

rectum, and cervix (considering females only). The estimated number of deaths from stomach cancer around 1980 was 607,000 (276,000 in developed regions and 331,000 in developing regions), while the estimated number of deaths from lung cancer was 597,000 (390,000 in developed regions and 207,000 in developing regions).

It is expected, on the basis of demographic and health status trends, that the number of cancer deaths may rise to approximately eight million annually by the year 2000. This prediction is based on three trends:

1) *Changes in the health spectrum and demographic structure of the population.* With successful efforts being made in developing countries to reduce mortality in childhood and young adult life, the proportion of the birth cohort surviving to middle and old age will increase. In addition, fertility rates are declining in many countries. Thus, as the number of people in the

older age groups (where cancer risks are high) increases, so will the number of deaths from cancer, both in absolute terms and relative to other causes of death.

2) *Changes in lifestyles.* With socioeconomic development, lifestyles and behavior patterns can be expected to change. These changes may be associated with an increased risk of certain cancers and a decreased risk of others. At the present time, largely owing to the increased cigarette consumption that so frequently accompanies these developments, the overall trend is toward increased cancer risk.

3) *Changes in the environment.* Important changes can be anticipated in the environment as a consequence of industrialization and urbanization. Some of these changes may work toward increased cancer risks for the population.

Source: World Health Organization. *Weekly Epidemiological Record* 59(17):125-126, 1984

CIGUATERA POISONING IN CANADA

In January 1983 a couple from Ontario ate 60-80 grams of cooked barracuda whose taste and smell were normal; 90 minutes later they complained of numbness of the tongue and lips, weakness, and diarrhea. They were placed in intensive care at a local hospital but recovered rapidly and were released the next day. The barracuda had been caught off western Jamaica and dried in December 1982. It was brought to Canada a week before the incident by a friend of the couple. Because of the symptoms experienced and the type of fish eaten, ciguatera poisoning was suspected and subsequently confirmed.

Since ciguatera poisoning is associated with fish from coral reefs, it would not be expected to occur in Canada, and this is the first Canadian incident to be confirmed.

In addition to persons eating fish brought into the country by travelers, another group at risk of experiencing ciguatera poisoning are tourists

who travel to regions where toxic fish are found. There are two unconfirmed reports of such poisoning involving Canadian visitors.

In addition, a Toronto physician reports that since 1978 he has seen four or five patients suffering from apparent ciguatera poisoning following vacations in Florida or the Caribbean, where they had eaten grouper, red snapper, or barracuda. Two of the patients were nurses in a Toronto hospital who diagnosed themselves as suffering from "travelers' diarrhea" but could not understand why recovery was so long and associated with neurologic symptoms.

Warnings about the possibility of ciguatera poisoning have been given in various medical journals in recent years.

NOTE: Ciguatera poisoning occurs frequently in tropical and subtropical coastal areas of the world, including the Caribbean, Florida, Hawaii, and the South Pacific. The origin of the poisoning has only recently been determined.

The dinoflagellate *Gambierdiscus toxicus* is widespread among coral reef systems and is associated with algal growth on coral that is browsed by herbivorous fish. Only when the coral is disturbed, however, by hurricanes, seismic shocks, underwater construction, or dumping do the algae grow rapidly and the dinoflagellates proliferate in a dangerous manner. Ciguatoxin, a fat-soluble, heat-stable neurotoxin produced by the dinoflagellates, is absorbed into the herbivorous fish tissues and passes into the flesh of carnivorous fish. The most toxic fish are usually the largest predators.

Over 400 species in the Indian and Pacific Oceans and the Caribbean Sea have been implicated in illness. The fish are apparently not affected by the toxin. But if enough ciguatoxin is present in the flesh, human consumption may

result in typical symptoms of sweating, chills, tingling or numbness of the mouth, prostration, dizziness, blurred vision or temporary blindness, paralysis, muscular pain, abdominal cramps, diarrhea, and vomiting. Neurologic symptoms may persist for a long time. The appearance, smell, and taste of toxic fish are usually normal, although a slight metallic taste may occasionally be noticed. Cooking does not destroy the toxin. Local fishermen avoid areas where toxic fish are found and this can have a severe economic impact—as, for instance, in the Virgin Islands, where 50% of the fish consumed is imported. Tourists visiting areas near coral reefs and wishing to eat fish should inquire if toxic fish are found locally.

Source. Ministry of Health and Welfare of Canada, *Canada Diseases Weekly Report* 9(44), 1983.

RUBELLA IMMUNIZATION STRATEGIES IN CANADA

Rubella vaccine was introduced in Canada in 1969. At first, however, immunization practices and vaccine coverage varied from province to province. In the early seventies, seven of the 10 provinces initiated mass vaccination programs for infants. The vaccine was given routinely at or soon after the subject's first birthday, either alone or (later) in combination with measles and mumps vaccines. Four of these provinces supplemented their infant programs with immunization of prepubertal girls. In addition, the three Prairie provinces (Manitoba, Saskatchewan, and Alberta) favored selective immunization of all prepubertal girls (11-12 years of age) and rubella-susceptible women of childbearing age.

During the seventies the Canadian National Advisory Committee on Immunization expressed no preference for either mass vaccination of infants or selective immunization of prepubertal girls, and instead it endorsed both policies. However, in 1982 the Committee revised its recommendations and advocated a *comprehensive* policy. This policy, if implemented throughout Canada, should significantly reduce the incidence of congenital

rubella syndrome (CRS) in the shortest possible time.

The new policy incorporates the best features of the alternatives previously recommended for infants and children (routine vaccination of all infants of 12 months and all prepubertal girls lacking documentary evidence of immunization) and also increases the emphasis on immunization of susceptible adolescent and adult women.

As of 1983, all provinces had adopted the policy of routine immunization of infants at 12 to 15 months of age, and seven of the 10 provinces were administering the vaccine to **prepubertal girls**. There had also been a remarkable increase in the immunization level of children at school entry, with all provinces reporting a current vaccine coverage of 90% or more using rubella vaccine in combination with measles and mumps vaccines. Two provinces (New Brunswick and Ontario) have passed legislation making **rubella immunization mandatory** for school entry.

Rubella has been a notifiable disease in Canada since 1924, with the exception of the