

# The Evolving Role of Statistical Assessments as Evidence in the Courts

Stephen E. Fienberg  
Editor

# The Evolving Role of Statistical Assessments as Evidence in the Courts

Panel on Statistical Assessments as Evidence in the Courts

Committee on National Statistics and Committee on Research on Law Enforcement  
and the Administration of Justice

Commission on Behavioral and Social Sciences and Education

National Research Council



Springer-Verlag  
New York Berlin Heidelberg  
London Paris Tokyo

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#### Library of Congress Cataloging-in-Publication Data

The Evolving role of statistical assessments as evidence in the courts

/ Stephen E. Fienberg, editor.

p. cm.

Bibliography: p.

Includes indexes.

1. Forensic statistics—United States. I. Fienberg, Stephen E.

KF8968.75.E96 1988

349.73'021—dc19

[347.30021]

88-31207

Printed on acid-free paper

© 1989 by Springer-Verlag New York Inc.

Softcover reprint of the hardcover 1st edition 1989

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Camera-ready copy prepared by the editor using T<sub>E</sub>X.

9 8 7 6 5 4 3 2 1

ISBN-13:978-1-4612-8174-0

e-ISBN-13:978-1-4612-3604-7

DOI: 10.1007/978-1-4612-3604-7

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# Preface

With increasing frequency, the proof of facts in legal proceedings entails the use of quantitative methods. Judges, lawyers, statisticians, social scientists, and many others involved in judicial processes must address issues such as the evaluation and interpretation of quantitative evidence, the ethical and professional obligations of expert witnesses, and the roles of court-appointed witnesses. The Panel on Statistical Assessments as Evidence in the Courts was convened to help clarify these issues and provide some guidance in addressing the difficulties encountered in the use of quantitative assessments in legal proceedings.

This report is the culmination of more than three years of research and deliberation. In it, we address a variety of issues that arise in federal and state court proceedings when statistical assessments such as quantitative descriptions, causal inferences, and predictions of events based on earlier occurrences are presented as evidence. We appraise the forms in which such assessments are presented, aspects of their admission into evidence, and the response to and evaluation of them by judges and juries.

Our recommendations include several innovations to improve the comprehension of statistical evidence by judges and juries. In addition to jurists, who must evaluate statistical testimony, our report is addressed to lawyers, who may have occasion to draw on statistical testimony or to present factual arguments that incorporate statistical assessments; to statisticians, social scientists, and others who may serve as expert witnesses presenting statistical arguments; and to the research communities in law, statistics, and the social sciences that seek to understand how courts cope with unfamiliar and technically complex information. Our ultimate goal is to improve the legal process.

Our study was a joint effort of the Committee on National Statistics and the Committee on Research on Law Enforcement and the Administration of Justice. We benefited greatly from the suggestions and advice provided by the members of these committees, especially from their diverse areas of expertise and experiences, which they also ensured was well represented on the panel.

Some who have read drafts of this report have asked why the scope of the report is limited to statistical assessments as evidence when many of the same issues arise when courts in general are faced with complex scientific testimony. The sponsoring committees debated this point in developing

the study and agreed that statistical evidence was sufficiently rich to cover the important issues in a variety of applications, especially in the social sciences, without being so broad a topic as to be intractable of study by a small panel. We acknowledge, however, that, had the members of the sponsoring committees not been jurists, social scientists, and statisticians, another focus for the study might have been chosen. We have attempted to indicate some of the points where the results of our study extend to scientific or complex evidence in general, but the reader may still justifiably feel that other topics discussed primarily in the context of statistics and statistical evidence are applicable more broadly to science and scientific evidence.

The study was funded by the National Science Foundation. We are grateful to Felice Levine, head of the NSF Law and Society Program, and Jerome Sacks and the NSF Division of Mathematics for their valuable advice. The West Publishing Company graciously donated use of WESTLAW for computer-assisted searching of legal research. A special leasing arrangement was made by direct aid for us to have software to access WESTLAW. The Federal Judicial Center, especially through Joseph Cecil, provided valuable advice and access to legal resources. The Center for Advanced Study in the Behavioral Sciences hosted the panel for one of its meetings and also provided resources that aided the preparation of this report, while one of us was a Center fellow.

We also benefited greatly from the thoughtful and scholarly work of several consultants: Thomas J. Campbell, John H. Langbein, Daniel L. Rubinfeld, and Neil Vidmar. Appendix H, which reviews the impact of statistical evidence in the legal system, was prepared for the panel by Neil Vidmar after the main text was completed in order to supplement the report's discussion of relevant social science literature on the topic. While the panel had previously reviewed some of the materials cited in this appendix and had chosen not to discuss or reference them, the alternative perspective provided by this supplemental material should prove valuable to many readers. Gordon J. Apple, National Research Council fellow and Albyn C. Jones, research associate—both with the Committee on National Statistics—served as staff on the study and made important contributions to the preparation of this report. A number of other Committee on National Statistics staff, including Edwin D. Goldfield, Roberta R. Piroso, Anne M. Sprague, Kristine L. Smith, Eleanor M. Bateman, and Michele Zinn, provided highly competent administrative and secretarial assistance. Jeffrey A. Roth, study director of the Committee on Research on Law Enforcement and the Administration of Justice, provided valuable input at several stages in the panel's deliberations. Christine L. McShane, in the Commission on Behavioral and Social Sciences and Education, through careful editing of our report, made many improvements. Eugenia Grohman of the Commission provided valuable assistance in the review of the report, as well as in its editing and production. To all we are very grateful.



Our special appreciation goes to Margaret L. Smykla of the Department of Statistics, Carnegie Mellon University, and to Lee R. Paulson and Miron L. Straf of the Committee on National Statistics. Margaret Smykla typed innumerable drafts of the panel report and supervised the computer-based photo-typesetting of the final version on equipment at Carnegie Mellon University. Lee Paulson helped in the editing of the report and provided research and library assistance that was crucial in the completion of our work. Finally, we thank Miron Straf, who, as research director of the Committee on National Statistics, guided the development of the study from its inception as an idea, through the preparation of a proposal and appointment of the panel, to the development of this report. By serving as study director for this project, he participated in and guided our work. In addition to planning our meetings and coordinating our investigations, deliberations, and drafts, he also organized presentations at professional societies and even the development and production of a mock trial, which illustrated many of the issues discussed in this report.

May 30, 1988

Stephen E. Fienberg  
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as Evidence in the Courts

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