

Granddaughters and great-granddaughters of men who start to smoke before puberty, have more body fat than expected

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A new study, led by the University of Bristol and published in *Scientific Reports* today, has reported increased body fat in females whose grandfathers or great-grandfathers began smoking before puberty.

Experiments with model studies elsewhere have shown that exposure of males to certain chemicals before breeding can have effects on their offspring. There has, however, been doubt as to whether this phenomenon is present in humans and whether any apparent effects may be more readily explained by other factors.

To investigate effects of prepubertal exposures in humans, scientists from the University of Bristol have studied possible effects of ancestral prepubertal cigarette [smoking](#) on participants in the [Children of the 90s](#), a study of over 14,000 individuals. In earlier [research from 2014](#), they found that if a father started smoking regularly before reaching puberty (before 11 years of age), then his sons, but not his daughters, had more body fat than expected. In the newly published study, they extended this analysis to earlier generations using recently collected data on the grandfathers and great-grandfathers of study participants obtained by questionnaires. They discovered higher body fat in females whose paternal grandfathers or great-grandfathers had started smoking before age 13 compared to those whose ancestors started smoking later in childhood (age 13 to 16). No effects were observed in male descendants. Further research will be needed to confirm these observations in other [longitudinal studies](#) and to expand the investigation into other transgenerational effects and ancestral exposures.

Professor Jean Golding, lead author of the report, said: "This research provides us with two important results. First, that before puberty, exposure of a boy to particular substances might have an effect on generations that follow him. Second, one of the reasons why children become overweight may be not so much to do with their current diet and exercise, rather than the lifestyle of their ancestors or the persistence of associated factors over the years.

If these associations are confirmed in other datasets, this will be one of the first human studies with data suitable to start to look at these

associations and to begin to unpick the origin of potentially important cross-generation relationships. It is with great thanks to participants within the Children of the 90s study that we are able to carry out such pioneering research. There is much to explore."

More information: Human transgenerational observations of regular smoking before puberty on fat mass in grandchildren and great-grandchildren, *Scientific Reports* (2022). [DOI: 10.1038/s41598-021-04504-0](https://doi.org/10.1038/s41598-021-04504-0)

Provided by University of Bristol

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