In the study of work related diseases, John Corbett McDonald was a pioneering investigator, whose research and techniques in many ways defined occupational epidemiology. His best known role from the mid-1960s onwards—analysing the effects on health of different forms of asbestos—yielded controversy in a highly contentious field.

An inspiration to epidemiologists worldwide, McDonald produced research that was “groundbreaking and vital to our understanding of asbestos health effects,” says Bruce Case, a pathology professor who worked with him at McGill University in Montreal, Canada.

Supporters say that McDonald was hurt by allegations that he came under industry influence—correspondence showed that he consistently blocked attempts to interfere with his methods and findings.

“I personally think he is someone whose results stand for themselves,” says Anthony Newman Taylor, research and development director at the National Heart and Lung Institute, Imperial College, London. In a highly polarised climate, debate surrounding asbestos was marred by efforts to discredit work of high academic standing, Taylor says.

McDonald, who developed the use of tissue indicators of exposure, believed in the “big study.” He created a reliable national system of surveillance for work related respiratory disease (the SWORD system) as a basis for control and simple epidemiological research in the UK.

It was first used by chest physicians to report cases of work related disease, then adapted and expanded for use by other clinicians. A vital innovation, it led to a new understanding of the nature and scale of problems concerning occupational disease, says Taylor.

“Corbett was an important figure who informed my generation about the essentials of epidemiological based research, helping us understand how it should be done properly,” he says.

Belfast born McDonald qualified during the second world war, served as an army medical officer, and worked with Alexander Fleming at St Mary’s Hospital, London. He studied epidemiology at the London School of Hygiene and Tropical Medicine and spent two years at Harvard University on a Rockefeller fellowship.

In 1951 he joined the Public Health Laboratory Service in Colindale (where he was head of the epidemiological research laboratory from 1960 to 1964) and worked on the epidemiology of viral diseases, particularly influenza.

Walter Holland, who studied under McDonald and researched the 1957 flu pandemic, remembers a “superb” teacher whose “tremendous enthusiasm” and “itchy feet” took him to the
epidemiology professorship at McGill, where he would go on to establish a school of occupational health.

In 1976 McDonald returned to the London School of Hygiene and Tropical Medicine as professor of occupational health.

Asbestos and mesothelioma

McDonald attended the seminal New York conference on asbestos in 1964, four years after studies had established the link between asbestos and mesothelioma in South Africa.

For decades he studied the effects on Quebec’s miners, millers, and factory workers of different forms of asbestos—one of the “mineral gold” that enriched Canada’s economy. McDonald worked on a series of cohort studies, many with his wife, Alison, who was also an epidemiologist and played a key part in the success of these studies.

In 1973 he showed that previous industry conclusions that lung cancer was unrelated to asbestos exposure were false, and that mesothelioma among chrysotile asbestos workers was “fourfold greater than expectation.”

He later concluded with Case and others that 27 mesothelioma deaths “could be attributed with reasonable certainty to occupational exposure in the Quebec chrysotile production industry.”

McDonald discovered that different occupational populations had different risks in terms of cancer. Importantly, he showed that much of the risk of mesothelioma was related to the presence of other fibres (“contamination” by tremolite asbestos for the most part).

This did not suggest that there was no health risk from chrysotile asbestos, but rather that “greater exposure to tremolite asbestos conveyed greater risk,” explains Case. This was important, says Case and led to further understanding of mesothelioma risk factors in places like Libby Montana and northern California, and to “extensive work there to mitigate that risk.”

But the so called tremolite hypothesis and evidence of differential risk was seized on by pro-asbestos groups defending asbestos in 1964, four years after studies had established the link between asbestos and mesothelioma in South Africa.

They pushed for continued mining and exports of “pure” chrysotile asbestos from developing countries, while quoting “dishonestly” and “selectively” from McDonald’s studies.

McDonald and his department faced criticism from anti-asbestos activists and questions over industry funding for the epidemiological research on asbestos.

Research integrity

In 2012 a research integrity probe by McGill found that there was “no evidence of scientific misconduct” and concluded that industry sponsorship had been openly declared and acknowledged.

It also said that the research by McDonald and others “generated the information that led to the near complete disappearance of the asbestos industry in the developed world and the universal recognition of the toxicity of the product.”

McDonald contributed to the modernisation of Québec’s public health system in the 1970s by designing a “landmark” before and after study of the effects of state run health insurance on the use of health services.

Later on, in the 1990s, he devoted time to projects in Bangladesh where he introduced a training course in epidemiology for the country’s young physicians, and investigated the effect of arsenic on the outcomes of pregnancy and cancer rates.

In 2005, aged 87, McDonald had to have a leg amputated after being hit by a motorbike when crossing the road. Although it was assumed he wouldn’t walk again, he did so and remained active in teaching and research well into his 90s. He continued working on a programme of occupational health surveillance at the National Heart and Lung Institute in London, where he had set up the department of clinical epidemiology in 1986.

Taylor says that McDonald leaves a “considerable” legacy in terms of occupational health and improved understanding of the risks related to asbestos.

Case recalls interviewing the eminent epidemiologist Richard Doll about asbestos research history in April 2004 and asking him who made the greatest contributions to the knowledge of asbestos exposure and disease. “Doll looked puzzled for a moment and then said, ‘You mean—besides Corbett McDonald?’”

McDonald leaves his four children.

Biography

John Corbet McDonald (b 1918; q 1947; MD, MSc, DPH Lond, DH Eng, FRCP Lond, FRCP Can, FFCM, FFOM, FFPHM), d 25 April 2016.


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