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Press information

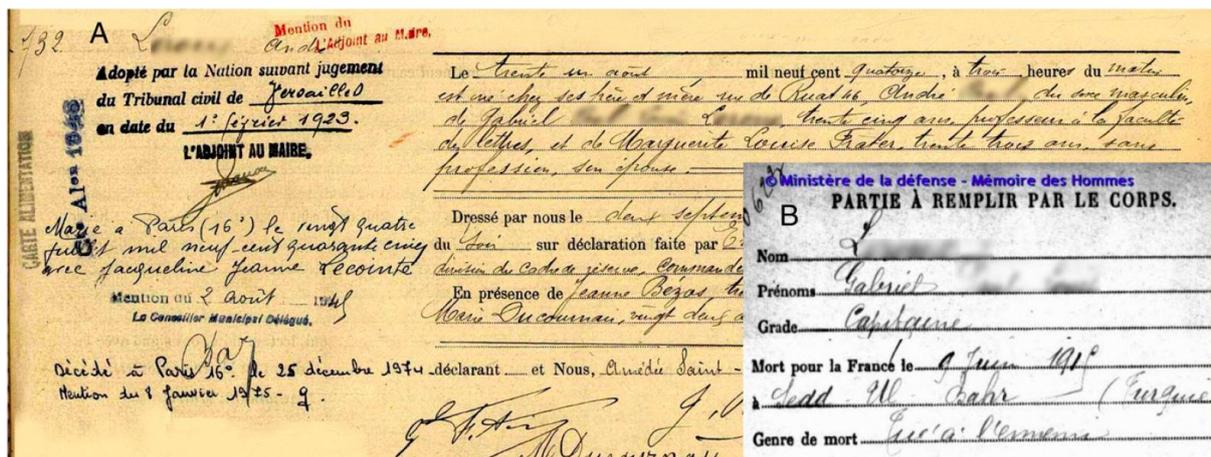
Prenatal stress affects life expectancy in offspring

Major prenatal stress reduces the lifespan of adult offspring by over 2 years. Inserm researchers have obtained these results by studying a cohort of children born between 1914 and 1916, some of whom lost their father in combat before they were even born. Stress suffered by the mother seems to weaken the fetus, at a developmental stage characterized by a high level of plasticity. These results were published in [PNAS](#) by a team from Inserm Unit 1169, "Gene Therapy, Genetics and Epigenetics in Neurology, Endocrinology, Cardiology, and Child Development": Nicolas Todd, Pierre Bougnères, and Alain-Jacques Valleron.

Research has shown that early-life stress can have repercussions throughout an individual's life. This is the case for example with exposure to famine during pregnancy, which increases the risk of cardiovascular, metabolic, and mental disorders in the offspring. However, the long-term consequences of such stress on mortality remain largely unknown. In an attempt to better understand this issue, Inserm researchers studied a cohort of children born in the period 1914-16, a group that has now passed away, and examined over 90,000 birth certificates. Following comparison with the French Ministry of Defense's database of the 1.4 million soldiers killed in World War I, they identified 2,651 *pupilles de la Nation* (orphans of the Nation) whose fathers died in combat during this period.

Each war orphan was paired with a control child born at the same time, in the same commune, to a mother of comparable age, and their respective lifespans were compared. The lifespan of children whose father died after their birth was the same as that of their control counterparts. But the adult lifespans of children whose father died before their birth were shortened by 2.4 years, and by 4 years if this death took place in the final trimester of pregnancy. This historical study reveals for the first time that prenatal maternal stress weakens the fetus, at a stage of its development characterized by a high level of plasticity, and particularly of epigenetic plasticity.

The article describes the maternal, placental, and fetal mechanisms that may have contributed to the long-term impact of paternal death on prenatal orphans. These include, for example, variation in the level of cortisol, a steroid hormone that controls various stages of fetal development but which is also involved in the body's response to stress in other periods of life.



Extract from the birth certificate of a child given "orphan of the Nation" status (A) after being linked to the father's military death certificate (B).

(A) Archives de Bordeaux / (B) [Mémoire des Hommes](#).

Sources

Prenatal loss of father during World War One is predictive of a reduced lifespan in adulthood

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