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EDITORIALS

Air pollution as a carcinogen

Further strengthens the rationale for accelerating progress towards a low carbon economy

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The possibility that air pollution might increase the risk of cancer is not a new idea. Richard Doll and Austin Bradford Hill initially believed that general atmospheric pollution from car exhaust fumes, surface dust of tarred roads, gas works, industrial plants, and coal fires might be responsible for the increased incidence of lung cancer in the first half of the 20th century. However, their landmark 1950 paper implicated tobacco smoking and set the direction for decades of research that firmly established smoking as a leading cause of lung cancer.¹ By contrast, research into other possible causes was relatively neglected, and further evidence on the effects of air pollution was slow to accumulate.

However, more than 60 years later, the International Agency for Research on Cancer has released a monograph concluding that there is sufficient evidence to establish outdoor air pollution as carcinogenic to humans.² This conclusion is based on consistent associations between pollution levels and the risk of lung cancer in animals and humans, as well as strong mechanistic evidence.³

The statement that air pollution causes cancer may at first sight seem imprecise. What exactly is “air pollution”? Although typically only a handful of pollutants—such as particulate matter, ozone, carbon monoxide, nitrogen oxides, and sulphur dioxide—are widely monitored, the reality is highly complex. For example, diesel exhaust alone has been broken down into more than 100 constituents,^{4,5} and much of the pollution mix remains unidentified on a molecular scale.⁶ The latest assessment considers air pollution as a broad entity and, as with tobacco smoke (another complex mixture), finds incontrovertible evidence that the mixture as a whole is carcinogenic. Some of the individual carcinogenic components are known, but given the sheer number of compounds involved, the full mechanistic picture may never be understood.

A further complication is that the specific make-up of the air pollution mix varies considerably from place to place—from London to New York to Delhi to Bangkok to Kampala, people are exposed to different cocktails of pollutants across the globe. With such variation, the judgment in the latest report that there is enough evidence to classify air pollution as a human

carcinogen in all regions of the world is a strikingly strong conclusion.⁷

But how does the agency’s conclusion move us forward? On one level, it could be argued that this latest review simply adds one more disease to an already considerable repertoire of harms wreaked by air pollution—links with cardiovascular and respiratory morbidity and mortality are already well established.^{8,9} Yet, despite these known harms, the importance of air pollution as a threat to health struggles to gain the attention it deserves. One reason for this may be that those who are adversely affected, although too evident in the statistics, are hard to identify in the real world. Behavioural psychologists and charity publicity departments alike know that we relate to and are moved by individual human stories far more than by abstract health messages and statistics. But the stories about lives devastated or lost due to air pollution have been, and are likely to remain, largely hidden.

A common feature of public health issues that have captured public attention in recent times—from HIV to cycling deaths—is that individual stories and individual tragedies have helped to increase awareness of the problem in the public consciousness. Without such human narratives, perhaps the biggest challenge for public health professionals in this field is not so much confirming the detrimental effects of pollution, but moving the public and political leaders to care (and to do) more about achieving cleaner air.

The recent announcement might help in this regard. In a survey commissioned by Cancer Research UK, 35% of adults chose cancer as their most feared disease or health condition, leading all others by a considerable margin. Only 3% of people were most scared of cardiovascular disease, one of the other major health problems thought to be worsened by pollution exposure.¹⁰ Thus, even though cancer is just one of many harms related to pollution, it may hold particular sway with the public. Its formal addition to the list of adverse effects of pollution may shift perceptions and ultimately help to push forward policy development around air quality.

Such policy development will be facilitated by better quantification of the burden of disease caused by air pollution,

and by further work to identify the constituents and sources most responsible for cancer risks. However, this should not delay action. The case for concerted international efforts to improve air quality is already strong. Because much air pollution is related to the combustion of fossil fuels or other processes that contribute to climate change, the latest conclusions about cancer risks strengthen even further the rationale for accelerating progress towards a “low carbon” economy. Not only is such progress crucial for mitigating climate change, but it is increasingly clear that the consequent improvements in air quality would bring substantial health benefits worldwide. The latest statement adds one more piece of compelling evidence to underline the importance of clean air for public health and the imperative for action.

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