

The influence of epidemiology on drug control policy

D. F. MUSTO

*Department of Psychiatry, Yale University, New Haven, Connecticut,
United States of America*

Z. SLOBODA

*Institute for Health and Social Policy, University of Akron, Akron, Ohio,
United States of America*

ABSTRACT

The changing face of drug abuse in the United States of America and elsewhere in the world over the past century presages what is to come in the fields of drug abuse prevention and treatment in the twenty-first century and in the new millennium. For the first time, professionals involved in those fields are prepared to address the challenge. Professionals of today are no longer dependent on ideology to drive research efforts. A vast knowledge base is now available that has its foundations in science. Although research is derived from projects supported and undertaken in the United States, a growing research infrastructure and a number of interactive networks enable research from other countries to be incorporated into that knowledge base. Such research and interconnected networks will enable those committed to protect future generations from the devastating psychological, social and physical consequences that arise from drug abuse and drug dependency, with particular reference to illicit drugs. In order to understand the current state of science relating to epidemiological research in the field of drug abuse, it is important to review the grounds for designating drug abuse as dangerous and illegal. Attempts to study drug abuse by establishing an infrastructure to support epidemiological and other research, in particular that related to marijuana and heroin use (both of which dominated the research agenda in the United States for several decades), grew out of concerns about the negative effects of drug use. Such research informed those interested in developing policies concerned with interdiction and demand reduction. In the present article, an overview of the historical development of epidemiological data systems in the United States is given. The discussion focuses on means by which to continue and improve the influence of epidemiology on policy.

Keywords: history of drug abuse and policy in the United States; epidemiologic research and policy (roles and training).

Historical overview

Policy makers used statistics, often epidemiological, to buttress their policies throughout the twentieth century [1]. They launched surveys in order to quantify a problem or to obtain a broad view of a national problem. Such surveys were on a small scale compared with contemporary surveys. In the first quarter of the twentieth century, the pharmaceutical profession and the Public Health Service of the United States of America made reasonable and cautious studies of drug users. An alternative approach to the drug issue, however, was the manipulation or creation of "statistics" to justify policies already adopted or to raise the public's consciousness so that strict drug control laws could be enacted. The battle over the legitimacy and interpretation of epidemiological data has been dramatic and increasingly successful from the point of view of professional epidemiologists.

In the late nineteenth century, there was growing concern in the United States about the effect of drugs on society, after decades of easy access to drugs such as morphine and cocaine. The temperance movement of the early twentieth century achieved national prohibition through an amendment to the United States Constitution in 1919. A similar attitude of rejection prevailed in the case of narcotics. The Government of the United States promoted the view that non-medical drug use should be prohibited and it worked to persuade other countries to adopt that view. Two problems arose. The first was that other countries would bear the greater burden of controlling drug production because the drugs of most concern to the United States Government were not grown to a significant extent within the United States. The second problem was to persuade the United States Congress to enact legislation controlling the local availability of drugs when many lawmakers believed that the Government had no constitutional right to do so. It was evident that a campaign needed to be launched that would convince Congress and the public that legislation must be passed to control the availability of drugs to individual citizens.

In the United States, misrepresentation of statistical data came early through the efforts of Hamilton Wright, appointed Opium Commissioner of the United States. In 1908, Wright was offered the opportunity to become a member of the delegation representing the United States at the first international conference to consider the control of opiates. After that conference, which became known as the International Opium Commission, Wright sought to frame a national anti-drug law. Based in the United States Department of State, Wright had to work around the Constitution, which left police powers, such as the control of health professions, to the discretion of individual states. There was especially strong opposition from southern states to any scheme that encroached on the rights of states. Wright went so far as to contact newspapers published in southern states, urging them to publicize fears that African-Americans were using cocaine, which might cause them to run amok [2]. In addition, Wright misrepresented the extent to which opium was being imported into the United States. In reality, opium imports on a per capita basis had been falling since the mid-1890s. By manipulating import

figures, however, Wright gave the impression in his report to the President of the United States and to Congress that opium use was increasing [3].

Eventually, the Harrison Narcotics Tax Act, which Wright had negotiated with pharmaceutical interests, became law in December 1914. In 1916, the Supreme Court of the United States decided that, according to the Constitution, the Harrison Act could not set limits on the prescription of opiates and cocaine by physicians [4]. To the proponents of the Harrison Act, that decision weakened the law and made curbing opiate maintenance extremely difficult. A campaign was launched to reverse that legal interpretation: within the United States Department of the Treasury (which administered the Harrison Act), the Special Committee of Investigation was formed to estimate the number of addicts in the United States. The Committee concluded that there were about one million addicts in the country and that the use of narcotic drugs was leading drug users to commit criminal acts [5]. Compared with other more carefully conducted studies, the Committee overestimated the number of addicts by a factor of about five. The goal was to present drug use as an urgent national problem that demanded strong central action. It is not clear whether the Supreme Court was affected by such claims. Nevertheless, in March 1919, the Supreme Court in effect reversed its position and declared that simple opiate maintenance, that is, addiction unrelated to a medical disease such as cancer, was illegal [6]. That formally established the drug policy of the United States as one that opposed the use of drugs except for medical purposes, a position that the United States had taken at the international opium conference held in Shanghai in 1909 and at a second international opium conference held at The Hague in 1912, where the first international treaty to control the traffic in opiates and cocaine had been formulated.

Once the anti-maintenance stance had been officially adopted, the government enforcement agency known as the Field Force of the Bureau of Narcotics minimized the extent of the drug problem; the estimate made by the Special Committee of Investigation of the numbers of addicts was reduced from about one million to about 100,000 [7]. Following that, however, private anti-drug entrepreneurs such as Richmond Pearson Hobson raised the estimate to more than one million [8]. Hobson, a former member of Congress and a hero of the Spanish-American War, created national and international drug control committees that sought severe penalties against drug users, mandatory drug abuse prevention lessons in schools and a heightened awareness of the drug-related danger facing the public. In contrast to assertions made by Hobson, the Public Health Service surveyed available evidence and concluded that the national prevalence of addiction was 110,000 [9]. Such research, careful and undramatic as it was, received less attention than the extreme claims that addicts numbered more than one million.

In 1930, the Federal Bureau of Narcotics of the Department of the Treasury was established, succeeding the Field Force of the Bureau of Narcotics, which had had responsibility for the Harrison Act since 1919. The issue of how many addicts lived in the United States continued to be a debated and contentious topic. In an interview in 1970, Harry J. Anslinger, Commissioner of the Bureau of Narcotics

from 1930 to 1962, discussed informally the problems surrounding the number of addicts. He said that he would never let an independent party determine the official estimate: the Federal Bureau of Narcotics had to keep that function to itself. He felt that the number of addicts itself was “dynamite” and that if the number increased, the Federal Bureau of Narcotics was not doing its job, and, if the number decreased, the budget would be cut. The estimate of the Federal Bureau of Narcotics ranged between 60,000 and 80,000 [10]. The casual comments of Anslinger illustrate the political power of epidemiological data and interpretation. The possibility of an epidemiological surprise that may undercut carefully matured plans or refute claims of an improvement in the drug problem presents some awkward issues to policy makers. How such antipathy to an independent epidemiology was overcome signifies an important change in the policy-making process.

In 1968, the United States Administration made a number of changes, one of which involved moving the Bureau of Narcotics from the Department of the Treasury to the Department of Justice. In part, the move was in response to the sudden growth of drug use in the United States in the second half of the 1960s. In the lull between two drug “epidemics”, from 1920 to the mid-1960s, there had been a sense of relative calm about the number of addicts; subsequently, however, there was a dramatic upsurge in drug use. The public demanded that the apparent increase in the use of drugs, including heroin, cannabis and lysergic acid diethylamide (LSD), be addressed. The public alarm and signs of widespread drug use called into question the traditionally low figure for addicts. Statisticians of the new agency, called the Bureau of Narcotics and Dangerous Drugs, concluded that there were about 300,000 serious drug users in the country. It was pointed out that that did not mean the drug problem had suddenly increased, but that the old figures were too low [11]. Government officials sought a more reliable way of estimating drug use.

Another important development was the rise to power of long-standing critics of the Federal Bureau of Narcotics, in particular members of the legal and medical professions who disagreed with what they saw as an inappropriate punitive approach. They favoured conceptualizing the drug problem as medical and wanted to offer treatment, perhaps even provide the drugs themselves [12]. In such a context, there was no traditional policy to defend. Further, the critics had long asserted that the Federal Bureau of Narcotics underestimated the number of addicts. With great public concern over drugs and a new start in the agencies involved, modern survey methods seemed to be an improvement.

Included in the Comprehensive Drug Abuse and Control Act of 1970 was the requirement that a National Commission on Marihuana and Drug Abuse be established, with the goal of reporting on marijuana in 1972 and on drugs in general in 1973 [13]. The Commission was designed to obtain an informed, independent evaluation of the drug problem. Instead of a government agency with its backlog of policies, controversies and personalities, an outside group could review the whole of the drug problem and give a fresh appraisal. The Commission recognized at the outset that reliable statistics on the extent of drug use were not available. As a result, the National Household Survey on Drug Abuse was put in place. The

survey revealed growing use of marijuana among youth and signs of rising heroin use. The level of cocaine use was low in the early 1970s. More important than the levels of drug use was the fact that a more reliable means of evaluating drug use had been established. Since its establishment in 1974, the National Institute on Drug Abuse has conducted the survey, in which approximately 98 per cent of households in the United States are represented.

The Monitoring the Future survey, which complements the National Household Survey, has been conducted by the University of Michigan under a grant from the National Institute on Drug Abuse since 1975. That survey is used to monitor, over a number of years, drug use among students in grades 8, 10 and 12 (ages 17-18) at a representative sample of both public and private secondary schools in the United States.

The reports of the National Commission on Marihuana and Drug Use appeared as "Marihuana: a signal of misunderstanding" (1972) and "Drug use in America: problem in perspective" (1973). The recommendation of the report on marijuana that the drug be decriminalized met with strong opposition from President Richard Nixon, but the analysis of the National Commission stands as a thoughtful review of the drug problem in an atmosphere of extreme agitation over drugs and drug users.

Other surveillance systems that were put in place in the 1970s include the Drug Abuse Warning Network (DAWN), which reports on drug use occurring among persons admitted to sentinel hospital emergency rooms, and what is now called the Community Epidemiology Work Group, a group of researchers who report semi-annually on patterns of drug use using existing data sets on treatment and arrests, as well as medical and other data sets, from many cities across the United States. The establishment of the National Household Survey on Drug Abuse and the Monitoring the Future survey, in addition to DAWN and the Community Epidemiology Work Group, have provided the best information on emerging drug abuse trends and problems for over two decades.

Owing to confidence in contemporary epidemiological investigation, Congress mandated that the national strategy formulated by the Office of National Drug Control Policy [14], in the Act that established that office, include criteria of progress that would be measured by such instruments as the National Household Survey on Drug Abuse. Specifically, the law required the National Drug Control Strategy to include comprehensive, research-based, long-range goals for reducing drug abuse in the United States and short-term, measurable objectives that the Director determines may be realistically achieved. The assumptions underlying those mandates, that drug use can be reasonably well determined and that policies can have their effectiveness measured, are far different from the early years of the anti-drug campaign. The manipulation and manufacturing of statistics early in the twentieth century contrast sharply with the current circumstance where independent surveys provide a check on the expectations of policy makers. The change in approach represents enormous progress for scientific and impartial research. It is a credit to those researchers whose careful work has won the confidence of the nation's lawmakers.

Improving the influence of epidemiological research on drug control policy

Despite efforts by policy makers to base strategies for combating drug abuse on existing information and knowledge and the availability of well-grounded epidemiological findings, the different perspectives represented by policy makers and epidemiologists in dealing with drug abuse sometimes makes the exchange of ideas difficult. In the long term, a successful agenda that focuses on the reduction of drug abuse is hindered by those differences.

Facilitating such an exchange between the policy maker and the drug abuse epidemiologist requires identifying where lines of communication can be established and understanding can be developed. The orientation of each professional group, however, may impede that exchange. The role of the policy maker is to set an agenda for solving a problem of public interest. The policy maker may have a strong appreciation of science but feel compelled to solve or ameliorate problems in a short period of time. In contrast, the epidemiologist is interested in seeking knowledge and does not have the same political and time constraints as the policy maker. To a large extent, those role differences influence the way each group views the phenomenon of drug abuse, the methods used to gather information to assess the phenomenon and the interpretation of the results of the information-gathering process.

Defining the phenomenon of drug abuse

Differences between the professional orientation of the policy maker and that of the epidemiologist may create conflicting premises that lead to disagreements and misunderstandings. The policy maker projects the viewpoints and values of his or her constituents. In many cases, the policy maker must juggle the views of multiple constituent groups. An epidemiologist is looked to for guidance in the development of a definition of the phenomenon or problem being addressed. The policy maker, however, needs to place such a definition in a framework that reflects the values of his or her constituents. Defining a phenomenon such as drug abuse involves two main dimensions: (a) aetiology or cause; and (b) individual responsibility. Definitions of problems are important as they guide society's solutions to those problems. For the problem of drug abuse, the aetiology is multifactorial. Current research indicates that drug abuse is a behaviour resulting from incomplete or maladaptive development processes at the physiological, psychological and social levels. Without the research knowledge base that is currently available, drug abuse was for years considered to be a moral or criminal problem or a medical disorder. Considering drug abuse a moral or criminal problem has led to the imprisonment of drug abusers, while considering it a medical disorder has led to the treatment of drug abusers.

The other dimension of the definition of drug abuse, individual responsibility, assesses the degree to which the behaviours that involve drug abuse are volitional.

Common questions include whether drug abusers are victims and whether they are in control. Again, society responds differently in each case. The emphases of interventions vary depending on which way society or the policy maker views drug abuse. Ideally, scientifically based research, by its nature, is value-free and neutral, neither blaming nor excusing drug abusers for their behaviour. The primary constituent base is the research community itself. “Good” science is the motivating influence on the epidemiologist. Phenomena such as the behaviours involving drug abuse are defined by what the epidemiologist observes, that is, those behaviours and their relationship to other life factors. In that way, the epidemiologist presents an unbiased, broad and comprehensive picture of the nature and extent of behaviours involving drug use. By examining the extent of such behaviours in a general population, the epidemiologist is able to show where they cluster, what factors are associated with them and what consequences follow from them. An epidemiologist is likely to view drug abuse as evidence of multidimensional, dynamic behaviours that have divergent aetiologies and consequences. The epidemiologist, ideally, is guided by scientific principles and the discipline associated with specialist field. Making use of the research and the exchange of research findings, an epidemiologist tends to view drug abuse not as a static, homogeneous phenomenon, but as one that changes over time, that manifests itself in a variety of forms, with multiple aetiologic pathways, which may also vary over the course of an individual’s life.

Research methodologies

Given the divergent needs and constraints discussed above, it is not surprising that a major potential source of tension between the policy maker and the epidemiologist relates to research methodology. Policy makers need information in order to plan actions around both specific phenomena and measurements which reflect the effectiveness of the strategies being implemented. For political reasons, strong and significant short-term effects are needed. For example, policy makers are interested in using prevalence rates to assess the impact of the implementation of demand and supply reduction strategies; however, they may be impatient with the time needed for the extensive “cleaning” required of large databases in order to ensure accuracy—time that is often not available to policy makers. Furthermore, with a phenomenon such as drug abuse, which is highly stigmatized and often hidden, it is important to have many data systems in order to “capture” the hard-to-reach drug abuser. Such systems are expensive and difficult to integrate. Again, time-consuming methodologies do not always satisfy the needs of the policy maker.

The epidemiologist is concerned with the scientific dimension associated with addressing an issue. To develop valid measurements of an observation or variable, the epidemiologist strives to define all pertinent parameters or dimensions of that variable. For some variables, the measurement is a simple matter; for others, the process of measurement development may be complex. For example, it is important to specify several dimensions involved in the measurement of the behaviours

that relate to drug use. At a minimum, those dimensions should include the type of drug and the frequency of use within a specified period of time.

Methodologies to collect information on drug abuse include the following:

- (a) Secondary analyses of data abstracted from records, such as arrest files, admissions to medical facilities, admissions to drug abuse treatment programmes;
- (b) Data collected through laboratory studies, ethnographic studies and focus groups;
- (c) Personal interviews with drug abusers, as well as with individuals who do not abuse drugs but have background characteristics similar to those who do;
- (d) Household or school surveys.

An epidemiologist will use one or more of those techniques depending on several factors: the question being addressed; the availability of existing information that would guide the development of an approach, sample selection criteria and instrumentation; and time and funding constraints. The epidemiologist weighs the advantages and disadvantages of the various approaches and the level of accuracy that is reasonable to achieve within given resources. There are often trade-offs. Studies, for example, that are longitudinal in design and include sequential cohorts may represent the ideal approach for studying the aetiology of behaviours involving drug use; however, they are expensive and take years to complete. Instead of such a study, the epidemiologist may opt for a cross-sectional or case-control approach that would require the careful selection of control subjects, comprehensive measurements and diverse statistical techniques to ensure that the sequencing of events is structured to parallel the temporal relationship among variables.

In the United States, several national data systems have been developed to assess the extent of behaviours involving drug abuse in various population groups. "True" prevalence data have been based on the National Household Survey on Drug Abuse and on the Monitoring the Future survey.

Other major data systems that provide valuable information on the consequences of drug abuse in the United States include the following:*

- (a) DAWN;
- (b) National Drug and Alcoholism Treatment Unit Survey and Client Data System;

*DAWN currently assesses drug-related emergency room visits among a representative sample of hospitals in the United States. That network also includes a voluntary reporting programme of drug-related mortality, based on information from medical examiners in over 20 cities. The National Drug and Alcoholism Treatment Unit Survey and the Client Data System include data on drug abuse and alcohol abuse treatment facilities and admissions. Both systems were under the auspices of the National Institute on Drug Abuse until October 1992, when they were transferred to the Substance Abuse and Mental Health Services Administration. Finally, the Arrestee Drug Abuse Monitoring programme assesses drug use through self-report and urinalysis among representative samples of arrestees in several booking facilities in the United States. That data system is supported by the National Institute of Justice of the United States Department of Justice.

(c) Arrestee Drug Abuse Monitoring programme (previously known as the Drug Use Forecasting study).

Descriptions of those data systems are provided to enhance information about the range of data being collected and to emphasize the different nature of the populations being surveyed. Data from arrestees, as well as individuals seeking medical care and treatment, do not represent prevalence but consequences of drug abuse in society. Policy makers, however, often confuse the two, and it is not infrequent for trends in consequence data to be used, such as emergency room admissions, to show changing trends in drug abuse. In the late 1980s and early 1990s, for example, drug-related emergency room rates in the United States increased while prevalence rates, as shown in the National Household Survey on Drug Abuse and Monitoring the Future survey, declined. Several policy makers challenged the general population survey results, using the emergency room rates to support their challenges. It was up to the epidemiologists to demonstrate the differences in those systems.

Policy makers need immediate answers and may use compromised research methodologies to obtain those answers. It is not surprising, then, given the perspective of epidemiologists, that there is a hesitation on their part to provide quick answers to policy makers without being sure of the question being asked and without adding caveats to the information they render. In the case of the emergency room reporting system, for example, there is often a delay of 3-6 months in reports. At a time when emergency visits related to the use of cocaine and heroin were increasing, policy makers monitored the system frequently. In their need for immediate answers, policy makers may use alternative, but possibly less scientifically valid, approaches to address a question. In one case, policy makers sponsored a telephone survey of a number of emergency rooms to ask if visits relating to drug use were increasing, rather than wait for reports. The telephone survey revealed more about the perceptions of the person surveyed than the objective data from medical charts. The findings showed discrepancies that were difficult for the policy makers to resolve.

There is a need for epidemiologists to develop rapid methodologies in the collection of valid information for policy makers. Such methodologies should include statistical procedures for analysing already existing archival as well as survey data. Although the data items may not be the most exact measurements, they may approximate or assess indirectly the desired information. Furthermore, alternative approaches to analysing several data sets or a comprehensive review of a number of studies would assist the policy maker. In addition, the use of focus groups and other tested, but not necessarily conventional, approaches need to be used by epidemiologists to assist policy makers.

Interpreting information

Drawing conclusions from research data and interpreting them in terms that have implications for policy require a clear understanding of the language of research

and the statistically defined boundaries that exist for any data set. Interpretation becomes the “hazard zone” for epidemiologists and policy makers. Important questions arise about what the data mean and whether the results are significant for policy. Significance tests, trends, directions of trends and distributions are interpreted within two different frameworks. The epidemiologist ties research results to specific, carefully crafted research questions. Elements that include sample selection, construction of variables and methodology for data collection and analysis are incorporated with a view to addressing such questions. Some leeway may be allowed but the epidemiologist’s training imposes a discipline that has its own constraints.

The policy maker, not having an epidemiological perspective, may not understand the limits imposed by science and, owing to pressures of time, may extend findings to meet immediate needs. Common breaches committed by policy makers include generalizing the findings from one group to dissimilar populations, using levels of statistical significance beyond the conventional one of 95 per cent and broadening the definition of a variable or the relationship between variables.

Whereas an epidemiologist will be more concerned with the statistical significance of differences in prevalence rates between time periods, a policy maker will focus on differences in absolute numbers of users. That poses a problem when such data are derived from population samples, including survey data that require imputation and weighting procedures. Conflicts may occur over the interpretation of a policy maker with reference to differences observed over time when such differences are found not to have statistical significance by the epidemiologist. The policy maker may observe that a trend of some kind is occurring, while the epidemiologist has found that no statistically significant change has occurred.

The issue of statistical significance is fraught with problems, for there are no hard rules about the establishment of significance. In general, conventional wisdom prevails. In establishing levels of significance, epidemiologists consider many factors, including question or hypothesis being assessed, the size of the sample and the type of measurement being used. Epidemiologists, in testing a hypothesis or relationship among measurements, may impose stringent criteria for an accepted level of significance. Associations among measurements that the epidemiologist tests statistically and finds not to be significant may be viewed by the policy maker as having importance. For example, in assessing the effectiveness of an intervention programme, the epidemiologist may consider a programme unsuccessful if the differences in outcome, such as drug use, for the control and experimental conditions has a significance level greater than 95 per cent. The policy maker, on the other hand, may regard the programme as successful because the percentage difference between the two conditions represent lives being saved or reductions in instances of hospitalization or imprisonment. In that case, the discrepancy in interpretation of such findings by the epidemiologist and the policy maker will lead to conflicts. It is important to remember that the level of statistical significance is a man-made decision and consideration must be given to the importance of any research finding in the real world.

Recommendations for research-informed policy

The solution to such conflicts is difficult to achieve without mutual regard and trust. The most important factors are communication, a clear understanding of what the policy maker needs and an understanding of how best the research can help the policy maker achieve those goals. Recommendations for the epidemiologist who wishes to influence policy fall into the following areas: communication, education and collaboration. Paramount to the process, however, is obtaining and retaining respect. The epidemiological researcher must always be cognizant of scientific integrity. There are many grey areas associated with the transition from research to policy. The way the researcher handles those particular areas can reinforce or undermine relationships, both with policy makers and with scientific peers. Scientific principles should always guide the process.

Communication

Some of the most important actions that epidemiologists should take when discussing issues with policy makers include listening, asking questions and providing feedback, that is, repeating their understanding of the issue in order to ensure that there is two-way communication. At times in their discussions, epidemiologists may use a vocabulary or make reference to a context without realizing that the concepts or expressions have other meanings to policy makers. Policy makers may use terms that have a precise meaning in the research context but mean something else in the vernacular. Epidemiologists, responding solely within the context of science, may frustrate policy makers and themselves by not addressing the needs of policy makers, without fully understanding the cause of the miscommunication. Such crossed communications may make the epidemiologist appear unresponsive to the policy maker and widen the gap between the two. It is therefore important for both the epidemiologist and the policy maker to try to use everyday language for concepts rather than research terminology.

Education

It is important for the policy maker and the epidemiologist to create a learning atmosphere when they are discussing issues. They need to learn from each other about the content and boundaries of the contexts in which each functions. In other words, it is not enough for the policy maker to have an appreciation of scientific methods. It is also important to understand on what basis and how far the epidemiologist will extrapolate the results of the research. The epidemiologist should be able to speak openly to the policy maker about the issue being discussed, given the characteristics of the study population and the measurements of interest. The epidemiologist needs to assist the policy maker in reviewing the findings of studies and in drawing conclusions about results. It is important to explain what impact varying methodologies, sample selection and measurements may have on results. By going through such a process, the epidemiologist educates the

policy maker about the importance of research design on findings and the policy maker educates the epidemiologist on the specific needs of policy formulation. It is through such give and take that the epidemiologist will become more aware of the objectives and requirements of the policy maker and be able to be more responsive and informative. In addition, the policy maker will become more aware of the ongoing nature of the accumulation of knowledge and be more open to changes in research findings and revisions that may take place as the epidemiologist continues to refine research questions and data analyses. That means that the policy maker must be more cautious about interpreting certain types of research findings and be prepared for alternative explanations of the results if the findings are revised. The epidemiologist can be helpful in assisting the policy maker identify potential problems with studies and exploring alternative interpretations.

Collaboration

The term collaboration is used to refer to joint ownership. Through the processes of communication and education, it is hoped that mutual and compatible objectives are developed and that research is designed to address those aims. The collaboration between policy maker and epidemiologist should produce research and policy which both are prepared to support, as both have helped to shape the processes and the outcomes.

In the present article, several suggestions are given with regard to where research methodologies could be improved or modified to address the needs of the policy maker as well as the epidemiologist. Those suggestions include reassessment of the meaning of various levels of statistical significance; validation of alternative methodological approaches, such as focus groups, mall or intercept surveys and telephone surveys; improvement of statistical approaches for conducting secondary analyses; and development of statistical approaches for integrating archival data concerning arrests, hospital admissions and drug abuse treatment admissions, as well as acceptable techniques for the use of population data, including data from the census. Such collaboration, however, requires involvement and commitment. In addition, formal infrastructure for collaboration needs to be developed. Simply meeting to share mutual needs and objectives and to develop strategies for finding answers with ongoing work sessions to implement such strategies will go a long way towards creating a collaborative atmosphere for both policy maker and epidemiologist. Such meetings should be openly supported institutionally as well as professionally.

Conclusion

The history of the relationship between epidemiological research and policy in the United States indicates that it is possible to form a relationship that is satisfactory for both the research and political communities. Researchers in epidemiology are readily available to policy makers. They hold posts in government, in universities

and in research institutes and agencies. Furthermore, such researchers have access to policy makers through their agencies in the case of government, but also through their professional associations. Every effort should be made for the two groups to reach out to each other. Barriers to communications between the two groups need to be identified and overcome. The barriers vary, but perhaps the greatest barrier is language. Fortunately, there are both epidemiologists and policy makers who are “bilingual” and can bridge the communication gap. Those individuals need to be encouraged to bring their colleagues together. The twenty-first century presents new challenges to both groups. The globalization of drug abuse, the emergent new and, in some cases, more dangerous drugs of abuse will require international collaborations between both researchers and policy makers.

References

1. D. F. Musto, *The American Disease: Origins of Narcotic Control*, 3rd ed. (Oxford, Oxford University Press, 1999).
2. Hamilton Wright to the Editor of the *Louisville Courier-Journal*, 16 April 1910, Wright Papers, United States National Archives and Records Administration, entry 36.
3. Hamilton Wright, “Report on the International Opium Commission and on the opium problem as seen within the United States and its possessions”, *Opium Problem: Message from the President of the United States*, Sen. Doc. No. 377, Sixty-First Congress, Second Session, 21 February 1910.
4. *U.S. v. Jin Fuey Moy*, 241 U.S. 394, decided 5 June 1916.
5. Special Committee of Investigation, appointed 25 March 1918, by the Secretary of the Treasury: *Traffic in Narcotic Drugs* (GPO, 1919).
6. *U.S. v. Doremus*, 249 U.S. 86, decided 2 March 1919; *Webb et al v. U.S.*, 249 U.S. 96, decided 3 March 1919.
7. Hearings before the House Appropriations Committee, Treasury Department Appropriation Bill 1927, 2 December 1925, Sixty-Ninth Congress, First Session, pp. 438-439.
8. “Saving youth from heroin and crime”, *Literary Digest*, vol. 81, No. 32 (5 May 1924).
9. L. G. Kolb and A. G. DuMez, “The prevalence and trend of drug addiction in the United States and factors influencing it”, *Public Health Report*, vol. 39, May 1924, pp. 1179-1204.
10. Personal communication to D. F. Musto, 30 May 1970.
11. D. F. Musto and P. Korsmeyer, *The Quest for Drug Control: Politics and Federal Policy in a Period of Increasing Substance Abuse, 1963-1981* (New Haven, Connecticut, Yale University Press, 2002).
12. Joint Committee of the American Bar Association and the American Medical Association on Narcotic Drugs, *Drug Addiction: Crime or Disease? Interim and Final Reports of the Joint Committee of the American Bar Association and the American Medical Association on Narcotic Drugs* (Bloomington, Indiana, Indiana University Press, 1961).

13. Comprehensive Drug Abuse Prevention and Control Act of 1970, Public Law 91-513, Ninety-First Congress, approved 27 October 1970.
14. Anti-Drug Abuse Act of 1988, Public Law 100-690, One Hundredth Congress, Section 1005 "Development and Submission of National Drug Control Strategy", approved 18 November 1988.