THE HEALTH EFFECTS OF NITROGEN DIOXIDE (NO_2)

FOCUS POLAND

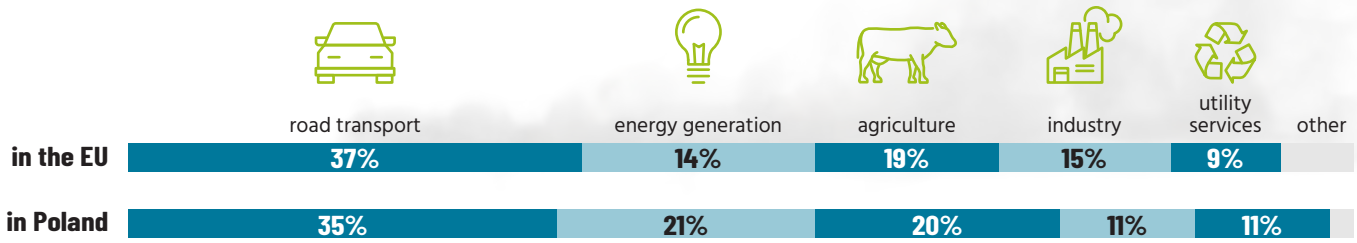
HEAL

Nitrogen dioxide (NO_2) is a **reddish--brown gas** with a characteristic pungent odour. NO_2 is **harmful to health** and **impacts the environment** because:

- it absorbs visible solar radiation reducing air transparency and contributing to atmospheric warming,
- as a strongly reactive gas, it participates in the generation of oxidising gases in the atmosphere,
- it contributes to the formation of ground-level ozone, which is another pollutant of concern for health.

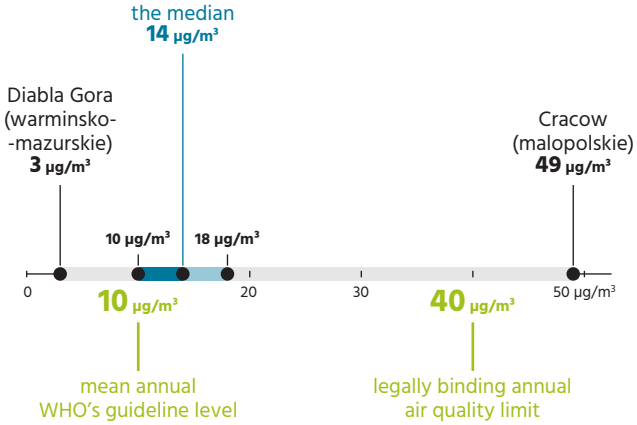
THE PRIMARY SOURCES OF NITROGEN OXIDES

Although the discussion on air pollution in Poland focuses mainly on the problem of coal burning, road transport is also of concern for clean air, given that **the transport sector is the highest emitter of NO_2**.

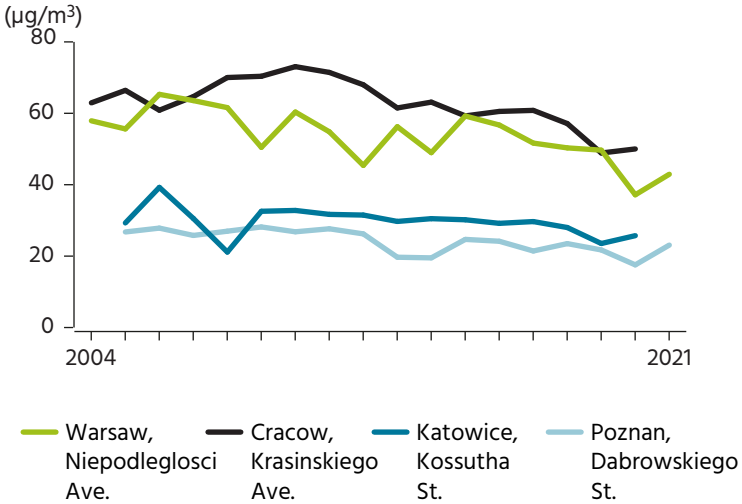


MEAN ANNUAL NO_2 CONCENTRATION

in Poland, in 2020



in the centres of major Polish cities



WHO GUIDELINES FOR NO_2 AND EU LIMIT VALUE

40 µg/m³

The current legally binding limit value for NO_2 for the EU, including Poland is 40 ugm/m3 annually. This limit was set in 2008, and since then the body of evidence on the health harm from NO_2 has considerably increased.

10 µg/m³

Currently WHO, based on a review of numerous studies the health harm of NO_2, recommends not exceeding an average annual concentration of 10 µg/m³. Work is underway in the EU to update the current air quality standard for NO_2 and other air pollutants.

RESEARCH ON NO_2

Research has been conducted for many years (in many countries, on various groups) documenting the impact on health. Selected examples below.

Increase of NO_2 concentration in the air – increase in health risk:

asthma incidence **17%**

Project: ELAPSE
Observation period: 16 years
Test: above 98 thousand adults residents of Denmark and Sweden

diabetes incidence **6%**

Test: above 41 million Americans at the age of +65

premature deaths:
bronchitis or pneumonia **6%**
respiratory diseases (including COPD) **3%**
all-cause death risk **2%**

Project: 41 cohort studies conducted until 2018

HEALTH IMPACTS OF NO_2

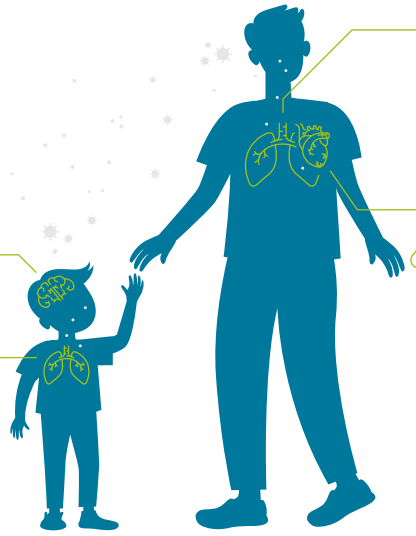
and the percentage of selected diseases associated with exposure to NO_2 exceeding the WHO guideline level in Poland

Children

- disturbances in concentration, general malaise
- disturbed development of children from stage fetal life

Respiratory diseases

- **2,9%** asthma
- **2,6%** acute infections of the airways



Adults

Respiratory diseases

- **4,8%** asthma
- **3,2%** Chronic Obstructive Pulmonary Disease (COPD)

Cardiovascular diseases

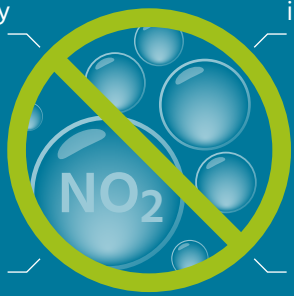
- **1,8%** diabetes

Studies have confirmed that NO_2 causes **health effects** even at very low concentrations and **increases the number of premature deaths** due to respiratory and circulatory system disorders.

HEAL RECOMMENDATIONS

1. Change the legally binding limit value for NO_2, to 10 ug/m2 annual average for the maximum concentration, by 2030 (which is fully in line with the recommendation by the WHO), and reduce the possibility for exemptions to this more health protective limit

2. Improve information requirements by sending out alerts on NO_2 peak pollution and associated health risks, as well as regular information on health effects of NO_2 and improve air quality indeces to include information on health risks and for vulnerable groups.



3. Improve monitoring of NO_2 concentrations by monitoring in smaller geographic locations, and at locations frequented by vulnerable groups (such as children, those suffering from disease, or those facing health inequalities), and at air pollution hot spots.

4. Regularly review the evidence on the health effects of NO_2 and other air pollutants, as part of an independent review by the WHO.

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Infographic: Polska Grupa Infograficzna (Infograficy.pl)