

Air pollution linked to higher risk of infertility in men

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Long term exposure to fine particulate matter (PM2.5) air pollution is

linked to a higher risk of infertility in men, whereas road traffic noise is linked to a higher risk of infertility in women over 35, finds a Danish study published by *The BMJ*.

If these findings are confirmed in future studies, they could help guide strategies to regulate noise and air pollution to protect the general population from these exposures, say the researchers.

Infertility is a major global health problem affecting one in seven couples trying to conceive.

Several studies have found negative links between particulate air pollution and [sperm quality](#) and success after fertility treatment, but results on fecundability (the likelihood of conceiving) are inconsistent, and no studies have investigated the effects of transport noise on infertility in men and [women](#).

To address this uncertainty, researchers set out to investigate whether long term exposure to [road traffic noise](#) and [fine particulate matter](#) (PM2.5) air pollution was associated with a higher risk of infertility in men and women.

Their findings are based on national registry data for 526,056 men and 377,850 women aged 30–45 years, with fewer than two children, cohabiting or married, and residing in Denmark between 2000 and 2017.

This group was selected to include a high proportion of people actively trying to become pregnant, and thus at risk of an infertility diagnosis. Individuals with an existing infertility diagnosis were excluded, as were women who had undergone surgery that prevents pregnancy and men who were sterilized.

Yearly average PM2.5 concentrations and road traffic noise levels at

each participant's address (1995–2017) were calculated, and infertility diagnoses were recorded from the national patient register.

Infertility was diagnosed in 16,172 men and 22,672 women during an 18-year follow-up period (average of just over 4 years).

After adjusting for several potentially influential factors including income, [education level](#), and occupation, exposure to 2.9 $\mu\text{g}/\text{m}^3$ higher average levels of PM2.5 over five years was associated with a 24% increased risk of infertility in men aged 30-45 years. PM2.5 was not associated with infertility in women.

Exposure to 10.2 decibels higher average levels of road traffic noise over five years was associated with a 14% increased risk of infertility among women older than 35 years. Noise was not associated with infertility among younger women (30–35 years).

In men, road traffic noise was associated with a small increased risk of infertility in the 37-45 age group, but not among those aged 30-37 years.

The higher risk of noise related infertility in women and PM2.5 related [infertility](#) in men was consistent across people living in rural, suburban, and [urban areas](#) as well as across people with low, medium, and high socioeconomic status.

This is an observational study, so it can't establish cause, and the researchers acknowledge that couples not trying to conceive may have been included, and that information on lifestyle factors and exposure to noise and air pollution at work and during leisure activities was lacking.

However, this was a large study based on reliable health and residential data that used validated models to assess pollution and noise levels, and the researchers were able to account for a range of important social and

economic factors.

As such, they conclude, "If our results are confirmed in future studies, it suggests that political implementation of air pollution and noise mitigations may be important tools for improving birth rates in the Western world."

More information: Long term exposure to road traffic noise and air pollution and risk of infertility in men and women: nationwide Danish cohort study, *The BMJ* (2024). [DOI: 10.1136/bmj-2024-080664](https://doi.org/10.1136/bmj-2024-080664)

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