Biostatistics for Health Care Researchers: A Short Course

May 13, 14, 15, 2025
1PM-5PM
via Zoom
(CME registration and daily Zoom registration required)

INDIANA UNIVERSITY
SCHOOL OF MEDICINE
RICHARD M. FAIRBANKS SCHOOL OF PUBLIC HEALTH

COURSE DESCRIPTION

The Department of Biostatistics and Health Data Science in the School of Medicine and Richard M. Fairbanks School of Public Health will present a short course in biostatistics that is designed especially for health care researchers in the health sciences. This course will consist of three sessions. Sessions I and II will cover basic principles, design of medical research studies, standard statistical tests and data analyses, and data management. Session III will focus on more advanced topics, including multiple linear and logistic regression, survival analysis, longitudinal data and genetic analysis. Registrants may choose to attend Sessions I and II, II and III or I, II and III.

COURSE OBJECTIVES

At the conclusion of this program, participants should be able to:

- Recognize common study designs and statistical methods used in medical research;
- Discuss complex study design and analysis with a statistician;
- Describe basic concepts of data management;
- Identify appropriate use of statistical procedures when given a common study design; and
- Implement simple statistical analyses under the guidance of a statistician.

Accreditation Statement

JOINTLY ACCREDITED PROVIDER™ INTERPROFESSIONAL CONTINUING EDUCATION

In support of improving patient care, Indiana University School of Medicine is jointly accredited by the Accreditation Council for Continuing Medical Education (ACCME), the Accreditation Council for Pharmacy Education (ACPE), and the American Nurses Credentialing Center (ANCC), to provide continuing education for the healthcare team.

Physicians

Indiana University School of Medicine designates this live activity for a maximum of 10.75 *AMA PRA Category 1 Credits™*. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

Indiana University School of Medicine (IUSM) policy ensures that those who have influenced the content of a CE activity (e.g. planners, faculty, authors, reviewers and others) disclose all financial relationships with any ineligible companies so that IUSM may identify and mitigate any conflicts of interest prior to the activity. All educational programs sponsored by Indiana University School of Medicine must demonstrate balance, independence, objectivity, and scientific rigor. There are no relevant financial relationships with a commercial interest* for anyone who was in control of the content of this activity.

Indiana University School of Medicine (IUSM) defines a **commercial interest as any entity producing, marketing, re-selling, or distributing health care goods or services consumed by, or used on, patients.*

LOCATION

This meeting will be held virtually via Zoom. A Zoom link will be created for each day of the course, and participants will register with Zoom each day to confirm attendance.

FURTHER INFORMATION

Indiana University School of Medicine
Department of Biostatistics and Health Data Science
410 W. Tenth Street, Suite 3000
Indianapolis, IN 46202-3002
PH:(317) 274-2661 • FAX: (317) 274-2678
https://medicine.iu.edu/biostatistics

AGENDA for May 13, 14, and 15, 2023

SESSION I — Tuesday, May 13 2025

1:00 p.m. **Welcome and Introduction** — Susan M. Perkins, Ph.D.

1:10 p.m. **Observational Study Design** — Susan M. Perkins, Ph.D.

Types of study designs with emphasis on observational studies

2:00 p.m. **Hypothesis Testing & Confidence Interval Estimation** — William F. Fadel, Ph.D.

Hypothesis test, type I and type II errors, statistical significance vs. practical significance, confidence interval, sample size estimation

2:50 p.m. **Break**

3:10 p.m. **Comparisons of Means** — William F. Fadel, Ph.D.

Paired T-test, group T-test, Wilcoxon, Mann Whitney, one-way ANOVA, multiple comparisons, non-parametric ANOVA, sample size estimation

4:05 p.m. **Analysis of Categorical Data** — Giorgos Bakoyannis, Ph.D.

Estimation and testing of single proportions, two proportions, tests of association (2x2 table, RxC table), Fisher's exact test

5:00 p.m. **Adjournment**

SESSION II — Wednesday, May 14, 2025

1:00 p.m. **Basics of Data Management** — Beverly S. Musick, M.S.

Database design, form design, data entry

1:55 p.m. **Clinical Trials Design** — Yong Zang, Ph.D.

Standard and adaptive designs, interim analyses, stopping rules

2:50 p.m. **Break**

3:10 p.m. **Correlation and Simple Linear Regression** — Joanne K. Daggy, Ph.D.

Correlation (Spearman & Pearson), regression, prediction, model evaluation

4:05 p.m. **Evaluation of Diagnostic Tests** — Susan M. Perkins, Ph.D.

Sensitivity, specificity, ROC curves, measures of agreement

5:00 p.m. **Adjournment**

SESSION III — Thursday, May 15, 2025

1:00 p.m. **Multiple Linear & Logistic Regression** — Joanne K. Daggy, Ph.D.

Interpretation of coefficients, R^2, odds ratios, logistic regression

1:55 p.m. **Analysis of Longitudinal Studies** — Susan M. Perkins, Ph.D.

Longitudinal vs. cross-section studies, cohort effect vs. age effect, examples, ad hoc vs. formal analysis

2:50 p.m. **Break**

3:10 p.m. **Survival Analysis** — Giorgos Bakoyannis, Ph.D.

Censoring vs. failure, Kaplan-Meier curves, log-rank test, proportional hazards model

4:05 p.m. **Design of Genetic Studies** — Leah Wetherill, Ph.D.

Review of basic genetics, study designs for association and sequence analysis, and polygenic risk scores

5:00 p.m. **Adjournment**

FEE

Attendance at Sessions I and II	$40
Attendance at Sessions II and III	$40
Attendance at Sessions I, II, and III	$60

Enrollment is limited to 90 attendees.

The fee includes access to the PowerPoint slides and video recordings of presentations each day. The instructional book is not provided.

SUGGESTED INSTRUCTIONAL BOOK

Participants who would like to have additional supplementary information are encouraged to purchase a copy of the book:

Basic and Clinical Biostatistics, 5th edition,

FACULTY AND STAFF

DEPARTMENT OF BIOSTATISTICS AND HEALTH DATA SCIENCE

Giorgos Bakoyannis, Ph.D.
Associate Professor

Joanne K. Daggy, Ph.D.
Associate Professor

William F. Fadel, Ph.D.
Associate Professor

Beverly S. Musick, M.S.
Principal Scientific Data Researcher

Susan M. Perkins, Ph.D.
Professor

Yong Zang, Ph.D.
Associate Professor

DEPARTMENT OF MEDICAL & MOLECULAR GENETICS

Leah Wetherill, Ph.D.
Assistant Scientist

Register and pay online using MasterCard, Visa, American Express or Discover before Nov 3 (unless capacity is met before then) at: https://iu.cloud-cme.com/BiostatisticsMay2025. Registrants will be sent the necessary Zoom links via email.

Please direct registration questions to:

Indiana University School of Medicine, Division of Continuing Education in Healthcare Professions

Phone: (317) 274-0104

Email: cehp@iu.edu

For other CME offerings, please visit our Website:

https://medicine.iu.edu/education/cme/

We want everyone to feel welcome at this and other CME events. If you have a disability and need an accommodation to participate in this program, we will try to provide it. Please contact the Biostatistics office at (317) 278-5428 before you come to the event. At least 72 hours notice may be necessary.