

# STATISTICAL SIGNIFICANCE

*Statisticians are vital to all forms of health care, from developing treatments to examining regimens for preventing and detecting disease. To deal with the complexity of the human body and its interactions with its surroundings, statisticians collaborate with health-care researchers to extract information from data, leading to treatments and information that reach the public more quickly.*

## Health Care Research

### ASSESSING DISEASE RISK:

The risk of an individual developing a disease or suffering an event such as a heart attack may be related to family history, environment, or behavior. Disentangling these factors requires sophisticated statistical methods. Statisticians have developed powerful risk assessment tools to predict a patient's chance of such adverse occurrences, which guide recommendations for screening for early disease detection and treatment. Early detection can result in better health and lower health costs. Try these risk-assessment tools:

Breast Cancer:

[www.cancer.gov/bcrisktool](http://www.cancer.gov/bcrisktool)

Heart Attack:

<http://hp2010.nhlbi.nih.net/atpiii/calculator.asp>

Melanoma:

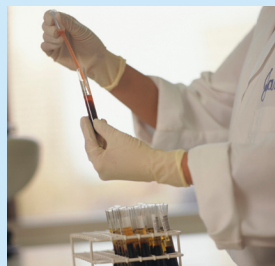
[www.cancer.gov/melanomarisksite](http://www.cancer.gov/melanomarisksite)



### INFORMING DECISIONS – HEALTHY MOMS, HEALTHY BABIES:

Many women must consider trade-offs when considering

childbearing and career. As women age, fertility declines and the probability of pregnancy complications and some birth defects begins to rise. Statistical models are crucial decision-



### Ensuring Safe and Adequate Blood Supply:

A safe and adequate blood supply is a critical requirement for modern medicine and public health. Because of the various social, demographic and health factors in all the components of realizing this goal, from forecasting supply and demand, and identifying likely donors, to understanding and reducing the risks of transfusion-transmitted

infections, advanced statistical analysis and modeling are needed. With this information, public health officials are better prepared to deal with insufficient supply and can better design targeted outreach and education programs on blood donation. Further, this information has been used to significantly reduce the risks of transfusion-transmitted infections.

making tools that help clinicians provide advice to hopeful mothers-to-be about how long to attempt pregnancy naturally before considering in vitro or other reproductive technologies. They also help obstetricians advise women about healthy pregnancy behaviors regarding optimal nutrition and weight gain during pregnancy.

### MEASURING PATIENT AILMENTS—IMPROVING CARE:

Symptoms that require patient reporting, such as pain and fatigue, are hard to measure. Statisticians are helping develop new efficient and consistent clinical measures for self-reported conditions that help adapt questions to each patient while enabling comparisons to broader populations. Tailored

questionnaires can leave patients more satisfied with their care, and therefore more likely to return for necessary follow-ups and supervision. Care providers and clinical researchers also benefit by having better patient information and better information about treatment effectiveness.

“Statistics Improves Health Care” is part of Statistical Significance, a series from the American Statistical Association documenting the contributions of statistics to our country and society. For more in this series, visit [www.amstat.org/outreach/statsig.cfm](http://www.amstat.org/outreach/statsig.cfm). The American Statistical Association is the foremost professional society of statisticians, representing 18,000 scientists in industry, government, and academia: [www.amstat.org](http://www.amstat.org). This Statistical Significance was produced under the supervision of the ASA Section on Health Policy Statistics, with input from the ASA Section on Statistics in Epidemiology.