

# Road traffic pollution doubles risk of rejection after lung transplant

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Lung transplant patients have double the risk of organ rejection and death within five years of the procedure if they live near a main road, indicates research published online in *Thorax*.

The Belgian researchers tracked the health of 281 patients who had undergone a lung transplant or retransplant at the same hospital between 1997 and 2008 until 2009.

They took into account how far these patients lived from a main road and therefore a source of airborne road traffic pollution to see if this had any impact on their survival rates, as pollutants are known to trigger [inflammation](#).

Around half of all patients who undergo a lung transplant develop a serious inflammatory condition called bronchiolitis obliterans syndrome within five years of having the procedure, say the authors.

The syndrome, which is caused by an overactive immune system, is the clinical equivalent of [organ rejection](#) and is considerably more common in lung transplant recipients than it is in other solid organ transplant patients - possibly because of the lung's direct contact with the environment, they add.

During the monitoring period, 117 patients (41%) developed the syndrome, one in five of whom (61) died.

Gender, age, or type of transplantation (single or double) had no bearing on the risk of death, the findings showed. But a clear pattern emerged for proximity to a main road.

Those who lived within a 171 metre radius of a main road were twice as likely to develop the syndrome and more than twice as likely to die as their peers who lived further away from this source of pollution.

Furthermore, the calculations showed that for every 10-fold increase in distance from a main road, patients were 43% less likely to develop the syndrome and 28% less likely to die.

Lung lavages (washing out of the lungs) and blood samples taken from 207 lung transplant recipients also showed that levels of inflammatory markers were associated with distance from a main road: the greater the distance from a main road, the lower they were.

The findings prompt the authors to conclude that one in four cases of bronchiolitis obliterans syndrome and almost 30% (28%) of deaths in [lung transplant](#) recipients across the country could be attributed to living near a major road.

"These population attributable fractions are significant not only in terms of patient suffering but also in terms of healthcare costs," say the authors. "Traffic related air [pollution](#) appears to constitute a serious risk ... If confirmed by other studies, [it] has substantial clinical and public health implications."

Provided by British Medical Journal

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