Reflections on the life and career of Professor Dame Valerie Beral AC DBE FRS FRCOG FMedSci (1943–2022)

Pioneering cancer epidemiologist and champion of women in science

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The Australian and international research community were immensely saddened by the passing in August 2022 of Professor Dame Valerie Beral, a giant of cancer epidemiology and women's health, and a trailblazer for women in science. Valerie, an Australian, spent most of her career in England and maintained very close links to Australian epidemiologists and the Australian research community.

Valerie grew up in Sydney, was New South Wales Female Junior Chess Champion, and graduated from the University of Sydney in 1969 as the first woman to be awarded the University Gold Medal in Medicine. After clinical placements in Australia and the United Kingdom, she was appointed research assistant in the Epidemiology Department of the London School of Hygiene and Tropical Medicine in 1971. After 17 years at the London School, she succeeded Professor Sir Richard Doll as Director of the Cancer Epidemiology Unit at the University of Oxford, remaining in the role for over 30 years, until her retirement in recent years. Valerie established the extraordinary Million Women Study in 1996, one of the largest ever prospective observational cohorts, involving 1.3 million women recruited though the National Health Service (NHS) Breast Screening Program. The study has made enormous contributions to understanding important areas of women's health, particularly the role of menopausal hormone therapy (MHT) in breast cancer.[1]

Alongside her achievements and career in Oxford, she also made the time to support epidemiology in Australia; she was instrumental in establishing Australia's largest prospective cohort in 2004, the 45 and Up Study, enabling Australian researchers an unprecedented opportunity to work with large-scale prospective cohort data.[2,3]

Valerie met her life partner in the Refectory at the London School in 1972. Paul Fine, who became an eminent infectious diseases epidemiologist, was also one of the founders of the John Snow Society — a communication network for epidemiologists worldwide. Valerie and Paul juggled their extraordinary careers with raising their two sons, Richard and Stephen.

In a 2013 BBC interview, *The Life Scientific*, Valerie articulated that her primary motivation was to answer questions to improve the health of women and the population.[4] Her work spanned areas central to human health, including the links between infectious disease and cancer,[5,6] radiation and cancer risk in Hiroshima survivors, the health effects of the oral contraceptive pill, and other reproductive and hormonal influences on women's cancers.[7,8] But it was her work on the epidemiology of breast cancer, particularly the role of oral contraceptives and MHT in breast cancer, for which she became best known.

Photo reprinted from the International Agency for Research on Cancer/World Health Organization: Professor Dame Valerie Beral (28 July 1946 – 26 August 2022); IARC/WHO, 13 Sept 2022; https://www.iarc.who.int/fr/news-events/professor-dame-valerie-beral-28-july-1946-26-august-2022/ (viewed March 2023).

Valerie's support directly transformed the lives of many aspiring female researchers around the world, including ourselves. Her book-lined and flower-filled home in Oxford was always open to visiting friends and colleagues. She loved nothing more than discussing an interesting or challenging scientific problem or reviewing epidemiological analyses, and she also loved to discuss the people and the strategies for practising science in a competitive world. Although immensely warm and supportive, she also excelled at challenging those whom she mentored to produce the very best work possible. One of her many legacies includes training a new generation of epidemiologists in her meticulous approach to data and their interpretation.

Typically several analytic steps ahead of everyone else in the room, she had an immense natural ability to see complex patterns in data. Her research spanned over 50 years and has stood the test of time, largely because she prioritised fidelity to the data above all — she once said that if she were stranded on a desert island the one luxury she would choose would be a dataset to analyse. She also excelled at articulating the public health implications of her findings. Working in a controversial area, she was

fearless in defending the data and her work. In this, also, she was a role model for other women in science: "Anyone who ever asks me, I always say go for it, and I'll support you!"[4]

In her last years, Valerie remained actively engaged and involved in some of the major health issues affecting women today. In 2019, she led an updated review of the worldwide evidence on MHT, published in *The Lancet*, confirming the increased risk of breast cancer associated with use of MHT.[9] With Professor Julietta Patnick, Professor Sir Richard Peto and others, she had initiated the AgeX trial, which randomised very large numbers of women to different breast screening protocols in order to assess the benefits and risks of screening at different ages.[10] Just weeks before her passing, she was animatedly discussing the unique trial design and expressing the fervent wish that she would live to see the interim mortality findings in 2026. It was not to be.

Professor Dame Valerie Beral (28 July 1946 – 26 August 2022) was Professor of Epidemiology at Oxford University, a Fellow of the Royal Society (2006), a Fellow of the Academy of Medical Sciences (2009), a Companion of the Order of Australia (2010) and a Dame Commander of the Order of the British Empire (2010). Valerie is survived by her husband, Professor Paul Fine, sons Richard Fine and Stephen Fine, her grandchildren Silas and Lark, and her sister Margaret.

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1 Beral V; Million Women Study Collaborators. Breast cancer and hormone-replacement therapy in the Million Women Study. *Lancet* 2003; 362: 419-427.

2 Bleicher K, Summerhayes R, Baynes S, et al. Cohort profile update: the 45 and Up Study. *Int J Epidemiol* 2022; 52: e92-e101.

3 McNamara M, Canfell K. Reflecting on the "45 and Up Study" after 15 years: learnings, impact and future opportunities from a large-scale cohort study. *Public Health Res Pract* 2022; 32: 3242229.

4 The Life Scientific. Valerie Beral: Jim Al-Khalili talks to breast cancer pioneer Valerie Beral about her Million Women Study and why she thinks a so-called "vaccine" should be developed to prevent breast cancer. *BBC Radio 4* 2013; 5 Feb. https://www.bbc.co.uk/programmes/b01qdw1k (viewed Dec 2022).

5 Beral V. Cancer of the cervix: a sexually transmitted infection? *Lancet* 1974; 1: 1037-1040.

6 Beral V, Peterman TA, Berkelman RL, Jaffe HW. Kaposi's sarcoma among persons with AIDS: a sexually transmitted infection? *Lancet* 1990; 335: 123-128.

7 Collaborative Group on Hormonal Factors in Breast Cancer. Menarche, menopause, and breast cancer risk: individual participant meta-analysis, including 118 964 women with breast cancer from 117 epidemiological studies. *Lancet* 2012; 13: 1141-1151.

8 Beral V, Bull D, Doll R, et al; Collaborative Group on Hormonal Factors in Breast Cancer. Breast cancer and abortion: collaborative reanalysis of data from 53 epidemiological studies, including 83?000 women with breast cancer from 16 countries. *Lancet* 2004; 363: 1007-1016.

9 Collaborative Group on Hormonal Factors in Breast Cancer. Type and timing of menopausal hormone therapy and breast cancer risk: individual participant meta-analysis of the worldwide epidemiological evidence. *Lancet* 2019; 394: 1159-1168.

10 Nationwide cluster-randomised trial of extending the NHS breast screening age range in England: AgeX trial protocol. Oxford: University of Oxford, 2020. www.AgeX.uk (viewed Dec 2022). ■