USING STATISTICS TO EVEN THE ODDS WITH EXPERTS

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We've all been there. Standing toe-to-toe with the plaintiff's expert, sparring over issues that are critical to our client's case. The plaintiff's expert has devoted over 30 years of his life to this subject matter and is a recognized authority in his field. By contrast, you have never taken a single course of study in the field at issue, and (if you are lucky) have had mere weeks to learn as much as you can about the subject matter to prepare for this showdown.

Many defense lawyers relish the challenges these situations present—other lawyers become transactional lawyers. Those that stay in the game are constantly looking for ways to level the playing field so that opposing experts can share our anxiety about venturing into unfamiliar territory.

To survive in this arena, defense counsel has to become adept at enticing opposing experts out of their comfort zone onto that level field. The purpose of this article is to demonstrate that, although the vast majority of testifying experts don't realize it, they are treading on thin ice when they offer statements about probabilities, odds, frequencies, or likelihoods. This article offers a general set of factors to consider when confronting statistics offered by an expert to support his or her contentions, and provides specific examples of experts overstepping their knowledge in various types of cases.

Experts Standing on Slippery Slopes

Statistical claims appear at some point in almost all cases. They can be deceptively convincing to juries because they superficially convey certainty and finality. They are the frequency that a given event has occurred, they are the odds that an event will occur, they are the rate of change used in a "but for" calculation, they are the forecast that a number of deaths "will" occur. Although statistics are malleable and subject to manipulation, today's experts are usually too sophisticated to employ such blatant tactics. You are much more likely to encounter experts offering opinions based on erroneous assumptions and miscalculations. You may even encounter statistical evidence that is accurate, but applies to a population that is not relevant to the issues at hand. Therefore, it is critical to fully explore any percentages an expert includes in his or her testimony or report.

The absence of peer review should bear on the weight given to the expert's opinion.

Despite the cavalier way that many experts make statistical claims, most are woefully unqualified to make such determinations. For instance, most medical schools (including pre-med curricula) only require one course in statistics. That course is usually an introduction to epidemiology or biostatistics. Most graduate-level engineering programs grind out students with only one or two semesters of statistics. A Ph.D. in economics may have as few as two courses in econometrics in his or her graduate training, with no exposure to sampling theory and little exposure to probability theory. Many accounting programs don't require any training in statistics, even though auditors routinely use samples in their investigations.

Appraisers can come from virtually any educational background, and are not required to complete any training in statistics or probability theory. (This may not apply to appraisers involved in assessments, *e.g.,* tax assessors, which would require at least one course in regression theory to enable them to conduct mass appraisals.) Consequently, each of these learned professionals may be unsettled if they are forced to substantiate the methods they use.

Controlling Legal Principles

Depending on your jurisdiction, an expert's testimony will have to satisfy the standard set forth in Rule of Evidence 702, *Daubert,* a *Daubert-like* test, or *Frye* in order to be admissible. The criteria for the relevant standard of admissibility will serve as guideposts for your cross-examination. In a Rule 702 jurisdiction, you will want to determine whether:

1. the expert's opinion is based on sufficient facts or data;
2. the expert's opinion is the product of reliable principles and methods; and
3. the witness has reliably applied the principles and methods to the facts of the case.

Fed.R.Evid. 702 (advisory committee notes). In a *Daubert* or *Daubert-like* jurisdiction, the focus of your inquiry will be on determining if the expert's reasoning and methodology are reliable and whether it can be properly applied to the case at hand. *Daubert v. Merrell Dow Pharmaceuticals, Inc.,* 509 U.S. 579,592—94(1993). *Frye* jurisdictions concern themselves with whether the expert's conclusion, methodology, theory, and/or application of the methodology to the facts at issue have gained "general acceptance" in the relevant scientific community. *Frye v. United States,* 293 F.1013, 1014 (D.C. Cir. 1923). In these jurisdictions, it is important to bear in mind that "general acceptance" is not synonymous with "unanimity." *People v. Leahey,* 882 P.2d 321, 329 (Cal. 1994); *Brimm v. State,* 695 So.2d 268, 272 (Fla. 1997).

Depending on the facts of your case, your goals will include either excluding the expert from testifying at all, excluding certain testimony that is damaging to your client's case, or discrediting the witness in front of the fact finder. The latter goal is much more likely to occur in the vast majority of your cases because, "[n] ot every error in the application of a particular methodology should warrant exclusion[, buti an alleged error in the application of a reliable methodology should provide the basis for exclusion of the opinion [wheni that error negates the basis for the reliability of the principle itself." *State v. Porter,* 698 A.2d 739, 756 (Conn. 1997).

Universal Considerations and Common Statistical Errors

When the plaintiff's expert offers up a set of statistics, or even better, an analysis that the expert has conducted him- or herself, the following questions should help you determine the accuracy of that opinion:

1. What is the correct population under study? Or, what is the correct set of occurrences that are at issue?
2. What has been excluded from this set? What has been included incorrectly?
3. What assumptions has the expert expressly or tacitly made in his or her analysis?
4. What data has been excluded from the analysis (the sample, not the population!), and what effect does that exclusion have on the expert's conclusions?
5. Does the expert's analysis correctly test the data?
6. Does the expert have the right data to address the issue?
7. Is there other data that supports or contradicts the expert's conclusion?
8. Are there common sense alternatives to the expert's conclusion? If so, have they been addressed?
9. Does the expert's analysis actually support his or her conclusion?
10. If the expert conducted the study, did he have an initial plan that laid out some of these concerns and how they would be addressed?

As always, it is critical to be prepared. You exponentially increase your chances of success when you know and understand the witness's educational and professional experience before the examination. Thoroughly investigate the expert's background. An incredible amount of information is available through the Internet, DRI's Expert Witness Database, your state and local defense organization, trade publications, and/or discovery requests.

Often, answers to the 10 questions above are available in documents that the expert or his or her colleagues prepared long before the case at hand arose. If you turn over the right stone, these documents can provide a wealth of information. What hurdles did the researcher have to clear to obtain funding or to have his or her research published? Where is the paper trail? This documentation can be very fertile ground and is likely to provide valuable information that will help you evaluate your case before trial, and help you control and/or discredit the witness at trial. If an expert cites his or her own research that was conducted for some other purpose (for example, under a grant for the federal government) he or she will have already prepared an exhaustive grant proposal that addresses many, if not all, of these issues. Grant review committees generally do not authorize millions of dollars for research without attempting a similar analysis to the one you are undertaking. If the expert is citing published research, earlier drafts of his or her research should have been subjected to peer review, where other experts in the field critically analyzed the data. Does the expert still have those earlier drafts? The absence of peer review should bear on the weight given to the expert's opinion. Still have that grant proposal? Still have those questions from the review committee (public documents for publicly funded research)?

If the expert cites someone else's research, the same rules apply. Has he or she blindly accepted the other researcher's conclusions without conducting any independent evaluations of them? Are these documents available from the original researcher, or has the original researcher addressed these issues in his publications? Even better, because experts are usually part of a tight-knit group, they frequently serve as reviewers on other people's research. Did the expert you are facing serve as a reviewer on the original piece of research? If so, what questions did he or she raise? Why did the questions have to be raised—didn't the original researcher address those issues in the original grant application?

Not all research is federally funded— but you get the idea. If the expert you are facing is citing research done for some other purpose, you can bet that someone else has already critiqued it. That review process might be extremely helpful to your determination of whether the statistics cited actually apply to your case.

Specific Case Examples

Environmental/Toxic Tort Case

Assume a class action against a manufacturer who had allegedly emitted toxic substances from its plant. The plaintiffs claim, along with various claims for personal injury, that all properties within a 1.5 mile radius of the site had lost value. The plaintiffs' expert appraiser cited numerous published studies and opined that, as a result of the improper emissions, real property in the area had lost 20 percent of its value. He further claimed, based on his past experience appraising real property in similar areas, that this effect was common for properties located near manufacturing plants after an environmental incident.

Defense counsel in this case should determine precisely what real property the expert evaluated *(i.e.,* what population is being studied and what has been excluded from the analysis). Does the real property the expert studied accurately represent all of the real property to which he claims his analysis applies? Does he have the right data to address the issue? Did he consider other factors that might have caused the diminution of its value? If so, how did he account for those factors? Is there other data that supports or contradicts his conclusion? Are there common sense alternatives to his conclusions?

More often than not, you are not going to successfully bar the jury from hearing the opposing expert's conclusions. Therefore, you need to focus your efforts on determining the sufficiency of the expert's data, the reliability of his methods, and the appropriateness of his application of the methods to your case. (In the case of statistical evidence, this will typically be the extrapolation of the expert's results from the sample to a larger population.) Anything that questions those elements of his report is likely to diminish the expert's credibility in the jury's eyes. Unless you have had the luxury of critiquing the expert's report with your own consulting expert prior to deposing the expert, much of this analysis will take place between the expert's deposition and trial.

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Products Liability Case
Involving Wrongful Death

Plaintiffs sued the manufacturer of an SUV after their son was killed in a rollover accident. Although the manufacturer's expert does not believe the decedent was wearing a seatbelt, Plaintiffs' biomechanical engineering expert claims that the seat-belt failed, which caused the decedent to be ejected from the vehicle resulting in his death. At her deposition, the plaintiffs' expert testified that a safer alternative design existed, and that its use in four-door sedans had reduced fatalities in rollover accidents by 50 percent. What does she base the 50 percent claim on? If it is not her own study, who conducted it? Don't be tempted to settle for an organization. Ask if she knows which researchers at that organization conducted the study. If she knows who, ask what their educational and professional qualifications are.

You may be surprised how often an expert will state a percentage he or she has gleaned from trade journals or seminars with remarkably little information about its basis. If an ill-prepared expert is forced to admit that he or she has little or no information about the research that his or her percentage is based upon, you have an opportunity to preclude the damaging testimony because:

- In a Rule 702 jurisdiction, the expert can neither prove that the claim is based on sufficient facts or data, nor that it is the product of reliable principles and methods;
- In a *Daubert* or *Daubert-like* jurisdiction, the expert cannot prove that his or her reasoning and methodology are reliable; and
- In a *Frye* jurisdiction, the expert cannot prove that his or her conclusion, methodology, theory, and/or application of the methodology to the case are "generally accepted" in the relevant scientific community.

Even if the court doesn't preclude the expert from testifying, you'll be able to put his or her credibility at issue by demonstrating to the jury how carelessly the analysis was conducted.

Vioxx Claims

The current wave of litigation over Vioxx and the dangers allegedly associated with its use are instructive. Current claims against Merck regarding Vioxx repeatedly cite one paper published in *The Lancet* that estimates the number of deaths attributable to Vioxx. There are two parts to this paper. Part one is a case-control experimental study, based on records from 1.4 million members of Kaiser Permanente, that estimates whether Vioxx raised the risk of a heart attack for people in the sample studied. Part two is an extrapolation of those results to the full U.S. population. This paper is dragged into every discussion of Vioxx, and is cited by every plaintiff's lawyer as evidence of the total number of people affected. Experts citing this number are relying on a number generated by a medical doctor who made a variety of assumptions to go from the tabulations of the Vioxx records at Kaiser-Permanente in California to a national projection. Are those assumptions warranted?

Lawyers defending those claims need to fully explore the basis for this assertion. One could question whether the study was performed on the correct population. Certain individuals were excluded from the study. Does their exclusion make sense? How does further limiting the population under study affect the results? Does the study reflect a diverse array of dosages, or is it skewed toward patients taking higher doses? If it is skewed toward higher dosages, how does that affect the study's prediction that the drug caused 140,000 heart attacks in the U.S.?

By questioning the plaintiff's medical expert about the basis for his or her statistical claims, you may find out that he or she has little or no first-hand knowledge about the studies that form the basis of his or her opinion. More likely than not, you will discover that the plaintiff's expert has very limited knowledge or understanding about statistics. The witness is unlikely to recognize his or her limitations (few of us do), so give the expert every opportunity to paint him- or herself into a corner. Fortunately, you have the advantage of checking the accuracy of his assertions with a biostatistician afterward. Of course, the plaintiff's expert may have a firm understanding of the studies that he or she is relying upon, as well as the statistical principles involved. Your job, however, is to make the expert prove it.

Conclusion

Cross-examining experts always presents a challenge, and opportunities to score points can be hard to find. The next time an opposing expert offers a statistic or likelihood, don't let that opportunity pass. Fully explore the factual basis and mathematical principles at issue. In some cases, it can be a very effective way to discredit testimony that would otherwise be very damaging to your client.

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