Biomedicine

War against the heart

War, that notorious thief of a country's wealth, takes a subtle toll on civilian health as well. In a study of war as a risk factor for heart disease, researchers have documented a correlation between exposure to wartime events and the risk of coronary artery disease among people living in Beirut.

Abla M. Sibai and her colleagues at the American University of Beirut studied 127 patients referred to a hospital for possible coronary artery disease. The researchers interviewed and gave specially designed questionnaires to the patients and to matched controls randomly chosen from hospital visitors. They collected data on classic coronary risk factors such as smoking history, diabetes and family history of coronary disease and on war-exposure variables, which they characterized as either "acute" or "chronic." Acute war-related variables included major events directly affecting a patient's nuclear family or property, such as kidnappings or property damage; chronic variables included more general stress factors, such as living in a dangerous neighborhood or crossing the "green lines," which separate belligerent factions within the city. When crossing green lines, citizens enter the line of sniper fire, and they must stop at multiple checkpoints manned by opposing military and political groups.

Even after adjusting for the expected effects of the classic risk factors, the researchers conclude that exposure to both chronic and acute war-related events increases an individual's risk of coronary artery disease. Moreover, they found that the risk increases with the frequency of exposure to war-related stressors; patients exposed to four or more events have a coronary disease risk up to 11 times greater than that of patients exposed to just one event.

Coauthor Haroutune K. Armenian, now at the Johns Hopkins University School of Hygiene and Public Health, cautions that the small sample size makes it difficult to draw definitive conclusions. Sibai is currently conducting a larger study to investigate the trends. Previous studies have noted a correlation between the stress of natural disasters and the occurrence of coronary artery disease, but this is the first study to focus on wartime risk factors, the researchers report in the October AMERICAN JOURNAL OF EPIDEMIOLOGY.

Supersensitive supersecrecy

At UNISYS Corp.'s defense group computer facility in Camarillo, Calif., workers are putting final touches on a new data bank set to go on line within the next six months. The computer system will house information so secret that even high-ranking government officials will have no direct access by telephone links. Instead, information will be entered by hand from sealed, written reports and, upon request, distributed to qualified personnel via the mail — perhaps in double-wrapped envelopes that will not give away the nature of their contents.

What information could be so sensitive? Nothing less than a national compilation of all professional reprimands against individual physicians, dentists and other health care practitioners along with detailed accounts of any malpractice payments made by these practitioners.

Last week the federal government published its description of the new system, stirring controversy for its decision to deny individuals and health care advocacy groups access to the computer's contents. Physician organizations want the data kept out of non-physician hands for fear they will be misinterpreted by consumers. Patient advocates counter that such information could help people choose health care providers.

The new plan allows licensing boards, health care facilities and individuals who are the subjects of reports access to reports. Hospitals must check the records of medical staff applicants and must periodically review their staffers' records.

Environment

Ozone hole threatens polar plankton

Elevated levels of ultraviolet light filtering through a seasonal "hole" in the stratospheric ozone layer above Antarctica threaten tiny plants that feed, directly or indirectly, virtually all other polar life, according to oceanographer Sayed El-Sayed at Texas A&M University in College Station. His studies at Antarctica's Palmer Station show the photosynthetic capacity of marine phytoplankton at the bottom of the polar food chain is extremely vulnerable to the increases in ultraviolet (UV) light that accompany the ozone hole detected annually over the Antarctic since the late 1970s (SN: 10/14/89, p.246).

In a series of experiments, El-Sayed measured the photosynthetic rate of polar phytoplankton housed in adjacent tanks and exposed to four different UV conditions. Ambient light irradiated the one-celled organisms in the first tank. Plexiglas filters eliminated all UV light from the second tank. Filters screened out about one third of the ambient UV from tank three. And fluorescent UV lamps augmented natural solar-UV irradiation by about 16 percent in the fourth tank, conditions meant to simulate what might occur under an ozone hole.

Compared to phytoplankton raised under ambient light, those exposed to the enhanced UV reduced their photosynthetic rate 35 to 75 percent — depending on the source of the tiny plants (open water, ice or a sea-ice hole). By contrast, those exposed to just two-thirds the normal UV increased their photosynthetic rate from 35 to 175 percent. Those in the UV-free tank boosted their photosynthetic rate a dramatic five- to seven-fold.

These data "are very consistent with our results," says Osmund Holm-Hansen at the Scripps Institution of Oceanography in La Jolla, Calif. He says they show that where the light intensity is high — as it is in the upper one or two meters of the ocean — "natural UV levels are having a very dramatic effect," substantially reducing the productive capacity of these plants. Less clear, he says, is whether UV effects are as potent in the ocean's darker, deeper reaches.

A light meal at sea

In a molecular bucket brigade of life, carbon atoms pass from soil to plant to animal to air. Scientists studying the cycle have long puzzled over the ocean — which seems to hog the buckets rather than pass them on. In the ocean, organic molecules from decaying plants and animals — known as humic material — combine into larger molecules that plankton or bacteria can't ingest. These inedible molecules can last thousands of years without decaying.

Now researchers at the University of Miami report sunlight can boost these molecules back into circulation. They exposed samples of seawater to sunlight and found that the light breaks these larger molecules into smaller fragments. Tiny zooplankton and bacteria rapidly gobble them up, returning them to the carbon cycle. The Miami team, led by marine chemist Kenneth Mopper, observed the reaction in coastal waters and open ocean, in the tropical Sargasso Sea and along the Maine coast.

The finding, reported in the Oct. 19 NATURE, both explains what happens to the enormous amount of carbon in the ocean, Mopper says, and accounts for regions where microorganisms thrive without an obvious source of edible carbon.

The marine chemists found a daily rhythm to the reaction, with sunlight breaking down the large molecules slightly faster than the microorganisms eat the results. At night, the creatures finish off the day's production. "Here is a mechanism that makes sense," says oceanographer John I. Hedges of the University of Washington in Seattle. "It's not [the result of] some little organism that lives only in Antarctica. It's global in scope — it occurs wherever sunlight hits the ocean."