

# Festival of darkness

## Smog tends to be worst in middle-income countries

CITY-DWELLERS are used to dirty air, but few have seen a haze like the one enveloping Delhi this week. The concentration of PM<sub>2.5</sub> (fine particles that settle in lungs) has exceeded 1,000 micrograms per cubic metre of air—100 times the limit the World Health Organisation suggests for long-run exposure. Inhaling this is as unhealthy as smoking 50 cigarettes a day. On November 1st the city closed schools and declared an emergency. It is letting cars only with odd- or even-numbered plates drive each day.

Such smog drifts over Delhi each November, after farmers burn the remnants of their rice crops to clear the land for wheat, and Hindus celebrate Diwali, a festival of lights, with a barrage of firecrackers. Even when the autumn haze subsides, air is filthy all over India—especially in the north, where the Himalayas act as a wind trap. AirVisual, a monitoring company, reckons that northern India contains 22 of the world's 30 most toxic cities. One academic study found that of the 9.7m Indians who died in 2017, 670,000 would not have perished if the atmosphere had been clean.

The response from Indian politicians has been piecemeal. Limiting cars will help only a bit, since 75% of the pollution does not come from vehicles. Judges have tried to restrict crop-burning and firecrackers, but local governments have not enforced their rulings. The health minister's contribution has been advising Delhi-ites to protect themselves by eating carrots.

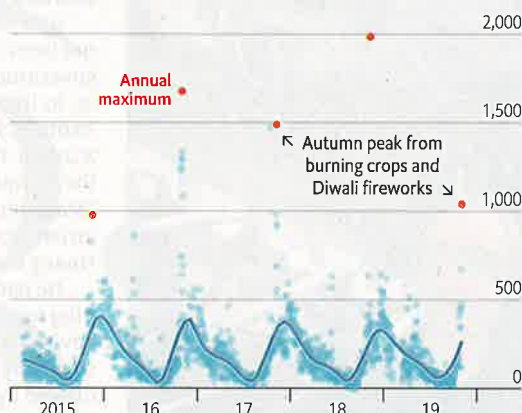
These woes are grave but predictable. In general, as economies develop, pollution-related deaths rise at first, due to the growth of industry. Later, they fall, as countries get rich enough to afford clean production and their economies shift to services. According to Our World in Data, a website, deaths attributable to pollution peak in the middle-income range, at a GDP per person of \$5,000-15,000 (adjusted for local costs of goods and services).

This suggests that India will eventually clean up its air. A few steps are within politicians' power now, such as enforcing court rulings, cutting subsidies for rice (which farmers over-produce) and discouraging the use of coal. Shortly after China reached India's current level of development, its death rate from air pollution began to fall. But achieving a rapid, nationwide transformation is perhaps easier for an authoritarian state with direct control over big companies than for a chaotic democracy. ■

## → Air pollution in Delhi spikes each November

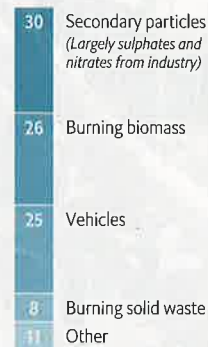
Delhi, daily air pollution

Maximum reading\*, PM<sub>2.5</sub> micrograms per cubic metre



Winter air pollution

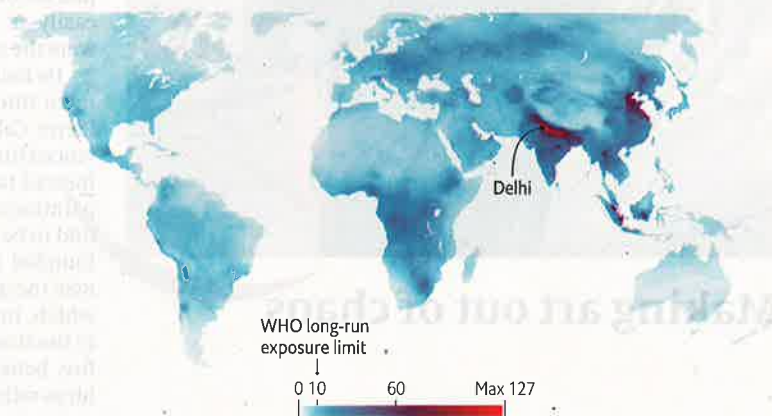
By source, %



## → Smog in Asia is much worse than anywhere else

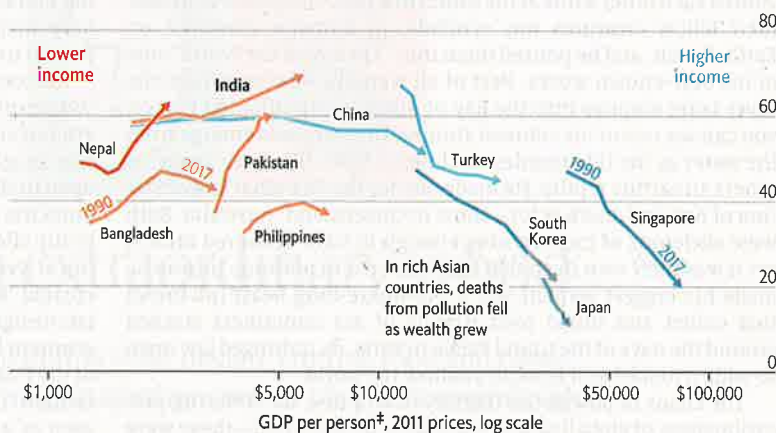
Air pollution

PM<sub>2.5</sub> micrograms per cubic metre, excluding dust and sea salt, 2016 average



## → Economic growth leads first to a rise in deaths from pollution, then a fall

Excess deaths per 100,000 population attributed to air pollution† v GDP per person 1990-2017



Sources: United States Environmental Protection Agency; Indian Institute of Technology Kanpur; Centre for International Earth Science Information Network; Institute for Health Metrics and Evaluation; World Bank \*At American embassy †From ambient particles in atmosphere ‡At purchasing-power parity