

Implicacions sanitàries de la qualitat de l'aire

Elena Codina Sampera

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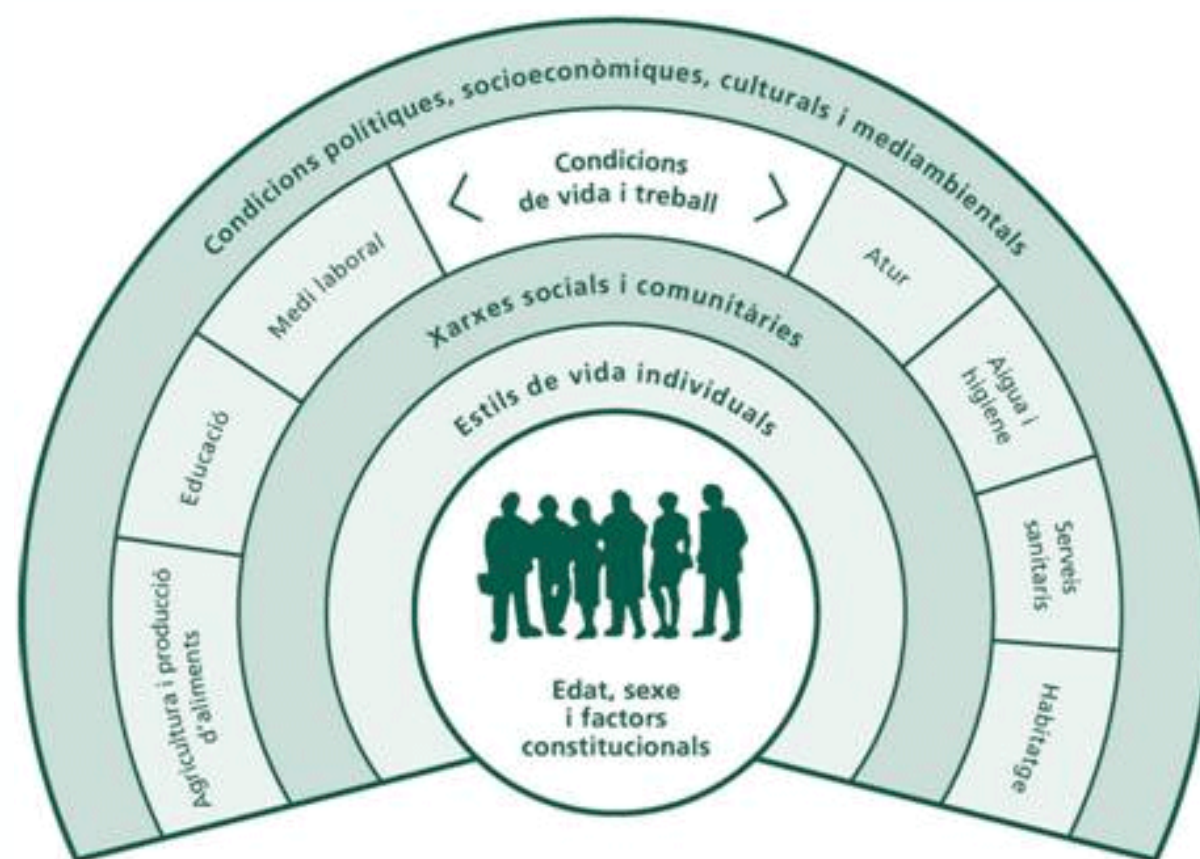
SJD Sant Joan de Déu
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Exposoma



Exposoma



Model de determinants de la salut de Dahlgren i Whitehead, 1991. Modificat per l'ASPB





PROTECTING **CHILDREN** FROM THE ENVIRONMENT

Environmental risks include air pollution, chemicals, poor water, sanitation and hygiene.

CHILDREN ARE AFFECTED BY:



Air pollution



Inadequate water,
sanitation and hygiene



Built environment



Second-hand smoke



Climate change



Hazardous wastes



UV radiation



Hazardous chemicals

CHILDREN ARE ALSO AFFECTED BY EMERGING THREATS SUCH AS:



Persistent organic pollutants /
endocrine-disrupting
chemicals



e-Waste

Minimising these risks are key to protecting children and achieving the Sustainable Development Goals.

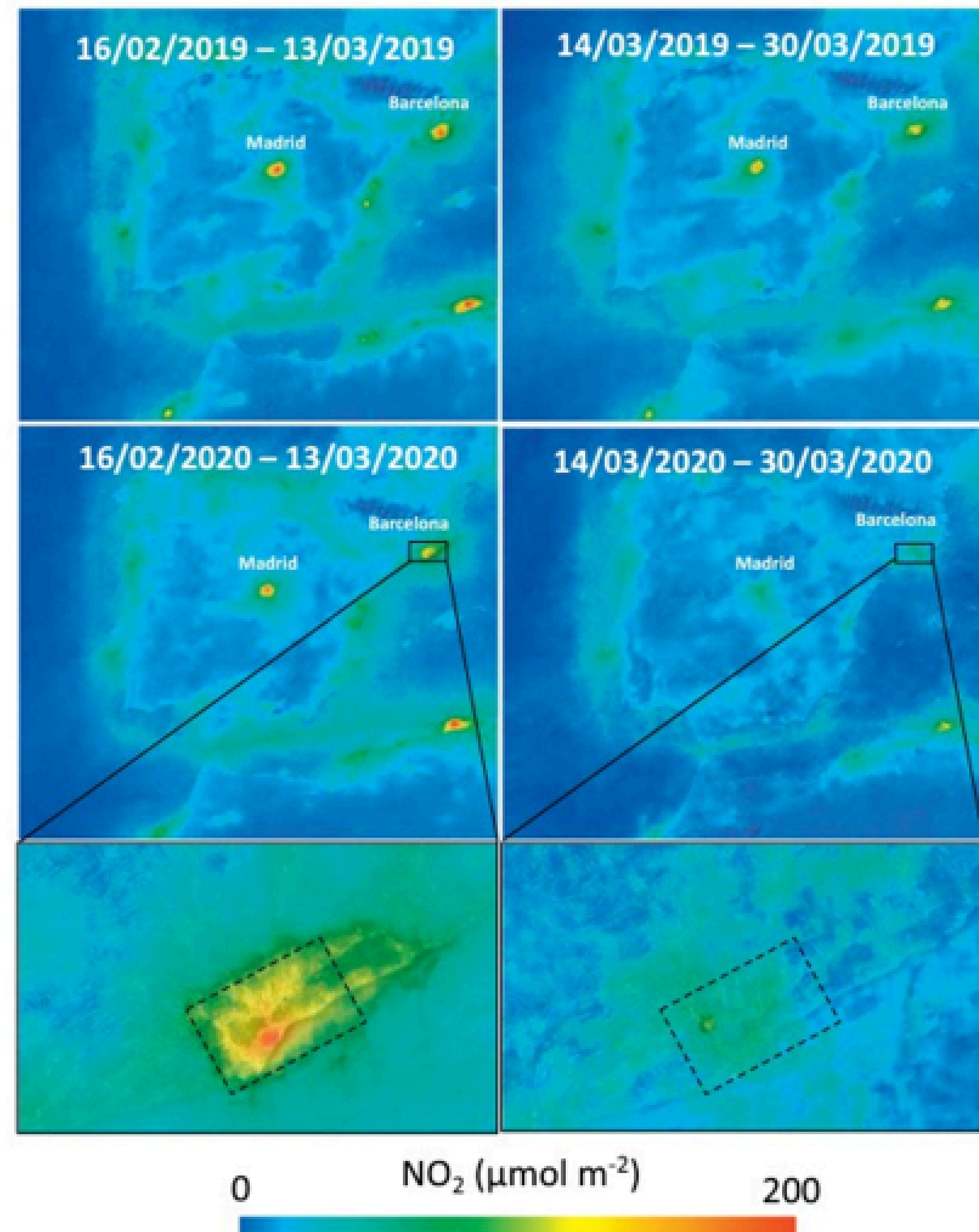


World Health
Organization

Concentracions troposfèriques de NO₂ durant la pandèmia de la COVID-19 a Barcelona

Disminució d'un 57% durant
el confinament
(en comparació amb el període de referència)

Tobías, A., Carnerero, C., Reche, C., Massagué, J., Via, M., Minguillón, M. C., Alastuey, A., & Querol, X. (2020). Changes in air quality during the lockdown in Barcelona (Spain) one month into the SARS-CoV-2 epidemic. *Science of the Total Environment*, 726, 138540



Major vulnerabilitat infantil davant els tòxics i agents contaminants

L'organisme en les primeres etapes de la vida està en ple desenvolupament. La seva reacció davant els tòxics ambientals és diferent de la d'una persona adulta i resulta molt més vulnerable per diversos motius:





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Immadesa del seu cos i els seus òrgans



Moltes funcions encara no s'han desenvolupat, la qual cosa redueix la seva capacitat de defensa enfront de substàncies tòxiques.

Major taxa de creixement cel·lular



Les cèl·lules es divideixen més ràpidament, facilitant l'absorció de tòxics.

Comportament social



Són curiosos, espontanis i confiats. No tenen consciència del perill en les seves accions: juguen a terra, no es protegeixen del sol, són curiosos i tenen tendència a posar-se els objectes a la boca.

Major temps d'exposició acumulada

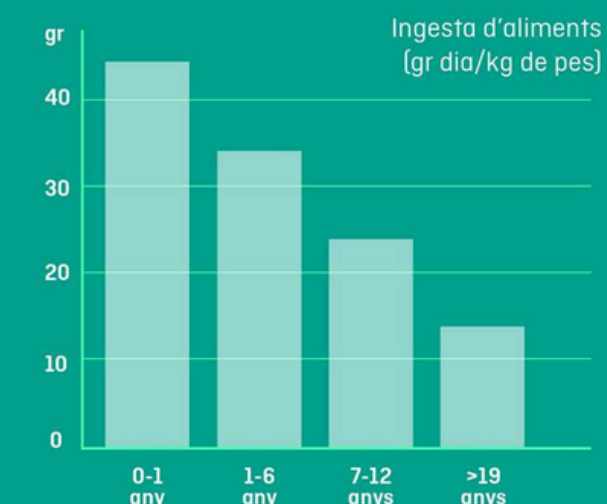


Tenen tota la vida per davant i estaran més temps exposats als contaminants ambientals.

Major consum per quilo de pes



El seu cos necessita més oxigen, nutrients i aigua, per la qual cosa està més exposat als atacs externs.



Sense capacitat de decisió

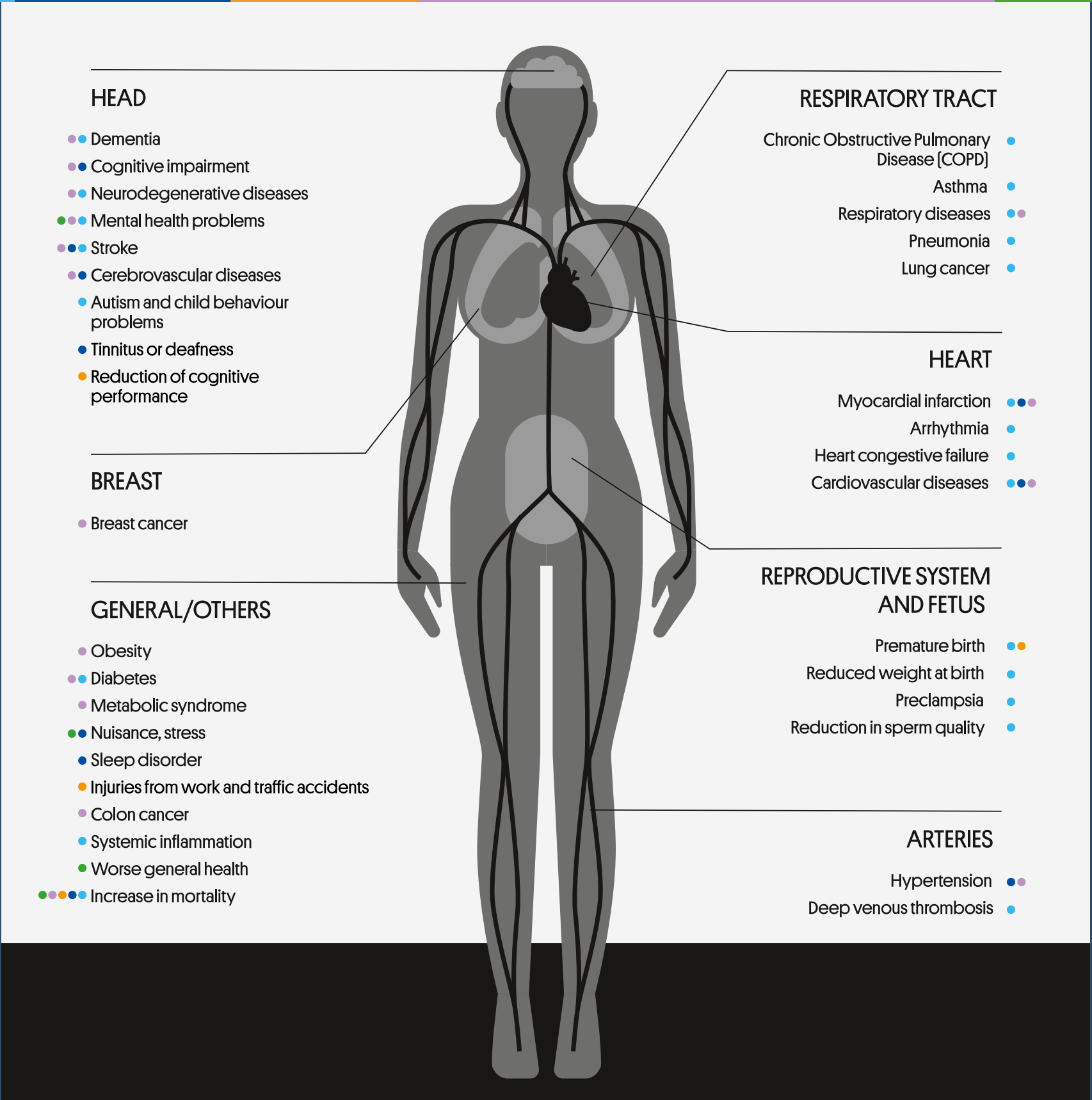


No poden triar l'entorn en el qual viuen, i les males decisions d'avui afectaran la seva vida futura.

Estatuta més baixa



Respiren l'aire que està més pròxim al sòl, on molts contaminants aconseguixen majors concentracions (pesticides, radó...).



RECERCA, PLANIFICACIÓ URBANA, MEDI AMBIENT I SALUT

Prop de la meitat dels casos d'asma infantil a Barcelona són atribuïbles a la contaminació atmosfèrica

Els nens i nenes més afectats són els que tenen un nivell socioeconòmic més alt

06.02.2020

RECERCA

L'exposició a la contaminació atmosfèrica durant la infància s'associa a una menor connectivitat cerebral

Les associacions es mantenen al llarg de l'adolescència, fet que suggereix alteracions persistents en el desenvolupament normal de les xarxes cerebrals

01.04.2025

RECERCA, PLANIFICACIÓ URBANA, MEDI AMBIENT I SALUT

Els nens i nenes amb major exposició a la contaminació de l'aire i menor exposició a espais verds tenen un 62% més de risc de patir TDAH

Un estudi realitzat al Canadà amb dades de 37.000 nens i nenes troba evidències de desigualtats ambientals en relació amb el TDAH

24.02.2022

Iniciativa sobre urbanismo, medio ambiente y salud - **Datos clave**

La contaminación atmosférica y la infancia – Protejamos a nuestra futura generación con mejores directrices sobre la calidad del aire ambiente

Autores: Mark Nieuwenhuijsen, Carolyn Daher, Inés Vallis, Claudia García-Vaz (ISGlobal)

junio de 2023

Puntos principales

- La contaminación atmosférica es una importante amenaza para la salud de los niños y niñas, con efectos tanto a corto como a largo plazo.
- La población infantil y adolescente es especialmente vulnerable y las repercusiones sobre su salud pueden prolongarse durante toda su vida.
- Los efectos negativos de la contaminación atmosférica sobre la salud no se limitan al sistema respiratorio, e incluyen el sistema cardiovascular, el peso y la función y el desarrollo del cerebro, lo que significa que la contaminación atmosférica puede afectar a la capacidad de aprendizaje de los niños y niñas.
- El 33 % aproximadamente de los casos de asma infantil en Europa pueden atribuirse a la contaminación atmosférica. Si se cumplieran los niveles mínimos de algunos contaminantes atmosféricos (por ejemplo, PM_{2.5}, NO₂ y BC), Europa podría evitar más de 200.000 nuevos casos de asma infantil al año.
- Una mayor contaminación atmosférica puede provocar desigualdades en los primeros años de vida y una desventaja competitiva porque afecta al aprendizaje y al rendimiento.
- Es necesario tomar medidas urgentes para reducir los actuales niveles de contaminación del aire ambiente. Alinear la Directiva de la UE sobre calidad del aire ambiente con las directrices de la OMS sobre calidad del aire es una oportunidad crucial para la salud infantil.

Antecedentes

Suele pasar que sólo cuando leemos sobre la trágica muerte y el caso judicial de Ella Roberta, la escolar de Londres que murió de asma debido a la contaminación atmosférica (Fundación Ella Roberta 2021), nos paramos a pensar en el tipo de entorno en que están creciendo nuestros hijos e hijas. Pero entonces ya es demasiado tarde. Mientras tanto, millones de niños y niñas siguen sufriendo.

The NEW ENGLAND JOURNAL of MEDICINE

REVIEW ARTICLE

FOSSIL-FUEL POLLUTION AND CLIMATE CHANGE

Caren G. Solomon, M.D., M.P.H., *Editor*, and Renee N. Salas, M.D., M.P.H., *Guest Editor*

Climate Change, Fossil-Fuel Pollution, and Children’s Health

Frederica Perera, Dr.P.H., Ph.D., and Kari Nadeau, M.D., Ph.D.



Table 1. Exposure Pathways and Selected Associated Effects on Children’s Health.*

Exposure Pathways	Health Effects	Examples of Specific Health Effects
Heat stress	Heat-related illness Increased ED visits and hospitalizations (e.g., for cardiovascular, respiratory, and renal diseases) ¹⁵ Mental health effects Increased infections Pregnancy complications	In a U.S. study of 3.8 million ED visits by children and adolescents, extreme heat was associated with a relative risk of an ED visit for any cause of 1.17 (95% CI, 1.12 to 1.21), as compared with hospital-specific minimum morbidity temperature. [†] Associations were strongest for visits for dehydration and electrolyte disorders, bacterial enteritis, and otitis media and externa. ¹⁶
Extreme weather events	Injuries Deaths Displacement or migration Post-traumatic stress disorder and other mental health effects Immune-system dysregulation	Among 7258 children and adolescents who were affected by Hurricane Katrina in 2005, half of those surveyed in the 2005–2006 period met criteria for referral for mental health services (i.e., for post-traumatic stress disorder or depression), and 41% still met these criteria the following year. ¹⁷
Air quality and pollution	Increased incidence of pregnancy complications Increased risks of asthma, asthma exacerbations, lower respiratory infection, and bronchitis Increased allergen exposure Decreased cognition in children and adolescents and increased risks of attention deficit–hyperactivity disorder, autistic traits, depression, and anxiety ^{15,18–23} Immune-system dysregulation Increased risk of hypertension	Pooled estimates from a meta-analysis indicated a 12% greater risk of preterm birth (1.12; 95% CI, 1.06 to 1.19) per 10-μg increase in PM _{2.5} per cubic millimeter of ambient air. ²⁴ In a birth cohort study, the adjusted odds ratios per interquartile range of traffic-related air pollution were 1.3 (95% CI, 1.0 to 1.7) for doctor-diagnosed asthma and 1.2 (95% CI, 1.0 to 1.3) for ear, nose, and throat infections during the first 4 years of life. ²⁵ In an Italian birth cohort study, a 10-μg/mm ³ greater nitrogen dioxide exposure at birth was associated with an absolute change in verbal IQ of –1.4 points (95% CI, –2.6 to –0.20) at 7 yr of age. ²³ Exposure to PM _{2.5} , carbon monoxide, and ozone in children was linked to increases in blood pressure and altered genes involved in immune regulation. ²⁶
Food supply and safety	Nutritional deficits Stunting Infection	In a meta-analysis, drought conditions that were associated with climate change were significantly associated with wasting (odds ratio, 1.46; 95% CI, 1.05 to 2.04) and underweight (odds ratio, 1.46; 95% CI, 1.01 to 2.11) in children. ²⁷
Water quality and quantity	Spontaneous abortion, stillbirth, premature birth, and low birth weight Waterborne infection and diarrhea Waterborne allergy, immune dysfunction, increased respiratory illnesses, decreased lung function, and decreased cognitive and motor skills due to increased toxic metals from climate change–induced water scarcity ^{17,28,29}	Harmful algal blooms (<i>Vulcanodinium rugosum</i>) in the Cienfuegos Bay in Cuba resulting from increasing ocean temperatures and droughts were associated with a dermatitis outbreak involving many children. ²⁸ Children who were exposed to flooding during Hurricane Harvey in Houston in 2017 were at increased risk for upper respiratory tract and allergic symptoms. ³⁰
Vector distribution and ecology	Infectious diseases Associated pregnancy complications	The incidence of Zika virus infection has increased in geographic range in association with climate change. Infections in pregnant women in South America between December 2015 and June 2017 were associated with microcephaly in the fetus (in 11 of 376 cases; absolute risk, 2.9%). ³¹
Social factors	Increased risk of displacement and associated effects on mental health and cognitive development Increased risks of health conditions related to heat or air pollution exposure	Among children in Southeast Asia, early life exposure to temperatures that were 2 SD above average (vs. average) was associated with 1.5 fewer years of education. ³² A spatial analysis of 108 urban areas in the United States showed consistent patterns of elevated land-surface temperatures in formerly redlined areas relative to their nonredlined neighbors by as much as 7°C, affecting mainly persons of color and vulnerable populations, including pregnant women and children. ³³

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Frederica P. ...

Els menors de cinc anys patiran fins el 88% de la càrrega de malaltia atribuïble al canvi climàtic



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Editorial

Climate change and health: the role of health professionals

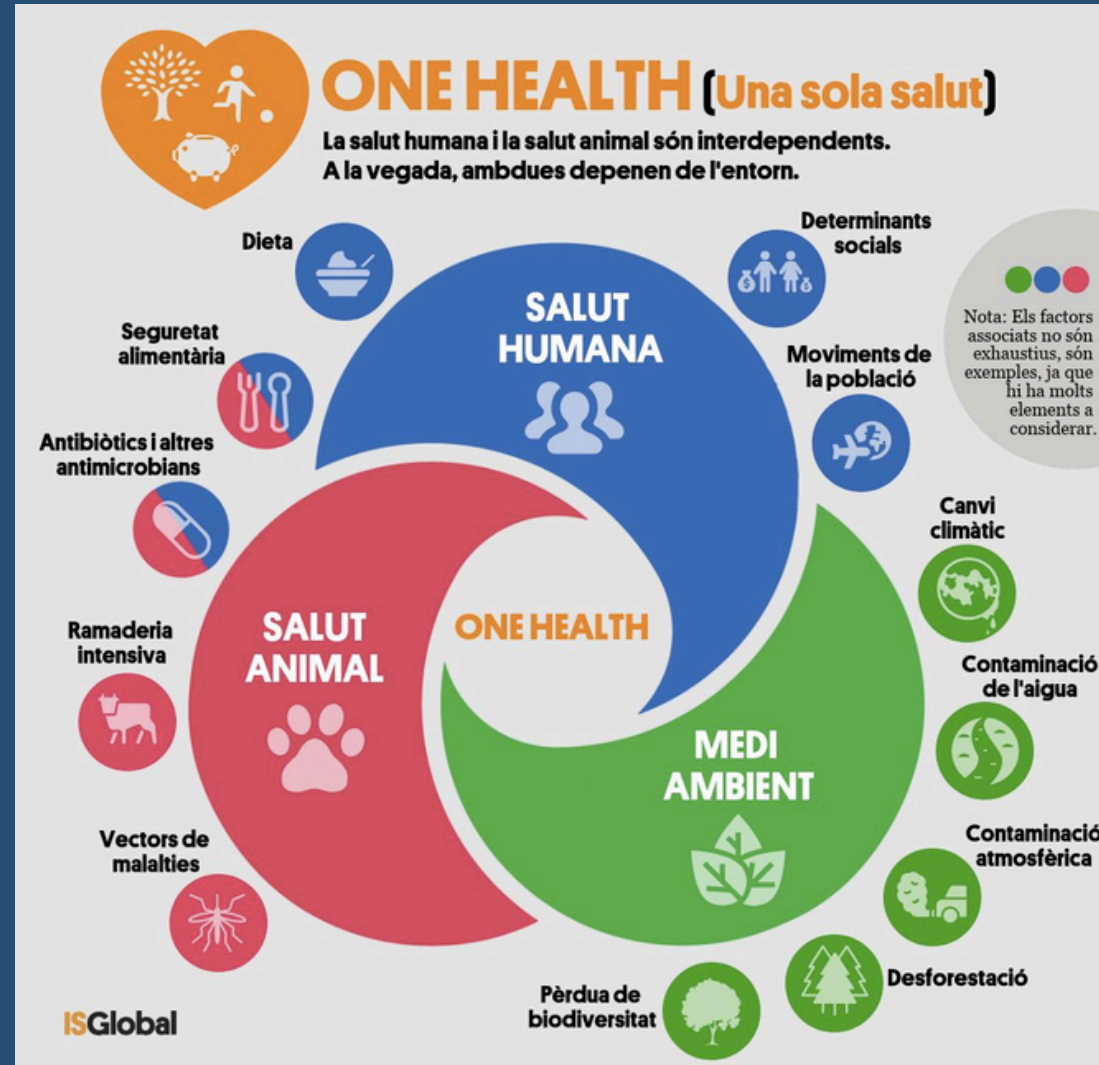
P. Crowley¹, C. O'Connor², E. Power³, M. Cannon⁴, D. Cotter³ and F. McNicholas⁵ 

¹Pediatric Liaison Psychiatry, Children's Health Ireland, Dublin, Ireland, ²St Patrick's Mental Health Services, Dublin, Ireland, ³RCSI University of Medicine and Health Sciences, Dublin, Ireland, ⁴Royal College of Surgeons in Ireland, Education and Research Centre, Beaumont Hospital, Dublin, Ireland and ⁵Child Psychiatry, UCD, Dublin, Ireland

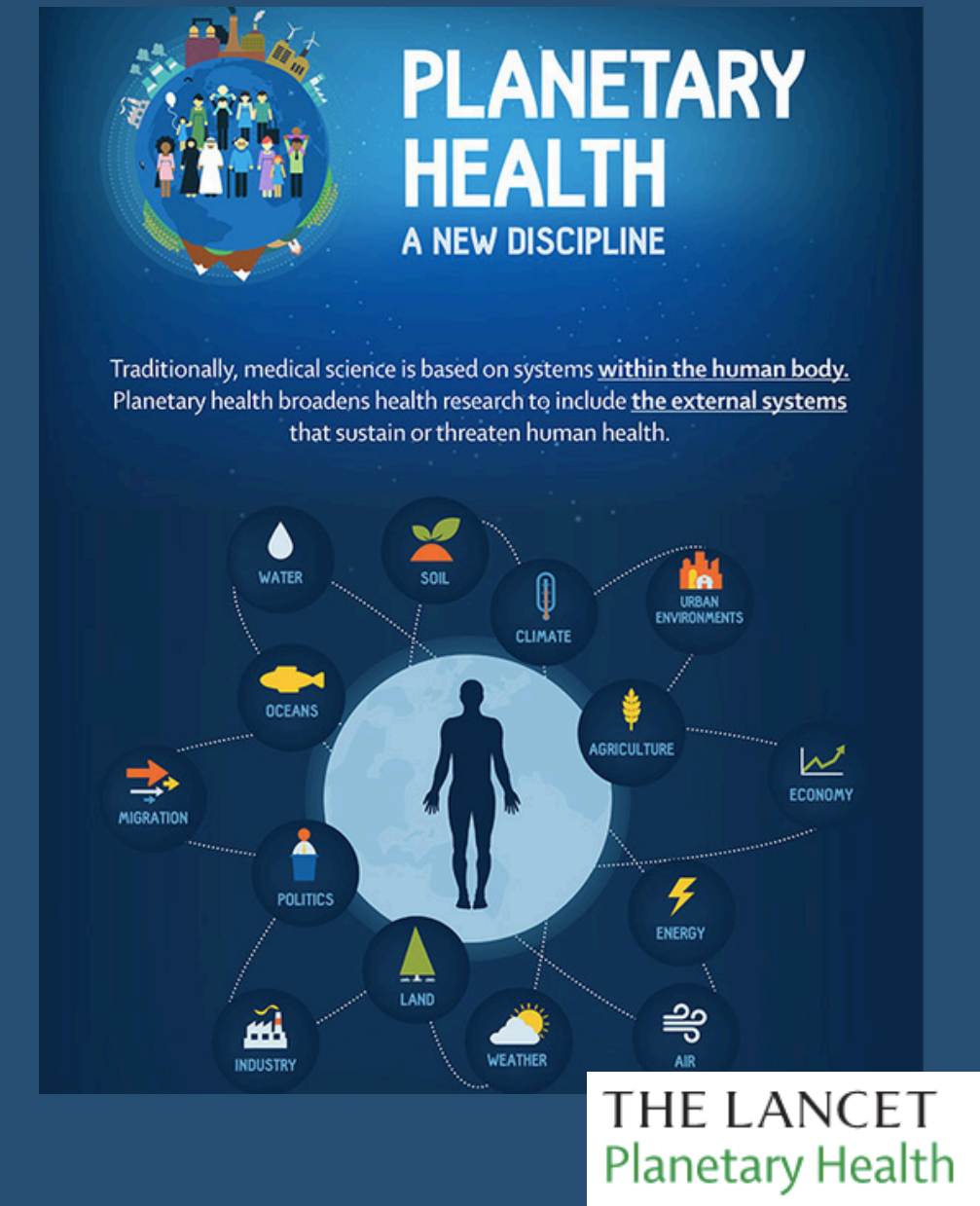
The role of health professionals in climate change

Given the multi-faceted components of climate change, health professionals have a role in addressing the direct and indirect physical and mental health consequences in individuals, in their own health services and in society more broadly. All individuals have a role in advocating for policy to mitigate climate change and protect our natural world. Clinicians also have a role to play in supporting climate change education, ensuring that patients and colleagues are aware of the health impacts of climate change and promoting more sustainable lifestyle choices. Strong advocacy is required to promote behavioural change, to protect vulnerable groups and to highlight the health benefits of climate neutral and advantageous activities. This work is needed in all aspects of our professional lives – clinical, education, advocacy, administration, and research. Our health is contingent on a healthy planet, with a fundamental need for clean air, water, and energy. As healthcare professionals and as citizens of the world, we must collectively take responsibility for protecting our planet and, with that, our lives and the lives of those who follow us.

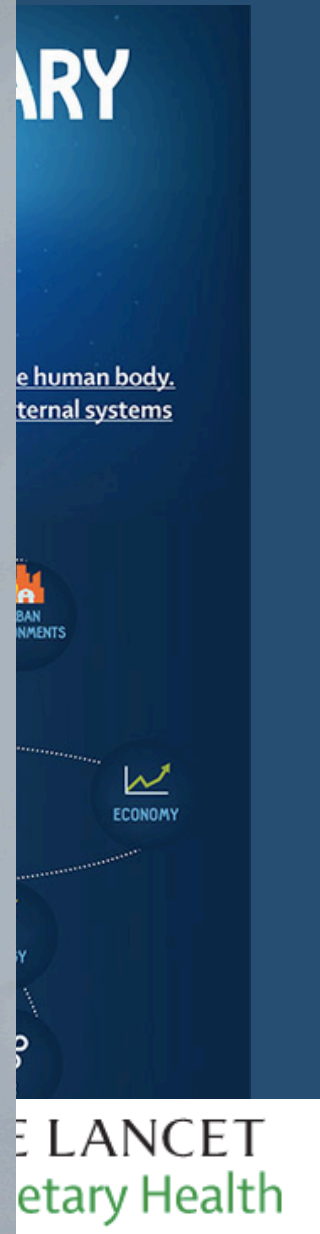
Salut planetària



Font: Forbes



Salut planetària



Quina realitat tenim?

Població urbana mundial

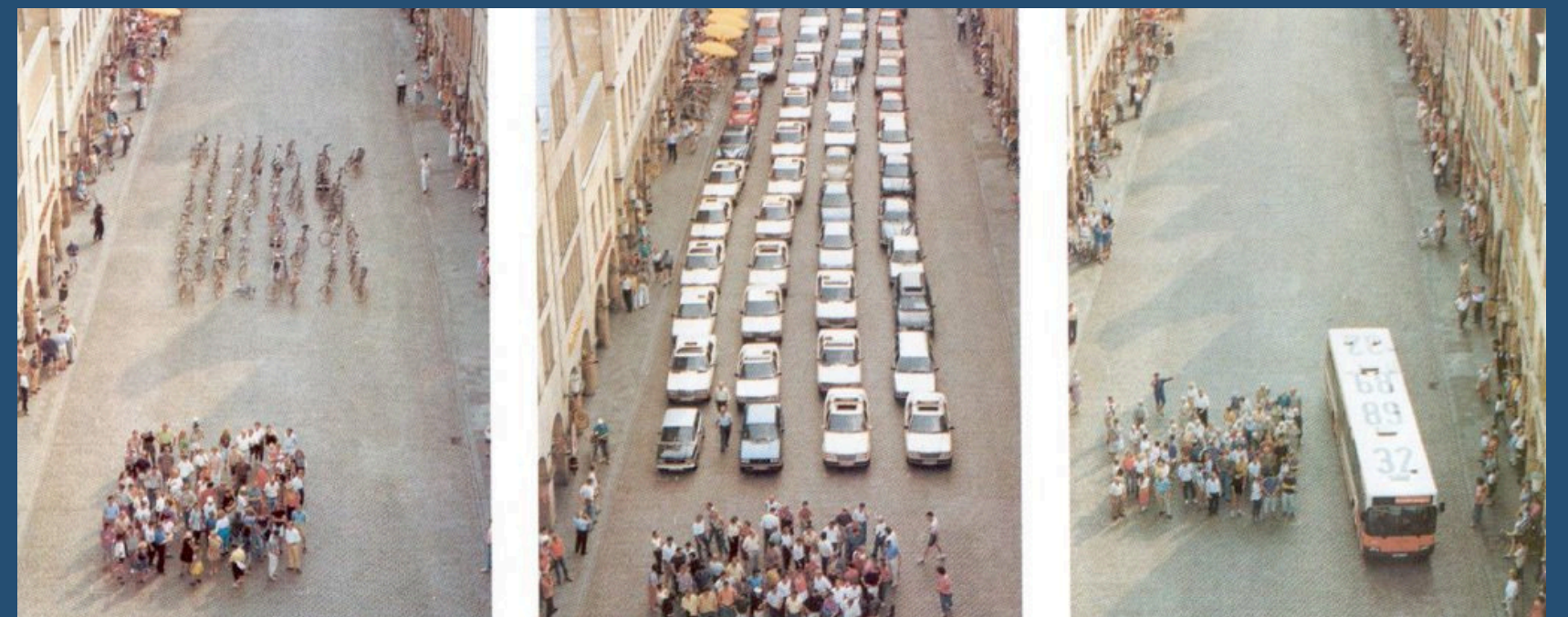
2018

55%



2050

68%





Conceptual framework of the relationships between health and the urban environment (Nieuwenhuijsen 2018).

isglobalranking.org

CITIES IN EUROPE
COULD PREVENT UP TO

43,000 deaths
each year

if they achieved the WHO
recommendations on access to

green space.

Over

60%

of population has
insufficient access
to green space.

#ISGlobalRanking

ISGlobal _____ RankingOf Cities



ADULTS

- Stress reduction
- Improved life expectancy
- Better general mental and physical health
- Improved cognitive performance
- Improved sleep quality
- Reduction in cancer risk



CHILDREN

Improvements in:

- Attention capacity
- Concentration
- Emotional and behavioural development
- Coordination
- Balance
- Agility
- Self-confidence
- Self-discipline
- Social skills
- Weight of newborns



Regla 3-30-300

Environmental Research 215 (2022) 114387



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journal homepage: www.elsevier.com/locate/envres



The evaluation of the 3-30-300 green space rule and mental health

Mark J. Nieuwenhuijsen^{a,b,c,*}, Payam Dadvand^{a,b,c}, Sandra Márquez^{a,b,c}, Xavier Bartoll^{d,e}, Evelise Pereira Barboza^{a,b,c}, Marta Cirach^{a,b,c}, Carme Borrell^{b,c,d,e}, Wilma L. Zijlema^{a,b,c}

^a Barcelona Institute for Global Health (ISGlobal), Doctor Aiguader 88, 08003, Barcelona, Spain

^b Universitat Pompeu Fabra (UPF), Doctor Aiguader 88, 08003, Barcelona, Spain

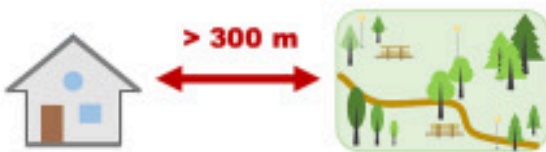
^c CIBER Epidemiología y Salud Pública (CIBERESP), Melchor Fernández Almagro, 3-5, 28029, Madrid, Spain

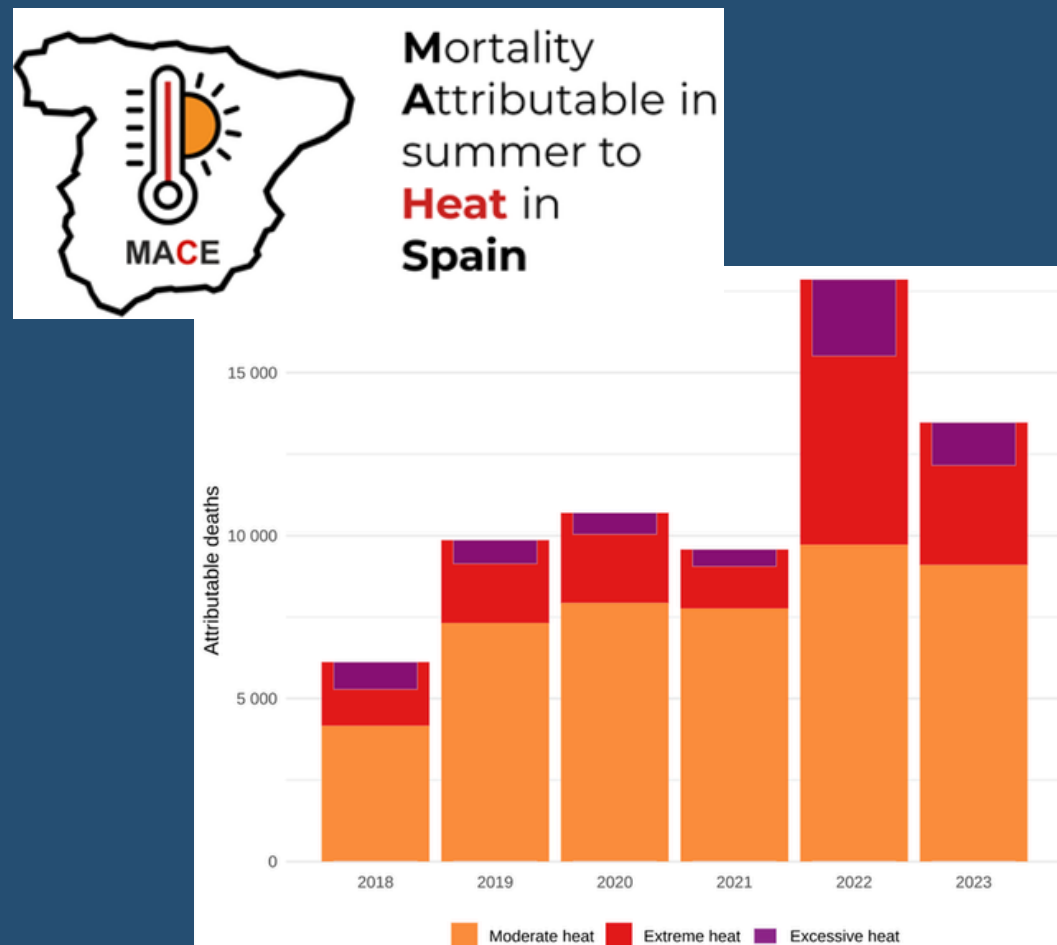
^d Agència de Salut Pública de Barcelona, Avinguda Príncep D'Astúries, 63 (1-1), 08012, Barcelona, Spain

^e Institut de Recerca Biomèdica Sant Pau (IIB-Sant Pau), 08041, Barcelona, Spain



Cecil Konijnendijk

3	 Trees visible ≥ 3	 Trees visible < 3
30	 Canopy coverage $\geq 30\%$	 Canopy coverage $< 30\%$
300	 From green space ≤ 300 m	 From green space > 300 m
	Met	Not met



Beneficis de la infraestructura verda urbana

ISGlobal

- Disminució del risc de **malalties cardiovasculars** i càncer
- Reducció de la **contaminació atmosfèrica** i acústica
- Foment de l'**activitat física**
- Millora de la **salut mental** i augment de la **satisfacció amb la vida**
- Millora de la **memòria** i l'**atenció**
- Reducció de l'efecte de l'**illa de calor urbana**

Font: Jungman T., et al., The Lancet, 2023.

L'efecte de l'illa de calor urbana

ISGlobal

Fa referència a l'**augment de temperatura** que registren els **entorns urbans** en comparació amb les àrees que els envolten.

Les **altes temperatures afecten la salut**, augmentant el risc de patir malalties cardiovasculars, insolacions, deshidratació i morts per cops de calor

Materials de construcció com el **formigó** o l'**asfalt** absorbeixen i atrapen la calor, escalfant les ciutats

Les conseqüències són més grans en **col·lectius vulnerables**, com ara persones d'edat avançada, nadons o persones amb patologies cròniques

Les **àrees amb vegetació** que envolten les ciutats es mantenen **més fresques**

Font: Jungman T., et al., The Lancet, 2023.





Mobilitat activa

- Increment del 140% de la infraestructura ciclista durant l'última dècada.
- Més de 1.000 km de carrils bici disponibles actualment a tota la ciutat.

Reducció del trànsit de vehicles

- Més del 60% de reducció del trànsit de vehicles de motor en els darrers 10 anys.

Millora de la qualitat de l'aire

- Reducció del 50% dels nivells de diòxid de nitrogen (NO₂) des del 2005.
- Reducció del 55% de les partícules fines (PM_{2,5}) des del 2005.

Entorns escolars més saludables

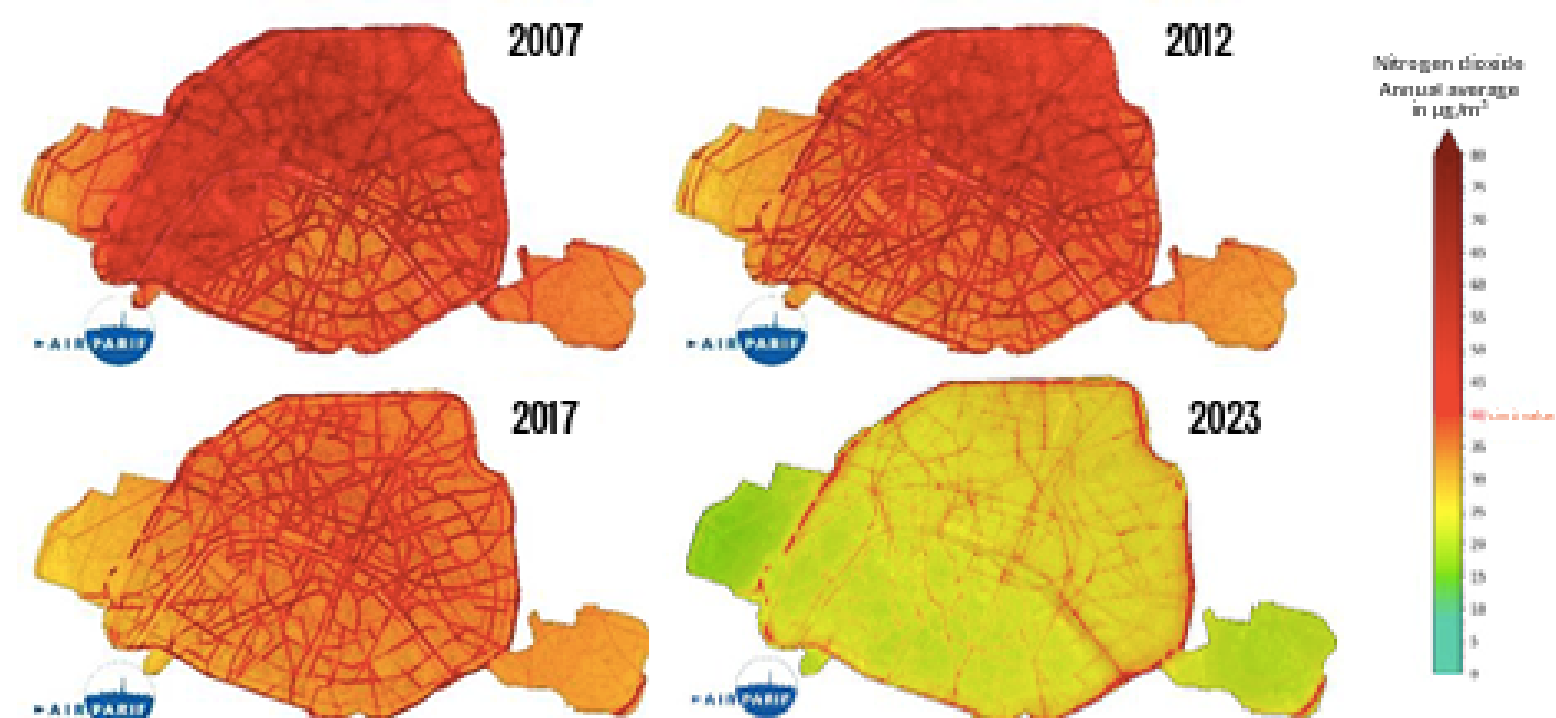
- Més de 300 carrers escolars pacificats i destinats als vianants des del 2020.
- Fins a un 30% de reducció de les concentracions de NO₂ al voltant dels centres educatius transformats.
- 84% de suport ciutadà entre les famílies.

Una ciutat més verda

- Més de 130.000 arbres plantats com a part de les estratègies d'adaptació al canvi climàtic i de refrigeració urbana.

Figure 5

Trends in average annual NO₂ levels from 2007 to 2023 in Paris

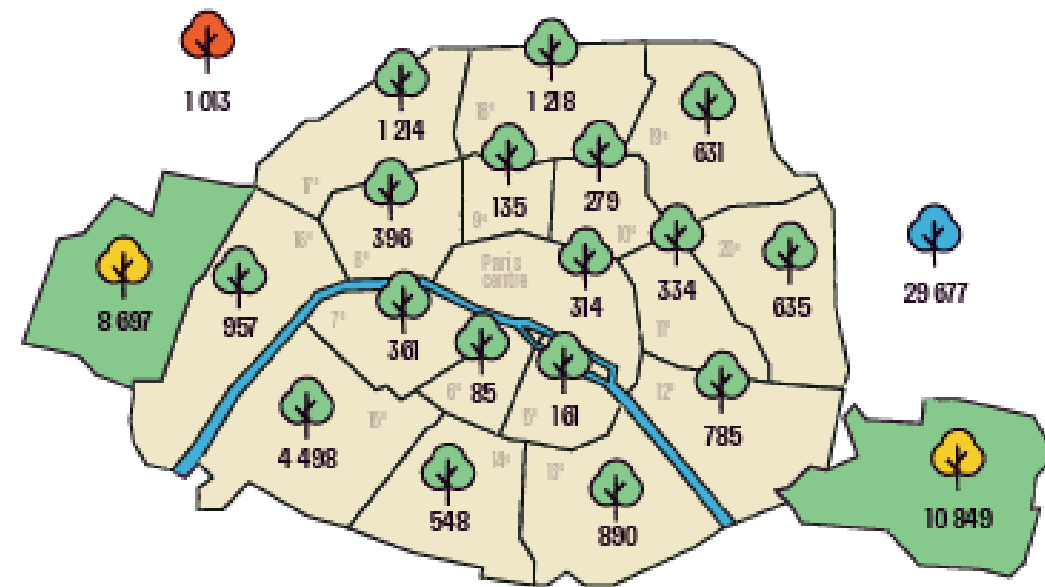


Airparif, 2023



Figure 8

Planting balance November 2020



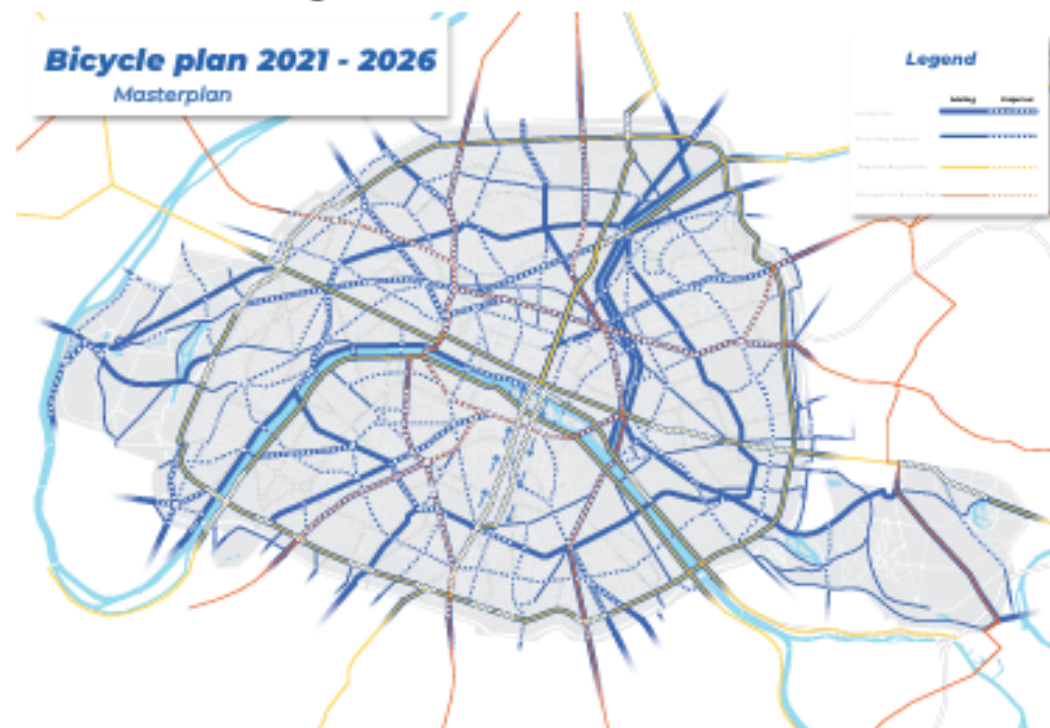
Planted trees

-  Streets, gardens
-  Ring road
-  Wood
-  Municipal facilities out of Paris

City of Paris, April 2025 - Green spaces & environment directorate

Figure 20

Map of the 2021-2026 Bicycle Plan



City of Paris - roads infrastructures & mobility directorate





Comment

The 15-minute city offers a new framework for sustainability, liveability, and health

Zaheer Allam ^{a b} ✉, Mark Nieuwenhuijsen ^{c d e}, Didier Chabaud ^a, Carlos Moreno ^a

Shaping urban environments to improve respiratory health: recommendations for research, planning, and policy



Mark Nieuwenhuijsen, Audrey de Nazelle, Judith Garcia-Aymerich, Haneen Khreis, Barbara Hoffmann

Urban areas carry a large burden of acute (infectious) and chronic respiratory diseases due to environmental conditions such as high levels of air pollution and high population densities. Car-dominated cities often lack walkable areas, which reduces opportunities for physical activity that are fundamentally important for healthy lungs. The already restricted amount of green space available—with often poorly selected plants—could produce pollen and subsequently provoke or worsen allergic diseases. Less affluent neighbourhoods often carry a larger respiratory disease burden. A multisectoral approach with more diverse policy measures and urban innovations is needed to reduce air pollution (eg, low emission zones), to increase public space for walking and cycling (eg, low traffic neighbourhoods, superblocks, 15-minute cities, and car-free cities), and to develop green cities (eg, planting of low-allergy trees). Stricter EU air quality guidelines can push these transformations to improve the respiratory health of citizens. Advocacy by medical respiratory societies can also make an important contribution to such changes.

Lancet Respir Med 2023

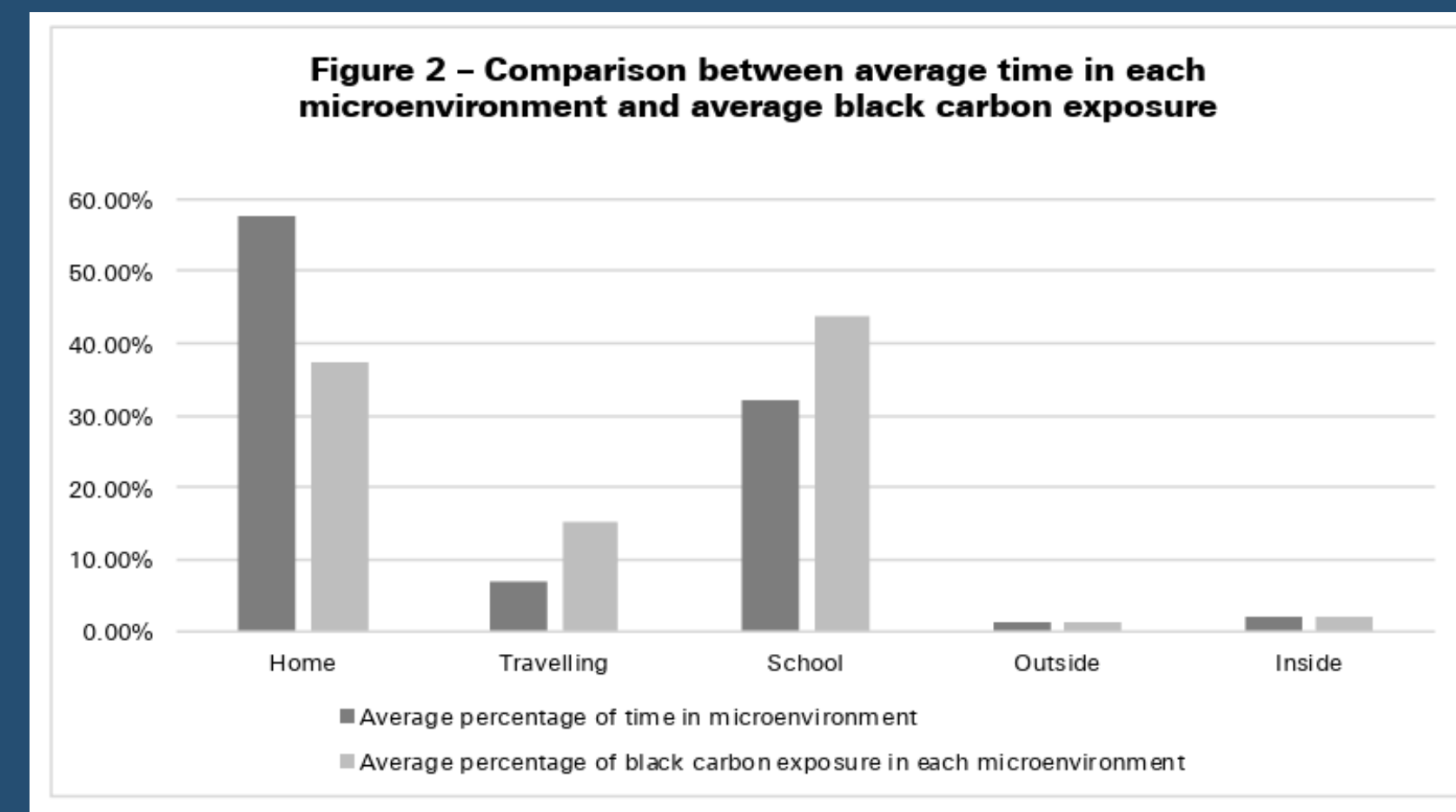
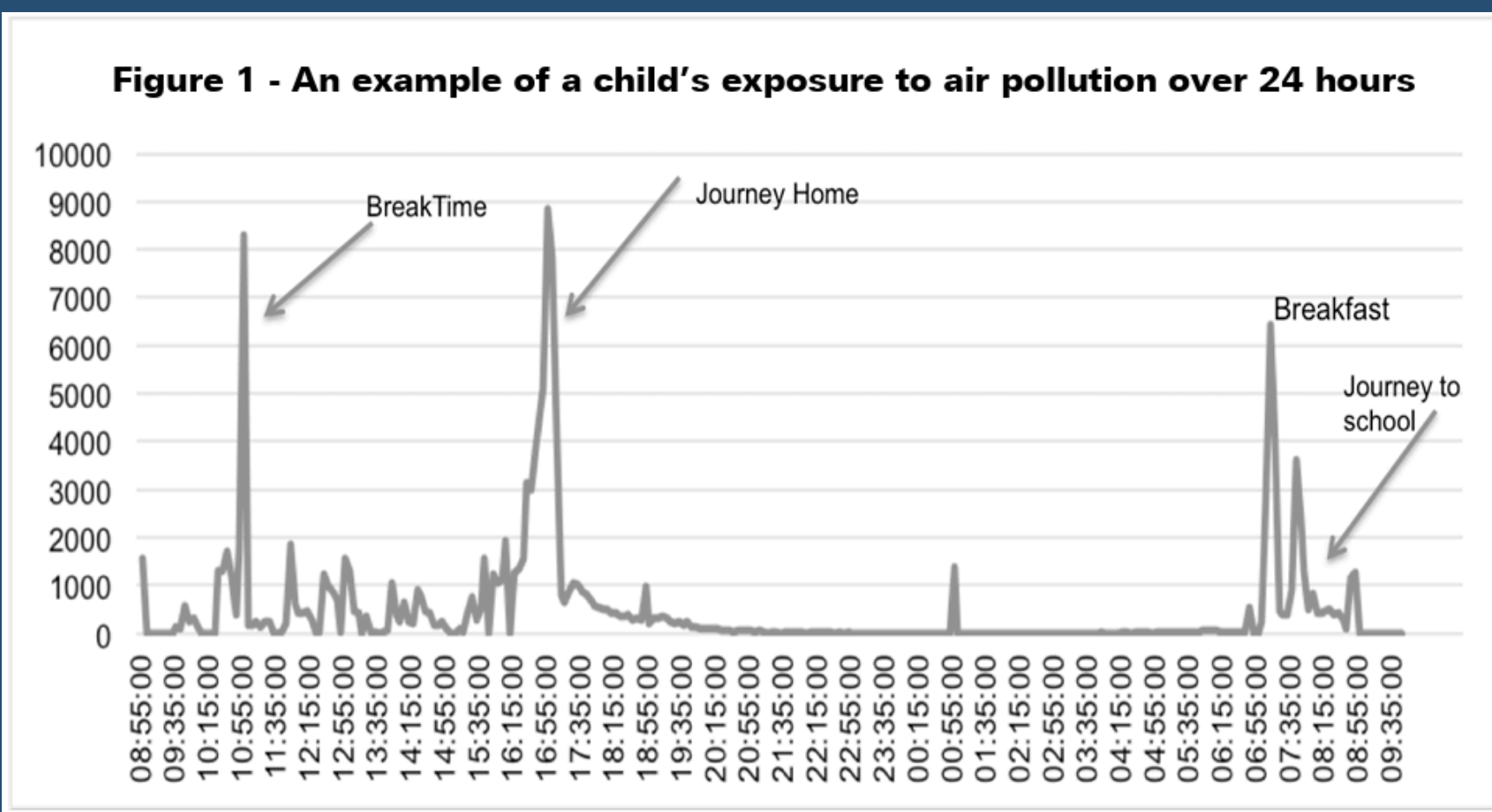
Published Online
October 19, 2023
[https://doi.org/10.1016/S2213-2600\(23\)00329-6](https://doi.org/10.1016/S2213-2600(23)00329-6)

ISGlobal, Barcelona, Spain
(Prof M Nieuwenhuijsen PhD,
Prof J Garcia-Aymerich MD PhD);
Universitat Pompeu Fabra
(UPF), Barcelona, Spain
(Prof M Nieuwenhuijsen,
Prof J Garcia-Aymerich); CIBER

LE PARIS DU 1/4 HEURE



La importància dels entorns escolars

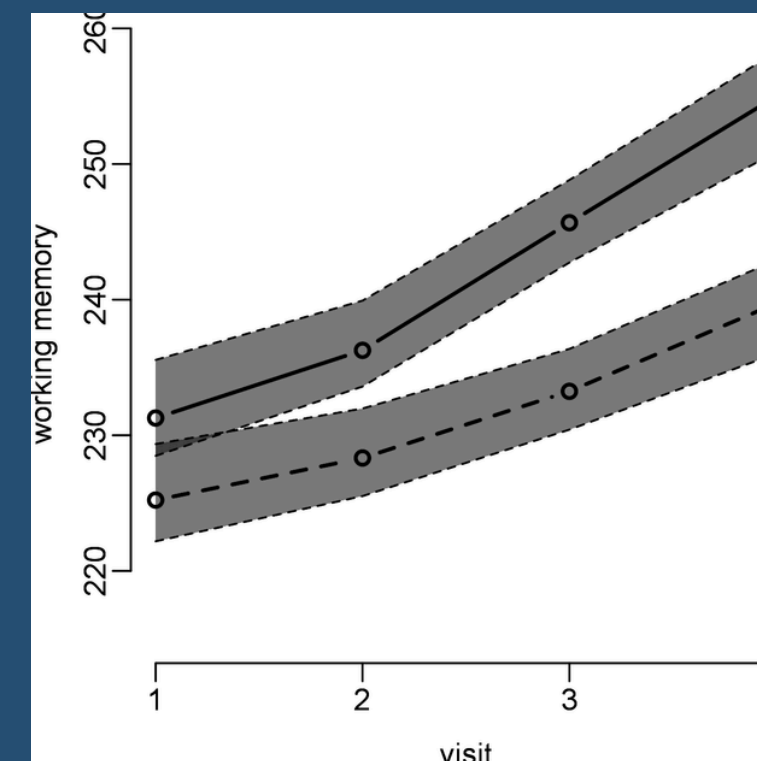


UNICEF UK. (2018, setembre). The toxic school run: UK children at daily risk from air pollution.

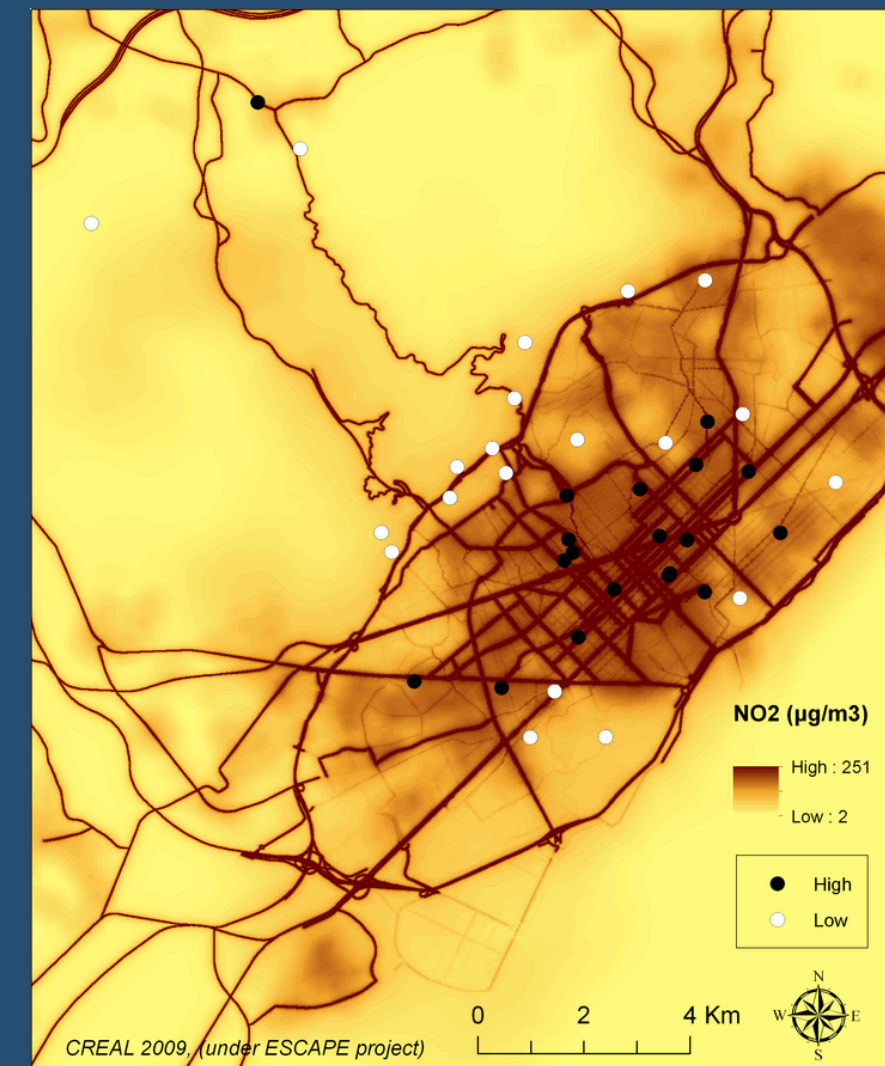
Association between Traffic-Related Air Pollution in Schools and Cognitive Development in Primary School Children: A Prospective Cohort Study

Jordi Sunyer , Mikel Esnaola, Mar Alvarez-Pedrerol, Joan Forns, Ioar Rivas, Mònica López-Vicente, Elisabet Suades-González, Maria Foraster, Raquel Garcia-Esteban, Xavier Basagaña, Mar Viana, Marta Cirach, Teresa Moreno, [...], Xavier Querol [view all]

In schools with low pollution, the work memory increased by 11.5%.



In the most polluted schools, it increased by 7.4%.



Contaminació als entorns escolars de Catalunya - 2024

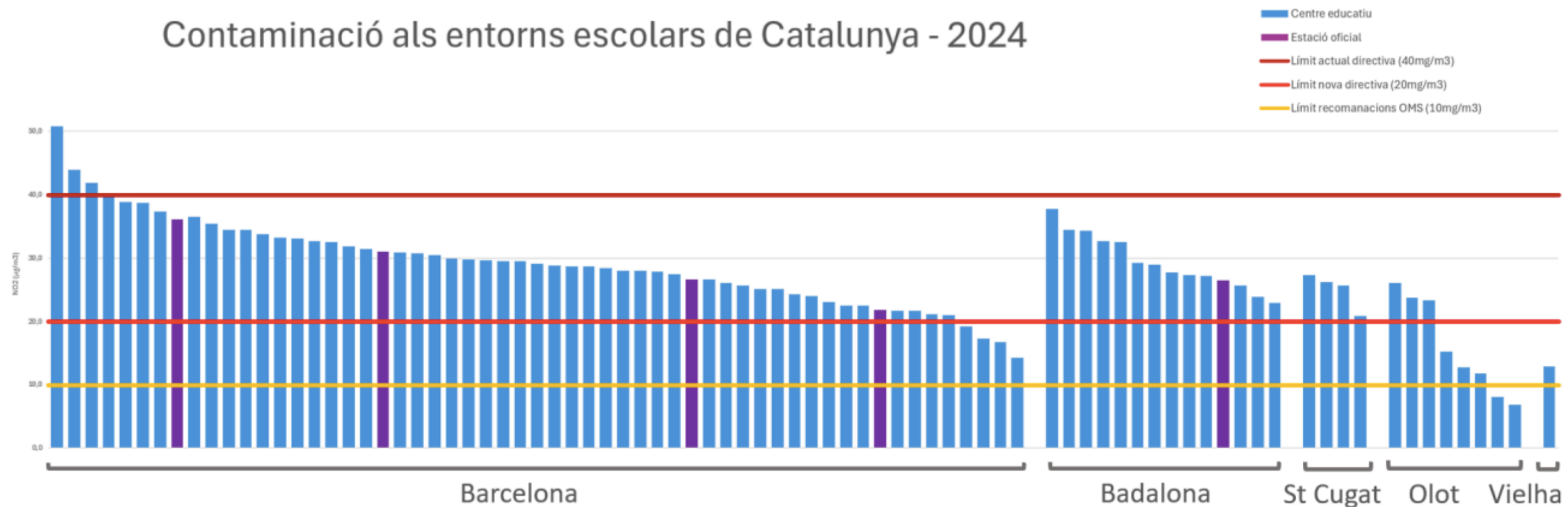
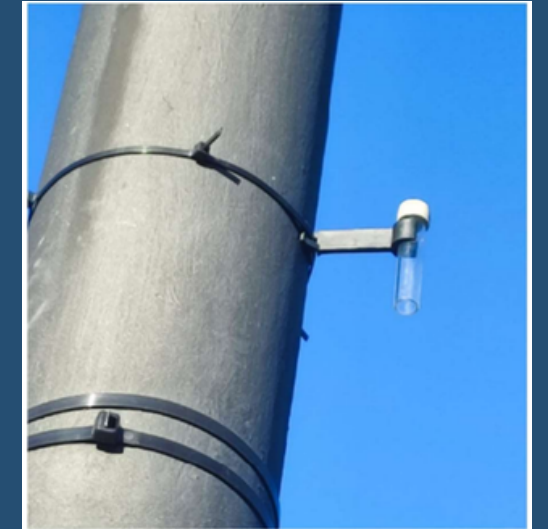


Figura 3. Gràfic amb la contaminació per NO₂ als entorns escolars de la campanya de mesurament a Catalunya l'any 2024.



Qualitat de l'aire en els entorns educatius de Catalunya

Campanya de ciència ciutadana: mesuraments de diòxid de nitrògen (NO₂) realitzats el novembre de 2024 en 79 entorns escolars a Barcelona, Badalona, Sant Cugat, Olot i Vielha

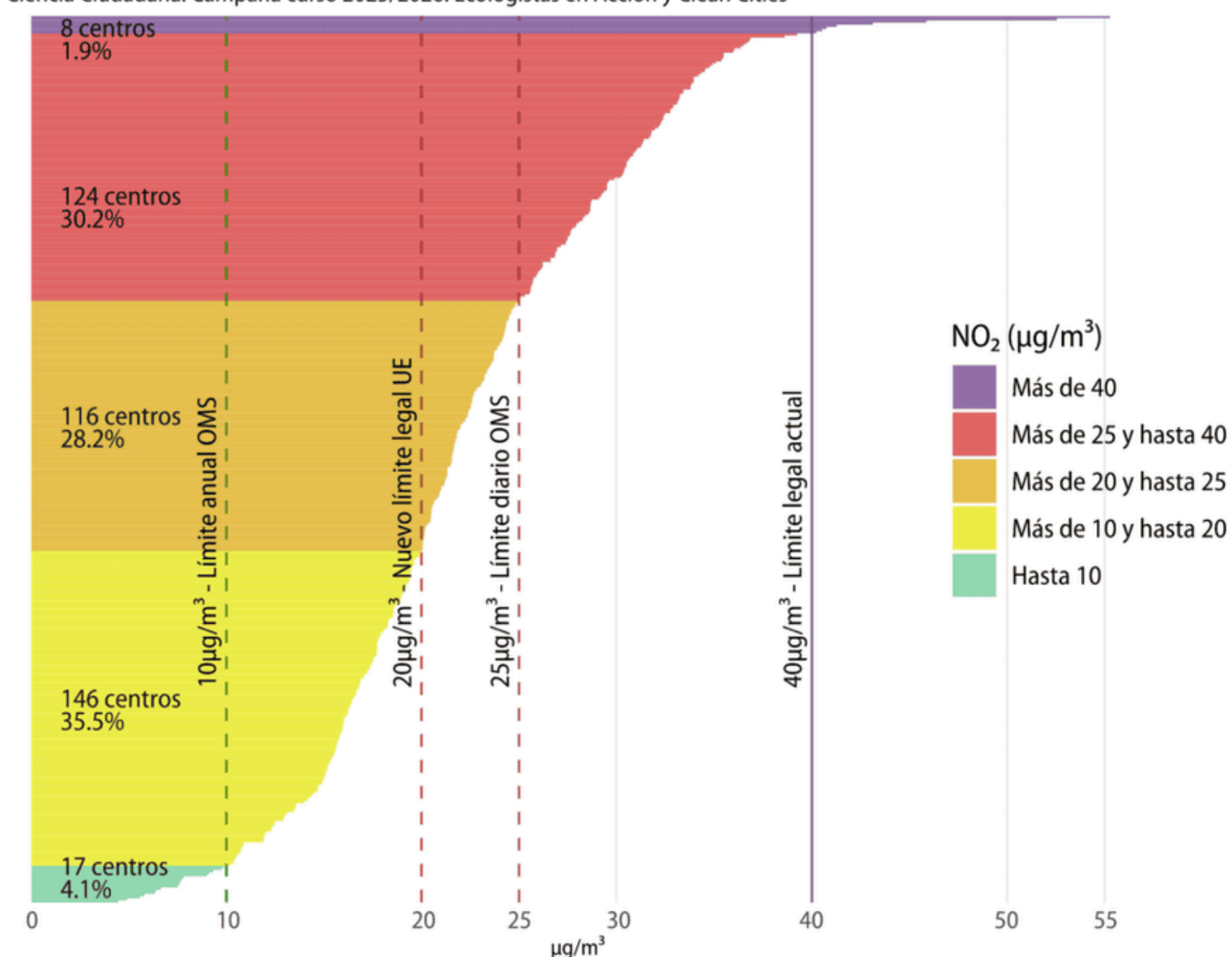


El 96 % de los entornos escolares superan los niveles de NO₂ recomendados por la OMS

15/04/2026 | Área, portada, Calidad del aire, Ciencia ciudadana NO2

Medición de la calidad del aire con NO₂ en 412 centros escolares

Ciencia Ciudadana. Campaña curso 2025/2026. Ecologistas en Acción y Clean Cities



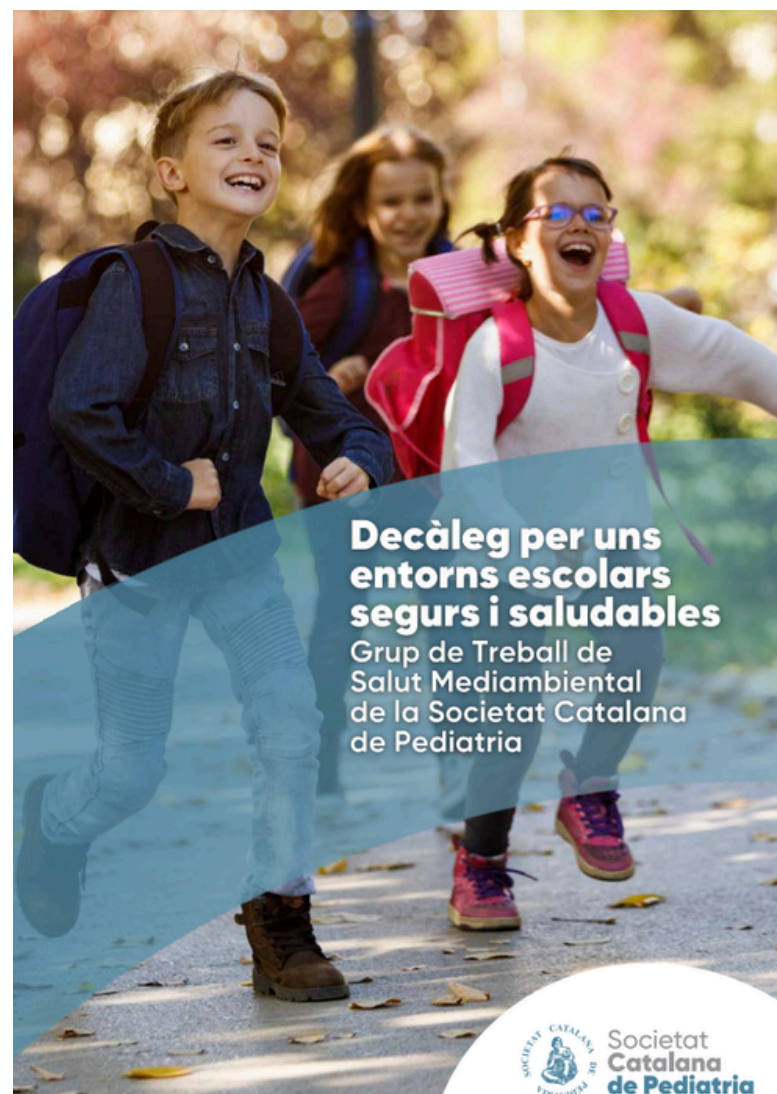


Taula 2. Dades totals dels resultats de la campanya el 2025.

	Nº centres educatius	Mitjana NO ₂ (µg/m ³)	> 40 µg/m ³ (límit legal actual)	> 20 µg/m ³ (límit nova directiva)	> 10 µg/m ³ (OMS)	< 10 µg/m ³ (OMS)
Total	147	21,9	1	90 (61,2%)	140 (95,2%)	7 (4,7 %)

28 municipis

Decàleg entorns escolars





Pacificar el trànsit en els entorns escolars, prioritzant la peatonalització i la restricció del trànsit motoritzat, així com promoure un canvi generalitzat cap al model de "Ciutat 30" per reduir de manera efectiva la velocitat del trànsit a tot el viari urbà.

2

Creació de camins escolars i carrils bici amples i segregats per tal d'afavorir la mobilitat escolar activa i promoure l'arribada al centre educatiu i la sortida de manera autònoma i segura.



Prioritzar la proximitat al centre escolar com a criteri bàsic de l'àrea escolar, en benefici de la infància i de tota la comunitat per tal de disminuir el nombre de desplaçaments motoritzats diaris i promoure la mobilitat activa.



Substituir aparcaments per a cotxes dels carrers contigus als centres educatius per aparcaments per a bicicletes, patinets i zones d'espera, de trobada i joc a l'espai públic amb arbrat, vegetació i aigua, així com crear pàrquings de bicicletes i patinets a dins dels centres educatius.

Recomanem la utilització d'autobusos elèctrics en les línies escolars.



Monitorar les aules: instal·lar sensors de qualitat de l'aire i acústica com una eina pedagògica i de millora de la salut. Els valors de referència que motivaran mesures correctores seran els de l'Organització Mundial de la Salut.



Naturalitzar els patis escolars i els entorns escolars amb arbrat i plantes que contribueixin a millorar la qualitat ambiental proporcionant ombra, frescor i color a aquests espais, i mitiguin l'efecte illa de calor (refugis climàtics). Aplicar principis de resiliència arquitectònica i urbana per adaptar l'escola i el seu entorn al canvi climàtic.

7

Realització de l'activitat lectiva i no lectiva a l'aire lliure sempre que sigui possible (traslladar l'aula a entorns naturals propers al centre educatiu com a mínim un cop a la setmana).



Posada en marxa d'iniciatives com la d'"Entorns sense fum" o "Classe sense fum" per afavorir l'eliminació de l'exposició al fum ambiental del tabac als entorns immediats dels centres educatius i prevenir el tabaquisme abans de l'adolescència, així com treballar en activitats preventives a l'àmbit del consum d'alcohol i altres drogues.



Establir plans de salut mediambiental escolar per a cada centre, amb un diagnòstic escolar i amb la participació de tota la comunitat educativa i incorporant la salut mediambiental al currículum escolar.

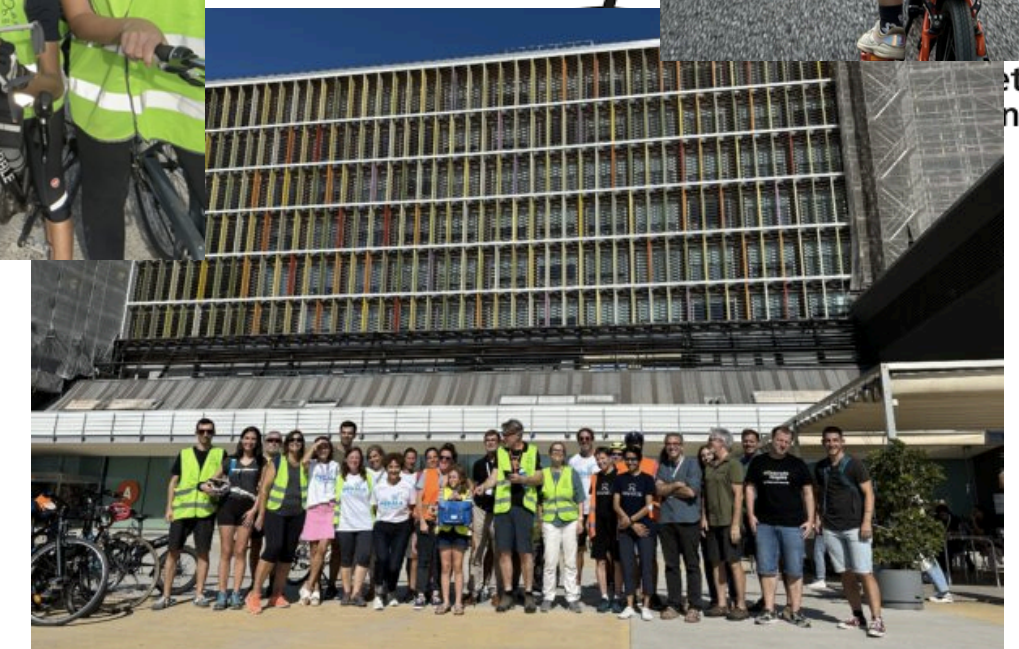
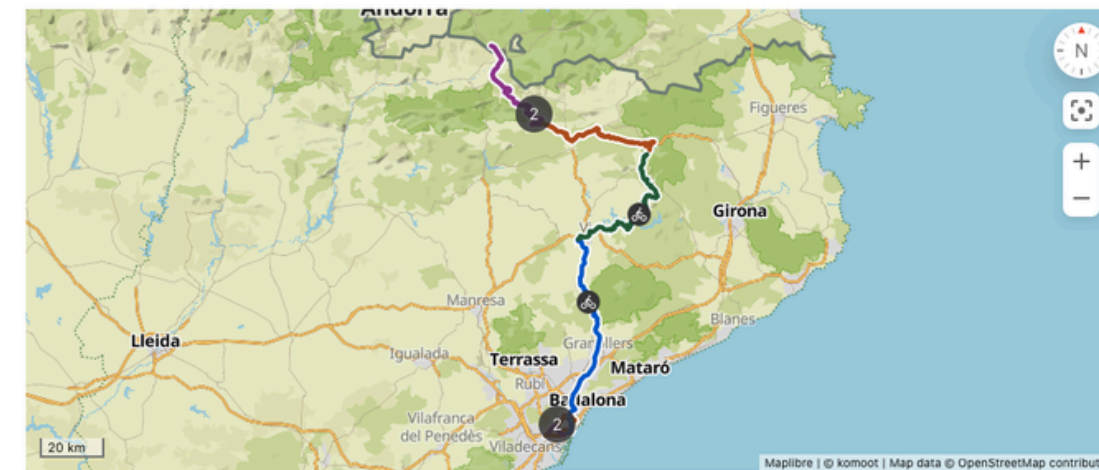


Incloure experts i afectats en les decisions en relació amb la mobilitat i els entorns escolars segurs i saludables i integrar-les en la redacció dels POUM (Plans d'Ordenació Urbanística Municipal) i els PMUS (Plans de Mobilitat Urbana Sostenible).

Ride For Their Lives



RIDE FOR THEIR LIVES



Estudi

Millorar els entorns escolars:
Metodologia d'anàlisi i estat actual en
l'àmbit metropolità de Barcelona

Encarregat pel PEMB i l'AMB i realitzat per Xavier Matilla i Helena Cruz, de TerritoriXLM

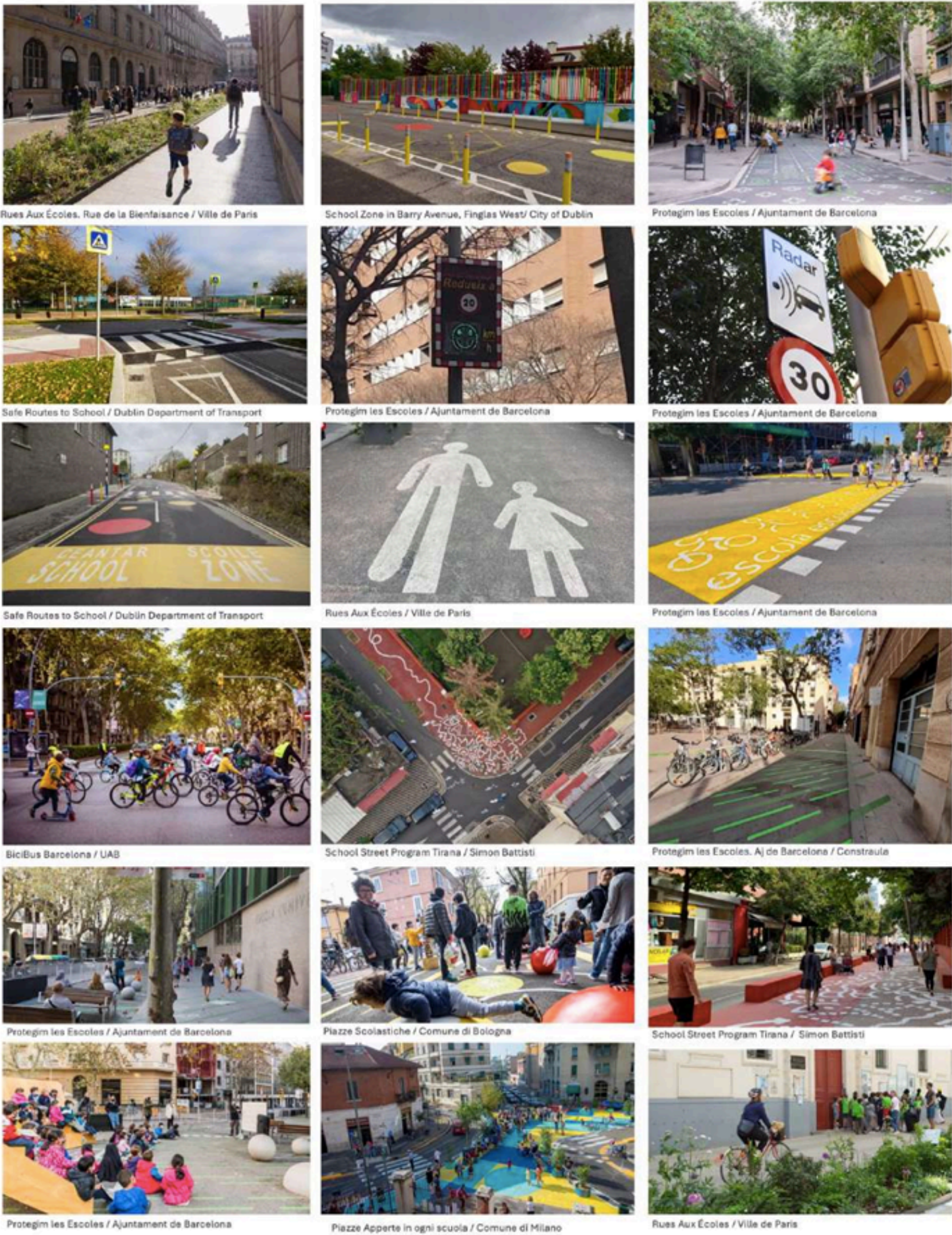
Què podem fer?	OBJECTIUS			
	Qualitat Ambiental	Habitabilitat	Seguretat vial	Implicació Comunitats
1. GUANYAR ESPAI				
Tancar el carrer al transit de vehicles	●	●	●	●
Crear carrer compartit amb prioritat vianants	●	●	●	●
Reduir carrils de circulació	●	●	●	●
Eliminar espais d'aparcament de vehicles	●	●	●	●
Efectuar talls de transit temporals	●	●	●	●
2. REDUIR VELOCITAT DELS VEHICLES				
Carrer compartit amb velocitat màx 10Km/h	●	●	●	●
Límitar velocitat màx. en carrer escolar 20Km/h	●	●	●	●
Límitar velocitat màx. en carrer escolar 30Km/h	●	●	●	●
Instal·lar ràdar pedagògic	●	●	●	●
Instal·lar radar	●	●	●	●
Instal·lar elements reductors	●	●	●	●
Evitar efecte “onada verda semafòrica”	●	●	●	●
3. VISIBILITZAR L'ESCOLA				
Pintar catifa color distintiva a l'accés del carrer	●	●	●	●
Ubicar Tòtem identificatiu escola	●	●	●	●
4. FOMENT DE LA MOBILITAT SALUDABLE I SOSTENIBLE				
Prioritzar criteris de proximitat en l'escolarització	●	●	●	●
Ampliar voreres	●	●	●	●
Implantar carrils bici	●	●	●	●
Implantar aparcaments bici	●	●	●	●
Impulsar bici-bus	●	●	●	●
5. CREAR ESPAIS D'ESTADA I JOC				
Instal·lar mobiliari urbà per seure: bancs i taules	●	●	●	●
Instal·lar elements de joc espontani	●	●	●	●
Organitzar activitats col·lectives en espai exterior	●	●	●	●
6. RE-NATURALITZAR L'ESPAI				
Incorporar jardineres	●	●	●	●
Organitzar tallers i programes de jardineria	●	●	●	●
Des-asfaltar	●	●	●	●
Plantar vegetació i arbrat	●	●	●	●

Grau assoliment objectiu

● ALT

● MIG

● BAIX



Nou protocol “Créixer en salut”

Protocol d'activitats preventives i de promoció de la salut a l'edat pediàtrica

Créixer amb Salut



Novetats en el nou protocol d'activitats preventives i de promoció de la salut a l'edat pediàtrica

Créixer amb Salut



Nou calendari amb 4 noves visites



→ als 0 - 7 dies, 3, 10 i 12 anys.

Detecció de malalties cardiovasculars amb risc de mort sobtada



→ Nou cribatge amb qüestionari clínic i realització d'un ECG de 12 derivacions als 10 anys.

Neurodesenvolupament



→ Nous cribatges per a la detecció precoç de trastorns del neurodesenvolupament.
→ Taula Haizea-Llevant fins als 5 anys.

Salut mediambiental



→ Incorporació del full verd a les visites pediàtriques.
→ Prevenció, detecció, avaluació de riscos mediambientals relacionats amb la salut dels infants i adolescents.

Salut digital



→ Explorar i valorar senyals d'alarma sobre l'ús de l'entorn digital.
→ Pla de salut digital familiar.



Per més informació consultar el **Protocol d'activitats preventives i de promoció de salut a l'edat pediàtrica**

Nou protocol “Créixer en salut”

4. A continuació, presentem una escala d'opinió del 0 al 10 perquè pugui expressar en quin grau li molesten o pertorben el soroll i la contaminació de l'aire al seu domicili. Per exemple, si vostè està “absolutament gens” molest/a pel soroll o la contaminació de l'aire haurà d'escollir el 0, i si vostè està “extremadament” molest/a haurà de triar el 10.

	0 (gens molest)	1	2	3	4	5	6	7	8	9	10 (extremadament molest)
Soroll											
Contaminació de l'aire											

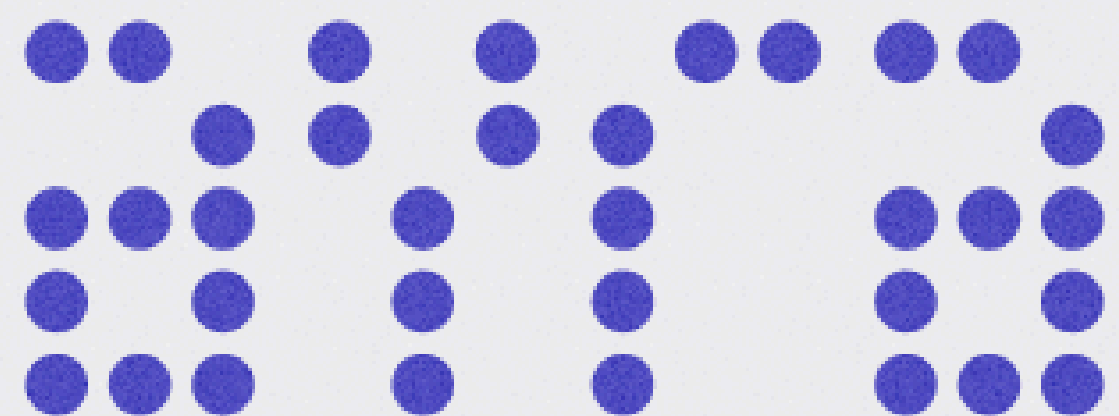
Acció a fer: recollir la preocupació sobre la contaminació atmosfèrica i acústica pot facilitar la presa de decisions i millorar la conscienciació tant a nivell familiar com col·lectiu. A l'interior del domicili es poden plantejar mesures que millorin l'aïllament acústic i tèrmic, i la instal·lació de filtres tipus HEPA. La mesura de la qualitat de l'aire mitjançant sensors (propis o municipals) és altament desitjable. Si no es disposa de sensors propis es poden recomanar altres apps com, per exemple, Aire.cat.

Nou protocol “Créixer en salut”

11. **Amb quina freqüència realitza activitats en contacte amb la natura (parc del barri, horta, muntanya, platja) amb el seu fill o la seva filla?**

- Tots els dies
- Alguna vegada a la setmana
- Alguna vegada al mes
- Només per vacances
- Cap contacte

Acció a fer: cal recomanar 2 hores a la setmana, com a mínim, d'activitats a l'aire lliure i en contacte amb la natura. Una pauta a seguir pot ser: cada dia uns minuts a un parc urbà, cada setmana unes hores en un entorn natural, i algun cop al mes passar un dia a un parc natural. És aconsellable disposar d'un llistat d'entorns naturals i d'entitats que en fomentin l'accés en l'àmbit local per poder realitzar una prescripció de natura.



Digital platform for environmental monitoring of pediatric patients



Donen suport





ORIGINAL ARTICLE



Results of a Home-Based Environmental Intervention among Urban Children with Asthma

Authors: Wayne J. Morgan, M.D., C.M., Ellen F. Crain, M.D., Ph.D., Rebecca S. Gruchalla, M.D., Ph.D., George T. O'Connor, M.D., Meyer Kattan, M.D., C.M., Richard Evans, III, M.D., M.P.H., James Stout, M.D., M.P.H., [+6](#), for the Inner-City Asthma Study Group* [Author Info & Affiliations](#)

Published September 9, 2004 | N Engl J Med 2004;351:1068-1080 | DOI: 10.1056/NEJMoa032097

VOL. 351 NO. 11 | Copyright © 2004

CONCLUSIONS

Among inner-city children with atopic asthma, an individualized, home-based, comprehensive environmental intervention decreases exposure to indoor allergens, including cockroach and dust-mite allergens, resulting in reduced asthma-associated morbidity.

Environmental Management of Pediatric Asthma

Guidelines for Health Care Providers

August 2005



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E-mail: health@neefusa.org
Web: www.neefusa.org/health



Thousands of babies and toddlers falling sick from damp homes in Britain, NHS doctor warns

Exclusive: Nearly 31,000 children aged four or under admitted to hospital each year in England due to respiratory virus, with 80% developing acute bronchiolitis



📷 Toddler with inhalation mask. Government data suggest more than 520,000 rented properties in England have hazards posing a serious and immediate risk to health and safety, a large proportion being cold, damp and mould. Photograph: Steve Debenport/Getty Images

Dr Camilla Kingdon, president of the Royal College of Paediatrics and Child Health, said the body was encouraging paediatricians to ask about housing when reviewing children with lung issues, but she called on the government to do more to improve standards.

“The UK has some of the very worst housing stock in Europe and evidence shows a rising number of families are living in poor quality accommodation, with detrimental impacts on children’s health. Cold and damp housing conditions lead to increased risk of asthma, respiratory infections, slower cognitive development, and mental health problems in children. We must remember that our housing crisis is also a health crisis.”



Environmental exposure

ORIGINAL ARTICLE

Damp mouldy housing and early childhood hospital admissions for acute respiratory infection: a case control study

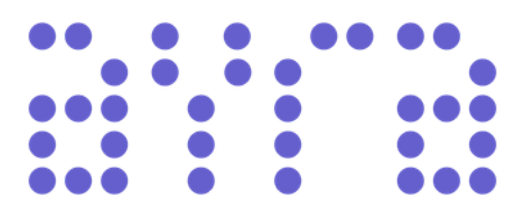
Tristram Ingham,¹ Michael Keall,² Bernadette Jones,¹ Daniel R T Aldridge,¹ Anthony C Dowell,³ Cheryl Davies,⁴ Julian Crane,¹ Jessica Barbara Draper,^{1,4} Lauren Olivia Bailey,¹ Helen Viggers,² Thorsten Villiers Stanley,^{5,6} Philip Leadbitter,⁷ Mereana Latimer,⁴ Philippa Howden-Chapman²

Ingham T, Keall M, Jones B, *et al*/Damp mouldy housing and early childhood hospital admissions for acute respiratory infection: a case control study *Thorax* 2019;**74**:849-857.

IMPLICATIONS FOR POLICY

Given the findings of this study, we predict that 19% of ARI admissions for children under 2 years old would be prevented if all housing were free from damp and mould. This represents savings in costs solely due to hospitalisation (ignoring wider social costs) of just under \$8 million NZD (£4.5 million GBP) per annum. Improving housing quality to prevent such hospitalisations is highly desirable also in terms of future costs. Poor housing quality in childhood has also been shown to be associated with adverse health outcomes in adulthood.⁴³ Conversely, improvements in housing contribute to long-term improvements in the health of the occupants, for as long as such improvements remain effective.

The results of the study also highlight the importance that all healthcare professionals are made aware of housing as a risk factor for respiratory illness. This is of particular relevance to primary healthcare, given the high service use generated by childhood respiratory conditions. As an important aspect of the primary and secondary preventions of childhood ARI, we suggest that part of the routine clinical assessment of preschool children should include enquiry about the home environment, particularly regarding the presence of dampness and mould, with referral to appropriate remedial services.



Plataforma digital per la monitorització ambiental dels pacients pediàtrics

CLINICAL DATA

Patient selection criteria
SJD a casa

+

CONTEXTUAL DATA

Environmental and household habits
survey
Survey of household structural
characteristics

+

ENVIRONMENTAL DATA

Device data (indoor environment)
Satellite data (outdoor environment)

=

CREATION OF INDEXES

Residential Air Quality Index
Impact Index

ISGlobal Institut de
Salut Global
Barcelona



PREOCUPACIÓ DE PROFESSIONALS DE LA SALUT PER LA MALA QUALITAT DE L'AIRE QUE RESPIREM

- **Malalties cardiovasculars:** Hi ha una estreta relació entre la contaminació atmosfèrica i l'augment del risc d'infarts de miocardi, accidents cerebrovasculars i altres malalties cardiovasculars.
- **Malalties respiratòries:** L'exposició prolongada a nivells de contaminació per sobre dels recomanats augmenta el risc d'agreuja l'asma, la bronquitis crònica i altres malalties pulmonars [3]. Un clar exemple d'aquest tipus d'efectes és l'increment de nous casos d'asma infantil relacionats amb nivells elevats de NO₂ [4].

example
respira



Moltes gràcies

elena.codina@sjd.es

[@elenacodina_pediambiental](https://www.instagram.com/elenacodina_pediambiental)

