BROCK UNIVERSITY PROFESSOR PREDICTS RISK OF HEART DISEASE

Business Issue

Predict future health outcomes based on past behavior and environmental factors.

Solution

SAS® accesses and analyzes massive amounts of data from multiple sources to understand the relationship between high cholesterol intake at an early age and chronic disease in adulthood.

Benefits

By looking at a variety of factors, including cholesterol intake, height, weight and level of physical activity, epidemiologists can predict the risk of adult cardiovascular illness and fatality in children.

Today, people routinely keep an eye on their cholesterol intake. Not only have changes in diet and lifestyle sharply reduced the risk of cardiovascular disease, but doctors also have better strategies to treat patients and speed their recovery.

Much less is known, however, about the impact of childhood experiences and environmental factors on cardiovascular disease. Leading the way in analyzing these effects among adults is Jian (Jason) Liu, PhD, an Assistant Professor at Brock University's Department of Community Health Services.

Using SAS software, Liu studies the connection between a high level of cholesterol in childhood and the risk of adult cardiovascular problems. Called epidemiology, Liu's area of study includes the incidence and distribution of diseases and ways to control and prevent them. It typically requires massive amounts of data from a variety of sources, including nutrition databases, as well as healthcare and community demographic information. Liu says he depends on SAS to pull this information together to be used for analyses, trending and correlations.

He also makes it clear that he isn't the only one to benefit from the use of statistical tools at Brock; his students can learn from them too. And that's why, since coming to Brock University in 2004, he prefers to use SAS. It allows him to further his own research while developing his students' appreciation of the role SAS can play. "The beauty of SAS is that it can be used at differing levels, from basic homework assignments for a second-year university student to heavy-duty, PhD-level research and beyond," he says.

The students have the opportunity to use real-world data and essentially work as epidemiologists before they graduate. For example, Liu asks his students to find correlations between environmental factors and health risks using information pulled from the National Health and Nutrition Examination Survey (NHANES, a US data set based on interviews with literally thousands of citizens). They can further compare this data with information supplied by Health Canada and the US Centers for Disease Control and Prevention. And while students can be daunted by the sheer volume of data, by "breaking it down into small pieces, they see the benefit," says Liu.

Liu is taking the research even further, building on years of work to develop statistical models that predict risk of disease. These models establish the relationship between high cholesterol intake at an early age and chronic diseases later in life. For example, the evidence indicates that cardiovascular disease has a long latency time, and that problems begin in early childhood.

Using data from NHANES to examine the lifestyle habits of 1,068 adolescents ranging in age from 12 to 16, Liu and his team can now prove this hypothesis. By looking at a variety of factors, including cholesterol intake, height, weight

> "The beauty of SAS is that it can be used at differing levels, from basic homework assignments for a second-year university student to heavy-duty, PhD-level research and beyond."
>
> **Dr. Jian (Jason) Liu**
> Assistant Professor

and level of physical activity, he can predict the risk children have for adult cardiovascular illness and possibly a fatality.

Given recent concerns that the number of overweight children and teens has surged in recent years, his research is taking on added significance, prompting public health experts to look for ways to improve both dietary and fitness habits of children. For that reason Liu, who has published the results of his research in academic periodicals such as the *International Journal of Obesity*, sees the benefits of looking at the big picture and getting his findings out into the community.

While admitting that he is not an "expert" user of SAS – "I am an epidemiologist, not a statistician," he says – Liu feels the potential for the use of SAS in his field of endeavor is unlimited. "You can expand its use into so many new areas."