

BEHAVIOR

John H. Douglas reports from Tokyo, Japan

Pressures on Japanese children

When the mother of a 14-year-old Tokyo boy refused to buy him a radio-cassette recorder last September, he responded by hanging himself from the veranda by an electric cord. That same day, in Osaka, another 14-year-old jumped into the path of an oncoming train after apparently cracking under the strain of preparing for stiff high school entrance exams.

On the average, more than one child a day committed suicide someplace in Japan during September, and two recent government studies reveal the problem is getting worse. Although suicide among adults appears to be declining (Japan now has the 15th highest overall suicide rate in the world), the number of children younger than 14 who kill themselves has doubled during the past decade.

When the Education Ministry surveyed suicides of school-children, it found that family troubles and under-achievement in school were two of the leading causes, with the latter category increasing more rapidly. More than twice as many junior high school students committed suicide because of academic worries in 1976 than in 1974.

A study by the National Police Agency, however, revealed sharp differences by sex: Among older teenagers, at least, boys killed themselves more often because of school-related problems, but girls more often committed suicide over some love-related problem. Suicide rates are twice as high for boys.

Another indication that Japanese children are increasingly unable to meet the rigorous demands society places on them comes from the 15-year study by Masayoshi Namiki of the Asahikawa Medical College. While examining students complaining of stomach trouble, Namiki and his colleagues at first identified two or three cases of ulcers a year; but in the first seven months of 1977, he says 19 have been found. The majority of cases, he reports, arise from cramming for exams, and the ulcers disappear within a few weeks after tensions are eased.

The safest country

The Japanese Justice Ministry's Research and Training Institute has, in its 1977 "White Paper on Crime," compared domestic crime rates to those abroad and says that Japan is by far the safest industrialized nation in the world. In only one crime does Japan have a higher rate than a major Western nation — its incidence of rape is slightly greater than Britain's.

Compared to the United States, Japan has one-fifth the murder rate, less than one percent of the robbery rate and about 28 percent of the rate for theft. Although the crime rate edged up one percent last year, the long-term trend has been downward.

Some reasons for the low crime rate are obvious: Japan has strict gun control laws and even laws controlling toy guns. But the institute cites other major factors, including racial homogeneity, a high educational level and relatively weak class barriers. The study admits, however, that no "systematic and in-depth analysis" of these factors has ever been pursued.

A few clouds appear on the otherwise cheery horizon, however, as some classes of crime appear to be rising rapidly. Among these are crimes related to property or business, such as larceny, fraud and embezzlement. (Some observers relate this increase to the current economic slump.) Finally, for reasons not clear yet, the number of women arrested for committing crime has jumped 9.5 percent in one year.

Japan enjoys one other benefit that may be related to the low crime rate — an efficient police force and a tradition of citizen cooperation — which help give the country the highest arrest rate, relative to crimes committed, of all advanced nations.

BIOLOGY

Julie Ann Miller reports from San Diego at the annual meeting of the American Society for Cell Biology

Serum-free diet for lab grown cells

Animal cells growing in laboratory vessels are far removed from the fluctuating nutrients and hormones of a living body. Yet even this artificial environment has not been totally understood by scientists. Researchers have had to add a mysterious ingredient, serum from animal blood, to the solution of carefully measured chemical components. Blood serum contains a complex blend of thus far unquantified and unidentified biological compounds.

Now cells can be grown in a completely defined chemical medium, says Gordon Sato in an interview. Hormones turn out to be the critical ingredient. Sato and co-workers at the University of California at San Diego have succeeded in replacing serum with cocktails made up of six to twelve hormones, such as insulin, hydrocortisone and epidermal growth factor. Each of the human, mouse, rat and rabbit cell types so far grown without serum requires a different mixture. The researchers are searching for new hormonal factors to allow the laboratory growth of even more cell types.

By growing cells under defined conditions, researchers can learn what hormones cells need for growth. "This is absolutely fundamental information about human tumor cells that we couldn't get before," Sato says. For example, cancer of the prostate, which was previously thought to depend on testosterone, actually has a much greater requirement for a wide variety of hormones. Identifying hormone requirements of cancer cells, Sato hopes, will give scientists fine control over cancer metabolism within an animal. Then, for example, growth could be depressed or stimulated to make the cells maximally sensitive to chemotherapy.

Abnormal chromosome in breast cancer

A specific chromosome abnormality has been identified in cells grown from twelve women with breast cancer. Researchers from the University of Texas System Cancer Center in Houston suggest this anomaly may be a "common denominator" among all breast tumors. If so, researchers will be able to focus on a small fraction of the total array of human genes in the study of breast cancer.

In 12 out of 13 cases, Sen Pathak and colleagues Peter E. Barker, Q. V. Jones Cruciger, Relda Cauilleau and Michael J. Siciliano found extra, abnormal chromosomes made up of a fusion between the long arm of the chromosome geneticists call "chromosome number 1" and one of five other chromosomes. Similar fusions have not been found in studies of 15,000 persons free of cancer. None of the genes on the long arm of chromosome 1 are known to be associated with breast cancer, but only a few of the several thousand genes have been identified.

Recently the researchers studied 10 enzymes that genetically different cells may make in different forms. Their results demonstrate that the similar chromosome abnormalities found in the cells from women with breast cancer are not due to contamination among the cells or contamination with other laboratory grown cells.

Specific chromosome changes that occur in all tumors of the same type have been identified in several other human cancers. "We still need to see how unique the marker is to breast tumors by looking for these kinds of translocations in other kinds of cell lines," Siciliano says. Because the researchers do not yet know whether the chromosomal aberration appears in the cells of breast cancer patients before the malignancy, it remains unclear whether the abnormality is the cause or the effect of cancer.