

Health benefits through cleaner air

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Executive summary

Health Council of the Netherlands



The air in the Netherlands has become much cleaner in recent decades and now meets European standards almost everywhere. Nevertheless, concentrations of particulate matter, nitrogen dioxide and ozone in the air result in an estimated 12,000 premature deaths per year. Considerable health benefits can still be made. In order to achieve this, the World Health Organisation's air quality guidelines could be used to further reduce air pollution. And even less air pollution would be even better. The health-based air quality guidelines are more stringent than the European standards, particularly for particulate matter, but even with concentrations of air pollution below these guidelines, effects on human health have been observed.

Trends in air quality

Air quality in the Netherlands has improved considerably in recent decades. The concentrations of the three main components of air pollution – particulate matter, nitrogen dioxide and ozone – have been reduced (for ozone only

during summer episodes). In particular, concentrations of particulate matter and nitrogen dioxide in the air have declined sharply in the last decades so that the European limit values for these substances are now met almost everywhere in the Netherlands, with the exception of a few hot spots in the major cities (nitrogen dioxide) and in areas with intensive livestock farming or industry (particulate matter). When the air quality meets the European limit values, however, this does not mean that public health is fully protected. The European limit values are less stringent than the WHO's air quality guidelines, except for nitrogen dioxide. The expectation is that with the implementation of the current air and energy policy, concentrations of particulate matter and nitrogen dioxide will decline further and that the WHO's air quality guidelines can be achieved in a large part of the country around 2030. The picture is less favourable for ozone: at best, there is no increase in the number of ozone peaks and annual average exposure.

Health effects of air pollution

Exposure to particulate matter, nitrogen dioxide and ozone can cause adverse health effects. It mainly concerns:

- the development and aggravation of respiratory and lung diseases, including lung cancer; and
- the development and aggravation of cardiovascular diseases.

For other disorders, the evidence for a causal relationship is insufficient. Exposure to air pollution can also cause premature death. The concentrations of particulate matter, nitrogen dioxide and ozone in Dutch air resulted in an estimated 12,000 premature deaths in the Netherlands in 2014. Even at concentrations *below* the WHO's health-based air quality guidelines, air pollution can impair health and result in premature death. Thus, more health benefits can be expected from further improvement of the air quality than the WHO advises.

Children, older adults and people with



respiratory diseases (especially asthma patients) appear to be particularly vulnerable to the effects of exposure to particulate matter, nitrogen dioxide and ozone. People with cardiovascular diseases are particularly vulnerable to particulate matter.

Focal points for air quality policy

Generic measures to protect all Dutch people

The committee recommends that priority be given to reducing the concentrations of particulate and nitrogen dioxide matter originating from road traffic (in particular diesel vehicles) and dealing with the emissions of ammonia from livestock farming. In this way, the blanket of air pollution over the Netherlands can be reduced. Such a generic approach is expected to yield the most health benefits for the entire Dutch population.

Specific measures to protect high-risk groups

Further health benefits can be achieved by taking high-risk groups into account: people who

are exposed to air pollution for a prolonged period and people who are particularly susceptible to air pollution because of age (children and older adults) or illness. In order to protect groups with *high exposure*, the committee recommends extra measures around hot spots: locations with relatively high air pollution, e.g. around busy roads. Examples of the approach of such hot spots in cities are: low-traffic inner cities, environmental zones and speed limits. To specifically protect the *high-sensitivity groups*, the committee advocates a zoning policy for air quality sensitive locations: no facilities for children and older adults in the vicinity of a hot spot. To provide extra protection for sensitive groups the committee advocates the more active dissemination of specific behavioural advice, e.g. not engaging in any heavy effort during the afternoon or staying indoors during episodes of smog by ozone.

International approach

The Netherlands is a small country bordering densely populated neighbouring countries.

Nearly half of the particulate matter we breathe in the Netherlands comes from abroad. An international approach is therefore indispensable, not only for particulate matter but also for the other components of air pollution. To effectively lower the ozone concentration in the Netherlands emissions of, for example, nitrogen oxides and methane must be reduced throughout Europe and even in the rest of the northern hemisphere. In addition, it is important that the Dutch policy focuses on reducing the emissions of substances such as ammonia, which also contribute to particulate matter formation in neighbouring countries.

Conditions for health benefits

The amount of health benefits that can be achieved in practice depends on political choices. For a reduction of air pollution to below the WHO's air quality guidelines, additional policy measures are required. The amount of health benefits to be achieved in practice depends, among other things, on how strictly compliance with the regulations can be enforced.



The Health Council of the Netherlands, established in 1902, is an independent scientific advisory body. Its remit is “to advise the government and Parliament on the current level of knowledge with respect to public health issues and health (services) research...” (Section 22, Health Act).

The Health Council receives most requests for advice from the Ministers of Health, Welfare and Sport, Infrastructure and Water Management, Social Affairs and Employment, and Agriculture, Nature and Food Quality. The Council can publish advisory reports on its own initiative. It usually does this in order to ask attention for developments or trends that are thought to be relevant to government policy.

Most Health Council reports are prepared by multidisciplinary committees of Dutch or, sometimes, foreign experts, appointed in a personal capacity. The reports are available to the public.

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