

# Introduction: Biostatistics and epidemiology lecture series, part 1

**P**hysicians are inundated with clinical research findings that potentially impact patient care. Evaluating the strength and clinical application of research results requires an understanding of the underlying biostatistics and epidemiological principles.

The articles in this supplement are based on a series of lectures originally developed for fellows in pulmonary and critical care medicine to provide them with the tools to transform a scientific or clinical question into research projects, and then pursue the answer to their question with the appropriate methods. The same skills also enable them to appraise the published literature in a systematic and rigorous manner.

Each topic in the series began with a presentation and discussion of statistical principles and methods, then moved to a practical module using the principles to appraise a specific publication. Participants in the course had an immediate opportunity to try the techniques, both to demonstrate understanding and to reinforce the concepts to each learner. The articles of this series follow the same outline, providing clinicians of all specialties the basic statistical tools to conduct and appraise clinical research, along with a sample article for practicing each statistical method presented.

This *Cleveland Clinic Journal of Medicine* supplement includes 3 lectures from the “Biostatistics and Epidemiology Lecture Series.” Dr. Stoller’s presenta-

tion, *The Architecture of Clinical Research*, describes the basic structure of clinical research and the nomenclature to understand trial design and sources of bias.

Building on those concepts, Dr. Chatburn’s lecture, *Basics of Study Design: Practical Considerations*, outlines the structured approach to develop a formal research protocol. How to identify a problem, expand the scope of it through a literature review, create a hypothesis, design a study, and an introduction to basic statistical methods are discussed.

And in *Chi-square and Fisher’s Exact Tests*, Dr. Nowacki introduces the statistical methodology of these 2 tests to assess associations between 2 independent categorical variables. The sample article illustrates step-by-step calculation of both the large sample approximation (chi-square) and exact (Fisher’s) methodologies providing insight into how these tests are conducted.

My hope is that these articles, and future installments based on forthcoming lectures, are helpful to physicians both in conducting their own research and in evaluating the research of others

**Aanchal Kapoor, MD**

Critical Care Medicine

Cleveland Clinic

Supplement Editor