

# BIOSTATISTICS DEPARTMENT

Shuangge Ma, Ph.D., Chair

Biostatistics is a scientific discipline that focuses on developing new statistical methodology and theory to address important questions in the biological and health sciences, including study designs, data collection and analysis, as well as result interpretation. In addition to independent methodological and theoretical developments, the faculty in the Department of Biostatistics are involved in a wide variety of collaborative research efforts throughout the university, including at the School of Public Health and the School of Medicine. We bring these innovations into practice through active participation in many disciplines at Yale and beyond. Our students are well prepared for positions in public/governmental and nonprofit agencies, medical centers, and various industries, as well as for doctoral studies in biostatistics and related fields.

## DEPARTMENTAL REQUIREMENTS

BIS 525	Seminar in Biostatistics and Journal Club	0
BIS 526	Seminar in Biostatistics and Journal Club	0
BIS 623	Advanced Regression Models	1
BIS 628	Longitudinal and Multilevel Data Analysis	1
BIS 630	Applied Survival Analysis	1
BIS 678	Statistical Practice I	1
BIS 679	Advanced Statistical Programming in SAS and R	1
S&DS 541	Probability Theory <sup>1</sup>	1
S&DS 542	Theory of Statistics <sup>1</sup>	1

One of the following:

BIS 681	Statistical Practice II	1
EPH 525	Thesis	2

<sup>1</sup> Course offered in the Graduate School of Arts and Sciences.

## COMPETENCIES

Upon receiving an M.P.H. with a concentration in Biostatistics, the student will be able to:

- Derive and apply the fundamentals of mathematical statistics (e.g., probability concepts, random variables, probability distributions, statistical inference)
- Calculate the required sample size and statistical power for basic study designs
- Apply the fundamentals of statistical analysis to make relevant inferences using the appropriate analytic tools
- Design computer programs for study management (i.e., creating suitable data sets for statistical analyses), statistical analysis, and presentation of data using statistical programming languages (e.g., SAS, R)

- Produce and present audience-appropriate statistical summaries describing research in health science through oral presentations and written communications