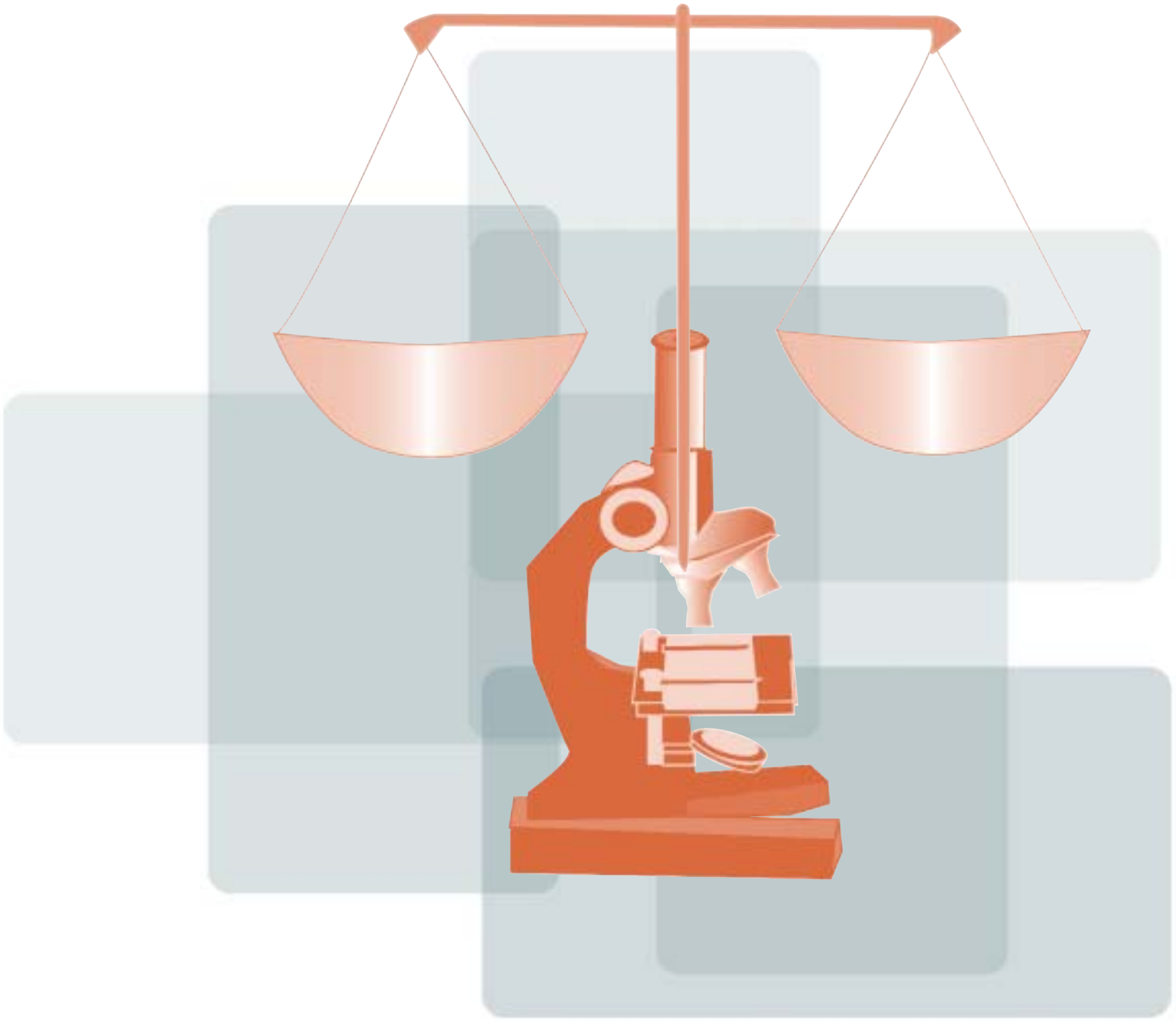
Daubert:
The Most Influential Supreme Court Ruling You've Never Heard Of

A Publication of the Project on Scientific Knowledge and Public Policy, coordinated by the Tellus Institute



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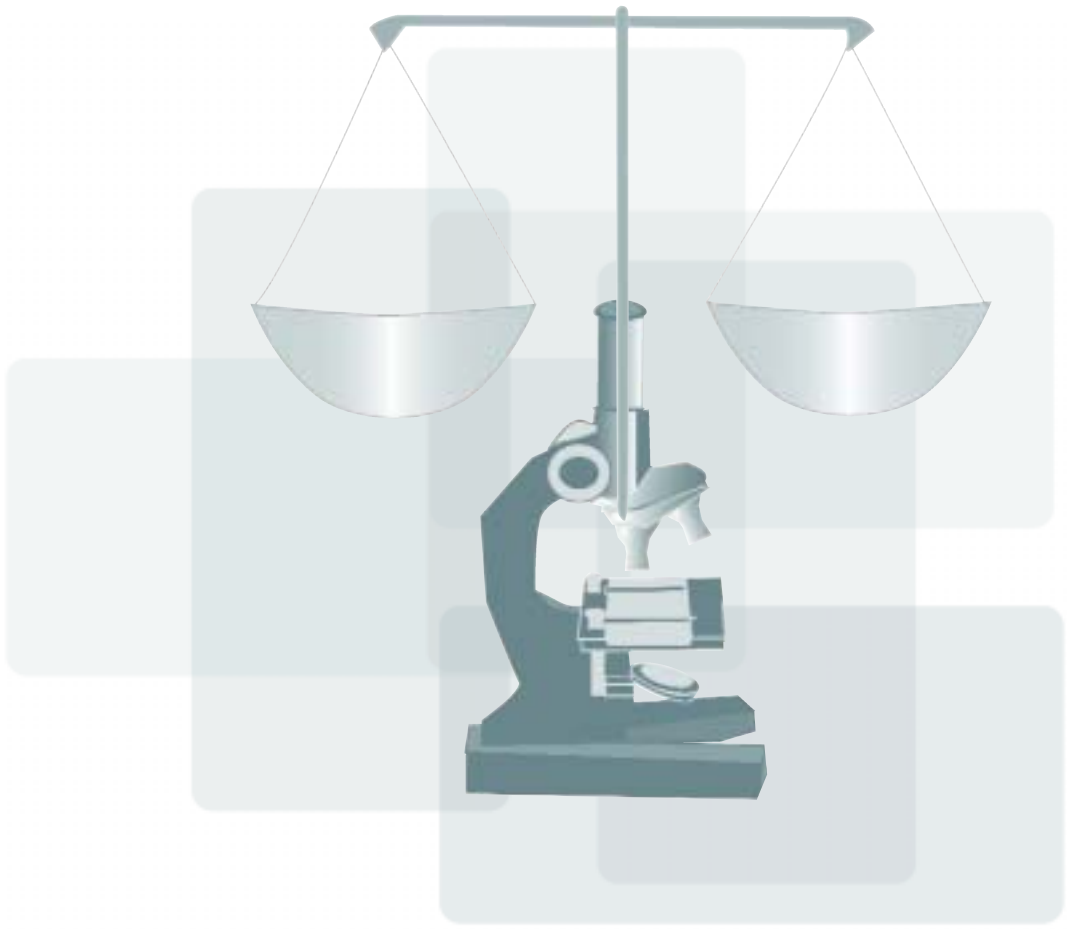

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THE PROJECT ON SCIENTIFIC KNOWLEDGE AND PUBLIC POLICY (SKAPP) is an initiative engaging eminent scholars and scientists to examine scientific evidence and its application in the legal and regulatory arenas. The project encourages the understanding and use of the best available scientific evidence in policy decision-making. The planning committee and staff for SKAPP include academics and researchers with backgrounds in philosophy, biochemistry, medicine, epidemiology, economics, and occupational and environmental health, several of whom have previously served at high levels in government.

Planning Committee

Eula Bingham, PhD, Professor of Environmental Health, University of Cincinnati College of Medicine.

Les Boden, PhD, Associate Chair and Professor of Environmental Health, Boston University School of Public Health.

Richard Clapp, DSc, MPH, Professor of Environmental Health, Boston University School of Public Health.

Polly Hoppin, ScD, Senior Scientist, Tellus Institute.

Sheldon Krimsky, PhD, Professor of Urban and Environmental Policy and Planning, Tufts University.

David Michaels, PhD, MPH, Research Professor of Environmental and Occupational Health, George Washington University School of Public Health and Health Services.

David Ozonoff, MD, MPH, Professor of Environmental Health, Boston University School of Public Health.

Anthony Robbins, MD, MPA, Professor of Family and Community Medicine, Tufts University School of Medicine.

Staff

Molly Jacobs, MPH, Research Associate, Tellus Institute.

Celeste Monforton, Senior Research Associate, George Washington University School of Public Health and Health Services.

Daubert:
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TEN YEARS AGO, on June 28, 1993, the United States Supreme Court issued an opinion relating to how federal judges should decide whether to allow expert testimony into the courtroom. Prior to this, most federal and state court judges had been relying upon two standards to decide if expert testimony was admissible: relevance (if the testimony addressed a fact at issue in the case and if it would be helpful to the jury); and a 1923 ruling known as *Frye*, which held that the methods used by the expert in forming his scientific conclusions must be generally accepted within the expert community. Critics of *Frye* argued that it often excluded new but legitimate science that had not yet gained a consensus within the scientific community. Moreover they pointed out that science was not a "majority rules" endeavor. On the other hand, others argued that abandoning the *Frye* standard and relying merely on the relevance standard allowed in too much science that was poorly designed or not reliable – what some chose to call "junk science."

The Supreme Court sought to clarify these standards in *Daubert v. Merrell Dow Pharmaceuticals, Inc.*[1] by directing judges to act as "gatekeepers" in the courtroom. It instructed judges to examine the scientific method underlying expert evidence and to admit only that evidence that was both "relevant and reliable." Two later cases, *General Electric v. Joiner* and *Kumho Tire Co. v. Carmichael*, expanded upon this opinion.[2] In *Joiner*, the Supreme Court ruled that appellate courts should not overturn the admissibility decision of a trial court unless the trial court abused its discretion, an extremely difficult thing to show. *Kumho* clarified the *Daubert* ruling by finding that it should be applied to all expert testimony, including testimony based on experience, not merely that which relied upon science.

But what started as a well-intentioned attempt to ensure reliable and relevant evidentiary science has had troubling consequences. Over the past 10 years some judges, in our opinion, have routinely misinterpreted and broadened the reach of *Daubert*, which has become the latest and most effective tool used by tort defendants to protect themselves from product liability and personal injury cases. Polluters and manufacturers of dangerous products are successfully using *Daubert* to keep juries from hearing scientific or any other evidence against them.

In the aftermath of *Daubert*, not only are many legitimate scientists and their work being barred from the courtroom, but plaintiffs are being denied their day in court, unfairly in our view. Much of the evidence that forms the basis of a plaintiff's case, from the safety of drugs and consumer products to whether pollution has caused harm, is based on science. In many cases, pre-trial "*Daubert* hearings" exclude so much of the evidence upon which plaintiffs intend to rely that a given case cannot proceed.

Moreover, this process is largely shielded from public view. The *Daubert* hearing does not happen at the trial, and most judicial decisions on admissibility are not published. And because of *Joiner*, they are nearly impossible to overturn.

Following *Daubert*:

- The percentage of expert testimony by scientists that was excluded from the courtroom rose significantly.[3]
- This rise in excluded testimony has led to an increase in successful motions for summary judgment, since, without expert testimony, there is often little left with which to proceed. The percentage of summary judgments granted post-*Daubert* more than doubled. Over 90 percent of these judgments came down against plaintiffs.[4]
- The expense of defending a *Daubert* challenge appears to be having a "chilling effect" upon plaintiffs, who don't have the same resources as large corporations and often cannot afford to defend against aggressive attacks on their experts.[5]
- Scientists and physicians are likely to be increasingly reluctant to provide expert testimony in civil litigation cases because of the lengths to which defendants go to discredit them and their work.
- Emboldened by their success in the courtroom, powerful interests are now trying to extend the reach of *Daubert*-like evidentiary standards to the regulatory arena, where they may affect the federal government's ability to understand and act to reduce risk from hazardous exposures.[6,7]
- In contrast, because of the cost of mounting *Daubert* challenges, they are rarely brought in the criminal justice system, where life and liberty – rather than economic interests – are at stake.[3] It is in this arena where the most meager rather than the most stringent scrutiny of scientific evidence is applied.

The *Daubert* Definition of Good Science

When the Supreme Court issued its opinion in *Daubert*, it suggested four criteria for determining whether science was reliable and, therefore, admissible:

1) is the evidence based on a testable theory or technique;
2) has the theory or technique been peer reviewed;
3) in the case of a particular technique, does it have a known error rate and standards controlling the techniques operation; and
4) is the underlying science generally accepted?

The Court cautioned that the list should not be regarded by judges as "a definitive checklist or test," opening the door for judges to employ criteria of their own.

Two Supreme Court Justices voiced serious concerns about asking federal judges to take on the role of deciding what is good versus bad science, fearing that this was akin to asking judges to become "amateur scientists." Notably, Chief Justice Rehnquist, joined by Justice Stevens, wrote in a dissenting opinion: "Questions arise simply from reading this part of the Court's opinion, and countless more questions will surely arise when hundreds of district judges try to apply its teaching to particular offers of expert testimony."[1]

It isn't just federal district judges who interpret these teachings, however. Though *Daubert* was based on an interpretation of the Federal Rules of Evidence, and intended for use by federal judges, roughly one-third of state courts (which routinely adopt Federal Rules of Evidence) have also adopted the *Daubert* criteria in determining the admissibility of expert testimony.

Some leading jurists, however, seem quite dismayed by the notion of judges attempting to determine the validity of scientific evidence using the criteria established in *Daubert*.

> "…the *Daubert* opinion appears politically naïve about the 'methods and procedures' of both science and evidentiary admissibility," wrote Arizona Supreme Court Chief Justice Stanley Feldman, in a case in which expert testimony had been excluded in a lower court. "Multi-factored, 'flexible' tests of the sort announced in *Daubert* are more likely to produce arbitrary results than they are to produce nuanced treatment of complex questions of admissibility."[8]

One result of *Daubert* is a battle over where product liability and toxic tort cases are tried. Plaintiffs prefer those state courts that are friendlier to their experts. Defendants on the other hand, try to remove these cases to federal court, where they have a better chance of having expert testimony excluded and winning summary judgment.

In some cases, plaintiffs have even tried suing the doctor who prescribed the drug or the pharmacist who filled the prescription to keep the case in state court. Noted legal scholar and Brooklyn Law School Professor Margaret Berger explains that if one of the defendants lives in the same jurisdiction as the plaintiff, the action cannot be removed to federal court.

"Now, there is an effort by defendants to stop that [venue-based suits] by alleging fraud or collusion because the plaintiff never really intended to proceed against the doctor or pharmacists," said Berger. "Defendants are asking that the case should be removable to federal court where it's often much easier to get the plaintiff's experts excluded; because it's in federal court that you are getting these opinions."[9]

Whose Definition of Science Is This?

In the two decades prior to *Daubert,* the number of product liability and so-called "toxic tort" cases had been rapidly increasing. Corporations that had manufactured hazardous products, like asbestos, were losing in court and paying large sums of money to people who died or were made sick by their products.

It was against this backdrop that Peter Huber and the ultra-Conservative Manhattan Institute launched a highly successful public relations campaign aimed at discrediting the work of scientists who found evidence of adverse health effects caused by exposure to a range of toxic chemicals.[10]

Well-funded by corporate backers, Huber and the Manhattan Institute promoted the phrase "junk science." The term "junk science" has no real meaning. In his widely publicized and distributed book, *Galileo's Revenge,* Huber offers only a broad-ranging "I know it when I see it" description of "junk science" rather than a definition:

> "Junk science is the mirror image of real science, with much of the same form but none of the substance….It is a hodgepodge of biased data, spurious inference, and logical legerdemain…..It is a catalog of every conceivable kind of error: data dredging, wishful thinking, truculent dogmatism, and, now and again, outright fraud."[11]

The term "junk science," like pornography, seems to be in the eye of the beholder. Simply stated, junk science usually seems to be science whose results or methods the user of the phrase disagrees with. Predictably, researchers who are funded by the tobacco industry, (which also helped fund the "junk science" movement) are never labeled junk scientists by Huber and his colleagues.

In *Galileo's Revenge,* Huber attacked the environmental and occupational sciences in particular, leveling factually inaccurate charges against many scientific endeavors that might appear to threaten corporate interests. Following the publication of his book in 1991, Huber gained unprecedented influence among judges and policymakers. The widespread publicity elevated Huber to a position as one of the country's leading voices in the policy debate over tort reform.

Galileo's Revenge became so widely recognized it was frequently cited by lawyers, lobbyists, former Vice President Dan Quayle and – most crucially – Judge Alex Kozinski, who used Huber's definition of "good science" as "the main explication of the scientific method" when writing his opinion in *Daubert* for the U.S. Court of Appeals for the Ninth Circuit, where the case was remanded by the U.S. Supreme Court.[12]

That this book was quoted by Judge Kozinski when he wrote his opinion was a major coup for Huber and his backers. The *Daubert* opinion – and the way in which it is being interpreted – has provided a mechanism for Huber's point of view to substantially impact the entire civil litigation system.

When Judge Becomes Scientist…and Clinician…and Jury

One of the myths propagated by *Daubert* is that scientific methodologies and opinions are made up of universally-adopted standards that can be evaluated by judges using a simple checklist. *Daubert* encourages judges to separately evaluate the various elements of scientific evidence, rather than proceeding as most scientists do, by assessing the totality of the evidence, giving greater or lesser importance to particular parts. Reputable scientists often reach different conclusions when analyzing the same data and using the same methodologies. Perhaps in an attempt to find clarity where none may yet exist, some federal judges seem to be setting standards for "good science" that are higher (and often based on an erroneous understanding of the methods) than those used by experts within the field – taking on precisely the role of "amateur scientist" as Chief Justice Rehnquist feared.

Scientific evidence and opinion is especially crucial in toxic tort cases, when a plaintiff relies on scientific experts to demonstrate causality. This burden on the plaintiff is considerable because very little is known about the toxicity of the 100,000 chemicals or their derivatives that are registered for use in commerce. A study by the National Research Council found that the most basic toxicity data on 75 percent of the nation's 3,000 high-volume chemicals cannot be found in public records.[13]

Even when toxicity data is available, researchers rarely reach definitive conclusions that proclaim: "exposure to toxic substance A will cause disease B." What they do find is that a group of people, when exposed to a certain substance, are more or less likely to develop a particular disease or condition than those not exposed. Epidemiologists – scientists who study the distribution and determinants of disease and injury – also examine the length of time between an exposure and when a person first develops symptoms of the disease; the intensity and duration of the exposure; and other factors, such as whether she has been exposed to anything else that might have caused the disease, among other things.

"In the final analysis, assessment of evidence and causal inferences depend on accumulating *all* potentially relevant evidence and making a subjective judgment about the strength of the evidence," according to Dr. Jerome P. Kassirer, former editor-in-chief of the *New England Journal of Medicine* and Dr. Joe S. Cecil of the Federal Judicial Center. Drs. Kassirer and Cecil examined the impact of *Daubert* in a 2002 article published in the *Journal of the American Medical Association (JAMA)*. They found that a number of courts require standards for expert testimony that exceed those that physicians use in ordinary clinical decision-making.[14]

Some judges, however, have dismissed cases because the plaintiff did not have evidence from epidemiological studies. The scientific community understands that for many toxic substances, epidemiological evidence does not exist and may never be available for particular chemicals. It is unethical for researchers to feed toxic substances to people or force them to breathe hazardous chemicals to see what dose causes cancer. Instead, scientists rely on the results of "natural experiments" where exposures have already happened. Scientists rely on the data that is available, like a detective gathering evidence. Scientists, like detectives, may never have all the evidence, but will offer an opinion based on the available information.

Making "reasoned judgments" after "accumulating *all* potentially relevant evidence" is the role a jury ordinary plays. The "preponderance of the evidence" standard, which juries are directed to apply in civil cases, would have them do precisely that. But oftentimes juries do not have the opportunity to make those judgments, because judges are excluding evidence via *Daubert* hearings – not based on its cumulative impact but based upon the strength or weakness of each individual piece of evidence – before it ever reaches the jury.

"It is all being handled pretrial," remarked Berger. "And the public trial before a jury doesn't occur."

That's more than just a shame – it raises serious constitutional issues.

"I think the Seventh Amendment could be read as not just entitling a litigant to a jury verdict, but more broadly to a jury trial when experts in different disciplines disagree," Berger explained.

> "Even if a plaintiff's verdict were ultimately set aside as not based on sufficient evidence of causation, a public trial means the plaintiff gets to tell his or her story and it also means that wrongdoing on the part of defendants can be exposed. Even when causation cannot be proved, that does not necessarily mean that defendants did not act in a reprehensible manner in exposing the public to risk. For example, problems often develop with drugs long after they have been approved for market. Jury trials could reveal whether corporations knowingly kept drugs or products on the market after it became clear that problems existed. If such a case ends with a *Daubert* hearing, none of this will ever become public."[9]

The Two-Fold Increase in Risk Standard & Statistical Significance

In the post-*Daubert* world, judges increasingly prevent juries from hearing any epidemiological evidence related to causation. One reason for this is that some judges require that an epidemiological study demonstrate a two-fold increase in risk of

health effects from an exposure, plus statistical significance. In addition, it is well established that the legal community equates epidemiologic measures such as a two-fold increase in disease with the legal threshold of "more probable than not."[15]

"Insisting upon a study finding a two-fold increase in risk of disease related to exposure as a fixed standard of association inappropriately confuses a number of fundamental epidemiologic principles," said Dr. Barry Levy, a physician and epidemiologist. Dr. Levy is an independent consultant in occupational and environmental health and an Adjunct Professor of Family Medicine and Community Health at Tufts University School of Medicine. He is also a past president of the American Public Health Association and senior co-editor of a leading textbook on occupational health, now in its fourth edition. "There are many relatively weak associations that are well accepted as being causal, such as the association between passive smoking and lung cancer," he said.[9]

"For example, most studies of the relative risks of lung cancer among nonsmoking women as a result of their husbands being light smokers show a relative risk between 1.0 and 2.0 – elevated, but not doubled. This less than two-fold risk increase is widely accepted as causal. But under the two-fold standard required by some judges, this scientific finding would have been thrown out."

Consider the court's misunderstanding of epidemiologic principles in the case of *Chambers v. Exxon Corp.*, in which a contractor at an oil refinery in Baton Rouge was exposed to benzene and who then developed chronic myelogenous leukemia (CML), a rare form of cancer.

Dr. Peter Infante, former Director of the Office of Standards Review at the U.S. Department of Labor's Occupational Safety and Health Administration and an Adjunct Professor of Environmental and Occupational Health at George Washington University, was to have testified as the author of a 1977 study that confirmed that benzene caused leukemia. He also would have testified regarding a 1995 analysis he published that found a four-fold increase in the risk of developing CML from exposure to benzene.[16]

But the judge excluded his testimony, relying upon a statistical significance standard, and issued a summary judgment in favor of the defendant. Dr. Infante said the judge not only made a factual error – his analysis was the first to show a more than two-fold increase plus statistical significance – he asked for more than what most in the field would have required for such a rare disease.

"No one in the world will disagree that benzene causes leukemia," Dr. Infante said. "But, to show it causes the less common types of leukemia is very difficult because studies of blue collar workers don't have enough statistical power to identify these excessive risks even when they are present. Nonetheless, my 1995 analysis did just that."[9]

In the *Chambers v Exxon case,* it should not have been necessary to push the bar to such elevated heights, in any event, Dr. Infante said. "Because if you looked at the totality of the scientific evidence, there were enough other facts to support the claim. Furthermore, he was exposed to benzene and nothing else that was known to cause leukemia. How could it not have contributed to it?"

Legal scholar Margaret Berger notes that some state courts, such as the New Jersey Supreme Court, have rejected the two-fold relative risk as a threshold for the admission of epidemiological evidence.

Methodology

Because *Daubert* requires judges to examine scientific methodology, some judges appear to have interpreted this to mean they can simply exclude all testimony that relies upon any methodology they are not comfortable with – even if the methodology is well-accepted by experts in the field.

In the case of *Castellow v. Chevron USA*, for example, the court rejected all of the plaintiff's experts because it did not believe in the methodologies used by one of them.[17] In this case, Dr. Levy was to have testified regarding the strong association between exposure to benzene and development of acute myelogenous leukemia (AML), as he had in a deposition. In his trial testimony, he would have stated that benzene has been shown to cause AML and that, specifically, the plaintiff's exposure to benzene more likely than not caused him to develop this disease.

Another expert, a senior industrial hygienist, testified in a deposition about the exposure assessment he prepared that used an exposure model to estimate the plaintiff's exposure to benzene.

"The judge excluded both the industrial hygienist's modeling testimony and my testimony, which was, in part, based on modeling, because the judge did not believe in modeling as a methodology – even though modeling is an established practice among researchers and others in the field," Levy said.[9]

Other federal judges have excluded testimony because they disapprove of certain kinds of evidence, such as case studies or clinical diagnoses. In *Nelson v. American Home Products Corp.*, a man who was prescribed the drug Cordarone to control ventricular arrhythmia following a heart attack began losing sight in one eye shortly after he began taking the drug. The plaintiff brought together six expert witnesses, including a professor of neuro-ophthalmology at the University of California San Francisco who had diagnosed three similar cases of Cordarone-induced optic neuropathy. Included in their testimony would have been evidence that following this gentleman's

injury, the manufacturer changed the package insert for the drug, noting that some patients developed impaired vision after taking it.[18]

However, because most of the evidence the plaintiff would have presented was in the form of clinical evidence and case studies and *not* epidemiological studies, the judge excluded all of the evidence and granted summary judgment in favor of American Home Products.

Case reports, the judge wrote, "do not demonstrate a causal link sufficient for admission to a finder of fact in court," are not subject to peer review and "do not advance testable scientific analysis." The last two of these three points are false. Yet this is the type of evidence routinely used by clinicians, according to Drs. Kassirer and Cecil in their 2002 *JAMA* article on inconsistencies in evidentiary standards. "In clinical medicine, a biologically plausible relationship, physiological studies of a drug, animal studies, or even a handful of case reports can be useful in individual cases in helping a practitioner make judgments about cause and effect relationships."[14]

Same Evidence, Different Standards

Respected scientists often reach different conclusions regarding the same data. Unfortunately, when confronted with disagreement within the scientific community regarding such evidence, some judges take it upon themselves to resolve these disputes or disallow all testimony, rather than allowing the jury to hear both sides.

Not unexpectedly, different judges have also reached different conclusions when presented with the same evidence.

Several similar lawsuits brought in state and federal court against the manufacturer of Parlodel, a drug used to suppress lactation, support this point. Plaintiffs in these cases alleged that Parlodel caused them to have strokes, seizures and heart attacks. Sandoz Pharmaceuticals, the manufacturer of Parlodel, eventually revised its package insert to report case studies of postpartum hypertension, seizures and strokes. The FDA continued to receive reports of adverse reactions to the drug and in 1994 Sandoz agreed to the Food and Drug Administration's proposal that it completely withdraw the drug's indication as a lactation suppressant.[19]

The plaintiffs in these suits against Sandoz presented case studies, animal studies, challenge-rechallenge data, toxicology studies and the opinions of medical professionals, including testimony from a member of the FDA's Fertility and Maternal Health Drugs Advisory Committee who had reviewed the safety of Parlodel for the federal government.

In the majority of cases, judges excluded the expert testimony and granted summary judgment to Sandoz. In *Hollander v. Sandoz Pharmaceuticals, Corp.*, for example, the judge dismissed two entire classes of science – animal studies and case reports – as unreliable. The judge said the results of animal studies could not be extrapolated to humans and gave no credibility to case studies because they "are not controlled studies and do not eliminate confounding variables."[20]

At least one judge thought a jury should hear the disputed facts regarding Parlodel and make up its own mind. In *Globetti v. Sandoz Pharmaceuticals*, the U.S. District Court for the Northern District of Alabama wrote a starkly contrasting opinion, based upon much of the same evidence.

> "It is not part of the trial judge's gatekeeping role to determine whether the proffered opinion is scientifically *correct* or *certain* in the way one might think of the law of gravity [emphasis in original]," the court wrote. "…it is the fact-finder's role (usually a jury) to determine whether the opinion is correct or worthy of credence. For the trial court to overreach in the gatekeeping function and determine whether the opinion evidence is correct or worthy of credence is to usurp the jury's right to decide the facts of the case. All the trial judge is asked to decide is whether the proffered evidence is based on "good grounds" tied to the scientific method."[21]

Chilling Effect

Defending a *Daubert* challenge can cost plaintiffs hundreds of thousands of dollars. Even if the plaintiff prevails the jury award may barely cover those costs. This may be one of the reasons that, in the 10 years since *Daubert*, the number of tort trials has been steadily decreasing.[5]

In a 2002 analysis by the RAND Institute for Civil Justice, researchers examined 399 published and unpublished federal decisions over a 20-year period to determine the overall impact of *Daubert*. They found that after an initial spike in the number of challenges to expert testimony, the incidence began to fall off dramatically, suggesting that plaintiffs increasingly decided not to bring actions that relied heavily upon scientific testimony unless that testimony met the *Daubert* standards.

Plaintiffs may likely have been further discouraged from bringing claims by the rise in summary judgments following *Daubert*. The RAND analysis found that, in the period immediately after the ruling, several trends occurred simultaneously:

- the proportion of evidence that was challenged rose;
- the proportion of challenges resulting in evidence being excluded rose;

- the frequency with which motions for summary judgment were brought (and granted) also rose.[4]

The RAND analysis also found that judges were excluding challenged evidence if it failed to meet even a single one of the *Daubert* criteria, despite the Supreme Court's caution that they should not use these criteria as a "checklist."

These trends may have discouraged plaintiffs from bringing suits, and they clearly encouraged defendants "to expand the scope of their challenges to the point where they increasingly challenged the entire basis of the case and thus more frequently requested summary judgment," the RAND authors wrote. The percentage of summary judgments granted post-*Daubert* more than doubled, the RAND report found. Nearly 90 percent of these judgments were granted in favor of defendants.[4]

"*Daubert* works effectively as another tool for terminating litigation without a trial or jury," concluded Professor Berger, in her own analysis of the impact of *Daubert*, presented at a conference on scientific evidence and public policy earlier this year.[5]

> "In my mind, *Daubert* gives trial judges far more authority over civil cases than they ought to have," said Arizona State Supreme Court Chief Justice Stanley Feldman, now retired after 20 years on the bench. "What I feared would happen eventually, and what has happened, is that instead of having jury trials we now have *Daubert* hearings before the judge. The judge, in effect, then determines the outcome of the case by granting summary judgment. To my mind, this far exceeds any power that the Constitution gave judges over jury trials."[9]

If *Daubert* has had a chilling effect upon plaintiffs, it has also discouraged the experts, many highly regarded in their fields, whose testimony is at risk of being discredited by judges who disapprove of the methodology they used.

David Michaels, a Professor in the Department of Environmental and Occupational Health at the George Washington University School of Public Health and Health Services and former Assistant Secretary of Energy for Environment, Safety and Health at the U.S. Department of Energy, said the *Daubert* process may be keeping well-regarded scientists out of an area where they could be providing a public service. "I'm concerned that scientists are hesitant to testify for fear of being drawn into a lengthy and unpleasant process where they have to defend their good names," he said.[9]

Likewise, "some physicians now decline in frustration to participate in legal proceedings," Drs. Kassirer and Cecil write in their 2002 *JAMA* article.

Another costly consequence for plaintiffs is that the presentation of evidence at a *Daubert* hearing allows the defendant ample time to prepare its own experts. Since most defendants in product liability or toxic tort cases have far more resources than the person bringing suit, they can easily hire experts to prepare studies that, at the very least, cast doubt upon the "guilt" of their product.

As Justice Feldman rightly pointed out in his 2000 opinion, "corporations and other wealthy defendants…(are) the very parties most capable of manufacturing or purchasing questionable scientific opinions."[8]

Your Money or Your Life: Where's Daubert?

Daubert has *not* been widely applied in the criminal justice sciences, where prosecutors often rely on evidence of questionable validity (such as bite marks, blood splatter and shoe identification) – even though far more is at stake.

Most defendants in criminal cases simply do not have the financial resources to launch *Daubert* challenges to the state's expert witnesses, Berger points out. Nor can they afford to bring in their own experts. Because challenges to expert testimony in the criminal justice system are rare, exclusions are even rarer. "There have been some attempts but most criminals are indigent and get assigned counsel," she said. "They have neither resources nor time to investigate complex legal issues, and states with strained budgets are often unwilling to fund defense experts."[9]

Moreover, the courts tend not to sympathize with people accused of committing crimes. Faulty science routinely goes unchallenged in the criminal courts according to Peter Neufeld, an attorney and co-founder of The Innocence Project at the Benjamin N. Cardozo School of Law. The Innocence Project represents hundreds of inmates seeking post-conviction release through DNA testing. "*Daubert* has had little impact on protecting criminal defendants from wrongful convictions," Neufeld laments. Absent the context of potentially millions of dollars of corporate finances at stake, "in that kind of context, you're not going to get that kind of rigorous investigation of the merits of the evidence, generally speaking," he said.[22]

And that, said Professor Michaels, is where *Daubert* has turned our nation's system of justice upon its head. "Given our societal commitment to convict only those who are guilty of a crime beyond a reasonable doubt, the quality of scientific evidence used in criminal cases deserves far greater scrutiny than it currently receives," he said. "In contrast, it appears that inappropriate and inconsistent scrutiny of expert witness testimony is occurring in our system of civil justice. There is something very wrong about this."[9]

Taking *Daubert* Beyond the Courtroom

The influence of *Daubert* does not end at the doors of the courtroom. Empowered by their success in the federal and some state courts, tort "reform" groups, well-financed by industry and insurance trade associations, have expanded their decades-long campaign against "junk science," to include forays into the regulatory arena.

Toward this end, the Annapolis Center – a think tank founded by a vice president of the National Association of Manufacturers and funded by several steel companies, oil refiners, electric utilities and industry groups –convened a work group of scientists, doctors and lawyers – to develop "a primer for non-scientists who seek to understand epidemiologic studies" and how such evidence "can best be used by legal decision-makers." The primer, titled, "Epidemiology in Decision-Making" published in 1999, calls for "the application of *Daubert* to judicial review of the science upon which administrative agencies rely."[7]

Indeed, large corporations and their representatives have recently issued several *Daubert*-like challenges to the U.S. Environmental Protection Agency (EPA) under the Data Quality Act. This Act, passed in 2000, provides interested parties with a formal administrative mechanism for challenging the quality of scientific information used in Federal regulatory agency decision making.[23, 24]

In one of the first petitions under the Data Quality Act, the Center for Regulatory Effectiveness (CRE) – a lobbying group acting on behalf of corn growers and the chemical industry – challenged EPA's right to draw conclusions about the potential ecological effects of the widely-used herbicide, atrazine. The CRE petition argued that EPA could not include peer-reviewed academic studies documenting endocrine disruption effects in its assessment of risk from atrazine, because EPA had not yet established testing protocols to characterize endocrine effects. These studies showed that developing frogs exposed to atrazine at levels *below* those currently allowed in drinking water and ambient water produced sexual deformities, including hermaphroditism.[25, 26]

The EPA has deferred its decision about what conclusions it will draw about the endocrine-disrupting potential of atrazine until after a meeting of the pesticide Scientific Advisory Panel, scheduled for June 2003. But in a written response, EPA reassured CRE that the revised risk assessment would state that, "based on the existing data uncertainties, the chemical should be subject to more definitive testing once the appropriate testing protocols have been established." This comment raises the specter of EPA ignoring credible peer-reviewed studies that show unexpectedly dramatic effects because of industry pressure applied under the Data Quality Act.[27]

Last year, the U.S. Chamber of Commerce went even further, proposing that the Bush administration adopt an Executive Order "requiring all federal agencies to apply the *Daubert* standards in the administrative rulemaking process." In a statement posted on its website, the Chamber calls for "the same standards of relevance and reliability that safeguard the rights of litigants in federal courts" to be applied to the science underlying federal regulations.[6]

Should an Executive Order be adopted, the Chamber statement assures, "we will work with the administration and Congress to ensure that adequate enforcement procedures are available to compel agency compliance with any *Daubert*-based Executive Order or legislation and will continue to track federal agency rulemaking to ensure compliance with existing laws requiring the use of high quality information in the rulemaking process."[6]

Clearly, some powerful interests are hoping to extend the reach of *Daubert* well beyond the civil justice system and deep into the policies and regulations that protect the public's health and safety.

Where Will It End?

In his study of evidentiary standards in regulation and law, Professor Sheldon Krimsky of Tufts University identifies a disparity between how regulatory agencies and the courts assess risk of exposure to chemicals and other hazards.[28] Regulatory bodies such as the EPA and the Occupational Safety and Health Administration, drawing on practices widely accepted in the scientific and medical communities, are committed to a weight-of-evidence approach in which the totality of the evidence is considered. In contrast, some courts are following selected interpretations of *Daubert* and are rejecting a weight-of-evidence approach, and instead are evaluating each strand of evidence in isolation. This approach by the courts will typically tilt the scales of justice in favor of polluters and product liability defendants.

The Supreme Court may not have intended that the *Daubert* decision create an imbalance in our nation's system of justice. But, in our opinion, taken together, the Court's trilogy of decisions – *Daubert*, *Joiner* and *Kumho* – have done just that. *Daubert* and *Kumho* hand judges extensive powers for deciding not only whether complex evidence should be allowed into the courtroom, but whether a case should move forward at all when there are differences of opinion among experts. This is a role that the U.S. Constitution intended for juries. But plaintiffs who appeal these evidentiary exclusions run head-on into *Joiner*, which makes it extremely difficult for appellate courts to overturn the trial court's actions unless there is clear-cut abuse of judicial discretion, an extraordinarily high standard.

Chief Justice Rehnquist's prediction in his cautionary dissent was prescient. Today, judges acting as "amateur scientists" *are* issuing legal declarations about the validity of work in fields well outside their area of expertise.

On the tenth anniversary of *Daubert*, the scientific community needs to become much more aware that an obscure procedural decision intended to provide clarity has instead given rise to a serious social imbalance. It has led to unreasonable legal demands of scientific certainty when considering expert testimony that might otherwise demonstrate harm of individual plaintiffs by defendants, often wealthy and powerful companies. At the same time, inappropriate or inaccurate interpretations of science are becoming embedded in legal precedent. Yet in contrast, *Daubert* has failed to demand from criminal prosecutors better science in the face of weak forensic methods, resulting in the potential conviction of innocent people. And now, the application of *Daubert* and *Daubert*-like challenges threaten to paralyze the systems we use to protect public health and the environment.

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Tellus Institute
11 Arlington St.
Boston MA 02116
www.DefendingScience.org