

Epidemiology and policy: the post-war context*

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ABSTRACT

Chronic disease epidemiology emerged after the Second World War as the dominant public health research technology. It was important in the developing relationship between research and policy. The post-war years saw the rise of the randomized controlled trial and of the "evidence-based" movement, which also influenced the drugs field. Research collaboration between the United States of America and the United Kingdom of Great Britain and Northern Ireland was strong. A multitude of theories has been used to explain the relationship between research and policy. The present article outlines four broad tendencies: the evidence-based model, the journalistic view, sociology of scientific knowledge and science policy approaches. Four examples from the field of substance use underline the relationship: the discovery by Doll and Hill of the relationship between smoking and lung cancer; the Ledermann hypothesis that limiting alcohol consumption in a society reduces drinking problems and its impact on the alcohol field; the study by Hartnoll and Mitcheson of prescribing injectable heroin versus oral methadone; and the evaluation of needle exchange in 1987. Conclusions are drawn about why research had an impact and the forms of impact that can be identified. Quantitative methodologies, epidemiology above all, dominated research in the post-war period. There has been a complex process of mutual accommodation between policy makers and researchers, to which this public health technology has been central.

Keywords: epidemiology; policy; smoking; drugs; harm reduction; alcohol; history.

Introduction

The relationship between scientific research and public policy has been much discussed in recent years, in particular in the area of health policy and health services. In the United Kingdom of Great Britain and Northern Ireland, increasing concern at the Department of Health that policy should be based on "relevant" research was

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reflected in the launching of a National Health Service research and development initiative in 1990. A parallel concern in clinical medicine resulted in the growth of "evidence-based medicine", premised largely on the methodology of the randomized controlled trial, the "gold standard" of post-war medicine. The demand for "evidence-based" policy-making has grown ever louder and has become an international movement. Drug policy and research have shared in those evidence-based tendencies. However, the history both of drug policy and of the rise of research in the post-war years largely remains to be written. The topics of the articles in this special issue give an idea of the range of areas that need to be covered.

The present article aims to look at both the rise of epidemiology in general as a significant technical tool in the period after 1945 and the historical roots of the "evidence-based" notion of research and policy-making in the United Kingdom. It contains a survey of the range of theories that have been brought into play to analyse and describe that relationship and a description of four case studies chosen from substance use: smoking, alcohol and drugs. Finally, some conclusions are reached about the effect of evidence and epidemiology on policy in the last fifty years.

The rise of chronic disease epidemiology

"Vital statistics" have been important in studying patterns of disease since the early sixteenth century in many European countries and were central to the nineteenth century sanitarian movement. In the United Kingdom, the Registrar General's Reports were matched by independent enquiries by local societies such as the Epidemiological Society of London. Until the Second World War this tradition of enquiry allied to reform was essentially focused on the control of epidemic and infectious disease; thereafter, patterns of mortality and morbidity were changing from epidemic to chronic disease, with cancers and cardiovascular disease figuring more centrally. The immediate post-war years saw the rise of a new style of epidemiology that increasingly provided the dominant framework for the explanation of public health issues. Chronic disease epidemiology, with its use of probabilistic statistics and the concept of "risk", came to provide an autonomous mode of explanation. The British and American investigations of the relationship between smoking and lung cancer, which are discussed below, were milestones in the rise of modern epidemiology. The subsequent Framingham heart study in the United States of America provided epidemiology with a key role in the study of cardiovascular disease. This was a period in which risk factor epidemiology, with its technical tools like the odds ratio, case control and prospective studies, was established, not without controversy, as the dominant mode of investigation of post-war public health issues. It was the era of the science of chronic disease. Epidemiology established a hegemony equivalent to that of laboratory science and the probabilistic mode of statistical reasoning established its legitimacy in opposition to older genetic traditions within statistics. The culmination of these developments, at least as far as the United Kingdom was concerned, was marked by Bradford Hill's postulates for epidemiological causation enunciated in a lecture and published in 1965 [1, 2].

The history of research and policy

These technical developments took place during a period in which public health was reoriented to focus on the role of individual lifestyle and the individual's responsibility for his or her own health. Within government, there was an increasing emphasis on the use of research to inform policy. The idea that policy should be evidence-based emerged at that time. In the United Kingdom in the early 1970s, the Rothschild Report emphasized the role of government departments as clients or customers of the outside researchers from whom they commissioned research, which was to be developed on a customer-contractor basis. The danger of that approach, as some observers pointed out at the time, was that research was developed according to the view from the policy end rather than the more open-ended approach to funding that had previously been the norm. Although the history of those developments where drugs were concerned in the United Kingdom and elsewhere remains to be written, central to it would be the rise of the so-called drug problem in the 1960s and the perception by government and research councils, in particular the Medical Research Council, of the need for a better understanding of drug use to inform policy. The establishment of the Advisory Council on the Misuse of Drugs in the early 1970s, of the Addiction Research Unit at the Institute of Psychiatry and the use of notification as a research and surveillance tool all testified to the strong epidemiological dimension to drugs research [3]. Relationships between researchers in the United Kingdom and United States were close and visits to the United States by leading researchers from the United Kingdom had significant impact on ideas about research, in particular in the field of epidemiology.

Theories on the relationship between research and policy

A variety of different literatures and disciplinary traditions analysing the relationship between research and policy has developed, in particular since the 1980s [4]. In the present article, four broad tendencies are surveyed: the evidence-based medicine and health policy model, the journalistic view, sociology of scientific knowledge, and policy science and science policy approaches, all of which share areas of overlap.

The evidence-based medicine movement is much concerned with the concept of clinical effectiveness and is increasingly allied with the methodology of the randomized controlled trial; it is underpinned by positivist models of science and rational models of policy-making. Supporters of the movement believe that research, if properly funded and correctly positioned, can and should have an influence on policy, either directly or in some more diffuse way; what is important is to secure a working relationship between the two.

The journalistic view also sees the relationship between research and policy-making as desirable, but in a more partisan way. At times of crisis conspiracy theories abound, with key participants blamed for having been slow to act or

having failed to act. Such criticism is common not only in journalistic accounts, but also in academic analyses: recent examples are the crises of acquired immunodeficiency syndrome (AIDS) and bovine spongiform encephalopathy.

The third tendency, sociology of scientific knowledge, does not presuppose this rationality. Latour, for example, provides a model of the “actor networks” that sustain the research process [5]. The strength of any scientific claim is based on the resources, whether people, organizations, other disciplines or objects, from which its proponents are able to derive support. Much of this work is concerned with themes of emergence and resistance in science, an inward-looking perspective that does not take account of policy development.

This has been a concern of the policy science and science policy literature. Here, the policy dimension to the production of knowledge and its validation has been more central. Jasanoff, for example, has drawn attention to the differential impact of the “same science” in different national and policy contexts [6]. There is the “co-production” of knowledge, where government agencies also negotiate the meaning and the boundaries of science. The concept of the “policy community”, linking scientific communities and government in various forms, is of importance here [7]. Theories of various types in this field place emphasis on the role of networks in policy, networks that facilitate the interchange of scientific orthodoxies between researchers and policy makers and that underpin a reciprocal relationship between the two.

Four examples of the relationship between research and policy for substance use

In this theoretical context four key paradigmatic pieces of research will be considered [8]. The research carried out by Richard Doll and Sir Austin Bradford Hill, which was first published in 1950, was a case-control and subsequently a prospective epidemiological study that demonstrated the connection between the rise in lung cancer and the habit of smoking. It ultimately led to a new policy agenda for smoking and for public health more generally, stressing price mechanisms, advertising controls, and the role of the mass media and health education. Through a focus on epidemiological modes of proof and on public health epidemiology rather than the genetic and hereditarian modes of biostatistics, it marked a decisive “paradigm shift” for both science and policy.

The Ledermann hypothesis had little influence when it was first advanced in the 1950s, but came into its own in the 1970s: Sully Ledermann was a French demographer and statistician who suggested that there was a relationship between average per capita levels of alcohol consumption and the general level of alcohol misuse in a population. In the 1950s, the disease view of alcoholism was dominant, while population approaches such as that which Ledermann proposed had connotations of temperance and morality rather than science. Only in the 1970s did the policy agenda change, when a coalition of doctors specializing in the treatment of alcoholism and alcohol problems, civil servants, the voluntary sector that provided treatment and support for alcoholics and those with alcohol

problems, the police and the legal profession rallied behind a call for the limitation of availability and harm based on the Ledermann hypothesis.

The study by Hartnoll and Mitcheson of prescribing injectable heroin versus oral methadone was carried out in the 1970s in a drug dependence unit in London and randomly allocated addicts to injectable heroin or oral methadone. Although the researchers themselves had not sought to change prescribing policy from heroin to oral methadone, towards what was viewed as a more “confrontational” treatment response, their research was widely credited with having done so. The study coincided with the introduction of oral methadone and there is some evidence that the change in policy took place before the research had been completed and the results disseminated. Here was research support for a change that was already under way.

Finally, the needle exchange evaluation carried out in 1987, which was hastily funded by the United Kingdom Department of Health to see if such “harm-reduction” approaches were an appropriate means of dealing with the threat of the spread of human immunodeficiency virus from drug users into the general population appeared to prove that syringe exchange “worked” and was a significant factor in unlocking government support for harm reduction and for increased funding for such services. Here was apparently a classic example of the influence of research on policy [1].

Why did research have an impact?

The following section consists of an attempt to deconstruct these historical episodes and identify any common variables or any specific factors that appear to have influenced particular situations. It should be noted that some research, such as that on needle exchange programmes, had a direct impact, while other research, such as the studies on smoking and alcohol, had an indirect impact, in that it changed the climate of opinion in which policy was formed.

Taking into account that difference, some common variables and some issues specific to particular cases can be identified. In all the case studies cited in the present article, the primary methodology was quantitative rather than qualitative and that reflects the dominant statistical and epidemiological paradigm of post-war research, a paradigm for which the research by Doll and Hill was significant. These case studies show that statistical and epidemiological methodologies were dominant in post-war public health research. However, methodology alone does not explain the reason for the policy impact of these studies. The case studies demonstrate the importance of the policy alliances that support science within government and reveal the ways in which science and research have provided coherence for policy communities. Within that relationship, the perspective of change over time is important. Science that had had little impact on policy in the conditions of the 1950s acquired the status of orthodoxy by the 1970s, when the policy situation itself had altered. The case studies on smoking and alcohol provide examples of that process. By the 1970s, the research on smoking was emblematic of a new public health constituency in the United Kingdom that

strongly advanced the policy case. Similarly, Ledermann, who had been ignored in the conditions of the 1950s, was the hero of the new alcohol lobby by the 1970s. The other case studies cited in the present article also illustrate these processes at work. The Hartnoll and Mitcheson study appealed to a clinic worker constituency which, with psychiatrists, was convinced of the need for new “active treatment” policies. As far as AIDS as a policy issue was concerned, for some while harm reduction had been the unspoken objective of a new and broader health policy community around drugs. The AIDS crisis and the funding and results of research, which were carefully managed, enabled deeply held political objections to be overcome.

Here is a symbiotic process in which the validation of science is not just an internal matter, as in Latour’s model, but is rather a process of mutual accommodation with policy alliances and interests. For example, in the United Kingdom, links with government have been important, in particular links with civil servants and expert committees. In terms of government policy on smoking, the Chief Medical Officer, Sir George Godber, played a central role in the formation of the new public health agenda and later, in the era of AIDS and drugs, the civil servant responsible for drug policy, Dr. Dorothy Black, ensured that research results were presented in ways and situations that were acceptable to politicians. Committees have also played an important role. The reports on smoking published by the Royal College of Physicians, in particular those of 1962 and 1971 which had a considerable impact, gave independent authority to “scientific facts” and made them widely available through the media. In the debate over methadone versus heroin prescription surrounding the study by Hartnoll and Mitcheson, the committee of London drug psychiatrists that met at the Department of Health in the 1980s was important in determining prescribing policy. The reports on AIDS and Drug Misuse of the Advisory Council on the Misuse of Drugs, in particular the Part One report of 1988, provided important legitimacy for research results and the concept of harm reduction. These gatekeeping institutions or individuals have been important in the relationship between research and policy. In the post-war period, the media has played the role of mediator between research and policy: one example is the part played by the media in publicizing the early reports on smoking of the Royal College of Physicians and putting the “scientific facts” into the public and policy domain [1].

Some areas of policy have their own particular traditions. Health policy in the United Kingdom has been characterized by a tension between central direction and local self-determination. This is particularly clear in the field of drugs, where policy initiatives often emerge initially at the local level, as happened in the case of the Hartnoll and Mitcheson research, which was supported by a local, London-based, committee. Needle exchange also emerged first as a local initiative.

Crisis, too, is an important variable, well known to historians, who have analysed and debated its impact in, for example, war-time situations. The crisis of war has often led to more radical change in policy than would otherwise have been tolerated. The AIDS and drug policy case study of the introduction of harm-reduction cited above shows this clearly. This enabled what was essentially a

political change to be masked as a technical issue, as a matter of research results, made essential by the crisis of the day.

Clearly, the operative factors in different policy arenas may well be different. These case studies show that the alcohol and smoking arenas have been historically more diffuse than the arena for drugs, with a greater variety of interests involved, not least the industrial and legitimate economic interests within government [9]. The absence of these interests for drugs has given it a smaller and potentially more cohesive policy community and perhaps made the relationship between research and policy easier to establish. But this is to write from the British perspective. The nature of the structures and of the interrelationships with government will obviously vary in different national cultures. In some European countries such as the Netherlands, the relationship between researchers and policy-making civil servants has been close in recent years, while in others it has not been possible for research to be part of the process. In the United States, although there were moves in New York to establish needle exchange as a "controlled trial", that is, as a scientific procedure, these moves foundered on the opposition of local political interests, most notably African-American politicians, who condemned harm reduction as potential genocide for their constituency [10]. The fact that institutions and structures and local, federal or national political cultures vary has also to be taken into account.

The role of researchers in these processes has also changed over time. The role of the researcher as an active participant in the policy-making process has developed in the post-war period. Sir Austin Bradford Hill, in the 1950s, was firmly of the opinion that his role was to do scientific research and that it was the responsibility of the Chief Medical Officer and others to promote the policy options. He believed that too great an involvement in policy-making by scientists would undermine the independence and unbiased nature of science. Researchers such as Mitcheson took the view that their results were "hijacked" by policy makers to draw conclusions that they had not intended. Changes in research policy since the first smoking results were published in the 1950s have drawn researchers more closely into the policy-making process. However, they appear rarely to have been in control of the use made of their results.

Just four case studies are presented in the present article, but there are many others that would repay attention. Take, for example, the role of "community epidemiology", its development in the United States and its dissemination elsewhere. In the United Kingdom, community epidemiology was developed in the 1980s through the funding of local drug indicator studies by the Department of Health [11]. This research funding had a strong policy intent. It was part of a more general attempt to move drug services away from an exclusively London, psychiatrist-dominated, focus and to develop a broader range of services more accessible to users. Assessing the number of users that required drug services was a crucial dimension both of knowledge and of policy development. The expansion of these types of study into the European arena through the multi-city study on drug abuse of the Pompidou Group of the Council of Europe and the formation of the European Monitoring Centre for Drugs and Drug Addiction draws attention to

another aspect of the recent history, which is the growth of a strong European epidemiological dimension to the relationship between research and policy.

The “politics of evaluation” have been underlined more recently by the evaluation of the various heroin trials, in Switzerland in particular, and the controversies that have surrounded them [12, 13]. The “Cannabis Warning Scheme” introduced in July 2001 in the London borough of Lambeth, allowing those caught in possession of cannabis to be let off with a warning, was legitimated by widely quoted research demonstrating that police time could be saved and hence costs reduced [14, 15]. In those case studies, the policy dimension of research was of crucial importance. The use of research and the “value-free” scientific model underlines an attempt to depoliticize controversial policy issues and to present them to outsiders as simply technical questions to which research will provide the answer.

It is clear from the above discussion that the type of “rational” relationship between research and policy presupposed by the evidence-based medicine and policy model is rarely the case. Policy alliances both around science and in relation to policy are variable and the contexts of time, culture and country have to be taken into account. Overall, the case studies presented here demonstrate two things: one methodological and one that relates to policy processes. The dominant policy impact since the 1950s has been through quantitative methodologies, among which epidemiology has assumed increasing importance. Evaluation is also a policy tool. These methodologies are intricately bound up with policy processes and alliances. There is much in these examples to support the cynic’s view that policy makers use research as a drunk uses a lamp-post, for support rather than for illumination. There is also, however, a more complex process of mutual accommodation between researchers and policy makers through various networks; this is Jasonoff’s “co-production” of knowledge [6]. The role of epidemiology in that process became increasingly important in the post-Second World War era. However, the history of developments in terms of drugs and other substances in the last fifty years remains largely unexplored.

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