CANCER IN NORTH AMERICA, 1994-1998

EXECUTIVE SUMMARY

NAACCR is pleased to release this two-volume monograph of cancer incidence and mortality in North America for 1994 to 1998. This is NAACCR's 11th release of cancer incidence and the 5th release of cancer mortality statistics. The monograph reflects not only the efforts of the NAACCR Data Evaluation and Publication Committee, but also central cancer registry staff in 49 U.S. states and regions and 12 Canadian provinces and territories; the NAACCR sponsor organizations, the National Cancer Institute and the Centers for Disease Control and Prevention; staff from Information Management Services, Inc.; editors at the Louisiana Tumor Registry and the NAACCR Executive Office; and thousands of cancer registrars and abstractors throughout North America. As a result of their diligence, support, and effort, we are able to translate cancer data into meaningful information.

Sixty-one registries participated this year. Of these, data from 30 U.S. central cancer registries (25 states and 5 metropolitan areas) and eight Canadian cancer registries met the criteria for highest quality data for 1994 to 1998 (the highest number ever to achieve this goal) and were used to compute the combined cancer incidence rates for each of the two nations. To be included in the combined rates, each registry was required to submit five years of data that passed rigorous criteria for completeness of reporting, non-duplication of records, and internal consistency among data items. The 30 U.S. registries in the combined rate provided data that represents about half of the total U.S. population. The Canadian combined rate represents about one third of the Canadian population.

The data for this monograph were submitted to NAACCR on or before December 1, 2000. This means that within 23 months of the close of the 1998 diagnosis year registries throughout North America were able to register the vast majority of new cases for 1998 and have a data file available for analysis and submission to NAACCR. This is the second consecutive year in which registries were able to meet this ambitious deadline without sacrificing data completeness. In fact, the completeness and quality of the data included in this volume are the best ever published in *Cancer in North America*. Thirty-eight registries met or exceeded stringent NAACCR standards of completeness and quality. These achievements are helping central registries use their data confidently in research, in the design and management of cancer control interventions, and in the development of cancer control policies. It is with great pride in our member registries, therefore, that we release *Cancer in North America, 1994-1998,* on behalf of them all.

For the second time, two tables summarizing the five most common cancer types for eight race groups and for persons of Hispanic origin have been included in the combined section for the United States. These include cancer burden information for Filipino, Japanese, Chinese, Vietnamese, Korean, American Indian/ Alaska Natives, and Hispanic populations, in addition to comparable information for the black population, white population, and the U.S. population as a whole.

Among males of different races, prostate cancer is the most common cancer type for all groups except the Vietnamese, among whom lung cancer is the most common of all cancers, and Korean males, among whom stomach cancer is the most common. Liver cancer is included among the top five common sites for the each of the Asian American populations except Japanese males, reflecting the burden of hepatitis and other liver disease in the developing countries from which substantial proportions of these groups have immigrated. Stomach cancer is also listed among the top five cancers among four of the five Asian American populations (excluding Filipinos), for African Americans, and for American Indians, Eskimos, and Aleuts,

probably reflecting differences in the diets of these groups and American males as a whole. Stomach cancer is less frequently found among white males in the U.S., although it still ranks among the top ten cancers. Cancer of the lung and cancer of the colon and rectum are on the top five list for males of all race/ethnic groups. These last statistics demonstrate substantial opportunities for cancer prevention, by reducing the use of tobacco, and by screening effectively for cancers of the colon and rectum, both proven interventions. Reducing the use of tobacco would also prevent many of the bladder and kidney cancers seen in these lists.

Among females of different races, breast cancer is the most common cancer in each of the nine racial or ethnic groups. This may actually be a good sign, as it may reflect aggressive screening for breast cancer among all groups. Aggressive screening for breast cancer has had the effect of increasing the incidence of breast cancer in the U.S., as formerly "occult" tumors are uncovered by improved mammographic techniques. Both cancer of the lung and cancer of the colon and rectum also rank among the top five most common types in each of the populations, again, as in the case of males, suggesting opportunities for cancer prevention. Unfortunately, cancer of the cervix persists as one the most common cancers for Hispanic, African American, Vietnamese, Korean, and American Indian/ Alaskan Native women, reflecting failures of screening. The Pap test, when used according to guidelines, should be able to detect almost all cervical lesions before they become invasive, like the tumors counted in these tables.

As racial and ethnic diversity increases in the populations we serve, it is essential to be able to classify case reports ever more finely according to race and ethnicity. Doing so helps us serve each of our subpopulations more effectively, and also provides significant opportunities for study of the determinants and consequences of cancer. In this vein, NAACCR is conducting an assessment of member registries' practices related to the collection, editing, and coding of data on race and ethnicity. After careful interpretation of results, he and his colleagues will make recommendations to NAACCR for the adoption of standards and practices to enhance the quality of these data.

Cancer in North America, 1994-1998 continues to include mortality data for all states and provinces, as well as comparable statistics for the United States, Canada, and North America. Special tables of combined rates for the United States and Canada, sorted by country, race (where applicable), and U.S. region (for mortality statistics) are included in this monograph to facilitate comparisons of rates among registry areas. In Volume One, Incidence, these special tables present only the registries achieving NAACCR's highest standards of quality, to minimize the effect that under-ascertainment of cases would have on interpreting differences among the registries.

NAACCR's standards for data quality are regularly updated to reflect the ever-changing needs for complete, accurate, and timely cancer incidence data. This past year, NAACCR convened two ad hoc work groups to address significant data quality issues.

The Work Group for High Quality Criteria for Data Use was assembled "to review the NAACCR method for estimating the completeness of case ascertainment and to develop a consensus on the standards defining high quality data." The Work Group's first task was to revamp NAACCR's method for estimating case completeness, based on incidence-to-mortality rate ratios. This method assumes that the relationship between cancer incidence and cancer mortality in a nation such as the U.S. or Canada is stable over time and across large geographic areas. In recent years, this assumption had been violated seriously enough by cancer screening programs and other relevant phenomena in both nations that completeness estimates had become suspect. The Work Group analyzed trends in incidence, mortality, and incidence-to-mortality rate ratios in great detail, examining the validity of completeness estimates when different combinations of data were used to compute them, and developing a configuration that restored the utility of the method. The Work Group considered the impact of screening programs and the increasing diversity of the U.S. population in its assessment. The Work Group's second task was to examine the standards by which registry data are certified,

and the standards by which registry data are judged to be eligible for inclusion in NAACCR's combined cancer incidence rates for the U.S. and Canada. No new standards were added, but two were modified. Starting with the data found in this volume, a registry's data must pass 100 percent of the edit checks specified by NAACCR for the data submission to achieve gold certification. Starting next year, a registry's data will have to achieve gold certification for each year's data submitted to be included in combined cancer incidence rates for the U.S., Canada, or North America.

This year, CINA Editors began a CINA Data Quality Assessment and Feedback was assembled to address the persistent difficulties some member registries have encountered in their attempts to improve the completeness, accuracy, and timeliness of their data. The Editors began by calling each of the relevant registries (about 20 in all) to ask specific questions about registry structure, management, and operations. The responses obtained were collated, analyzed, and summarized for discussion. A number of general themes emerged, which will help define the focus of a NAACCR program to help registries keep pace with the increasing demands for high-quality incidence data. In a nutshell, many registries need ongoing training of registrars and managers to keep up with best practices, and to cope with the rapid turnover of staff. These are problems which can and will be addressed systematically by NAACCR and its member registries, in collaboration with Centers for Disease Control and Prevention's National Program of Cancer Registries, and with the National Cancer Institute's SEER Program.

Part of NAACCR's quality assurance program for cancer incidence data is rapid feedback to its member registries on data quality assessments performed as part of the annual call for data. This year, members had feedback on data quality within two weeks of the deadline for data submission. The feedback included general observations across all registries, and specific feedback to each separate registry. Registry-specific feedback included a description of each problem noted in the data and specific suggestions for improving data quality. Members were invited to call NAACCR staff immediately if any of the results contained in their registry-specific feedback seemed incorrect, or if they had any difficulty interpreting the feedback report. It is through such systematic iterations that NAACCR members have been able to improve the quality and availability of their data over the past decade. We value their input, their doggedness in the pursuit of these ends, and most especially, their unflagging dedication to the people they serve.

John P. Fulton, Ph.D.
Rhode Island

HIGHLIGHTS OF CANCER IN NORTH AMERICA, 1994-1998

NAACCR is pleased to release this two-volume monograph of cancer incidence and mortality in North America for 1994-1998. The monograph reflects not only the efforts of the Data Evaluation and Publication Committee, but also central cancer registry staff in 50 U.S. states and regions and 12 Canadian provinces and territories; the NAACCR sponsor organizations, the National Cancer Institute and the Centers for Disease Control and Prevention; staff from Information Management Services (IMS), Inc.; editors at the Louisiana Tumor Registry and the NAACCR Executive Office; and thousands of cancer registrars and abstractors throughout North America. As a result of their diligence, support, and effort, we are able to translate the data into meaningful information. Highlights of the monograph are presented below.

VOLUME ONE: INCIDENCE

United States

Data from 49 U.S. central cancer registries were received in response to the *Call for Data*. Of these, data from 30 central cancer registries (25 states and 5 metropolitan areas) met the criteria for inclusion in the combined rates and were used to compute the U.S. combined cancer incidence rates. To be included in the combined rates, each registry was required to submit five years of data which have passed rigorous criteria for completeness of reporting, non-duplication of records, and internal consistency among data items. These central cancer registries include data from about 53 percent of the total U.S. population, 53 percent of U.S. whites, 46 percent of African Americans, and 68 percent of all other races combined.

Among Males of All Ages

- The age-adjusted (1970 U.S.) incidence rate for all cancers combined in the U.S. was 34 percent higher in males than in females for all races.
- The five most commonly diagnosed cancers among U.S. males were cancers of the prostate (28% of total incident cases), lung (17%), colon and rectum (12%), urinary bladder (7%), and non-Hodgkin's lymphoma (4%).
- The incidence rate for all cancers combined was 24 percent higher among African American males than white males.
- Significantly higher age-adjusted (1970 U.S.) incidence rates were observed among African Americans compared with U.S. whites for the more common cancers, such as prostate (63%) and lung (40% higher) as well as some less common ones, such as cancers of the oral cavity (40%), stomach (87%), esophagus (>100%), larynx (73%), and multiple myeloma (>100%).
- The age-adjusted (1970 U.S.) incidence rates were higher among U.S. whites than African Americans for urinary bladder cancer (>100% higher) and other less common cancers such as melanoma of the skin (>1,000%), brain and central nervous system (74%), testis (>300%), lymphomas (27%), leukemias (28%).

Among Females of All Ages

- The five most frequently diagnosed cancers among U.S. females were cancers of the breast (30% of total incident cases), lung (13%), colon and rectum (12%), uterine corpus (6%) and ovary (4%).
- The age-adjusted (1970 U.S.) incidence rate for all cancers combined was 6 percent higher for U.S. white females than African American females, a pattern different from that of U.S. males.
- White females in the U.S. had higher incidence rates than African American females for cancers of the breast (16%), ovary (44%), uterine corpus (40%) and melanoma of the skin (>1,000%). The reverse pattern was observed for the following cancers where African American females have higher incidence rates than U.S. white females: cervix (65%), pancreas (49%) and colon and rectum (17%).

Among Children and Adolescents, Ages 0-19

- Leukemias (26% of total incident cases), cancers of the central nervous system (17%), and lymphomas (15%) were the three most common cancers among all children in the U.S., accounting for 58 percent of the total pediatric cancer cases.
- The age-specific incidence rates for all cancer types combined were higher for all U.S. children ages 0 to 4 and ages 15 to 19 than for children ages 5 to 9 and ages 10 to 14.
- The age-adjusted (1970 U.S.) incidence rate for all cancers combined was 32 percent higher among U.S. white children than among African American children.
- Pediatric cancers, in general, occurred more frequently among boys than among girls.

Canada

Data from 12 Canadian central cancer registries were received in response to the *Call for Data*. Of these, data from seven provinces and one territory were used to compute the Canadian combined cancer incidence rates. These registries have met all four criteria required for inclusion in the combined rates, as mentioned earlier, and include data from about 36 percent of the total Canadian population.

- The age-adjusted (1991 Canadian population) incidence rate for all cancers combined in Canada was 33% higher among males than among females.
- The five most frequently diagnosed cancers among Canadian men were cancers of the prostate (27% of total incident cases), lung (16%), colon and rectum (13%), urinary bladder (7%), and non-Hodgkin's lymphoma (4%).
- The five most common cancers among Canadian women were cancers of the breast (30% of total incident cases), colon and rectum (12%), lung (12%), uterine corpus (5%), and ovary (4%).
- The three most common cancers among Canadian children and adolescents, ages 0 to 19, were leukemias (25% of total pediatric cases), cancers of the central nervous system (17%), and lymphomas (15%).
- Age-specific incidence rates for all cancers combined were higher for Canadian children ages 0 to 4 and ages 15 to 19 than for children ages 5 to 9 and ages 10 to 14.
- Site-specific pediatric cancer incidence rates were generally higher among Canadian boys than among girls.

- The cancer incidence patterns for Canadian children and adolescents were very similar to those observed for U.S. children.

VOLUME TWO: MORTALITY

Mortality data for 50 U.S. states, the District of Columbia and six SEER metropolitan areas were obtained from the National Center for Health Statistics for the years 1994 to 1998, via the National Cancer Institute. Mortality data for the years 1994 to 1997 (4 years) were provided by the Statistics Canada for 10 provinces and two territories.

- Cancer mortality rates for all races were very similar between the U.S. and Canada during the study period, although the ranking of specific cancers varied slightly.

United States:

- A total of 2,693,324 persons in the U.S. died of cancer in the 5-year period (1994-1998), averaging more than half a million (538,665) per year.
- A little over half of the U.S. cancer deaths occurred among males (52%), and about 48% among females.
- For both genders combined, the most common cancer deaths in the U.S. were lung (760,026), colon and rectum (285,472), breast (216,045), and prostate (168,590).
- Deaths from lung cancer alone in the U.S. during this study period were approximately 416 a day.
- Among U.S. males, the five leading cancer deaths were lung (33% of total cancer deaths), prostate (12%), colon and rectum (10%), pancreas (5%), and non-Hodgkin's lymphoma (4%).
- Among U.S. females, the five leading cancer deaths were lung (23% of total cancer deaths), breast (17%), colon and rectum (11%), pancreas (6%), and ovary (5%).
- About 4,500 women in the U.S. died from cervical cancer every year during this time period. With early detection and prompt treatment, nearly all of these deaths could have been prevented.
- The age-adjusted, site-specific cancer mortality rates for African Americans were generally higher than those for U.S. whites.
- For all cancers combined mortality rates were 46% higher for African American males than for U.S. white males and 21% higher for African American females than for U.S. white females.
- Deaths from cancers of the prostate, lung, and colon and rectum accounted for much of the racial differences in men. The mortality rate for prostate cancer was more than two-fold higher among U.S. African American males than U.S. white males.
- Cancers of the colon and rectum, breast, and cervix accounted for much of the racial differences in cancer mortality among women in the U.S. The age-adjusted mortality rate for cancer of the cervix among African American females was two times the rate for white females.
- Cancer mortality rates by census division and state showed geographic variations. In general, mortality rates for all cancers combined were highest in the East South Central Division and lowest in the Mountain Division.

Canada:

- A total of 233,059 persons in Canada died of cancer during the years 1994 to 1997, averaging about 58,265 per year.
- More than half of the Canadian cancer deaths occurred among males (54%); slightly less than half (46%) occurred among females.
- For both genders combined, the most common cancer deaths in Canada were lung (61,314 deaths), colon and rectum (29,740), breast (20,077), and prostate (14,594).
- Among Canadian males, the five leading cancer deaths were lung (31% of total cancer deaths), colon and rectum (13%), prostate (12%), pancreas (5%), and stomach (4%).
- Among Canadian females, the five leading cancer deaths were lung (21%), breast (19%), colon and rectum (13%), pancreas (5%), and ovary (5%).
- An average of 424 Canadian women died from cervical cancer each year during this time period. Because of the widespread availability and proven efficacy of the Pap test and effective treatments for cancer of the cervix, deaths from cervical cancer are largely preventable.
- Provincial geographic variations showed, in general, higher rates for all cancers combined in the east coast (Quebec, Nova Scotia and Prince Edward Island), whereas lower rates were observed for the west coast (British Columbia and Alberta)

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CANCER IN NORTH AMERICA, 1994-1998

VOLUME ONE: INCIDENCE

A Publication of the
North American Association of Central Cancer Registries

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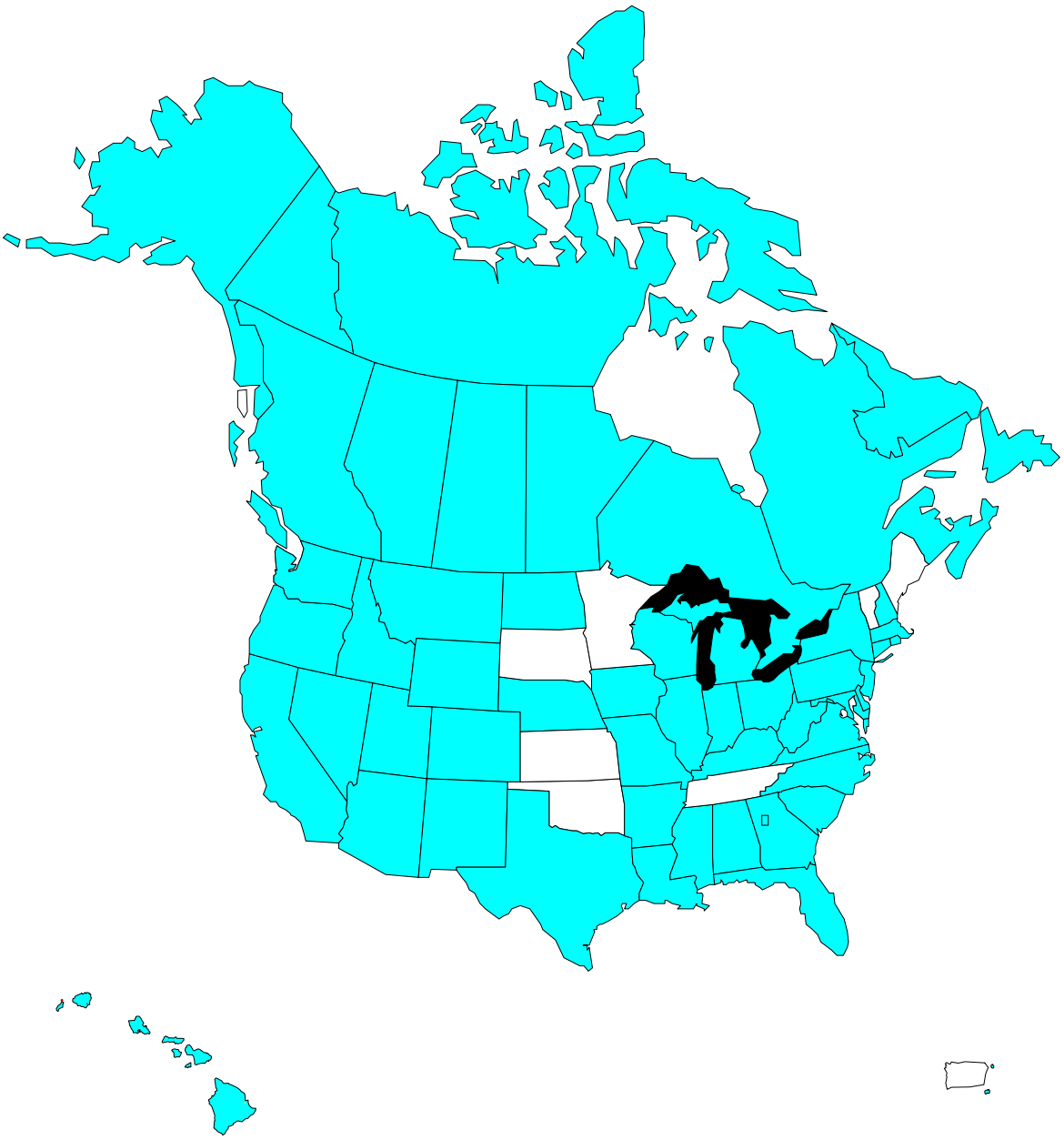
CINA PARTICIPANTS
1994-1998



Participating Registries

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