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The effect of socio-economic status and food availability on first birth interval in a pre-industrial human population

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Individual variation in nutritional status has direct implications for fitness and thus is crucial in shaping patterns of life-history variation. Nevertheless, it is difficult to measure in natural populations, especially in humans. Here, we used longitudinal data on individual life-histories and annual crop yield variation collected from pre-industrial Finnish populations experiencing natural mortality and fertility to test the validity of first birth interval (FBI; time between marriage and first birth) as a surrogate measure of nutritional status. We evaluated whether women with different socio-economic groups differ in length of FBI, whether women of poorer socio-economic status and experiencing lower crop yields conceive slower following marriage, and whether shorter FBI is associated with higher lifetime breeding success. We found that poorer women had longer FBI and reduced probability of giving birth in months with low food availability, while the FBI of richer women was not affected by variation in food availability. Women with shorter FBI achieved higher lifetime breeding success and a faster reproductive rate. This is, to our knowledge, the first study to show a direct relationship between environmental conditions and speed of childbirth following marriage, highlighting the value of FBI as an indicator of nutritional status when direct data are lacking.

1. Introduction

It is well established that nutritional status in adulthood affects female fertility [1]. Females in better condition have a higher chance of successful reproduction and achieve greater lifetime reproductive success [2], and favourable environmental conditions reduce the costs of breeding [2,3]. Linking variation in