Cancer Control in the United States

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The expanding attack on cancer has been sharply accelerated during the past 5 years by the efforts of public health agencies and other groups throughout the country to reduce mortality from this disease through early suspicion, accurate diagnosis, and effective treatment. These well-directed efforts at cancer control add a new and powerful force to basic and clinical research.

An upsweep of public interest following World War II contributed much to the establishment of cancer control programs. Even more vital have been the contributions of State health agencies, voluntary organizations, hospitals, universities and medical schools, and other institutions. Many of these groups have received Federal support under the cancer control program of the National Cancer Institute of the National Institutes of Health, Public Health Service.

The extent of the cancer problem makes clear why public health emphasis on cancer is strong. In relation to other diseases, cancer has advanced in the last 30 years from sixth to second place as a cause of death in the United States. It is responsible for more than 200,000 deaths a year and accounts for 14 percent of mortality from all causes.

Control programs are aimed at reducing cancer mortality: first, by finding ways to shorten the dangerous intervals between the onset of the disease and diagnosis, and between diagnosis and the start of treatment; and second, by improving cancer diagnosis and clinical management. To these ends, real progress has been made since 1947 in developing programs of action throughout the country.

Today, official agencies in all the States, the District of Columbia, Alaska, Hawaii, Puerto Rico, and the Virgin Islands have cancer control programs. Thirty-three States and the District of Columbia are making specific appropriations for cancer control activities. In the District of Columbia and more than half the States and Territories, cancer has been made a reportable disease. Cancer teaching programs in almost all of the Nation's medical and dental schools have been strengthened. Postgraduate training of physicians in the field of cancer has been expanded, and educational programs for public health workers, general practitioners, dentists, and nurses have been started. Intensive public educational campaigns—notably those of the American Cancer Society and the National Cancer Institute—are under way, and substantial improvements have been made in the treatment facilities and diagnostic services reaching the individual citizen.

Increased Federal support has been an important factor in the accomplishments of the past 5 years. Up to July 1946, when Congress appropriated $2,500,000 for cancer grants to the States, the Public Health Service had been able to assist State and community cancer control activities only through consultation services and funds amounting to less than $250,000 a year. Since then, the National Cancer Institute has allotted $17,300,000 in Public Health grants-in-aid for expansion of the cancer control programs of the States, the District of Columbia, Alaska, Hawaii, Puerto Rico, and the Virgin Islands. During this period $14,815,000 has also been allotted in special grants-

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in-aid to institutions and individuals engaging in educational, research, and clinical projects dealing with cancer control. These allocations are made with the advice of a Cancer Control Committee of 12 members representing the American College of Surgeons, American Cancer Society, State health departments, hospitals, and medical schools.

Professional Education

Since the person with cancer is usually seen first by his family doctor, major cancer control emphasis is on programs designed to improve the diagnostic ability of the general practitioner. Such programs not only offer better professional education to undergraduates, graduates, and postgraduates, but also provide diagnostic and other special services to help the practicing physician.

So that oncoming general practitioners will be better prepared to meet the cancer problem, teaching grants totaling more than $7,000,000 have been made to 79 medical schools to augment teaching staffs and to provide training materials (*1*).

Postgraduate training for physicians has also been emphasized. Clinical traineeships totaling about $2,000,000 have assisted 450 young physicians, including 14 women, in taking advanced training in radiology, surgery, pathology, and other specialties. These physicians are established in practice or in positions where their special training benefits cancer patients.

In addition, many new aids to better cancer diagnosis and therapy are available to all physicians in general practice. The American Cancer Society and the National Cancer Institute have jointly produced a series of motion pictures on the problem of early diagnosis of cancer. A collection of slides assembled by the National Cancer Institute shows typical lesions and other aspects of the disease. Information on the progress of research, development of control techniques, and epidemio-statistical activities is available in printed form.

Thirty-nine of the Nation's dental schools have also used grants of funds to give students better grounding in cancer pathology, recognition of early lesions, and principles of cancer diagnosis and treatment (*2*). An oral cancer exhibit and a set of projection slides showing oral cancer lesions have been made available to dentists throughout the country, and special cancer education programs for practicing dentists have been conducted by the State health departments of Idaho and Michigan.

Physicians add to their knowledge of cancer by taking part in meetings of hospital tumor boards. In the board meeting shown here a physician (standing) discusses a cancer patient with the director of the tumor clinic and other members of the tumor board while medical students look on.

Nurses and Cancer Control

The extent to which public health nurses and other registered nurses have been brought into cancer control accounts for much of the success of these programs. Regular courses in cancer nursing and cancer control are now taught at the University of Minnesota and Columbia University. Early in 1952 the Department of Nursing at Skidmore College, New York, and the School of Nursing at Boston University began pilot studies to develop better methods for teaching undergraduate nurses about cancer. For this they are using a monograph on "Cancer Nursing in the Basic Professional Nursing Curriculum—Suggested Content and Methods," provided by the National Cancer Institute. Another aid, "Cancer Nursing—A Manual for Public Health Nurses," produced by the New York State Department of Health

and the National Cancer Institute, is being widely used.

Cancer nursing seminars have been conducted in several States, Hawaii, and Puerto Rico, and a number of universities have offered concentrated, full-credit courses in cancer nursing.

Programs for Public Health Workers

The increasing public health problem of cancer is of special concern to health educators, medical social workers, statisticians, medical record librarians, and other public health personnel.

The Schools of Public Health at Yale, Harvard, and the University of Michigan have made use of grants-in-aid to establish courses in cancer control for public health workers. A number of cancer publications for public health workers have been prepared by various organizations during the last 3 years. The newest is "Cancer Control: A Manual for Public Health Officers," developed cooperatively by the New York State Department of Health and the National Cancer Institute, and soon to be published.

Pharmacists throughout the country became active in cancer control programs in 1948 through an educational campaign conducted by the American Pharmaceutical Association and the National Cancer Institute (*3*). During the year-long campaign, pharmacists in some 15,000 drug stores displayed counter cards to the public and posted bulletins in their prescription rooms giving information on the signs of early cancer.

Public Education

Effective measures for cancer control have their foundations largely in public education. Public and voluntary agencies in the cancer field have evolved programs of public information and education designed to enlist the cooperation of the layman by alerting him to the threat of cancer and guiding him to medical aid.

A timely example of public educational work is the nation-wide campaign to control breast cancer by urging women to adopt a simple procedure for monthly self-examination and to report to a physician any lump or other abnormality discovered. State health departments, the American Cancer Society, the medical profession, and many other organizations have joined in a campaign to carry this message to the 32,000,000 American women 35 years of age and older. This is being done through showing a 15-minute motion picture, "Breast Self-Examination," jointly produced and distributed by the American Cancer Society and the National Cancer Institute.

The public learns about cancer from exhibits like this. Women's clubs and professional groups in the United States are using the exhibit shown above in the campaign to control breast cancer.

It is still too early to estimate the number of lives which may be saved by this campaign. However, a long-range study undertaken during 1951 in Iowa by the State Medical Society, the State Health Department, the Iowa Division of the American Cancer Society, and the National Cancer Institute is expected to provide basic data for a representative population of American women. Effectiveness of the film in teaching women how to examine their breasts has been indicated in a preliminary study made in New Haven by the Yale University Department of Public Health. This study found that 77 percent of the women who had not previously examined their breasts did so as a result of seeing the film (*4*).

Other instruments for public educational use have been developed. One especially suitable for high school and college students is the motion picture, "Challenge—Science Against

Cancer," sponsored by the Canadian Department of National Health and Welfare and the National Cancer Institute of the Public Health Service. The film points up the meaning in cancer research of new achievements in biology, physics, chemistry, and genetics.

Public educational work is also aided by a variety of pamphlets, leaflets, and other publications. Distribution of material of this kind in 1 year alone totaled 11,374,950 (*5*). These publications reach virtually all segments of the general population through activities of the American Cancer Society, the Public Health Service, State, county, and city public health departments, women's clubs and other organizations, and physicians in general practice.

Cancer Diagnostic Services

Striking increases and improvements in cancer diagnostic services and treatment facilities have been made since 1947 (*6*).

The number of approved cancer clinics grew from 407 in 1946 to 659 in 1951, stimulated by funds granted to the American College of Surgeons and State health departments.

Thirty States, the District of Columbia, Alaska, Hawaii, and Puerto Rico have added tissue diagnostic services to their cancer control programs. In Kentucky and Florida mobile cancer diagnostic units have been provided for rural patients.

Tumor registers and tissue-slide loan services, established at a number of universities, medical schools, and hospitals, have greatly improved training facilities for pathologists.

Studies to develop improved cancer therapy have also been conducted by universities, medical schools, and hospitals in various parts of the country.

Case-Finding Studies

Searchers for a practicable cancer case-finding method are exploring the possibilities of screening the general population by conventional clinical methods or of finding a suitable clinical test for cancer.

Although none of the diagnostic tests developed thus far has proved specific or sensitive enough to be of practical value, work in this field continues. To develop new tests, a direct operational unit was set up at the University of Washington, Seattle, to work principally in the fields of immunology, enzyme chemistry, and blood proteins. Two national conferences have been held to review developments in the continuing search.

Cancer informational materials go abroad. Shown above are United States cancer magazines, books, pamphlets, and exhibits displayed in Paris at the Fifth International Cancer Congress, 1950.

The practicability of the cancer detection center as a case-finding device was studied during 1947 and 1948 by the National Cancer Institute through its operation of a cancer investigation center at Hot Springs, Ark. (*7*). The Hot Springs experience indicated that the detection center as such did not offer an economical, practical approach to the problem of controlling cancer. The study revealed that the vaginal cytologic test of Papanicolaou might be useful for screening the general female population. To obtain a group large enough for such screening, the center was moved to Memphis, Tenn. In general, most authorities feel at the present time that cancer detection centers have served a definite educational role for the profession, as well as the communities where they are located, by demonstrating the need for cancer clinic services in an area. The present tendency is to convert detection centers into cancer clinics.

Six cytology training centers are now in operation, one each at Cornell University, Tulane and Louisiana State Universities, and the Universities of California, Colorado, and Oregon.

Environment and Cancer

Environmental cancer-causing hazards and their control are subjects of intensive study. State health departments are conducting occupational and environmental cancer studies and surveys of selected industries in California, Colorado, Connecticut, New Jersey, Ohio, and Pennsylvania. Of special interest is the study of the exposure of workers and inhabitants on the Colorado plateau to radioactive substances in the uranium mining and processing industry. One completed occupational cancer survey in Ohio has yielded new facts and concepts on chromate cancer of the lung and associated health hazards. In a new project, the Ohio Department of Health is investigating possible cancer hazards to which workers in the rubber industry may become exposed.

Environmental cancer research units are also in operation at the Universities of Utah, Pittsburgh, and Southern California. The Utah unit is studying cancer hazards associated with the mining and milling of uranium ores and other radioactive materials. The Pittsburgh study deals with substances derived by high-temperature distillation of coal and coal tar products. The California group is investigating potential cancer-causing environmental hydrocarbons related to the petroleum industry.

Other work in this field is being done by the National Cancer Institute at its cancerigenic research laboratory established in 1949 at the Georgetown University Medical School in Washington, D. C. These investigators are studying environmental cancer-inciting agents in metals, environmental poisons, and synthetic oils.

Studies of Cancer Morbidity

Valuable new information on the size and nature of the cancer problem in the United States has been collected since the close of World War II.

New studies of cancer morbidity during 1947 covering 10 major metropolitan areas in the United States, first surveyed in 1937, have been completed by the National Cancer Institute. Individual reports have been published on the areas centering about San Francisco and Alameda Counties, Calif.; Atlanta, New Orleans, Denver, and Pittsburgh (see table); and, more recently, Chicago. Reports on Dallas, Detroit, Birmingham, and Philadelphia are in the process of publication.

These studies provide basic information on cancer incidence, prevalence, and mortality with regard to such factors as site, sex, age, and race. They re-emphasize the importance of

Incidence, prevalence, and mortality rates per 100,000 population for all cancers, 1947 and 1937, by sex

[Based upon data collected in Atlanta, San Francisco, New Orleans, Denver, and Pittsburgh, and adjusted on continental United States population, 1947.]

Item	1947			1937			Percent increase		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
Incidence									
Number of cases	16,476	7,714	8,762	10,209	4,510	5,699	61.4	71.0	53.7
Crude rate	349.3	338.8	359.0	260.3	232.5	287.4	34.2	45.7	24.9
Age-standardized rate	341.2	342.9	343.4	269.5	249.9	290.6	26.6	37.2	18.2
Prevalence									
Number of cases	21,938	10,011	11,927	14,179	5,991	8,151	54.7	67.1	46.3
Crude rate	465.1	439.7	488.7	361.5	308.9	411.0	28.7	42.3	18.9
Age-standardized rate	453.9	445.2	467.4	373.9	332.4	417.3	21.4	33.9	12.0
Mortality									
Number of deaths	6,748	3,302	3,446	4,711	2,197	2,514	43.2	50.3	37.1
Crude rate	143.1	145.0	141.2	120.1	113.3	126.8	19.2	28.0	11.4
Age-standardized rate	140.8	148.1	135.8	126.2	123.6	129.7	11.6	19.8	4.7

the various programs directed toward early case finding and early diagnosis.

Cancer in Human Experience

Much is being learned from cancer epidemiology, the study of cancer in human experience. Its immediate objective is to describe group characteristics associated with cancer and those associated with its absence, with the ultimate aim of explaining the natural history of cancer and thus provide a basis for prevention and control.

Physicians at Beilinson Hospital in Israel are studying the incidence of cancer of the uterine cervix, other female genital organs, and the breast among Hebrew women in Israel. The ethnic distribution of cancer in Hawaii is receiving special attention in epidemiological studies by the Territorial Department of Health. Epidemiologists at the University of Southern California are studying cancer of the uterine cervix. The Medical College of Georgia is conducting a one-county study of the incidence and control of cervical cancer by general population screening. Genetics of human cancer are being investigated by scientists at the University of Utah. Other cancer epidemiology studies are being conducted by the Maryland State Department of Health, the University of Cincinnati, Georgetown University, and Washington University.

Epidemiological records collected from cancer clinics in New York City, St. Louis, and New Orleans are being analyzed at the National Cancer Institute to test, on a large series of cases, a number of factors thought to have etiological significance in human cancer and to evaluate the further usefulness of this type of study in learning more about the etiology of human cancer. Among factors being studied are the relationship of fertility and marital status to cancer of the breast and cervix, and the relationship between smoking and cancer of the lung. The geographic distribution of leukemia in the United States is also being studied.

There Is Hope

How well are we getting at the control of cancer?

The question is partly answered by a recent report of the Metropolitan Life Insurance Company which stated: "Some encouraging signs are already evident in the postwar record of industrial policyholders. A comparison of death rates for 1946–47 and 1949–50 shows reductions in mortality from the malignant neoplasms among white females at ages 25 to 74 years. For the accessible sites as a group, both sexes experienced declines in mortality, white males by 2.4 percent and white females by 7.2 percent. Both sexes were favored with reductions in mortality for such specific sites as the stomach, the intestines and duodenum, the rectum and anus, the liver and biliary passages, and the bladder" (*8*).

Other signs of progress can be seen. The atmosphere of pessimism which has surrounded the cancer problem for so many years is being cleared away. Knowledge of etiological factors of cancer is increasing. Improved techniques for cancer therapy are numerous and varied. Programs and facilities for maximum discovery, early diagnosis, and adequate therapy have been created. These advances point to a progressive reduction in the death rates from cancer and to control of the disease.

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