

EPIDEMIOLOGY IN LEGAL PROCEEDINGS IN THE UNITED STATES

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A symposium "The Epidemiologist in Court" was sponsored by the American College of Epidemiology in 1985. Its purpose was to initiate a dialogue between the legal and epidemiologic communities and to educate epidemiologists about the practical aspects of presenting evidence in legal proceedings.

Among the eminent symposium participants were United States District Court Chief Judges with experience in epidemiologic cases as well as epidemiologists with courtroom experience. This chapter provides an understanding of tort law and its relevance to determinants of disease, and describes the role of epidemiology in litigation. Among others, asbestos cases serve to provide explication.

The difficulties faced by epidemiologists who participate in the legal process include the adversarial nature of their role, and the need for familiarity with the vocabulary employed in the legal domain. In the social context, another difficulty includes the professional stigma associated with the epidemiologists' willingness to serve in the litigation process. Issues surrounding

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the professional ethics of epidemiologists who are involved in litigation are explored.

The importance of having the profession identify a group of epidemiologists who are willing and able to serve in legal proceedings is discussed in terms of minimizing the risk of harm in relation to epidemiology as a profession, the epidemiologist who serves in the process and, last, but not least, the pursuit of truth.

INTRODUCTION

In September 1985, the American College of Epidemiology sponsored a symposium on the "Epidemiologist in Court." The symposium was intended to initiate a dialogue between the legal and epidemiologic communities and to educate epidemiologists about the practical aspects of presenting epidemiologic evidence in legal proceedings.

Six symposium participants were selected, all of whom had experience in the use of epidemiologic data in legal proceedings. They included two United States District Court Chief Judges, the Honorable Sherman G. Finesilver of Denver, Colorado, and the Honorable Carl Rubin of Cincinnati, Ohio. Two epidemiologists also participated: George Carlo, Ph.D., and Paul D. Stolley, M.D. Finally, two attorneys, Ronald Motley, Esq., and Bert Black, Esq., presented their views.

This chapter is based on the proceedings of the 1985 symposium. It begins with a discussion of tort law, the legal context in which epidemiologic evidence increasingly appears. It then describes the role played by epidemiology in litigation. The difficulties faced by epidemiologists who participate in the legal process and who venture into the generally foreign environment of the courtroom also are considered. Other items discussed include the stigma that the profession places on those epidemiologists who participate in legal proceedings, and the ethical considerations that necessarily attend such activities. The chapter concludes by describing unresolved issues for both epidemiologists and lawyers to address in the future. A glossary of terms is also included at the end of the chapter.

TORT LAW FOR EPIDEMIOLOGISTS

Although the formulation of laws and regulations aimed at the prevention of disease has long been an area of epidemiologic activity, litigation is still foreign territory to most epidemiologists. Nonetheless, in cases involving substances or products, such as Agent Orange, asbestos, the swine flu vaccine, tampons, intrauterine devices, Bendectin, and Diethylstilbestrol, epidemiologic evidence has often played a crucial role. It is in this kind of civil litigation, often called

toxic tort litigation, that the relationship between epidemiology and the law is developing most actively.

Tort Theories

Understanding the role of epidemiology in lawsuits about diseases or injuries requires an understanding of tort law. Broadly defined, a tort is a wrong against private rights for which compensation can be obtained through legal action (Keeton et al., 1984). Tort law encompasses the rules and doctrines that govern disputes between private parties (as opposed to public parties) when the subject of the dispute is not an agreement (contract) between the parties. In other words, tort law protects private rights that exist in the absence of any prior consensual undertaking by the litigants (Shapo, 1984). For example, a plaintiff can sue for injuries sustained in an automobile accident without any prior arrangement with the driver of the other car, but she/he could not sue a dealer for failing to deliver a new car unless the plaintiff had entered into a contract with the dealership.

Lawyers think in terms of "legal theories," which are somewhat akin to the epidemiologist's postulates of causation. Just as satisfaction of most (if not all) of the Henle-Koch-Evans Postulates is necessary to establish causation, proof of the elements of a tort theory is required for a plaintiff to prevail in tort litigation. In a traditional action for negligence, which is the predominant tort theory in personal injury cases, the plaintiff must establish the following elements (Keeton, et al., 1984):

- that the defendant owed the plaintiff a *duty* (for example, not to drive in a way likely to cause harm);
- that this duty was *breached* (for example, by driving too fast);
- that the breach *caused* harm to the plaintiff; and
- that the harm constitutes legally compensable *damages* (for example, a broken arm is generally compensable, while emotional distress upon learning that one's car has been damaged is not).

The "duty" and "breach" elements of tort theory relate to a desire to make culpable or negligent parties pay for the harms that result from conduct deemed unreasonable under the circumstances of a given case. The "causation" and "damages" elements relate to the idea that it is unjust to make a party pay for that which she/he did not cause, even if that party acted negligently. No one can sue a driver for speeding if no harm results, even though the government may seek sanctions under criminal law.

As might be expected, a number of variants on the basic tort theme have developed. When negligence is gross, or harm is intentionally inflicted, culpability increases, and punitive as well as compensatory damages may be

assessed (Cleary et al., 1984; Keeton et al., 1984; Shapo, 1984). The types of harm deemed compensable also may depend on culpability. For example, in many states, a plaintiff may cover damages for *intentionally* inflicted emotional distress, but not for *negligently* inflicted emotional distress (Keeton et al., 1984).

Strict liability involves a tort law variant in which the required showing of negligence (duty and breach) is greatly reduced (Keeton et al., 1984; Shapo, 1984). Under certain circumstances "[o]ne who sells any product in a defective condition unreasonably dangerous to the user or consumer or to his [or her] property is subject to liability for physical harm thereby caused to the ultimate user or consumer".¹ This theory represents a revolutionary legal change that has occurred within the past 25 years. Courts have extended the theory by holding that the failure to warn of dangers associated with a product can itself be a defect. For example, the strict liability/failure to warn approach has been at the heart of much of the litigation about asbestos.

Workers compensation reduces the emphasis on negligence perhaps even more than strict liability. A workers compensation claimant must show only that an injury or disease arose out of his or her employment (a concept paralleling causation) and that it is compensable. A broken foot resulting from a slip on a ladder at a construction site would meet the cause test, and if the claimant construction worker lost wages as a result, he or she probably would receive compensation. Workers compensation is intended as an administrative way to avoid litigation over certain covered diseases and injuries. The damages a worker can recover are limited in return for relative ease in obtaining compensation. Unfortunately, the system has not always functioned very well, and injured workers often try to avoid its limitations by finding a way to bring regular tort actions. For example, rather than suing an employer, whose liability would be limited, a worker might sue a "third party" manufacturer that sold allegedly harmful materials to the employer without adequate warnings.

Although tort theories vary in the relative emphasis placed on each of the four tort elements, causation is an element of all recognized theories. It also is the element most related to epidemiology. The degree to which causation must be proven may vary, but some proof of causation always is required.

Burden of Proof

Because tort law involves disputes between private parties, the law has no bias toward plaintiffs or defendants. It seeks only to decide the facts correctly in as many cases as possible. Thus, the usual rule is that a plaintiff, to win, must show by a preponderance of the evidence that his or her version of the facts is correct. That is, the plaintiff must introduce evidence sufficient to establish that his or her story is, more likely than not, true (Belton, 1981; Cleary et al., 1984).

¹ American Law Institute. (1965). Restatement of the Law of Torts. 2nd ed. American Law Institute Publishers, St. Paul, MN.

The plaintiff also must convince the jury (or the judge in a case tried without a jury) that this evidence substantiates what it purports to prove. If the plaintiff adequately proves the story, and if the law recognizes that such facts can be the basis for a claim, she/he will prevail.

The legal preponderance of the evidence standard meshes very neatly with the epidemiologic concept of attributable fraction. If, in an exposed population, more than half the cases of a disease can be attributed to the exposure, and if the basic epidemiologic criteria of causation are satisfied, then, in the absence of other information about a diseased individual who was exposed, the plaintiff can argue that it is more likely than not that her or his illness was caused by the exposure (Black and Lilienfeld, 1984). This simple, straightforward application of the preponderance rule lies at the core of most efforts to use epidemiology in tort litigation.

The traditional burden of proof, however, cannot often be met by toxic tort plaintiffs, and as a result there have been a number of proposals to relax the preponderance rule. Frequently, these suggestions address those situations in which the attributable fraction is less than 50 percent, which would otherwise put the plaintiff out of court. If, however, the attributable fraction were 30 percent for a population, and if it were clear that a substance caused some cases of disease in that population, a member of the population could argue that there is some probability that her or his case was caused by that substance. Some plaintiffs have endeavored to use evidence such as toxicology findings in conjunction with epidemiologic data to circumvent this conundrum. Other proposals have been advanced that stay within the confines of epidemiology.

The Diethylstilbestrol (DES) litigation illustrates how some courts have used proportional recovery to circumvent the harsh results of combining the epidemiologic attributable fraction concept with the legal preponderance rule. Much of the concern in these cases focuses on who made the drug taken by a specific plaintiff, rather than what disease the drug caused. Nonetheless, this litigation has spawned a host of suggestions for apportioning liability based on the probability of causal contribution. In a 1980 decision, the California Supreme Court held that DES manufacturers would be liable to a plaintiff DES daughter in proportion to their share of the market for the drug.² Thus, even though the plaintiff could not identify which manufacturer had caused her harm, she was allowed to recover damages for her injuries. The DES situation is peculiar because it is almost certain that each manufacturer caused some harm, but an individual plaintiff could not establish causation by a preponderance of the evidence against any particular manufacturer. The California decision is not clear on many points, but it does stand for the principle of proportional liability.

² *Sindell v. Abbott Laboratories*, 607 p. 2d 924 (Cal. 1980), cert. denied sub nom *E.R. Squibb & Sons, Inc. v. Sindell*, 449 U.S. 912 (1980).

In theory, if all states in the United States adopted the California rule, *and* if all used the same definition of market share, *and* if no defendant had to pay more than its market share, the result would be that the defendant DES manufacturers, as a group, would pay to DES victims, as a group, an amount about equal to the dollar value of the damages caused by the drug. This assumes, of course, a valid theory of liability on all points other than the specificity of the causal link between manufacturer and individual plaintiff. Whether in fact such an equitable result will occur, and whether the proportional scheme is applicable to other situations, remains to be seen. A number of commentators have suggested applying proportionality to cases involving exposure to several substances (Rosenberg, 1984). Issues like this continue to be the subject of legal debate. However, if any proportional system for allocating causation among exposures to a variety of chemicals is to be rationally applied, epidemiologic evidence will figure prominently in the assessment of damages.

The Legal Status of Epidemiology

In several recent cases, plaintiffs have alleged that a substance or product made or marketed by a company caused their disease(s), despite an absence of epidemiologic evidence, or in the face of negative epidemiologic evidence. The Agent Orange, Bendectin, and some of the swine flu vaccine cases involved such facts, as have some cases that involved injuries allegedly caused by leaking landfills. As one might expect when the law first begins to adapt to new kinds of cases, courts have treated these situations in a variety of ways and have not necessarily been consistent in their treatment.

When epidemiology convincingly establishes causation, courts have generally accepted epidemiologic evidence, though not always explicitly. Over 60 years ago, the New York Court of Appeals decided in favor of a plaintiff who had contracted typhoid.³ The evidence showed that the defendant city had negligently allowed a portion of its water system to become contaminated, that the plaintiff regularly drank from this part of the system; and that the typhoid incidence was much higher in this part of the town than in other parts. Although the word "epidemiology" appears nowhere in this decision, the court clearly employed epidemiologic reasoning in the process of adjudication.

In the asbestos litigation, causation of asbestosis is hardly ever at issue, precisely because the epidemiologic evidence is so overwhelming. Most judicial decisions in the area focus on the problem of identifying the manufacturer of the asbestos to which a plaintiff was exposed, or on certain other defenses raised by defendants. DES litigation also has turned on issues largely unrelated to whether or not the drug caused a plaintiff's vaginal cancer.

Although epidemiology has played an obvious role in tort law, its exact legal status remains the subject of debate. Some have argued that statistical reasoning

³ *Stubbs v. City of Rochester*, 124 N.E. 137 (N.Y. 1919).

cannot apply to an individual plaintiff and that epidemiologic evidence therefore is insufficient, by itself, to sustain a plaintiff's verdict (Dore, 1983). Others have argued that epidemiology is far more than statistics and that good epidemiologic evidence ought to suffice when measured against the preponderance rule (Black and Lilienfeld, 1984). When a single factor and a single disease are at issue, epidemiologic evidence dovetails very well with the standard preponderance of the evidence rule. In more complex cases involving multiple chemicals and perhaps several diseases, continued evolution can be expected in both epidemiology and the law.

THE NEED FOR EPIDEMIOLOGY IN TORT LITIGATION

The federal courts have been overwhelmed by tort litigation in all of its varieties: mass, toxic, and so on (Feinberg, 1987). Judge Rubin, one of the symposium participants, described his experience in trying about 1,100 cases involving congenital malformations allegedly caused by Bendectin. The average length of previous Bendectin trials had been 40 courtroom days. Because a federal judge has about 230 courtroom days available each year, 190 judge-years would have been needed to try all 1,100 cases. With fewer than 600 federal district court judges in the United States⁴, the current federal court system obviously is incapable of dealing with a case load of this size.

The Bendectin situation provides just one example. An analogous situation arose with Agent Orange⁵, with the Dalkon Shield⁶, and with asbestos.⁷ Other examples abound, and the number continues to grow. As Judge Rubin explained, this is a burden of direct concern to epidemiologists, because only they can assist the legal community in adjudicating many of these cases.

The need for epidemiologists arises because so many troublesome cases revolve around the issue of *causation*. In each of the 1,100 Bendectin cases consolidated for trial before Judge Rubin, there was a common question: does Bendectin cause birth defects? This kind of question can be answered only by epidemiologists (Black and Lilienfeld, 1984). A biochemist may be able to describe the chemical reactions leading to a disease. She or he cannot state, however, whether or not a latent disease, in a specific case, was more likely than not the result of an exposure to a given chemical. The epidemiologist *can*. Such issues of causation

⁴ Title 28 U.S. Code Annotated, Section 133.

⁵ "Agent Orange" Product Liability Litigation, 597 F. Supp. 740 (E.D. N.Y. 1984), affirmed on other grounds 818 F.2d 145 (2nd Cir. 1987).

⁶ Northern District of California "Dalkon Shield" IUD Products Liability Litigation, 526 F.Supp. 887 (N.D. Cal. 1981), vacated 693 F.2d 847 (9th Cir 1982), cert. denied 103 S.Ct. 817 (1983).

⁷ Borel v. Fiberboard Paper Products Corp., 493 F.2d 1076 (5th Cir. 1973), cert. denied, 419 U.S. 869 (1974).

simply are not capable of resolution by lawyers and judges without input from epidemiologists.

The Epidemiologist as a Witness

The law categorizes witnesses as either *fact witnesses*, who have observed things relevant to a case⁸, or *expert witnesses*, who are allowed to give opinions based on the facts in evidence or on facts generally relied upon in their areas of expertise.⁹ In United States' law, when a person, by reason of experience, background, or education, has knowledge that is not commonly shared (such as epidemiologic expertise), that person may give an opinion. The jury is not bound, however, to accept the opinion simply because the person is an expert. Rather, the jurors are the ones who determine the credibility of all witnesses, be they fact witnesses or experts.

Epidemiology cannot provide absolutely certain answers, but that limitation does not disqualify an epidemiologist from being an expert. The question of causation then becomes a matter for the jurors to decide, i.e., whether or not they believe what the epidemiologist has said, or whether they believe the expert on the other side. They also must decide whether the testimony, even though not completely certain, satisfies the legal burden of proof.

Examples of the Use of Epidemiologic Testimony

Epidemiologists only recently have participated as expert witnesses in tort litigation. Judge Finesilver reported to the symposium, for example, that in the early toxic shock syndrome cases, it was argued that the epidemiologic studies conducted by the Centers for Disease Control should not be admitted into evidence because they were based on "hearsay"¹⁰. That is, the defense had no opportunity to cross-examine the individual study participants. Although the studies were eventually admitted, this example shows how the law can lag behind science.

Consider the remarkable case of Charlie Chaplin, who was sued by Joan Barry as the alleged father of her child. All of the hematologists familiar with the case agreed that blood typing proved that Mr. Chaplin could not have been the father.¹¹ The judge, however, held that science was not that far advanced. Thus, he allowed the jury to decide, and it concluded that Charlie Chaplin was the father. It took some 20 years to remedy this misuse of scientific knowledge (Ellman and Kaye, 1979).

⁸ Article VI, Federal Rules of Evidence.

⁹ Article VII, Federal Rules of Evidence.

¹⁰ Kehm v. Proctor & Gamble Manufacturing Co. 724 F.2d 613 (8th Cir. 1983).

¹¹ Barry v. Chaplin, 74 Cal App. 2d 652 (1946).

Epidemiologic Evidence Outside the Courtroom

George Carlo explained to the symposium participants how epidemiologists can serve important legal functions other than providing expert testimony in court. For example, in the legal discovery process, each side prepares for trial by gathering information from the other side. This process reveals and defines the parameters of the litigation. Each attorney prepares interrogatories, which are a series of questions, to submit to the other side. The principles used in formulating the proper questions to one's adversaries are those used in doing survey research. Hence, the epidemiologic expert can provide much insight into what questions are asked and what the answers might mean.

Another example of the use of epidemiologic expertise outside the courtroom is in devising remedies. From an epidemiologic perspective, for example, one remedy might be to screen high-risk groups. Perhaps periodic medical surveillance may be a more appropriate remedy in a given situation. The latter example from public health is one that has not been used much in the courtroom, but it may become a feature of legal remedies in the future. As a further example, epidemiologists can provide courts with estimates of how many cases of a given disease can be expected in the future. Hence, while the causation aspect of epidemiologic input is foremost, there are other areas of legal activity in which the epidemiologic community is qualified to provide assistance.

THE EPIDEMIOLOGIST AS A PARTICIPANT IN THE LEGAL PROCESS

In the federal courts and in most state courts, almost anyone who holds a degree of any kind may be recognized as an expert (Graham, 1986). Some judges are more strict than others about the enforcement of the legal rules on experts, but Mr. Ron Motley explained to the symposium participants that courts generally do a poor job policing so-called "professional witnesses." Mr. Motley cited problems with asbestos industry experts as an example. According to him, asbestos companies often have used expert witnesses who are more like advocates than scientists. These individuals do a disservice to the profession in their misinterpretation of epidemiologic data. This unseemly side of science may taint all expert witnesses with suspicion of complicity and non-professionalism.

The role of the attorney relative to expert witnesses also must be understood. An epidemiologic expert might well be a highly credentialed person. If her or his testimony is injurious to an attorney's case, however, the lawyer certainly will attempt to prove to the jury that the epidemiologist does not know what she or he is talking about, or that she or he is biased. For instance, Mr. Motley told how, in 1958, one epidemiologist had allowed lawyers for several asbestos companies to rewrite a report of a lung cancer study that he, the epidemiologist, had conducted. The epidemiologist then published only that portion of the rewritten report that supported the industry argument (Brodeur, 1985). As a consequence, when this same epidemiologist started testifying in support of

industry during the 1970's, his authority was difficult to challenge. This exemplifies why lawyers must cross-examine vigorously.

After a court accepts an epidemiologist as a qualified expert witness, her or his task is to explain to the jurors (many of whom may not have completed high school) concepts such as experimental versus non-experimental research design, statistical significance, and relative risk. As Paul Stolley noted, the task is challenging enough in a school of medicine or public health. To communicate simply and intuitively to the jury is very difficult; it requires a great deal of preparation. One cannot test the explanation on one's colleagues; they are too well-educated. Professor Stolley suggested to the symposium participants that an expert test her or his testimony on a teenager, or on some friend who has roughly the same educational background as the members of the jury are likely to have.

Judge Rubin, however, cautioned against any tendency to underestimate jurors; that, he said, is an enormous mistake. Jurors are probably not in the same category as graduate medical students, but one should not assume that they are stupid. Jurors will follow the presentation to the best of their ability. Judge Rubin counseled that one should assume that the jury consists of intelligent but *uninformed* people, and thus plan to keep the testimony as simple as possible. Terms that are not commonly understood should be avoided; every effort must be made to *communicate*. If any type of demonstrative evidence is needed to help convey a concept, it must be well prepared; sketching something out the night before is likely to fail. Instead, it should be done in a legible, bold way, keeping in mind that one misspelled word on a chart can adversely affect one's credibility.

Judge Finesilver further advised that one should not be afraid to say "I don't know" to a question. Such a response builds credibility. One also should learn the rules of the courtroom, which is an adversarial arena. A witness should try to negate anything that would give either the judge or the jury cause to question her or his objectivity. One also should avoid complicated mathematics, such as the Chi-squared test. There are other ways of explaining statistical concepts. Finally, when one is finished testifying, one should not shake hands with either lawyer. It should appear to the jury that one is an impartial professional who has been asked to provide information. Too many experts become identified with only the plaintiff's side or only the defendant's side.

After an epidemiologist has served as an expert witness and has completed her or his presentation of data, she or he will be cross-examined. The epidemiologist's credentials will be questioned by the opponent's lawyer. For example, in a case involving vaginal cancer and DES, the opposing lawyer may seize on the fact that epidemiologists do not treat cancer. Paul Stolley presented to the symposium the kind of "dialogue" that might ensue:

"This case involves cancer, does it not"? the lawyer will intone.

"Yes," the expert will reply, "the case involves cancer."

"Doctors who take care of cancer and treat it are called oncologists, isn't that right"?

"Yes."

"Are you an oncologist"?

"No."

"You're not an oncologist"?

"No."

As Stolley tells it, a pregnant pause will follow, after which the lawyer will move to limit the epidemiologist's testimony. The litany then will continue, with an attack on the epidemiologic abilities of the witness. As Stolley reported, the deposition that precedes the trial may be even worse, because no judge will be there to limit some of the more obtuse explorations or the rudeness.

The task of being cross-examined is obviously not easy. Yet, it is important, because some expert witnesses are not adequately qualified. This problem is especially evident in weak cases, or in cases that are hard to defend. Such witnesses provide incorrect information, and if members of the epidemiologic community do not correct this practice, who will? Professor Stolley sees this kind of service as part of the responsibility one assumes when one enters the profession.

PROFESSIONAL ETHICS

Professional Stigmatization

Some of the discussion at the symposium focused on the fact that many epidemiologists are reluctant to become involved with legal issues because of the profession's reaction to such activities. Unlike lawyers, who are usually not stigmatized because they happen to be defending a recognized rogue, when an epidemiologist is retained by someone so perceived, she or he is almost certain to be chastised (overtly or covertly) for being part of the process of defending the "big bad business enterprise."

Some members of the profession will allow themselves to be retained, when their time commitments permit such activities, by whomever contacts them first in a particular instance. Consider what happens if that party happens to be a chemical company about which there has been a great deal of adverse publicity, perhaps unrelated to the case at hand. An epidemiologist is lucky if she/he is not seen as a supporter of the bad conduct. One person attending the symposium

gave the example of Dow Chemical and the antipathy that was expressed toward the company as a result of its manufacture of napalm. If a person is uncomfortable with that scenario, then she/he tends not to become involved in the first place.

Ethical Obligations

As epidemiologists become increasingly involved with litigation, a number of ethical questions arise. Individual epidemiologists sometimes will face tough personal decisions. Many of these issues were highlighted in a 1981 satire by Rothman about the rise and fall of epidemiology between 1950 and 2000 A.D. As he put it, "[epidemiological] issues were clouded by sharp controversy, since many involved conflicts between business and consumer interests, and there were nearly always epidemiologists voicing opinions on both sides of each issue." With continually growing administrative and other impediments to the conduct of epidemiologic research, Rothman foresaw a shrinking of the academic base of epidemiology as an initial indication of its decline: "[Epidemiologists] then were more often representing vested interests on one side or another of the ever controversial issues. Their credentials as health lobbyists required an official sanction, and the once ignored American College of Epidemiology became the professional Union... By 1990, certification by the College was regarded as instrumental for success in the courtrooms and hearing rooms where nearly all epidemiologic issues were decided." Indeed, the lobbyist role and the notion of vested interests have been documented (Teret, 1986).

Is Rothman's satirical retrospective given credence by the members of the symposium panel who indicated that epidemiologic testimony in court is a growth industry? All participants appealed for the involvement of epidemiologists in litigation, and even in the administrative role of surveillance to assist courts in structuring settlements. Indeed, it is conceivable that many more epidemiologists will be lured to the role of the expert witness.

Rothman, in his 1981 paper, referred to a progressive decline in the academic base for epidemiology, suggesting that those so trained would be hired by industry and government "as if both sides were recruiting for a coming regulatory war..." Yet, Judge Rubin, in appealing for epidemiologic input to the courts, assumed that epidemiologists who take on this role will engage in "moral and ethical conduct." Can "moral and ethical conduct" indeed be assumed in the adversarial courtroom setting and with the observation of a proliferation of apologists entering the court system?

Sohl and Bassford (1986) have noted that "among the commonly accepted traits used to distinguish a *profession* from an *occupation* is the autonomy of self-regulation of the profession...self-regulation carries with it an ethical component, and involves a moral commitment on the part of the profession... Professional codes...have two moral functions: as a quality assurance guarantee

to society and as a checklist for the initiated members of the profession of the standards and limits of practice."

It is noteworthy that although epidemiology recently has evolved to the point where it generally is perceived as a profession, the view of Sohl and Bassford would suggest that epidemiology should be perceived only as an occupation. Ethics guidelines and self-regulation have not yet been established by this group of self-proclaimed professionals. While such a situation prevails, can epidemiologists legitimately testify under oath that they indeed are offering a "professional opinion?" It also is noteworthy that only physician-trained epidemiologists will have taken any professional oath and/or belong to those medical associations that are self-regulating. The Ph.D.-trained (non-M.D.) epidemiologist, however, has no such professional base. Furthermore, questions may be raised as to the appropriateness of medical association governance over the realm of epidemiologic endeavor. In light of these considerations, no person engaged in epidemiology could be deemed to have subscribed to standards of ethics appropriate for epidemiologists.

The prophesy of Rothman, therefore, needs to be re-examined in terms of the role of the American College of Epidemiology. The College is not a regulating body. However, in 1992, work was begun on the formulation of appropriate ethics guidelines and standards of practice. Soon to be expected are ethics guidelines that will facilitate ongoing education and, hence, that self-regulation deemed fundamental by any group of professionals. The likelihood of success is great because of recent attempts by sub-specialty groups to develop guidelines¹² (Beauchamp et al., 1991).

One outcome from the efforts of the American College of Epidemiology could be to assist the legal community in selecting an epidemiologic expert. If concern over stigmatization influences the epidemiologist against serving the court, a body such as the College could establish a list of members by region and expertise from which judges and counsel could draw in selecting expert witnesses.

It becomes important for organizations like the American College of Epidemiology to define and publicize the scope of the profession's investigations and other activities. If a set of ethics guidelines existed, it might establish the integrity of the witness and minimize any potential for stigmatization by:

- protecting participation of selected epidemiologists as a public service;
- defining, among other things, the limits of interpretation associated with the

¹² The Chemical Manufacturers Association's Epidemiology Task Group. "Guidelines for Good Epidemiology Practices for Occupational and Environmental Epidemiologic Research." (1991). *J. Occup. Med.* 33(12):1221-1229.

- uncertainty related to various types of epidemiologic evidence;
- providing guidelines for professional and personal conduct;
- defining what type of case warrants the expert testimony of an epidemiologist as an expert witness in relation to society.

In this way, a roster of all epidemiologists for court actions would exist and the opportunity for stigmatization would be minimized. These constraints could also apply to cases in which the legal representatives of the plaintiff or the defendant require expert witnesses.

A set of ethics guidelines has been recommended before (Soskolne, 1985, 1989), and the prospect of epidemiologists taking an active role in court proceedings serves to provide additional and urgent justification for the development of guidelines. In the absence of such guidelines, a greater disservice to epidemiology could arise. Guidelines might serve to obviate the more sinister predictions of Rothman, affirm the professional stature of epidemiology, and save the discipline from any possible demise.

UNRESOLVED ISSUES

The symposium upon which this chapter is based highlighted a number of issues that require further discussion by both the epidemiologic and legal communities. These include: the handling of conflicting interests by epidemiologists; establishing, as suggested above, through the American College of Epidemiology, a register of epidemiologists who are qualified to serve as expert witnesses; determining the best means for communicating technical data to juries; and establishing the legal mechanisms needed to deal with multi-factor causation. Even more fundamental, of course, is the need for continued communication between epidemiologists and lawyers; many outstanding issues require their ongoing attention.

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GLOSSARY OF TERMS

- Administrative Law:** That branch of law dealing with the setting of standards and in determining, for example, whether a drug should or should not be used.
- Admissible Testimony:** Evidence which the jury is permitted to consider in its deliberations.
- Attributable Fraction:** The excess number or percentage of diseased cases as a result of the exposure in question.
- Defendant:** The persons defending themselves against the allegations of the plaintiff.
- Deposition:** Proceedings preceding a court trial involving information gathering for either out-of-court settlements or for the court proceedings.
- Discovery Process:** The early stages of litigation when lawyers representing both the plaintiff and defendant gather and exchange information so that the parameters of the case can be decided.
- Expert Witness:** Any person agreeing to provide testimony in the capacity of her/his profession at the request of the court — a powerful weapon for a judge. Such a witness is an "opinion witness" as opposed to a "fact witness."
- Fact Pattern:** The facts of legal cases are often categorized into "fact patterns" that recur from case to case. When a "fact pattern" is identified, a rule of law may be developed to address it.
- Fact Witness:** A person who has seen, heard, or done something.
- Friend of the Court:** Evidence presented by an interested party who feels she/he can be of assistance; the evidence usually is filed as a brief rather than as testimony.

Jury Survey:	The process of identifying jurors for a particular case. A jury survey may be conducted by the representative of the plaintiff and/or the defendant.
Litigation:	The process of invoking law to argue against or defend an allegation.
Opinion Witness:	See "Expert Witness."
Plaintiff:	The person(s) alleging that they have been harmed and demanding that an injustice be corrected, usually through financial compensation.
Remedies:	The means by which a legal right is enforced, or the violation of a right is prevented, redressed, or compensated.
Rule 702:	A court ruling that governs the testimony of expert witnesses.
Structured Settlement:	A court decision awarding compensatory payment from an established fund based on projected future case demand. It is a settlement over a period of time for both present and future expected cases based on a scientific determination for the projections.
Tort Law:	That branch of civil law - distinct, for example, from criminal law and administrative law- dealing with personal injuries or diseases.

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