The impact of air pollution from transport on children’s health and development

Why are pollutants particularly harmful for children’s health?

Children are more vulnerable to air pollutants than adults, as their bodies are still developing.

- Children breathe more rapidly and have less developed natural protective barriers.
- Their body/surface ratio is higher, so they inhale more pollution.
- They also have a higher breathing rate and metabolism which makes them more sensitive to pollutants.
- The ratio of children’s mass to surface area is higher, so their lungs and blood absorb more pollutants.
- They breathe polluted air.
- Their lungs and blood absorb more pollutants.
- Inhaled air is directly transported to the blood. There, it enters the blood-brain barrier and the blood goes to all body organs, thus they breathe in polluted air.
- Children’s nervous system is still developing.
- They have more frequent exposure to pollutants.

The impact on the human body

- Cognitive impairment, poor memory, reduced learning abilities
- Embolism and thrombosis / arterial vascular disease
- Atherosclerosis / arteriosclerotic disease
- Autoimmunity
- Allergic reactions
- Premature skin aging
- Atopic dermatitis
- Carboxyhemoglobinemia (carbon monoxide poisoning)
- Impaired haemoglobin formation, anemia
- Reduced lung capacity
- Bronchial hyperactivity (bronchial asthma), exacerbation of many respiratory hyperresponsiveness
- Bronchial hyperactivity
- Cough
- Impaired psychomotor development
- Mood and behaviour disorders
- Cognitive impairment
- Concentration difficulties
- Reduced intelligence development
- Impaired respiratory function
- Impaired pulmonary function
- Exacerbation of asthma
- Exacerbation of allergy
- Exacerbation of many respiratory hyperresponsiveness
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AIR POLLUTION FROM TRANSPORT

ROAD TRANSPORT IN POLAND IS RESPONSIBLE FOR:

- 41% of emissions
- 50% of NOx
- 8% of PM2.5

New WHO Global Air Quality Guidelines

BASED ON: A COMPREHENSIVE REVIEW OF THE SCIENCE, WHO HAS PUT FORWARD THESE RECOMMENDATIONS FOR MAXIMUM CONCENTRATIONS OF AIR POLLUTANTS.

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Annual average (µg/m³)</th>
<th>24-hour (µg/m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PM2.5</td>
<td>4</td>
<td>25</td>
</tr>
<tr>
<td>PM10</td>
<td>10</td>
<td>50</td>
</tr>
<tr>
<td>NOx</td>
<td>1</td>
<td>35</td>
</tr>
<tr>
<td>CO</td>
<td>0.5</td>
<td>5</td>
</tr>
<tr>
<td>O₃</td>
<td>150</td>
<td>200</td>
</tr>
</tbody>
</table>

The key parameters of WHO recommended air quality guidelines. The parameters are set for various pollutants (µg/m³) and exposure periods (annual average and 24-hour average).

Recommendations for City authorities

- Develop and implement a city-wide road transport strategy.
- Create conditions and safety for walking and cycling in the city planning.
- Ensure effective enforcement on streets.
- Implement the WHO air quality standards and quality levels by 2030.
- Reduce the need to use private cars by cycling, public transport, walking and use of low-emission zones.
- Ensure effective enforcement on streets.
- Create low emissions zones (LEZ).
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- Ensure effective enforcement on streets.
- Create low emissions zones (LEZ).

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