 0.634               | 0.974               | 19.99   | 0.483 | -4.188 | 6.711 |
| Copper Age-Copper Age         | 0.932               | 0.974               | 23.85   | 0.086 | -3.881 | 4.220 |
| Bronze Age-Bronze Age         | 0.889               | 0.974               | 8.01    | -0.143| -6.290 | 5.552 |
| Cribrum orbitalia | Mean of residuals | Std. dev. |
|------------------|------------------|-----------|
| PreNeo_T         | -1.711           | 2.323     |
| PreNeo_F         | 1.748            | 6.068     |
| UP_T             | -0.069           | NA        |
| UP_F             | -3.224           | NA        |
| Meso_T           | -3.354           | NA        |
| Meso_F           | 2.742            | 6.214     |
| Neo_T            | -5.401           | 8.701     |
| Neo_F            | -1.276           | 7.608     |
| CA_T             | 1.503            | 4.371     |
| CA_F             | 1.438            | 5.311     |
| BA_T             | 2.942            | 6.315     |
| BA_F             | 2.401            | 5.554     |
| IA_T             | 5.674            | NA        |
| IA_F             | 2.292            | 5.028     |
| PostNeo_T        | 1.862            | 4.644     |
| PostNeo_F        | 1.812            | 5.335     |
| **Porotic hyperostosis** | | |
| PreNeo_T         | 2.201            | 6.978     |
| PreNeo_F         | -0.619           | 5.611     |
| UP_T             | -0.069           | NA        |
| UP_F             | -3.224           | NA        |
| Meso_T           | 3.336            | 9.461     |
| Meso_F           | 0.032            | 6.257     |
| Neo_T            | -1.649           | 8.403     |
| Neo_F            | -0.387           | 3.85      |
| CA_T             | 1.609            | 4.393     |
| CA_F             | 1.778            | 5.606     |
| BA_T             | 2.262            | 3.89      |
| BA_F             | 1.895            | 6.046     |
| IA_T             | NA               | NA        |
| IA_F             | 1.402            | 4.965     |
| PostNeo_T        | 1.783            | 4.137     |
| PostNeo_F        | 1.832            | 5.705     |
| **LEH** | | |
| PreNeo_T         | 0.105            | 5.881     |
| PreNeo_F         | -0.105           | 2.209     |
| UP_T             | 2.822            | 8.551     |
| UP_F             | -0.069           | NA        |
| Meso_T           | -2.162           | 1.048     |
|     |     |     |
|-----|-----|-----|
| Mesop F | -1.551 | 2.88 |
| Neo T   | -3.322 | 9.98 |
| Neo F   | -1.348 | 7.606 |
| CA T    | 0.633  | 4.567 |
| CA F    | 2.487  | 4.689 |
| BA T    | 3.095  | 5.657 |
| BA F    | -0.684 | 2.248 |
| IA T    | 1.133  | 6.003 |
| IA F    | 2.661  | 5.57  |
| PostNeo T | 2.088 | 5.269 |
| PostNeo F | 1.883 | 4.469 |

**Cribra orbitalia (healed)**

|     |     |     |
|-----|-----|-----|
| PreNeo T | -1.711 | 2.323 |
| PreNeo F | 1.748  | 6.068 |
| UP T    | -0.069 | NA   |
| UP F    | -3.224 | NA   |
| Meso T  | -3.354 | NA   |
| Meso F  | 2.742  | 6.214 |
| Neo T   | -5.213 | 9.714 |
| Neo F   | -1.276 | 7.608 |
| CA T    | 1.503  | 4.371 |
| CA F    | 1.438  | 5.311 |
| BA T    | 2.942  | 6.315 |
| BA F    | 2.401  | 5.554 |
| IA T    | 5.674  | NA   |
| IA F    | 2.292  | 5.028 |
| PostNeo T | 1.862 | 4.644 |
| PostNeo F | 1.812 | 5.335 |

**Porotic hyperostosis (healed)**

|     |     |     |
|-----|-----|-----|
| PreNeo T | 4.979 | 7.138 |
| PreNeo F | -0.619 | 5.611 |
| UP T    | -0.069 | NA   |
| UP F    | -3.224 | NA   |
| Meso T  | 10.026 | NA   |
| Meso F  | 0.032  | 6.257 |
| Neo T   | -1.649 | 8.403 |
| Neo F   | -0.387 | 3.85  |
| CA T    | 1.609  | 4.393 |
| CA F    | 1.778  | 5.606 |
| BA T    | 2.262  | 3.89  |
| BA F    | 1.893  | 6.046 |
| IA T    | NA    | NA   |
| IA F    | 1.402  | 4.965 |
Table S13. Comparisons for individuals with LEH, cribra orbitalia or porotic hyperostosis with the residuals from a linear model of osteological height and polygenic height score with sex as a co-variate within cultural periods.

|        | PostNeo_T  | 4.137 |
|--------|------------|-------|
| PostNeo_F | 1.832 | 5.705 |
| Condition                      | Pre-Neolithic - Neolithic | Neolithic - Post-Neolithic |
|-------------------------------|---------------------------|---------------------------|
| **Linear enamel hypoplasia**  |                            |                           |
| P-value                       | 0.49                      | 0.101                     |
| df                            | 8.904                     | 6.466                     |
| t                             | 0.721                     | 1.913                     |
| 95% CI                        | -7.349 14.203             | -1.866 16.393             |
| Cribrar orbitalia             |                            |                           |
| P-value                       | 0.382                     | 0.171                     |
| df                            | 5.996                     | 20.411                    |
| t                             | 0.943                     | 1.419                     |
| 95% CI                        | -5.887 13.267             | -1.606 8.470              |
| Porotic hyperostosis          |                            |                           |
| P-value                       | 0.457                     | 0.208                     |
| df                            | 3.291                     | 7.116                     |
| t                             | 0.842                     | 1.386                     |
| 95% CI                        | -10.002 17.703            | -3.789 14.609             |
| Cribrar orbitalia (healed)    |                            |                           |
| P-value                       | 0.486                     | 0.183                     |
| df                            | 4.83                      | 4.782                     |
| t                             | 0.754                     | 1.556                     |
| 95% CI                        | -8.564 15.568             | -4.773 18.924             |
| Porotic hyperostosis (healed) |                            |                           |
| P-value                       | 0.393                     | 0.171                     |
| df                            | 1.4                       | 20.411                    |
| t                             | 1.206                     | 1.419                     |
| 95% CI                        | -29.936 43.192            | -1.606 8.470              |

**Table S14.** Output of t-test results for individuals with LEH, cribrar orbitalia or porotic hyperostosis with the residuals from a linear model of osteological height and polygenic height score with sex as a co-variate.
|       |       |       |       |
|-------|-------|-------|-------|
|       | MDS4* | Estimate | Std. Error | tvalue | Pr(>|t|) |
| MDS 1 | 58.625 | 38.486 | 1.523 | 0.1296 |
| MDS 2 | 98.696 | 49.609 | 1.989 | 0.0483 |
| MDS 3 | 269.855 | 76.977 | 3.506 | 0.0006 |
| MDS 4 | -72.707 | 93.479 | -0.778 | 0.4378 |

*Residual standard error: 6.251 on 162 degrees of freedom
*Multiple R-squared: 0.1058, Adjusted R-squared: 0.08374
*F-statistic: 4.793 on 4 and 162 DF, p-value: 0.00113

|       |       |       |       |
|-------|-------|-------|-------|
|       | MDS5** | Estimate | Std. Error | tvalue | Pr(>|t|) |
| MDS 1 | 58.624 | 38.594 | 1.519 | 0.1307 |
| MDS 2 | 98.697 | 49.748 | 1.984 | 0.0490 |
| MDS 3 | 269.855 | 77.193 | 3.496 | 0.0006 |
| MDS 4 | -72.707 | 93.741 | -0.776 | 0.4391 |
| MDS 5 | 30.502 | 97.874 | 0.312 | 0.7557 |

**Residual standard error: 6.268 on 161 degrees of freedom
**Multiple R-squared: 0.1064, Adjusted R-squared: 0.07861
**F-statistic: 3.832 on 5 and 161 DF, p-value: 0.002625

|       |       |       |       |
|-------|-------|-------|-------|
|       | MDS6*** | Estimate | Std. Error | tvalue | Pr(>|t|) |
| MDS 1 | 58.624 | 38.712 | 1.514 | 0.1319 |
| MDS 2 | 98.697 | 49.901 | 1.978 | 0.0497 |
| MDS 3 | 269.855 | 77.429 | 3.485 | 0.0006 |
| MDS 4 | -72.707 | 94.028 | -0.773 | 0.4405 |
| MDS 5 | 30.502 | 98.174 | 0.311 | 0.7564 |
| MDS 6 | 14.081 | 101.229 | 0.139 | 0.8895 |

***Residual standard error: 6.288 on 160 degrees of freedom
***Multiple R-squared: 0.1065, Adjusted R-squared: 0.07296
***F-statistic: 3.177 on 6 and 160 DF, p-value: 0.005673

|       |       |       |       |
|-------|-------|-------|-------|
|       | MDS7**** | Estimate | Std. Error | tvalue | Pr(>|t|) |
| MDS 1 | 58.627 | 37.426 | 1.566 | 0.1192 |
| MDS 2 | 98.721 | 48.243 | 2.046 | 0.0423 |
| MDS 3 | 269.855 | 74.857 | 3.605 | 0.0004 |
| MDS 4 | -72.707 | 90.904 | -0.8 | 0.4250 |
| MDS 5 | 30.502 | 94.912 | 0.321 | 0.7483 |
| MDS 6 | 14.082 | 97.867 | 0.144 | 0.8858 |
| MDS 7 | 352.510 | 100.991 | 3.491 | 0.0006 |

****Residual standard error: 6.079 on 159 degrees of freedom
****Multiple R-squared: 0.1701, Adjusted R-squared: 0.1335
****F-statistic: 4.654 on 7 and 159 DF, p-value: 9.121e-05

|       |       |       |       |
|-------|-------|-------|-------|
|       | MDS8***** | Estimate | Std. Error | tvalue | Pr(>|t|) |
| MDS 1 | 58.625 | 37.466 | 1.565 | 0.1196 |
| MDS 2 | 98.726 | 48.294 | 2.044 | 0.0426 |
| MDS 3 | 269.855 | 74.937 | 3.601 | 0.0004 |
| MDS 4 | -72.707 | 91.001 | -0.799 | 0.4255 |
| MDS 5 | 30.502 | 95.014 | 0.321 | 0.7486 |
| MDS 6 | 14.081 | 97.971 | 0.144 | 0.8859 |
| MDS 7       | 352.510 | 101.098 | 3.487 | 0.0006 |
|------------|---------|---------|-------|--------|
| MDS 8      | 84.531  | 103.915 | 0.813 | 0.4172 |

*****Residual standard error: 6.085 on 158 degrees of freedom
*****Multiple R-squared:  0.1735,    Adjusted R-squared:  0.1317
*****F-statistic: 4.147 on 8 and 158 DF, p-value: 0.0001607

**Table S15.** Output of linear models of osteological height with sex and ancestries using MDS components 4, 5, 6, 7 and 8 (excluding polygenic height score).
### MDS4*

|                  | Estimate | Std. Error | tvalue | Pr(>|t|) |
|------------------|----------|------------|--------|----------|
| Polygenic height score | 1.19E+04 | 3.45E+03  | 3.458  | 0.0007   |
| MDS 1            | 9.16E+01 | 3.85E+01  | 2.383  | 0.0183   |
| MDS 2            | 5.98E+01 | 4.93E+01  | 1.213  | 0.2270   |
| MDS 3            | 2.11E+02 | 7.64E+01  | 2.756  | 0.0065   |
| MDS 4            | -6.12E+01 | 9.05E+01 | -0.676 | 0.5000   |

*Residual standard error: 6.05 on 161 degrees of freedom
*Multiple R-squared: 0.1677, Adjusted R-squared: 0.1418
*F-statistic: 6.486 on 5 and 161 DF, p-value: 1.603e-05

### MDS5**

|                  | Estimate | Std. Error | tvalue | Pr(>|t|) |
|------------------|----------|------------|--------|----------|
| Polygenic height score | 1.19E+04 | 3.46E+03  | 3.451  | 0.0007   |
| MDS 1            | 9.16E+01 | 3.86E+01  | 2.377  | 0.0186   |
| MDS 2            | 5.98E+01 | 4.95E+01  | 1.209  | 0.2285   |
| MDS 3            | 2.11E+02 | 7.67E+01  | 2.748  | 0.0067   |
| MDS 4            | -6.12E+01 | 9.08E+01 | -0.674 | 0.5013   |
| MDS 5            | 3.28E+01 | 9.47E+01  | 0.346  | 0.7300   |

**Residual standard error: 6.066 on 160 degrees of freedom
**Multiple R-squared: 0.1683, Adjusted R-squared: 0.1371
**F-statistic: 5.395 on 6 and 160 DF, p-value: 4.211e-05

### MDS6***

|                  | Estimate | Std. Error | tvalue | Pr(>|t|) |
|------------------|----------|------------|--------|----------|
| Polygenic height score | 1.19E+04 | 3.47E+03  | 3.442  | 0.0007   |
| MDS 1            | 9.27E+01 | 3.72E+01  | 2.494  | 0.0137   |
| MDS 2            | 5.85E+01 | 4.77E+01  | 1.227  | 0.2217   |
| MDS 3            | 2.09E+02 | 7.39E+01  | 2.822  | 0.0054   |
| MDS 4            | -6.08E+01 | 8.76E+01 | -0.695 | 0.4884   |
| MDS 5            | 3.28E+01 | 9.14E+01  | 0.359  | 0.7198   |
| MDS 6            | 1.60E+01 | 9.42E+01  | 0.169  | 0.8657   |
| MDS 7            | 3.64E+02 | 9.72E+01  | 3.741  | 0.0003   |

***Residual standard error: 6.085 on 159 degrees of freedom
***Multiple R-squared: 0.2361, Adjusted R-squared: 0.1974
***F-statistic: 4.6 on 7 and 159 DF, p-value: 0.0001044

### MDS7****

|                  | Estimate | Std. Error | tvalue | Pr(>|t|) |
|------------------|----------|------------|--------|----------|
| Polygenic height score | 1.23E+04 | 3.34E+03  | 3.695  | 0.0003   |
| MDS 1            | 9.27E+01 | 3.72E+01  | 2.494  | 0.0137   |
| MDS 2            | 5.85E+01 | 4.77E+01  | 1.227  | 0.2217   |
| MDS 3            | 2.09E+02 | 7.39E+01  | 2.822  | 0.0054   |
| MDS 4            | -6.08E+01 | 8.76E+01 | -0.695 | 0.4884   |
| MDS 5            | 3.28E+01 | 9.14E+01  | 0.359  | 0.7198   |
| MDS 6            | 1.60E+01 | 9.42E+01  | 0.169  | 0.8657   |
| MDS 7            | 3.64E+02 | 9.72E+01  | 3.741  | 0.0003   |

****Residual standard error: 5.85 on 158 degrees of freedom
****Multiple R-squared: 0.2361, Adjusted R-squared: 0.1974
****F-statistic: 6.104 on 8 and 158 DF, p-value: 7.598e-07

### MDS8*****

|                  | Estimate | Std. Error | tvalue | Pr(>|t|) |
|------------------|----------|------------|--------|----------|
| Polygenic height score | 1.22E+04 | 3.36E+03  | 3.625  | 0.0004   |

*****Residual standard error: 5.85 on 158 degrees of freedom
*****Multiple R-squared: 0.2361, Adjusted R-squared: 0.1974
*****F-statistic: 6.104 on 8 and 158 DF, p-value: 7.598e-07
|       | MDS 1     | MDS 2     | MDS 3     | MDS 4     | MDS 5     | MDS 6     | MDS 7     | MDS 8     |
|-------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
|       | 9.23E+01  | 3.73E+01  | 2.476     | 0.0143    |           |           |           |           |
|       | 5.90E+01  | 4.78E+01  | 1.234     | 0.2189    |           |           |           |           |
|       | 2.09E+02  | 7.41E+01  | 2.826     | 0.0053    |           |           |           |           |
|       | -6.10E+01 | 8.78E+01  | -0.695    | 0.4883    |           |           |           |           |
|       | 3.28E+01  | 9.16E+01  | 0.358     | 0.7207    |           |           |           |           |
|       | 1.59E+01  | 9.44E+01  | 0.169     | 0.8662    |           |           |           |           |
|       | 3.64E+02  | 9.75E+01  | 3.731     | 0.0003    |           |           |           |           |
|       | 5.15E+01  | 1.01E+02  | 0.512     | 0.6091    |           |           |           |           |

*****Residual standard error: 5.864 on 157 degrees of freedom
*****Multiple R-squared: 0.2374, Adjusted R-squared: 0.1936
*****F-statistic: 5.429 on 9 and 157 DF, p-value: 1.772e-06

**Table S16.** Output of linear models of osteological height and polygenic height score with sex and ancestries using MDS components 4, 5, 6, 7 and 8.
| Number of SNPs | P-value clumping threshold | Population | Sex       | Total number of individuals (N) | $r^2$ subset 167: mean | $r^2$ subset 167: std. deviation |
|---------------|-----------------------------|------------|-----------|---------------------------------|------------------------|---------------------------------|
| 5183          | 5.00E-08                    | GWAS       | Female    | 194167                          | 0.078                  | 0.0936                          |
| 5183          | 5.00E-08                    | GWAS       | Male      | 167015                          | 0.076                  | 0.0938                          |
| 5183          | 5.00E-08                    | GWAS       | Both combined | 361182                        | 0.0398                  | 0.0433                          |
| 5183          | 5.00E-08                    | other European | Female | 2771                          | 0.0595                  | 0.0721                          |
| 5183          | 5.00E-08                    | other European | Male | 1941                          | 0.0578                  | 0.0652                          |
| 5183          | 5.00E-08                    | other European | Both combined | 4712                        | 0.0312                  | 0.0369                          |

Table S17. Correlation between osteological height and polygenic height score for UK Biobank GWAS cohort and non-GWAS individuals as well as a downsampled subset of 167 individuals.
| URI | Value | Value | Value | Value |
|-----|-------|-------|-------|-------|
| WA1301 | 0.108 | 56882 | 321504 | 0.981751 |
| WA1301 | 0.108 | 268074 | 2502412 | 0.911935 |
| WA1301 | 13.9 | 2474078 | 806978 | 0.245835 |
| RDVS218 | 3.523 | 491914 | 2794972 | 0.85009 |
| RDVS5117 | 3.173 | 454685 | 2827301 | 0.861618 |
| RDVS5117 | 3.097 | 412517 | 288889 | 0.874166 |
| RDVS593 | 4.109 | 523884 | 2730222 | 0.836877 |
| RDVS596 | 1.143 | 37134 | 3246562 | 0.900329 |
| RDVS597 | 3.203 | 466404 | 2814692 | 0.857864 |
| RDVS598 | 3.566 | 486165 | 2793221 | 0.811232 |
| RDVS594 | 0.175 | 151458 | 3120923 | 0.935843 |
| RDVS480 | 0.11 | 166926 | 3114440 | 0.941929 |
| RDVS483 | 0.1 | 123522 | 3107446 | 0.902253 |
| RDVS486 | 0.25 | 163575 | 3117811 | 0.950151 |
| RDVS489 | 0.49 | 254693 | 3036693 | 0.922832 |
| RDVS586 | 0.15 | 116885 | 3168051 | 0.965688 |
| SCH011 | 0.002 | 3281398 | 1 | 0 |
| SCH016 | 0.0401 | 316209 | 3249717 | 0.990361 |
| SCH018 | 0.004 | 3281398 | 1 | 0 |
| Smyadovci12 | 0.63 | 346385 | 2535001 | 0.894439 |
| Smyadovci2 | 0.063 | 30102 | 3251284 | 0.906826 |
| Smyadovci3 | 0.06 | 25553 | 3020209 | 0.920061 |
| Smyadovci3 | 1.27 | 327518 | 2953868 | 0.901189 |
| Smyadovci4 | 1.13 | 321409 | 2959871 | 0.902051 |
| Sipinga1 | 3.164 | 53331 | 3228055 | 0.983747 |
| Sipinga2 | 1.522 | 523 | 3275103 | 0.908065 |
| Srapčow | 0.022 | 10123 | 3271263 | 0.996915 |
| Sunghir1 | 1.1 | 1171468 | 2136924 | 0.658645 |
| Sušinža8 | 0.215 | 85337 | 3189849 | 0.971393 |
| Sušinža9 | 0.026 | 10870 | 3207515 | 0.996887 |
| Sušinža32 | 1.492 | 381615 | 2890771 | 0.853703 |
| Thurston | 0.999 | 330242 | 2551144 | 0.985359 |
| Tibo2a | 0.446 | 206697 | 3086098 | 0.938338 |
| Turqijaca1 | 0.131 | 38691 | 3222425 | 0.902032 |
| Turqijaca3 | 0.671 | 58691 | 3222425 | 0.902032 |
| Tyrekan kisan | 7.6 | 2085058 | 1153528 | 0.334275 |
| Uži10 | 0.254 | 507051 | 2774335 | 0.845477 |
| Uži12 | 0.323 | 562842 | 2728544 | 0.831522 |
| Uži13 | 0.255 | 55505 | 2774749 | 0.845825 |
| Uži21 | 0.251 | 509099 | 2771877 | 0.844728 |
| Uži26 | 0.249 | 498775 | 2794607 | 0.848807 |
| Uži31 | 0.374 | 614058 | 2667328 | 0.812868 |
| Uži37 | 0.179 | 449093 | 3232293 | 0.863139 |
| Zernik1 | ZEM8 | ZEM33 | ZEM24 | YABA4 | XN206 | XN175 | XN170 | VLSC_80a | VEJ5a | V229 | V228 | Urzi68 | Urzi65a | Urzi51 | Urzi48 | Urzi39 |   |
|--------|------|-------|-------|-------|------|------|------|--------|------|------|------|-------|-------|-------|-------|-------|-----|
| 1.099  | 2.43 | 3.22  | 0.945 | 1.37  | 0.0202 | 0.0342 | 0.669 | 0.109  | 0.365 | 0.175 | 0.284 | 0.109  | 0.365 | 0.175 | 0.284 | 0.109 |   |
| 516719 | 467658 | 392408 | 596678 | 364170 | 477941 | 426700 | 339025 | 265898 | 353509 | 298757 | 2803445 | 2945687 | 2942361 | 3266236 | 3281386 | 3272316 | 3281386 |
| 0.84254 | 0.142518 | 0.17157 | 0.126773 | 0.103318 | 0.000246 | 0.10383 | 0.00461 | 0.00383 | 0.04792 | 0.03283 | 0.03666 | 0.03612 | 0.03694 | 0.03272 | 0.03666 | 0.03612 |   |
| 30761499 | 30761499 | 30761499 | 30761499 | 30761499 | 30761499 | 30761499 | 30761499 | 30761499 | 30761499 | 30761499 | 30761499 | 30761499 | 30761499 | 30761499 | 30761499 | 30761499 |   |

**Table S18.** Per-individual coverage and pre/post-imputation metrics.
Coverage level | all_correct=counts['REF/REF'] + counts['ALT_1/ALT_1'] + counts['ALT_2/ALT_2'] | all_total= het_total + (counts['REF/ALT_1'] + counts['REF/ALT_2'] + counts['REF/REF'] + counts['REF/MISSING_ENTRY_'].format(sample_name)) + counts['ALT_2/ALT_2'] + counts['ALT_2/ALT_1'] + counts['ALT_2/REF'] + counts['ALT_2/MISSING_ENTRY_'] | Proportion correct
--- | --- | --- | ---
3x | 1651039 | 1663075 | 0.9928
2x | 1536362 | 1545724 | 0.9939
1x | 1425122 | 1432173 | 0.9951
0.7x | 1366946 | 1372489 | 0.9960
0.5x | 1311063 | 1314487 | 0.9974
0.4x | 1294473 | 1297030 | 0.9980
0.3x | 1270668 | 1298111 | 0.9789

Table S19. Assessing imputation accuracy in high coverage vs. low coverage paleogenomic data
Coverage level | het_nonmissing = (counts["ALT_1/REF"] + counts["ALT_1/ALT_2"] + counts["ALT_1/ALT_1"] | het_total=counts["ALT_1/REF"] + counts["ALT_1/ALT_2"] + counts["ALT_1/ALT_1"] + counts["ALT_1/MISSING_ENTRY_{}" | Proportion of heterozygote sites recovered
--- | --- | --- | ---
3x | 1217 | 1238 | 0.9830
2x | 767 | 788 | 0.9734
1x | 518 | 539 | 0.9610
0.7x | 348 | 369 | 0.9431
0.3x | 148 | 173 | 0.8555

**Table S20.** Assessing imputation of heterozygote sites in imputed data.
| Combined: MDS5          |      |      |      |      |
|------------------------|------|------|------|------|
|                        | P-value | df  | t    | 95% CI |
| Pre-Neolithic - Neolithic | 0.118  | 43.802 | 1.594  | -0.747 - 6.405 |
| Neolithic - Post-Neolithic | 0.729  | 71.053 | 0.347  | -1.899 - 2.700 |
| Combined: MDS6         |      |      |      |      |
|                        | P-value | df  | t    | 95% CI |
| Pre-Neolithic - Neolithic | 0.117  | 43.794 | 1.597  | -0.742 - 6.411 |
| Neolithic - Post-Neolithic | 0.725  | 71.03  | 0.353  | -1.892 - 2.706 |
| Combined: MDS7         |      |      |      |      |
|                        | P-value | df  | t    | 95% CI |
| Pre-Neolithic - Neolithic | 0.198  | 46.893 | 1.305  | -1.174 - 5.505 |
| Neolithic - Post-Neolithic | 0.679  | 70.475 | 0.416  | -1.785 - 2.726 |
| Combined: MDS8         |      |      |      |      |
|                        | P-value | df  | t    | 95% CI |
| Pre-Neolithic - Neolithic | 0.191  | 47.144 | 1.327  | -1.136 - 5.539 |
| Neolithic - Post-Neolithic | 0.638  | 70.074 | 0.472  | -1.724 - 2.794 |

| Combined: MDS5          | Mean of residuals | Std. dev. |
|------------------------|-------------------|-----------|
| Pre-Neolithic          | 2.226             | 6.965     |
| Upper Paleolithic      | 4.83              | 8.63      |
| Mesolithic              | 0.837             | 5.75      |
| Neolithic               | -0.603            | 6.911     |
| Copper Age              | -0.234            | 5.247     |
| Bronze Age              | -0.141            | 5.055     |
| Iron Age                | -0.724            | 4.843     |
| Post-Neolithic          | -0.202            | 5.154     |

| Combined: MDS6          | Mean of residuals | Std. dev. |
|------------------------|-------------------|-----------|
| Pre-Neolithic          | 2.227             | 6.996     |
| Upper Paleolithic      | 4.843             | 8.631     |
| Mesolithic              | 0.833             | 5.746     |
| Neolithic               | -0.607            | 6.911     |
| Copper Age              | -0.222            | 5.241     |
| Bronze Age              | -0.157            | 5.059     |
| Iron Age                | -0.731            | 4.849     |
| Post-Neolithic          | -0.200            | 5.152     |

| Combined: MDS7          | Mean of residuals | Std. dev. |
|------------------------|-------------------|-----------|
| Pre-Neolithic          | 1.627             | 6.348     |
| Upper Paleolithic      | 4.269             | 8.499     |
| Mesolithic              | 0.218             | 4.592     |
| Neolithic               | -0.538            | 6.793     |
| Copper Age              | -0.309            | 4.997     |
| Bronze Age              | 0.398             | 5.082     |
| Iron Age                | -0.923            | 4.185     |
| Post-Neolithic          | -0.068            | 5.009     |

| Combined: MDS8          | Mean of residuals | Std. dev. |
|------------------------|-------------------|-----------|
| Pre-Neolithic          | 1.612             | 6.331     |
| Period     | T-value | P-value |
|------------|---------|---------|
| Upper Paleolithic | 4.312   | 8.567   |
| Mesolithic  | 0.172   | 4.462   |
| Neolithic   | -0.589  | 6.816   |
| Copper Age  | -0.254  | 4.989   |
| Bronze Age  | 0.332   | 5.04    |
| Iron Age    | -0.72   | 4.262   |
| Post-Neolithic | -0.054 | 4.986   |

Table S21. Output of t-test results for comparisons of the residuals from a linear model of osteological stature and polygenic height score with sex and ancestries with MDS axes 5, 6, 7 and 8.
Legend for Dataset S1

Dataset S1. Description of individuals in data set (n=167) including individual ID, genetic sex, radiocarbon dates, archaeological/cultural period, geographical coordinates, publication sources for the ancient DNA data and long bone measurements/terminal stature.
SI References

1. C. B. Ruff, et al., Stature and body mass estimation from skeletal remains in the European Holocene. *Am. J. Phys. Anthropol.* **148**, 601–617 (2012).