

Population history and ecology, in addition to climate, influence human stature and body proportions

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Supplementary Information

Supplementary Tables

Table S1 and S2: Full datasets analysed in this study: see accompanying Excel file.

Table S3: Summary statistics for the anthropometric and environmental variables used in this study for the male sample (n = 571).

Variable	Mean	Standard deviation	Maximum	Minimum
Stature (cm)	165.3	5.7	182.1	144.4
Sitting height (cm)	85.5	3.4	95.2	75.9
Lower limb length (cm)	79.8	4.0	92.5	68.5
Date (years CE)	1944	39	2015	1870
Minimum temperature of the coldest month (°C)	5.4	13.1	24.6	-45.0
Maximum temperature of the warmest month (°C)	29.6	7.2	46.0	7.2
Net primary productivity (tonnes of carbon m ⁻² yr ⁻¹ x 10 ⁻⁶)	3.30	2.78	11.15	0.0
Temperature-adjusted relative humidity (%)	88.0	10.0	100.0	56.6

Table S4. Summary statistics for the anthropometric and environmental variables used in this study for the female sample (n = 268).

Variable	Mean	Standard deviation	Maximum	Minimum
Stature (cm)	153.8	5.7	166.5	136.0
Sitting height (cm)	80.2	3.4	87.8	70.4
Lower limb length (cm)	73.5	4.3	87.1	63.6
Date (years CE)	1959	42	2015	1885
Minimum temperature of the coldest month (°C)	4.2	15.2	23.8	-44.7
Maximum temperature of the warmest month (°C)	29.3	7.4	47.9	7.3
Net primary productivity (tonnes of carbon m ⁻² yr ⁻¹ x 10 ⁻⁶)	0.351	0.299	1.100	0.0
Mean maximum relative humidity (%)	66.9	15.0	96.8	36.5

Table S5. Regression models for stature and body proportions relative to environmental conditions for the full male sample (n = 571).

Dependent variable	R	R ²	Adjusted	p	AIC	Partial regression R ²				Predictors	B	SE	Beta	p	Spatial filters (n)
						Predictors	Filters	Shared	Unexplained						
Stature	0.686	0.470	0.464	<0.001	3261	0.178	0.242	0.050	0.530	Max. temperature	0.191	0.036	0.242	<0.001	4
										Min. temperature	-0.012	0.022	-0.027	0.6	
										Humidity	-0.052	0.184	-0.009	0.8	
										NPP	-7.431	0.770	-0.363	<0.001	
Lower limb length	0.705	0.497	0.487	<0.001	2826	0.169	0.268	0.059	0.503	Max. temperature	0.151	0.026	0.275	<0.001	8
										Min. temperature	0.050	0.016	0.164	0.002	
										Humidity	-0.771	0.131	-0.195	<0.001	
										NPP	-3.528	0.530	-0.248	<0.001	
Sitting height	0.687	0.471	0.464	<0.001	2675	0.136	0.156	0.179	0.529	Max. temperature	0.003	0.021	0.006	0.9	5
										Min. temperature	-0.046	0.013	-0.178	<0.001	
										Humidity	0.586	0.112	0.172	<0.001	
										NPP	-3.320	0.455	-0.272	<0.001	
Relative lower limb length	0.706	0.498	0.487	<0.001	1258	0.190	0.252	0.056	0.502	Max. temperature	0.041	0.007	0.298	<0.001	9
										Min. temperature	0.015	0.004	0.191	<0.001	
										Humidity	-0.242	0.033	-0.241	<0.001	
										NPP	-0.703	0.134	-0.195	<0.001	

Relative lower limb length = standardised residual from regression of lower limb length on sitting height. Max. temperature = maximum temperature of the warmest month; Min. temperature = Minimum temperature of the coldest month; Humidity = standardised residual of maximum relative humidity adjusted for maximum temperature of the warmest month; NPP = Net Primary Productivity. Statistically significant predictors of the dependent variable at $p \leq 0.05$ are shown in bold.

Table S6. Regression models for stature and body proportions relative to environmental conditions for the pre-1950 male sample (sensitivity analysis: n = 323).

Dependent variable	R	R ²	Adjusted	p	AIC	Partial regression R ²				Predictors	B	SE	Beta	p	Spatial filters (n)
						Predictors	Filters	Shared	Unexplained						
Stature	0.777	0.604	0.591	<0.001	1741	0.039	0.319	0.246	0.396	Max. temperature	0.073	0.047	0.091	0.1	7
										Min. temperature	-0.029	0.027	-0.067	0.3	
										Humidity	-0.316	0.214	-0.058	0.1	
										NPP	-3.953	1.049	-0.182	<0.001	
Lower limb length	0.790	0.624	0.611	<0.001	1503	0.116	0.363	0.145	0.376	Max. temperature	0.152	0.034	0.266	<0.001	8
										Min. temperature	-0.001	0.019	-0.004	0.9	
										Humidity	-0.922	0.145	-0.238	<0.001	
										NPP	-1.950	0.727	-0.127	0.008	
Sitting height	0.733	0.537	0.527	<0.001	1441	0.116	0.140	0.281	0.463	Max. temperature	-0.078	0.029	-0.165	0.007	4
										Min. temperature	-0.040	0.017	-0.158	0.017	
										Humidity	0.413	0.135	0.128	0.002	
										NPP	-2.428	0.634	-0.191	0.002	
Relative lower limb length	0.787	0.619	0.607	<0.001	619	0.145	0.344	0.130	0.381	Max. temperature	0.038	0.008	0.264	<0.001	7
										Min. temperature	0.004	0.005	0.046	0.4	
										Humidity	-0.253	0.037	-0.258	<0.001	
										NPP	-0.409	0.185	-0.105	0.028	

Relative lower limb length = standardised residual from regression of lower limb length on sitting height. Max. temperature = maximum temperature of the warmest month; Min. temperature = Minimum temperature of the coldest month; Humidity = standardised residual of maximum relative humidity adjusted for maximum temperature of the warmest month; NPP = Net Primary Productivity. Statistically significant predictors of the dependent variable at $p \leq 0.05$ are shown in bold.

Table S7. Regression models for stature and body proportions relative to environmental conditions for the full female sample (n = 268).

Dependent variable	R	R ²	Adjusted R ²	p	AIC	Partial regression R ²				Predictors	B	SE	Beta	p	Spatial filters (n)
						Predictors	Filters	Shared	Unexplained						
Stature	0.724	0.524	0.510	<0.001	1513	0.093	0.247	0.183	0.476	Max. temperature	0.147	0.048	0.193	0.003	5
										Min. temperature	0.004	0.026	0.010	0.9	
										Humidity	0.072	0.322	0.013	0.8	
										NPP	-6.130	1.001	-0.323	<0.001	
Lower limb length	0.754	0.569	0.554	<0.001	1342	0.112	0.309	0.149	0.431	Max. temperature	0.173	0.034	0.299	<0.001	6
										Min. temperature	0.023	0.019	0.082	0.2	
										Humidity	-0.196	0.236	-0.046	0.4	
										NPP	-2.442	0.715	-0.170	<0.001	
Sitting height	0.653	0.427	0.405	<0.001	1301	0.146	0.166	0.115	0.573	Max. temperature	-0.166	0.032	-0.359	<0.001	7
										Min. temperature	0.012	0.017	0.053	0.5	
										Humidity	0.776	0.217	0.225	<0.001	
										NPP	-1.369	0.706	-0.119	0.05	
Relative lower limb length	0.761	0.579	0.564	<0.001	552	0.141	0.322	0.116	0.421	Max. temperature	0.043	0.008	0.319	<0.001	6
										Min. temperature	0.006	0.004	0.087	0.2	
										Humidity	-0.055	0.054	-0.055	0.3	
										NPP	-0.815	0.172	-0.244	<0.001	

Relative lower limb length = standardised residual from regression of lower limb length on sitting height. Max. temperature = maximum temperature of the warmest month; Min. temperature = Minimum temperature of the coldest month; Humidity = standardised residual of maximum relative humidity adjusted for maximum temperature of the warmest month; NPP = Net Primary Productivity. Statistically significant predictors of the dependent variable at $p \leq 0.05$ are shown in bold.

Table S8. Regression models for stature and body proportions relative to environmental conditions for the pre-1950 female sample (sensitivity analysis: n = 94).

Dependent variable	R	R ²	Adjusted R ²	p	AIC	Partial regression R ²				Predictors	B	SE	Beta	p	Spatial filters (n)
						Predictors	Filters	Shared	Unexplained						
Stature	0.808	0.652	0.628	<0.001	523	0.155	0.161	0.336	0.348	Max. temperature	0.284	0.084	0.288	<0.001	3
										Min. temperature	-0.045	0.046	-0.109	0.3	
										Humidity	-0.309	0.575	-0.059	0.6	
										NPP	-7.547	1.798	-0.354	<0.001	
Lower limb length	0.809	0.654	0.635	<0.001	462	0.135	0.242	0.277	0.346	Max. temperature	0.317	0.061	0.433	<0.001	2
										Min. temperature	-0.065	0.034	-0.213	0.06	
										Humidity	0.081	0.414	0.021	0.8	
										NPP	-2.127	1.242	-0.134	0.09	
Sitting height	0.661	0.437	0.412	<0.001	427	0.395	0.038	0.004	0.563	Max. temperature	-0.117	0.05	-0.244	0.021	1
										Min. temperature	0.011	0.027	0.056	0.7	
										Humidity	1.073	0.248	0.418	<0.001	
										NPP	-2.841	1.006	-0.274	0.006	
Relative lower limb length	0.786	0.618	0.596	<0.001	192	0.164	0.279	0.175	0.382	Max. temperature	0.082	0.014	0.500	<0.001	2
										Min. temperature	-0.015	0.008	-0.213	0.07	
										Humidity	-0.065	0.097	-0.074	0.5	
										NPP	-0.184	0.292	-0.052	0.5	

Relative lower limb length = standardised residual from regression of lower limb length on sitting height. Max. temperature = maximum temperature of the warmest month; Min. temperature = Minimum temperature of the coldest month; Humidity = standardised residual of maximum relative humidity adjusted for maximum temperature of the warmest month; NPP = Net Primary Productivity. Statistically significant predictors of the dependent variable at $p \leq 0.05$ are shown in bold.