

The legacy of Archibald Cochrane: from authority based towards evidence based medicine

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Archibald Cochrane was born on January 12th 1909 in Galashiels (Northern-Scotland) as first son of Walter Francis Cochrane and Emma Mabel Purdom. A brother and a sister will follow. His father gets killed in the battle of Gaza in 1917, during which the western powers destroy the ailing Ottoman empire and the Middle East is divided for oil between England and France. His younger brother dies at a young age from pneumonia caused by tuberculosis. Both events will weigh heavily on Archibald's life.

Aged 22 years, he studies at Cambridge where he obtains in 1934 an MA degree, which in the after-Bologna educational terminology would probably be called a bachelor in medicine. He is strongly attracted by psychiatry and psycho-analysis, revolutionary at the time but in their infancy, and heads towards Vienna where he studies psycho-analysis with Theodore Reik, then the number two after Freud. He undergoes psycho-analysis himself but, more importantly, learns to speak fluent German. After this interruption, he returns to England where he resumes his medical studies at the University College Hospital in London. In 1935 civil wars erupt in Spain and he is easily convinced to join a "field ambulance unit" of the "Spanish Medical Aid Committee", installed to provide medical help to the resistance movement opposing Franco. In August 1937 he resumes his medical studies once more. In the same year his mother, with whom he had a strong bond, passes away. In 1938 he obtains the degree of MB Bch, which means he is a full doctor and in 1939 enters the West London Hospital as "house physician". At the same time, he becomes research assistant at the University College Hospital, London. In those years, a very painful unanswered love affair marks him for the rest of his life. He will remain unmarried and fully devoted to nothing but his work. In 1940 World War II erupts and moved once more

by the good cause, he enters the army as captain in the Royal Army Medical Corps. He is made prisoner of war during the German invasion of Crete and moves from one POW-camp to another (Saloniki, Hildburghausen, Elsterhorst, Wittemberg-am-Elbe) where his knowledge of German proves invaluable to himself and to his fellow POWs.

In the PWO-camp of Saloniki, where there are prisoners of many different nationalities, his position of English and German speaking physician puts him "in charge" of medical supervision of the all prisoners. During the summer 1941, he notices an increased death toll amongst the prisoners preceded by severe hypoproteinemic ankle edema or hunger edema, of which he suffers himself. His request to the German camp authorities for more calories per day is turned down. He then recalls that edema may also be caused by vitamin B1 deficiency, the so-called "wet beri-beri" and he hopes that the problem may lie there. He chooses twenty prisoners with "pitting edema" reaching higher than the knee as study subjects and divides them in a group who will get yeast and a placebo group who receives nothing but vitamin C. The whole operation is conducted double-blind, both to the prisoners and to the Germans! He himself is yellow due to hepatitis. This is what he writes in his autobiography about this first-ever RCT, conducted in the most incredible and inhuman of circumstances:

" I chose 20 men, all in their early twenties, all emaciated and with oedema above the knee. I put 10 in each of two small wards. They all received the standard rations, but those in one ward were given a supplement of yeast three times a day (I had to use my own reserve of Greek money to get it on the black market). In the other ward they got one vitamin C tablet each day (I had kept a small reserve for an emergency). I had meant to measure the volume of urine passed, but

that proved impossible. I could obtain no buckets, so I had to fall back on “frequency” measurements. Each man counted the number of times he passed water in 24 hours. I kept the whole thing secret. I expected, and feared, failure. I noted the numbers each morning. There was no difference between rooms for the first two days; on the third day, there was a slight difference; and on the fourth it was definite. In addition, eight out of the ten men in the “yeast room” felt better, while no one felt better in the “vitamin C room”. I wrote it up at once and took it to the Germans at 1.30 pm. (...) A young German doctor asked what I wanted in a civilized way and I said: A lot of yeast at one, an increased diet as soon as possible, and the rapid evacuation of the camp.”

What an enlightened intellect! What morality! The weekly incidence of sick prisoners with hypoproteinaemic edema decreased drastically when Germans provided yeast and calory-intake was raised to 800 cal/day (Fig. 1).

In the other POW-camps he distinguishes himself by his courage, self-sacrifice and constant effort for the prisoners whose medical care were given to him and in 1946 he is awarded an MBE (military distinction) for his “gallant and distinguished” behaviour in the camps. He obtains a (poorly paid) Rockefeller fellowship and obtains the “Diploma in Public Health at the London School of Hygiene & Tropical Medicine”, where his interest in epidemiology (a non-existing term at the time) is awakened. He obtains a scholarship to study in 1947-1948 at the Henry Phipps Institute, Philadelphia, USA en starts research into radiology of pulmonary tuberculosis, where the phenomenon of “inter-observer error” in radiology is studied. That was not without interest given the large numbers of tuberculosis patients whose treatment schemes depended largely on the radiological classification they were attributed to. Back in the UK, he goes to Wales where from 1949-1959 his research is focussed on pneumoconiosis (“dust lung”) and he becomes a member of the Medical Research Council’s Pneumoconiosis Unit, Cardiff. His main activities were to provide a reliable and clinically useful RX-classification of pneumoconiosis in coal miners; to study the relationship between dust exposure and classification and labour incapacity; to understand the etiology of progressive massive lung fibrosis. His “life work” comprised the initiation during those years of the innovative Rhondda Fach Scheme, a survey of lung diseases in the population of the two coal mine areas in South-Wales. The amount of time and energy it took to survey the whole of South-Wales and to allocate each and every coal miner into risk categories for lung disease, defies imagination. The man was *always* at work, from early morning to late at night.

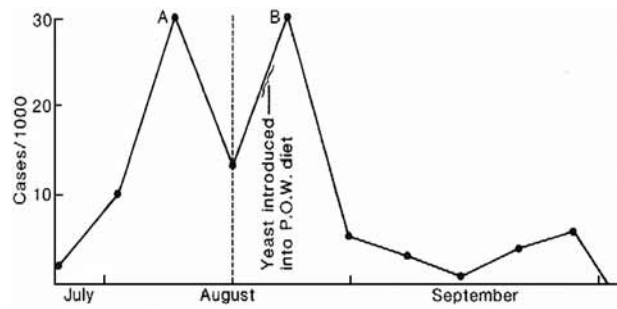


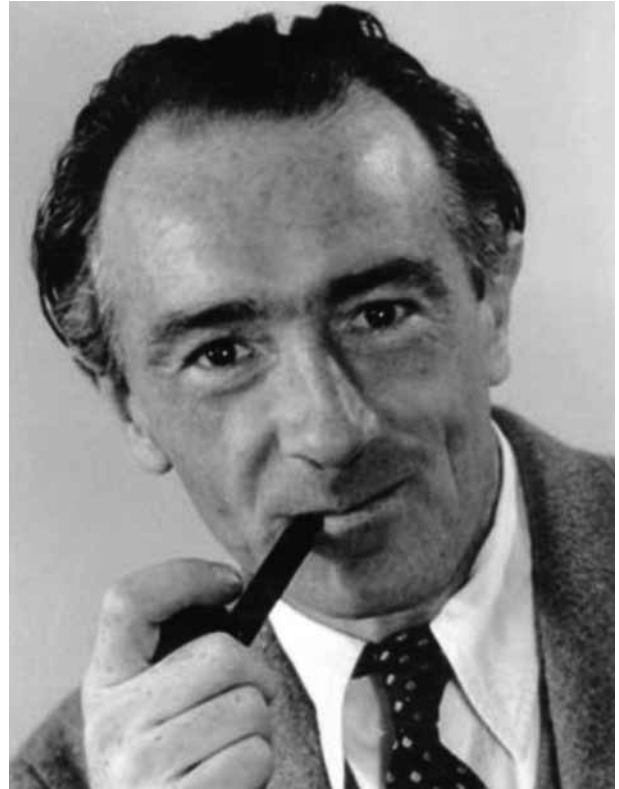
Fig. 1. — The weekly incidence of sickness figures for hypoproteinaemic oedema in the Salonica prisoner of war camp, July-October 1941. The broken line indicates the point from which the author adopted a change in classification procedure to produce, as he explains in the text, the artificial low shown for mid-August.

The individual follow-up and the mass screening sessions he organised driven by his social feeling and his human involvement with the health of tens of thousands of men and their families stand as an example for excellent clinical epidemiological research. Recognition for his drive and vision does not fail to materialize. Between 1960-1969 he becomes the David Davies Professor of Tuberculosis and Chest Diseases at the Welsh National School of Medicine (now: Wales College of Medicine) and director of the Medical Research Council’s Epidemiology Unit, Cardiff, where epidemiology for the first time receives scientific form and content and becomes an internationally accepted branch of medicine. In 1961 he is invited to present the Cutter lecture on Preventive Medicine in Harvard. This is considered as one of the most respected institutionalised lectures in the field of preventive medicine. In 1971 the text of his Rock Carling Lecture “Effectiveness and Efficiency – Random reflections on Health Services”, is published. In it, his medical-epidemiological thinking as well as his criticism of the workings of the NHS at that time, are ventilated. He summarizes the crux of his experience in the phrase “All effective treatment must be free”. He deplores, using examples, that many medical activities rely on principle of authority and not on the results of validates research, of which the randomized clinical trial is the highest example. Examples for “lack of proof of efficiency” are pulmonary tuberculosis, arterial hypertension, ischemic heart disease, type 2 diabetes and psychiatry. On obstetrics, mentioned as “midwifery” in his book (given the strong position of midwives in obstetrical care in the UK), he comments:

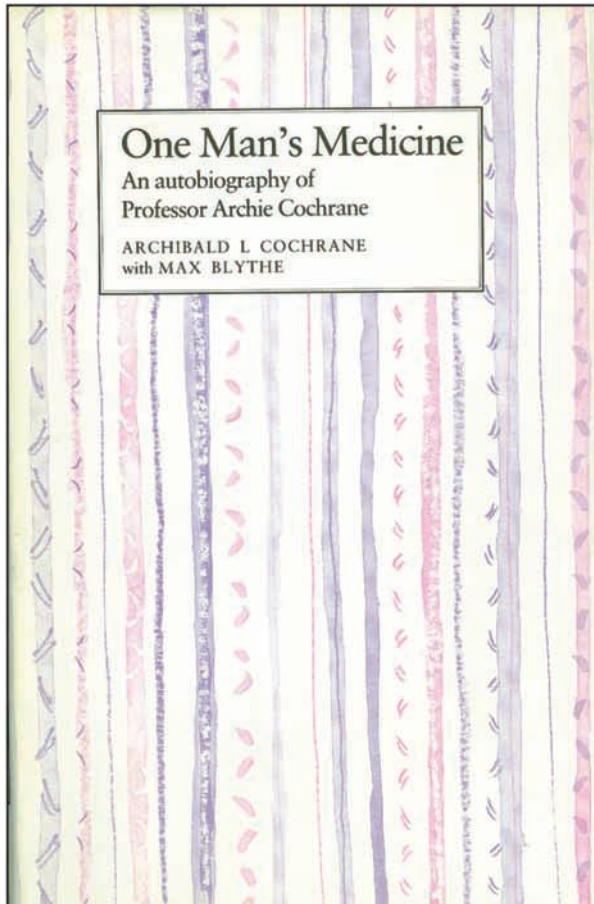
“Midwifery is an unusually emotive subject, so a priori (in italics in his text) a very high standard of statistical analysis or an experimental approach would NOT (my capitals) be expected. Even so it is surprising how



Archibald Cochrane at 22 as a young medical student at Cambridge.



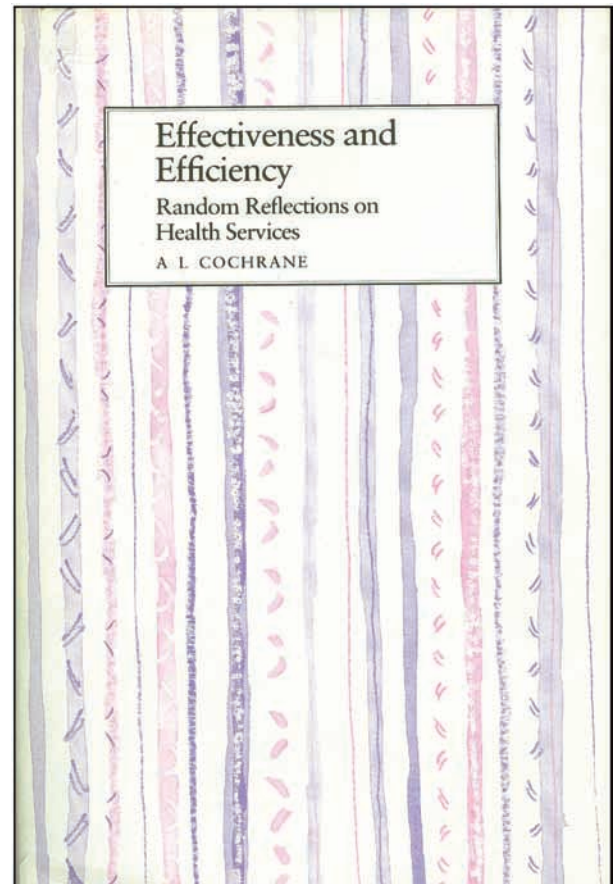
Archibald Cochrane at 45 during his Rondhha Fach years in Wales.



One Man's Medicine

An autobiography of
Professor Archie Cochrane

ARCHIBALD L. COCHRANE
with MAX BLYTHE

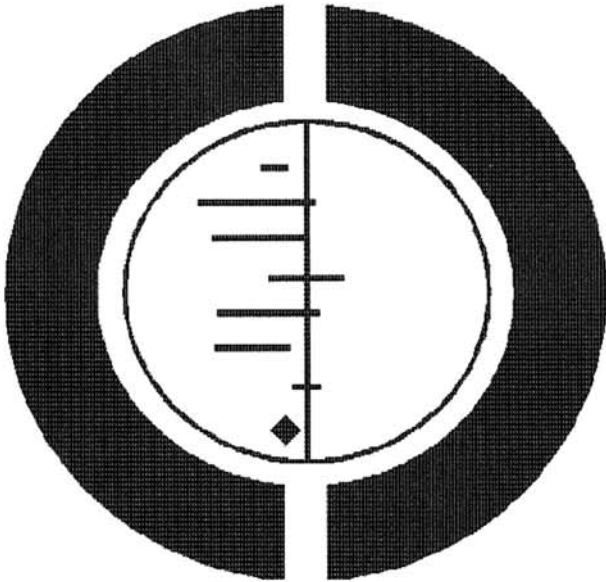


Effectiveness and Efficiency

Random Reflections on
Health Services

A L. COCHRANE

Archibald Cochrane's autobiography and his ground-breaking short text "Effectiveness and Efficiency" that set in motion the wheel of Evidence based medicine.



The Cochrane Collaboration is an international organisation that aims to help people make well-informed decisions about health-care by preparing, maintaining and promoting the accessibility of systematic reviews of the effects of healthcare interventions.

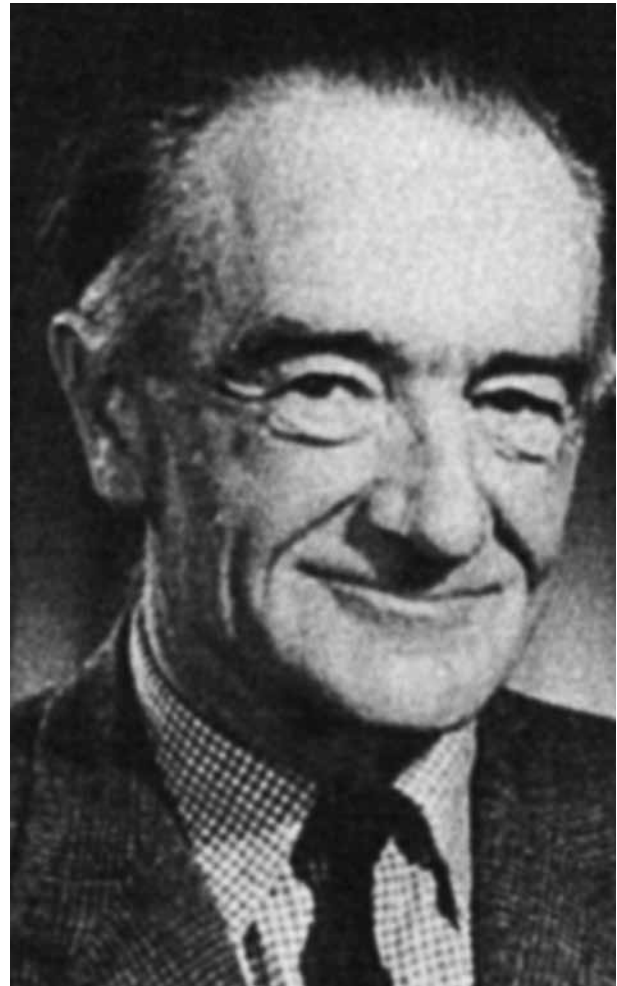
successive committees have been content to accept trends as something God-given which must be followed, instead of demanding a more rigorous analysis looking into causality”.

As early as then, he questions the unnecessarily long hospitalisation after an uneventful normal delivery, stating that

“...it might be better to put the question in a cruder form and ask: what is gained by keeping such mothers in more than forty-eight hours?”

“Such mothers” means “uncomplicated cases with adequate social conditions”.

He offered the obstetric societies at the time a “wooden spoon” because of the total lack of scientific underpinning of daily practice. Perhaps as a result, the number of Cochrane reviews at this time is one of the highest of all specialities (367 for gynaecology and 386 for pregnancy and childbirth = 753 out of a total of 6787 reviews!). His rather small book testifies of the vision and strength of a truly great medical mind and makes good reading for anyone interested in clinical research. It made a much greater impact than he himself had ever anticipated because it carried such a fundamental message that tried to elevate medicine from an “art” to a science. That message has not always been well understood. This is due on the one hand to the fact that medicine should not necessarily be less of an art because it is *also* a science; on the other hand the evidence based part of our profession is just one leg of the medical table: ethics, acceptance by the patient



Archibald Cochrane at the age of 65

and cost are three other legs. In 1974 the 65-year old Archibald Cochrane is further honoured by becoming a member of the Med Res Council’s Epidemiology Unit. He is invited to give the Dunham Lectures in Harvard, the highest possible honour awarded to a non-American. In 1975 he becomes honorary member of the American Epidemiological Society. Between 1977-1986 he obtains several honorary doctorates. In 1987 he accepts to give an in-depth interview about his life and work to Max Blythe for the Medical Sciences Video Archive (posthumous publication of his “autobiography”). He dies a peaceful death at the age of 79 years on June 18th 1988.

Archibald Cochrane was not a doctor with a huge private practice that procured him money, fame and authority. He was not a fundamental scientist whose name figures next to those who did great discoveries, such as Watson & Crick, who were his contemporaries. He was a man with a vision and with a heart. His vision consisted of the conviction that the means that are provided to the creation of health (i.e. to medicine) should be provided on the basis of proven efficacy and efficiency and not on the basis of

authority, emotion, politics, fashion of fantasy. His heart told him that “all effective treatment must be free”. The rest is not medicine but commodity. An evergreen to think about.

These fundamental viewpoints, of which his own medical activities testified, subsequently took the form of the co-called Cochrane Collaboration, an international network of physicians, epidemiologists and statisticians, who provide an increasing number of “systematic reviews” to the medical community. Archie’s great dream was that scientific underpinning should be the rule for daily practice of *all* physicians, wherever in the world. The Cochrane Collaboration is an international organisation that contributes to the taking of well-informed decisions with respect to health care by composing, updating and improving access of systematic reviews of the effects of health care interventions. It comprises a Cochrane Library, a Cochrane database of systematic reviews, a Cochrane central register of controlled trials, Cochrane guidelines, a Cochrane handbook, a Cochrane journal club, among other activities. Many countries have their own Cochrane centre, some-

times in collaboration with neighbouring countries. The moment where nearly all medical decision can be supported by the results of systematic research, is not far away.

Authority based medicine is medicine where we perform what we have been made to accept as “in the patients’ best interest”, copying those who have trained us to the best of their knowledge. Evidence based medicine is more than uncritical copy-and-paste behaviour. That would be *against* the Cochrane spirit. The practice of EBM consists of the integration of individual clinical expertise – still very useful – with the best available external clinical evidence coming from systematic research, with the values and expectancies of our patients.

Literature

- Cochrane A. Effectiveness and Efficiency – Random Reflections on Health Services, 1971, Cambridge University Press.
Cochrane A. and Blythe M. One Man’s Medicine. An autobiography of Professor Archie Cochrane, 1989, The British Medical Journal, Cambridge University Press.