Case histories

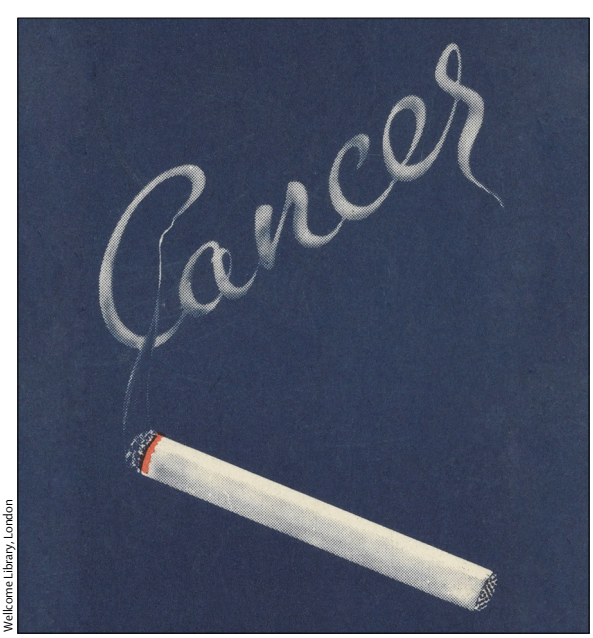
Lung cancer

Adrian Roots

For more on **Case histories** see **Comment** *Lancet* 2016; **387:** 211 and **Perspectives** *Lancet* 2017; **390:** 351

At the intellectual heart of the new scientific medicine of the late 19th century was the idea of specificity: each disease had a single specific cause, and in time medicine would generate a specific and effective cure. This idea transformed the diagnosis and treatment of infectious diseases, but through the 20th century, as the burden of mortality shifted towards chronic diseases, its limitations became abundantly clear—nowhere more so than in the case of lung cancer.

As the historian Carsten Timmermann has observed, histories of lung cancer often begin with the claim that lung cancer was "extremely rare" in early 20th-century western nations. Timmerman has shown that little evidence supports this claim, and he argues that many cases would have been misdiagnosed as tuberculosis. From the 1840s physicians, applying the principles of Parisian pathological anatomy, sought to differentiate lung cancer from tuberculosis, pneumonia, or empyema, but even with the advent of microscopy this remained a condition "for which there was no known cure, and that with certainty could only be diagnosed after death". Whether or not lung cancer was a historically rare disease, European and American physicians at the end of the 19th century began to argue that its incidence was rising. By the 1930s surgeons were seeking to cure it with heroic cutting, using techniques they had developed to treat tuberculosis. As antibiotics replaced surgery in the treatment of tuberculosis, lung cancer surgery became the "bread and butter" operation for thoracic surgeons, placing the diagnosis and treatment of the condition within a surgical, rather than medical, frame.



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In the late 1940s clinical statistics showed a sharp rise in lung cancer diagnoses, and two studies begun in 1947 and published in 1950 sought to explain this. As a medical student at Washington University in St Louis, MO, USA, Ernst Wynder began a statistical investigation of the causes of lung cancer with his mentor, the surgeon Evarts Graham. Wynder and Graham published their results, showing an association between tobacco smoking and lung cancer, in the *Journal of the American Medical Association* in May, 1950. 4 months later *The British Medical Journal* published a Medical Research Council-funded study by the epidemiologists Richard Doll and Austin Bradford Hill, which reached similar conclusions. In the following year Hill and Doll established the British Doctors Study, and in 1956 they published evidence of a clear association between smoking and lung cancer, supported and expanded by reports from the Royal College of Physicians in 1962 and the US Surgeon General in 1964.

Hill later wrote that "cigarette smoking was such a normal thing and had been for such a long time that it was difficult to think it could be associated with any disease", and the evidence base he helped to establish brought radical complexities to the politics and cultural meaning of lung cancer. A programme of prevention seemed more promising than any existing treatment, but the tobacco lobby led a concerted programme of misinformation and evidence denial. In Timmermann's words, "it turned out that those who allegedly needed education knew already, and many continued to smoke". During a period when many patients' groups were working to remove the stigma and shame associated with cancer, the campaign against lung cancer actively sought to stigmatise smoking and, by extension if not intention, the diseases it caused.

Although important progress has been made in tobacco control, Timmermann identifies "gloom" as the prevailing clinical attitude to lung cancer in the 1960s, 1970s, and 1980s. Radiotherapy, chemotherapy, and radical resection yielded disappointing results, and lung cancer seemed "recalcitrant" in the face of multimillion-pound research initiatives. From the early 1970s flexible fibre-optic bronchoscopy improved diagnosis, and in the past 20 years genetic and immunological work has cast new light on the 10–15% of lung cancers not associated with smoking. Although more effective personalised therapies are on the horizon, 5-year survival rates have not increased substantially in the past few decades. Lung cancer remains the main cause of cancer death in the UK and the USA, and in developing nations its incidence is rising in parallel with tobacco sales.

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Further reading

Cantor D, ed. Cancer in the twentieth century. Baltimore, MD: Johns Hopkins University Press, 2008

Talley C, Kushner HI, Sterk CE. Lung cancer, chronic disease epidemiology, and medicine, 1948–1964. *J Hist Med Allied Sci* 2004; **59:** 329–74

Timmermann C. A history of lung cancer: the recalcitrant disease. London: Palgrave, 2014