

Early-life environment, fertility and reproductive success in two European populations

Growing numbers of studies show the importance of the early-life environment. In humans, a poor early-life environment increases the risk of dying from infectious diseases in early adulthood and the risk of many lifestyle diseases (*e.g.* obesity, cardiovascular diseases, diabetes). Further, it is suggested that favourable early-life conditions impact on lifetime reproductive success and longevity. However, a comprehensive assessment of the effect of early-life environment on later reproductive success in humans, including intergenerational effects on reproductive success, has never before been conducted. Thus, I propose to do a comprehensive test of early-life environment and its effect on fertility and ultimately reproductive success, including intergenerational effects.

Detailed data on two European populations will be used in order to test the proposed hypothesis. Firstly, I will take advantage of unusually detailed records available on Polish rural population spanning from 1782 to modern records of living people. Secondly, I will use Finnish pedigree and reproductive data across 15 complete generations living in eight ecologically and sociologically different areas since the early 18th century. Measures of early-life condition include: birth year (ranking good and bad years using weather records and grain figures), month/season of birth, birth order, and social class, fingerprints, fluctuating asymmetry, digit ratio (2D:4D), and leg length. Using data from two different populations will allow us to compare and determine if observed trends are consistent across populations.

We will use detailed datasets to answer the complex question of how early-life environment impacts fertility and lifetime reproductive success. Thus, this project will add substantially to our understanding of variation in human fertility. Moreover, I hope that it will also draw the attention of specialists from the field of public health and will contribute to the general public's awareness of the importance of the early-life environment for fertility.