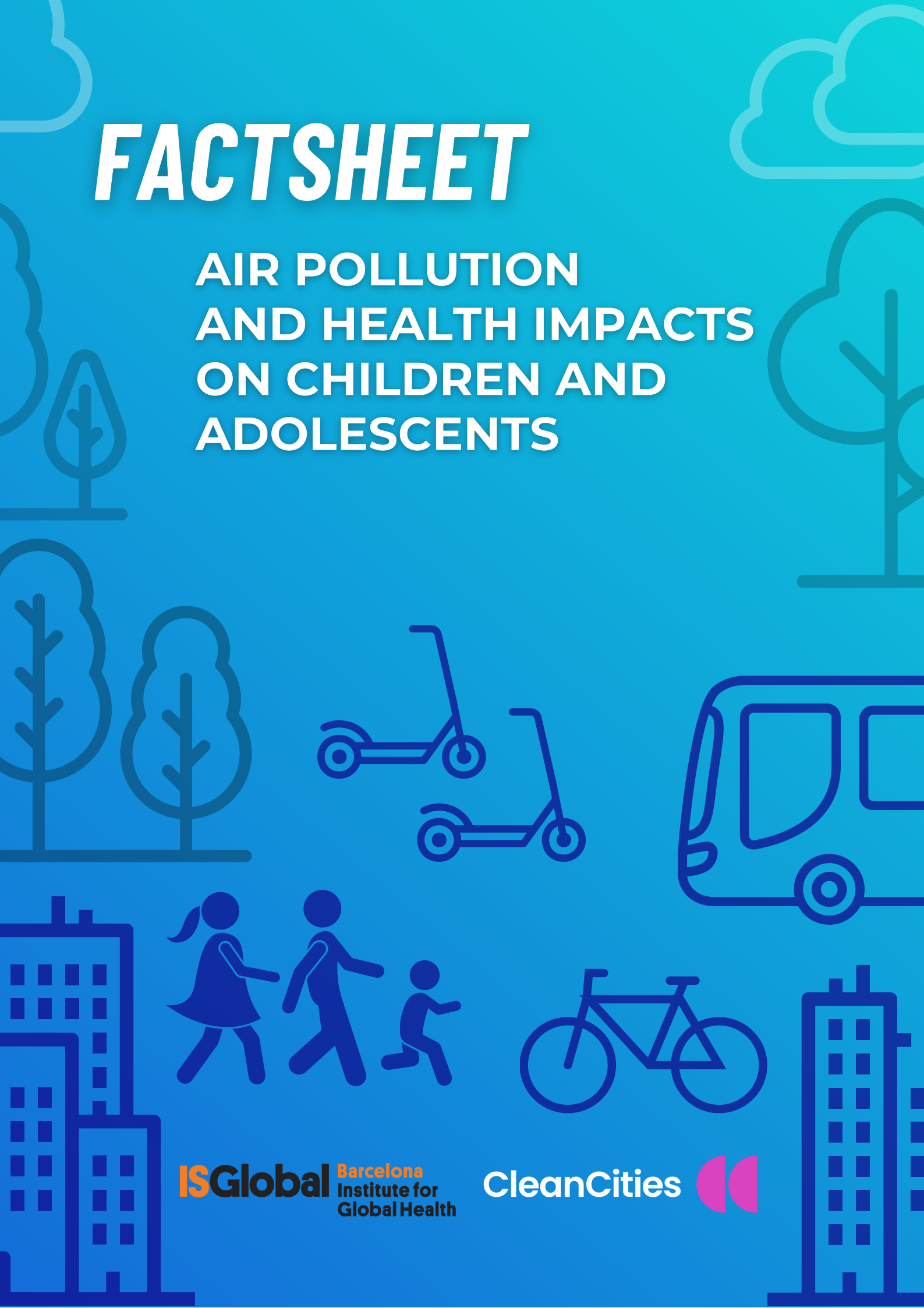


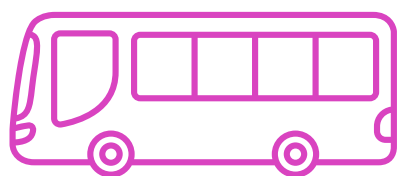
FACTSHEET

AIR POLLUTION AND HEALTH IMPACTS ON CHILDREN AND ADOLESCENTS



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Key points

- Over 90% of children living in European cities breath air that is dangerous for their health.
- Children and adolescents are particularly vulnerable to environmental exposures and the health impacts can last throughout their lives.
- Air pollution is a significant health threat to children with both short- and long-term health effects.
- 33% of European childhood asthma cases can be attributed to air pollution. If the minimum levels of air pollutants (e.g., PM_{2.5}, NO₂, and BC) were met, Europe could prevent more than 200,000 new cases of childhood asthma each year.
- Negative health impacts from air pollution are not only limited to the respiratory system. They include the cardiovascular system, weight, and brain function and development - meaning air pollution can impact the ability to learn.
- The negative impacts of air pollution contribute to inequity for children in European Cities.
- Children spend a large portion of their time at school, making these ideal areas to improve air quality with the many strategies that already exist.
- Urgent action is needed to reduce current ambient air pollution levels. Aligning the EU Ambient Air quality Directive with WHO air quality guidelines is a critical opportunity for child health.



Background

In European cities, our youngest and most vulnerable do not have the air quality that they deserve to best learn, grow and thrive (1). It is often only when we read about tragic news, such as the death and legal case of Ella Roberta, the schoolgirl in London that died of asthma due to air pollution (2), that we pause and think about the environments that our children are growing up in. But then it is too late. Meanwhile, millions of children suffer the impacts.

Children spend much of their day in school settings. Schools are often urban 'hotspots' for environmental exposures, located in dense areas of high pollution and noise with scarce vegetation and high traffic, including the traffic from those commuting to school in private vehicles. Transforming schools into health-promoting spaces with good air quality can help improve the health of children and their communities.

Early air pollution effects during pregnancy

The effects of air pollution are already observed during pregnancy. Air pollution has been associated with a lower birth weight (3), which in turn is a

well-known risk factor for other longer-term health conditions, such as cardiovascular disease and diabetes mellitus type II (4).



Air pollution and respiratory health



Exposure to air pollution affects the respiratory system. Long-term exposure to air pollution may lead to a higher increased risk of respiratory infections, worse asthma, asthma-related emergency department visits, and hospitalizations (5, 6). High concentrations of NO₂ and other air pollutants in and around the school and home can result in airflow obstruction and impaired lung function and development in children, particularly affecting children with asthma (7).

Changes to normal lung functioning due to childhood air pollution exposure are likely to remain into adulthood. The

strongest predictors of adult COPD, a respiratory obstructive disease, are childhood asthma, airflow obstruction, and worse lung function originating from childhood exposures. Strategies for reducing children's exposure to air pollution would positively impact their entire lives (8).

Approximately 33% of European childhood asthma cases can be attributed to air pollution (9). If the minimum levels of some air pollutants (NO₂, PM_{2.5} and BC) were met, Europe could prevent more than 200,000 new cases of childhood asthma each year (9, 10).



Air pollution and cognitive health and academic performance

Children's acute and prolonged exposure to air pollution from road traffic can lead to impaired mental and cognitive development, poorer executive functions, and increased risk and prevalence of Autism Spectrum Disorder (ASD) and Attention Deficit and Hyperactivity Disorder (ADHD) (11–14).

High concentrations of air pollution in and around schools can negatively impact academic performance and academic scores, impair problem-solving skills and result in lower IQ, increased hyperactivity, and inattention problems in children and adolescents (15,16). Air pollution can reduce learning memory function and increase the risk of developing learning difficulties. A study conducted on air

pollution and cognitive development in primary schools found that children from highly polluted schools had a significantly smaller annual growth in cognitive development (7.4%) compared to children from lower-polluted schools (11.5%) (17).

Air pollutants are also associated with changes in brain structure, structural connectivity, and functional connectivity that may have lasting effects (18–20). Moreover, adolescents' mental health is also affected, as studies show that exposure to air pollution is associated with symptoms of depression, anxiety, psychotic disorders, and poorer general mental health (21).



Air pollution and cardiovascular health

Transport-related air pollution can result in increased blood pressure and hypertension and increased risk for rapid weight gain and childhood obesity (22–25). Childhood obesity is

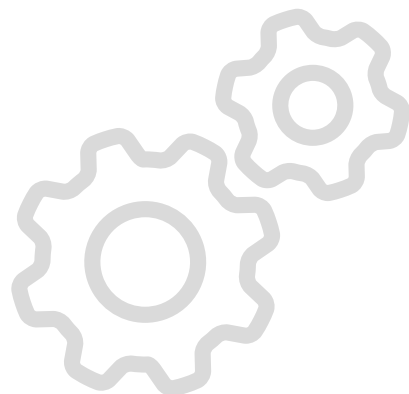
one of the main health challenges for European children and adolescents, and it has long-term health impacts into adulthood.

Action needed

Better air is within our reach, but requires urgent actions in our cities to create safer and healthier environments for our children, including around schools. Strategies and actions from citizens, organizations, and policymakers, such as increasing green spaces or reducing traffic and noise the school environments, are needed to reach clean air quality standards around schools. Adopting new EU air quality

guidelines that are aligned with the WHO air quality guidelines is a critical step to protect the health and wellbeing of our children now and future generations.

The EU ambient air quality directives are an essential opportunity to protect European children and adolescents, and will provide the catalyst for member states and cities to take action.

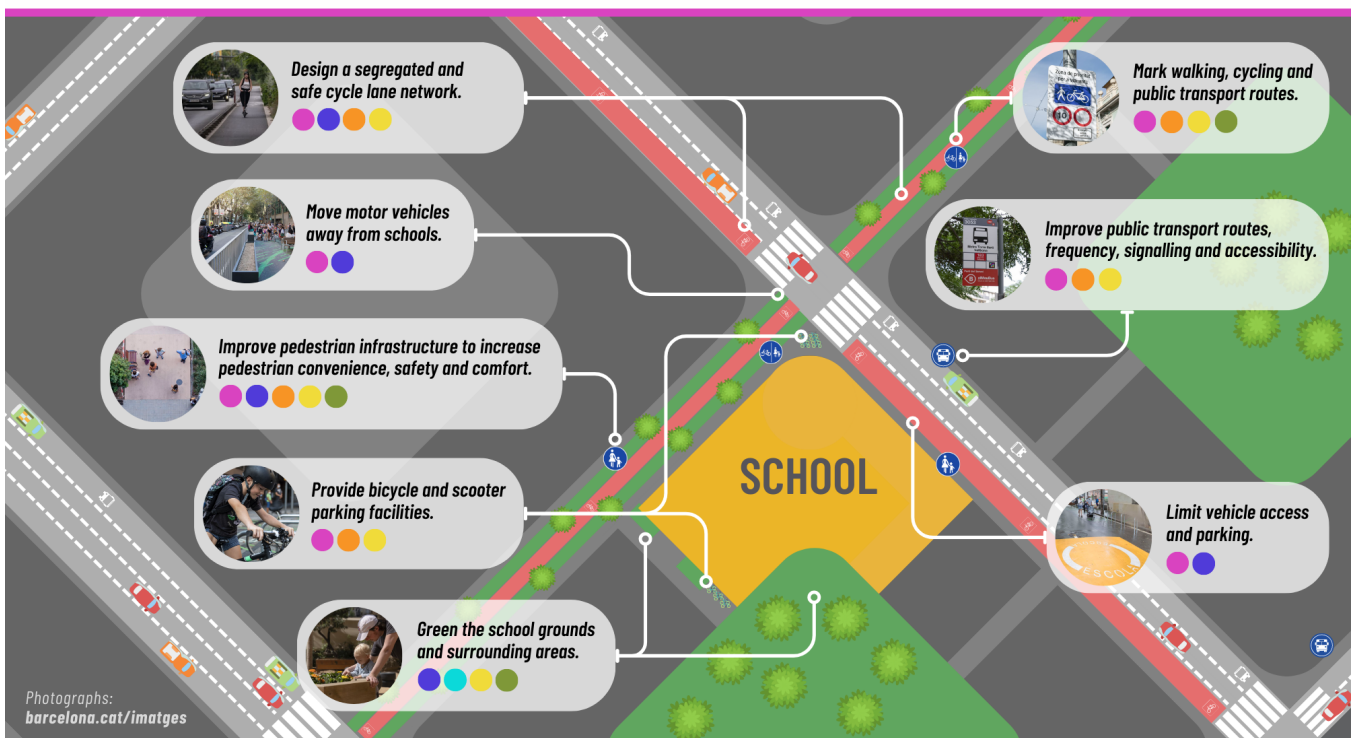


Infographic for the #SchoolStreets campaign

#SCHOOLSTREETS Making school environments healthier

WHAT ARE THE BENEFITS FOR CHILDREN?

- Improves air quality
- Reduces noise impact
- Reduces heat impact
- Promotes healthy habits
- Fosters active and autonomous mobility
- Promotes social interaction



Photographs:
barcelona.cat/imatges

More Information:
cleancitiescampaign.org

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Find out more

The Clean Cities Campaign is a European coalition of organisations hosted by Transport & Environment. Together, we aim to encourage cities to transition to zero-emission mobility by 2030 and to become champions of active, shared and electric mobility for a more liveable and sustainable urban future.

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