

Population genetic differentiation of height and body mass index across Europe - DTU Orbit (08/11/2017)

Population genetic differentiation of height and body mass index across Europe

Across-nation differences in the mean values for complex traits are common(1-8), but the reasons for these differences are unknown. Here we find that many independent loci contribute to population genetic differences in height and body mass index (BMI) in 9,416 individuals across 14 European countries. Using discovery data on over 250,000 individuals and unbiased effect size estimates from 17,500 sibling pairs, we estimate that 24% (95% credible interval (CI) = 9%, 41%) and 8% (95% CI = 4%, 16%) of the captured additive genetic variance for height and BMI, respectively, reflect population genetic differences. Population genetic divergence differed significantly from that in a null model (height, $P < 3.94 \times 10^{-8}$; BMI, $P < 5.95 \times 10^{-4}$), and we find an among-population genetic correlation for tall and slender individuals ($r = -0.80$, 95% CI = $-0.95, -0.60$), consistent with correlated selection for both phenotypes. Observed differences in height among populations reflected the predicted genetic means ($r = 0.51$; $P < 0.001$), but environmental differences across Europe masked genetic differentiation for BMI ($P < 0.58$).

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