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Transport - Health Nexus



SLOCAT Partnership on Sustainable,
Low Carbon Transport

Transport, Climate and Sustainability
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Key findings



Health impacts of transport

- Ambient air pollution increases the risk of cardiovascular and respiratory diseases, contributing to 4.2 million premature deaths in 2019.
- Land traffic contributes an estimated 5% of the mortality from small particulate matter (PM_{2.5}) globally, and as much as 32% in North America.
- The average level of PM_{2.5} pollution in the world's largest cities is nearly four times higher than World Health Organization guidelines.
- An estimated one-in-four adults and four-in-five adolescents are not sufficiently active, due in part to urban and transport infrastructure that prioritises vehicles, not people.
- Around 1.35 million people worldwide were killed due to road traffic crashes in 2016 (latest available data), with pedestrians, cyclists and motorcyclists accounting for more than half of these deaths.
- Traffic crashes are the leading cause of death among young people ages 5-29 and the eighth greatest cause of death among all age groups. Despite ambitious targets, there has been no reduction in traffic deaths for a decade.
- In 14 of 20 countries (mostly in the Organisation for Economic Co-operation and Development), road traffic crashes increased in the first half of 2022 but remained lower than pre-pandemic levels.
- Investment in safe, reliable and affordable public transport systems can reduce crashes by attracting motorcycle users even in areas with high motorcycle ownership.
- Inaccessibility to transport can reduce opportunities for people to get the healthcare services they need, and at times even discourage them from seeking care.
- Studies have shown that safe, active transport can boost mental health and that safe and efficient public transport can reduce commuter anxiety.

Policy measures and targets for a transport-health nexus

- The indirect costs of fossil fuel subsidies (including respiratory disease and traffic crashes) are an estimated ten times greater than their direct financial cost.
- Redirecting fossil fuel subsidies towards sustainable, low carbon transport modes (and to directly benefit healthcare systems) can lead to improved health outcomes.
- Urban and national decision makers can choose from an increasing number of policy tools to promote health-focused transport systems.
- In response to stronger emission standards in many jurisdictions, decision makers are increasingly turning to newer vehicle technologies to curb outdoor pollution and promote better health.
- In the post-pandemic world, national and sub-national governments are increasingly recognising the health benefits of active mobility and are investing in policies to promote walking and cycling, such as cycle lanes and bike sharing schemes.
- After the world failed to meet road safety targets set for the decade 2010-2020, the United Nations General Assembly in 2020 declared a second Decade of Action for Road Safety (2021-2030), setting an ambitious target to halve road traffic deaths and injuries by 2030.

Overview



As cities recover from the experience of the COVID-19 pandemic, there is heightened awareness of the relationship between urban settings and people's exposure and vulnerability to health risks, which include air pollution, road crashes and sedentary lifestyles.¹ Achieving equitable, healthy, green, and resilient transport and mobility systems has implications for the success of the United Nations' (UN) 2030 Agenda for Sustainable Development and its 17 Sustainable Development Goals (SDGs) – particularly for synergistic implementation of SDG 3 on health and well-being and SDG 11 on sustainable cities, while responding to SDG 13 on climate action.²

The planning of healthy cities strongly favours public and active transport, and the health benefits from reduced car dependence are increasingly influencing urban planning processes. The promotion of active transport modes, such as walking and cycling, provides a wide range of health and economic co-benefits by reducing healthcare costs linked to cardiovascular disease, improving labour productivity and decreasing congestion costs.³ Reducing high emissions and environmental externalities in port cities is also essential to addressing these recognised health hazards.⁴

The Intergovernmental Panel on Climate Change (IPCC) highlighted the nexus between transport, climate and health in its Sixth Assessment Report, released in 2022.⁵ The IPCC notes that many strategies for mitigating climate change in the transport sector also have health benefits, including from air quality improvements, reduced fatalities, equitable access to transport services and reduced stress (see Table 1).⁶ The electrification of transport, combined with renewable energy and shifts to public and active transport, can enhance health outcomes.⁷ The report shows that decision making that is focused on health benefits will encourage cities to place greater emphasis on public transport, walking and cycling.⁸

TABLE 1. Health benefits from low carbon, active and electrified transport

Source: See endnote 6 for this section.

	Improved air quality	Low-emission transport reduces air pollution and contributes to positive health outcomes.
	Reduced traffic injuries	Public transport systems have the potential to reduce injuries and deaths from road traffic crashes, although active transport also can increase vulnerability to crashes.
	Active transport	Walking and cycling have major health benefits, such as reducing the risk of obesity and other chronic health conditions, as well as improving mental health and well-being; however, active transport also may increase exposure to air pollution.
	Access to services	Accessible, affordable public transport can improve access to health care and other essential services for disadvantaged population groups.
	Reduced stress	Reductions in personal driving can result in reduced stress levels.

Health impacts of transport

Analysis of the health impacts of transport demonstrates the range of health and mobility inequalities experienced across the world.⁹ Negative health impacts associated with transport are typically felt more acutely by people in vulnerable situations (including those in lower-income groups, people of colour, older people, children and people with disabilities) due to greater exposure to air pollutants and lower access to safer transport options. Transport impacts have higher health risks in middle- and low-income countries, and interventions to address impacts are most effective when they also aim to reduce inequalities.¹⁰

Air quality

Ambient air pollution increases the risk of cardiovascular and respiratory diseases, contributing to 4.2 million premature deaths in 2019.¹¹ In higher-income countries, more marginalised populations are often disproportionately affected, with studies showing that low-income, Black, Asian and Hispanic communities in the United States are exposed to higher levels of particulate matter 2.5 (PM_{2.5}) which stems from historical policy inequities.¹²

Land traffic contributes an estimated 5% of the mortality from small particulate matter (PM_{2.5}) globally, and as much as 32% in North America.¹³ In addition to pollution impacts from urban land transport, freight transport activities in ports are key contributors to air pollution (nitrogen oxides and sulphur oxides) and leading causes of premature deaths.¹⁴ The International Maritime Organization has a key responsibility to reduce emissions of pollutants in maritime port areas.¹⁵

The average level of PM_{2.5} pollution in the world's largest cities is nearly four times higher than the World Health Organization's guideline of 10 micrograms per cubic metre.¹⁶ The worst-affected urban areas are all in Asia, with cities in Pakistan, India, and China, respectively, having the highest measured levels of pollution.¹⁷ Lockdowns during the COVID-19 pandemic led to estimated PM_{2.5} reductions of 29.7% in China and 17.1% in Europe, resulting in a significant decline in premature deaths.¹⁸ In rapidly growing African cities, rising traffic congestion is a major threat to social and economic resilience and sustainable growth (see Box 1).¹⁹

Active mobility and obesity

The WHO estimates that one-in-four adults and four-in-five adolescents are not sufficiently active, due in part to urban and transport infrastructure that prioritises vehicles, not people.²⁰ Many countries are facing health challenges associated with reduced physical activity, which include obesity, diabetes and cardiovascular diseases. Evidence suggests that promoting active mobility plays a huge role in reducing obesity and in minimising individual motorised transport, a major cause of air and noise pollution.²¹ A shift to sustainable, active transport through walking, cycling and public transport is thus critical to meet both climate targets and health objectives.

- ▶ Research on transport policy in nine countries (Brazil, China, Germany, India, Indonesia, Nigeria, South Africa, the United Kingdom and the United States) found that a shift towards greater active transport would help save around 1.15 million lives across the nine countries by 2040 due to increased physical activity (while also reducing 1.18 million deaths related to air pollution).²²
- ▶ An assessment of lessons from the world's largest bike sharing system in Shanghai (China) shows the immediate health benefits of encouraging safe active transport, including increasing levels of exercise and decreasing respiratory events (see Box 2).²³

BOX 1. The cost of traffic congestion and air pollution for African cities

The negative impact of traffic congestion on air quality and health is understated. In Ghana, the World Bank reports that air pollution is costing the economy close to USD 2.5 billion per year. A study of four of the fastest growing African cities (Accra, Cairo, Johannesburg and Lagos) estimates that if development follows the business-as-usual scenario, the total cost related to air pollution from 2023 to 2040 will reach USD 115.7 billionⁱ. Government-provided public transport options are limited in many African cities, and planning approaches that focus on private vehicles continue to have grave implications for human health.

i This number reflects the "Value of Statistical Life" applied to an estimation of premature deaths.

Source: See endnote 19 for this section.

BOX 2. Lessons from bike sharing in Shanghai

Shanghai's bike sharing scheme is being managed as part of China's first urban cycling strategy. The strategy includes a set of policies and regulations supporting the integration of cycling into the wider transport network and prioritises cycling safety to help maximise the benefits of urban cycling.

In 2020, researchers assessed data on more than 2 million trips made by bicycle in Shanghai and considered the impact that increased cycling has on air quality, levels of exercise and numbers of traffic accidents. They found that the city's bike sharing scheme, after only a year and a half of operation, prevented an estimated 23 premature deaths, hundreds of hospital visits and tens of thousands of respiratory events (such as asthma attacks). The scheme reduced greenhouse gas emissions equivalent to removing around 9,000 vehicles from Shanghai's roadsⁱ.



i The authors accounted for the mode share and distance of the trips. Only 20% of trips are made by car in Shanghai (well below the average mode share), and bike trips under 1 kilometre are assumed to have been walked.

Source: See endnote 23 for this section.

Road traffic injuries²⁴

Around 1.35 million people worldwide were killed due to road traffic crashes in 2016 (latest available data), with pedestrians, cyclists and motorcyclists accounting for more than half of these deaths.²⁵ Deaths of users of motorised two- and three-wheelers are increasing as a share of overall road traffic deaths.²⁶

Traffic crashes are the leading cause of death among young people ages 5-29 and the eighth greatest cause of death among all age groups.²⁷ Despite ambitious targets, there has been no reduction in traffic deaths for a decade. Studies show that crash survival rates increase with good post-crash care, including access to timely care.²⁸

In 14 of 20 countries (mostly in the Organisation for Economic Co-operation and Development), road traffic crashes increased in the first half of 2022 but remained lower than pre-pandemic levels.²⁹ Motorcycle use has risen rapidly (especially in emerging economies in Africa and Asia) in the wake of the pandemic due to restricted and uneven access to public transport. Investment in safe, reliable and affordable public transport systems can reduce crashes by attracting motorcycle users even in areas with high motorcycle ownership (as was demonstrated by research in Khon Kaen City, Thailand).³⁰

- ▶ The WHO estimates that 93% of road crash deaths in 2016 occurred in low- and middle-income countries, where pedestrian and motorcycle vulnerability is high and road safety infrastructure and regulation are not prioritised.³¹ The Southeast Asia and Western Pacific regions have the highest percentage of road traffic fatalities involving two- and three-wheeled motorised vehicles, with shares of 43% and 36% among all transport modes, respectively.³²
- ▶ Brazil ranked fifth in the world for traffic deaths³³ in 2018, with most of the fatalities occurring among pedestrians, cyclists and motorcyclists.³³ Crashes involving motorcycles accounted for 62.2% of all traffic crash visits performed by emergency services in Brazil in 2019.³⁴ Disaggregation of data by gender, race and age is needed to determine the relative impacts by demographic group.

Other health-related concerns

Inaccessibility to transport can reduce opportunities for people to get the healthcare services they need, and at times even discourage them from seeking care.³⁵ Limited access to transport often means limited access to health care, with critical barriers including poor road infrastructure, an absence of available and connected transport routes, and a lack of affordable transport options.³⁶ The COVID-19 pandemic further highlighted the importance of access to transport for health care.

ⁱ Ideally, these data would be further disaggregated by gender, race, and age, to determine relative impact.



- ▶ A 2019 study in Malawi confirmed that both cost and access to transport posed significant barriers to healthcare access for rural residents, who comprise 90% of the population.³⁷ This challenge is higher for those with impaired health or disabilities, who may lack suitable modes of transport.³⁸
- ▶ In the Philippines, studies found that the closure of public transport during the pandemic severely reduced the ability of individuals to access health care.³⁹

Studies have shown that safe, active transport can boost mental health and that safe and efficient public transport can reduce commuter anxiety.⁴⁰ Conversely, the lack of access to quality transport can impact mental health in different ways, including by creating isolation, longer commutes, noise and anxiety about personal safety.⁴¹

Policy measures and targets for a transport-health nexus

Policies that target a healthy and just energy transition in transport can greatly enhance physical and mental health outcomes by providing better living and work environments. This includes increasing active transport options that enable walking and cycling and providing safer and less-congested travel solutions that improve well-being and mental health.

The indirect costs of fossil fuel subsidies (including respiratory disease and traffic crashes) are an estimated ten times greater than their direct financial cost.⁴⁵ Fossil fuel subsidies – including direct subsidies to oil producers and consumers, as well as indirect subsidies to sectors such as aviation and shipping – continue to incentivise unsustainable, unhealthy transport investments.

Redirecting fossil fuel subsidies towards sustainable, low carbon transport modes (and to directly benefit healthcare systems) can lead to improved health outcomes.

Reforming fossil fuel subsidies and scaling up the use of renewable energy in the transport sector can help reduce emissions of carbon dioxide (CO₂) and other greenhouse gases, as well as PM_{2.5}. It also can reduce air pollution deaths, generate economic benefits and increase social spending.

- ▶ In Egypt, fiscal savings from energy subsidy reforms were redirected towards social spending on health and education.⁴⁶
- ▶ India has demonstrated the benefits of shifting energy subsidies to direct cash transfers to low-income

- ▶ A study in Hong Kong (China) demonstrated that public transport routes using multiple modes (e.g., bus and metro) create mental and physical health benefits for older adults. The study shows that satisfaction with sidewalk width also has a positive impact on mental health.⁴²
- ▶ A study in New Zealand found that promoting active mobility improved the mental well-being of low-income communities, as walking and cycling offered greater control over individual travel conditions and were less expensive.⁴³
- ▶ A study in Sanandaj (Iran) showed that frequent urban traffic jams affect mental health at a human relationship level (both for urban drivers and general residents), reducing tolerance, causing discord and eroding cohesion among family members.⁴⁴

households, as a way to alleviate the unintended consequences of subsidies (e.g., loss of public and private revenues, inefficient consumption of fossil fuels).⁴⁷

- ▶ The Glasgow Climate Pact, agreed to at the 2021 UN Climate Change Conference in Glasgow, UK (COP 26), makes a clear call for countries to phase out inefficient fossil fuel subsidies and to support a just transition towards low-emission energy systems.⁴⁸
- ▶ Recognising the health implications of making this transition, in 2022 more than 200 professional health organisations from around the world – including the WHO – signed on to the Fossil Fuel Non-Proliferation Treaty, which calls for a planned phase-out of all fossil fuels.⁴⁹ The WHO Director-General has called the continued addiction to fossil fuels an “act of self-sabotage”.⁵⁰

Other measures to reduce air pollution from transport include command-and-control measures such as fuel standards (for example, low sulphur content for ship bunkers when at port). Such standards have been mandated by the IMO and at the national and regional levels (for example, in the European Union (EU), Baltic Sea region, China and the United States). These measures have shown success in the EU and are highly relevant to increasing health outcomes in port cities worldwide.⁵¹

Urban and national decision makers can choose from an increasing number of policy tools to promote health-focused transport systems. Recent initiatives have aimed to encourage good practice on health-centred sustainable

transport systems.⁵² This work shows that healthy, fossil fuel-free cities can be designed to be energy efficient and to support new ways of living, travelling and working that allow for healthier lifestyles and safer urban spaces.

- ▶ The SLOCAT Partnership on Sustainable, Low Carbon Transport, in collaboration with the Health and Climate Network (HCN), have put a spotlight on transport and health in the global drive for a just energy transition. SLOCAT and HCN have produced a knowledge base (and user guide) to help prioritise packages of transport policies that contribute to health and climate objectives and to complement existing resources from other HCN members.⁵³
- ▶ The WHO's Health Economic Assessment Tool (HEAT) for cycling and walking assesses policy options and outcomes for health, transport and climate.⁵⁴ Through a set of questions, HEAT enables governments to assess the health benefits of active mobility among populations.⁵⁵
- ▶ The Global Climate and Health Alliance's Healthy NDCs Scorecard ranks 94 different Nationally Determined Contributions (NDCs) submitted under the Paris Agreement, covering proposed emission reduction measures in 120 countries.⁵⁶ The scorecard ranks countries' NDCs based on five health categories: health impacts, health in adaptation measures, health co-benefits, economics and finance.

In response to stronger emission standards in many jurisdictions, decision makers are increasingly turning to newer vehicle technologies to curb outdoor pollution and promote better health. With an aim to phase out fossil fuels and meet climate targets, countries are moving away from fossil fuels and focusing on greater adoption of zero-emission vehicles. This transition has public health benefits, as it leads to reduced air pollution caused by emissions from the transport sector.

- ▶ At the 2021 UN Climate Change Conference in Glasgow, UK (COP 26), many countries, cities and companies joined transport initiatives to phase out vehicles with internal combustion engines and to scale up electric heavy-duty vehicles and electric vehicle charging.⁵⁷
- ▶ In Brazil, an ordinance within the scope of the RENOVABIO programme to promote biofuels regulates the issuance, bookkeeping, registration, negotiation and retirement of the avoided carbon credit, which has been marketed since June 2020.⁵⁸
- ▶ To curb outdoor air pollution, in 2022 the Israeli Ministry of Environmental Protection set mandatory targets for 100% zero-emission vehicles in new public transport procurements by 2026.⁵⁹

- ▶ In 2022, the US Environmental Protection Agency updated its truck emission rules, the first time since 2001, with a view to halve nitrogen oxide emissions from trucks by 2045.⁶⁰
- ▶ A study found that electrification of Mexico City's Metrobus bus rapid transit fleet, targeted for completion in 2028, is a viable option to reduce local and climate pollutants, leading to as much as an 85% reduction in CO₂ emissions.⁶¹
- ▶ In Ecuador, every bus that intends to enter public transport service from 2025 on must be electric, according to the Energy Efficiency Law.⁶²

In the post-pandemic world, national and sub-national governments are increasingly recognising the health benefits of active mobility and are investing in policies to promote walking and cycling, such as cycle lanes and bike sharing schemes.

- ▶ In response to the pandemic, Barcelona (Spain) carried out measures such as widening sidewalks and building more cycling lanes to encourage active mobility.⁶³
- ▶ In 2020, India's Ministry of Housing and Urban Affairs launched two initiatives, Cycles4Change and Streets4Change Challenge, to support cities in implementing more pedestrian and cycling initiatives.⁶⁴
- ▶ To improve health and well-being and reduce air pollution, Canada introduced a national active transport strategy in 2021 to promote active mobility across the country.⁶⁵
- ▶ Local associations in Argentina and Moldova are calling for speed limits of 30 kilometres per hour to improve pedestrian and cycling safety, and in Wales driving speeds will be limited to 20 kilometres per hour on all urban and village roads to reduce injuries and deaths from road crashes.⁶⁶
- ▶ Austria's 2030 Mobility Master Plan, adopted in 2021, highlights the importance of active mobility in meeting health targets and aims to double the share of cycling in the country to 13% by 2030.⁶⁷

After the world failed to meet road safety targets set for the decade 2010-2020, the United Nations General Assembly in 2020 declared a second Decade of Action for Road Safety (2021-2030), setting an ambitious target to halve road traffic deaths and injuries by 2030.⁶⁸ Led by the WHO, this initiative takes a holistic approach to road safety, with calls for continuing improvements in the design of cities, roads and vehicles; enhancing laws and law enforcement; and providing timely, life-saving emergency care.⁶⁹

Countries also acknowledge the urgent need to deliver on road safety, noting that recent efforts to reduce traffic fatalities have fallen short, especially in low- and middle-income countries.⁷⁰

- ▶ In response to the Decade of Action, Brazil's Ministry of Infrastructure revised in 2021 the National Plan of Traffic Deaths and Injuries Reduction, which has a goal to reduce traffic fatalities by 50% as a means to save around 120,000 lives between 2018 and 2030.⁷¹
- ▶ The European Commission's plan to improve road safety in the EU, announced in 2023, seeks to set the legal age for taking a driving exam at 17 years old, with new licence holders facing a two-year probation period.⁷²
- ▶ In 2021, Colombia introduced the Julián Esteban road safety law, named after a 13-year-old killed by a truck while cycling. The law aims to implement stronger regulation of road and infrastructure design as well as speed limits of 50 kilometres per hour in urban areas and 30 kilometres per hour in residential areas and school zones.⁷³
- ▶ In 2022, the United Nations Environment Programme (UNEP) established a Pan-African Action Plan for Active Mobility, recognising that millions of people in Africa are dependent on active transport (see Box 3).⁷⁴

Other Initiatives

- ▶ The Bloomberg Philanthropies Initiative for Global Road Safety focuses on five key areas: strengthening national legislation; enhancing data collection; improving user behaviour; improving road infrastructure; and enhancing vehicle safety.⁷⁵
- ▶ The BreatheLife Campaign (led by the WHO, the UN Environment Programme and the Climate & Clean Air Coalition) calls for local, regional and national governments to commit to achieving WHO Air Quality Guidelines by 2030.⁷⁶
- ▶ In 2023, more than 20 African countries adopted the Dakar Declaration on road safety, with the aim of improving data collection in support of the goal to halve road traffic deaths by 2030.⁷⁷
- ▶ The Global Road Safety Partnership provides road safety programme co-ordination at a global level, supports capacity building of road safety practitioners and traffic police, and offers an expert source of road safety knowledge and good practice.⁷⁸
- ▶ Vision Zero is a multidisciplinary strategy to bring together traffic planners and engineers, policy makers, and public health professionals to eliminate traffic fatalities and increase safe, healthy, equitable mobility.⁷⁹
- ▶ The WHO's Global Plan for the Decade of Action, released in 2021, outlines the need to reduce road traffic injuries and to accelerate measures and targets on walking, cycling and safe public transport.⁸⁰

BOX 3. The Pan-African Action Plan for Active Mobility

The Pan-African Action Plan for Active Mobility (PAAPAM) is focused on helping the more than 1 billion people in Africa who walk or cycle for more than 55 minutes every day to reach their workplaces, homes, schools and other essential services. The PAAPAM aims to raise the profile of active mobility, while improving the safety of people walking and cycling in every country in the region and reducing the number of fatalities and serious injuries among road users.

Source: See endnote 74 for this section.



Credit: Mohamed Mambo, via AmendPolicy

SPOTLIGHT 1 TRANSPORT - HEALTH NEXUS

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