

Biostatistics



**University of South Florida College of Public Health
Department of Epidemiology and Biostatistics**

What is Biostatistics?

Biostatistics is the use of quantitative tools and concepts to elucidate, predict, or infer significant causes or variables and their relationships to, and effects on life relate outcomes

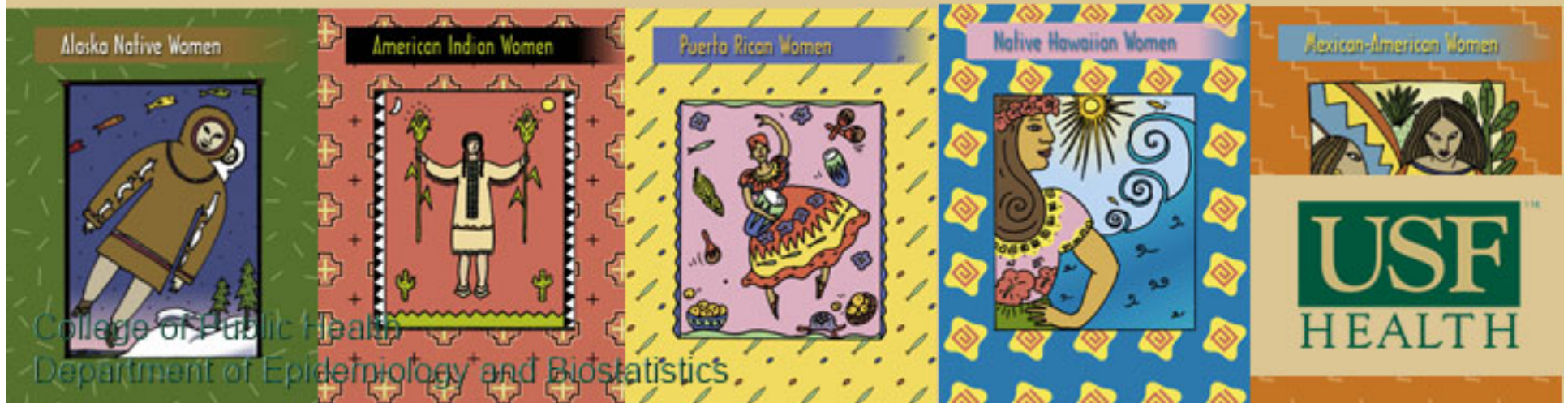


What Does a Biostatistician Do?

With all the research in the world today, the need for individuals skilled in biostatistics is increasing. Biostatistics is at the core of scientific research and needs to be considered when designing studies. Biostatistics is used when analyzing data - whether it be to explore the effects of unnatural agents on the environment, behavioral outcomes after stressful events, or other complex issues that affect the health and wellness of a population or community.

Biostatisticians are consulted on the design of research projects. If you were a biostatistician, you might be consulted on what data to collect for tracking lifestyle diseases in underserved populations.

Images used with permission of the National Cancer Institute



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Biostatisticians are in Demand!

The demand for competencies in this area is growing. Biostatistics skills can be used in various fields, including the diverse biological sciences, medicine and public health.

You might find a biostatistician comparing models of potential flu epidemics with proposed vaccination programs.



- Growing research opportunities related to maternal, child and family health
- High demand for application of statistical methods to environmental research
- Steep increase in biomedical and biopharmaceutical research
- Growing need for health economics and health service research

Image used with permission of the National Cancer Institute (NCI), 2003



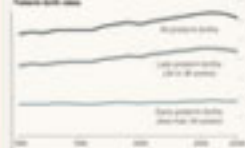
Biostatistics Is In the News!

Premature Birth Rate Drops for 2nd Year

By MICHELE BARAJAK
Published in *USA Today*, 11/15/08

The rate of premature births declined for the second year in a row in 2008, the first two-year decrease in almost 30 years, the government reported this month.

By MICHELE BARAJAK



The report, from the National Center for Health Statistics, finds that preterm births (babies born at least three weeks early) declined to 12.3 percent in 2008, from 12.8 percent in 2006 and 12.7 percent in 2007. The decrease held for all races, and for all age groups except mothers over 40, and the numbers went down nationwide. Rates increased only in Hawaii.

"The rate is still too high," said the lead author, Joyce A. Martin, an epidemiologist at the center. "But the suggestion that the trend is going down is a hopeful sign."

600,000 Dead May Total, Study Says



By SHIRAZI LANE SMITH and DONALD G. MATT B. JR.
Published in *USA Today*, 10/15/08

BAGHDAD, Oct. 10 — A team of American and Iraqi public health researchers has estimated that 600,000 civilians have died in Iraq since the 2003 American invasion, the highest toll of the war here.

ALARMING TREND, DROP IS SEEN IN BREAST CANCER

By MICHELE BARAJAK
Published in *USA Today*, 11/15/08

The most common form of breast cancer dropped a startling 15 percent from August 2002 to December 2003, researchers reported yesterday.

The reason, they believe, may be that during that time, millions of women used hormone treatment to ease symptoms of menopause after a surgical study concluded that they had increased breast cancer risk.

A new analysis of breast cancer cases from the M. D. Anderson Cancer Center in Houston and presented at a conference in San Francisco last week. It was a recent report by the National Cancer Institute on the cancer's

researchers cautioned that if

Experts Question Study on Youth Suicide Rates

By ALEX BENSON and BENEDICT CAREY
Published in *USA Today*, September 14, 2007

The study, leading psychiatric researchers say, is a 2004 increase in the suicide rate for adolescents to a warning by the Food and Drug Administration about the use of antidepressants in minors. The F.D.A. researchers suggested, might be needed in severely depressed

January 23, 2007

Study Explores the Effect of Temperature on Mortality

The relationship between extreme temperature and mortality in the United States varies by location, according to a study from researchers at the Johns Hopkins Bloomberg School of Public Health. Excessive heat is more likely to increase mortality risk in the North, while excessive cold is more likely to increase mortality risk in the South. The study appears in the January 1, 2008 issue of the *American Journal of Epidemiology*.

"Historically, we know that episodes of extremely hot temperatures increase mortality. Global warming and other phenomena, such as El Niño, have warranted the need for more investigation into the weather-mortality relation," says Frank Currier, PhD, an assistant professor of Biostatistics.

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Programs offered in Biostatistics

Biostatistics graduate programs available at USF College of Public Health: MPH and MSPH degrees; a dual concentration MPH in Epidemiology and Biostatistics; a Doctoral Degree in Biostatistics; as well as Interdisciplinary Dual Degree programs with Biochemistry & Molecular Biology and Medicine. We also offer a Graduate Certificate in Biostatistics.

You might find a biostatistician using a probability model to predict genetic variability in an expanding population.



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The MPH in Biostatistics

The MPH program is intended for students with strong quantitative backgrounds who are interested in a career in a health related field. This program prepares students to assist with the design, implementation and analysis of research projects. Training in this area also presents students with the tools needed to better understand statistical analyses found in scientific reports and professional journal articles related to health studies.

“Designing an experiment that answers our question may be easy, but what if our goal is to design the best possible experiment? Forming a good understanding of biological variability, while reducing technical noise and confounding variables, is often not so easy to do.”

Fran Lewitter & George Bell, Whitehead Institute for Biomedical Research "Maximizing the Experiment" (2010)

The MSPH in Biostatistics

The MSPH program is intended for students with strong quantitative backgrounds interested in pursuing a career in Research. The program prepares students to fulfill a primary or shared responsibility for handling quantitative and computational aspects of research projects, ranging from study design, data collection and management, developing analysis plans, conducting analyses and communicating findings.

Academic & government biostatisticians analyze data of populations exposed to environmental chemicals and conditions to understand their risks and effects.

From When Will I Use Math at www.whenwillusemath.com



The PhD in Biostatistics

The PhD program in Biostatistics provides advanced training and research opportunities in statistical theory, biostatistical methods and their applications in a wide spectrum of health research areas including epidemiology, mental health prevention, environmental health, clinical trials and health services research. The PhD program prepares students for research careers in academia, government, pharmaceutical industry and health care organizations.

Biostatisticians are key players on scientific teams. As a Biostatistician, you might collaborate with health research on national and international programs or serve as the director of research programs at a major university.



Certificate Program in Biostatistics



This certificate will meet and surpass the needs of many of the health, biological and related programs across the University that requires one or two statistics courses. At the same time the students in this program will gain a solid analytical background for future research and employment prospects in the medical and health fields.

Effects of medical treatments are often unpredictable. Effects vary from person to person and from group to group, making it difficult to draw reliable conclusions from clinical research. The extent of this chance variability is revealed through biostatistical analysis.



Cartoon: Wonderful Effects of Morrisons Vegetable Pills. "They told me if I took 1000 pills at night I should be quite another thing in the morning." by Hodgson. Pub. 18??, London. Used through the courtesy of the National Library of Medicine.

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Research Opportunities for Students

We have numerous opportunities for research and field experience throughout the area.

Our department has had close collaborative relation with local health organizations including Tampa VA Hospital, Moffitt Cancer Research Center, USF College of Medicine and Nursing , Tampa General Hospital and All Children's Hospital.

Some of the Areas of interests and research our faculty participate in range from suicide prevention, health risk assessments from contaminated data analysis, mental health preventive trials & longitudinal data and semi parametric methods.



Artwork used through the courtesy of the National Cancer Institute

Biostatisticians have changed public policy and helped make new law by testifying on air pollution before congress, courts, and the Environmental Protection Agency.



Employment Opportunities!



- **Biostatistician**
- **Survey Statistician**
- **Biomedical Statistician**
- **Health Care Analyst**

- **Universities**
- **Federal, State, and Local Government**
- **Research Firms**
- **Pharmaceutical Companies**

For More Information

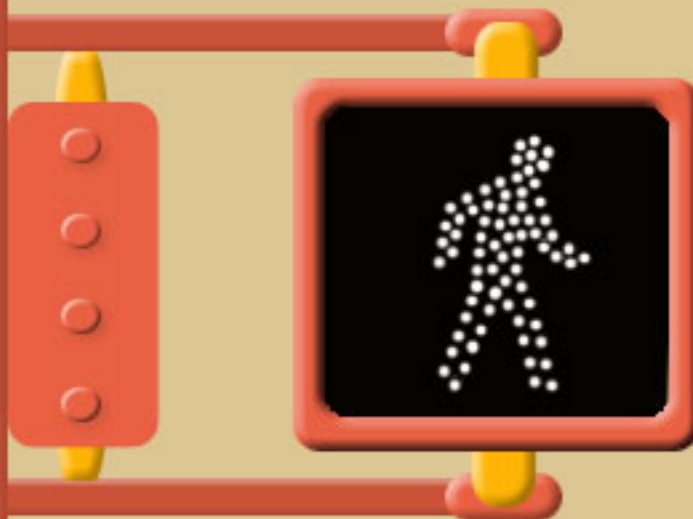
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