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Health cost of traffic jams counted

Mitigating congestion could save billions of dollars each year by preventing premature deaths



Image credit:
SXC/drouu

Traffic jams cost the US economy billions of dollars each year in wasted time and fuel. But premature deaths from pollutants emitted in congested areas can cost at least as much in some cities, according to a study published in *Environmental Health*.

The authors say these losses should also be counted when policy makers weigh up the benefits of traffic-mitigation measures.

"Considering only the direct economic costs of congestion will underestimate societal benefits of mitigating congestion, significantly so in certain urban areas," write Jonathan Levy, from Boston University School of Public Health, and colleagues from the Harvard School of Public Health and the Harvard Center for Risk Analysis, Massachusetts, USA.

They used a series of models to reach their conclusion, without taking into account congestion-mitigation measures but factoring in population growth.

First, they estimated how much congestion motorists would experience in each one of 83 US cities between 2000 and 2030. Linking data on traffic volume and speed, they worked out how much fine particulate matter (PM_{2.5}) would be released into the air as a result of congestion rather than other sources. This led to an estimate of how these emissions — as well as sulphate and nitrate particles formed as secondary pollutants — would affect the total pollution levels in outdoor air.

Because small changes in the level of PM_{2.5} are a known trigger of premature death from cardiovascular or respiratory problems, the authors could link the congestion-associated increase in PM_{2.5} concentrations with changes in mortality. They estimated the cost of this public health impact by statistically assigning a dollar value to the loss of life.

The time and fuel that goes to waste when people get stuck in traffic jams can cost the economy up to US\$124 billion each year. Levy and colleagues estimate that for the cities included in the study, the figure stands at US\$60 billion. By comparison, the public health impacts measured as premature mortality amounted to US\$31 billion (measured in 2007 dollars). But the overall picture masks differences between cities.

"Across cities and years, the public health impacts range from more than an order of magnitude less, to in excess of the economic impacts," write the authors. "For example, in 2000, 17 urban areas had health impacts contributing less than 20% of the total cost of congestion, whereas 19 urban areas had contributions in excess of 50%."

Their analysis suggests that in some cities the public health cost of traffic jams will probably continue to be significant in spite of a reduction in car emissions. This contrasts with the general trend forecast by the study, which shows health costs declining relative to economic costs.

Levy and colleagues caution that their model predictions come with numerous uncertainties and limitations, notably the exclusion of improvements in transport infrastructure and technologies, as well as incompatibilities between the way economic and public health impacts are measured relative to congestion.

The study did not consider the impact of exposure to air pollutants other than PM_{2.5}, or health impacts other than premature mortality, such as hospital visits or the build-up of heart disease. But cars contribute about a third of total outdoor-air concentrations of fine particulate matter in US cities, and the evidence linking changes in pollution to premature mortality is strong.

The estimates of economic costs and health damage are similar to those of previous studies, according to the authors. Despite its limitations, the analysis can feed into policy and future studies, they say. "Our model results show that health impacts... are likely significant enough to necessitate inclusion in a comprehensive evaluation of the benefits of measures to reduce congestion."

Reference and link

1. Levy JI, Buonocore JJ, von Stackelberg K. Evaluation of the public health impacts of traffic congestion: a health risk assessment. *Environmental Health* 2010, **9**:65. doi: [10.1186/1476-069X-9-65](https://doi.org/10.1186/1476-069X-9-65)

[World Health Organization information](#) about air pollution and health



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