Causal Inference in Statistics. A Primer

Description: Causal Inference in Statistics: A Primer

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Causality is central to the understanding and use of data. Without an understanding of cause effect relationships, we cannot use data to answer questions as basic as, Does this treatment harm or help patients? But though hundreds of introductory texts are available on statistical methods of data analysis, until now, no beginner–level book has been written about the exploding arsenal of methods that can tease causal information from data.

Causal Inference in Statistics fills that gap. Using simple examples and plain language, the book lays out how to define causal parameters; the assumptions necessary to estimate causal parameters in a variety of situations; how to express those assumptions mathematically; whether those assumptions have testable implications; how to predict the effects of interventions; and how to reason counterfactually. These are the foundational tools that any student of statistics needs to acquire in order to use statistical methods to answer causal questions of interest.

This book is accessible to anyone with an interest in interpreting data, from undergraduates, professors, researchers, or to the interested layperson. Examples are drawn from a wide variety of fields, including medicine, public policy, and law; a brief introduction to probability and statistics is provided for the uninitiated; and each chapter comes with study questions to reinforce the readers understanding.

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