

 CORRESPONDENCE

## The Effects of Fine Dust, Ozone, and Nitrogen Dioxide on Health

by Beate Ritz, Barbara Hoffmann, and Annette Peters in issue 51–52/2019

### No Environment Is Free From Pollutants

The authors of the review article promote a further reduction in maximum levels and reference values (1). However, one may also postulate that in tandem with further refinement of the measuring methods, effects can be confirmed below the currently required reference values that could then be defined as diseases.

The question is whether these effects are tolerable or even conducive (keyword: immunocompetence) or whether in order to prevent these effects lifestyles should be restricted and a reverse development into a preindustrial age should be achieved.

The latter is equal to a fight against windmills, because as long as volcanoes and fires exist on Earth, the air will carry pollutants. Eliminating these altogether is illusory.

We wish to remind readers of the 1958 Delaney Clause (Food Additives Amendment), an addition to the 1938 law regulating food, drugs, and cosmetics in the USA. The amendment provided that American foods are not allowed to contain carcinogenic additives. But improved measuring methods led to the discovery of ever smaller doses of possible carcinogenic substances over the years. This could have resulted in a situation where in practice the sale of all agricultural foods would have had to be banned, since plants, for example, themselves produce such substances in minuscule amounts. For this reason, the Delaney Amendment was abolished in 1996 (2).

The precautionary principle valid in Europe, which obliges the legislator to protect the population even if only the possibility exists that a substance may be causing harm, should be put on the testing workbench. It is extremely useful in restricting epidemics.

At its most extreme, this means that any fires, candles, or summer barbecues should be prohibited. The use of public transport should also be prohibited because of the possibility of an above-average transmission rate of flu viruses, and individual means of transport, such as cars, should be promoted.

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#### References

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### Environmental Science or Environmental Activism?

We need both, but we clearly need to separate one from the other. Science has to adhere to principles of objectivity, even disinterestedness, according to one of Merton's norms. Is it science or activism that after the discussion of allegedly 6000 fatalities owing to NO<sub>2</sub> in Germany the topic has re-appeared in the *Deutsches Ärzteblatt* (1)?

The legitimate but methodologically weak criticism of pneumologists of the epidemiological findings on the toxicity of NO<sub>2</sub> was followed by a not particularly well founded reply from the epidemiologists. Most of the journalists were overtaxed with the subject, and only the Leopoldina's statement "clean air" managed to calm down the discussion somewhat. The World Health Organization, the European Union, and the Environmental Protection Agency all advise against calculating mortality rates due to NO<sub>2</sub>. And yet, the authors cited the Hoek study again, although the effects disappear if methodologically weak studies are omitted from the meta-analysis (3)?

In theory it is not controversial what constitutes evidence. But the article is an unfortunate example of how theory is ignored in practice. Evaluations in environmental epidemiology should be registered beforehand, such as has long been the default for clinical studies. Heterogeneity (i.e. lacking replication) should occasionally also prompt an all-clear signal, and statistically questionable comments should be dropped (4).

Environmental epidemiology has lost much of its credibility. This is the tragedy inherent in any "overselling" strategy, especially as I support the political call at the end of the article—not because of the NO<sub>2</sub> effects but because of the indisputably toxic mixture of exhaust gases, noise, energy and land consumption, and road traffic fatalities.

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