

families displayed particularly large IQ gains by adolescence.

The new study expanded on that work. Using data from seven French public adoption agencies, the researchers identified 65 children who had been adopted between ages 4 and 6 and had received institutional or foster care because they had been abused or neglected as infants.

Just before adoption, the youngsters had an average IQ of 77, with no scores above 86. The IQ range classified as normal runs from 90 to 110.

When tested in early adolescence—mostly ages 13 and 14—the average IQ score of all the adoptees was 91. Average IQ reached 86 for those in low-income homes, 94 for those in mid-income homes, and 98 for those in high-income homes. The researchers say they don't know whether these IQ gains will last into adulthood.

"They've done a nice job of showing that IQ is malleable and that it responds to the kind of environments adopted children go into," says psychologist Robert J. Sternberg of Yale University. Sternberg

views IQ as a measure of analytic intelligence, distinct from what he calls practical and creative intelligence.

Psychologist John C. Loehlin of the University of Texas at Austin also sees the new study as evidence for environmental influences on IQ. But other data suggest that such gains decline at later ages, says Loehlin, who views IQ, especially a statistical component known as *g*, as the core sign of a person's intelligence.

Linda S. Gottfredson, a sociologist at the University of Delaware in Newark and also a *g* advocate, says that abusive care during infancy may have deflated IQ scores of the French children, who then recovered their true IQs after adoption. Thus, the findings don't show whether the environment would affect the IQs of kids receiving at least adequate care, she argues.

While seeing value in studying environmental effects on intelligence, psychologist Peter H. Schönemann of Purdue University in West Lafayette, Ind., argues that neither IQ nor *g* provide insight into mechanisms of intelligence. —*B. Bower*

## Women's heart attacks kill more often

Heart attacks typically hit men at an earlier age than they do women, but women may not hold the ultimate advantage. Among people stricken during middle age, women are much more likely than men to die in the hospital, new findings indicate.

Using data from 1,658 hospitals around the United States, researchers led by Viola Vaccarino of Yale University studied almost 400,000 men and women between the ages of 30 and 89 who were hospitalized for heart attacks.

The team found that the male patients were on average almost 7 years younger than the female patients. However, 16.7 percent of women but only 11.5 percent of men died in the hospital, although about the same number of men and women died. For patients under age 50, women were more than twice as likely as men to die in the hospital, the group reports in the July 22 *NEW ENGLAND JOURNAL OF MEDICINE*. That gap steadily narrowed as patients got older, closing at age 74.

Seeking an explanation for this striking pattern, Vaccarino's group uncovered several notable sex differences among younger patients, none of which emerged in elderly patients.

Women under age 70 were more likely than their male counterparts to have diabetes, congestive heart failure, or stroke, lessening their odds of surviving a heart attack. Younger women also tended to wait longer than men before going to the emergency room and were more often misdiagnosed. The researchers report that the crushing chest pain and other warning signs that typify men's heart attacks are less com-

mon for women, making their symptoms tougher to evaluate.

Finally, younger women tended to have heart attacks that were more severe and were accompanied by more complications than their male peers did. Even so, physicians were slightly less likely to give these women aspirin, beta-blockers, clot-busting drugs, and other crucial early remedies for heart attacks.

Together, sex differences in all these risk factors explain only about one-third of the difference in death rate between women and men, the researchers calculate.

"The bottom line is that women who have a heart attack may not all be the same," says Vaccarino. "There may be some subgroups that are susceptible to a particularly aggressive disease for reasons we don't yet understand."

In an editorial accompanying the report, Laura F. Wexler of the University of Cincinnati Medical Center underscores the apparent severity of heart attacks in younger women. Noting that many sex differences in coronary artery disease lessen after menopause, she speculates that genetic variations in the regulation of estrogen may make some younger women more vulnerable to heart disease.

Charles Maynard of the University of Washington in Seattle says the new study is important because it highlights the danger of heart attacks in women, a threat that has long been underappreciated. Further research, he suggests, should scrutinize habits and treatments that might promote women's long-term health after heart attacks. —*S. Carpenter*

## Vitamin A thwarts malaria in children

Regular doses of vitamin A hold off many cases of malaria in children, particularly those ages 1 to 3, new research shows. These findings suggest that the vitamin bolsters the immune system's fight against the mosquito-borne disease.

Vitamin A is known to boost production of macrophages, T cells, and antibodies—all immune system stalwarts. To gauge its effects against the parasite that causes malaria, U.S. scientists teamed with researchers at the Papua New Guinea Institute of Medical Research in Goroka to track 480 children in that country.

Every 3 months for 13 months, half the children received an inert substance; the rest got a capsule containing 200,000 international units of vitamin A, which the liver stores and parcels out as needed.

Subsequent medical examinations and blood tests of the children, ages 6 months to 5 years, revealed that those getting the placebo experienced 249 episodes of fever that were accompanied by a substantial presence of malarial parasites in the blood. In contrast, the children getting vitamin A supplements suffered only 178 such episodes. The study appears in the July 17 *LANCET*.

Children less than a year old gained little benefit from the vitamin A, but such babies don't usually become as ill with malaria as do children 1 to 3 years old. Vitamin A imparted significant resistance to the disease to these toddlers, says study coauthor Anuraj H. Shankar of Johns Hopkins Medical Institutions in Baltimore.

Of 90 such children getting the placebo, 67 (74 percent) had enlarged spleens, a frequent complication of malaria. Only 46 (58 percent) of 79 children this age getting vitamin A had the condition.

By age 5 or 6, many children in the tropics have built partial resistance to malaria. The children ages 1 to 3 getting vitamin A exhibited an immune response against the disease resembling the response normally seen in their older siblings. "This appears to accelerate the acquisition of [some] immunity by a few years," Shankar says.

The vitamin helped deter mild and moderate disease rather than the most severe illness. Equal numbers of children in the two groups had harsh cases of malaria. Vitamin A may not affect the mechanism in the body that controls susceptibility to high concentrations of parasites, and hence, severe disease, says James W. Kazura of Case Western Reserve University in Cleveland.

Nevertheless, at pennies per capsule, vitamin A may prove to be a useful weapon against the most common malarial infections, he says. —*N. Seppa*