



# Biostatistics for Health Care Researchers: A Short Course

Tuesday, Wednesday, and Thursday  
November 14, 15, 16, 2017  
1PM-5PM  
Health Information and  
Translational Science Building  
410 W. 10th Street, HS 1110



**INDIANA UNIVERSITY**

SCHOOL OF MEDICINE  
Department of Biostatistics



**RICHARD M. FAIRBANKS  
SCHOOL OF PUBLIC HEALTH**

INDIANA UNIVERSITY  
Department of Biostatistics  
IUPUI

## COURSE DESCRIPTION

The Department of Biostatistics 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

The Indiana University School of Medicine is accredited by the Accreditation Council for Continuing Medical Education to provide continuing medical education for physicians.

## DESIGNATION STATEMENT

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

## NOTE

While it offers CME credits, this activity is not intended to provide extensive training or certification activity.

## FACULTY DISCLOSURE STATEMENT

In accordance with the Accreditation Council for Continuing Medical Education (ACCME) Standards for Commercial Support, educational programs sponsored by Indiana University School of Medicine (IUSM) must demonstrate balance, independence, objectivity, and scientific rigor. All faculty, authors, editors, and plan-

ning committee members participating in an IUSM-sponsored activity are required to disclose any **relevant financial interest or other relationship** with the manufacturer(s) of any commercial product(s) and/or provider(s) of commercial services that are discussed in an educational activity.

## COMMERCIAL SUPPORT

This CME activity does not have any commercial support.

## LOCATION

The short course will be held at the Health Information and Translational Science Building (HITS), 410 West 10th Street, HS 1110 on the Indiana University Purdue University Indianapolis campus. It is recommended that you park at an IUPUI parking lot and walk or take the People Mover (exit at the IU Health Canal Station) to get to the building. A campus map with the location of the building can be found at [http://www.iupui.edu/maps/campusmap\\_full.pdf](http://www.iupui.edu/maps/campusmap_full.pdf). The closest IUPUI parking lots are next to the ETC Building on 10th street (labeled TK on campus map) and at the Gethsemane Church on Martin Luther King Blvd., just south of 10th Street.

## FURTHER INFORMATION

Indiana University School of Medicine  
Department of Biostatistics  
410 W. Tenth Street, Suite 3000  
Indianapolis, IN 46202-3002  
PH:(317) 274-2685 • FAX: (317) 274-2678  
<http://www.biostat.iupui.edu>

For other CME offerings, please visit the CME website at <http://cme.medicine.iu.edu>.

## AGENDA for November 14, 15, 16, 2017

### SESSION I **Tuesday, November 14, 2017**

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

**1:10 p.m. 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** Spencer Lourens, 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** Spencer Lourens, 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, sample size estimation*

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

### SESSION II **Wednesday, November 15, 2017**

**1:00 p.m. Basics of Data Management** Robert L. Davis, B.S.

*Database design, form design, data entry*

**1:55 p.m. Issues in Clinical Trials** Susan M. Perkins, Ph.D.

*Design, analysis, interim reviews, ethics, and reporting of clinical trials*

**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** Giorgos Bakoyannis, Ph.D.

*Sensitivity, specificity, ROC curves, measures of agreement*

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

### SESSION III **Thursday, November 16, 2017**

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

*Interpretation of coefficients, R<sup>2</sup>, odds ratios, logistic regression*

**1:55 p.m. Analysis of Longitudinal Studies** Ying Zhang, 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** Ying Zhang, Ph.D.

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

**4:05 p.m. Design of Genetic Studies** Leah Wetherill, M.S.

*Review of basic genetics, study designs for association and sequence analysis.*

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

### FEE

Attendance at Sessions I and II \$125

Attendance at Sessions II and III \$125

Attendance at Sessions I, II, and III \$150

Enrollment is limited to 30 attendees.

The fee includes handout materials and break refreshments each day. Lunch is not provided, nor is the instructional book.

### 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**, 4th edition,

© 2004, by Dawson-Saunders and Trapp, ISBN# 0071410171. The book will be available at the IUPUI Campus Center, Barnes and Noble Bookstore, 420 University Boulevard, Indianapolis, Indiana, 46202. When searching for this optional textbook online or in-person at the bookstore, note the class name is BIOSTATS and section number FOR HEALTHCARE.

The bookstore phone number is (317) 278-2665.

### FACULTY AND STAFF

Indiana University School of Medicine

Indianapolis, Indiana

### DEPARTMENT OF BIostatISTICS

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**Spencer Lourens, Ph.D.**

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Professor of Biostatistics

**Giorgos Bakoyannis, Ph.D.**

Assistant Professor of Biostatistics

**Ying Zhang, Ph.D.**

Professor of Biostatistics

### DEPARTMENT OF MEDICAL & MOLECULAR GENETICS

**Leah Wetherill, M.S.**

Applied Statistician II

## Biostatistics for Health Care Researchers: A Short Course

November 14, 15, 16, 2016, HITS HS 1110, Indianapolis, Indiana

*Enrollment is limited to 30 attendees*

*PLEASE TYPE OR PRINT BELOW*

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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) 274-2685 before you come to the event. At least 72 hours notice may be necessary.

### Cost

Sessions I and II \$125

Sessions II and III \$125

Sessions I, II, and III \$150

### Method of Payment

Check enclosed (made payable to Indiana University)

OR

Indiana University Account Number

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**SEND REGISTRATION AND PAYMENT TO:** Indiana University School of Medicine, Department of Biostatistics, 410 W. Tenth Street, Suite 3000, Indianapolis, IN 46202-3002, or fax to: (317) 274-2678. Please send to the attention of Ann Lyon.

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