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.

Introduction

Half of the world's population lives in cities, and this number is likely to increase to 70% in the next 20 years.[1] Cities are complex systems that provide job availability, social ecosystems, and diverse opportunities for individual and population development. Jericho is known as the world's oldest continually inhabited city, possibly dating back to around 10 000 BCE, but urban planning and design emerged as a practice only in the late 19th and early 20th centuries, partly because of poor living conditions that existed at the time. Health and wellbeing considerations were central to these new practices, but the connection between health and city planning has since been largely forgotten.

The Lancet Group has published two Series that examine the important role of urban design and transport in the health of populations living or working in urban environments: the 2016 *Lancet* Series and the 2022 *Lancet Global Health* Series on urban design, transport, and health. This Policy View focuses on the effects of (suboptimal) urban environments on respiratory health, including lung development during childhood and adolescence, new-onset respiratory disease, exacerbation of existing lung disease, and the factors (eg, air pollution, infectious diseases, and physical inactivity) that contribute to lung disease in this setting.

Cities carry a large burden of respiratory disease due to suboptimal urban and transport planning, which leads to high air pollution and increased risks of infectious diseases due to higher population densities than in rural and suburban areas.[2,3] High traffic density, residential heating and cooking, surrounding agriculture, and the presence of air and sea ports all contribute to increased air pollution within cities.[2,4] Car-dominated cities often lack walkable areas, which reduces opportunities for physical activity that are fundamentally important for healthy lungs;[5] in people with asthma or chronic obstructive pulmonary disease (COPD), reduced movement can increase the risk of respiratory exacerbations and mortality.[6–8] Cities often have restricted amounts of green space, and the few green spaces available often include poorly selected plants that can provoke or worsen allergic diseases. Furthermore, the distribution of risk factors is inequitable. Less affluent neighbourhoods are often exposed to higher amounts of air pollution than affluent neighbourhoods, and are therefore disproportionately affected by respiratory disease.[5]

In this Policy View, we have two main aims: (1) to raise awareness of these issues among populations living or working in urban areas, including patients with respiratory disease and their families, and among health-care professionals; and (2) to set out priorities for improving urban environments for politicians and policy makers, researchers, funders, planners and related stakeholders, the education sector, and environmental and health professionals. We highlight gaps in understanding and challenges in improving the design of urban environments, and provide recommendations for urban planning and policy to improve urban conditions and thereby improve respiratory health (figure 1; panel 1). Although we focus mainly on high-income countries, some solutions are also applicable to low-income and middle-income countries, where a range of different challenges might also apply. We also discuss the role that scientific and medical societies and health-care professionals should have in urban and transport planning for respiratory health.

Urban environments and respiratory health

Respiratory diseases are a major cause of mortality and disability worldwide. Three of the top five causes of death worldwide are COPD, lower respiratory tract infections, and lung cancer.[3] Chronic respiratory diseases, including COPD and asthma, have grown in absolute numbers since 1990, although they have declined in several age-standardised estimations.[3] Respiratory infections, including tuberculosis, have decreased in prevalence but still contribute to high disability-adjusted life-years,

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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 Epidemiología y Salud Pública (CIBERESP), Madrid, Spain** (Prof M Nieuwenhuijsen, Prof J Garcia-Aymerich); **Centre for Environmental Policy, Imperial College London, London, UK** (A de Nazelle PhD); **MRC Epidemiology Unit, Public Health Modelling Group, University of Cambridge, Cambridge, UK** (H Khreis PhD); **School of Clinical Medicine, University of Cambridge, Cambridge, UK** (H Khreis); **Centre for Health and Society, Institute for Occupational, Social and Environmental Medicine, Heinrich–Heine–University of Duesseldorf, Duesseldorf, Germany** (Prof B Hoffmann MD MPH)

Correspondence to:
Prof Mark Nieuwenhuijsen, ISGlobal, Barcelona 08003, Spain
mark.nieuwenhuijsen@isglobal.org

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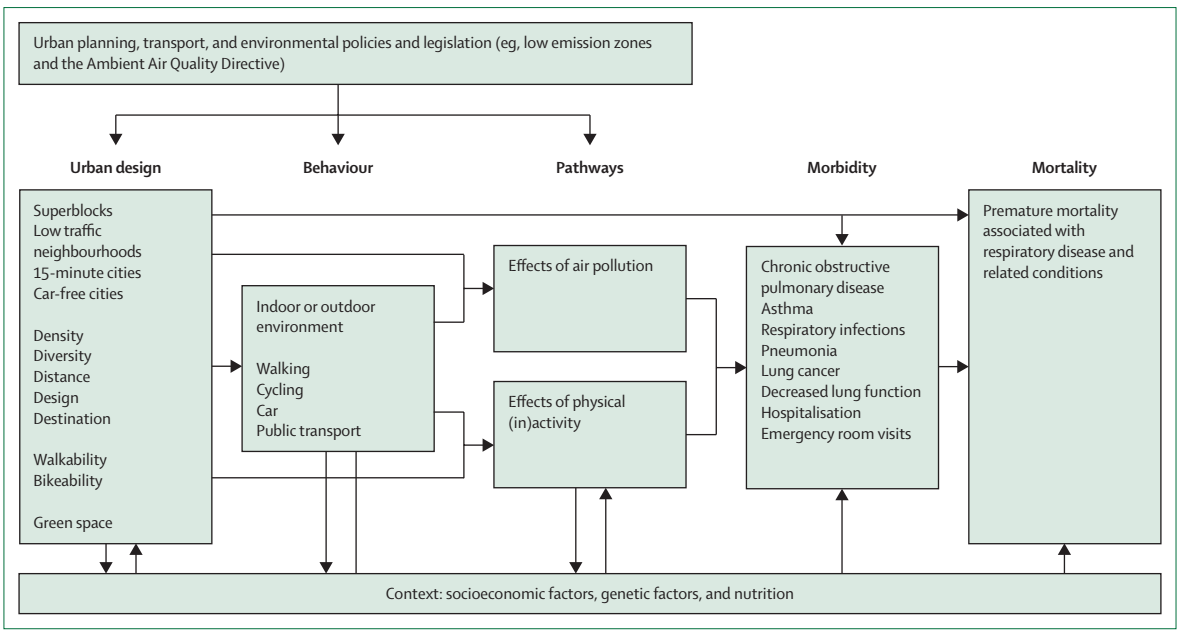

Figure 1: **Framework on urban planning, transport, environment and lifestyle, morbidity, and premature mortality**
Modified from Nieuwenhuijsen.[4]

particularly among children. The burden of respiratory diseases is likely to persist with increasing urbanisation, as air pollution and other risk factors continue to affect populations worldwide.[3] However, substantial regional variations exist, and premature mortality and disability are higher in low-resource settings than in high-resource areas.[3]

Air pollution damages most organ systems and is linked to respiratory disease, cardiovascular disease, stroke, diabetes, and dementia, among other conditions.[18] Respiratory health effects of air pollution (eg, those caused by fine particulate matter [PM] and nitrogen oxides) include the development and worsening of asthma in children, COPD in adults, lung cancer, pneumonia, allergic disease, and respiratory infections. Long-term exposure to high air pollution leads to compromised pulmonary immune defence mechanisms, decreased lung growth in children, and accelerated decline in adult lung function. Short-term increases in air pollution lead to asthma and COPD exacerbations that result in hospital admissions, emergency department visits, and increased medication use. In people with pre-existing chronic respiratory conditions, increased air pollution has been related to worsening symptoms, increased exacerbations, acute reductions in lung function, excess emergency room and hospital admissions, and increased mortality.[19,20] Regularly updated scientific evidence for organ-specific effects, including toxicological, human clinical, and epidemiological studies, are provided in the comprehensive Integrated Science Assessments conducted by the US Environmental Protection Agency.[21]

Interventions to reduce risk factors and respiratory health burden

The most important environmental risk factor for impaired respiratory health is air pollution. In a systematic evidence map indexing 376 articles and 1139 policy scenarios, Khreis and colleagues[12] summarised numerous global measures to reduce emissions and air pollution in the transport sector. The measures most often studied are emerging technologies. Zero emission vehicles (such as electric cars) are often promoted as a solution, but they still have non-exhaust emissions (eg, from brakes and tyres), produce noise from tyres, and take up valuable public space in a similar way to internal combustion cars.[4] Measures related to land use and behavioural changes are understudied but can have direct effects that are important to air quality and have various health co-benefits, such as increasing physical activity, public and green space provision in cities, and reducing traffic injuries and fatalities. Policy packages that combine behavioural and technological measures are largely missing, although these can achieve air pollution reductions more quickly and better promote population health.[22]

Within the past 10 years, numerous urban interventions such as low traffic neighbourhoods (eg, in London),[16] superblocks (eg, in Barcelona),[23] the 15-minute city (eg, in Paris),[24] and car-free cities or neighbourhoods (eg, in Vaughban and Freiburg)[25] have been proposed and are being implemented. These interventions reduce car use and increase active travel and public green spaces for physical activity (figure 2). An evaluation of low traffic neighbourhoods showed a 6% reduction in NO_2 air

pollution, a 58% reduction in traffic within the affected areas, and traffic reductions in surrounding areas.[26] For superblocks in Barcelona, a 25% reduction in NO_2 concentrations and a 17% reduction in PM_{10} was reported.[27] These measures could also promote a shift from extensive car use to more active transport,[16,27] and thereby increase overall physical activity in the population.

Despite being a more focused approach than superblocks, low emission zones (LEZs)—in which vehicles are required to abide by strict emission standards or the owner has to pay an entrance fee—are increasingly implemented in cities. Most of the evidence base, primarily from Europe and China, shows reductions in emissions or concentrations of black and elemental carbon, particulate matter, and nitrogen oxides; however, some studies show no or mixed effects from the intervention, and one study showed an increase in $PM_{2·5}$.[12,28] The effects of LEZs seem to vary according to the pollutant studied. The effects of black and elemental carbon might be generally small and limited by the geography of implementation, and at times might be hard to evaluate because of other changeable conditions (eg, climate, COVID-19, and urban planning). As with any policy that results in vehicle recirculation, effects might be redistributed in an environmentally unjust way due to potential displacement—rather than elimination—of emission sources. Vehicles might avoid LEZs and thereby increase traffic volumes in boundary areas, which might result in a large proportion of high-emitting vehicles in those areas, but little evidence exists to support this theory. Unfortunately, vocal opposition by (privileged) groups of car users passing through the area might make city councils reluctant to introduce a LEZ, even though it could have great benefits for less privileged citizens (eg, in terms of socioeconomic status).

Provision of green space could also reduce air pollution through the deposition of particles, and the absorption and adsorption of particles and gases to plant surfaces. However, studies of the impact of greening cities on air pollution are still sparse, and the effects are contingent on the types of tree and other plants, physical characteristics of leaves, and their dispersion, which are complex and variable at the local level.[29] Planners can maximise benefits and minimise unintended consequences by thinking carefully about the type of vegetation they introduce near to roadways and in cities—eg, by increasing the surface area of leaves and choosing species that do not emit compounds that can increase allergic responses or air pollution.[29] The provision of green space has many health benefits, such as a reduction in premature mortality and improvements in cardiovascular, respiratory, and mental health, and such spaces can contribute to climate mitigation and adaptation by providing cooling in cities and opportunities for CO_2 sequestration, although these opportunities might be limited by the small surface area available.[30]

Panel 1: **Solutions to shape urban environments**

Good urban planning guidelines

Urban planning that protects and promotes public health should take a multifaceted and holistic approach that considers the various pathways linking land use and transport to human health in cities, and their interactions. Multiple new frameworks conceptualise the relationships between urban planning and public health[5,9] and show how pathways linking the two factors are not mutually exclusive but, instead, are strongly linked and affect each other and should address the Sustainable Development Goals.[10] Transport planning has a crucial role in the long-term trajectories of the built environment as it dictates infrastructure, land use, and urban sprawl, and is tightly linked to human behaviours and the provision of new technologies. Active travel can be promoted through built environmental interventions that are often characterised according to dimensions related to accessibility and design.[11] Equity is a cross-cutting theme of urban and transport planning and is influenced at the different levels of planning decisions. Good urban planning practices consider these multifaceted issues and attempt to address multiple issues together (eg, air pollution, physical inactivity, traffic injuries, and social exclusion) through holistic solutions that embed equity as the cross-cutting theme. In addition, these practices consider the efficient use of policy packages that comprise multiple tools to maximise benefits and overcome limitations of singular instruments. For example, the provision of dedicated buses with right of way can improve both air quality and air pollution, but ridership needs to be increased with ancillary measures, such as subsidised fares, reliable schedules, and electrification of the fleet. These issues have been discussed by Khreis and colleages,[12,13] with both studies showcasing tools that can aid in the process of policy option generation and selection for public health. Checklists for evidence-based healthy urban planning are also readily available (figure 1).[14]

Low traffic neighbourhoods

Low traffic neighbourhoods (LTNs) are low-cost, area-based interventions that restrict vehicular access or use traffic-calming measures such as modal filters, sidewalk widening, and street furniture (eg, bollards, planters, and benches) that take up space previously dedicated to cars. LTNs were implemented at an increasing pace in the UK during COVID-19 lockdowns, but have wider international coverage in the form of traffic calming or so-called tactical urbanism.[15] These neighbourhoods simultaneously discourage car use and encourage active travel by making the streetscape more attractive and appealing to pedestrians and cyclists, and rendering car use more cumbersome, therefore improving safety and comfort for active transport modes. LTNs have at times been perceived as controversial, in part due to the fear of displacement of air pollution and traffic to neighbouring streets, but an increasing body of grey literature and a few peer-reviewed articles have mostly dispelled such fears. Studies have shown that LTNs increase active travel and reduce car traffic, air pollution, and traffic injuries, with potential benefits for respiratory health.[15–17]

In addition to improving access to green open spaces, steps could be taken to encourage walking and cycling by providing clean, safe, and green routes for commuters and residents, and considering the proximity of housing to work, schools, and services.[4] To reduce air pollution exposure, the cycling and walking infrastructure should be implemented away from traffic wherever possible. These factors should be considered during urban and transport planning by the introduction of health indicators.[31] City policies can also promote clean, safe, and affordable public transportation that facilitates access to health services, thus improving the prevention, early detection, treatment, and sustained management of

Figure 2: **Innovative urban designs to promote health**
(A) Flower boxes to create a low traffic neighbourhood in London. (B) Illustration of a superblock in Barcelona in which various transport modes are allowed before and after implementation. (C) Illustration of a 15-minute city in Paris with possible destinations (in French). (D) Green space and sustainable housing in Vaughban, Germany, and the car-free neighbourhood in Freiburg, Germany. Reproduced from Nieuwenhuijsen.[5] (E) Utrecht city promoting healthy urban and transport planning. (F) Amsterdam before and after urban and transport changes.

For more on the **US National Ambient Air Quality Standards** see https://www.epa.gov/criteria-air-pollutants/naaqs-table

For more on the **EU Ambient Air Quality Directives** see https://environment.ec.europa.eu/topics/air/air-quality_en

respiratory disease. Finally, city-driven actions to prevent overcrowding and provide adequate ventilation could also reduce the risk of respiratory infections and other diseases.

Legislation

Air pollution is ubiquitous—individuals can do little to evade it. Therefore, governments should be responsible for ensuring clean air for citizens, much as it is their duty to supply clean water or soil. The EU, for example, regulates air quality for all member states with the aim of providing equal living conditions, since air pollution can traverse long distances and cross national borders.

Air pollution regulations typically target emissions at their source and define maximum amounts of pollution in ambient air. In Europe, the legislation that controls emissions includes the Euro standards for vehicles, the Industrial Emissions Directive for large industrial developments, and the EU National Emission Ceilings Directive, which defines the maximum permitted amounts of emissions and mandates reductions for each national economic sector. Legislation targeting the quality of ambient air includes the US National Ambient Air Quality Standards and the EU Ambient Air Quality Directive. These pieces of legislation usually define air quality standards, consisting of legally binding limits for short-term and long-term exposure periods, non-binding target values, or a suite of alert thresholds. Ideally, these standards should be based on scientific evidence about the magnitude and relevance of the related health outcomes, and set at the lowest amount of pollution at which adverse health outcomes can be observed. The EU has charged WHO with this task, but the organisation publishes air quality guidelines irregularly. By contrast, the US Environmental Protection Agency has a fixed schedule for integrating the latest science and revisits their standards every 5 years on an individual pollutant basis. Data pertaining to the effects of air pollution and of measures to reduce air pollution on respiratory health and disease are needed to inform the setting of standards.

In 2021, after 16 years, WHO provided updated recommendations that are in stark contrast to current legislation in the EU. The 2008 EU Ambient Air Quality Directive set outdated annual limit values for $PM_{2·5}$ at 25 μg/m³ and NO_2 at 40 μg/m³; however, WHO recommends that exposures not exceed 5 μg/m³ for $PM_{2·5}$ and 10 μg/m³ for NO_2.[32] These discrepancies highlight the urgent need for fast and ambitious air quality action in Europe. The ongoing revision of the Air Quality Directive in the EU provides an opportunity to catch up with the annual standard in the USA for $PM_{2·5}$ of 12 μg/m³, which might be further revised to a range of 9·0–10·0 μg/m³. The 24 h $PM_{2·5}$ standard in the USA is still 35 μg/m³, which is far higher than the recommendation of 15 μg/m³ by WHO. Ambitious air quality legislation is also an opportunity to set an example of how efforts to reduce greenhouse gases and fossil fuel dependency and improve air quality can synergise.[33] However, legislators need to work with scientists to obtain optimal legislation.[34]

Respiratory patients as a clinically vulnerable group

People with respiratory diseases are particularly vulnerable to city environments. Some patients with chronic respiratory diseases could face contradictions between recommendations provided by their health professionals and conditions posed by the city environment. For people with COPD, regular exercise is crucial to prevent admission to hospital and death, but the practice of outdoor physical activity exposes them to harmful air pollutants, which could be magnified during exercise due to faster breathing rates. Various population studies have shown that the benefits of physical activity in reducing premature mortality outweigh the risks associated with greater exposure to air pollution in

healthy individuals,[35,36] but research is still scarce for vulnerable populations such as people with COPD.

A crossover study found that patients with COPD who walked on a street in London with high amounts of pollution had an increase in respiratory symptoms and a reduction in lung function within a few hours. Most benefits obtained from a walk in a park with lower amounts of air pollution were diminished or cancelled out.[37] A real-world study of healthy adults over several weeks found a reduced benefit of additional physical activity and an increased risk of lung function decline in areas with higher black carbon concentrations.[38] A large longitudinal study in adults spanning several years found that the benefits of physical activity on asthma and COPD exacerbations were not affected by the amounts of traffic-related air pollution.[39] A similarly complex situation is faced by patients with allergic diseases who are exposed to high pollen concentrations during some seasons in the city.[40] Given the multiple benefits of green spaces, these individuals should be encouraged to take precautions to minimise exposure to allergens but still benefit from being outdoors (see panel 2 for recommendations).

Panel 2: **Recommendations for patients**

Air pollution, physical activity, and chronic obstructive pulmonary disease

Recommendations for physical activity in highly polluted settings for patients with chronic obstructive pulmonary disease are largely lacking an evidence base. Patients should be encouraged to take personal actions to reduce their air pollution exposure and minimise the associated risks. These measures could include: reducing exposure by time (eg, avoiding morning and evening rush hours, and avoiding outdoor exercise during rush hours), avoiding exercise in the presence of extreme pollutant events (eg, wildfires or high air pollution alerts), exercising away from sources of air pollution (eg, major roads, highways, or factories), monitoring amounts of air pollution through trustable sources, and consequently adapting the location and time of activity.[21,41–43]

Green space, physical activity, and allergic respiratory diseases

In the absence of consistent evidence on which to base recommendations, people with respiratory allergies to plants are often advised to check pollen counts and avoid times or areas with high counts (eg, by planning outdoor activities in the early morning or late evening when pollen counts are typically lower), choose green spaces with fewer allergenic plants (eg, grassy areas rather than parks with lots of trees or flowers), and take medications following instructions from health-care professionals.[44]

Barriers and facilitators to change

Making changes to the urban environment is not straightforward. Cities tend to be governed and managed with siloed approaches, leading to short-sighted and narrow decision making. Recognising cities as complex systems, agreeing on ultimate societal goals (such as human and planetary health and equity), and fostering collaborations across sectors are crucial to transitioning towards health-promoting urban planning. Understanding how actions in one sector affect other outcomes through synergies, feedback loops, and unintended consequences will help to identify optimal solutions to reach the desired outcomes.[45]

A strong evidence base that integrates these interlinkages and makes trade-offs and co-benefits apparent will help alliances form across sectors and make the case for transdisciplinary collaborative approaches to decision making.[45] For example, air pollution policies are often aimed solely at bringing areas into compliance with standards, and neglect the fact that health is of the utmost importance. A strong focus is often given to technological solutions, such as alternative fuel technologies[12] and electric vehicles. Such solutions miss the opportunity to promote holistic city planning policies that generate further respiratory health benefits, such as reducing car reliance, which creates space for walking and cycling-friendly environments and mitigates climate change. Furthermore, equity issues mean that these measures might benefit those who can afford to invest in new technology (eg, electric cars). In addition, these new technologies could take away resources that would benefit low-income populations, such as public transport, in favour of developing new infrastructure, such as electric car charging stations. Ultimately, political leaders and the public need to be engaged and convinced of the benefits of greener and cleaner cities.[45]

To help in this regard, the evidence base for policy making should embrace real-world complexity and diversity, explain its policy relevance for various local contexts, acknowledge competing interests, and recognise the reality of short-term political cycles. For scientists, recounting good stories about healthy urban planning might be just as relevant as presenting p values, and emphasising long-term visions could help to counteract the powerful effects of loud lobby groups. Co-design processes, in which positive visions of the future are laid out and cross-sectoral evidence is explained, can simultaneously engage different stakeholders and help to push the agenda towards ambitious policies.[3]

Advocacy

Medical and scientific societies and health-care professionals have an important role in the design and implementation of preventive measures to reduce the burden of air pollution on respiratory health. The scientific community produces and communicates the evidence necessary to inspire societal and political action. However, this new evidence should be made available to

Panel 3: Key messages and recommendations

Urban and transport planners

- Car-dominated cities often hinder opportunities for physical activity, which is fundamentally important for healthy lungs. Urban and transport planners should integrate health in planning processes, include indicators for health under the Health in All Policies approach, plan to reduce the current health burden related to current planning practices, and include health in the curricula of urban and transport planning courses.
- Urban innovations such as low emission zones, low traffic neighbourhoods, superblocks, 15-minute cities, and car-free cities can reduce air pollution and increase green space and physical activity.
- Urban green space could have many beneficial health effects but might cause allergies.

Researchers

- More policy-relevant research could be developed by embracing decision making as an important goal of research and by recognising the complexity of city functioning.
- Studies should make use of and evaluate interventions taking place in cities.
- Researchers should develop cross-sectoral collaborations, consider the needs and avenues for societal engagement, and assess synergies and unintended consequences of alternative policies.

Medical and scientific societies

- Societies should engage in policy processes, communicate with policy makers and other relevant stakeholders (eg, transport engineers and urban planning, environment, and education experts) on the importance of healthy urban transitions, develop cross-sectoral collaborations, and develop guidelines for patients.
- Advocacy by medical respiratory societies can make an important contribution to change.

Patients and members of the public

Urban areas still carry a large burden of acute (infectious) and chronic respiratory diseases due to high amounts of air pollution among other inter-related stressors. Patients and members of the public should adopt behaviours for avoidance (of places and times of high air pollution and pollen emissions), protection (by engaging in healthy physical activity), reduced contribution to air pollution (eg, by choosing active travel over car travel), and participation in policy development sessions (eg, by voicing concerns over air pollution and expressing a desire for healthy urban transformations).

Governments

- Governments should take a lead in supporting urban planning for improved respiratory health, provide funding to address key (policy-related) research questions, and be held accountable for the health effects of urban developments.
- A multisectoral approach with more diverse and synergetic policy measures in integrated packages is needed.
- Stricter EU air quality guidelines can push such transformation to improve the respiratory health of citizens.

Search strategy and selection criteria

We searched PubMed and Google Scholar with free-text searches for (urban planning, transport planning, 15-minute city, low traffic neighbourhoods, superblocks, car free, low emission zones) AND (air pollution, NO_2, $PM_{2.5}$, green space, greenness, pollen) AND (respiratory disease, respiratory infections, asthma, COPD, lung cancer, pneumonia, legislation, burden of disease) AND/OR (interventions, barriers and facilitators and advocacy) using different search combinations. We also checked the reference list of selected papers. We restricted the search to papers published in English between Jan 1, 2000, and Jan 31, 2023. We included papers that supported the narrative developed in the text linking urban and transport planning, environment, physical activity, and respiratory health.

non-experts and should be accessible to the public, health-care professionals, civil society groups, and decision makers. Such requirements are an integral part of consequential epidemiology and advocacy to communicate the evidence to policy makers and make them aware of the urgency of the problem.

Medical societies such as the European Respiratory Society and the American Thoracic Society, and their organised membership of health-care professionals, should spread new knowledge, ensure that the evidence is translated into academic curricula and postgraduate training courses, and train their clinical membership to inform and coach patients. In addition, we recommend that health-care professionals and other public health and professional societies, such as the International Society of Environmental Epidemiology, advocate for measures to protect and improve population health to minimise the risk of healthy people developing disease due to air pollution. Therefore, profound knowledge on the relevance of air pollution in the clinical context is necessary, especially the identification of vulnerable patient groups, expertise in risk communication, coaching of patients, knowledge on public information systems (eg, freely accessible air quality indices), and updated evidence-based behavioural recommendations for each individual patient. Medical societies are the advocates of patients and should promote healthy living conditions through supporting prevention of detrimental exposures (eg, air pollution) at all political levels, including local, national, and international.

Research gaps and future directions

Researchers have sufficient knowledge to change urban planning for the better, increase physical activity among citizens, and reduce adverse stressors (eg, air pollution). What is less clear and understudied are the intended and unintended consequences of such changes and of policy alternatives. Although examples of specific interventions have been given, many others would also be suitable and effective. However, the evidence supporting widespread implementation of interventions, including potential effects on respiratory health, is scarce. Furthermore, research on the translation of scientific knowledge into policy and action is still insufficient, including barriers and facilitators, the role of governance, and the role of beliefs, attitudes, values, and behaviours towards healthier urban environments. Identifying how policy and decision makers can be engaged is challenging, and how governments can be compelled to implement

For more on the **European Respiratory Society** see https://www.ersnet.org/

For more on the **American Thoracic Society** see https://www.thoracic.org/

changes is even more so. Understanding and influencing these processes is essential for improving urban environments and respiratory health.

Advances do not come by themselves but need an active, multisectoral approach. Diverse policy measures, urban innovations, and stricter legislation are needed to reduce air pollution, increase public space for active transportation, improve green space provision with low-allergy planting options, and ultimately improve the respiratory health of citizens. Advocacy by medical respiratory societies can make an important contribution to change. The interventions discussed in this Policy View have multiple co-benefits, including climate change mitigation and increased resilience. Specific recommendations for key stakeholders are given in panel 3. As with many issues, no single solution can reduce air pollution or other environmental stressors, but a range of synergistic policy measures are needed alongside stakeholder involvement. Multisectoral approaches that combine urban planning, transport engineering, environment, education, and health are essential to make the required changes and interventions.

Contributors
MN conceptualised the paper. All authors contributed to the writing, reviewed the manuscript, and provided feedback. All authors were responsible for the decision to submit the paper for publication.

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We declare no competing interests.

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