

September 2023

Policy brief

Promoting healthy ageing in Asia-Pacific through action on climate and air pollution

Summary

- Asia-Pacific is the world's most rapidly ageing region and also among the most vulnerable to climate change impacts.
- People in older age and who have pre-existing conditions are particularly harmed by the combined impacts of heat and air pollution.
- Climate change mitigation measures that also reduce air pollution will benefit population health. At present, there is a lack of detailed studies that explore the country-specific net benefits of such measures.
- Improving health in later life by reducing air pollution and promoting healthier behaviours can increase resilience to climate change impacts such as extreme heat. This will improve quality of life, reduce pressure on health and social care and improve labour force health.
- Policymakers need to be made more aware of the health and economic burdens of population ageing exacerbated by air pollution and climate change, and of the co-benefits of climate action for health and thus as a driver of sustainable, inclusive and resilient growth.
- Japan is the only ageing society in Asia to have explicitly linked its net zero transition with the implications of population ageing, though in China, climate change adaptation has been recognised to protect older people, particularly from increasing extremes of heat.
- Governments could integrate health benefits into macroeconomic decision-making to mobilise capital for climate change mitigation and adaptation. Targeted policies to protect older people could include reducing air pollution, expanding access to cooling, investing in early warning systems (e.g. for extreme heat), and strengthening the resilience of healthcare facilities to climate change.
- In China, health-centred long-term policy planning can inform the development of the 15th Five-Year Plan (2026–30). Regional cooperation to enhance climate action, with leadership from China, could contribute to improving air quality and health resilience in Asia-Pacific.

Policy briefs provide analysis on topical issues, presenting specific recommendations to inform ongoing policy debates. Drawing on the Grantham Research Institute's expertise, they summarise either our research findings or the state of knowledge about a particular issue.

This policy brief has been written by **Lei Bian** and **Elizabeth JZ Robinson**.



THE LONDON SCHOOL
OF ECONOMICS AND
POLITICAL SCIENCE



Introduction

The interaction between climate change, air pollution and health is a critical challenge for the 21st century. There is currently insufficient understanding of how increased investments to foster healthy living can protect older people from the combined impacts of air pollution and climate change and enable healthier lifestyles. Such investments might include measures to reduce exposure to climate-related health hazards, and encouraging healthier diets and physical activity. Investment of this nature is particularly important in the Asia-Pacific region, where populations are ageing and are vulnerable to both poor air quality and the increasing frequency and intensity of heatwaves caused by climate change.

This policy brief provides evidence to support policymakers in mobilising capital for a just, resilient transition to net zero, by highlighting the potential health co-benefits of addressing the risks from heat and air pollution in combination.

The integrated challenge of ageing, air pollution and climate change

Ageing has been identified as a global economic risk (UN, 2019). In Asia-Pacific, one in four people will be aged over 60 by 2050. Japan has the oldest population in the region, and its ageing population has contributed to a slowdown in manufacturing growth (European Parliament, 2020). China's population peaked in size in 2022, and the country has the world's largest ageing population, which will almost certainly have profound implications for global economic growth.

In parallel, air pollution and climate change together have been identified as the number one threat to global health (WHO, 2019). Air pollution is estimated to be responsible for over 8 million deaths globally every year (Vohra et al., 2021).¹ Ambient air pollution caused by fine particulate matter (PM_{2.5}) is estimated to have contributed to 3.3 million global premature deaths in 2020, of which about 1.1 million were in China (Romanello et al., 2022). Mortality in people aged over 65 attributed to climate-related heat² increased by 68% between 2000–2004 and 2017–2021 globally, with the largest annual number of deaths in China, followed by India, due to a combination of global warming and a growing and ageing population (ibid.).

Burning fossil fuels causes both air pollution and warming temperatures, which exacerbate the impacts of climate change. On days when there is both extreme heat and air pollution, there are more than double the number of deaths as from the individual exposures combined (Rahman et al., 2022). This particularly heightens the vulnerability of older people and those with pre-existing medical conditions, those working in sectors highly exposed to heat, such as agriculture and construction, and young children.

The combined impacts of air pollution and climate change also make it difficult for people to adopt healthier behaviours. For example, in many countries, rising temperatures are reducing the number of hours each day that are safe for exercise, thus jeopardising the health benefits of activities like cycling and walking, which can protect older people against non-communicable diseases (NCDs). Food insecurity is also exacerbated by air pollution and heat stress, which is likely to increase the number of undernourished older people (Dasgupta and Robinson, 2022).

Key terms - healthy living and healthy ageing

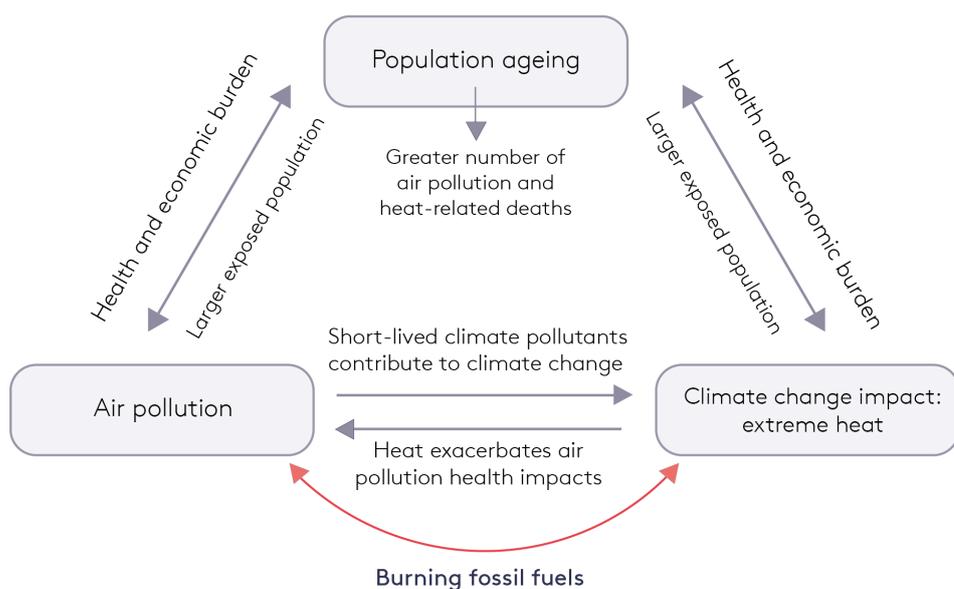
Healthy living is characterised by physical and mental wellbeing achieved through eating a healthy diet and being able to exercise, while **healthy ageing** is the process of developing and maintaining the functional ability that enables wellbeing in older age (WHO, 2020). Functional ability is made up of the intrinsic capacity of the individual, relevant environmental characteristics and the interaction between them. In the context of this brief, we consider healthy living and ageing as being enabled by actions on climate change and environmental degradation that reduce exposure of vulnerable populations to climate-related health hazards.

1. From air pollutants including PM_{2.5}, PM₁₀, ozone (O₃), nitrogen dioxide (NO₂), carbon monoxide (CO) and sulphur dioxide (SO₂). Air pollution is the greatest environmental health risk and the second leading cause of non-communicable disease (after tobacco). It also affects health indirectly by harming crop yields, and damages biodiversity and ecosystems.

2. The health consequences of extreme heat include heat stress, heat stroke, worsened heart disease and acute kidney injury.

Tackling the challenges at the nexus of ageing, air pollution and climate change/extreme heat will require building climate resilience through a just transition approach that puts the health and wellbeing of vulnerable groups at the heart of climate action (EEA, 2023). Figure 1 illustrates this nexus and the Annex provides an overview of existing policies that reference these risks.

Figure 1. Conceptual framework for ageing, air pollution and climate change



Source: Authors.

Implications of heat and air pollution for health inequalities in China

Healthy ageing is a policy priority in China, with over 14% of the population being aged over 65. The country’s ageing challenge is most severe in rural areas, due in part to income, welfare and pension inequalities. Over one-third of provinces are running pension budget deficits. It is estimated that China’s public social expenditure will account for over 26% of GDP by 2050 (CAWA, 2019).

More than 70% of heat-related deaths in China occur in older people (Cai et al., 2022). Heat stress is predicted to increase mortality and morbidity caused by cardiovascular disease (CVD), which is the leading cause of death in China. In 2019, CVD caused almost 47% of deaths in rural China, and 44% of deaths in urban areas (China CDC, 2022). Future projected additional deaths³ related to heat could particularly affect Northeast China, which has the highest proportion of older people in the country (Yang et al., 2021). Heat-related mortality affects working-age populations too, causing US\$109.4 million in economic costs in 2021 and weakening manufacturing growth (Cai et al., 2022). However, while strengthening health adaptation to climate change is increasingly recognised as important for protecting older people against extreme weather events, climate action was not factored into the 14th Five-Year Plan Healthy Ageing Strategy for 2021–25 (ibid.).

3. As China’s population ages and as global temperatures rise, heat-related excess mortality in older people aged over 75 is projected to increase from 1.9% in the 2010s to 2.4% in the 2030s, and 5.5% in the 2090s. The highest mortality rate is predicted in Northeast China, where future heat-related additional deaths could increase by about 2–5 times (Yanget al., 2022).

China achieved a significant reduction in air pollution of 42.3% between 2013 and 2021 (AQLI, 2023), particularly through reducing coal combustion, which has reduced the number of premature deaths attributed to that activity (Romanello et al., 2022), though these improvements have been partially offset by the effect of population ageing (Liu et al., 2022). However, the country still has the world's largest number of deaths attributable to PM_{2.5} caused by fossil fuel combustion, through disease including stroke, respiratory diseases, ischemic heart disease, chronic obstructive pulmonary disease (COPD), and type 2 diabetes (although in part this is due to China's population size) (Romanello et al., 2022).

The health effects of long-term exposure to PM_{2.5} (and NO_x) also include an increased risk of developing dementia (Wilker et al., 2023). China has the world's largest number of dementia patients, with a higher prevalence in the rural, less economically developed regions, where air pollution is primarily caused by crop residue burning and the use of solid fuels for cooking and heating. This is increasing the burden on the rural healthcare system (Chen et al., 2017). Indoor air pollution can also increase the risk of osteoporosis and can be linked to around 22–24% of cases in rural China, particularly harming the health of older women (Qiao et al., 2020).

“China still has the world's largest number of deaths attributable to PM_{2.5} caused by fossil fuel combustion.”

Global governance in climate, health and the environment

The urgency for creating a healthy living environment that enables healthier behaviours to reduce deaths from NCDs is widely accepted as an important strategy to foster healthy ageing. It is also consistent with the new concept of health that requires transforming the health system to address socioeconomic and environmental factors (WHO, 2023).

Links between climate, health and environmental pollution are starting to be explicitly recognised in global governance (see also details of policies in the Annex table). For example, integrating healthy ageing into socioeconomic development was recognised as a policy priority in the UN's Madrid Plan of Action on Ageing in 2002. The World Health Organization (WHO) urges countries to tighten regulation of air quality standards to address the health risks of air pollution exacerbated by climate change and population ageing. And the World Meteorological Organization is pushing for adaptation investments in early warning systems to reduce loss and damage from climate-related disasters, which could reduce heat- and air pollution-related mortality. Early warnings could enable people to adjust their daily schedules, alert workers to protect themselves from extreme heat, or support local authorities in determining when to take additional short-term measures to reduce air pollution. COP28, to be held in UAE at the end of 2023, will see the first-ever dedicated Health Day at a UN climate conference, highlighting the increasingly important role health is playing in international climate action.



Implications for policy: accelerating a just, resilient transition in Asia-Pacific

Mainstreaming health arguments into a just transition approach

The concept of a 'just transition' primarily focuses on the way impacts of climate change mitigation policies are distributed across society. Integrating health considerations into a just transition approach would increase the focus on climate resilience within the net zero transition, encouraging policymakers to accelerate the energy transition away from fossil fuels to reduce air pollution and the vulnerability of older people and societies to the impacts of climate change.

Creating an enabling environment

The urgent actions that are needed today require whole-of-government and whole-of-society approaches to improve coordination and collaboration for developing integrated cost-effective climate actions.

An increased focus on the health co-benefits of a just transition away from fossil fuels, particularly through reduced air pollution, can support policymakers to close the evidence gap needed for justifying the mobilisation of all sources of finance to scale up investments in accelerating coal phase-out and renewable energy. Increased investments in sustainable food systems can accelerate a shift to low-carbon and more plant-based diets in part through an improved understanding of the impacts of climate change on food security. For example, incorporating climate-related health risks into the development of green fiscal and monetary policies can contribute to domestic resource mobilisation for financing a just, resilient transition.

“Incorporating climate-related health risks into the development of green fiscal and monetary policies can contribute to domestic resource mobilisation for financing a just, resilient transition.”



PHOTO: LAURA THONNE/UNSPLASH

Effective and targeted policy support to prevent old-age poverty

Aligning climate change mitigation and adaptation policies can be a cost-effective way of reducing the risk factors for NCDs (including air pollution, physical inactivity, and unhealthy diets), improving the health of older and working age people, and reducing inequalities in income and social circumstance. For example, combining climate adaptation interventions, such as early warning systems, with an expansion of urban green space and low-carbon cooling systems, can protect people from extreme heat and air pollution.

Climate policies of this kind can reduce the substantial economic costs to health and social care systems from the increasing burden of NCDs, which can in turn make resources available to increase investment in social security systems. This will particularly improve the livelihoods of older people in rural areas in developing Asia, who tend to have limited health insurance and pension incomes.

Japan is currently the main example within the region of a country linking its net zero transition to tackling demographic challenges (see Annex). For example, it has increased investment in climate-smart agriculture to improve labour productivity and the livelihoods of ageing farmers and enhance food security while tackling climate change and biodiversity loss (MAFF, 2021).

Japan is also proposing increasing the carbon tax rate as a way to mobilise resources that can reduce upward pressure on public finance caused by a sharp rise in government spending on pensions and healthcare. This would improve the fiscal sustainability of the country's welfare system while contributing to climate goals (Jones, 2023).

Improving health-centred long-term planning in China

Improved long-term policy planning that has health at its heart can help identify actions needed today to deliver a 'Healthy China',⁴ informing the 15th Five-Year Plan. These actions include accelerating a just, resilient transition in the energy, food and health systems, bringing forward the peaking of China's carbon emissions earlier than the current schedule of 2030, and enabling healthier lifestyles throughout the life course.

Policymakers in China can mobilise public and private capital to close climate financing gaps. For example, the Ministry of Finance is responsible for the national social security fund; moving forward with the development of a carbon tax can incentivise investments in low-carbon innovation, while the use of proceeds could be redistributed to strengthen social safety nets as part of climate resilience strategies, improving health as one outcome. Institutional investors such as public pension funds and private health insurance providers could also be channelled as an important source of domestic funding.

Strengthening the climate resilience of healthcare facilities, including care homes, particularly through health sector reform in China, can enhance the country's preparedness and response to future pandemics and health shocks caused by climate change and environmental pollution. This can be part of the 15th Plan.

“Climate policies can reduce the substantial economic costs to health and social care systems from the increasing burden of non-communicable diseases.”

4. 'Healthy China' is the name given to China's 2030 strategy for improving health and development.

Looking ahead

Without fully taking climate change into account as a systemic risk, progress already achieved in the Asia-Pacific region to improve health in old age might be reversed. Climate-related disasters and associated air pollution will widen gaps in healthy life expectancy between different socioeconomic groups, increasing inequalities and vulnerabilities, and creating conflicts that may undermine social stability.

Regional cooperation within Asia-Pacific is vital to addressing this complex interplay of factors. In particular, China can play a significant role in improving regional air quality in Southeast Asia, by delivering on its commitment of financing a just transition in and beyond the energy sector through bilateral and multilateral initiatives.

Identifying priorities for future policy-relevant research to improve understanding of the health and socioeconomic benefits of climate action could contribute to supporting policymakers to optimise resources and policy tools to tackle the triple threat of ageing, air pollution and extreme heat. The Grantham Research Institute intends to broaden analysis of the interrelationship between these three factors to provide further insights into how the Asia-Pacific region might address key knowledge and policy gaps.

“China can play a significant role in improving regional air quality in Southeast Asia.”



PHOTO: PHOTOHOLGIC/UNSPLASH

References

- Air Quality Life Index [AQLI] (2023) Annual update: China fact sheet. University of Chicago. <https://aqli.epic.uchicago.edu/reports/>
- Cai W et al. (2022) The 2022 China report of the Lancet Countdown on health and climate change: leveraging climate actions for healthy ageing. *The Lancet Public Health*.
- Dasgupta S and Robinson E (2023) The labour force in a changing climate: research and policy needs. *PLOS Climate*.
- European Environment Agency [EEA] (2023) Towards 'just resilience': leaving no one behind when adapting to climate change.
- European Parliament (2020) *Japan's ageing society*. Think Tank European Parliament.
- Jones R (2023) *The Japanese economy: strategies to cope with a shrinking and aging population*. Research Institute of Economy, Trade and Industry.
- Liu Y et al. (2022) Population aging might have delayed the alleviation of China's PM_{2.5} health burden. *Atmospheric Environment*.
- Ministry of Agriculture, Forestry and Fisheries [MAFF] (2021) *Strategy for sustainable food systems*.
- Prada D et al. (2023) Air pollution and decreased bone mineral density among Women's Health Initiative participants. *The Lancet Discovery Science*.
- Qiao D et al. (2020) Long-term exposure to air pollutant might increase prevalence of osteoporosis in Chinese rural population. *Environmental Research*.
- Romanello M et al. (2022) The 2022 report of the Lancet Countdown on health and climate change: health at the mercy of fossil fuels. *The Lancet*.
- United Nations [UN] (2019) In historic first, G20 weighs ageing as global risk. <https://www.un.org/development/desa/pd/events/g20-osaka-summit-ageing>
- WHO (2019) *Ten threats to global health in 2019*.
- WHO (2020) *UN Decade of Healthy Ageing: Plan of Action 2021- 2030*.
- WHO (2021) *WHO global air quality guidelines: particulate matter (PM_{2.5} and PM₁₀), ozone, nitrogen dioxide, sulfur dioxide and carbon monoxide*.
- World Meteorological Organisation [WMO] (2023) *Early Warnings for All initiative scaled up into action on the ground*.
- Yang J et al. (2021) Projecting heat-related excess mortality under climate change scenarios in China. *Nature Communications*.

Annex – bibliography and overview of policies

A separate Annex of further reading materials is available at: www.lse.ac.uk/granthaminstitute/publication/promoting-healthy-ageing-in-asia-pacific-through-action-on-climate-and-air-pollution

The Annex also presents an overview of existing policies that directly or indirectly promote healthy ageing linked to climate change and air pollution.

Grantham Research Institute on Climate Change and the Environment

London School of Economics and Political Science

Houghton Street, London, WC2A 2AE

e gri.policy@lse.ac.uk

w www.lse.ac.uk/granthaminstitute
www.climate-laws.org

Authors and acknowledgements

Lei Bian is a Policy Fellow at the Grantham Research Institute on Climate Change and the Environment. Elizabeth JZ Robinson is the Director of the Grantham Research Institute.

The authors would like to thank Dr Sefi Roth, Dr Chunging Xie, Professor Jintao Xu, and Professor Wenjia Cai for their invaluable feedback. Special thanks to Georgina Kyriacou for editing and producing the brief. Thanks too to Natalie Pearson for production support.

The authors acknowledge support from the Grantham Foundation for the Protection of the Environment and Ms Mei Fung Michelle Liem.

The authors acknowledge support from the Grantham Foundation for the Protection of the Environment, and the UK Economic and Social Research Council (ESRC) through the Centre for Climate Change Economics and Policy (CCCEP).

This policy brief is intended to inform decision-makers in the public, private and third sectors. It has been reviewed internally and externally before publication. The views expressed in this brief represent those of the authors and do not necessarily represent those of the host institutions, funders or reviewers. Any errors and omissions remain those of the authors.

We encourage the wide use of this document. All permissions requests should be directed to the Grantham Research Institute on Climate Change and the Environment.

This brief was first published in September 2023 by the Grantham Research Institute on Climate Change and the Environment and the Centre for Climate Change Economics and Policy.