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THE PROGRAM OF THE NATIONAL CANCER INSTITUTE [1]

Cancer is well recognized as a major public health problem in the United States today. It has steadily increased its toll to more than 180,000 lives a year, and as a cause of death, has become second only to heart diseases, and first for women between the ages of 35 and 54. In truth, the problem warrants our growing concern. But fortunately an enlightened public is now seeking earlier treatment; the medical profession is better prepared to combat cancer than ever before; and science, through research, continues to offer hope of an ideal preventive or cure.

For the last quarter of a century, the Federal Government has taken some part in cancer research, and more recently in cancer control activities. However, it was not until 1937, in response to repeated demands for increased guidance and active assistance in these fields, that the National Cancer Institute was established and placed in the National Institute of Health, the principal research branch of the United States Public Health Service. The program of the National Cancer Institute is designed for the effective performance of two functions: first, to minimize cancer deaths through prevention, early discovery and adequate treatment; and second, to increase our knowledge of the disease through laboratory and clinical research, with universal eradication of cancer as the ultimate goal.

The functions of the Federal Government in cancer research and control were broadly but definitively outlined in the National Cancer Institute Act of 1937, which created the Institute and the National Advisory Cancer Council. The latter is composed of six leading cancer experts who serve 3-year terms, with the Surgeon General as chairman. The Council advises on Institute plans and policies, and reviews and makes recommendations on grant-in-aid applications.

Present members of the Council are Dr. Charles Huggins, professor of surgery at the University of Chicago School of Medicine; Dr. Robert S. Stone, professor of radiology at the University of California School of Medicine; Dr. Shields Warren, assistant professor of path-

[1] From the Cancer Reports Section. Prepared by William Carrigan and Ora Marshino.

ology, Harvard Medical School; Dr. Waltman Walters of the Mayo Clinic and professor of surgery, University of Minnesota School of Medicine; Dr. Edward A. Doisy, professor of biochemistry at the St. Louis University School of Medicine and one of the Nobel Prize winners in medicine in 1943; and Dr. John J. Morton, Jr., professor of surgery at the University of Rochester (New York) School of Medicine and Dentistry. Dr. A. C. Ivy who is vice president in charge of professional colleges of the University of Illinois is executive director of the Council.

In July 1947 the National Cancer Institute was reorganized to provide for effective integration of a much-expanded program. For administrative purposes, the activities of the Institute were divided into three major fields—scientific research within the Institute, research grants to outside institutions, and cancer control. The Institute is directed by Dr. Leonard A. Scheele. Dr. Harry Eagle is scientific director of the Research Branch; Dr. David E. Price is chief and Dr. Ralph G. Meader is scientific director of the Research Grants Branch; Dr. Austin V. Deibert, assisted by Dr. Raymond F. Kaiser, directs the Cancer Control Branch.

The Institute's total appropriation for the fiscal year 1948 is $14,000,000. $2,885,000 has been allocated for intramural research; $4,803,000, for cancer research grants; and $5,777,000, for cancer control purposes. Of the total control allotment, $2,500,000 has been set aside for State health agencies, $1,000,000 for special control-project grants, $250,000 for clinical traineeships, $1,500,000 for grants to medical and dental schools for the improvement of undergraduate cancer teaching, and $527,000 for control demonstrations, consultation and control administration. The remainder of the $14,000,000 has been allocated for research fellowships ($300,000) and for administration of the over-all program ($235,000). Thus, approximately 40 percent of the total appropriation for the year 1947–48 will be expended for cancer control, and most of the remainder will be used for research.

CANCER RESEARCH

Cancer research within the Public Health Service was initiated in 1923 by two groups of scientists—one at Harvard University, under Dr. J. W. Schereschewsky, and the other at the Hygienic Laboratory in Washington, D. C., under Dr. Carl Voegtlin. When merged in 1937, these groups formed the nucleus of the National Cancer Institute. Dr. Voegtlin became the first chief of the Institute in January 1938. He was succeeded by Dr. R. R. Spencer upon his retirement in July 1943.

The research of the Institute has been conducted, for the most part, in a well-equipped building completed in 1939 at Bethesda, Md.

This is one of the buildings that compose the National Institute of Health, constructed about 10 miles from the center of Washington on a plot of land donated by Mr. and Mrs. Luke I. Wilson. In January 1948 another building on the grounds of the National Institute of Health became the second large laboratory of the National Cancer Institute.

The investigation of cancer in human beings is pursued in hospitals that serve the Institute as clinical research laboratories. First to be used was the Tumor Clinic of the United States Marine Hospital in Baltimore, Md., where merchant marine personnel and other Public Health Service beneficiaries may report for cancer diagnosis and treatment. Specialized clinical research is conducted at several other hospitals, including Laguna Honda Home, associated with the University of California Medical School, and the Warwick Clinic at Garfield Hospital in Washington, D. C. Part of a new appropriation to the National Institute of Health will enable the Cancer Institute to purchase land and draw plans for its share of a new clinical facility. This will be a 500-bed research hospital at Bethesda headquarters, of which 150 beds will be used for cancer research, 150 for heart disease research, 150 for mental health studies, and 50 for other diseases.

In order to facilitate publication and distribution of scientific reports, the Journal of the National Cancer Institute is issued bimonthly. This carries the findings of scientists working at the National Cancer Institute and accounts of outside research. Occasionally an entire issue is devoted to a special subject, such as a gastric cancer conference sponsored by the National Advisory Cancer Council. One thousand copies of the Journal are sent free to research scientists and scientific libraries, and others are distributed to subscribers.[2]

It is generally recognized that the cancer problem, because of its broad scope as a problem of growth, requires the inter-disciplinary efforts of a research group in which many basic sciences are represented. In the development of the Institute's research staff, therefore, attempts have been made to select workers on the basis of training in the fundamental medical and biological sciences rather than their particular experience in the field of cancer. There is also a flexible separation of activities into projects. At present the Research Branch comprises more than 250 scientists, technicians, and attendants.

The laboratory research staff, under the direction of Dr. Harry Eagle, is divided into administrative sections headed as follows: Biology, Dr. H. B. Andervont; Biochemistry, Dr. J. T. Greenstein; Chemotherapy, Dr. M. J. Shear; Biophysics, Dr. E. Lorenz; Endocrinology, Dr. R. Hertz; Pathology, Dr. H. L. Stewart; Biostatistics, Dr. Harold Dorn; and the California Laboratory of Experimental

[2] Subscriptions at $2.00 a year may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C. Single copies, 40 cents each.

Oncology, Dr. M. B. Shimkin. The work of the sections may be described as follows:

Biology.—The literature of cancer indicates that the following definition would be generally accepted: A cancer is a malignant neoplasm (new growth) resulting from a transformation of normal cells to cells that multiply excessively, become parasitic, and in most types of cancer, invade surrounding tissue and metastasize (spread to other parts of the body). Since cancer occurs in many multicellular species and all mammals, it is often assumed to be a universal cell potentiality. Primarily, then, the malignant change involves the multiplication, differentiation and organization of cells and related processes, common to all multicellular life—in a word, biology. Hence, to advance the science of biology is to approach a solution of the cancer problem.

One invaluable technique employed by this section is the artificial production of cancer in experimental animals. Cancers may be induced by means of (1) injection or feeding of more than 300 different chemicals, some of which are organ specific, (2) genetic manipulations (inbreeding and crossbreeding), (3) hormonal disturbances, (4) energy agents (X-rays, ultraviolet rays, heat, radium, etc.), and (5) combinations of these. The artificial production of cancer yields data concerning influences in carcinogenesis and provides tumors for further study.

Another project is the study of tumors grown within a transparent chamber attached to the living animal. This technique, developed at the Institute, permits microscopic comparison of growing tissues, malignant and normal, and is used to observe effects of therapeutic agents.

In studies employing another technique—the growth of animal tissue in vitro—the usual procedure is to cause and observe cancerous changes in cells growing outside the body. The cancerous tissue, if transferred to an animal, continues to grow autonomously; whereas normal tissue, though its growth be unlimited in vitro, is again regulated after such a transfer.

Little is known of the cellular transformation preceding malignancy. Accordingly, investigations in developmental embryology and physiology are made of tissues, ova, and lower forms of animal life such as protozoa, in order to study the differences between normal processes of growth and differentiation and those involved in carcinogenesis.

In tumor immunity projects, the reactions of animals to the growth of transplated tumors are investigated. The findings are applied in efforts to control tumors that arise spontaneously.

Much has been accomplished in genetics, in which studies are undertaken to ascertain the place of heredity in the occurrence of spontaneous tumors in animals and man. The study of mammary

and gastric cancer is emphasized. Intensive efforts are made to define relations between the factors of mammary tumor development in the mouse, which include an infectious agent believed to be a virus.

In the investigation of gastric cancer, data from clinical studies are analyzed to guide in attempts to reproduce the disease in animals by altering the physiology of the stomach. The study of spontaneous tumors in animals has contributed to the understanding of cancer in man.

The section is also engaged in establishing procedures for the isolation of tumor-inducing viruses. Attempts are made to characterize these agents and to explain their intricate relations to living cells.

Adaptation studies are also conducted. Strictly speaking, cancer cannot be called a universal cell potentiality, since it cannot, by definition, occur in unicellular organisms. But processes similar to some that occur in cancer may be observed when bacteria and protozoa are exposed to known carcinogens over many generations. Strains of paramecia, long exposed to methylcholanthrene and then removed, showed enhanced survival value and population levels. Again, certain species tended to adapt to unnatural conditions when exposure was rhythmic, but perished when continuous. The possible bearing of these adjustment processes on the genesis of mammalian cancer is being investigated.

Biochemistry.—Morphologic and physiologic differences between normal and cancerous tissues suggest chemical differences, which may indicate approaches to therapy. Many differences have already been observed. It has been shown that the enzyme pattern of cancers more closely resembles that of embryonic than of adult tissue, and that diets deficient in certain protein constituents retard carcinoma in mice.

Projects include comparative metabolism and enzyme studies; comparison of carbohydrates, proteins, fats and other tissue components common to the normal and malignant state; and nutrition and intermediary metabolism studies, in which comparisons are made of the dietary requirements of normal and tumor-bearing animals, and of the fate of dietary constituents in their passage through the body. One technique employed is the tracing of stable or radioactive isotopes that have been specifically placed in certain constituents of the diet.

Chemotherapy.—In general the work of this section is directed toward discovery and investigation of chemical agents that may result in a chemical treatment of cancer in man. At present most chemicals that are effectively tumor-necrotizing are unduly toxic. Some degree of success, however, has been reported for such agents as bacterial metabolites, certain organic arsenical compounds, colchicine derivatives and podophyllotoxin.

This section conducts intensive studies in organic chemistry, biochemistry, pharmacology, physiology, immunology and bacteriology. Several of the agents developed by the section have been given preliminary clinical trial. Since the investigation is directed toward the ultimate treatment of patients, more extensive collaboration with clinicians is projected as the experimental work advances.

Endocrinology.—The relation between cancer and hormones is well established by facts such as these: (1) Hormones influence normal growth, (2) reduction of male hormones (by castration) or addition of female hormones may inhibit cancer of the prostate, (3) reduction of male or addition of female hormones may promote cancer of the breast, (4) reduction of female or addition of male hormones may inhibit cancer of the breast, and (5) there is a similarity in chemical constitution between the steroid hormones and certain carcinogens.

Accordingly, studies in endocrinology are undertaken to contribute knowledge of the role of hormones in normal and pathologic processes and to develop therapeutic methods. In laboratory and clinical investigation, emphasis is placed upon cancer of the breast, uterus and prostate, as well as on hormone-producing tumors of the pituitary, ovary, testis, and adrenal glands. New methods for the treatment of persons with cancer of the prostate or breast have been developed through investigations in this field.

Biophysics.—In projects of this section, physical agents and methods are applied to biologic problems of cancer. At present the section is mainly interested in the biologic effects of radiation on cells, cell constituents, unicellular organisms and laboratory animals. The ultimate aim is a better understanding of the mechanism of cell destruction and the subsequent proliferative changes that lead to carcinogenesis. Nonionizing (ultraviolet) and ionizing radiations (X-rays, gamma rays, etc.) are used in this work. Instruments are adapted or developed for specific purposes such as dose measurements of radiation from external sources, and of internally administered radioactive isotopes.

Another major problem concerns the physico-chemical properties of cell constituents, especially viruses. Techniques used include ultracentrifugation, electrophoresis, and electron microscopy.

Jointly with Biochemistry, the Biophysics Section investigates the metabolism of normal and cancerous tissues by means of stable, rare isotopes. Analysis with a mass spectrometer reveals the way in which biochemical compounds are metabolized.

Pathology.—This section applies many major branches of pathology in a broad attack upon the cancer problem. Progress has been made in organizing a staff trained in neuropathology, endocrine and orthopedic pathology, dermatological and oral pathology, gynecologic and

urologic pathology, and respiratory, gastrointestinal, and ophthalmic pathology and hematology. These groups will be assisted by a unit on biochemistry, bacteriology, clinical pathology and serology, and pathology technology.

When reports of investigations in cancer are reviewed, information is found to be inadequate on the effects of the disease upon many body systems. This section, however, is engaged in experiments that should add much to the knowledge of liver function in rats with hepatomas, the normal blood picture in mice, early cancer of the gastrointestinal tract, histogenesis and classification of leukemia in mice, and the cytology of lung tumors. Studies of endocrine and brain-tissue tumors are planned.

Biostatistics.—This section is responsible for two types of projects: (1) Provision of assistance to scientists conducting laboratory experiments in the Institute, and (2) statistical studies of cancer mortality and morbidity. In projects of the first type, assistance is given in designing experiments, analyzing results, and developing new techniques for quantitative investigation. The mortality and morbidity studies include the development of a case-reporting system and surveys to determine the extent of control measures.

Laboratory of Experimental Oncology.—This section of the National Cancer Institute is detailed to the University of California Medical School, San Francisco, for cooperative investigation of neoplastic disease. The objective of the Laboratory is clinical research in cancer. With the cancer patient as the focal point of investigation, the work is oriented along three broad approaches: (1) Physiology, including cardiovascular and respiratory physiology of the cancer patient as compared with that of other patients, and the study of electric potentials and other physiological characteristics of human neoplastic tissue, in vitro and in vivo; (2) biochemistry-metabolism, including the over-all caloric and protein balance of the cancer patient, and studies of specific biochemical reactions; and (3) clinical chemotherapy, providing material for the first two approaches, utilizing their techniques, and permitting studies in clinical pharmacology of new agents in cancer treatment.

In addition, immunological techniques are utilized in studying fractions of cancer and normal cells of human origin.

CANCER RESEARCH GRANTS

The support of research in institutions outside the Federal Government's own laboratories was a new venture in the Public Health Service when the National Cancer Institute was established in 1937. The act creating the Institute gave the National Advisory Cancer Council the authority "to review applications from any university, hospital, laboratory, or other institution, whether public of private, or

from individuals, for grants-in-aid for research projects relating to cancer, and certify to the Surgeon General its approval of grants-in-aid in the cases of such projects which show promise of making valuable contributions to human knowledge with respect to the cause, prevention, or methods of diagnosis or treatment of cancer." The Surgeon General was in turn authorized "to make grants-in-aid for research projects certified by the Council."

At its second meeting held in November 1937, the Council recommended the first grants to further the investigations of Dr. E. O. Lawrence at the University of California, Dr. L. F. Fieser at Harvard University and Dr. E. W. Wallace at the University of Cincinnati. The grants were paid, and this combined action of the Council and Surgeon General may be said to have inaugurated the Government's cancer research grants-in-aid program. The first three grants totalled $54,910. Six others bringing the total up to $90,925 were made during the first year. The following table shows the number of grants and amounts paid up to January 1, 1948.

Fiscal year—	Number of grants	Total paid	Fiscal year—	Number of grants	Total paid
1938	9	$90,925.00	1944	5	52,540.00
1939	10	68,002.50	1945	9	85,027.50
1940	13	61,380.00	1946	13	76,890.94
1941	12	77,870.00	1947	51	469,634.50
1942	12	78,146.00	1948 (first 6 months)	143	1,332,919.00
1943	9	49,400.00			

Cancer research, like all peacetime research, was retarded during the war years. The return to peace liberated many scientists from wartime pursuits, and growing public support of cancer research turned their energies to this work. The concurrent popular realization of cancer's place as a major cause of death, inspired largely by the educational program of the American Cancer Society, led to the larger allotments of the fiscal year 1947 and to the greatly increased appropriations of 1948. By 1947 the National Cancer Institute was spending nearly half a million dollars for research grants to nonfederal laboratories. In 1948 this was increased to $4,803,000. This sum exceeds the total expenditure for grants during the entire preceding 10 years of the Institute's existence.

In this current appropriation the Congress authorized the Surgeon General to make grants for the construction of research facilities, in addition to grants for the support of research projects. The allotments established provide $2,500,000 for project grants, and $2,303,000 for construction grants-in-aid.

The widespread interest in cancer research is indicated by the fact that grants have been awarded for the work of 192 different investigators in 88 institutions, mostly universities, or hospitals with research laboratories. They have been given to support a wide variety of

investigations in every branch of biology, in chemistry, physics, clinical medicine, and in work directed at improving the diagnosis and treatment of cancer. In several instances projects requiring a number of years to complete have been supported continuously.

The recommendations of the National Advisory Cancer Council are made after careful review of the proposed project and a discussion of its merits. Each application is sent to all members of the Council sufficiently in advance of a meeting to permit such inquiries and investigation as may be indicated. The staff of the Cancer Institute, and consultants selected for their familiarity with specific areas of the cancer research field, assist the Council in assembling the information needed to frame its recommendations.

A Committee on Gastric Cancer was formed in 1940 to create greater research interest in gastric cancer and to stimulate investigators who had not previously had primary interest in gastric cancer to enter this field. Three conferences, attended by leading specialists in scientific disciplines bearing on the problem, helped to direct attention to the possibility of a broader attack on this type of cancer. The number of gastric cancer projects now under way (see table) reflects the success of this committee's work.

Present grants.—On January 1, 1948, the active grants numbered 160. They support work in 82 institutions in 26 States, the District of Columbia, and in two foreign countries. Space does not permit the listing of each project, but the following summary shows the fields of investigation being subsidized, the number of active grants and the amount of subsidy in each field.

Field of investigation	Number of active grants	Amount	Field of investigation	Number of active grants	Amount
Carcinogenesis	16	$200,247	Isotopes	2	18,208
Chemistry	2	20,668	Viruses	9	78,581
Extracts affecting growth	2	13,000	Blood	1	17,388
Proteins and enzymes	8	107,598	Children's tumors	1	20,000
Chemotherapy	29	448,963	Gastro-intestinal	2	10,320
Comparative pathology	2	14,110	Colon	1	9,375
Cytology and cytochemistry	13	87,515	Gastric	11	125,187
Diagnostic tests	4	50,086	Lymphomata	2	26,240
Genetics	6	50,705	Leukemia	2	17,700
Hormones	17	209,761	Lung	1	13,950
Immunology	5	67,163	Mammary	1	5,250
Metabolism	5	53,993	Mouth	1	10,260
Nutrition	5	24,279	Nervous system	2	5,007
Pathology	1	10,800	Pigmentation, melanomas	3	15,068
Biological and therapeutic effects	1	2,000	Uterine	1	7,000
Instruments	1	16,536	Miscellaneous	3	18,500

Many research projects could appropriately be classified under any one of several fields of investigation, so that this table does not express adequately the full scope of the projects receiving aid. Some of the research is fundamental laboratory work; some is clinical in nature; much is a combination of the two.

Many applications for grants to aid in constructing research facilities now await consideration by the Council. Only one has been recommended—$250,000 to assist in rebuilding the Roscoe B. Jackson Memorial Laboratory, Bar Harbor, Maine. This institution has not only made many valuable contributions to our fundamental knowledge of cancer through studies of mammalian genetics, but has been the principal source of laboratory animals of known genetic constitution. The dependence of many research problems upon adequate supplies of stock from this source placed a high priority on its rehabilitation. It is hoped that this and other construction grants will help to provide the new and expanded facilities that are so badly needed to permit clinical and fundamental laboratory studies to advance together.

Through grants-in-aid any suitable research institution can take part in cancer research. This makes it possible to use existing laboratory facilities and secures for the fight against cancer the ideas, experience and technical competence of men trained in a great variety of scientific disciplines.

As a means of expanding and expediting cancer research, either by bringing more laboratories and scientists into the cancer field, or by making possible increased productiveness of established research groups, the cancer research grants program is a powerful weapon in the battle against cancer.

Research Fellowships.—The Institute also awards research fellowships for the purpose of increasing the number of trained scientists from whose ranks men and women may be recruited to staff the laboratories in which cancer research is conducted. Under this program young scientists are given fellowships which permit them to take postgraduate training under the direction of a senior investigator in a branch of science in which studies of the cancer problem may be carried on. There were 109 research fellows on duty as of January 1, 1948.

CANCER CONTROL

Although the United States Public Health Service had aided cancer control activities in various ways previous to July 1, 1946, a nationwide government-supported cancer control program did not come into being until that date. The appropriation to the States Relations Division of the Public Health Service for the fiscal year 1947 included $2,500,000 which could be used for grants to States to support cancer control activities. It was not until the fiscal year 1948 that support of cancer control activities became part of the program of the National Cancer Institute. Again $2,500,000 was allotted for grants to States, and additional funds amounting to $3,277,000 were made available for other control activities, such as grants to support expanded cancer teaching programs in medical and dental schools, clinical traineeships, demonstrations, and grants for special cancer control projects. These

allotments were part of the over-all appropriation of $14,000,000 to the National Cancer Institute.

Assistance to States.—Since a large part of the Federal appropriation for cancer control work was set aside for allotment to the State health authorities to be spent directly by them and local agencies and institutions, the first objective of the Federal program is to assist in the development of well-rounded State cancer control programs.

In anticipation of the inauguration of a nation-wide cancer control program, the National Advisory Cancer Council in 1944 appointed a committee to study and make recommendations on certain phases of the cancer problem. The report of this committee contains, among other things, an outline of the basic elements of a State cancer program and certain basic data for each State. The report was published in the April 1946 issue of the Journal of the National Cancer Institute and made available for the information and guidance of organizations and individuals engaged in, or planning, cancer control activities. In broad terms the basic elements of a cancer control program as outlined in the report are:

- The accumulation and analysis of data needed in planning and evaluating a program.
- Educational activities with—
  - The public.
  - Professional groups:
    - Physicians.
    - Nurses.
    - Dentists.
    - Students training in these professions.
    - Public health workers.
- Provision of medical facilities and services.
  - Preventive services:
    - Cancer detection centers.
  - Diagnostic facilities and services:
    - Tissue diagnostic services.
    - Cancer diagnostic clinics.
  - Treatment facilities and services:
    - Cancer clinics.
    - Hospital beds.
    - Consultation services.
  - Facilities and services for the advanced cancer patient:
    - Institutional facilities.
    - Home care facilities.
  - Integration of effort of all agencies to provide a complete program.

This report has served as a blueprint for the States in formulating their programs, since practically all control activities fall into one or

another of the above categories. The types of activities to be undertaken in a State and their administrative patterns vary with local conditions and are therefore matters for local determination. Accordingly, a liberal policy has been adopted by the Public Health Service as to the activities that may be financed with the State allotments.

Direct assistance to the States in developing programs consists largely of consultation and advisory services, loans of personnel, and assistance in the training and recruitment of personnel for State staffs. A consultant in cancer control activities has been or will be added to the staff of each of the Public Health Service district offices to assist State staffs in any problems on which they wish consultant service and to act as liaison officers between the States and the Washington office.

Public health nurses on the district office staffs have been given special training in cancer control activities to prepare them to assist in the development of the nursing phases of the State programs. They are also prepared to conduct short courses and institutes on cancer nursing activities.

A staff of trained cancer control workers will also be assembled to form a pool from which workers may be detailed to the States to assist in the conduct of various programs or to substitute for State staff members while the latter are taking special orientation or training courses.

Other control activities.—The other activities in the Federal cancer control program are designed to gain new knowledge and to provide better techniques, facilities and services from which all agencies engaged in cancer control activities may draw in developing and carrying on their own programs. These activities are grouped around five main objectives: (1) The accumulation of new knowledge concerning the cancer problem, (2) education of professional and lay groups, (3) better utilization of present knowledge, (4) improvement and increase of medical services and facilities, and (5) evaluation of techniques and activities. The attainment of these objectives will require a diversity of projects and the cooperation of the many official, professional and lay organizations concerned with the cancer problem.

Many of the activities mentioned below will aid in attaining more than one of the objectives, but they are grouped according to the objective with which they are most directly concerned. All these activities, regardless of the immediate objective, have for their ultimate purpose the provision of more adequate cancer facilities and services. The most important factor in stimulating the program at present is the

allotment of $2,500,000 to State health agencies. With these funds the State agencies are in a position to carry on any activity with their own staffs, to pay for services to cancer patients on a fee or contract basis, or to reallot their funds to other agencies which are in position to carry on some part of the program.

In addition to the financial support of the State activities, the National Cancer Institute will attempt to realize the objectives of the cancer control program by stimulating appropriate agencies to undertake cancer control activities or to expand their programs, by giving financial support to cancer projects, and by undertaking cooperative projects with other agencies. The diversity of activities required in the cancer control program is in proportion to the diversity of the problems involved in the control of the disease. No one agency can possibly cover the whole field, but through the integrated effort of all agencies a comprehensive program can be carried on and the objective of more adequate cancer facilities and services achieved.

THE ACCUMULATION OF MORE KNOWLEDGE CONCERNING THE CANCER PROBLEM

The planning and development of a cancer control program must be based on facts. Available data must be made more useful by study and analysis. Data not now available must be assembled. For example, we need to know whether there is a definite relationship between environment and cancer. Do diet, climate, or occupation have an effect on the incidence of the disease? If so, what are the favorable and unfavorable factors, and what can be done to control the unfavorable ones? In which industries are workers brought into contact with carcinogenic agents and how can they be protected against them? Why is there a higher incidence of cancer in some geographic areas than in others; does this variation pertain only to cancer of certain sites or to cancer of all sites? These and many other types of basic data are needed in the intelligent conduct of cancer control activities, and it is one of the objectives of the Federal program to see that such data are made available. Studies under way or contemplated include analyses of cancer mortality statistics, collection and analysis of cancer incidence statistics, studies of cancer epidemiology, and studies of types of facilities and services needed in providing care for the cancer patient. State health departments will be asked to cooperate in some of these studies, particularly in the collection of morbidity data in which the establishment of central cancer registers would be of great value.

EDUCATION OF PROFESSIONAL AND LAY GROUPS

The control of cancer can be brought about only by adequately trained professional groups, and by a public informed of the nature of the disease and the action to be taken if present diagnostic and treatment measures are to be made more effective.

The key figure in cancer control is the physician, and every effort will be made to provide the medical profession with opportunities for training in the diagnosis and treatment of the disease. Acting on the recommendation of the National Advisory Cancer Council, a grant-in-aid program has been undertaken to enable medical schools to develop better integrated courses in cancer for their students. Grants to 40 schools, amounting to approximately $900,000, had been recommended up to January 1, 1948. Since the establishment of the National Cancer Institute in 1937, a number of traineeships have been granted annually to properly qualified physicians to enable them to secure special training in the diagnosis and treatment of cancer. Seventy-five trainees were on duty on January 1.

In cooperation with the American Cancer Society, teaching materials are being prepared for the use of State and local medical groups. Other activities include assistance to State staffs in developing and conducting cancer teaching days and other short-term courses in cancer. Efforts will also be made to develop more hospital residencies in pathology, surgery and radiology in which cancer work receives the major emphasis.

In recognition of the important role that may be played by the dentist in the control of oral cancer, financial assistance is also being given to dental schools to assist them in developing courses in this subject. Twelve grants amounting to $60,000 have been given for this purpose.

The nursing section of the Cancer Control Branch will develop courses in cancer for public health nurses, to be given in local institutes. Schools of nursing and schools giving courses in public health nursing will be encouraged to incorporate appropriate courses in their curricula.

To promote the training of public health personnel, efforts will be made to establish short-term traineeships in cancer in cooperation with hospitals, universities and States with well-established cancer programs. Schools of public health and departments of preventive medicine in medical schools will be encouraged to include cancer in their courses. To meet the need for a limited number of public health administrators with special training in the administration of cancer control activities, efforts will be made to interest one or two schools in providing this training.

BETTER UTILIZATION OF PRESENT KNOWLEDGE ABOUT CANCER

It is generally agreed that if full use were made of present knowledge concerning cancer the disease could be cured in a much larger percentage of patients. All of the educational activities and the work directed at providing better cancer services and facilities mentioned above will aid in bringing about a fuller use of available knowledge concerning cancer. In addition, studies will be made to discover why patients delay in seeking treatment for cancer, and appropriate measures to overcome these factors will be planned in cooperation with appropriate medical groups and public health agencies. Interest in annual physical examinations will be stimulated. Films depicting the new cytologic test for the detection of early cancer are being made available for the use of medical groups in familiarizing their members with this test. Consultants in radiology and pathology will also be made available to assist groups in the States in developing greater interest in cancer diagnosis and in making diagnostic services easily available to practicing physicians. Assistance will be given State health departments in developing programs which will emphasize to physicians the need to be constantly on the alert for the signs and symptoms of cancer.

IMPROVEMENT AND INCREASE OF CANCER SERVICES AND FACILITIES

The educational activities mentioned above will also have the effect of improving the services rendered to cancer patients as they will increase both the competency of the personnel and their numbers.

Other activities directed at this objective include financial assistance in the development of tissue diagnostic services, in the establishment of additional cancer diagnostic and treatment clinics, and in the expansion of existing clinics through the addition of personnel and equipment. One of the first activities of this kind undertaken by the National Cancer Institute was loans of radium to hospitals which either had none of their own or did not have an adequate supply. This service has been carried on continuously since it was inaugurated and will be continued. Fifty-one hospitals have loans at the present time. The development of mobile diagnostic clinics and traveling teams of physicians with special competence in the diagnosis and treatment of cancer for consultation services to local clinics and individual physicians will be explored.

Studies of the types and amount of nursing services required for cancer patients in hospitals, convalescent homes and in their own homes will be made in order to improve the nursing care of cancer patients. Studies of socio-economic factors in relation to the

cancer problem will be made in order to devise ways of developing and integrating State and local resources to provide assistance and services to persons needing them.

EVALUATION OF ACTIVITIES, TECHNIQUES, METHODS, AND SERVICES

Administrators of cancer control programs need information as to the efficiency, costs, and results of methods, techniques, types of service, and the value of the over-all program. Studies directed at determining these facts will be conducted in cooperation with national organizations such as the American College of Surgeons and the American Cancer Society, State and local medical societies and health agencies, and other appropriate groups.

Among the contemplated studies are the following:

(1) Study of report forms and statistical procedures used in detection centers and diagnostic and treatment centers to develop forms that can be used for collecting comparable data.

(2) Study of follow-up procedures used by cancer services to determine whether present methods are adequate or whether more effective follow-up work could be done.

(3) Study of the role of the public health nurse in follow-up activities to determine how follow-up of cancer patients may be correlated with other public health nursing activities.

(4) Study of types of hospital facilities for cancer patients to determine what kind of facilities are most satisfactory to patients of different income levels; also the type most suitable according to the population density of the area served.

(5) Study, in cooperation with a number of cancer detection clinics, of the periodic physical examination as a cancer control measure.

(6) Study, in cooperation with medical groups, of the effectiveness of various types of management of the cancer case, and also study of methods of increasing the salvage rate in advanced cancer cases.

Also, it is obvious that evaluation methods must be devised to determine the results of the over-all cancer program and to indicate where revisions need to be made and the activities on which greatest emphasis should be placed.

SUMMARY

The program of the National Cancer Institute is directed at two complementary objectives: (1) to try to find the ultimate solution of the cancer problem through research designed to give us a better understanding of the causes of cancer and more effective methods of

diagnosis and treatment; and (2) to save as many lives as possible through the use of our present methods of diagnosis and treatment of cancer.

To attain the first objective, the Institute is conducting in its own laboratories numerous studies in the fields of biology, biochemistry, chemotherapy, endocrinology, biophysics, pathology, and biostatistics. Clinical studies are conducted in the cancer clinic of the United States Marine Hospital, Baltimore, Md., and in two other cooperating hospitals. A greatly expanded clinical research program is envisioned in the plans for a research hospital on the grounds of the National Institute of Health.

A research grants program supports cancer research in many different fields of investigation in a large number of laboratories throughout the United States, and in two foreign countries. These grants make it possible to bring into the cancer program already existing laboratories and some of the ablest investigators in various fields of science involved in the study of cancer. Grants to help expand and equip outside laboratories will be made in order to provide more research facilities.

Research fellowships are granted to provide larger numbers of trained scientists to staff cancer laboratories.

To attain the second objective, the Institute is carrying on a cancer control program. This program includes grants to State health agencies and other agencies and institutions to enable them to undertake or to expand cancer control programs, including the provision of more adequate cancer facilities and services for the cancer patient and studies to gain new knowledge applicable to cancer control problems; grants to medical and dental schools to provide more adequate training in cancer for medical and dental students; a clinical traineeship program to provide training in cancer diagnosis and treatment for physicians who wish to specialize in this field; loans of radium to hospitals; special studies and demonstrations; educational activities; consultant and advisory services; loans of personnel; and stimulation of cancer control activities by other agencies.

This over-all program represents the combined planning of the National Cancer Institute and the National Advisory Cancer Council. It has been designed to attack the cancer problem on all fronts and represents the best that can be evolved on the basis of our present knowledge and experience. The effectiveness of the program will be evaluated from time to time and changes made to conform to the new knowledge gained by the various activities.

INCIDENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED MARCH 27, 1948

Summary

A total of 4,642 cases of influenza was reported, as compared with 5,941 last week, a 5-year (1943–47) median of 3,477, and 52,115 for the corresponding week last year, the year's highest incidence. The current total, except for the week last year, is higher than reported for any corresponding week since 1941. Of 8 States reporting currently more than 86 cases, only 3 showed increases—West Virginia 115 (last week 103), Alabama 636 (last week 272), and California 196 (last week 108). The total for the year to date is 117,650, as compared with 157,694 for the same period last year, which latter figure was also the 5-year median for the period.

Of 33 cases of poliomyelitis reported (last week 30, corresponding week last year 31, 5-year median 27), only California, with 8 cases (last week 5), reported more than 3 cases. The total for the year to date is 381, as compared with a 5-year median of 425 and 643 for the same period last year.

The total of 100 cases of meningococcus meningitis reported for the week is the lowest number reported for a corresponding week since 1942. The total for the year to date is 1,040, as compared with 1,039 last year, the lowest number reported for a corresponding period of the past 5 years, 6,637, the highest, in 1944, and 3,016, the median, in 1945.

The figures for the year to date for amebic and undefined dysentery are above the corresponding 5-year medians, while the total for bacillary dysentery is below both the median and the figure for the corresponding period last year. Cumulative figures for infectious encephalitis, Rocky Mountain spotted fever, and undulant fever are slightly above the corresponding medians.

North Dakota reported 1 case of smallpox, and Louisiana and Texas each 1 case of leprosy.

A total of 9,634 deaths was recorded for the week in 92 large cities of the United States, as compared with 9,969 last week, 10,795 and 9,433, respectively, for the corresponding weeks of 1947 and 1946, and a 3-year (1943–47) median of 9,436. The total for the year to date (13 weeks) is 132,665, as compared with 131,043 for the corresponding period last year. Infant mortality in the same cities totaled 679 deaths, as compared with 621 last week and a 3-year median of 695. The cumulative figure is 9,012, as compared with 10,518 for the same period last year.

Telegraphic morbidity reports from State health officers for the week ended March 27, 1948, and comparison with corresponding week of 1947 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median 1943–47	Week ended—		Median 1943–47	Week ended—		Median 1943–47	Week ended—		Median 1943–47
	Mar. 27, 1948	Mar. 22, 1947		Mar. 27, 1948	Mar. 22, 1947		Mar. 27, 1948	Mar. 22, 1947		Mar. 27, 1948	Mar. 22, 1947	
NEW ENGLAND												
Maine	0	2	1	-	-	2	21	148	24	0	0	2
New Hampshire	0	0	0	-	2	1	5	6	6	0	2	1
Vermont	0	0	0	-	11	-	7	230	155	0	0	0
Massachusetts	4	22	3	-	-	-	1,084	376	761	2	0	6
Rhode Island	0	1	1	1	1	1	4	173	31	0	0	2
Connecticut	0	0	1	6	2	2	43	642	349	3	1	4
MIDDLE ATLANTIC												
New York	13	18	15	[1] 14	[1] 10	[1] 6	2,186	424	2,413	10	9	32
New Jersey	1	10	6	8	22	10	1,005	432	1,515	2	1	5
Pennsylvania	5	10	10	([2])	([2])	[2] 3	1,052	321	940	5	12	12
EAST NORTH CENTRAL												
Ohio	10	8	8	4	74	16	1,331	817	634	11	2	7
Indiana	7	13	7	9	179	10	734	48	262	0	2	5
Illinois	1	5	12	-	475	30	2,131	93	1,092	4	4	10
Michigan [3]	1	4	10	4	4	4	1,617	31	904	3	5	11
Wisconsin	1	0	5	86	537	70	1,401	291	1,260	2	1	3
WEST NORTH CENTRAL												
Minnesota	4	6	6	-	-	1	392	32	45	0	3	3
Iowa	2	2	2	-	2,321	-	326	29	133	1	2	1
Missouri	10	7	4	8	378	5	443	14	340	0	9	9
North Dakota	1	2	0	-	190	12	30	15	22	0	0	0
South Dakota	1	3	2	-	17	-	21	11	50	0	0	0
Nebraska	1	2	2	4	116	8	114	21	110	0	0	0
Kansas	4	6	5	27	1,947	4	41	7	760	1	3	5
SOUTH ATLANTIC												
Delaware	0	0	0	-	-	-	82	1	29	1	2	1
Maryland [3]	4	8	8	8	23	6	141	22	91	1	2	5
District of Columbia	0	0	0	-	5	1	135	27	91	0	1	2
Virginia	4	5	5	343	1,439	442	157	299	687	1	3	10
West Virginia	7	2	2	115	2,589	8	406	34	73	3	1	3
North Carolina	8	8	8	-	-	-	8	248	248	2	2	9
South Carolina	2	0	3	435	1,814	539	90	128	128	0	1	1
Georgia	1	3	3	21	1,019	79	83	181	298	2	1	3
Florida	2	3	2	4	73	5	171	8	65	3	3	3
EAST SOUTH CENTRAL												
Kentucky	2	11	5	-	-	14	86	7	89	2	0	5
Tennessee	3	15	6	65	550	74	213	115	218	5	3	8
Alabama	*2	7	7	636	1,847	124	45	113	141	*1	4	8
Mississippi [3]	2	5	4	27	354	-	92	21	-	3	2	6
WEST SOUTH CENTRAL												
Arkansas	1	5	5	216	6,859	109	259	212	172	1	1	3
Louisiana	1	5	5	2	85	60	19	42	197	6	3	6
Oklahoma	2	5	5	34	7,624	125	38	-	74	3	3	2
Texas	14	20	37	2,064	19,087	1,243	2,062	216	1,359	6	6	8
MOUNTAIN												
Montana	11	3	1	-	565	22	56	136	136	0	0	1
Idaho	1	0	0	27	147	5	52	9	50	0	1	0
Wyoming	3	0	0	-	25	20	118	11	36	0	1	1
Colorado	3	7	7	36	921	29	568	43	367	0	0	0
New Mexico	3	2	2	-	12	4	11	61	33	0	0	0
Arizona	1	4	2	141	86	133	216	30	53	1	0	0
Utah [3]	4	0	0	27	81	29	34	3	116	0	0	0
Nevada	0	0	0	-	3	-	1	1	1	0	0	0
PACIFIC												
Washington	1	11	4	19	353	6	357	54	241	1	3	5
Oregon	1	0	1	55	241	30	64	32	98	0	0	1
California	11	27	25	196	27	85	2,061	214	1,226	14	7	20
Total	160	277	272	4,642	52,115	3,477	21,613	6,429	24,632	100	106	225
12 weeks	*2,546	3,510	3,510	117,650	157,694	157,694	175,422	62,501	184,225	*1,040	1,039	3,016
Seasonal low week [4]	(27th) July 5–11			(30th) July 26–Aug. 1			(35th) Aug. 30–Sept. 5			(37th) Sept. 13–19		
Total since low	*8,904	11,076	12,123	161,208	190,669	190,669	210,368	85,388	212,665	*1,822	2,011	5,468

[1] New York City only.
[2] Philadelphia only.
[3] Period ended earlier than Saturday.
[4] Dates between which the approximate low week ends. The specific date will vary from year to year.
* Delayed report (included in cumulative totals only): Alabama; diphtheria 1, meningitis 2.

Telegraphic morbidity reports from State health officers for the week ended March 27, 1948, and comparison with corresponding week of 1947 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever		
	Week ended—		Median 1943-47	Week ended—		Median 1943-47	Week ended—		Median 1943-47	Week ended—		Median 1943-47
	Mar. 27, 1948	Mar. 22, 1947		Mar. 27, 1948	Mar. 22, 1947		Mar. 27, 1948	Mar. 22, 1947		Mar. 27, 1948 [3]	Mar. 22, 1947	
NEW ENGLAND												
Maine	0	1	0	16	15	33	0	0	0	0	2	0
New Hampshire	0	0	0	1	11	11	0	0	0	0	0	0
Vermont	0	0	0	4	12	12	0	0	0	0	0	0
Massachusetts	0	0	0	184	140	380	0	0	0	1	3	2
Rhode Island	0	0	0	10	8	15	0	0	0	0	0	0
Connecticut	0	0	0	41	36	78	0	0	0	0	0	0
MIDDLE ATLANTIC												
New York	3	0	1	326	415	646	0	0	0	1	3	5
New Jersey	2	0	0	91	143	160	0	0	0	2	2	1
Pennsylvania	1	2	2	354	231	451	0	0	0	3	2	2
EAST NORTH CENTRAL												
Ohio	0	0	0	379	469	447	0	0	1	0	1	2
Indiana	1	0	0	59	136	136	0	0	1	0	1	3
Illinois	1	3	1	110	175	224	0	0	0	1	1	1
Michigan [3]	0	0	0	230	168	168	0	0	0	2	1	1
Wisconsin	1	0	0	55	97	294	0	0	0	0	1	1
WEST NORTH CENTRAL												
Minnesota	1	0	0	52	72	72	0	0	0	0	0	0
Iowa	0	0	0	29	53	67	0	0	0	0	0	0
Missouri	0	1	0	30	64	82	0	0	0	1	0	2
North Dakota	0	4	0	2	13	15	1	0	0	0	0	0
South Dakota	1	0	0	7	15	15	0	0	0	0	0	0
Nebraska	1	3	0	24	42	42	0	2	0	0	0	0
Kansas	1	0	0	58	32	87	0	0	0	0	0	0
SOUTH ATLANTIC												
Delaware	0	0	0	9	14	14	0	0	0	0	0	0
Maryland [3]	0	0	0	35	55	107	0	0	0	0	0	0
District of Columbia	0	0	0	11	6	25	0	0	0	0	0	0
Virginia	0	1	1	25	53	121	0	0	0	2	1	1
West Virginia	0	0	0	24	10	39	0	0	0	0	0	0
North Carolina	3	0	0	17	35	35	0	0	0	0	0	2
South Carolina	1	0	0	7	5	9	0	0	0	0	3	0
Georgia	0	0	0	20	8	14	0	0	0	9	0	3
Florida	0	0	0	9	14	7	0	0	0	2	1	1
EAST SOUTH CENTRAL												
Kentucky	0	0	0	24	56	55	0	0	0	3	1	1
Tennessee	0	0	0	29	72	64	0	0	0	2	0	0
Alabama	*2	0	0	10	30	17	0	0	0	1	0	0
Mississippi [3]	1	0	0	3	15	16	0	0	0	0	0	1
WEST SOUTH CENTRAL												
Arkansas	0	1	0	4	1	15	0	0	0	0	0	1
Louisiana	0	1	1	3	2	10	0	1	0	5	0	5
Oklahoma	0	0	0	17	14	16	0	0	0	0	0	1
Texas	3	1	4	51	38	61	0	0	0	8	2	3
MOUNTAIN												
Montana	0	0	0	10	6	9	0	0	0	2	0	0
Idaho	1	0	0	5	11	11	0	0	0	0	0	0
Wyoming	0	0	0	2	4	17	0	0	0	0	0	0
Colorado	0	0	0	26	61	60	0	0	0	1	2	0
New Mexico	0	0	0	12	2	14	0	1	0	0	0	1
Arizona	0	0	0	11	7	17	0	0	0	1	1	1
Utah [3]	0	0	0	25	20	47	0	0	0	0	0	0
Nevada	0	0	0	4	0	1	0	0	0	0	0	0
PACIFIC												
Washington	1	1	1	89	59	59	0	0	0	0	5	1
Oregon	0	0	0	15	15	19	0	0	0	2	0	0
California	8	12	3	108	143	200	0	0	0	0	3	2
Total	33	31	27	2,667	3,103	4,107	1	4	8	49	36	50
12 weeks	*381	643	425	28,705	32,977	46,702	33	49	118	522	521	638
Seasonal low week [4]	(11th) Mar. 15-21			(32nd) Aug. 9-15			(35th) Aug. 30-Sept. 5			(11th) Mar. 15-21		
Total since low	33	31	24	51,244	59,663	85,023	54	103	201	49	36	53

[3] Period ended earlier than Saturday.
[4] Dates between which the approximate low week ends. The specific date will vary from year to year.
[5] Including paratyphoid fever reported separately, as follows: Massachusetts 1 (salmonella infection), Michigan 1, Virginia 1, Georgia 8, Texas 6, Oregon 1.
*Delayed report (included in cumulative totals only): Poliomyelitis, Alabama, 1 case.

Telegraphic morbidity reports from State health officers for the week ended March 27, 1948, and comparison with corresponding week of 1947 and 5-year median—Con.

Division and State	Whooping cough			Week ended March 27, 1948							
	Week ended—		Median 1943–47	Dysentery			Encephalitis, infectious	Rocky Mt. spotted fever	Tularemia	Typhus fever, endemic	Undulant fever
	Mar. 27. 1948	Mar. 22, 1947		Amebic	Bacillary	Unspecified					
NEW ENGLAND											
Maine	30	11	30	------	------	------	------	------	------	------	------
New Hampshire	5	8	1	------	------	------	------	------	------	------	------
Vermont	51	17	19	------	------	------	------	------	------	------	4
Massachusetts	49	171	171	------	2	------	------	------	------	------	------
Rhode Island	12	14	19	------	------	------	------	------	------	------	------
Connecticut	24	54	54	------	------	------	------	------	------	------	------
MIDDLE ATLANTIC											
New York	128	177	177	11	3	------	3	------	------	1	5
New Jersey	72	118	118	------	------	------	------	------	------	------	------
Pennsylvania	96	202	197	------	------	------	------	------	------	------	3
EAST NORTH CENTRAL											
Ohio	100	108	108	------	------	------	------	------	1	------	2
Indiana	38	46	17	------	1	------	2	------	1	------	1
Illinois	39	52	55	10	------	------	1	------	------	------	4
Michigan [3]	86	166	119	7	------	------	------	------	------	------	1
Wisconsin	82	107	95	3	------	------	------	------	------	------	10
WEST NORTH CENTRAL											
Minnesota	7	7	16	------	------	------	------	------	------	------	------
Iowa	19	18	18	------	------	------	------	------	------	------	7
Missouri	27	22	22	------	------	------	------	------	4	------	1
North Dakota	8	------	1	9	------	------	------	------	------	------	------
South Dakota	11	------	1	------	------	------	------	------	------	------	------
Nebraska	1	15	10	------	------	------	------	------	------	------	------
Kansas	64	6	30	------	------	------	1	------	------	------	2
SOUTH ATLANTIC											
Delaware	2	4	4	------	------	------	------	------	------	------	------
Maryland [3]	22	67	50	------	------	2	------	------	------	------	1
District of Columbia	15	4	7	------	------	------	------	------	------	------	------
Virginia	37	75	74	------	------	89	------	------	------	------	3
West Virginia	18	13	16	------	------	------	------	------	------	------	------
North Carolina	31	36	151	2	------	------	------	------	1	1	1
South Carolina	88	24	52	1	2	------	------	------	------	------	------
Georgia	16	8	11	------	4	------	------	------	3	1	4
Florida	12	25	22	1	------	------	------	------	------	2	2
EAST SOUTH CENTRAL											
Kentucky	11	9	20	------	------	------	------	------	------	------	------
Tennessee	57	34	34	1	------	1	------	------	------	------	1
Alabama	48	67	25	(*)	------	------	------	------	------	2	1
Mississippi [3]	1	11	------	------	------	------	------	------	2	------	1
WEST SOUTH CENTRAL											
Arkansas	35	14	14	1	------	1	------	------	3	------	3
Louisiana	14	3	2	4	------	------	------	------	------	1	------
Oklahoma	44	14	12	------	------	------	------	------	------	------	1
Texas	430	549	261	11	219	23	------	------	------	5	11
MOUNTAIN											
Montana	14	------	4	------	------	------	------	------	------	------	------
Idaho	15	3	3	------	------	------	------	------	------	------	------
Wyoming	6	------	2	------	------	------	------	------	------	------	2
Colorado	92	21	32	1	------	------	------	------	------	------	9
New Mexico	21	1	2	------	------	------	------	------	------	------	------
Arizona	64	9	19	------	------	9	------	------	------	------	1
Utah [3]	3	5	27	------	------	------	------	------	------	------	6
Nevada	------	------	------	------	------	------	------	------	------	------	------
PACIFIC											
Washington	36	42	28	------	------	------	------	------	------	------	1
Oregon	25	32	14	4	1	------	------	------	------	------	3
California	92	191	191	7	13	------	------	------	1	------	4
Total	2,198	2,580	2,580	73	245	125	7	0	16	13	95
Same week: 1947	2,580	------	------	42	314	143	7	2	30	35	93
Median, 1943–47	2,580	------	------	37	202	100	11	0	15	38	[6] 93
12 weeks: 1948	26,857	------	------	*750	3,022	2,473	111	6	224	172	1,087
1947	30,499	------	------	546	4,054	2,679	81	12	468	543	1,205
Median, 1943–47	29,090	------	------	332	3,459	1,312	97	4	226	576	[6] 1,014

[3] Period ended earlier than Saturday.
[6] 3-year median 1945–47.

*Delayed report (included in cumulative total only): Amebic dysentery, Alabama 1 case.
Territory of Hawaii: Rabies 0, bacillary dysentery 3, measles 3, leprosy 1, whooping cough 17.
Leprosy: Louisiana 1; Texas 1.

WEEKLY REPORTS FROM CITIES *

City reports for week ended March 20, 1948

This table lists the reports from 90 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	0	0	------	0	2	0	2	0	1	0	0	------
New Hampshire:												
Concord	0	0	------	0	------	0	0	0	0	0	0	------
Vermont:												
Barre	0	0	------	0	------	0	0	0	0	0	0	------
Massachusetts:												
Boston	6	0	------	0	299	0	8	0	54	0	0	10
Fall River	0	0	------	0	2	0	1	0	0	0	0	5
Springfield	0	0	------	0	------	0	1	0	3	0	0	3
Worcester	0	0	------	0	2	0	10	0	15	0	0	7
Rhode Island:												
Providence	0	0	------	0	------	0	0	0	6	0	0	8
Connecticut:												
Bridgeport	0	0	3	0	------	0	0	0	0	0	0	------
Hartford	0	0	------	0	3	0	0	0	3	0	0	------
New Haven	0	0	5	0	3	0	0	0	8	0	0	4
MIDDLE ATLANTIC												
New York:												
Buffalo	0	2	------	0	9	0	2	0	14	0	0	9
New York	5	3	19	2	1,464	3	109	1	112	0	0	30
Rochester	0	0	------	0	------	0	5	0	8	0	0	------
Syracuse	0	0	------	0	13	1	3	0	14	0	0	10
New Jersey:												
Camden	0	0	1	0	20	0	3	0	1	0	0	------
Newark	1	0	4	0	109	0	4	0	7	0	0	5
Trenton	0	0	3	0	1	0	2	0	6	0	0	------
Pennsylvania:												
Philadelphia	2	0	1	0	451	3	21	0	52	0	1	15
Pittsburgh	0	0	1	1	1	1	8	0	24	0	0	3
Reading	0	0	------	0	8	0	2	0	10	0	0	2
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	0	0	------	0	47	3	7	0	14	0	0	8
Cleveland	1	0	5	0	3	1	9	0	49	0	0	14
Columbus	1	0	------	0	158	0	4	0	2	0	0	------
Indiana:												
Fort Wayne	0	0	------	0	24	0	0	0	3	0	0	1
Indianapolis	0	0	------	0	325	0	7	0	11	0	0	2
South Bend	0	0	------	0	------	0	0	0	1	0	0	1
Terre Haute	0	0	------	1	------	0	1	0	0	0	0	------
Illinois:												
Chicago	0	0	------	0	845	2	29	1	46	0	0	21
Springfield	0	0	------	1	169	0	3	0	2	0	0	------
Michigan:												
Detroit	1	0	------	0	264	1	7	0	82	0	0	22
Flint	0	0	------	0	2	1	3	0	2	0	0	------
Grand Rapids	0	0	------	0	267	0	1	0	1	0	0	4
Wisconsin:												
Kenosha	0	0	------	0	124	0	0	0	0	0	0	------
Milwaukee	0	0	------	0	33	0	1	0	20	0	0	5
Racine	0	0	------	0	242	0	0	0	1	0	0	1
Superior	2	0	------	0	63	0	2	0	2	0	0	------
WEST NORTH CENTRAL												
Minnesota:												
Duluth	0	0	------	0	79	0	1	0	3	0	0	3
Minneapolis	0	0	------	0	40	0	3	0	4	0	0	10
St. Paul	1	0	------	0	63	0	5	0	7	0	0	1
Missouri:												
Kansas City	0	0	1	0	21	0	6	0	5	0	0	15
St. Joseph	0	0	------	0	------	0	0	0	1	0	0	------
St. Louis	3	0	------	0	222	1	7	0	24	0	0	14

* In some instances the figures include nonresident cases.

City reports for week ended March 20, 1948—Continued

Division, State, and city	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
North Dakota:												
Fargo	0	0	------	0	4	0	0	0	4	0	0	------
Nebraska:												
Omaha	0	0	------	0	71	0	2	0	2	0	0	------
Kansas:												
Topeka	0	0	------	0	16	0	1	0	4	0	0	------
Wichita	0	0	------	0	4	0	2	0	3	0	0	25
SOUTH ATLANTIC												
Delaware:												
Wilmington	0	0	------	0	27	0	1	0	6	0	0	------
Maryland:												
Baltimore	1	0	5	0	25	0	8	0	16	0	0	7
Cumberland	1	0	------	0	------	0	1	0	6	0	0	------
Frederick	1	0	------	0	------	0	0	0	0	0	0	------
District of Columbia:												
Washington	0	0	------	0	148	0	11	0	13	0	0	6
Virginia:												
Richmond	0	0	------	0	1	1	4	0	1	0	0	12
Roanoke	0	0	------	0	------	0	0	0	2	0	0	------
West Virginia:												
Charleston	2	0	------	0	3	0	5	0	0	0	0	------
Wheeling	0	0	------	0	9	0	0	0	0	0	0	------
North Carolina:												
Raleigh	0	0	------	0	2	0	1	0	1	0	0	------
Wilmington	0	0	------	0	------	0	0	0	1	0	0	------
Winston-Salem	0	0	------	0	2	0	2	0	0	0	0	------
South Carolina:												
Charleston	0	0	41	2	------	0	3	0	0	0	0	2
Georgia:												
Atlanta	0	0	------	0	2	0	3	0	10	0	1	1
Brunswick	0	0	------	0	1	0	0	0	1	0	0	6
Savannah	0	0	1	1	------	0	2	0	0	0	0	1
Florida:												
Tampa	0	0	------	0	12	1	3	0	0	0	0	2
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	0	0	1	0	190	0	5	0	5	0	0	3
Nashville	0	0	------	0	------	0	0	0	0	0	0	------
Alabama:												
Birmingham	1	0	------	0	4	0	3	0	3	0	0	5
Mobile	0	0	14	1	------	0	4	0	0	0	0	------
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0	4	0	------	0	1	0	0	0	0	------
Louisiana:												
New Orleans	0	0	6	2	2	2	9	0	3	0	1	6
Shreveport	0	0	------	0	------	0	6	0	0	0	1	------
Oklahoma:												
Oklahoma City	0	0	33	0	3	0	3	0	5	0	0	1
Texas:												
Dallas	0	0	------	0	132	0	4	0	6	0	0	10
Galveston	0	0	------	0	1	0	2	0	1	0	0	------
Houston	1	0	7	0	46	0	6	0	3	0	0	4
San Antonio	0	0	3	4	10	1	5	0	0	0	0	5
MOUNTAIN												
Montana:												
Billings	0	0	------	0	1	0	1	0	0	0	0	------
Great Falls	0	0	------	0	------	0	2	2	1	0	0	------
Helena	0	0	------	0	1	0	0	0	0	0	0	5
Missoula	0	0	------	0	4	0	0	0	3	0	0	------
Idaho:												
Boise	0	0	3	0	------	0	0	0	0	0	0	------
Colorado:												
Denver	3	0	5	0	403	0	5	0	6	0	0	21
Pueblo	0	0	------	0	44	0	3	0	6	0	0	12
Utah:												
Salt Lake City	0	0	------	0	16	0	2	0	4	0	0	------

City reports for week ended March 20, 1948—Continued

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
PACIFIC												
Washington:												
Seattle	0	0	------	0	22	0	5	0	11	0	0	5
Spokane	0	0	1	1	3	0	0	0	5	0	0	------
Tacoma	0	0	------	0	64	0	0	0	1	0	0	------
California:												
Los Angeles	3	0	18	1	156	2	3	0	14	0	0	16
Sacramento	1	0	1	0	10	0	2	0	1	0	0	1
San Francisco	0	0	3	0	331	0	5	2	12	0	0	17
Total	37	5	189	17	7,148	24	402	6	778	0	4	401
Corresponding week, 1947 [1]	76	------	603	33	1,689	------	491	------	789	0	11	663
Average 1943–47 [1]	69	------	239	[2] 32	[3] 6,312	------	[2] 433	------	1,600	1	11	640

[1] Exclusive of Oklahoma City.
[2] 3-year average 1945–47.
[3] 5-year median 1943–47.

Rates (annual basis) per 100,000 population, by geographic groups, for the 90 cities in the preceding table (latest available estimated population, 34,591,500)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza		Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	15.7	0.0	20.9	0.0	813	0.0	57.5	0.0	235	0.0	0.0	84
Middle Atlantic	3.7	2.3	13.4	1.4	961	3.7	73.6	0.5	115	0.0	0.5	34
East North Central	3.0	0.0	3.0	1.2	1,560	4.9	45.0	0.6	144	0.0	0.0	48
West North Central	8.0	0.0	2.0	0.0	1,034	2.0	53.7	0.0	113	0.0	0.0	135
South Atlantic	8.3	0.0	77.8	5.0	384	3.3	72.8	0.0	94	0.0	1.7	61
East South Central	5.9	0.0	88.5	5.9	1,145	0.0	70.8	0.0	47	0.0	0.0	47
West South Central	2.5	0.0	134.6	15.2	493	7.6	91.4	0.0	46	0.0	5.1	66
Mountain	23.8	0.0	63.5	0.0	3,725	0.0	103.3	15.9	159	0.0	0.0	302
Pacific	6.3	0.0	36.4	3.2	927	3.2	23.7	3.2	70	0.0	0.0	62
Total	5.6	0.8	28.6	2.6	1,080	3.6	60.8	0.9	118	0.0	0.6	61

Dysentery, amebic.—Cases: New York 10, Cleveland 1, Springfield 1, Memphis 4, New Orleans 3, Los Angeles 4.
Dysentery, bacillary.—Cases: Chicago 1.
Dysentery, unspecified.—Cases: Baltimore 1, San Antonio 1.
Tularemia.—Cases: Barre 1, Memphis 2.

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended March 6, 1948.—During the week ended March 6, 1948, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		44		187	374	59	24	29	120	837
Diphtheria				1	2	2	1	3		9
Dysentery, bacillary									4	4
German measles				51	26		2	6	10	95
Influenza		32			9				229	270
Measles		1		817	1,246	2		24	106	2,196
Meningitis, meningococcus					1					1
Mumps		22	1	262	321	32	62	43	20	763
Poliomyelitis						1				1
Scarlet fever		2	2	50	79	5	2	3	20	163
Tuberculosis (all forms)		7	26	107	39	29	1	2	27	238
Typhoid and paratyphoid fever				7	1			1	5	14
Undulant fever				2	2					4
Venereal diseases:										
Gonorrhea	2	10	9	65	56	27	21	34	102	326
Syphilis		5	4	89	42	14	10	10	40	214
Other forms									2	2
Whooping cough				20	28	6	4	36	10	104

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above-mentioned diseases, except yellow fever, during recent months. All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday in each month.

Cholera

India—Calcutta.—For week ended March 13, 1948, 208 cases of cholera were reported in Calcutta, India.

India (French)—Karikal.—For the month of February 1948, 208 cases of cholera were reported in Karikal, French India.

Pakistan—Chittagong.—For the week ended March 13, 1948, 17 cases of cholera were reported in Chittagong, Pakistan.

Plague

Argentina—Buenos Aires Province—El Tigre.—For the month of February 1948, 2 cases of plague were reported in El Tigre, Buenos Aires Province, Argentina.

Smallpox

British East Africa—Nyasaland.—During the week ended February 7, 1948, 273 cases of smallpox with 37 deaths were reported in Nyasaland, including 34 cases with 4 deaths in Cholo, 39 cases with 13 deaths in Fort Johnston, and 45 cases with 9 deaths in Liwonde. For the week ended February 21, 1948, 61 cases of smallpox with 45 deaths were reported in Blantyre.

Chile—Antofagasta (vicinity of).—For the week ended March 13, 1948, 3 cases of smallpox with 1 death were reported in the vicinity of Antofagasta, Chile.

China—Shanghai.—For the week ended March 13, 1948, 138 cases of smallpox were reported in Shanghai, China.

Tunisia.—Smallpox has been reported in Tunisia as follows: January 1948, 254 cases including 49 cases in Gabes and 106 cases in Tunis; February 1948, 145 cases including 57 cases in Tunis.

Typhus Fever

Tunisia.—Typhus fever has been reported in Tunisia as follows: February 1–10, 1948, 23 cases; February 11–20, 1948, 18 cases; February 21–29, 1948, 49 cases.

Yellow Fever

Ivory Coast—Gagnao.—On March 12, 1948, 1 fatal case of yellow fever was reported in Gagnao, Ivory Coast.

DEATHS DURING WEEK ENDED MAR. 20, 1948

[From the Weekly Mortality Index, issued by the National Office of Vital Statistics]

	Week ended Mar. 20, 1948	Corresponding week, 1947
Data for 93 large cities of the United States:		
Total deaths	10,004	10,186
Median for 3 prior years	9,640	
Total deaths, first 12 weeks of year	123,298	120,645
Deaths under 1 year of age	624	721
Median for 3 prior years	650	
Deaths under 1 year of age, first 12 weeks of year	8,350	9,731
Data from industrial insurance companies:		
Policies in force	71,165,108	67,330,226
Number of death claims	15,487	12,969
Death claims per 1,000 policies in force, annual rate	11.4	10.0
Death claims per 1,000 policies, first 12 weeks of year, annual rate	10.4	9.8

ANNOUNCEMENT

REGULAR CORPS APPOINTMENTS FOR ENGINEER OFFICERS IN THE PUBLIC HEALTH SERVICE

Competitive examinations for approximately 15 appointments in the Regular Corps in the Public Health Service in grades of Assistant Sanitary Engineer (1st Lieutenant) and Senior Assistant Sanitary Engineer (Captain) will be held during June 1948.

A Regular Corps appointment provides an opportunity for a qualified engineer to make a life career of engineering as it relates to the protection and promotion of the public health. Assignments are made with consideration of the officer's abilities and experience. Such assignments include general sanitary engineering, industrial hygiene, malaria and typhus control, milk and food sanitation and research.

Entrance pay for the Assistant grade with dependents is $3,811 a year and for the Senior Assistant grade with dependents is $4,351 a year. Promotions are made at regular intervals up to and including the grade of Senior Sanitary Engineer, which corresponds to the rank of Lieutenant Colonel, at $7,018 a year. Promotion to grades above Senior Sanitary Engineer is by selection. Retirement pay after 30 years service or at the age of 64 is $4,950 a year. Full medical care including disability retirement at three-fourths base pay and 30 days annual leave with pay are provided.

An applicant for the Assistant grade must (1) be a citizen of the United States at least 21 years of age, (2) have a degree in one of the several branches of engineering, from a school of recognized standing, and (3) have had at least 7 years of educational (exclusive of high school) and professional training or experience. At least 2 of the 7 years shall be qualifying professional training or experience in the field of public health or in an acceptable related field.

An applicant for the Senior Assistant grade must meet requirements (1) as stated for the Assistant grade, and (2) have had 11 years of education (exclusive of high school) and professional training or experience. At least 6 of the 11 years shall be qualifying professional training or experience in the field of public health in an official or non-official health agency or in an activity directly related to the field of public health.

Each applicant will receive a physical examination by a medical officer of the Public Health Service and a written examination, and will be rated by a Board of Officers as to professional knowledge and general fitness.

The written professional examination for the Assistant grade will be in the following subjects as they relate to courses of study generally provided in engineering schools of recognized standing and to professional training and experience required for this grade: (1) Basic science principles (including chemical, biological, physical, and social sciences), (2) basic science application, (3) engineering practices, (4) public health methods and procedures, and (5) specialty.

The written professional examination for the Senior Assistant grade will be in the same subjects listed for the Assistant grade as they relate to air hygiene, water, liquid and solid wastes, milk and food and vector control.

Application forms and information may be obtained from the Surgeon General, Public Health Service, Washington 25, D. C. Applications must be submitted prior to June 1, 1948. The written examination is scheduled for June 21, 22 and 23. Examinations will be held at designated Service stations convenient to candidates. Applicants will be notified of the date and location of the oral examinations. The applicants must assume transportation expenses and cost of maintenance at the place of examination. The written examination will require approximately 3 days.