

(Barely) living in smog: China and air pollution

There are few cities in the world where the first thing you do on waking is check the air quality app on your mobile phone—even before switching off the alarm. Beijing is such a city. On Feb 25, Beijing had been shrouded in heavy smog and hazardous levels of respirable fine particulate matter (PM_{2.5}) for 6 consecutive days. That morning the PM_{2.5} level read 383 µg/m³, which is 15 times the recommended safe WHO limit (25 µg/m³ for 24-h PM_{2.5}), but not the worst reported in a week when levels soared to 500 µg/m³. You wake your young child who you have kept at home for 2 days and switch the air purifiers up to high. You explain that at school today they will stay inside to play. Outside, the air is smoky and the sky a sunless thick grey yellow. A sheet of dust covers most vehicles and surfaces and you can almost taste it through your face mask. You call a taxi for a school run that on clear days is a 20 min walk. The driver can see no more than 150 metres ahead in the haze. The few pedestrians on the streets are mostly unmasked, confirming fears that public awareness of the health risks are low, or that some simply do not have the choice. There is a lone jogger ignoring the orange alert (the second highest level in a four-tiered system) issued for the very first time by the Beijing Environmental Bureau, closing industrial plants and advising people to stay indoors and to refrain from exercise.

At school and in offices all conversation is about the air. More than 19 Chinese cities recorded PM_{2.5} levels far exceeding the WHO safe level. Prevailing sentiments are of anger, fear, parental guilt, hopeless resignation, and wry humour about a common fate. Questions are asked. When will the winds blow? Why don't they close the schools? And why is this still happening 1 year after the winter smog of January, 2013? The National Action Plan on Air Pollution and Prevention Control (2013–2017) was announced in September, 2013, and among other comprehensive measures, aims that by 2017 the yearly PM_{2.5} level in Beijing should be controlled at 60 µg/m³. Although the government has heroically invested US\$277 billion to tackle air pollution, much of the new national plan is yet to be realised.

There is increasing evidence about the effects of air pollution and, in particular, fine particulate matter on cardiovascular and respiratory diseases (myocardial infarction, heart failure, asthma exacerbation, respiratory

infections, and lung cancer). There is emerging but as yet inconclusive evidence about the effects on premature births, intrauterine growth restriction, and lung development throughout the life course. The Global Burden of Diseases 2010 study estimated that around 1.2 million premature deaths and 25 million disability-adjusted life-years annually in China could be attributed to air pollution. Majid Ezzati of Imperial College London, UK, and an expert on air pollution told *The Lancet*: “No matter what assumptions or estimate you take, at the levels seen in Beijing, the health risks are massive.”

Three areas should be highlighted in the effort to tackle China's massive environmental challenge. First, research priorities should go beyond estimating health risks and address the effects and cost-benefit ratios of specific policy and environmental interventions, the source of the air pollution for specific ambient pollutants, and the protective role of masks and air purifiers. Second, clean and affordable energy sources and public transport systems must be prioritised by the government. Temporary measures such as restrictions on factories and vehicles, while useful in the short term, are unlikely to have major effects on preventing the kind of severe smog seen recently. Urbanisation, industrialisation, motorisation, and rapid economic growth all play a part, as reported in a Comment last year by Chen Zhu, President of the Chinese Medical Association. 52% of the total population in China live in urban areas. The country accounts for 50% of the world's total coal consumption and also has a large rural population still reliant on solid fuel cooking. The international community should support China to improve air quality while also examining its own contribution to air and water pollution through its demand for cheap Chinese products and manufacturing processes.

Third, and finally, among all the challenges facing China in its quest for cleaner air, the question of equity must remain central. As the 12th National Committee of the Chinese People's Political Consultative Conference convenes this week, responses to air pollution must address the poor, the young, and all who are yet to benefit from economic reform and the promise of good health. Clean air should be the expectation of all, not the luxury of some. ■ *The Lancet*



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For the **action plan** see <http://sustainabletransport.org/china-releases-national-action-plan-on-air-pollution-control/>

For the **2011 study on myocardial infarction** see **Articles** *Lancet* 2011; **377**: 732–40

For more on **lung cancer and air pollution** see **Articles** *Lancet Oncol* 2013; **14**: 813–822

For the **Global Burden of Disease Study 2010** see **Articles** *Lancet* 2012; **380**: 2224–60

For more on **urbanisation and health in China** see **Review** *Lancet* 2012; **379**: 843–52

For **Chen Zhu's Comment** see *Lancet* 2013; **382**: 1959–60

For more **statistics on China** see <http://www.stats.gov.cn/tjsj/ndsj/2013/indexeh.htm>