A Look Back at the London Smog of 1952 and the Half Century Since


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The modern field of environmental health owes much to the tragedy that befell Greater London, some 50 years ago this month. From 5 December through 9 December 1952 a heavy, motionless layer of smoky, dusty fumes from the region's million or more coal stoves and local factories settled in the London basin. This thick sulfurous smoky fog, the "smog," brought traffic and people to a standstill. Not all medical and political authorities appreciated what was happening, but the undertakers and florists knew there was a problem. They ran out of caskets and flowers.

Health officials at the time did not appreciate the magnitude or severity of the problem, having previously weathered many dense "pea-souper" fogs and smogs. This fog became known as the Big Smoke because its toll and the public reactions to it were without precedent. Hospital admissions, pneumonia reports, applications for emergency bed service, and mortality followed the peak of air pollution. Mortality remained elevated for a couple of months after the fog. A preliminary report, never to be finalized, attributed these later deaths to an influenza epidemic. New evidence shows that this could not be the case and that only a fraction of the deaths could be from influenza. Davis (2002) leaves 12,000 unexplained and additional deaths during the episode and in the two months after the peak fog ebbed (Bell and Davis 2001).

Happily for Londoners, air quality is now much better, with mean annual PM_{10} levels (particulate matter ≤ 10 μm in aerodynamic diameter) closer to 30 μg/m^3 than the 300 μg/m^3 50 years ago (and approximately 3,000 μg/m^3 in December 1952). However, risks from air pollution remain. In London, coal stoves are all but gone, but transport is the overwhelming source of PM and NO_x emissions. One recent estimate attributed 380 premature fatalities and 350 respiratory hospital admissions per year to emissions from from transport in London (Greater London Authority 2002). In a major collaborative study in Europe overall, Künzli et al. (2000) calculated that the net impact on health from pollution tied with transport was greater than that associated with traffic crashes alone.

These tragic public events in London half a century ago spurred the realization that polluted air could not only cause an immediate increase in deaths and illness but could also result in longer-term and more subtle effects. Numerous studies in *EHP* and elsewhere have provided a rich encyclopedia of studies, showing a wide range of health impacts ranging from increased death rates in infants and the elderly to a host of chronic respiratory and cardiac ailments, as well as low birth weight, impaired development, and cancer.

The evidence that even relatively low levels of air pollution have serious long-term effects has been reinforced by a number of recent reports. The ongoing study of nearly a quarter million volunteers begun by the American Cancer Society has recently revealed that those who live in more polluted areas have significantly higher risks of lung cancer (mortality relative risk of 1.14 for a 10 μg/m^3 increase of $PM_{2.5}$) as well as greater risks of cardiopulmonary mortality (Pope et al. 2002). A Dutch cohort study provides additional evidence of long-term effects tied to chronic exposures, again on cardiorespiratory deaths (Hoek et al. 2002). The benefits of reducing particulates tied with the burning of coal have recently been demonstrated in Ireland (Clancy et al. 2002). A decade after Dublin banned all burning of bituminous coal, black smoke concentrations have decreased 70%, deaths from respiratory causes have dropped 15.5%, and cardiovascular deaths have fallen 10.3%. This amounts to about 116 fewer respiratory deaths and 243 fewer cardiovascular deaths per year in Dublin after the ban (Clancy et al. 2002).

Thus, the London story is not merely historic. Conditions in some rapidly developing countries today can come eerily close to those of London, either indoors or outdoors. Although coal stoves are not generally the problem, biomass fuels, garbage, and other incompletely burned organic materials often cause unhealthy conditions inside homes and factories throughout the world. For example, in 1995 the mean annual concentration of total suspended particulates was 800 μg/m^3 in Lanzhou, China, and > 400 μg/m^3 in Delhi, India.

Women in some rural regions of India, Africa, and China are currently developing lung cancer and respiratory ailments at rates typically found in smokers because of their chronic exposures to indoor smoky fuels. In Teheran, Iran, in 1999, hospitals and clinics overflowed with cardiac patients as the city struggled with one of its worst health emergencies. Among the many serious problems of the Middle East and Asia, air pollution is one for which the causes are known and treatable.

This information is driving major shifts in public policy in both developing and developed countries. Choice of fuels is now recognized as a major influence on public health as well as a driving factor in development worldwide. Fifty years after the London episode, we need to reconcile aspirations to maintain or expand economies with the problem of reliance on inefficient, polluting, and greenhouse gas-emitting fuels. The lessons of London remain pertinent today as countries grapple with major policy choices on energy and transport.

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A Half Century Later: Recollections of the London Fog

David Bates

It is important to recognize that all environmental events occur in some specific context, and this was particularly true of the 1952 London Disaster. During World War II London suffered 30,000 civilian casualties in the bombardments from the air, first from aircraft, then from flying bombs, and finally from the V2 missiles. Famed for fogs since the days of Charles Dickens, people largely took London's fogs for granted.

When I arrived at Bart's Hospital on 10 December 1952, everything was normal for that time of year. Our wards at that time of year always had a number of cases of advanced chronic obstructive pulmonary disease, many in outright heart failure. A recent BBC documentary, "The Great Fog" (first shown 28 September 1999), recalled a coroner at the time remarking that the morgues were full. For those of us directly working in the hospitals, the elevated mortality was not widely realized.

By the mid-twentieth century, the population included a high number of people at high risk from lung disease, like those in our emphysema clinic. Cigarette smoking in men was nearly universal and had risen greatly during the stress of war. This must have contributed to the high mortality, which rose immediately during this episode, when many of the victims died very quickly. We knew why the fog affected smokers so drastically: Because ventilation distribution within the lungs of a smoker was usually seriously impaired, high exposure to polluted air could induce acute bronchiolitis that might quickly be fatal.

The media expressed public outrage at the attitude (largely inertia) of the government during the weeks after the event, and Harold MacMillan, Minister of Housing, finally agreed to appoint a committee to advise on the question. He told his cabinet colleagues that it was very unlikely that anything useful would come of this, but it might assuage the public concern ("The Great Fog"). The questions asked in the House of Commons and the discussions there show how little interest there was in identifying the harmful constituents present in the fog (see *Hansard,* United Kingdom Parliament).

We have only recently learned that Britain's economic situation in 1952 was extremely tenuous; for this reason, low-quality, high-sulfur coal was being burned in London to permit the export of the more valuable low-residue, low-sulfur coal. Thus, the economic situation contributed indirectly to the degree of pollution.

The medical profession did not take a leading role in the quest for cleaner air. When I worked as a clinical assistant at the Brompton Hospital in 1953, we had a printed sheet to give to new asthma patients, which advised that if the patient woke up at night with an attack, he or she should get out of bed, open the bedroom window, and take large breaths of the night air. It did not say that the next thing the patient should do was to call for an ambulance. It was not until 1980 that we knew that asthmatics were especially sensitive to sulfur dioxide.

Contrary to MacMillan's expectations that nothing would happen, the committee process he began led to clean air legislation in many different countries. Although both Pittsburgh, Pennsylvania, and St. Louis, Missouri, had passed city ordinances against air pollution from coal smoke before 1952, it was the London disaster that compelled governments to act. This is why the London Disaster of 1952 should be commemorated; the many efforts to limit ambient air pollution that have occurred in the past 50 years are the proper memorial to those who were its unheralded victims.

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