

# Health effects of in utero exposure to the Dutch Hunger Winter

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## Abstract

There is a vast literature on the health effects of in utero malnutrition, with the Dutch famine 1944-1945 being among the most frequently studied adverse shocks. In this paper, we revisit the results of the highly influential 1970s, but since then unexploited, studies of Stein et al. (1972) and Ravelli et al. (1976) who use male military recruits data to study the effects of famine exposure on mental development and obesity at age 18. Although the famine created a well-defined environment to study the effects of malnutrition, a binary indicator of exposure is mute on the mechanisms through which the famine affected these cohorts at the end of World War II. We enhance the analysis by linking the military recruits data with newly digitalised data on temperature, bombings, caloric and nutrients composition of the diet. While we find effects of in utero exposure, these are concentrated on those exposed since early gestation and are driven by exposure to bombings in the second trimester and reduction in protein intake in the third trimester. Moreover, we find evidence of both selection and scarring effects and account for selection using a copula-based approach to relax the, rather restrictive, normality assumption.

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