

## The impact of air pollution from transport on children's

health and development



## **NERVOUS SYSTEM**

- Cognitive impairment
- Impaired psychomotor development and intelligence development
  - Mood and behaviour disorders

#### Allergic reactions

**IMMUNE SYSTEM** 

(hypersensitivity reactions) Autoimmunity

Atopic dermatitis

**SKIN** DISEASES Premature skin aging

### The impact on the human body

#### Cough

**RESPIRATORY** SYSTEM

- Bronchial hyperactivity (bronchial hyperresponsiveness) Exacerbation of many respiratory
  - diseases Inhibited lung development

  - Reduced lung capacity

CARDIOVASCULAR SYSTEM

#### Endothelial dysfunction,

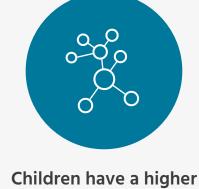
- Atherosclerosis / arteriosclerotic vascular disease
- Embolism and thrombosis / arterial and venous thrombosis
- Impaired haemoglobin formation,
- Carboxyhemoglobinemia (carbon monoxide poisoning)

# harmful for children's health?

Why are air pollutants particularly



vulnerable to the adverse health effects of air pollution than adults as their body including the nervous system is still developing.



breathing rate and a higher body/surface ratio, thus they breathe in more pollution; they also have less developed natural protective barriers against inhaled particles.



natural barriers such as respiratory epithelium, intestinal epithelium, or the blood-brain barrier is harmed when a child breathes polluted air.



adverse effects of air **pollution** is oxidative stress and inflammatory response throughout the body.



of nitrogen oxides







41% 8%

health than its other varieties

content of so-called black carbon

- up to 10 times more harmful to

10%

Photochemical smog

(or tropospheric ozone, O₃) in large urban agglomerations on hot, dry and sunny days

Annual

8% particulate matter

PM<sub>10</sub>, 11% PM<sub>2.5</sub>

brake pads and raising dust from the road surface

Up to 50% of pollution comes from the road surface abrasion of tires,

50%



**POLLUTANT** 

 $PM_{2,5}, \mu g/m^3$ 

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

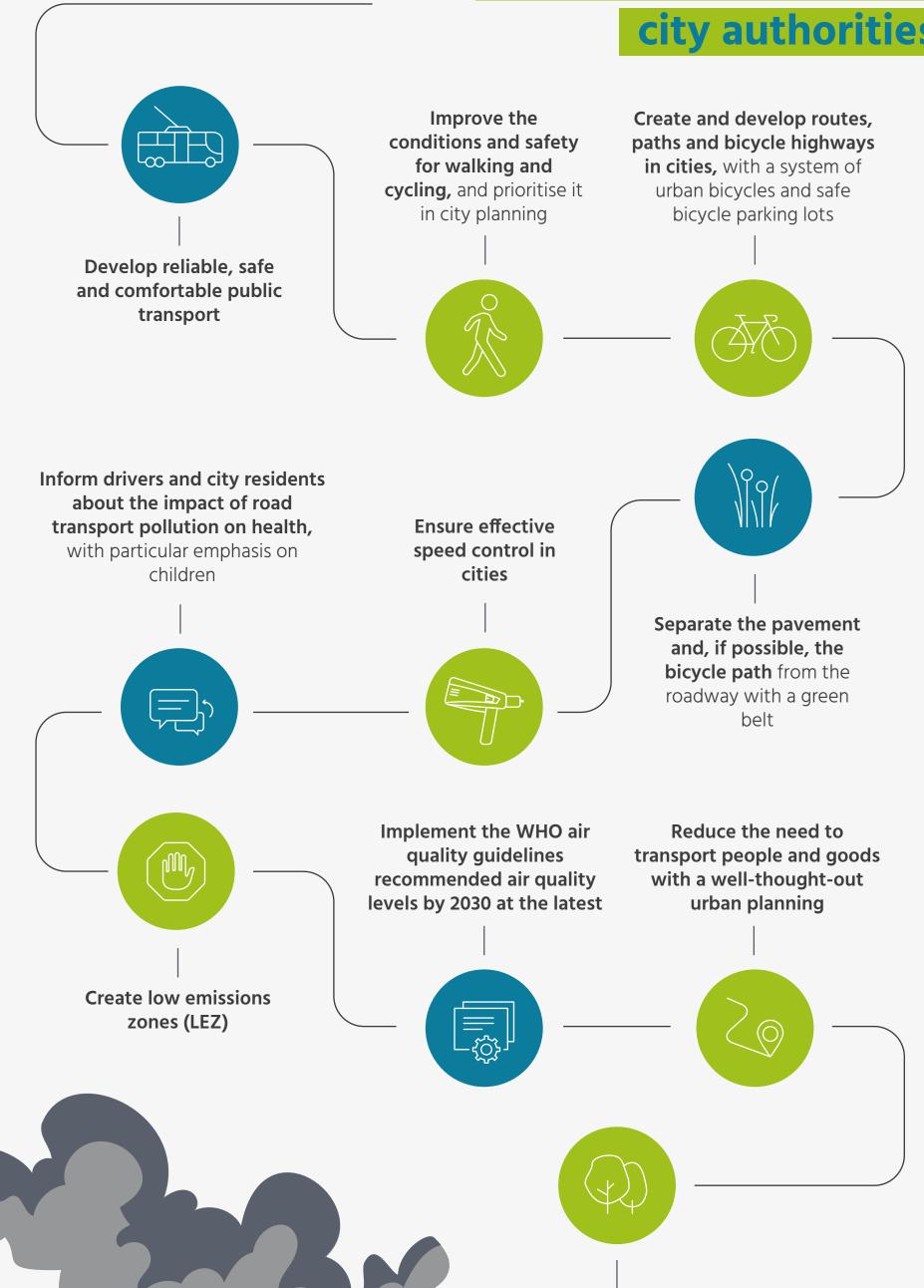
**New WHO Global Air** 

**Quality Guidelines** 

**AVERAGING TIME AQG LEVEL IN 2005 AQG LEVEL IN 2021** Annual 5 10 24-hour 25 15

20

50	45
	73
-	60
100	100
40	10
-	25
20	40
-	4
	40 -



source: "Impact of air pollution from transport on children's health and development"; HEAL, PKEOM 2021

**Designate more** urban green areas

infographic: Polska Grupa Infograficzna (infograficy.pl)

