MINNESOTA MDH DEPARTMENT OF HEALTH

Protecting, maintaining and improving the health of all Minnesotans

March 2003

Dear Colleague:

We are very pleased to present the seventh biennial report of the Minnesota Cancer Surveillance System (MCSS) on the occurrence of cancer in Minnesota, as required by Minnesota Statute 144.672 Subdivision 2.

Each of us has been, or will be, touched by cancer. Statistics presented in this report tell us that almost half of all Minnesotans will be diagnosed with a potentially serious cancer at some point during their lives. Reducing the occurrence of cancer is a critical element in the MDH's strategy for protecting and improving the health of our citizens. Because the MCSS was implemented in 1988, we are now able to measure how much progress is being made in cancer control and to determine where our best efforts, and limited resources, need to be focused.

This report documents important successes—decreasing rates of smoking-related cancers among men, breast cancer mortality among women, and colorectal cancer among both men and women. It also points to continuing challenges—increasing incidence rates of melanoma among both men and women and lung and breast cancer among women, as well as a disproportionate burden of cancer among persons of color. Of special concern are American Indians in Minnesota, whose risk of dying of cancer is twice that of American Indians in the U.S. as a whole. On the other hand, the results of examining cancer rates in different regions of the state should reassure Minnesotans that their risk of developing cancer is not dictated by where they choose to live.

The MCSS is a powerful tool for public health, and its value increases with each year of data collection. Please join us in thanking MCSS staff, cancer registrars, and health care providers throughout the state, whose efforts and diligence in data collection have made this report possible.

This report was prepared by MCSS staff under the direction of Dr. Sally Bushhouse. Questions and comments on the report can be directed to the MCSS at (612) 676-5216.

Sincerely,

Dianne Mandernach

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Cancer in Minnesota, 1988-1999

Biennial Report to the Minnesota Legislature 2003

March 2003

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Contents

Summary

This report summarizes the status of cancer in Minnesota, using cases reported to the Minnesota Cancer Surveillance System (MCSS) and deaths reported to the Minnesota Center for Health Statistics. Cancer surveillance plays a critical role in protecting and improving public health. These data enable the Minnesota Department of Health (MDH) to detect public health problems, to target goals for cancer control, and to inform citizens and health care professionals about risks, early detection, and treatment.

- More than 22,000 Minnesotans were diagnosed with cancer in 1999, excluding cancers that are rarely life-threatening, such as common skin cancers and *in situ* cancers.

- Nearly 8,900 Minnesotans died of cancer in 1999, accounting for one of every four deaths.

- Prostate, breast, lung, and colorectal cancers are the most common, accounting for 56 percent of cancer diagnoses and 49 percent of cancer deaths.

- Over the 12-year period 1988-1999, the overall cancer incidence rate among males in Minnesota decreased somewhat, largely due to significant decreases in colorectal, stomach, and several smoking-related cancers (lung, larynx, and oral cavity).

- Over the same period, the overall cancer incidence rate among women in Minnesota increased by about 8 percent, largely due to significant increases in breast and lung cancer. These increases were large enough to outweigh significant decreases in colorectal, stomach, and cervical cancer.

- Although the overall cancer incidence rate in Minnesota did not increase significantly between 1988 and 1999, the number of persons diagnosed with cancer increased by more than 20 percent because of the growth and aging of the Minnesota population.

- The cancer mortality rate declined among both men and women, but more sharply among men. For women, continuing increases in lung cancer mortality largely offset decreasing mortality rates in other sites, including breast cancer.

- Despite a 4 percent decrease in the cancer mortality rate in Minnesota between 1988 and 1999, the number of persons dying of cancer increased by 10 percent because of the growth and aging of the Minnesota population.

- Cancer rates in Minnesota are about 5 percent lower than reported nationally, largely due to lower rates of cancers caused by tobacco use.

- Race disparities in the burden of cancer are evident in Minnesota. Black men have the highest cancer rates in Minnesota—their incidence rate is 30 percent higher and their mortality rate is 60 percent higher than among white males. Of special concern are cancer rates among American Indians. Nationally, the overall cancer mortality rate is 40 percent lower among American Indians than whites; in Minnesota, their rate is 30 percent higher than whites. Among American Indian men, lung cancer mortality is two times higher in Minnesota than in the U.S. as a whole; among American Indian women, it is three times higher in Minnesota. Other smoking-related cancers appear to be unusually common among American Indians in Minnesota, as well as prostate, colorectal, and cervical cancer.

- The mesothelioma incidence rate among men in Minnesota increased by 70 percent between 1988, when statewide cancer reporting was implemented, and 1999. Rates did not increase among women. Mesothelioma incidence in Minnesota is 14 percent higher among men than reported for the nation, but is the same for women.

Questions and Answers about MCSS Data Privacy

The Minnesota Cancer Surveillance System (MCSS) is Minnesota's statewide, population-based cancer registry. It was mandated by the state legislature in 1987 to collect information on all newly diagnosed cancers among Minnesota residents. By law, new cancer cases must be reported to the MCSS, including the name, date of birth, and social security number of the person diagnosed with cancer. These data enable the Minnesota Department of Health (MDH) to protect and improve public health by monitoring cancer rates throughout the state and over time. The MCSS also benefits all Minnesotans by serving as a resource for education and research to prevent, detect, treat, and cure cancer.

Why does the MCSS need to obtain the names of individuals diagnosed with cancer? There are five primary reasons why MCSS functions depend on having information identifying individuals:

1. Most cancer cases are reported to the MCSS more than once. To determine how many new cancers have been diagnosed, multiple reports must be combined into a single summary of the case. Without personal information, separate reports from laboratories, physicians, treatment facilities, and hospitals could not be identified as representing the same case. Using patient names and other personal information to link multiple reports on the same person is essential to maintain the accuracy of the MCSS. Inaccurate date would undermine the public's investment in cancer registration, and render it ineffective in protecting public health.

2. No one source of information captures all cancer diagnoses or provides all the information needed for cancer surveillance. For example, pathology reports do not contain critical information such as stage at diagnosis or treatment received. The name of the patient allows this information to be obtained from the hospital or from the physician, if the patient was not admitted to a hospital. Since an increasing number of cancer patients are treated on an outpatient basis, the ability to request additional information from physicians and treatment facilities is very important to obtain complete and unbiased data.

3. Personal identifiers are needed to link MCSS cases with death certificates. This is done to make sure that all cancer cases have been reported, and to lay the groundwork for assessing cancer survival. About 2 percent of MCSS cases, and a higher proportion of certain cancers, would not be identified without this linkage. The MCSS hopes to have sufficient resources in the future to evaluate cancer survival, which is a critical element in identifying disparities in cancer care. This cannot be done in a cost-effective manner without linkage to death certificates.

4. Names are needed if cancer patients are to be given the opportunity to contribute to knowledge about their disease by participating in research. The MCSS is authorized to contact cancer patients, after obtaining consent from their physician, to see if they are interested in participating in specific cancer research projects. Participation is completely voluntary. MCSS data have enabled research to be conducted on such questions as the efficacy of colorectal cancer screening, the causes of pancreatic cancer, associations between cancer and occupational exposures such as mesothelioma and mining, and the epidemiology of childhood leukemia.

5. To protect the health of Minnesotans, the MCSS must be able to evaluate whether communities or workplaces are experiencing a higher occurrence of cancer than would be expected. Although names are never released in these investigations, they are vitally important to their conduct. For example, when a concern arises in an occupational setting, names of former and current employees can be linked to the MCSS by MDH staff to determine whether workers are experiencing an excess of cancer. Because personal

identifiers enable MCSS data to be highly complete and accurate, as discussed above, the MDH can be confident that investigations of cancer occurrence reflect reality, and not the artifacts of poor data collection.

Do other cancer registries obtain the names of people diagnosed with cancer? Yes. All 50 states and the District of Columbia have statewide cancer registries. All of them obtain personally identifying information on cancer cases for the reasons discussed above. Nine geographic areas (states or metropolitan areas) in the U.S. have been participating in the Surveillance, Epidemiology, and End Results (SEER) program of the National Cancer Institute since 1973. Each of the SEER registries has collected personally identifying information for nearly three decades.

How does the MCSS protect the privacy of cancer patients? Protecting data privacy is a high priority for the MCSS, and is mandated by Minnesota law. The MCSS is housed in a guarded, key-pass protected location that is not accessible to the general public. MCSS employees must sign confidentiality pledges as a condition of employment, and they are subject to criminal penalty for any breach of privacy. MCSS employees are given access to personally identifying information only as needed to perform their duties, and they are trained and monitored to keep private data secure. Data encryption, passwords, and computer firewalls are used to protect electronic data. By law, MCSS data are considered private. Data are only released in accordance with the Minnesota Government Data Practices Act. Minnesota law also protects the data from being discovered (i.e., released) during litigation without consent of the patient.

Was patient privacy taken in to consideration when the legislature mandated the creation of the MCSS? Yes. Prior to establishing the MCSS, the Commissioner of Health empanelled an advisory committee charged with assessing whether the benefits of statewide cancer registration to the citizens of Minnesota outweighed the potential costs to individual privacy. The committee consisted of members from the legal profession, business, labor, medicine, government, patient advocates such as the American Cancer Society, and the community. It deliberated for more than a year. Based on the importance of the proposed system to protecting public health and the ability to protect individually identifying medical data, the committee unanimously concluded that the benefits far outweighed the costs. On their recommendation, statutes that provided for both the collection of personal medical information and its stringent protection were adopted by the state.

Are patients asked for consent to have information about their cancer reported to the MCSS? No. Patient consent is not required by Minnesota statutes. Requiring consent would undermine the public's investment in cancer registration, and render it ineffective in protecting public health. Federal standards are that at least 95 percent of the expected number of cases must be reported before cancer registration is complete. MCSS completeness currently meets that standard. If even 10 percent of people with cancer refused to have their information reported to the MCSS, Minnesota cancer rates would appear to be much lower than they are. In addition, persons refusing consent would likely differ from those giving consent in unknown ways, such as gender, age, race/ethnicity, location of residence, type of cancer, or year of diagnosis. Because of this, data would be biased. It would be impossible to reliably compare rates among these important factors, which is the basis of cancer surveillance. In fact, the refusal rate could be even higher, give the challenges facing patients coping with new cancer diagnoses, and the physicians's need to discuss treatment, prognosis, and quality of life issues with the patient. Obtaining consent for cancer reporting in this context arguably represents an unnecessary and inappropriate burden on both patients and physicians.

Do other states require informed consent for cancer registration? No. For the same reasons as discussed above, no cancer registry in the U.S. requires informed consent for cancer reporting.

How are Minnesota cancer patients given an opportunity to participate in research projects? Before a patient is invited to participate in research, his or her physician is contacted by the MCSS to determine if there is any reason why the patient or

the patient's family should not be approached. This step is required by the statute that created the MCSS. If the physician consents, the patient is invited to participate, as specified in the study protocol. Participation is always voluntary, and the MCSS does not inform the patient's physician of his or her decision. Patients may request that they are never approached by the MCSS to participate in research by contacting the MCSS (see contact information below).

Cancer patients who are approached to participate in research are sometimes unaware that their names have been reported to the MCSS. The invitation may, therefore, come as a surprise and cause concern. Although first consulting the physician is intended to prevent patients and their families from being contacted at inappropriate times, this unfortunately can happen despite the best of intentions. Nonetheless, experience indicates that most cancer patients welcome the opportunity to contribute to knowledge about their illness.

How is data privacy protected by researchers? Data from the MCSS are only provided to a researcher whose project has been reviewed and approved both by the MCSS Peer Review Committee, which evaluates proposed studies for social and scientific merit, and by a federally approved Committee for the Protection of Human Subjects. These latter committees, also called Institutional Review Boards (IRBs), carefully review research protocols, including the provision of informed consent and methods to protect data confidentiality, to determine whether potential risks have been well explained prior to obtaining consent and are justified by potential benefits. Failure to protect confidentiality can result in the termination of the project and its funding. Research projects are reviewed annually, and complaints must be reported to the governing IRB. Researchers who receive private patient information from the MCSS are also contractually bound to protect the information under all the requirements of Minnesota law.

Does cancer reporting represent a risk to patient privacy? Yes, although the risk is small. Any time that data are exchanged, whether between individuals, between health care providers, between providers and insurers, or between providers and the MCSS, it is possible for breaches in data privacy, either inadvertent or intentional,to occur. The state legislature and MDH have taken extreme care to minimize these risks by the protections described above, with an outstanding record of success.

The underlying issue today is the same as deliberated by the Commissioner's advisory committee more than 15 years ago: "Are the benefits of cancer surveillance greater than its costs?" The answer remains an emphatic "Yes." The lifetime risk of developing a life-threatening cancer is nearly 50 percent. Thus, each of us will be affected directly or indirectly by this group of diseases. The methods used by the MCSS to collect and release data effectively balance the need to protect public health through cancer surveillance, the desire of the public for progress in preventing, detecting, and treating cancer, and the rights of individuals to privacy.

Where can more information about the MCSS be obtained? More information can be obtained by visiting the MCSS website, (http://www.health.state.mn.us/divs/dpc/cdee/mcss.htm), by telephoning the MCSS office at (612) 676-5216, or by writing to: MCSS, P.O. Box 9441, Minneapolis, MN 55440-9441.

Chapter I:

Introduction

Chapter I: Introduction

This report contains information on the incidence and mortality of cancer in Minnesota from 1988-1999. Cancer incidence and mortality provide two important measures of the impact of cancer. Incidence measures how many new cases of the disease are diagnosed, while mortality measures how many people die of the disease. The Minnesota Department of Health (MDH) collects and analyzes data on both the incidence and mortality of cancer. Incidence data in this report are compiled by the Minnesota Cancer Surveillance System (MCSS), and mortality data are compiled by the Minnesota Center for Health Statistics (MCHS).

The MCSS is an ongoing program within the Chronic Disease and Environmental Epidemiology Section of the MDH. The MCSS systematically collects demographic and diagnostic information on all newly diagnosed, microscopically confirmed cancers among Minnesota residents. The primary objectives of the MCSS are to: (1) monitor the occurrence of cancer in Minnesota and describe the risks of developing cancer, (2) inform health professionals and educate citizens regarding specific cancer risks, (3) answer the public's questions and concerns about cancer, (4) promote cancer research, and (5) guide decisions about how to target cancer control resources.

The need for accurate information about the occurrence of cancer was recognized by the Minnesota legislature in 1981, when legislation was introduced to establish a statewide cancer surveillance system. In 1987, following a 6-year process which included consensus building, development of methods, and a feasibility study, legislation (Minnesota Statutes 144.671-144.69) was passed to establish the MCSS. The MCSS began operations on January 1, 1988.

Funds for the enhancement of the MCSS became available in 1994 through the National Program of Cancer Registries (NPCR), which is administered by the U.S. Centers for Disease Control and Prevention (CDC). NPCR funding began in October 1994 and is scheduled to continue at least through June 2007. The support of the NPCR has enabled the MCSS to collect additional information on each case of cancer, perform death clearance, perform quality control studies, provide specialized training to Minnesota professionals who collect and code cancer data, and increase the analysis and utilization of the collected data.

An attempt has been made to minimize the use of technical jargon in this report. However, because of the nature of the material and the diverse audience that this report must serve, some technical terms remain. The Glossary (Appendix D) and Appendices A, B, and E will assist those desiring more basic definitions, as well as those requiring additional detail.

To minimize repetition of discussion and materials presented in previous reports, liberal cross-referencing is employed. The six previous reports are: *The Occurrence of Cancer in Minnesota 1988*; *The Occurrence of Cancer in Minnesota 1988-1990: Incidence, Mortality, and Trends*; *The Occurrence of Cancer in Minnesota 1988-1992: Incidence, Mortality, and Trends*; *The Occurrence of Cancer in Minnesota 1988-1994: Incidence, Mortality, and Trends; The Occurrence of Cancer in Minnesota 1988-1996: Incidence, Mortality, and Trends;* and *The Occurrence of Cancer in Minnesota 1992-1997*. These reports will be referenced as MCSS 1991, MCSS 1993, MCSS 1995, MCSS 1997, MCSS 1999, and MCSS 2001, respectively; they are available from the MCSS. MCSS 1999 and MCSS 2001 are available on the MCSS web site (http://www.health.state.mn.us/divs/dpc/cdee/mcss.htm).

Data Sources

Incidence Data

The MCSS collects information on microscopically confirmed, malignant tumors, as well as benign tumors occurring in the head and spinal cord. The MCSS does not collect information on the most common forms of skin cancer (basal and squamous cell carcinomas).

The MCSS has three important characteristics: it is population-based, it is pathology-based, and it is an active (vs. passive) system. Population-based surveillance means that data are collected from a defined population base (i.e., the state of Minnesota) so that incidence rates (risk) can be calculated. Pathology-based surveillance means that cancers are identified through the pathology laboratories where tissues are examined and the diagnosis of cancer is made. Active surveillance means that cancers are required to be reported to the MCSS by Minnesota statutes and that pathology reports in the state and surrounding border referral centers are reviewed by MCSS Field Service staff to ensure completeness of ascertainment.

Enough information is collected so that the MCSS can classify each new diagnosis by type of tumor (primary site, histologic cell type), tumor stage (how advanced the cancer is), and demographic characteristics of the patient (age, sex, race, and residence) as of the date of diagnosis of the cancer, as well as a summary of the first course of cancer-directed treatment. Information about the patient, cancer, stage, and treatment that the pathology laboratory cannot provide is obtained from hospital-based cancer registries or from the patient's hospital or clinic record.

Hospitals and pathology laboratories provide data to the MCSS in two main ways. Hospitals that have computerized cancer registries containing summaries for each cancer patient treated at the hospital submit computerized case reports. The remaining cancer diagnoses are reported through pathology laboratories. Pathology laboratories submit photocopies or electronic files of the pathology report, which contains information about the cancer, and the medical record face sheet or an equivalent form, which contains the patient's demographic data. More than 566,000 reports of cancer representing approximately 339,000 different cancers were registered with the MCSS as of December 2002. For the period covered by this report, January 1, 1988 to December 31, 1999, 238,860 newly diagnosed, invasive cancers were registered. *In situ* cancers of the urinary bladder are included with invasive cancers so that Minnesota data is consistent with national standards.

The data upon which this report is based are dynamic. That is, they are always being updated and improved. For example, in the first legislative report on the MCSS (MCSS 1991), filed 12 years ago, 17,728 cancers were included in the analyses of 1988 data. The current database for 1988 contains information on 17,993 cancers (some of the increase is because the data reported for 1988 did not include *in situ* cancers of the bladder). MCSS staff are constantly updating data for all years when new information becomes available. In this regard, all data are subject to change when appropriate. For purposes of analyses, the data are "frozen" (closed) in order that numbers and rates be consistent throughout the report. The date of closure for 1988-1999 data included in this report was October 7, 2002.

Mortality Data

Mortality data are obtained from death certificates. Death certificates are collected, coded, and computerized by the MCHS. Although the MCHS codes contributing causes of death as well as the underlying cause of death, only the underlying cause of death was used in calculating cancer mortality rates.

Population Data

Minnesota population estimates for the years 1988 and 1989 were developed from the U. S. Census Bureau's 1980 and 1990 censuses. Linear interpolation between the two census years provided age-sex-region estimates for 1988 and 1989. Adjusted census counts were used for 1990. Age-, sex-, and county-specific intercensal population projections obtained from the U.S. Census Bureau were used for the years 1991-1999. For race-specific analyses, age-, sex-, and race-specific intercensal projections for the entire state were obtained from the U.S. Census Bureau's web site.

Completeness and Quality of Data

MCSS Field Service staff first identified 9.6 percent of all the cancer diagnoses reportable to the MCSS during their independent review of pathology reports. This review is an important feature of MCSS quality control in that it assures that virtually all eligible cancers are included in the data. For all of the individual cancers diagnosed during 1988-1999, 5.1 percent would have been missed without this review. It is estimated that more than 6 million pathology reports were reviewed during the 12-year period included in this report.

The MCSS began performing death clearance in 1995. Death clearance is a quality control process by which cancer-related deaths are linked with the MCSS database to identify cancer cases that have not been reported by routine methods. Potentially missed cancers are then followed back to determine if the cancer indeed should have been included in the MCSS database. Unresolved cancers are included in the database as "Death Certificate Only" (DCO) cases. Death clearance can identify sources where cancer reporting might be improved. Results indicate that MCSS case ascertainment is excellent. Only 1.2 percent of all cancers diagnosed between 1995 and 1999 (the years for which death clearance has been performed) had the death certificate as the source of casefinding. A high-quality cancer registry should have between 1 percent and 3 percent of its cases as DCO.

MCSS data are very complete and of very high quality. This is documented by several measures of data quality which are available for the MCSS. First, in December 2001 the MCSS submitted a nonidentified file of its provisional data for 1999 to the Registry Certification Committee of the North American Association of Central Cancer Registries (NAACCR). NAACCR is the organization in North America which develops standards and models for the collection of cancer data in central cancer registries. Table I-1 contains the results of the certification process. The MCSS achieved the highest rating, the Gold Standard, for all criteria.

Second, a contractor of the NPCR performed an external audit of the completeness and quality of MCSS data in July 2002. Case completeness was estimated at 99.9 percent. Data accuracy was also exceptionally high, with an overall accuracy of 98.7 percent (51 errors identified out of 3,835 data items reviewed). The error rates for all audited data items were at or better than the average among other central registries funded by the NPCR, as well as those funded by the National Cancer Institute through its Surveillance, Epidemiology, and End Results program.

Third, the MCSS has completed several of its own studies of the accuracy of the data contained in the central registry. These studies indicate that MCSS data are of comparable quality to data of other central cancer registries in the U.S. (MCSS Quality Control Reports 97:2, 99:1, 2000:1, and 2001:1). Special attention has been paid to the data fields that were new to the MCSS in 1995, stage at diagnosis and the information on the first course of cancer therapy.

Race is an important variable for cancer surveillance. Unfortunately, race is not always reported on data submitted to the MCSS, and prior to the 1995 diagnosis year the MCSS did not have the resources to perform active follow-up to find the missing information. This is reflected in the fact that no indication of the patient's race was reported for 9.7 percent of the cancers diagnosed during the period 1988-1994. The percentage can be improved by assuming that individuals are white if they live in counties that had more than 95 percent of residents listed as white in the 1990 census, and no other racial information is available. After making this assumption, race was "unknown" for only 2.4 percent of the cancers diagnosed during the period 1988-1994. The effect of active follow-up is demonstrated by the fact that the percent with unknown race is much lower for cancers diagnosed in 1995 through 1999 (3.3 percent before and 1.1 percent after making an assumption based on county of residence).

Ethnicity (Hispanic origin) is even more difficult to collect accurately in Minnesota. Even when medical records are reviewed, usually no mention is made of whether or not a person is of Hispanic origin. Exploratory analyses of the available data indicate that the MCSS does not have complete enough data to provide meaningful information on

cancer incidence among Minnesota's Hispanic population at this time. Further work, including examining the usefulness of matching with Hispanic surname lists as is done in other states, is planned so that information can be available on cancer incidence in this growing population in Minnesota.

Despite recent improvements in the completeness of data on the patient's race, the ability of the MCSS to evaluate racial and ethnic differences in cancer risk among Minnesotans is limited by several factors. Although the Minnesota population is increasingly diverse, populations of color are still relatively small. Out of a total Minnesota population of 4.9 million, the 2000 census enumerated 168,813 African Americans, 142,797 Asian/Pacific Islanders, 52,009 American Indians, 143,382 Hispanics of any race, and 75,335 persons of mixed or "other" race, together representing 12 percent of the total Minnesota population. Because all but the five most common cancers occur infrequently, only a few cases or deaths will be reported each year for most cancers from populations of color in Minnesota. This means that the random fluctuation of a few cases or deaths can cause rates for these groups to vary considerably from year to year.

Secondly, race and ethnicity are often incompletely or inaccurately reported in the medical record or on the death certificate, which can compound the instability of rates based on small numbers. And finally, the population estimates that are available to calculate rates may represent undercounts of persons of color during the national census or inaccurate population estimates during the intercensal period. For example, the Hispanic population in Minnesota was estimated by the Bureau of the Census to be about 81,000 in 1999; the number of Hispanics enumerated in the 2000 census was 143,382. Since it is unlikely that the Minnesota Hispanic population increased by 75 percent in one year, it is reasonable to think that the population projections prior to the 2000 census were too low. However, at the time this report was prepared, the Bureau of the Census had not yet revised the population estimates for 1995-1999 to be consistent with the counts from the 2000 census.

These three factors limit our confidence in race- and ethnic-specific cancer rates in Minnesota, and make it difficult to interpret the differences we find. Despite these limitations, we believe that identifying race and ethnic differences in cancer risks is an important function of the MCSS, and is important in developing policies and interventions directed at cancer control. We have, therefore, aggregated data over the 5-year period, 1995-1999, to present cancer data by race and ethnicity. In addition, rates based on fewer than ten cases or deaths are suppressed. Nonetheless, the shortcomings discussed above should be kept in mind when evaluating race and ethnic differences in cancer rates presented in this report.

Uses of MCSS Data

As previously stated, the MCSS has five primary objectives. The following is a brief summary of how the MCSS is accomplishing each objective.

Monitoring the occurrence of cancer in Minnesota and describing the risks of developing cancer. Sophisticated computer programs have been written to support MCSS epidemiologists in describing the risks of developing cancer. The results of these analyses are partially included in this report. Cancer mortality data have also been analyzed and included in this description of cancer occurrence in Minnesota.

MCSS staff also conduct special analyses of the surveillance data. Emphasis is placed on integrating these findings into an epidemiologic and public health context. Recent examples are included below.

Informing health professionals and educating citizens regarding specific cancers. In the past two years, 16 formal presentations have been made before local public health, community, academic, and regulatory groups on the occurrence of cancer in Minnesota. A report entitled, "Cancer in Minnesota: Racial and Ethnic Disparities" was released in October 2001; this report was produced in collaboration with staff of the Minnesota Breast and Cervical Cancer Control Program (MBCCCP). The *Disease Control Newsletter* is published bimonthly by the MDH Acute Disease Investigation

and Control program, and is distributed to more than 16,650 health care providers statewide. Articles on breast and cervical cancer (Jan/Feb 2002), colorectal cancer (Mar/Apr 2002), melanoma (May/June 2002), and smoking-related cancers (Oct 2002) have been published. A nonexhaustive list of publications in the scientific literature (2001 - 2002) authored by MCSS staff or including MCSS data is in Table I-2.

Answering the public's questions and concerns about cancer. The MCSS receives 100 to 150 requests per year for information on cancer rates or cancer risks. These inquiries represent all geographic regions of the state. Although most of these inquires are from individual citizens, inquiries also frequently come from citizens' groups, schools, and workplaces, as well as the public health, scientific, and medical communities. Responses to these inquiries range from providing simple, descriptive statistics to detailed record-linkage studies of a defined cohort.

Promoting cancer research. The MCSS has assisted cancer researchers by providing information and data needed for the planning and support of grant applications. The MCSS has also received 26 data use applications since 1988, which are described in Table I-3. The involvement of the MCSS in the approved studies has varied from providing information about the completeness of case finding to providing rapid identification of cases for case-control studies. In addition, MCSS data have been used to investigate concerns about cancer occurrence in the workplace.

Guiding decisions about how to target cancer control activities. Health care professionals, community and civic leaders, hospital administrators, and public health professionals use MCSS data to identify populations who would benefit from screening programs, write grant proposals to obtain funds for establishing screening programs for particular cancers, aid in deciding where satellite treatment facilities should be built and additional staff hired to serve patients who otherwise have to travel long distances to obtain treatment, and identify populations needing public education programs for cancer prevention.

Statistical Methods

The statistical methods and constructs used in this report conform to standards established by the National Cancer Institute and are described in Appendix E.

Protection of Individual Privacy

Privacy of information which could identify an individual (e.g., name and address) is strictly protected by Minnesota law. Personally identifying information may be released only by permission of the subject of the data. Furthermore, this information is considered privileged in that the MDH cannot be compelled by court order to release any personal data collected by the MCSS.

One of the most important uses of MCSS data is to promote research on the prevention and control of cancer. In Minnesota, a large majority of cancer patients and/or their families agree to participate in studies designed to learn more about reducing the impact of cancer on our society. These people welcome the opportunity to translate their personal experience into knowledge that may help their families and others. Yet, even these important activities are voluntary. The subject or guardian must specifically agree to participate.

It is absolutely necessary that personally identifying information be collected by the MCSS. Multiple clinical reports are generated during the care of cancer patients. Personally identifying information is required to link this information to ensure completeness and accuracy of the resultant data. Federal guidelines require collection of personal identifiers to prevent a significant over-counting of cancer. Without accurate linkage of multiple reports made possible by personally identifying information, cancer rates would appear two-thirds higher, greatly exaggerating differences between Minnesota and the rest of the U.S. Thus, personally identifying information is both necessary for and strictly protected by the MCSS. For more details on this issue, please see "Questions and Answers about MCSS Data Privacy" following the Summary section at the beginning of this report.

Table I-1: North American Association of Central Cancer Registries certification results: quality, completeness, and timeliness of 1999 data, Minnesota Cancer Surveillance System

Registry Element	Gold Standard	Silver Standard	MCSS Measure	Standard Achieved
1. Completeness of case ascertainment	95%	90%	103.8%	Gold
2. Completeness of information recorded				
• Missing/unknown "age at diagnosis"	<= 2%	<= 3%	0.0%	Gold
• Missing/unknown "sex"	<= 2%	<= 3%	0.0%	Gold
• Missing/unknown "race"	<= 3%	<= 5%	2.1%	Gold
• Missing/unknown "county"	<= 2%	<= 3%	0.6%	Gold
3. Death certificate only cases	<= 3%	<= 5%	2.0%	Gold
4. Duplicate primary cases	<= 0.1%	<= 0.2%	0.08%	Gold
5. Passing EDITS	100.0%	97%	100.0%	Gold
6. Timeliness	Data submitted within 24 months of close of calendar year			Gold

Table I-2: Scientific publications (2001-2002)

Publications co-authored by MCSS/MDH staff

Boland LL, Mink PJ, Bushhouse SA, Folsom AR. Weight and length at birth and risk of early-onset prostate cancer. Submitted December 2002.

Perkins CI, Hotes J, Kohler B, Howe H. Association between breast cancer laterality and tumor location, United States, 1994-1998. Submitted.

Perkins CI, Wright WE, Allen M, Samuels SJ, Romano PS. Effects of capitated managed care on breast cancer detection and treatment among Medicaid enrollees in California. Medical Care. Submitted September 2002.

Kiffmeyer WR, Kastel E, Davies SM, Envall J, Bushhouse S, Robison LL, Ross JA. Susceptibility to cancer in the Minnesota Hmong population. Submitted August 2002.

Short M, Carlin BP, Bushhouse SA. Using hierarchical spatial models for cancer control planning in Minnesota. Cancer Causes and Control. In Press.

Publications incorporating/based on data from the MCSS

U.S. Cancer Statistics Working Group. United States Cancer Statistics: 1999 Incidence. Atlanta (GA): Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; 2002.

Camp NJ, Slattery ML. Classification tree analysis: a statistical tool to investigate risk factor interactions with an example for colon cancer (United States). Cancer Causes Control. 2002 Nov;13(9):813-23.

CBTRUS. Statistical Report: Primary Brain Tumors in the United States, 1995-1999. Chicago, Illinois: Central Brain Tumor Registry of the United States, 2002.

Anderson KE, Sinha R, Kulldorff M, Gross M, Lang NP, Barber C, Harnack L, DiMagno E, Bliss R, Kadlubar FF. Meat intake and cooking techniques: associations with pancreatic cancer. Mutat Res. 2002 Sep 30; 506-507:225-31.

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Woods WG, Gao RN, Shuster JJ, Robison LL, Bernstein M, Weitzman S, Bunin G, Levy I, Brossard J, Dougherty G, Tuchman M, Lemieux B. Screening of infants and mortality due to neuroblastoma. N Engl J Med. 2002 Apr 4; 346(14):1041-6.

McCarthy BJ, Surawicz T, Bruner JM, Kruchko C, Davis F. Consensus Conference on Brain Tumor Definition for Registration. November 10, 2000. Neuro-oncol. 2002 Apr; 4(2):134-45.

Table I-2: Scientific publications (2001-2002) (continued)

Publications incorporating/based on data from the MCSS: (continued)

Wu XC, Hotes JL, Fulton PJ, Cormier M, Correa CN, McLaughlin CC, Kosary C, Howe HL, Chen VW (eds). Cancer in North America, 1995-1999. Volume One: Incidence. Springfield, IL: North American Association of Central Cancer Registries, April 2002.

Shu X, Potter J, Linet M, Severson R, Han D, Kersey J, Neglia J, Trigg M, Robison L. Diagnostic X-rays and ultrasound exposure and risk of childhood acute lymphoblastic leukemia by immunotype. Cancer Epidemiolo Biomarkers Prev. 2002 Feb;11(2):177-85.

Slattery ML, Edwards SL, Caan B. Low-energy reporters: evaluation of potential differential reporting in case-control studies. Nutr Cancer. 2002; 42(2):173-9.

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Slattery ML, Samowitz W, Ballard L, Schaffer D, Leppert M, Potter JD. A molecular variant of the APC gene at codon 1822: its association with diet, lifestyle, and risk of colon cancer. Cancer Res. 2001 Feb 1; 61(3):1000-4.

Slattery ML, Potter JD, Curtin K, Edwards S, Ma KN, Anderson K, Schaffer D, Samowitz WS. Estrogens reduce and withdrawal of estrogens increase risk of microsatellite instability-positive colon cancer. Cancer Res. 2001 Jan 1; 61(1):126-30.

Table I-3: Applications requesting data for research as of December 2002

Year[a]	Nature of Study	Status (Institution)
1989	International study of the effectiveness of screening for neuroblastoma at birth	Completed: Study period 1989-1998. Minnesota was one of the control areas. (U of MN)
1990	Population-based, case-control study of the epidemiology of childhood acute lymphoblastic leukemia	Completed: MCSS provided data on the completeness of ascertainment. (U of MN)
1991	International, population-based, case-control study of renal cell carcinoma	Completed: MCSS provided rapid ascertainment for identification of cases.(U of MN)
1991	National, multi-center, population-based, case-control study of colon cancer	Completed: MCSS provided rapid ascertainment for identification of cases. (U of MN)
1993	Record linkage with a 4,000-member cohort characterized for cardiovascular disease risk factors	Biennial linkage project. Fourth linkage scheduled for early 2003. (U of MN)
1994	Record linkage with a 14,000-member cohort who completed a nutrition survey (American Cancer Society CPS-II Nutrition study)	Completed: Pilot linkage to estimate sensitivity and specificity of cancer identification using central cancer registries. (American Cancer Society - National Home Office)
1994	Record linkage with the list of women screened through the Minnesota Breast and Cervical Cancer Control Program	Annual linkage project. Most recent linkage completed Spring 2002. (MN Dept. of Health)
1995	Record linkage with Indian Health Service patient registries to characterize cancer incidence	Completed: Report describing cancer incidence in American Indians in Minnesota was released Fall 1996. (MN Dept. of Health)
1995	Multi-center, population-based, case-control study of gliomas in rural areas	Completed: MCSS provided rapid ascertainment for identification of cases. (U of MN)
1996	Multi-center, population-based, case-control study of proximity to toxic waste sites and occurrence of Wilms tumor	Application denied because of major methodological flaws. (Agency for Toxic Substances and Disease Registry)
1996	Randomized trial to assess whether risk-appropriate counseling increases utilization of screening by individuals with a first-degree relative who had colorectal cancer	Application withdrawn before peer review because study was not funded. (MN Dept. of Health)
1997	Multi-center, population-based, case-control study of acoustic neuromas and use of cellular phones	Application inactive because of funding issues. (U of IL - Chicago)
1997	Randomized, controlled clinical trial to determine whether screening for fecal occult blood reduces colorectal cancer mortality	Completed: MCSS validated cancer incidence in the 46,000 study participants via record linkage. MCSS also linked the study cohort with 1995 MCSS data. (U of MN)

Table I-3: Applications requesting MCSS data for research as of December 2002 (continued)

Year[a]	Nature of Study	Status (Institution)
1997	Population-based study of the role of aromatic amines in pancreatic cancer etiology	Completed: MCSS provided rapid ascertainment for identification and recruitment of cases. MCSS also linked the study cases with incidence and mortality data to assist in estimating response rates. (U of MN)
1997	Population-based pilot study of the quality of life in cancer survivors	Completed: MCSS identified and recruited a random sample of cases. (American Cancer Society - National Home Office)
1997	Occupational cohort linkage study to describe cancer incidence in a group of workers	Completed: MCSS linked a list of workers with MCSS data and provided aggregated results to the investigator. (3M)
1997	Occupational cohort linkage study to describe cancer incidence in two groups of workers, and to compare the results of incidence follow-up with the results of mortality follow-up	Completed: MCSS linked lists of workers with MCSS and death certificate data. (MN Dept. of Health)
1997	Identification and recruitment of families at high risk of colorectal cancer into a Familial Colorectal Cancer Registry	Renewal application in process: MCSS is identifying individuals diagnosed with colorectal cancer between 1997 and 2002, who are then invited to provide information on familial cancer histories and possibly invited to participate in a national database which would be used to investigate the genetics of colorectal cancer. (Mayo Clinic and U of MN)
1998	Evaluation of Treatment Information in the Cancer Registry through Linkage	In Process: MCSS linked the list of cancer patients diagnosed in 1995 with lists of enrollees in several sets of claims and encounter data. The goal is to compare completeness of treatment information between the two sources. (MN Dept. of Health)
1998	Mesothelioma Incidence in the Mining Industry: A Case Study	Completed: A list of 70,000 individuals who worked in the mining industry was linked with all individuals in MCSS who developed mesotheliomas. The goal was to ascertain if mesotheliomas among miners could be explained by occupational exposure to commercial asbestos. (MN Dept. of Health)
1999	Minnesota/Wisconsin Men's Health Study	Completed: MCSS identified individuals with prostate cancer diagnosed in 1999 and 2000. The study is looking for associations between genetic markers, exposure variables (pesticides, occupational, farming), and risk of prostate cancer. (U of MN)

Table I-3: Applications requesting MCSS data for research as of December 2002 (continued)

Year[a]	Nature of Study	Status (Institution)
1999	Pilot Test for Linking Population-Based Cancer Registries with CCG/POG Pediatric Registries	Completed: The MCSS list of cancer patients age 0 - 19 was linked with the CCG/POG databases for Minnesota to describe the completeness of ascertainment for both databases. (MN Dept. of Health)
2001	American Cancer Society CPS-II Nutrition study	Completed: Linkage with more than 500 Minnesotans who completed nutritional surveys to verify and update their cancer status. (American Cancer Society - National Home Office)
2001	National Quality of Life Study	In Process: MCSS is identifying and inviting cancer survivors to participate in this study of behavioral, psychosocial, treatment, and support factors that influence quality of life and cancer survivorship in the U.S. (American Cancer Society - National Home Office)
2002	Incidence of Endometrial Adenocarcinoma Following Endometrial Ablation in a Low Risk Population	In Process: The MCSS will assist in determining how many women who underwent endometrial ablation subsequently developed endometrial cancer. (St. Luke's Roosevelt Hospital)
2002	Family Health Study/Validation of a Family History of Cancer Questionnaire for Risk Factor Surveillance	Letter of Intent received: MCSS is being asked to assist with assessing the validity of self-reported family history of cancer. (National Cancer Institute)

a. Year application submitted

Chapter II:

Overview

Chapter II: Overview

This chapter summarizes the status of cancer in Minnesota, using cases reported to the Minnesota Cancer Surveillance System (MCSS) and deaths reported to the Minnesota Center for Health Statistics. The first section discusses the relative importance of various types of cancer by gender and age. Following this is a section summarizing race and ethnic differences in cancer occurrence. Changes in cancer rates in Minnesota over the 12-year period 1988-1999 are summarized in the third section of this chapter, and the fourth section evaluates geographic variation in cancer rates in the state.

Cancer surveillance plays a critical role in protecting and improving public health. The data presented in this report enable the Minnesota Department of Health to inform the public and health care providers about cancer risks, to target goals for cancer control, and to evaluate success in meeting those goals.

Cancer Incidence and Mortality in Minnesota by Gender and Age

Table II-1 shows the total number of new cancer cases and deaths due to cancer in Minnesota over the most recent 5-year period for which case reporting is complete (1995-1999), and the corresponding average annual age-adjusted incidence and mortality rates per 100,000 persons. To obtain the average number of cases or deaths per year, divide the total number of cases or deaths over the 5-year period by five. Chapter III provides annual counts and rates by year for the most common cancers.

Over the 5-year period 1995-1999, an average of approximately 20,900 invasive cancers (including *in situ* bladder cancers) were diagnosed among Minnesotans each year. The actual number of Minnesotans diagnosed with cancer is about 4.5 percent lower, since some persons were diagnosed with more than one cancer. Over the same period, an average of 8,800 Minnesotans died each year with cancer listed as the underlying cause of death on the death certificate. Some of these persons were diagnosed prior to 1995 with the cancer that caused their death, so it is not possible to calculate survival rates from the data in Table II-1. Survival rates based on national data are given for the most common cancers in Chapter III.

Cancer remains the second leading cause of death, following heart disease, and is responsible for about one out of every four deaths in Minnesota and nationally. However, cancer is not a single disease, and does not have a single cause or a single cure. The more than 65 types of cancer listed in Table II-1 vary considerably in their risk factors, in frequency and prognosis, and in the age group and gender most likely to be affected.

In general, males are at greater risk of developing and dying of cancer than females. The overall age-adjusted cancer incidence rate is 33 percent higher among males than females, and the overall mortality rate is 47 percent higher. For many specific cancers, men are at 2-4 times greater risk than women. Excluding the sex-specific cancers, women are at greater risk than men for only a few common cancers: breast, thyroid, and gallbladder. For some types of cancer, the higher risk among men can be directly attributable to historically higher smoking rates among men or to occupational exposures (for example, mesothelioma due to asbestos exposure). However, for many sites the reason for higher rates among men is not known.

Despite these differences in risk, which cancers are most common is similar among men and women. Figures II-1 and II-2 show the ten most common cancers among men and women in Minnesota, which together account for nearly 80 percent of cancer diagnoses and deaths. For men, the most commonly diagnosed cancer is prostate cancer, and among women, the most common is breast cancer. Breast and prostate cancers account for nearly one out of three cancers diagnosed among women and men, respectively. The next most commonly diagnosed cancers, lung and bronchus cancer and cancers of the colon and rectum, occur with similar frequency within each gender, and together account for about one out of four cancers among both men

and women. Although breast and prostate cancer are more common, lung and bronchus cancer kills more Minnesotans because survival is much poorer.

The fourth most commonly diagnosed cancer in Minnesota is bladder cancer among men and uterine cancer among women; they account for about 6 percent of cancers among men and women, respectively. Non-Hodgkin's lymphoma is the fifth most common cancer diagnosed among both men and women, accounting for roughly 5 percent of cases. Melanoma of the skin and leukemia are also among the ten most commonly diagnosed cancers in each gender; these cancers each account for about 3 percent of cases. Cancers of the brain and pancreas are relatively uncommon, but are among the ten leading causes of cancer death because survival is poor.

Tables II-2 and II-3 show the age distribution of persons in Minnesota who were diagnosed with or died of cancer during the most recent 5-year period for which case reporting is complete (1995-1999). In general, cancer is a disease of the elderly. Overall, 59 percent, or nearly three out of every five cancers, are diagnosed among persons age 65 years and older, and 73 percent, or nearly three out of four cancer deaths, occur in this age group.

Age-specific cancer rates are given for the most common cancers in Chapter III. The overall cancer incidence rate increases by more than 100 fold with age, from 20 new cases per year for each 100,000 children less than five years old to more than 2,000 new cases per 100,000 adults age 70 and older. Similarly, the overall cancer mortality rate increases 500 fold from less than three deaths per year for each 100,000 children less than five years old to more than 1,500 deaths per 100,000 adults age 80 and older.

However, as can be seen from Tables II-2 and II-3, the relationship between cancer risk and age varies with the type of cancer. Figure II-3 shows the age distribution of a few common cancers that have markedly different age distributions. For example, while only a few percent of prostate cancers are diagnosed among men under the age of 50, 20 percent of breast cancers, 40 percent of melanomas and brain cancers, 60 percent of cervical cancers, 70 percent of Hodgkin's lymphomas, and more than 80 percent of acute lymphocytic leukemias are diagnosed among persons less than 50 years old.

Disparities in Cancer among Race and Ethnic Groups in Minnesota

As discussed in the previous chapter, assessing race and ethnic differences in cancer risk in Minnesota is limited by the relatively small size of populations of color in Minnesota, incomplete or inaccurate reporting of race and ethnicity on the medical record and death certificate, and lack of accurate and up-to-date population estimates.

Nonetheless, it is clear from national data that race and ethnic disparities in the burden of cancer do exist, and data from the MCSS are consistent with that picture. Race- and ethnic-specific cancer data are presented for the most common cancers in the site-specific sections found in Chapter III. Tables in Chapter III show the total number of cases and deaths over the 5-year period 1995-1999 by race and gender for each site, but rates are only presented when based on ten or more cases or deaths. This section summarizes some of the most important disparities.

Figures II-4 and II-5 show cancer incidence and mortality rates for all cancer sites combined by gender and race/ethnicity in Minnesota. It is clear that overall cancer risk varies by race and ethnicity, as well as by gender. Black men have the highest cancer rates. Their incidence rates are about 30 percent higher than among white males, and their mortality is 60 percent higher. Men and women of Asian/Pacific Islander origin in Minnesota have the lowest risk of developing and dying of cancer, about 40 percent and 20 percent lower, respectively, than white men and women. The risk of developing cancer is about the same for black and white women, but black women are about 30 percent more likely to die of cancer. Similarly, American Indian men and women have somewhat lower incidence rates than white men and women, but their mortality rates are 30 percent higher. Although the MCSS is not currently able to present cancer incidence rates for Hispanics, Hispanic overall mortality rates appear to be similar to whites.

The types of cancers that are common also vary somewhat by race. Table II-4 shows the five most commonly diagnosed cancers by gender and race in Minnesota. Among both American Indian men and women, lung cancer is the most commonly diagnosed cancer, representing about 20 percent of their cases. Among the other race groups, prostate cancer is the most common cancer among males, and breast cancer is the most common cancer among women. Cervical cancer is not common among white women, but is the fourth most common cancer for women in the other three race groups, accounting for 6 to 7 percent of cases.

The differences in risk shown in Figures II-4 and II-5 for all cancers combined do not apply to each cancer type. For example, although Asian/Pacific Islanders generally have lower cancer rates than whites, their rates of liver, stomach, and cervical cancer are considerably higher. Similarly, although black males have much higher rates than white males for most cancers, their incidence of leukemia, non-Hodgkin's lymphoma, and cancers of the kidney and bladder are about the same or somewhat lower.

Eliminating race/ethnic and socioeconomic disparities in health, including disparities in cancer occurrence, has been identified as a national priority and as a major public health initiative in Minnesota. Much remains to be learned about the causes of racial differences in cancer risk. Given that a substantial proportion of cancers, and a third of cancer deaths, are caused by tobacco use, it is likely that some racial differences in cancer incidence are related to historic racial differences in the proportion of persons who smoke and in other factors related to tobacco use, such as age at initiation, number and type of cigarettes smoked, and inhalation patterns. Similarly, differences in other behaviors known to be associated with cancer risk, such as exercise, diet, and reproductive factors, may partially explain race/ethnic differences in cancer occurrence. Differences in the prevalence of infections with agents known to be associated with cancer, such as hepatitis B virus (liver cancer), human papilloma virus (cervical cancer), and *Campylobacter pylori* (stomach cancer) may also play a role in race differences in cancer incidence. Although genetic factors may play a role in some specific cancers, it is more likely that racial differences are based in cultural and socioeconomic differences, rather than in genetics.

It is also clear that social factors play a role. Education and access to health care affect whether individuals seek and receive prompt attention for symptoms of cancer and whether they are routinely screened for cancers for which early detection has been shown to improve survival or to prevent the development of cancer (for example, cervical cancer and colorectal cancer). These factors can also affect overall health status, treatment options, and quality of care, all of which affect cancer survival and quality of life for cancer survivors. Until all Minnesotans have equal access to quality health care, it is likely that health disparities will persist.

Cancer Trends in Minnesota

The MCSS is now able to review the 12-year period 1988-1999 to assess whether cancer rates are changing over time in Minnesota. The discussions of specific cancers in Chapter III include a brief summary of trends for each site. This section provides an overview of changes in cancer rates in Minnesota, and a more detailed examination of trends in the four most common cancers: lung and bronchus, colon and rectum, female breast, and prostate.

Trends in incidence and mortality are assessed by analyzing annual age-adjusted rates. To quantify changes, the statistic referred to as the "annual percent change" (APC) is calculated. The APC is a straight-line regression on the log of the age-adjusted rate, and best approximates all the data points for a given time frame, assuming that the proportional change has been constant over time. For example, an APC of +1.8% means that the cancer rate increased, on average, by 1.8 percent per year. Similarly, an APC of -2.3% indicates that the cancer rate decreased, on average, by 2.3 percent per year. Tests of statistical significance assess whether the change was likely to have occurred by chance. Appendix E contains the methodological details of these calculations.

Trends in overall cancer incidence and mortality in Minnesota are shown for both sexes combined in Figures II-6 and II-7. The bars show the number of new cancers diagnosed or the number of deaths due to cancer each year over the 12-year period, while the lines show the corresponding rates, adjusted to control for the growth and aging of the population.

The overall cancer incidence rate in Minnesota increased by a modest, but not statistically significant amount, from 441.5 new cases per 100,000 persons in 1988-1989 to 471.9 in 1998-1999. At the same time, the cancer mortality rate decreased steadily and significantly by 0.4 percent per year, from 197.4 deaths per 100,000 persons in 1988-1989 to 188.9 in 1998-1999. Despite a relatively stable incidence rate and a declining mortality rate, the number of persons diagnosed with cancer increased by 22 percent, from about 18,000 new cases in 1988 to 22,000 in 1999, and the number of persons dying of cancer increased by 10 percent, from 8,100 in 1988 to 8,875 in 1999. This apparent contradiction results from the fact that the Minnesota population is both growing and aging. Each year, there are more persons at risk for developing cancer, especially the elderly, among whom cancer rates are the highest. Although important gains are being made in the prevention, detection, and treatment of cancer, the burden of cancer will continue to increase into the foreseeable future, both in Minnesota and nationally.

Figures II-8 and II-9 depict the 12-year trends in incidence and mortality rates, respectively, for men and women in Minnesota. Cancer incidence rates in men increased from 1990 to 1992 due to the large number of prostate cancers detected during that time, and then decreased. Mortality rates in men decreased significantly by 0.8 percent annually. In women, the cancer incidence rate increased significantly by an average of 0.7 percent per year, due to substantial increases in lung cancer incidence and modest increases in breast cancer incidence. The cancer mortality rate in women decreased an average of 0.2 percent annually, which was not statistically significant. Increases in lung cancer mortality among women largely offset decreases in other sites, including breast cancer.

As an overview of changes in specific cancer sites, the APCs in incidence and mortality for the cancer sites discussed in Chapter III are shown in Figures II-10 and II-11 for men and Figures II-12 and II-13 for women. Bars on the right of the center line indicate that the rate is increasing, and bars on the left indicate that the rate is decreasing. Sites are listed in descending order of the sex-specific APC for incidence.

Among men, incidence rates increased significantly for six cancers over the 12-year period: mesothelioma (4.7% average increase in the age-adjusted rate per year), melanoma of the skin (+3.9%), cancers of the esophagus (+3.0%), thyroid (+2.1%), and testis (+1.9%), and non-Hodgkin's lymphoma (+1.4%). These increases were offset by significantly decreasing incidence rates for six other cancers: Kaposi's sarcoma (8.2% average decrease in the age-adjusted rate per year), and cancers of the oral cavity (-2.2%), stomach (-2.0%), colon and rectum (-1.8%), larynx (-1.7%), and lung and bronchus (-0.5%). Most sites that showed a significant change in incidence among men also showed a matching change in mortality, although the trend was not always statistically significant. The exceptions to this generalization are testicular cancer, which showed a modest, but not statistically significant decrease in mortality while incidence was significantly increasing, and laryngeal cancer, which showed a slight, but not statistically significant increase in mortality while incidence was significantly decreasing.

Among women, incidence rates increased significantly for seven cancers over the 12-year period: thyroid cancer (4.2% average increase in the age-adjusted rate per year), melanoma of the skin (+3.1%), cancers of the lung and bronchus (+2.4%) and kidney and renal pelvis (+2.3%), non-Hodgkin's lymphoma (+1.5%), and cancers of the breast (+0.7%) and uterus (+0.5%). These increases were only partially offset by significant decreases in the incidence of three cancers: cancers of the cervix (3.5% decrease in the age-adjusted rate per year), stomach (-2.1%), and colon and rectum (-0.8%). Most sites that showed a significant change in incidence among women also showed a matching increase or decrease in mortality, although the trend was not always statistically significant. The major

exceptions are melanoma of the skin, which showed a slight but not statistically significant decrease in mortality while incidence was significantly increasing, and breast cancer, which showed a large and statistically significant decrease in mortality (-2.4%) while incidence was significantly increasing.

Figure II-14 shows trends in lung cancer mortality. The age-adjusted lung cancer mortality rate has steadily and significantly increased in women since 1988 by 2.4 percent per year, while among men, the lung cancer mortality rate dropped steadily and significantly by 0.5 percent per year. Trends for lung cancer incidence are almost identical to those for mortality. Although these trends are not as steep as for some other cancers, the fact that lung cancer is the leading cause of cancer-related deaths among both men and women, accounting for nearly 25 percent of cancer deaths, means that these trends have a major impact on the overall cancer mortality rate. The trends in lung cancer among men and women in Minnesota are similar to what is seen nationally. It is likely that the differences between men and women are due to the fact that smoking rates began decreasing among women at a later date than among men. Because of the 20-year delay between exposure to tobacco smoke and development of lung cancer, lung cancer rates among males did not begin decreasing nationally until the mid- to late-1980s, even though smoking rates among men started decreasing in the 1960s.

Figure II-15 shows trends in colon and rectum cancer incidence among men and women. Colorectal cancer incidence rates decreased significantly for both men and women (-1.8% and -0.8% per year, respectively) from 1988 to 1999. Mortality rates for colorectal cancer also showed a statistically significant decrease since 1988 in both men (-2.7%) and women (-1.7%). Similar decreases are seen nationally. It has been suggested that incidence rates may be decreasing because more precancerous polyps are being removed following colorectal cancer screening, and that mortality may be decreasing because cancers are being diagnosed at an earlier stage. However, most surveys indicate that adherence to colorectal cancer screening recommendations is much lower than for other screening-sensitive cancers, and there is little evidence that colorectal cancer screening has increased dramatically over this time period. The reasons for decreasing colon and rectum cancer rates therefore remain unclear.

Figure II-16 shows trends in female breast cancer in Minnesota. Invasive breast cancer incidence rates in women have increased gradually, but significantly, by 0.7 percent per year over the 12-year period, with most of the increase occurring since 1994. It is likely that this reflects the fact that women born after World War II are at greater risk of developing breast cancer than their mothers due to earlier menarche, delayed child-bearing, and having fewer children. It has also recently been demonstrated that use of hormone replacement therapy (HRT) modestly increases risk for breast cancer, and use of HRT has increased dramatically over the last decade. At the same time as breast cancer incidence has been increasing in Minnesota, breast cancer mortality has decreased significantly by 2.4 percent per year. Breast cancer mortality rates are now lower nationally than they have been in several decades. It is likely that the decrease in mortality reflects both the success of breast cancer screening with mammography and improvements in breast cancer treatment.

Figure II-17 shows trends in prostate cancer in Minnesota. Prostate cancer incidence rates steadily increased in the late 1980s, followed by a sharp increase from 1990 to 1992 due to the widespread use of the prostate specific antigen (PSA) test to screen for prostate cancer. This test led to the diagnosis of a large number of cancers that would not have been identified until later without screening, and may also have identified cancers that would never have become symptomatic. From 1992 to 1994 the incidence rate dropped back to approximately the 1990 rate, and has stabilized or increased slightly since then. Mortality rates for prostate cancer have gradually decreased since 1988, particularly from 1996 to 1999. Whether the decrease in mortality can be attributed to early diagnosis with the PSA test is not clear. Improvements in treatment or other factors may be involved. Clinical trials to test the efficacy of PSA testing are underway, and should help resolve this question.

In summary, progress has been made among men in reducing the incidence and mortality of cancers caused by tobacco use, but these gains have not yet been seen for women. The legacy of the popularity of smoking that began in the early- and mid-1900s is still having a large negative impact on the health of Minnesotans. Mortality rates of prostate cancer and female breast cancer are declining markedly. Both the incidence and mortality of colon and rectum cancer are decreasing. Changes in other cancer sites are addressed in Chapter III.

Geographic Variation in the Occurrence of Cancer in Minnesota

To evaluate geographic variation in the occurrence of cancer in Minnesota, the state was divided into eight regions. The counties included in each region are shown in Appendix C. Regions of the state are used rather than individual counties because most counties have populations which are too small to produce rates stable enough to make meaningful comparisons. Outside of the Metro area, the average county population is less than 30,000 persons. Because all but the five most common cancers occur infrequently, only a few cases will be reported each year for most types of cancer in Minnesota counties. This means that the random fluctuation of a few cases can cause rates to vary considerably. In addition, regions better reflect economic, topographical, and occasionally, cultural differences in the state than do counties.

The regions defined in Appendix C are abbreviated in the text below and graphs as follows:

Metro	Metropolitan Minnesota
SE	Southeastern Minnesota
SC	South Central Minnesota
SW	Southwestern Minnesota
Central	Central Minnesota
WC	West Central Minnesota
NW	Northwestern Minnesota
NE	Northeastern Minnesota

Geographic variation was assessed for the most common cancers, limited to the sites discussed in Chapter III, aggregating data over the 5-year period 1995-1999. Comparisons were made using rates for whites, who constitute about 90 percent of the Minnesota population and about 96 percent of the cancer cases. Cancer rates for specific sites vary considerably between whites, blacks, Asian/Pacific Islanders, and American Indians, as discussed above. Comparing regional variation among whites removes race as a factor in observed differences.

In describing regional differences, it is important to recognize that the variation of cancer rates within Minnesota is much less than the variation between states or countries. Nationally, the overall cancer incidence rate among states in 1999 varied by 39 percent among females and by 45 percent among males; internationally, rates differ by as much as a factor of eight. In contrast, the Minnesota region with the highest overall cancer incidence rate is only 12 percent higher than the region with the lowest (Figure II-18). This is noteworthy, as there appears to be a common misperception that cancer rates are much higher in one part of the state than another.

The reader should also keep in mind that the MCSS only records microscopically confirmed cancers. Therefore, regional variation in medical practices, such as the likelihood of obtaining tissue from suspected cancer cases, will produce differences in cancer rates from region to region. For example, the Mayo Clinic, located in Olmsted County in southeastern Minnesota, is well known to have a higher than average rate of microscopic confirmation for suspected cancer patients. This contributes to Olmsted County having one of the highest cancer rates in Minnesota.

This section focuses on geographic differences in cancer rates that are statistically significant and likely to be meaningful, as well as reviewing geographic differences in the major cancer sites.

A notable and consistent difference in regional cancer rates is seen with lung cancer. Lung cancer incidence rates in Minnesota vary by 40 percent when comparing the highest to the lowest regional rate (Figure II-19). For both sexes combined, lung cancer rates in SC and SW Minnesota are 16-19 percent below the statewide rate. This is primarily due to lower female rates (25%-38% lower), although male rates (7%-11% lower) also contribute to the reduction (Figure II-20). In

contrast, higher female lung cancer rates in NE Minnesota (19% higher than the statewide rate) and higher male lung cancer rates (8% higher) give that region the highest lung cancer rate of the eight regions, 13 percent higher than the statewide rate. Although lung cancer rates among females in the Metro region are 8 percent higher than females statewide, Metro region male lung cancer rates are the same as the state average. For both sexes combined, the lung cancer rates for the Metro area are not statistically significantly different from the Minnesota average. The regional differences in incidence are very likely to be real (not an artifact of reporting or biopsy rates), since Minnesota lung cancer mortality rates fairly closely parallel those of the incidence rates. These differences in lung cancer are consistent with differences in the measured smoking behaviors among the regions' populations as noted in previous biennial reports.

Female breast cancer incidence rates are notable for their small geographic differences, varying by only 15 percent comparing the highest to the lowest regional rate. Rates range from 5 percent above the state average in the Metro area to 8 percent below the state average in Central and SW Minnesota (Figure II-21). These differences are statistically significant. However, breast cancer mortality rates in Central and SW Minnesota are not significantly lower than the state average. Mortality in the Metro region is 4 percent above the state average. Mammography screening rates can affect incidence rates in that areas with higher rates of screening will identify some additional cases that would not have been identified had the cancer been allowed to take its natural course. It is not known whether this has played any role in the differences of breast cancer rates among the regions of Minnesota. Socioeconomic status is correlated with breast cancer risk. This could also explain some portion of the slightly higher rates in the Metro area.

Colorectal cancer incidence rates vary by 30 percent among Minnesota regions, and show a statistically significant difference between the Metro and non-Metro areas of Minnesota (Figure II-22). The Metro rate is 9 percent lower than the state average. Incidence in the WC region (19% higher), the NW region (18% higher), and the SE region (11% higher) are all statistically significantly higher than the state average. Rates are also higher in the NE region (7% higher) and the SW region (6% higher), although these differences are not statistically significant. Colon and rectum cancer mortality and incidence have been declining since the 1980s both nationally and in Minnesota. Some of the decline is probably due to screening, which can identify and remove polyps before they become cancerous. If colorectal cancer screening is more common in residents of the Metro region than in the rest of the state, this would help to explain the rate differentials between the Metro and non-Metro regions. In addition, there may be risk factor differences such as diet that account for some of the differences.

Prostate cancer incidence rates vary by 21 percent among Minnesota regions. The Metro area was significantly lower than the state average (4% lower), and the WC region (15% higher) and the SE region (7% higher) were significantly higher. This contrasts with data from 1988-1994, when prostate cancer incidence rates were 6 percent higher than the state average in the Metro area and 2 percent lower in the WC region. The SE region during this earlier period was 7 percent higher than the state average. Rates in the earlier time period were for all races combined (race-specific rates are not available prior to 1995), so while these data are not directly comparable, using all races for both time periods produces similar results of higher rates in the Metro region in the early 1990s followed by higher rates in the non-Metro regions in the late 1990s. This is very likely due to varying medical practices among the regions in the use of the PSA test as a screening method for prostate cancer. It has been well documented that use (or lack of use) of the PSA test as a screening device is a significant factor in determining prostate cancer rates. It could be that PSA testing was more common in the Metro region in the early 1990s, but that by the late 1990s the reverse was true. This is partially born out by the different trends in prostate cancer incidence in the Metro area and non-Metro areas of the state (Figure II-23). One exception is the SE region where the Mayo Clinic serves one of the major counties and its surrounding area. Olmsted County has consistently had one of the highest prostate cancer rates in Minnesota. This is highly likely due to the Mayo Clinic using PSA tests as a screening device

early on and continuing with that practice. Prostate cancer mortality for Olmsted County is about the same as the state average.

Another notable and consistent regional pattern in cancer occurrence has been a higher incidence of mesothelioma, or cancer of the pleura, pericardium, and peritoneum, in the NE region. The only cause of mesothelioma is believed to be exposure to asbestos. Latency periods for this type of cancer are typically 30-50 years. Between 1995 and 1999, 41 men and 8 women in the NE region were diagnosed with mesothelioma, giving this region double the Minnesota rate (Figures II-24 and II-25). Mesothelioma rates among women do not vary statistically among Minnesota regions. Higher mesothelioma rates had pereviously been reported from 1988-1994 for males (75 percent higher than the statewide rate, based on 39 observed cases) but not for females (75 percent lower than the statewide rate, based on two observed cases), suggesting an exposure unique to males, most likely occupational exposures.

In our biennial report of 1995, which analyzed data from 1988-1992, we noted that leukemia incidence rates in females (all races) in the WC and Central regions were 39 percent and 37 percent, respectively, higher than the Metro region rates. However, those differences have not been noted for 1995-1999. The WC region (female, all races) rate for 1995-1999 is 1 percent higher than the Metro rate, and the Central region (female, all races) rate is 16 percent lower than the Metro region. For the period 1988-1992, the MCSS reported that leukemia rates in the non-Metro area of the state were 8 percent higher for males and 29 percent higher among females compared to the Metro area. In 1995-1999, there is very little difference in leukemia rates in the Metro and non-Metro areas of the state; rates for males are 1 percent higher and for females are 4 percent lower in the non-Metro area.

In addition to the differences already discussed, cancer incidence rates were significantly higher than the statewide rate for esophageal cancer in NE Minnesota, a region that has had higher esophageal cancer mortality over the past 50 years, melanoma of the skin in the SE region, multiple myeloma in the WC region, thyroid cancer in the SW region, ovarian cancer in the NW region, and Kaposi's sarcoma in the Metro region. During 1995-1999, none of the regions had incidence rates among whites, both sexes combined, that were significantly higher than the statewide rate for cancers of the brain, kidney, liver, oral cavity, pancreas, soft tissues, stomach, or urinary bladder, or for Hodgkin's or non-Hodgkin's lymphoma. Regional rates did not significantly differ from the statewide rate for testicular cancer among males, or among cervical or uterine cancer among females.

While these differences may or may not reflect real differences in etiologic factors by region, they certainly demonstrate a number of cautions one must take when examining regional variation.

1) Comparison of numerous types of cancers by region and by sex will, by chance alone, find a number of rates that are significantly different from the state average. In general, differences are more likely to be real when they are consisent over time, are evident in each sex and across similar regions, and when the increase is found for mortality as well as incidence.

2) Differences may result from regional coding practices. Although the MCSS, along with local registrars and national organizations, works hard to standardize coding practices, this is an ongoing and challenging effort given the many changes in coding practices over the years.

3) Small numbers produce greater variability and less reliability. This may explain the changes in regional variations in leukemia rates noted above. However, even with small numbers regional differences can be informative for certain cancers with clearly delineated causes, for example mesotheliomas and Kaposi's sarcoma.

4) Some differences may be the result of differing regional medical practices and screening rates (note above example with prostate cancer).

In summary, the overall risk of developing cancer does not vary to a large degree among Minnesota regions. The two cancers that show the most geographic variation in Minnesota, lung cancer and mesothelioma, have well-known causes (smoking

and asbestos, respectively). It is likely that the observed geographic variation in these cancers can be explained by past geographic differences in smoking rates and exposure to asbestos. Cancers of the colon and rectum, breast, and prostate also vary significantly across regions of the state, but to a lesser extent. Because the diagnosis of these cancers is affected by the extent to which the population is screened, it is likely that at least some of the variation is due to geographic variation in screening. Unfortunately, information on past and current screening utilization in Minnesota regions is not available to test this hypothesis. Geographic differences in leukemia incidence observed in 1988-1992 were not observed in this more recent time period, and the earlier differences may have resulted from random variation in cancer rates.

These findings should reassure Minnesotans that their risk of developing cancer is not dictated by where they choose to live. The MCSS will continue to monitor regional variation in cancer rates as part of ongoing surveillance of cancer in Minnesota.

Table II-1: Number of new cases and deaths and average annual incidence and mortality rates§ by anatomic site, Minnesota, 1995-1999

Cancer Site	Incidence†						Mortality					
	New Cases 1995-1999			Average Annual Rate			Deaths 1995-1999			Average Annual Rate		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
All Sites	53,823	50,650	104,473	543.5	409.6	463.3	22,611	21,308	43,919	238.6	161.9	191.8
Oral Cavity and Pharynx	1,709	800	2,509	16.9	6.5	11.2	350	202	552	3.5	1.6	2.4
Lip	385	80	465	4.0	0.6	2.0	4	0	4	0.0	0.0	0.0
Tongue	335	198	533	3.2	1.6	2.4	82	47	129	0.8	0.4	0.6
Salivary Gland	131	126	257	1.3	1.0	1.1	33	22	55	0.4	0.2	0.2
Floor of Mouth	121	74	195	1.2	0.6	0.9	7	4	11	0.1	0.0	0.1
Gum and Other Mouth	258	158	416	2.5	1.2	1.9	54	46	100	0.6	0.3	0.4
Nasopharynx	69	35	104	0.7	0.3	0.5	25	20	45	0.2	0.2	0.2
Tonsil	206	59	265	2.0	0.5	1.2	35	10	45	0.4	0.1	0.2
Oropharynx	48	14	62	0.5	0.1	0.3	30	17	47	0.3	0.1	0.2
Hypopharynx	129	45	174	1.3	0.4	0.8	23	7	30	0.2	0.1	0.1
Other Oral Cavity and Pharynx	27	11	38	0.3	0.1	0.2	57	29	86	0.6	0.2	0.4
Digestive System	9,910	8,942	18,852	101.8	68.5	83.1	5,435	4,922	10,357	57.1	35.8	45.0
Esophagus	761	240	1,001	7.7	1.8	4.5	738	213	951	7.6	1.6	4.2
Stomach	949	520	1,469	9.9	3.9	6.4	549	372	921	5.8	2.7	4.0
Small Intestine	267	224	491	2.7	1.8	2.2	47	60	107	0.5	0.5	0.5
Colon and Rectum	6,085	6,152	12,237	62.9	46.8	53.8	2,278	2,411	4,689	24.3	17.3	20.2
Colon excluding Rectum	4,272	4,844	9,116	44.5	36.6	40.0	1,908	2,136	4,044	20.4	15.3	17.4
Rectum and Rectosigmoid Junction	1,813	1,308	3,121	18.4	10.2	13.8	370	275	645	3.9	2.0	2.8
Anus, Anal Canal and Anorectum	89	146	235	0.9	1.2	1.0	11	20	31	0.1	0.2	0.1
Liver and Intrahepatic Bile Duct	430	216	646	4.3	1.7	2.9	484	286	770	4.9	2.2	3.4
Liver	376	165	541	3.7	1.3	2.4	392	195	587	4.0	1.5	2.6
Intrahepatic Bile Duct	54	51	105	0.6	0.4	0.5	92	91	183	0.9	0.7	0.8
Gallbladder	74	197	271	0.8	1.5	1.2	47	166	213	0.5	1.2	0.9
Other Biliary	148	105	253	1.5	0.8	1.1	78	80	158	0.9	0.6	0.7
Pancreas	996	888	1,884	10.1	7.0	8.4	1,168	1,246	2,414	12.1	9.1	10.5
Retroperitoneum	36	29	65	0.3	0.2	0.3	3	7	10	0.0	0.0	0.0
Peritoneum, Omentum, Mesentery	34	189	223	0.3	1.6	1.0	5	38	43	0.1	0.3	0.2
Other Digestive Organs	41	36	77	0.4	0.3	0.3	27	23	50	0.3	0.1	0.2

(Continues on next page)

Source: All cases were either microscopically confirmed (1988-1999) or Death Certificate Only (1995-1999) and were reported to the MCSS as of October 2002. Deaths are from the Minnesota Center for Health Statistics, and include all deaths with the specified cancer as the underlying cause of death during the time period, regardless of year of diagnosis. All rates were calculated by MCSS.

§Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.
†Excludes *in situ* cancers except *in situ* bladder cancer.

Table II-1: Number of new cases and deaths and average annual incidence and mortality rates§ by anatomic site, Minnesota, 1995-1999 (continued)

Cancer Site	Incidence†						Mortality					
	New Cases 1995-1999			Average Annual Rate			Deaths 1995-1999			Average Annual Rate		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Respiratory System	8,336	5,595	13,931	84.4	46.0	62.5	6,560	4,493	11,053	67.8	35.7	49.2
Nose, Nasal Cavity and Middle Ear	96	70	166	0.9	0.6	0.7	31	14	45	0.3	0.1	0.2
Larynx	688	155	843	6.9	1.3	3.8	192	38	230	2.0	0.3	1.0
Lung and Bronchus	7,293	5,314	12,607	74.0	43.7	56.6	6,260	4,417	10,677	64.7	35.1	47.5
Pleura	228	43	271	2.3	0.3	1.2	24	10	34	0.2	0.1	0.2
Trachea, Mediastinum and Other	31	13	44	0.3	0.1	0.2	53	14	67	0.5	0.1	0.3
Mesothelioma (all sites)	248	52	300	2.5	0.4	1.3	~	~	~	~	~	~
Bones and Joints	141	102	243	1.3	0.8	1.0	49	34	83	0.5	0.3	0.4
Soft Tissue including Heart	345	309	654	3.3	2.5	2.8	164	161	325	1.7	1.3	1.4
Skin	2,230	1,859	4,089	21.5	15.3	17.9	462	281	743	4.7	2.1	3.2
Melanoma of the Skin	1,934	1,661	3,595	18.6	13.7	15.7	360	225	585	3.6	1.7	2.6
Other Non-Epithelial Skin	296	198	494	2.9	1.5	2.1	102	56	158	1.1	0.4	0.7
Kaposis Sarcoma (all sites)	88	7	95	0.8	0.1	0.4	~	~	~	~	~	~
Breast	103	16,576	16,679	1.1	136.9	74.2	31	3,566	3,597	0.3	27.8	15.7
Female Genital System	~	6,808	~	~	56.5	~	~	2,086	~	~	16.2	~
Cervix	~	899	~	~	7.5	~	~	243	~	~	2.0	~
Corpus and Uterus, NOS	~	3,242	~	~	27.0	~	~	543	~	~	4.1	~
Ovary	~	2,161	~	~	18.0	~	~	1,164	~	~	9.1	~
Vagina	~	79	~	~	0.6	~	~	35	~	~	0.2	~
Vulva	~	344	~	~	2.6	~	~	67	~	~	0.5	~
Other Female Genital Organs	~	83	~	~	0.7	~	~	34	~	~	0.3	~
Male Genital System	17,926	~	~	181.8	~	~	3,145	~	~	35.8	~	~
Prostate	17,023	~	~	174.0	~	~	3,093	~	~	35.3	~	~
Testis	767	~	~	6.4	~	~	30	~	~	0.3	~	~
Penis	100	~	~	1.0	~	~	18	~	~	0.2	~	~
Other Male Genital Organs	36	~	~	0.4	~	~	4	~	~	0.0	~	~

(Continues on next page)

Source: All cases were either microscopically confirmed (1988-1999) or Death Certificate Only (1995-1999) and were reported to the MCSS as of October 2002. Deaths are from the Minnesota Center for Health Statistics, and include all deaths with the specified cancer as the underlying cause of death during the time period, regardless of year of diagnosis. All rates were calculated by MCSS.

§Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.
†Excludes *in situ* cancers except *in situ* bladder cancer.
~Rates are sex-specific or are not available for this site.

Table II-1: Number of new cases and deaths and average annual incidence and mortality rates§ by anatomic site, Minnesota, 1995-1999 (continued)

Cancer Site	Incidence†						Mortality					
	New Cases 1995-1999			Average Annual Rate			Deaths 1995-1999			Average Annual Rate		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Urinary System	5,288	2,326	7,614	54.3	18.3	33.8	1,299	775	2,074	14.0	5.5	9.0
Urinary Bladder	3,571	1,262	4,833	37.2	9.7	21.3	670	340	1,010	7.5	2.3	4.3
Kidney and Renal Pelvis	1,601	999	2,600	15.8	8.2	11.6	610	410	1,020	6.3	3.1	4.5
Ureter	76	49	125	0.8	0.4	0.5	11	16	27	0.1	0.1	0.1
Other Urinary Organs	40	16	56	0.4	0.1	0.2	8	9	17	0.1	0.1	0.1
Eye and Orbit	88	72	160	0.9	0.6	0.7	13	11	24	0.1	0.1	0.1
Brain and Other Nervous System	881	654	1,535	8.1	5.5	6.7	620	496	1,116	6.0	4.1	4.9
Brain	837	620	1,457	7.7	5.2	6.4	607	488	1,095	5.9	4.0	4.8
Other Nervous System	44	34	78	0.4	0.3	0.3	13	8	21	0.1	0.1	0.1
Endocrine System	465	1,123	1,588	4.2	9.4	6.8	76	99	175	0.8	0.7	0.8
Thyroid	384	1,072	1,456	3.5	9.0	6.3	37	77	114	0.4	0.6	0.5
Other Endocrine including Thymus	81	51	132	0.7	0.4	0.6	39	22	61	0.4	0.2	0.3
Lymphomas	2,909	2,525	5,434	28.5	20.1	23.8	1,218	1,172	2,390	12.7	8.7	10.4
Hodgkins Lymphoma	391	326	717	3.4	2.7	3.1	63	60	123	0.6	0.5	0.5
Non-Hodgkins Lymphoma	2,518	2,199	4,717	25.1	17.3	20.8	1,155	1,112	2,267	12.1	8.2	9.9
Multiple Myeloma	611	522	1,133	6.3	4.1	5.0	441	448	889	4.7	3.4	3.9
Leukemia	1,808	1,338	3,146	18.1	10.4	13.7	1,133	882	2,015	11.9	6.4	8.7
Lymphocytic Leukemia	916	615	1,531	9.1	4.8	6.7	396	280	676	4.2	2.0	2.9
Acute Lymphocytic Leukemia	184	113	297	1.6	1.0	1.3	70	59	129	0.6	0.5	0.6
Chronic Lymphocytic Leukemia	710	484	1,194	7.3	3.7	5.3	309	208	517	3.4	1.4	2.2
Myeloid Leukemia	701	566	1,267	7.1	4.4	5.5	489	414	903	5.0	3.1	3.9
Acute Myeloid Leukemia	405	365	770	4.1	2.8	3.4	356	300	656	3.7	2.3	2.9
Chronic Myeloid Leukemia	258	184	442	2.6	1.5	1.9	108	94	202	1.1	0.7	0.9
Monocytic Leukemia	45	35	80	0.5	0.3	0.3	12	11	23	0.1	0.1	0.1
Acute Monocytic Leukemia	44	33	77	0.4	0.3	0.3	8	10	18	0.1	0.1	0.1
Chronic Monocytic Leukemia	1	2	3	0.0	0.0	0.0	1	0	1	0.0	0.0	0.0
Other Leukemia	146	122	268	1.5	0.9	1.2	236	177	413	2.5	1.2	1.8
Ill-defined and unknown	1,073	1,099	2,172	11.1	8.4	9.5	1,615	1,680	3,295	17.0	12.3	14.3

Source: All cases were either microscopically confirmed (1988-1999) or Death Certificate Only (1995-1999) and were reported to the MCSS as of October 2002. Deaths are from the Minnesota Center for Health Statistics, and include all deaths with the specified cancer as the underlying cause of death during the time period, regardless of year of diagnosis. All rates were calculated by MCSS.

§Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.
†Excludes *in situ* cancers except *in situ* bladder cancer.

Table II-2: Age distribution (percent) of newly diagnosed cancers† by anatomic site, both sexes combined, Minnesota, 1995-1999

Cancer Site	Age at Diagnosis (Years)																	
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
All Sites	0.3	0.2	0.2	0.4	0.5	0.9	1.6	2.5	3.6	5.1	6.7	8.5	10.5	13.3	15.2	13.3	9.7	7.6
Oral Cavity and Pharynx	0.0	0.0	0.3	0.2	0.3	0.8	1.6	3.1	4.9	7.0	9.7	9.9	11.5	13.3	13.0	9.8	8.3	6.3
Lip	0.0	0.0	0.2	0.0	0.0	0.2	0.2	2.8	3.0	2.2	5.6	5.8	12.0	12.0	14.6	15.1	14.0	12.3
Tongue	0.0	0.0	0.2	0.0	0.4	1.1	1.9	4.1	6.2	6.9	12.4	11.8	12.0	12.0	12.6	7.9	7.3	3.2
Salivary Gland	0.0	0.0	1.6	2.0	0.8	2.3	6.2	3.1	5.5	4.7	7.8	7.4	4.7	10.9	11.7	13.6	10.1	7.8
Floor of Mouth	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	5.1	10.3	8.7	11.3	13.9	19.5	12.3	8.2	5.6	4.6
Gum and Other Mouth	0.0	0.0	0.2	0.0	0.2	1.0	1.4	2.4	3.6	7.0	8.4	9.6	11.8	13.9	12.7	11.1	8.4	8.2
Nasopharynx	0.0	0.0	1.0	1.0	2.9	1.9	3.9	8.7	12.5	7.7	12.5	11.5	8.7	10.6	4.8	3.9	3.9	4.8
Tonsil	0.0	0.0	0.0	0.0	0.0	0.0	0.8	3.0	6.4	16.6	16.6	11.7	11.3	11.7	12.1	4.5	2.6	2.6
Oropharynx	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.2	4.8	9.7	8.1	11.3	11.3	14.5	17.7	6.5	8.1	4.8
Hypopharynx	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	1.7	2.3	9.2	12.6	17.2	19.0	17.2	8.6	7.5	3.5
Other Oral Cavity and Pharynx	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.3	5.3	13.2	5.3	13.2	10.5	13.2	13.2	7.9	10.5	2.6
Digestive System	0.1	0.0	0.0	0.1	0.1	0.2	0.5	1.3	2.3	3.6	5.3	7.3	9.5	12.6	15.7	16.0	13.1	12.2
Esophagus	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.8	1.7	4.0	5.7	8.4	11.3	17.4	17.8	16.3	8.4	8.1
Stomach	0.0	0.0	0.0	0.1	0.1	0.3	1.0	1.3	3.1	3.4	5.1	6.3	9.3	11.6	13.9	15.4	14.4	14.8
Small Intestine	0.0	0.0	0.0	0.0	0.2	0.6	0.6	2.2	4.3	5.3	6.9	7.5	10.6	11.4	15.9	12.4	11.4	10.6
Colon and Rectum	0.0	0.0	0.0	0.0	0.1	0.2	0.5	1.1	1.9	3.2	4.9	7.2	9.5	12.0	15.6	16.1	14.3	13.3
Colon excluding Rectum	0.0	0.0	0.0	0.0	0.1	0.1	0.5	0.9	1.7	2.8	4.2	6.8	9.0	11.9	15.8	16.8	15.2	14.4
Rectum & Rectosigmoid Junction	0.0	0.0	0.0	0.1	0.0	0.3	0.6	1.8	2.8	4.4	7.2	8.5	10.7	12.4	14.9	14.4	11.9	10.2
Anus, Anal Canal and Anorectum	0.0	0.0	0.0	0.0	0.0	0.0	1.3	6.0	6.0	9.4	6.8	9.8	6.4	12.8	11.1	13.6	6.0	11.1
Liver and Intrahepatic Bile Duct	1.1	0.3	0.0	0.5	0.5	1.1	1.1	2.0	5.0	6.7	9.1	6.5	9.0	12.4	15.5	16.6	6.5	6.4
Liver	1.3	0.4	0.0	0.4	0.6	1.1	0.9	1.9	5.0	7.4	10.0	6.7	9.8	13.3	15.5	14.6	5.4	5.9
Intrahepatic Bile Duct	0.0	0.0	0.0	1.0	0.0	1.0	1.9	2.9	4.8	2.9	4.8	5.7	4.8	7.6	15.2	26.7	12.4	8.6
Gallbladder	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	1.5	4.1	4.8	6.3	15.5	18.8	17.7	16.6	14.4
Other Biliary	0.0	0.0	0.0	0.0	0.0	0.0	0.8	1.6	2.8	3.2	5.5	4.0	8.3	13.8	17.8	15.4	14.2	12.7
Pancreas	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.4	2.3	4.7	5.9	8.4	10.0	14.3	16.8	16.3	11.1	8.3
Retroperitoneum	7.7	0.0	1.5	4.6	1.5	1.5	4.6	6.2	3.1	9.2	4.6	4.6	9.2	12.3	9.2	9.2	7.7	3.1
Peritoneum, Omentum, Mesentery	0.0	0.0	0.0	0.0	0.5	0.5	0.0	2.2	2.2	1.8	4.5	14.8	10.8	15.7	21.5	14.8	4.5	6.3
Other Digestive Organs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	2.6	3.9	2.6	3.9	10.4	14.3	11.7	22.1	16.9	10.4

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Source: All cases were either microscopically confirmed (1988-1999) or Death Certificate Only (1995-1999) and were reported to the MCSS as of October 2002.

†Excludes *in situ* cancers except *in situ* bladder cancer.

Table II-2: Age distribution (percent) of newly diagnosed cancers† by anatomic site, both sexes combined, Minnesota, 1995-1999 (continued)

Cancer Site	Age at Diagnosis (Years)																	
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
Respiratory System	0.1	0.0	0.0	0.1	0.0	0.2	0.4	0.8	1.6	3.5	5.8	9.7	13.2	17.0	18.8	15.1	9.4	4.4
Nose, Nasal Cavity and Middle Ear	0.6	0.0	1.2	0.0	0.6	1.2	3.0	4.8	4.8	3.6	11.5	4.8	9.6	14.5	13.3	9.6	10.8	6.0
Larynx	0.0	0.0	0.0	0.0	0.0	0.0	0.8	1.7	1.5	4.6	7.7	12.8	16.5	15.4	15.9	12.6	7.0	3.4
Lung and Bronchus	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.7	1.6	3.4	5.6	9.7	13.1	17.1	19.1	15.4	9.5	4.4
Pleura	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.7	0.7	5.5	3.3	7.4	10.0	17.0	22.5	14.8	10.7	7.0
Trachea, Mediastinum and Other	15.9	0.0	0.0	6.8	4.6	11.4	6.8	11.4	6.8	4.6	6.8	2.3	6.8	9.1	2.3	2.3	0.0	2.3
Mesothelioma (all sites)	0.0	0.0	0.0	0.0	0.0	0.3	0.3	1.7	1.3	4.7	3.0	8.3	10.0	16.0	23.0	14.3	10.3	6.7
Bones and Joints	1.7	4.5	10.3	13.6	4.9	6.2	4.9	2.9	3.7	7.0	7.4	4.9	4.9	6.2	6.2	4.9	3.7	2.1
Soft Tissue including Heart	4.0	1.5	1.5	1.2	2.9	2.6	4.9	7.0	4.4	6.3	6.3	6	8.0	7.8	10.4	9.5	6.6	9.2
Skin	0.1	0.0	0.1	0.8	2.1	4.0	6.0	8.1	9.5	9.2	8.3	7.3	7.3	8.7	8.9	7.7	6.2	5.7
Melanoma of the Skin	0.0	0.0	0.1	0.7	2.0	3.9	5.8	8.4	10.0	9.7	8.7	7.7	7.6	8.9	9.0	7.2	5.7	4.7
Other Non-Epithelial Skin	0.2	0.2	0.4	1.6	3.0	4.9	7.5	5.9	6.3	5.7	5.3	4.9	4.9	7.3	8.1	11.3	10.1	12.6
Kaposis Sarcoma (all sites)	0.0	0.0	0.0	0.0	1.1	10.5	19.0	12.6	16.8	4.2	12.6	4.2	2.1	1.1	3.2	3.2	7.4	2.1
Breast	0.0	0.0	0.0	0.0	0.0	0.4	1.4	3.7	6.6	9.4	10.6	10.2	10.0	10.0	11.5	10.4	8.2	7.5
Female Genital System	0.0	0.0	0.1	0.3	0.7	1.7	2.7	4.7	5.9	7.9	9.8	10.7	10.2	10.5	10.9	10.1	7.9	5.9
Cervix	0.0	0.0	0.0	0.1	1.7	6.8	10.8	14.7	13.5	11.9	6.9	8.2	5.0	5.1	5.1	3.1	4.1	3.0
Corpus and Uterus, NOS	0.0	0.0	0.0	0.0	0.0	0.4	0.7	2.1	3.6	6.5	10.6	12.7	12.6	12.6	12.7	11.4	8.2	6.0
Ovary	0.0	0.1	0.3	0.8	1.3	1.8	2.6	5.1	7.0	9.2	10.7	9.5	9.2	9.4	10.6	9.7	8.1	4.8
Vagina	0.0	0.0	0.0	0.0	0.0	1.3	0.0	1.3	1.3	6.3	8.9	10.1	10.1	7.6	13.9	19.0	10.1	10.1
Vulva	0.0	0.0	0.0	0.3	0.6	0.6	1.2	2.3	3.5	3.8	5.2	6.1	7.0	9.9	10.5	16.3	14.2	18.6
Other Female Genital Organs	0.0	0.0	0.0	2.4	0.0	0.0	2.4	2.4	4.8	6.0	8.4	9.6	13.3	16.9	8.4	13.3	2.4	9.6
Male Genital System	0.0	0.0	0.0	0.1	0.5	0.8	1.0	0.9	0.7	1.6	4.1	8.2	13.2	19.1	20.9	15.3	8.7	4.9
Prostate	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.3	4.3	8.6	13.8	20.0	21.8	15.9	9.1	5.1
Testis	0.9	0.1	0.0	3.0	11.0	18.4	22.7	19.0	12.5	6.3	1.8	0.7	0.8	0.9	1.3	0.3	0.3	0.1
Penis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	5.0	2.0	3.0	9	9.0	17.0	11.0	18.0	11.0	14.0
Other Male Genital Organs	0.0	0.0	0.0	2.8	0.0	0.0	0.0	2.8	0.0	11.1	5.6	8.3	13.9	13.9	11.1	8.3	13.9	8.3

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Source: All cases were either microscopically confirmed (1988-1999) or Death Certificate Only (1995-1999) and were reported to the MCSS as of October 2002.

†Excludes *in situ* cancers except *in situ* bladder cancer.

Table II-2: Age distribution (percent) of newly diagnosed cancers† by anatomic site, both sexes combined, Minnesota, 1995-1999 (continued)

Cancer Site	Age at Diagnosis (Years)																
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
Urinary System	0.5	0.1	0.0	0.1	0.1	0.3	0.5	1.2	2.3	4.1	6.0	7.8	10.4	13.8	16.6	14.9	11.9	9.4
Urinary Bladder	0.1	0.1	0.0	0.1	0.1	0.2	0.3	0.6	1.5	2.8	5.1	6.8	9.4	14.3	17.1	16.0	13.9	11.7
Kidney and Renal Pelvis	1.3	0.2	0.0	0.2	0.1	0.5	0.8	2.4	4.0	6.4	7.8	10.2	12.1	13.0	16.1	12.5	7.8	4.6
Ureter	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.2	2.4	4.0	13.6	10.4	12.8	21.6	16.8	15.2
Other Urinary Organs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.6	0.0	0.0	5.4	1.8	17.9	10.7	7.1	14.3	17.9	21.4
Eye and Orbit	9.4	0.6	1.3	0.6	0.6	1.3	5.0	2.5	6.3	7.5	8.8	4.4	6.3	8.8	15.0	7.5	6.9	7.5
Brain and Other Nervous System	2.7	3.9	2.9	2.9	2.6	4.0	6.0	6.5	6.1	6.7	7.5	8.7	7.7	9.7	9.1	7.3	4.3	1.5
Brain	2.6	3.8	2.8	3.1	2.7	3.9	5.8	6.6	5.8	6.7	7.6	8.8	7.6	9.8	9.3	7.3	4.3	1.5
Other Nervous System	3.9	5.1	3.9	0.0	1.3	5.1	9.0	5.1	10.3	7.7	6.4	7.7	9.0	9.0	3.9	7.7	3.9	1.3
Endocrine System	1.9	0.3	0.7	2.6	4.5	7.2	10.5	13.4	12.2	9.9	7.4	5.9	4.9	5.9	4.9	4.0	2.3	1.8
Thyroid	0.1	0.0	0.6	2.4	4.5	7.5	11.3	13.8	12.9	10.4	7.6	5.6	4.8	5.6	5.0	3.7	2.4	1.9
Other Endocrine including Thymus	21.2	3.0	2.3	4.6	3.8	3.8	1.5	8.3	3.8	4.6	5.3	9.9	6.1	9.1	3.8	6.8	1.5	0.8
Lymphomas	0.2	0.5	0.9	1.7	2.5	2.6	3.5	4.0	4.6	5.7	6.2	7.0	7.8	11.1	11.4	12.0	10.3	8.0
Hodgkins Lymphoma	0.0	0.8	4.0	9.5	13.7	11.0	11.2	9.3	8.0	5.2	3.6	3.6	2.9	3.8	5.9	2.7	2.5	2.4
Non-Hodgkins Lymphoma	0.2	0.5	0.5	0.5	0.8	1.3	2.4	3.2	4.1	5.8	6.6	7.5	8.6	12.3	12.2	13.4	11.5	8.9
Multiple Myeloma	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.7	2.4	4.7	6.1	8.2	9.7	11.7	17.6	15.5	14.0	9.2
Leukemia	3.3	2.0	1.5	1.5	0.9	1.1	1.8	2.5	2.7	4.1	4.9	6.1	7.8	10.0	14.2	13.0	10.9	11.9
Lymphocytic Leukemia	5.6	3.4	2.1	1.6	0.5	0.7	1.0	1.0	2.0	3.4	4.1	6.7	8.8	11.8	14.2	12.2	10.4	10.7
Acute Lymphocytic Leukemia	28.3	17.5	10.4	8.4	2.4	3.4	3.7	2.0	3.0	3.7	1.4	1.4	3.0	2.4	2.4	3.0	1.4	2.4
Chronic Lymphocytic Leukemia	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.7	1.8	3.2	4.9	8.0	10.3	13.7	17.3	14.3	12.7	13.0
Myeloid Leukemia	0.9	0.7	1.0	1.5	1.4	1.2	2.9	4.1	3.2	4.8	5.6	5.4	7.2	9.1	14.8	13.7	10.8	11.8
Acute Myeloid Leukemia	0.9	0.8	1.0	2.1	1.4	1.3	2.3	2.9	2.7	4.7	5.7	5.2	6.2	10.3	15.3	12.7	11.4	13.0
Chronic Myeloid Leukemia	0.7	0.7	0.2	0.5	1.4	0.9	3.4	5.9	3.4	4.5	5.4	5.4	8.8	7.5	14.7	16.1	10.0	10.6
Monocytic Leukemia	7.5	1.3	1.3	1.3	2.5	6.3	0.0	0.0	7.5	2.5	5.0	5.0	5.0	10.0	10.0	10.0	15.0	10.0
Acute Monocytic Leukemia	7.8	1.3	1.3	1.3	2.6	6.5	0.0	0.0	7.8	2.6	5.2	5.2	5.2	10.4	10.4	9.1	13.0	10.4
Chronic Monocytic Leukemia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	33.3	66.7	0.0
Other Leukemia	0.4	0.0	0.4	0.4	0.4	1.1	1.1	4.5	2.6	5.2	6.0	6.7	6.0	4.9	13.1	15.3	13.1	19.0
Ill-defined and unknown	1.2	0.4	0.4	0.1	0.2	0.3	0.6	1.1	2.0	3.8	4.4	6.3	8.2	11.1	15.2	16.9	13.8	13.9

Source: All cases were either microscopically confirmed (1988-1999) or Death Certificate Only (1995-1999) and were reported to the MCSS as of October 2002.

†Excludes *in situ* cancers except *in situ* bladder cancers.

Table II-3: Age distribution (percent) of cancer deaths by anatomic site, both sexes combined, Minnesota, 1995-1999

Cancer Site	Age at Death (Years)																	
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
All Sites	0.1	0.1	0.1	0.2	0.2	0.3	0.5	1.2	1.9	3.1	4.4	6.4	8.5	11.7	15.0	15.6	14.4	16.5
Oral Cavity and Pharynx	0.0	0.0	0.2	0.0	0.4	0.5	0.5	2.0	2.7	4.9	7.8	8.7	10.7	14.1	15.4	10.3	10.0	11.8
Lip	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25.0	25.0	25.0	0.0	0.0	25.0
Tongue	0.0	0.0	0.0	0.0	0.0	1.6	0.0	3.1	1.6	4.7	7.0	10.1	8.5	14.0	15.5	16.3	8.5	9.3
Salivary Gland	0.0	0.0	0.0	0.0	1.8	0.0	0.0	1.8	1.8	3.6	3.6	12.7	5.5	16.4	14.6	12.7	10.9	14.6
Floor of Mouth	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.1	0.0	18.2	36.4	0.0	36.4	0.0	0.0	0.0
Gum and Other Mouth	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	2.0	8.0	7.0	3.0	8.0	14.0	16.0	9.0	13.0	19.0
Nasopharynx	0.0	0.0	2.2	0.0	0.0	2.2	6.7	6.7	8.9	2.2	13.3	11.1	6.7	6.7	8.9	0.0	13.3	11.1
Tonsil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	6.7	15.6	8.9	20.0	13.3	6.7	8.9	6.7	11.1
Oropharynx	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	6.4	8.5	10.6	10.6	6.4	21.3	4.3	8.5	10.6	10.6
Hypopharynx	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.3	3.3	3.3	13.3	20.0	10.0	10.0	20.0	6.7	10.0
Other Oral Cavity and Pharynx	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	1.2	1.2	7.0	5.8	12.8	16.3	27.9	7.0	10.5	8.1
Digestive System	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.9	1.5	2.9	3.8	5.9	8.1	11.6	14.4	15.6	15.0	19.8
Esophagus	0.0	0.0	0.0	0.0	0.0	0.1	0.2	1.1	1.9	3.6	4.8	6.3	10.2	16.1	17.0	16.9	11.4	10.4
Stomach	0.0	0.0	0.0	0.0	0.0	0.5	0.5	0.9	1.9	3.6	4.1	6.0	7.1	9.9	12.7	15.2	17.8	19.9
Small Intestine	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8	2.8	6.5	3.7	8.4	10.3	12.2	15.9	12.2	8.4	16.8
Colon and Rectum	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.9	1.1	2.3	3.3	5.9	7.9	10.6	13.1	15.7	15.2	23.7
Colon excluding Rectum	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.8	1.0	2.1	2.9	5.8	7.7	10.8	12.9	16.1	15.4	24.1
Rectum & Rectosigmoid Junction	0.0	0.0	0.0	0.0	0.0	0.2	0.3	1.4	1.6	3.6	5.4	6.1	8.8	9.6	14.3	13.5	14.1	21.2
Anus, Anal Canal and Anorectum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.2	3.2	9.7	3.2	6.5	22.6	3.2	9.7	19.4	6.5	12.9
Liver and Intrahepatic Bile Duct	0.4	0.0	0.1	0.3	0.4	0.5	0.4	1.2	2.9	5.2	5.6	5.3	9.0	12.3	15.6	16.5	12.9	11.6
Liver	0.5	0.0	0.2	0.3	0.5	0.7	0.2	0.9	2.7	6.0	6.6	5.6	8.7	13.8	14.3	16.4	12.6	10.1
Intrahepatic Bile Duct	0.0	0.0	0.0	0.0	0.0	0.0	1.1	2.2	3.3	2.7	2.2	4.4	9.8	7.7	19.7	16.9	13.7	16.4
Gallbladder	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.9	3.8	4.7	7.0	14.1	16.4	14.6	18.8	19.3
Other Biliary	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	2.5	3.8	5.7	8.2	13.3	16.5	21.5	27.2
Pancreas	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.8	1.5	3.2	3.9	6.1	8.1	12.0	16.2	14.9	15.3	17.9
Retroperitoneum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0	10.0	0.0	0.0	10.0	10.0	10.0	10.0	10.0	30.0
Peritoneum, Omentum, Mesentery	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	0.0	4.7	7.0	9.3	14.0	23.3	14.0	16.3	9.3
Other Digestive Organs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	4.0	0.0	16.0	10.0	10.0	18.0	40.0

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Source: Deaths are from the Minnesota Center for Health Statistics, and include all deaths with the specified cancer as the underlying cause of death during the time period, regardless of year of diagnosis.

Table II-3: Age distribution (percent) of cancer deaths by anatomic site, both sexes combined, Minnesota, 1995-1999 (continued)

Cancer Site	Age at Death (Years)																	
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
Respiratory System	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.6	1.2	2.4	4.6	7.9	11.6	15.9	18.3	16.7	12.4	8.3
Nose, Nasal Cavity and Middle Ear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.4	11.1	8.9	4.4	2.2	8.9	15.6	11.1	15.6	6.7	11.1
Larynx	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4	3.0	6.5	9.6	10.0	20.0	12.6	19.1	11.3	7.0
Lung and Bronchus	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.6	1.2	2.4	4.6	7.9	11.6	15.8	18.5	16.6	12.4	8.2
Pleura	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.9	2.9	2.9	14.7	5.9	17.7	17.7	11.8	14.7	8.8
Trachea, Mediastinum and Other	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.0	1.5	1.5	0.0	6.0	16.4	11.9	13.4	16.4	19.4	11.9
Mesothelioma (all sites)	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
Bones and Joints	0.0	0.0	2.4	10.8	6.0	8.4	6.0	0.0	4.8	2.4	3.6	9.6	3.6	2.4	9.6	10.8	14.5	4.8
Soft Tissue including Heart	0.0	0.0	1.2	2.5	1.2	1.9	2.8	3.1	3.1	6.5	5.9	9.2	7.7	8.6	8.9	14.2	10.2	13.2
Skin	0.0	0.0	0.0	0.0	0.8	0.9	2.0	4.2	5.3	6.9	7.4	7.0	6.7	8.5	12.0	12.0	11.0	15.3
Melanoma of the Skin	0.0	0.0	0.0	0.0	1.0	1.2	2.4	5.1	5.8	8.2	8.6	6.7	5.5	7.7	12.5	12.0	10.8	12.7
Other Non-Epithelial Skin	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.6	3.2	1.9	3.2	8.2	11.4	11.4	10.1	12.0	12.0	25.3
Kaposis Sarcoma (all sites)	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
Breast	0.0	0.0	0.0	0.0	0.0	0.2	1.0	2.5	4.6	6.2	7.1	7.6	9.2	8.9	11.5	11.7	11.5	17.9
Female Genital System	0.0	0.0	0.0	0.1	0.1	0.4	0.7	1.8	2.8	4.1	6.2	8.2	7.3	10.6	13.9	14.7	13.2	16.1
Cervix	0.0	0.0	0.0	0.0	0.0	2.5	2.9	7.4	9.1	9.5	10.3	12.8	6.2	5.8	11.1	6.2	8.2	8.2
Corpus and Uterus, NOS	0.0	0.0	0.0	0.0	0.0	0.2	0.2	1.1	0.6	2.0	4.4	6.1	8.7	10.9	12.9	17.5	14.6	21.0
Ovary	0.0	0.0	0.0	0.1	0.1	0.1	0.3	1.0	2.7	4.1	6.4	8.6	7.4	11.8	15.5	15.5	13.6	13.1
Vagina	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.9	2.9	2.9	5.7	5.7	2.9	2.9	5.7	14.3	17.1	37.1
Vulva	0.0	0.0	0.0	0.0	0.0	0.0	1.5	1.5	0.0	4.5	1.5	4.5	3.0	4.5	4.5	16.4	13.4	44.8
Other Female Genital Organs	0.0	0.0	0.0	0.0	2.9	0.0	2.9	0.0	2.9	0.0	8.8	2.9	5.9	20.6	20.6	2.9	8.8	20.6
Male Genital System	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.1	0.2	0.7	2.0	3.5	8.6	13.3	18.9	22.4	29.8
Prostate	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.7	2.0	3.5	8.6	13.4	19.1	22.7	30.0
Testis	0.0	0.0	0.0	0.0	3.3	20.0	20.0	20.0	3.3	3.3	3.3	6.7	0.0	0.0	10.0	0.0	3.3	6.7
Penis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.6	0.0	11.1	11.1	0.0	22.2	16.7	33.3
Other Male Genital Organs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25.0	0.0	25.0	0.0	0.0	0.0	50.0

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Source: Deaths are from the Minnesota Center for Health Statistics, and include all deaths with the specified cancer as the underlying cause of death during the time period, regardless of year of diagnosis.

~Mortality data not available for this site.

Table II-3: Age distribution (percent) of cancer deaths by anatomic site, both sexes combined, Minnesota, 1995-1999 (continued)

Cancer Site	Age at Diagnosis (Years)																	
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
Urinary System	0.1	0.1	0.0	0.1	0.0	0.1	0.2	0.6	1.2	2.6	4.3	5.2	7.0	9.9	14.7	15.0	16.3	22.8
Urinary Bladder	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.3	0.5	1.6	2.0	3.1	4.4	8.4	14.2	15.4	18.8	31.1
Kidney and Renal Pelvis	0.2	0.2	0.0	0.1	0.0	0.1	0.2	0.8	1.9	3.7	6.5	7.3	9.9	11.5	14.9	14.6	13.8	14.4
Ureter	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.7	0.0	0.0	0.0	3.7	0.0	3.7	18.5	25.9	22.2	22.2
Other Urinary Organs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.7	5.9	5.9	11.8	23.5	0.0	5.9	29.4
Eye and Orbit	4.2	4.2	4.2	0.0	0.0	0.0	4.2	0.0	0.0	0.0	16.7	16.7	4.2	8.3	12.5	12.5	0.0	12.5
Brain and Other Nervous System	0.5	1.6	0.7	1.6	0.5	1.4	3.1	4.6	5.1	5.1	7.7	10.5	10.0	11.8	13.2	9.5	8.5	4.6
Brain	0.6	1.6	0.6	1.6	0.4	1.5	3.1	4.6	5.1	5.2	7.7	10.3	10.1	11.8	13.2	9.5	8.7	4.6
Other Nervous System	0.0	0.0	4.8	0.0	9.5	0.0	0.0	4.8	4.8	0.0	9.5	19.1	4.8	14.3	14.3	9.5	0.0	4.8
Endocrine System	5.1	2.9	0.0	0.0	0.6	1.7	2.3	2.3	1.7	5.7	2.3	6.3	5.7	10.9	10.9	13.7	12.0	16.0
Thyroid	0.0	0.0	0.0	0.0	0.0	0.9	0.9	0.9	0.9	3.5	0.9	7.0	5.3	11.4	11.4	16.7	17.5	22.8
Other Endocrine including Thymus	14.8	8.2	0.0	0.0	1.6	3.3	4.9	4.9	3.3	9.8	4.9	4.9	6.6	9.8	9.8	8.2	1.6	3.3
Lymphomas	0.1	0.1	0.1	0.2	0.5	0.6	1.1	1.8	1.9	3.6	4.2	5.5	7.0	10.0	14.3	16.1	16.2	16.7
Hodgkins Lymphoma	0.0	0.0	0.0	1.6	3.3	7.3	3.3	4.1	7.3	8.9	3.3	5.7	5.7	8.1	15.5	8.9	8.1	8.9
Non-Hodgkins Lymphoma	0.1	0.1	0.1	0.1	0.4	0.2	0.9	1.6	1.6	3.4	4.3	5.5	7.0	10.1	14.2	16.5	16.6	17.2
Multiple Myeloma	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	1.1	2.4	3.4	4.8	8.0	10.6	15.4	19.1	17.3	17.4
Leukemia	1.0	0.7	0.4	1.1	0.9	0.9	1.2	1.9	1.8	2.5	2.7	4.9	5.8	7.9	14.9	15.7	15.8	19.9
Lymphocytic Leukemia	1.6	0.6	0.6	1.2	1.5	0.9	1.2	1.0	0.9	1.6	2.2	4.0	4.4	7.4	14.1	14.8	17.5	24.6
Acute Lymphocytic Leukemia	7.8	3.1	3.1	6.2	7.8	4.7	6.2	5.4	3.1	7.8	3.1	2.3	4.7	4.7	7.8	8.5	7.0	7.0
Chronic Lymphocytic Leukemia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.2	1.9	4.5	4.3	7.9	15.7	16.6	19.5	29.0
Myeloid Leukemia	0.9	0.8	0.1	0.7	0.7	1.0	1.4	2.8	2.3	3.8	3.0	6.9	6.8	8.9	16.6	15.3	13.5	14.7
Acute Myeloid Leukemia	1.2	1.1	0.0	0.6	0.6	1.1	1.1	2.3	2.6	3.1	3.1	6.1	6.0	9.5	17.2	14.8	14.3	15.6
Chronic Myeloid Leukemia	0.0	0.0	0.5	0.0	1.0	1.0	3.0	4.5	2.0	6.9	3.5	9.4	9.4	6.9	15.4	15.8	9.4	11.4
Monocytic Leukemia	0.0	0.0	4.4	4.4	0.0	0.0	0.0	0.0	4.4	0.0	0.0	4.4	0.0	0.0	8.7	17.4	21.7	34.8
Acute Monocytic Leukemia	0.0	0.0	5.6	5.6	0.0	0.0	0.0	0.0	5.6	0.0	0.0	5.6	0.0	0.0	5.6	16.7	22.2	33.3
Chronic Monocytic Leukemia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0
Other Leukemia	0.5	0.7	0.5	1.7	0.5	0.7	1.0	1.7	1.9	1.2	2.9	2.2	6.3	7.0	12.8	17.9	17.9	22.5
Ill-defined and unknown	0.0	0.0	0.0	0.1	0.2	0.2	0.4	0.9	1.7	2.6	3.8	5.6	7.5	11.0	15.0	16.7	15.4	19.2

Source: Deaths are from the Minnesota Center for Health Statistics, and include all deaths with the specified cancer as the underlying cause of death during the time period, regardless of year of diagnosis.

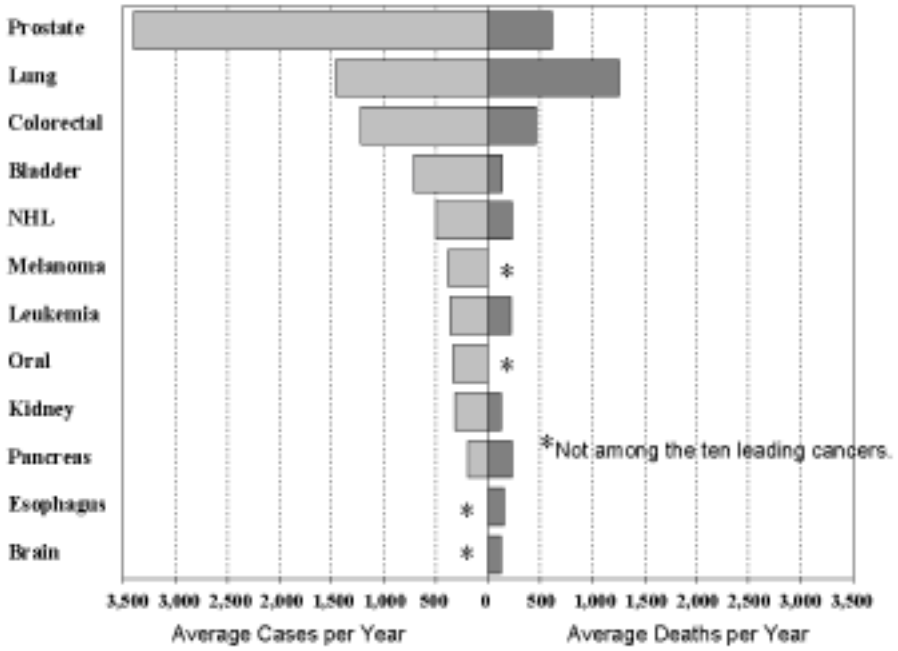
Table II-4: The five most commonly diagnosed cancers† by race and gender, Minnesota, 1995-1999

Race	Males				Females			
	Cancer Site	Cases†	Percent	Rate§	Cancer Site	Cases†	Percent	Rate§
American Indian	Lung & Bronchus	56	21.8%	114.3	Lung & Bronchus	52	22.0%	76.3
	Prostate	54	21.0%	134.7	Breast	44	18.6%	55.5
	Colon & Rectum	35	13.6%	69.3	Colon & Rectum	30	12.7%	48.3
	Oral Cavity	14	5.4%	25.7	Cervix	15	6.4%	14.2
	Kidney	14	5.4%	22.2	Uterus	12	5.1%	16.8
	All Sites	257	100%	494.7	All Sites	236	100%	317.8
Asian/Pacific Islander	Prostate	41	13.3%	52.0	Breast	105	27.5%	70.3
	Lung & Bronchus	37	12.0%	44.1	Colon & Rectum	33	8.6%	21.8
	Colon & Rectum	32	10.4%	28.0	Lung & Bronchus	23	6.0%	19.4
	NHL	26	8.4%	28.1	Cervix	23	6.0%	15.2
	Stomach	24	7.8%	27.8	Thyroid	22	5.8%	11.5
	All Sites	309	100%	304.5	All Sites	382	100%	256.3
Black	Prostate	251	27.9%	224.2	Breast	194	30.3%	109.7
	Lung & Bronchus	169	18.8%	136.0	Lung & Bronchus	85	13.3%	60.7
	Colon & Rectum	92	10.2%	82.2	Colon & Rectum	65	10.2%	44.7
	NHL	43	4.8%	23.6	Cervix	44	6.9%	21.4
	Oral Cavity	31	3.4%	17.6	Uterus	27	4.2%	18.2
	All Sites	899	100%	687.0	All Sites	640	100%	388.6
White (including Hispanic)	Prostate	16,384	31.7%	171.5	Breast	16,086	32.9%	137.2
	Lung & Bronchus	7,015	13.6%	73.0	Colon & Rectum	5,984	12.2%	46.5
	Colon & Rectum	5,893	11.4%	62.5	Lung & Bronchus	5,134	10.5%	43.3
	Urinary Bladder	3,502	6.8%	37.3	Uterus	3,145	6.4%	27.0
	NHL Lymphoma	2,409	4.7%	24.8	NHL	2,130	4.4%	17.3
	All Sites	51,730	100%	537.6	All Sites	48,871	100%	407.7

Source: All cases were either microscopically confirmed (1988-1999) or Death Certificate Only (1995-1999) and were reported to the MCSS as of October 2002.

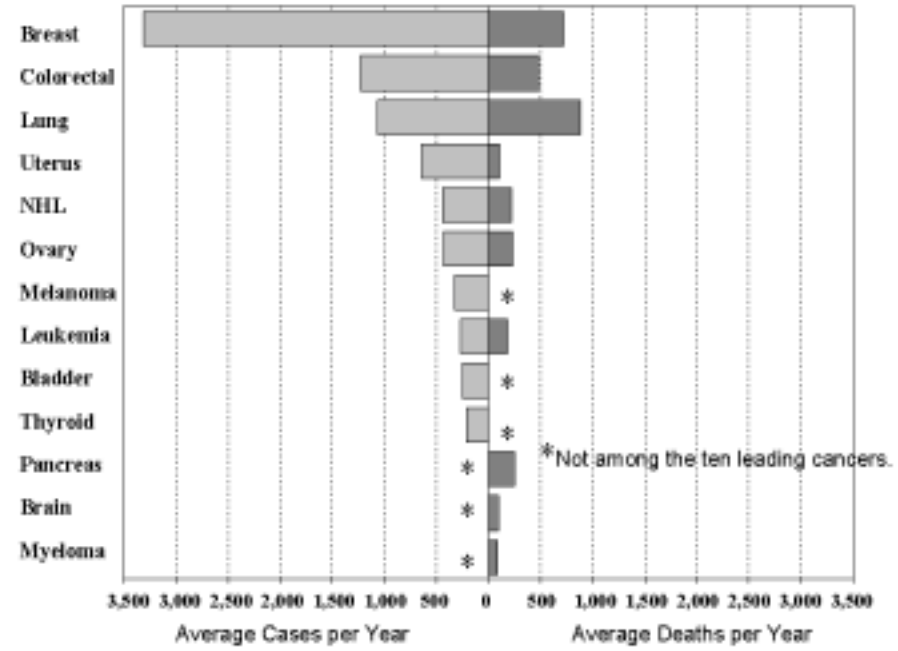
§Average annual rates per 100,000 persons, age-adjusted to the 2000 US population.
†Excludes *in situ* cancers except *in situ* bladder cancer.

Figure II-1: Ten Most Common Cancer Diagnoses and Deaths among Males, Minnesota, 1995-1999



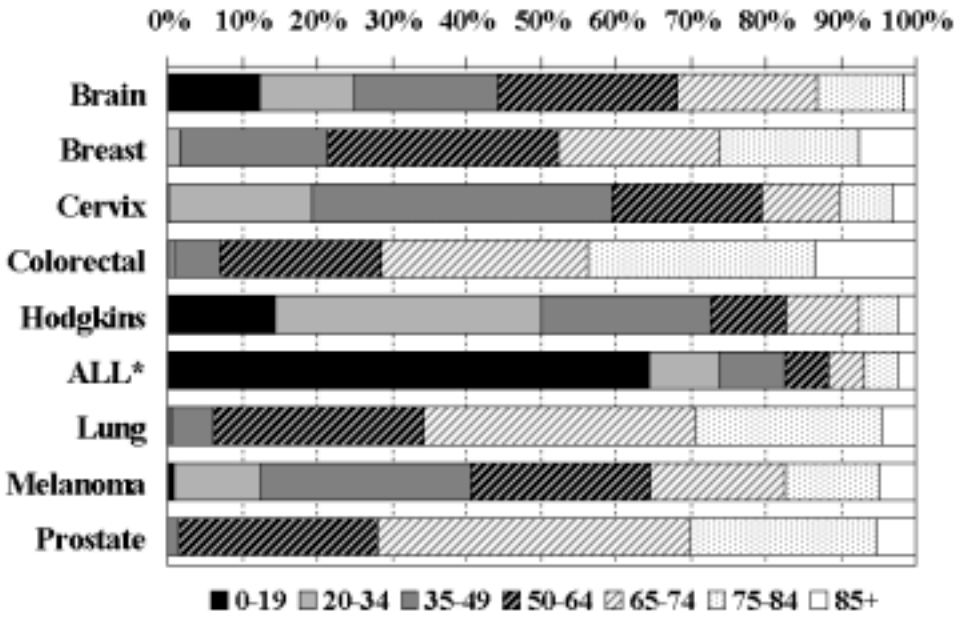
NHL = non-Hodgkins Lymphoma

Figure II-2: Ten Most Common Cancer Diagnoses and Deaths among Females, Minnesota, 1995-1999



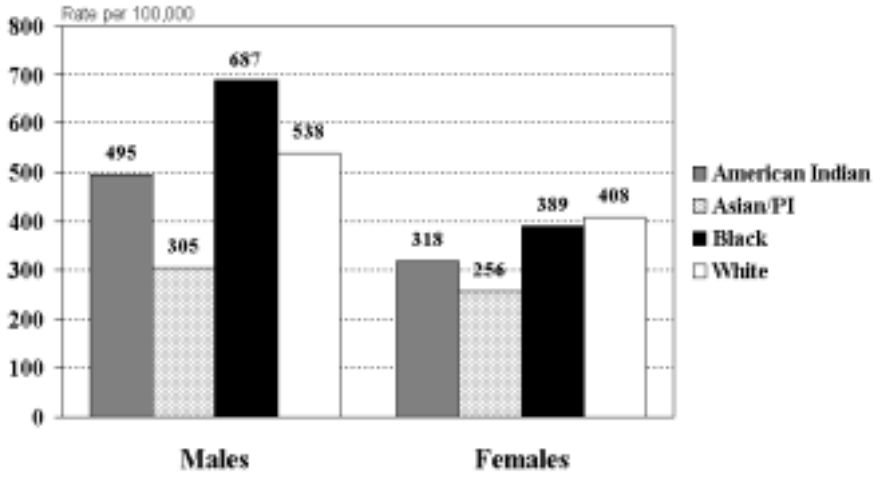
NHL = non-Hodgkins Lymphoma

Figure II-3: Percent of Cancers Diagnosed by Age Category among Selected Common Cancers, Minnesota, 1995-1999



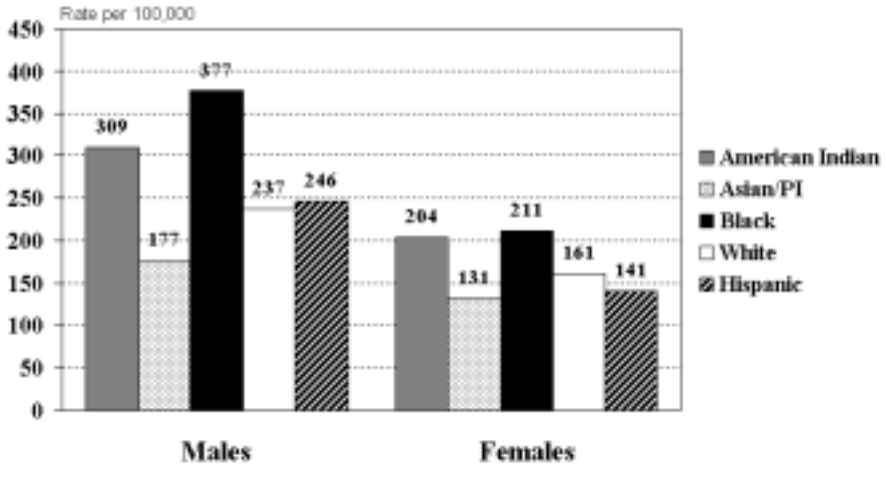
*Acute lymphocytic leukemia.

Figure II-4: Cancer Incidence Rates by Race and Ethnicity, Minnesota, 1995-1999, All Sites Combined



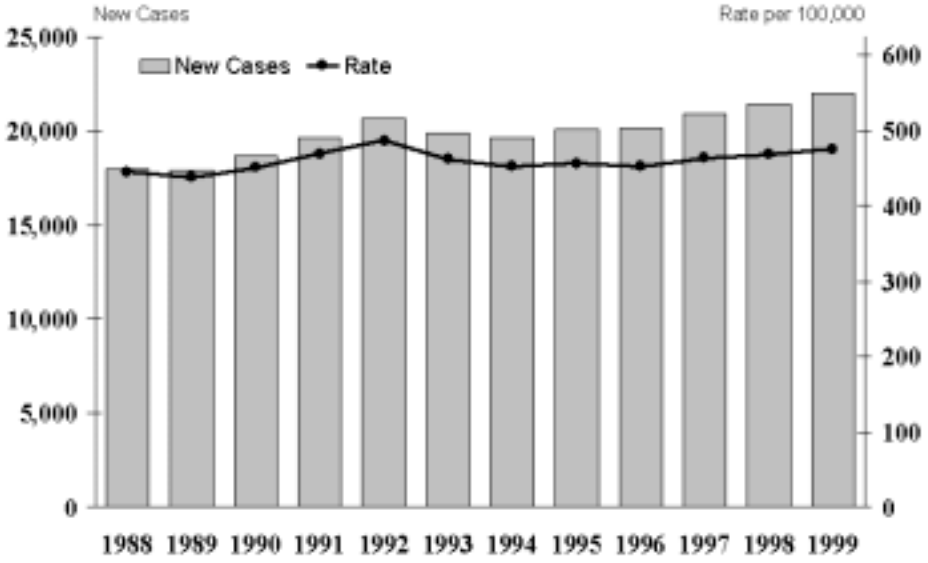
All rates are age-adjusted to the 2000 US population.

Figure II-5: Cancer Mortality Rates by Race and Ethnicity, Minnesota, 1995-1999, All Sites Combined



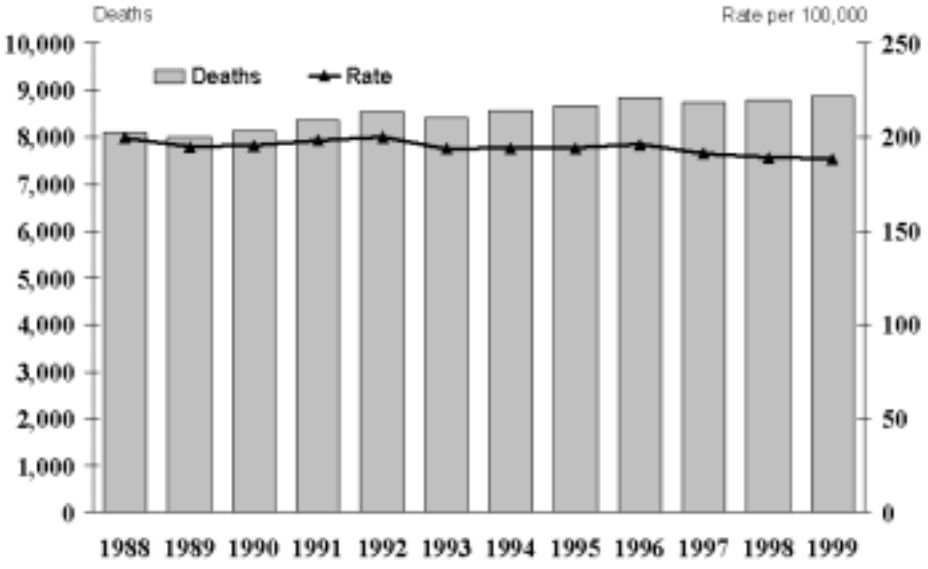
All rates are age-adjusted to the 2000 US population.

Figure II-6: Cancer Incidence in Minnesota by Year, 1988-1999



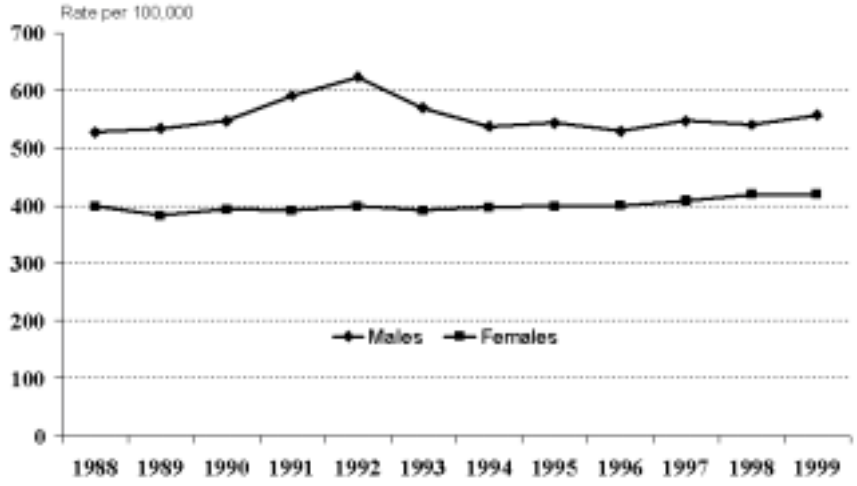
All rates are age-adjusted to the US 2000 population.
Includes all invasive cancers and in situ bladder cancers.

Figure II-7: Cancer Mortality in Minnesota by Year, 1988-1999



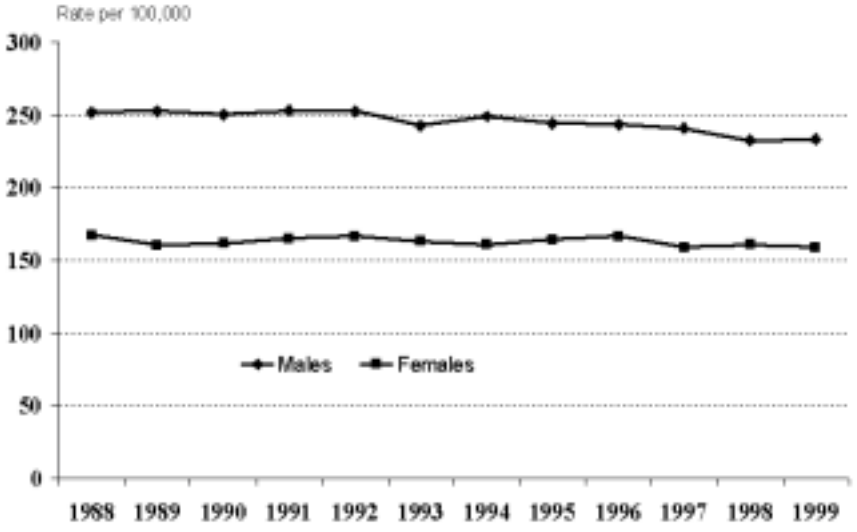
All rates are age-adjusted to the US 2000 population.

Figure II-8: Cancer Incidence by Year and Gender, Minnesota, 1988-1999



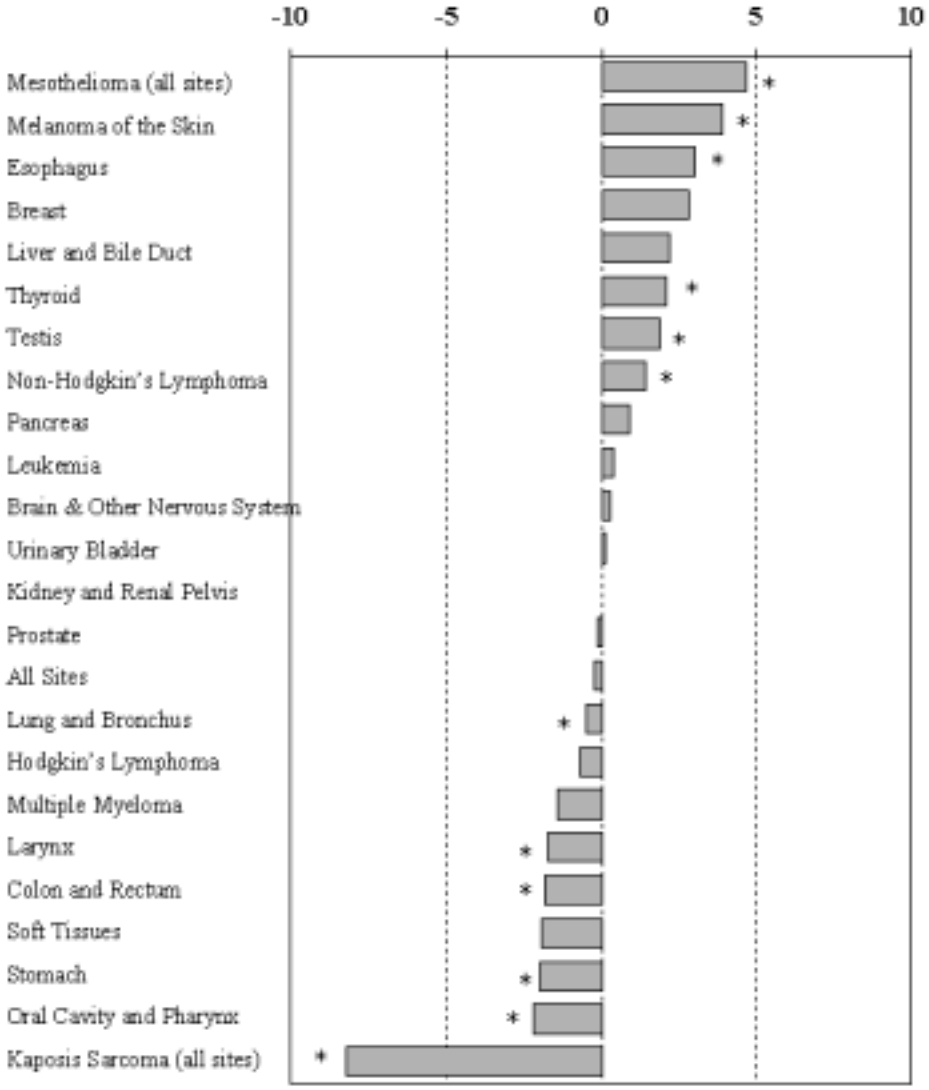
All rates are age-adjusted to the US 2000 population.

Figure II-9: Cancer Mortality by Year and Gender, Minnesota, 1988-1999



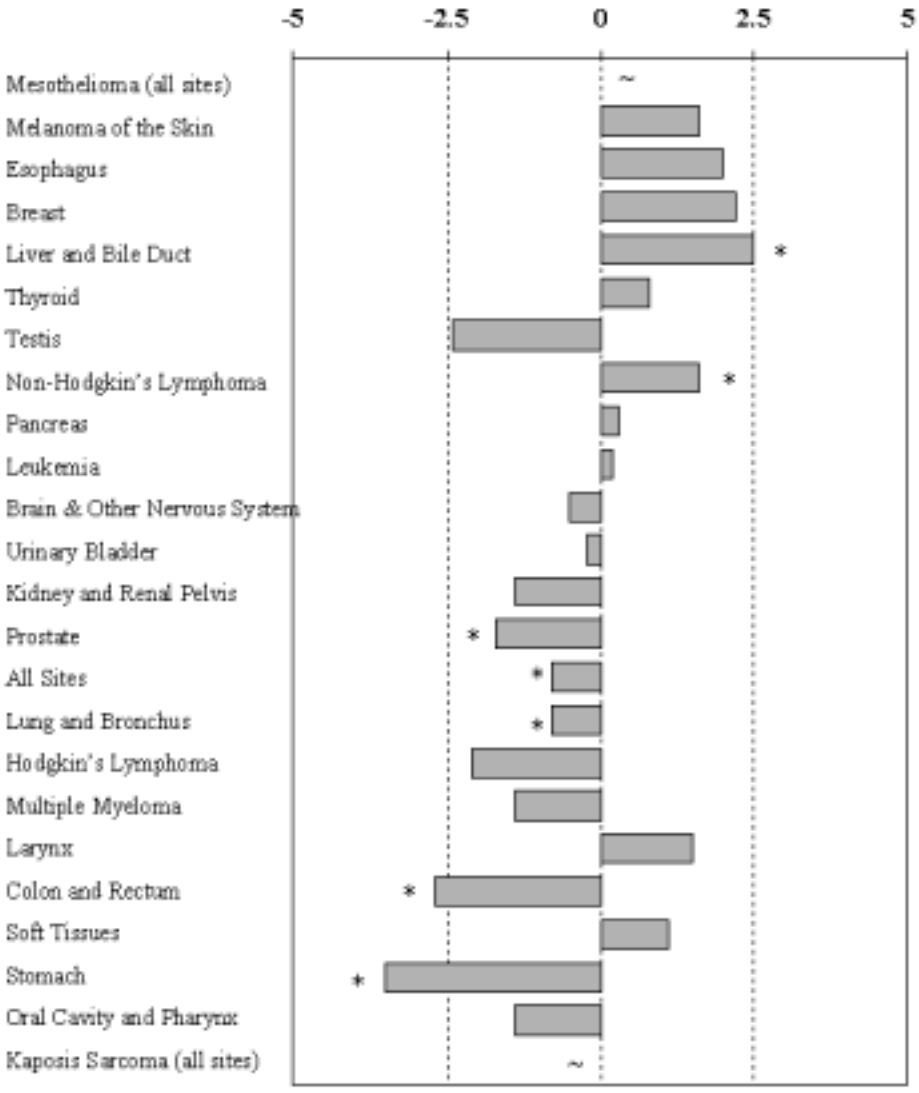
All rates are age-adjusted to the US 2000 population.

Figure II-10: Average Annual Percent Change in Cancer Incidence Rates among Males, Minnesota, 1988-1999



* The trend is statistically significant ($p < 0.05$).

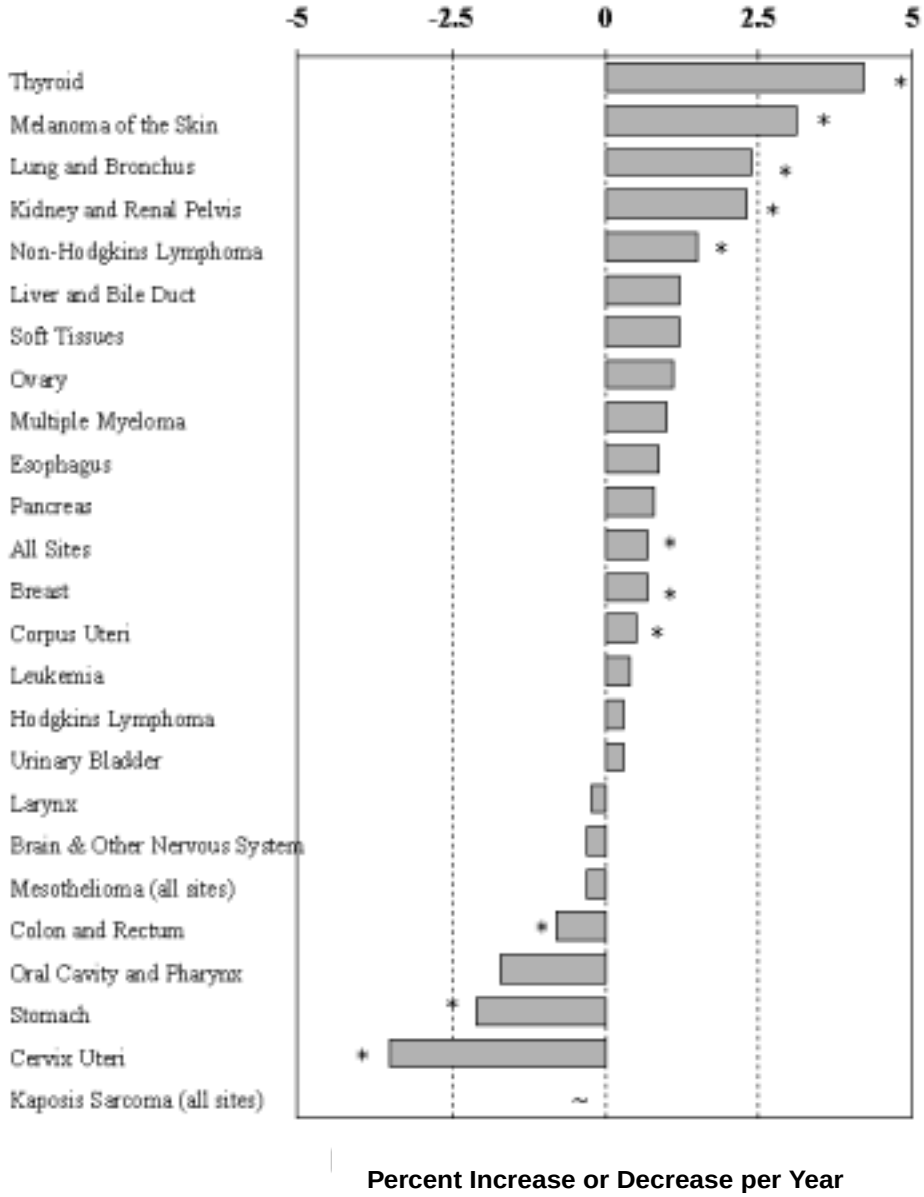
Figure II-11: Average Annual Percent Change in Cancer Mortality Rates among Males, Minnesota, 1988-1999



* The trend is statistically significant ($p < 0.05$).

~ The average annual percent change could not be calculated.

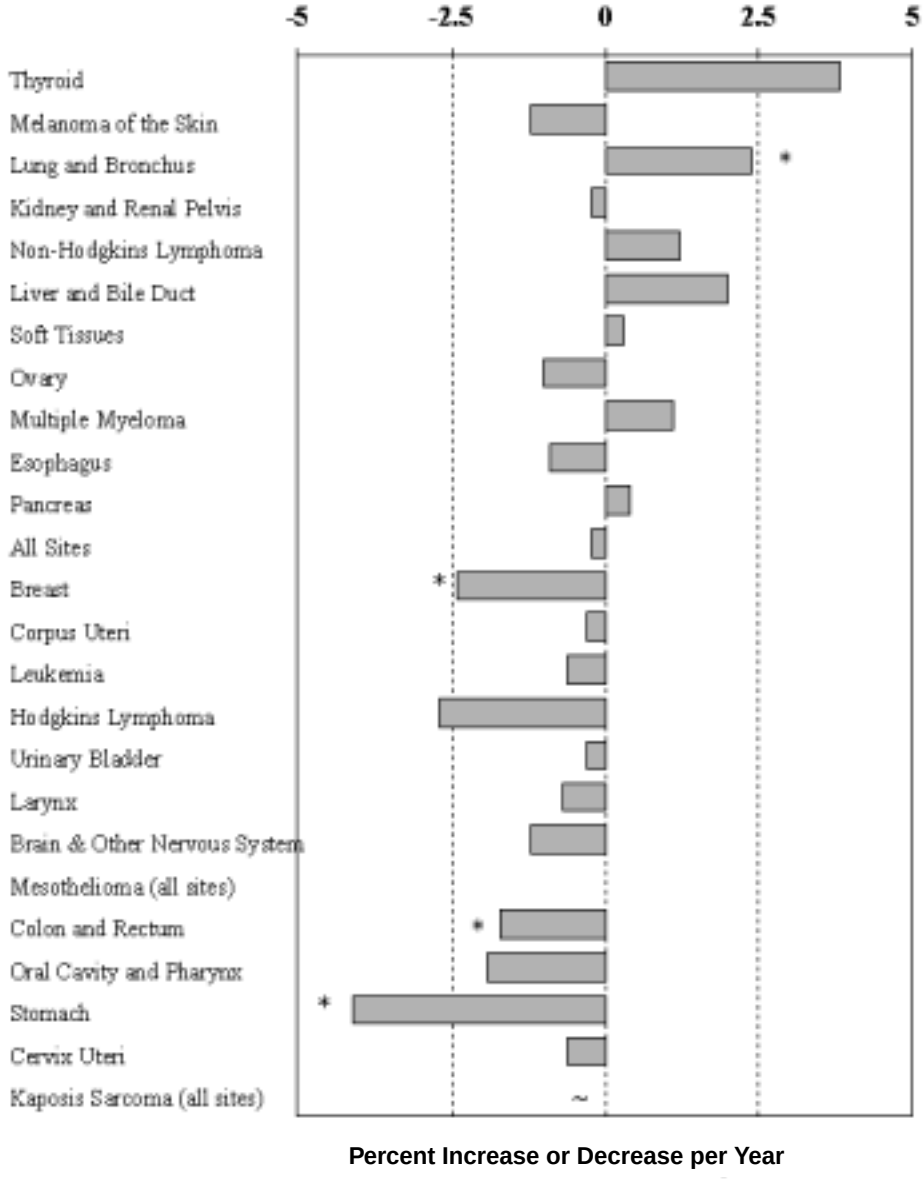
Figure II-12: Average Annual Percent Change in Cancer Incidence Rates among Females, Minnesota, 1988-1999



* The trend is statistically significant ($p < 0.05$).

~ The average annual percent change could not be calculated.

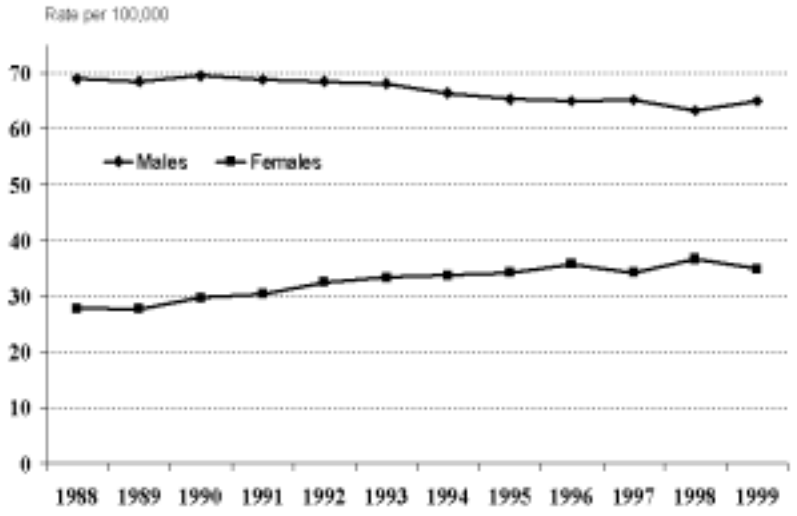
Figure II-13: Average Annual Percent Change in Cancer Mortality Rates among Females, Minnesota, 1988-1999



* The trend is statistically significant ($p < 0.05$).

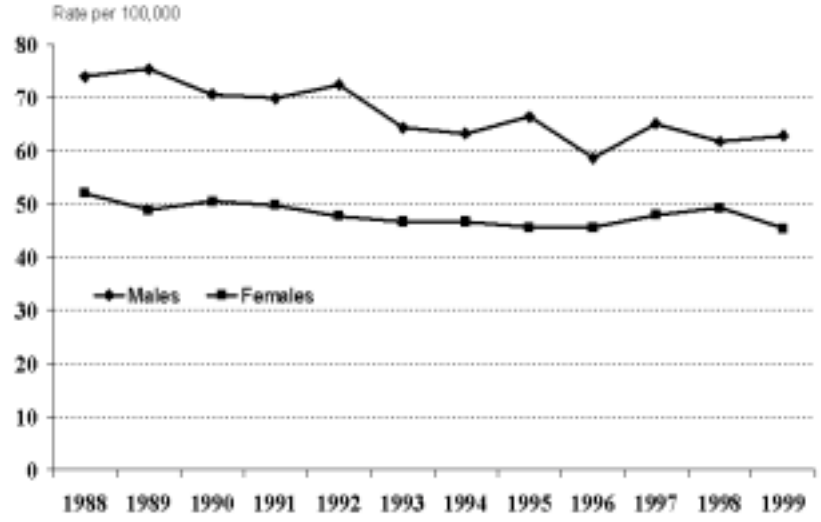
~ The average annual percent change could not be calculated.

Figure II-14: Lung Cancer Mortality by Year and Gender, Minnesota, 1988-1999



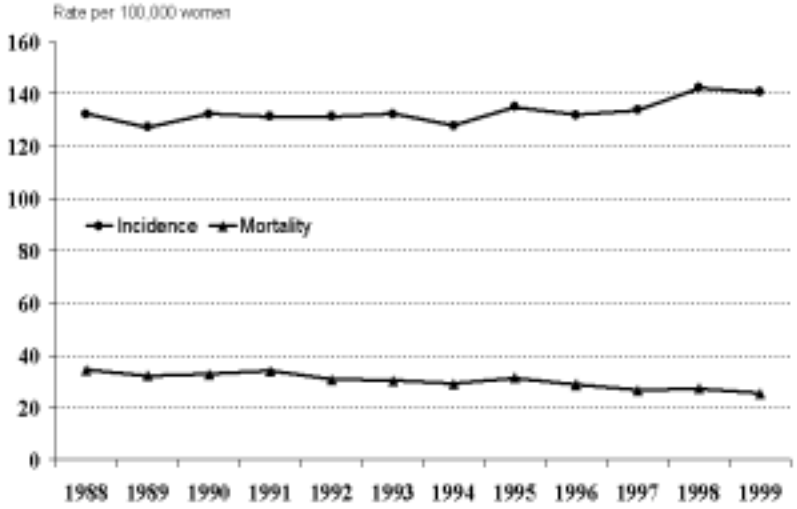
All rates are age-adjusted to the US 2000 population.

Figure II-15: Colon and Rectum Cancer Incidence by Year and Gender, Minnesota, 1988-1999



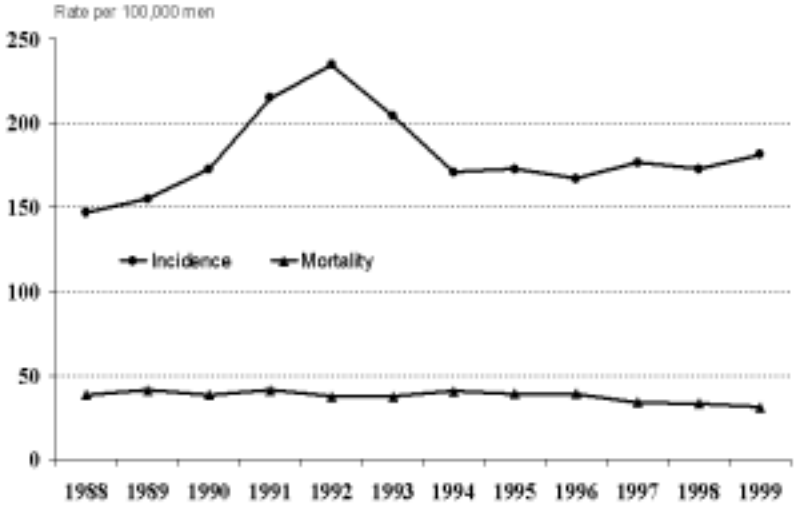
All rates are age-adjusted to the US 2000 population.

Figure II-16: Female Breast Cancer Incidence and Mortality by Year, Minnesota, 1988-1999



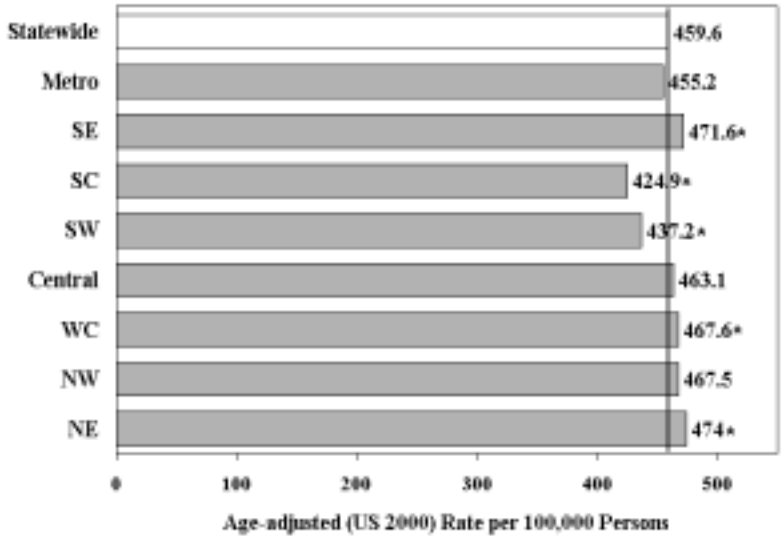
All rates are age-adjusted to the US 2000 population.

Figure II-17: Prostate Cancer Incidence and Mortality by Year, Minnesota, 1988-1999



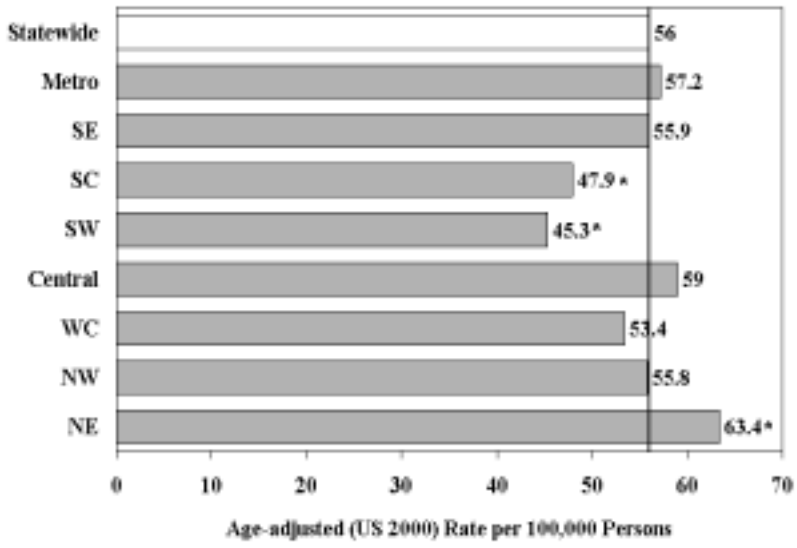
All rates are age-adjusted to the US 2000 population.

Figure II-18: Cancer Incidence among Whites by Region, Minnesota, 1995-1999, All Sites Combined



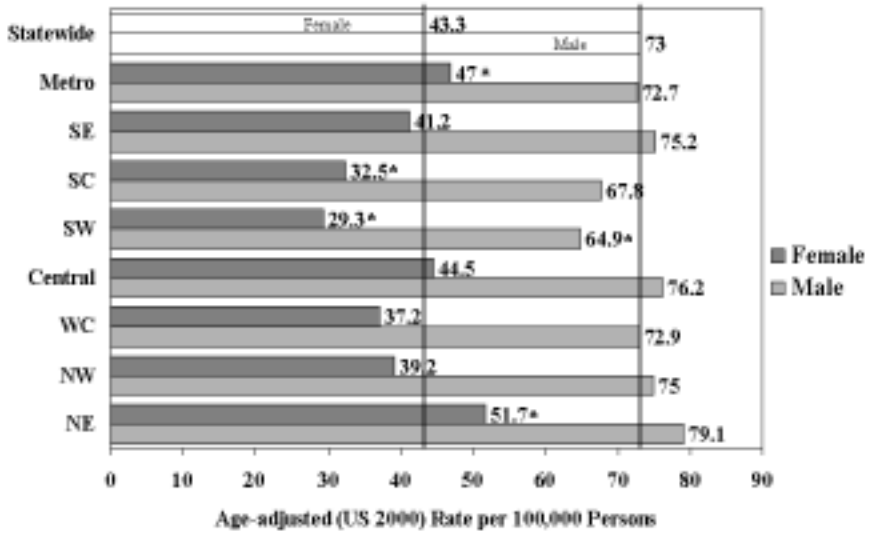
* Regional rate is significantly ($P < 0.05$) different from statewide rate.

Figure II-19: Lung Cancer Incidence among Whites by Region, Minnesota, 1995-1999



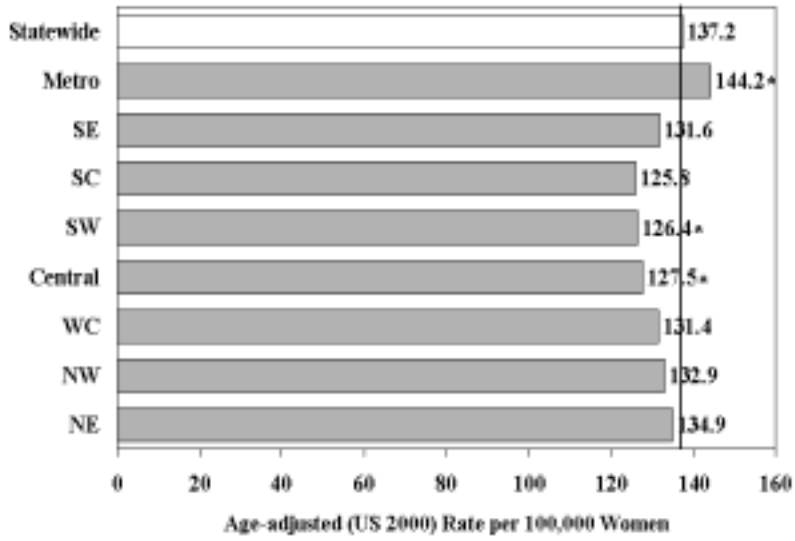
* Regional rate is significantly ($P < 0.05$) different from statewide rate.

Figure II-20: Lung Cancer Incidence among Whites by Gender and Region, Minnesota, 1995-1999



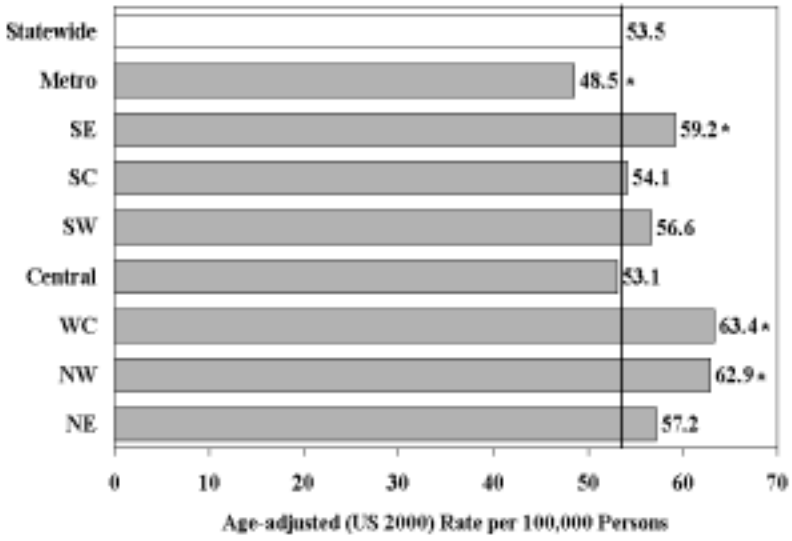
* Sex-specific regional rate is significantly ($P < 0.05$) different from statewide rate.

Figure II-21: Female Breast Cancer Incidence among Whites by Region, Minnesota, 1995-1999



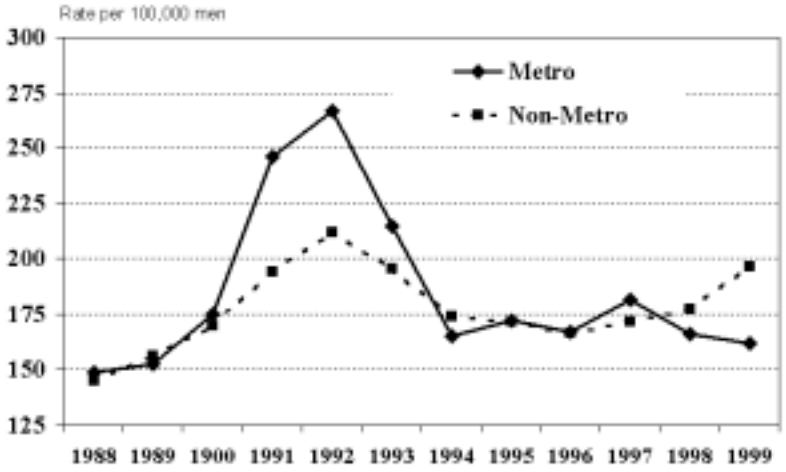
* Regional rate is significantly ($P < 0.05$) different from statewide rate.

Figure II-22: Colon and Rectum Cancer Incidence among Whites by Region, Minnesota, 1995-1999



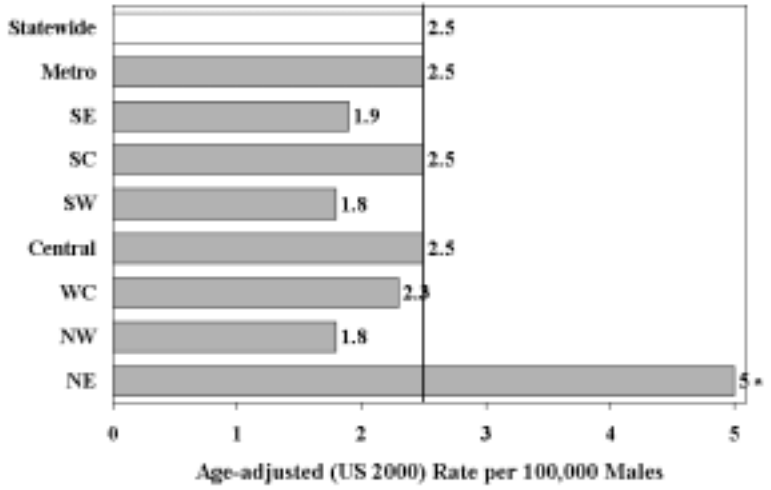
* Regional rate is significantly ($P < 0.05$) different from statewide rate.

Figure II-23: Prostate Cancer Incidence Trends among Whites by Region, Minnesota, 1995-1999



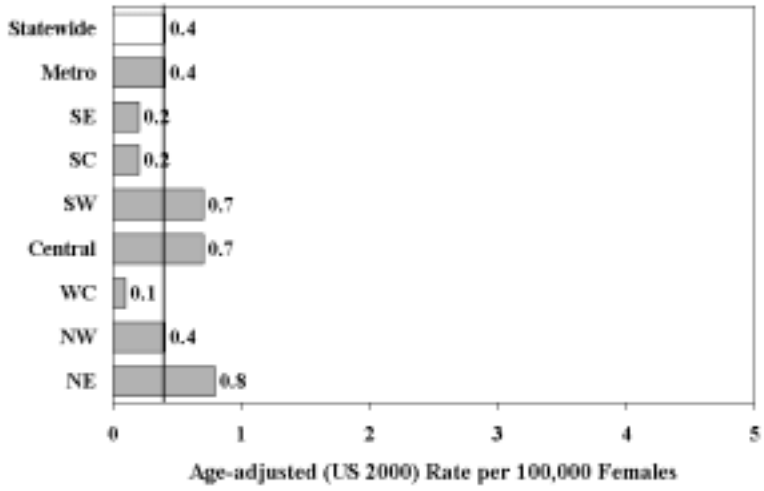
All rates are age-adjusted to the US 2000 population.

Figure II-24: Mesothelioma Incidence among White Males by Region, Minnesota, 1995-1999



* Regional rate is significantly ($P < 0.05$) different from statewide rate.

Figure II-25: Mesothelioma Incidence among White Females by Region, Minnesota, 1995-1999



* Regional rate is significantly ($P < 0.05$) different from statewide rate.

Chapter III:

Summary of Data for Specific Cancers

Chapter III: Summary of Data for Specific Cancers

This chapter provides detailed information on the most common cancers, using cases reported to the Minnesota Cancer Surveillance System (MCSS) and deaths reported to the Minnesota Center for Health Statistics. For comparison, incidence rates from the National Cancer Institute's Surveillance, Epidemiology, and End Results (SEER) cancer registry and mortality rates for the U.S. are provided.

Cancer Rates

Incidence data

The MCSS collects information on all microscopically confirmed invasive and *in situ* tumors diagnosed in Minnesota residents, with the exception of basal and squamous cell carcinomas of non-genital skin sites and *in situ* cancers of the cervix. Starting in 1995, cancers reported on death certificates that could not be identified from another source, including pathology reports (Death Certificate Only cases), were also included on the MCSS. These cases account for approximately 1.5 percent of cancers in the MCSS.

In most tables in this section, only invasive cancers are included in incidence data, with the exception of *in situ* bladder cancers. *In situ* bladder cancers are included in data on invasive bladder cancers and in data on all cancers sites combined because the distinction between *in situ* and invasive bladder cancers is often unclear, and some *in situ* bladder cancers can be life-threatening. *In situ* cancers for other sites are only included in tables showing the stage distribution of that site.

Age-adjustment

Age-adjustment is a statistical method that minimizes differences in rates that would occur solely because the populations being compared do not have the same age distributions. Because cancer occurs more frequently with increasing age, a population with a larger proportion of elderly individuals will have more cancers occur than a younger population of the same size, even if cancer rates at any given age are exactly the same in the two groups. Age-adjustment produces a hypothetical summary rate, the rate that would occur if the group had the age distribution of a "standard" population. If cancer rates among groups being compared are age-adjusted to the same standard population, rates will not be biased by differences in age, and a determination of whether one group has a greater risk of developing or dying from cancer will be more meaningful.

All rates presented in this report were directly age-adjusted to the 2000 U.S. standard population, given in Appendix E. Cancer rates presented in previous MCSS biennial reports were adjusted to the 1970 U.S. population. The change was mandated by the federal Office of Management and Budget, and has been widely adopted by cancer registries in the U.S., including SEER. Using the 2000 U.S. standard increases the absolute value of the rate, and therefore, rates in this report cannot be compared to those in earlier MCSS reports or to data from organizations using other standards. A fuller discussion of these issues can be found in the newsletter "MCSS Notes," Volume 15, Number 1 (July 2002), available on request.

Comparisons to SEER

SEER has been collecting population-based cancer data from selected geographic areas in the U.S. since 1973. Since a cancer registry covering the entire U.S. does not exist, SEER data on cancer occurrence are widely cited as national data. The SEER incidence rates presented in tables for comparison to Minnesota are for the original nine SEER cancer registries covering about 10 percent of the U.S. population.

When comparing Minnesota and SEER, it is important to recognize that the two populations differ in racial and ethnic composition, which will influence cancer incidence rates. During 1995-1999, the population in the original nine SEER registries was 78.5 percent white, while Minnesota's population was 93.4 percent white. In comparing Minnesota and SEER, it is therefore

most meaningful to compare rates among whites; this has been done in the text. Rates for whites in Minnesota and SEER are still not completely comparable, since Hispanics comprised about 1.6 percent of the Minnesota white population, and 10 percent of the white population in the nine SEER registries. For most cancers, this will tend to lower SEER cancer rates, since Hispanics tend to have lower cancer rates than non-Hispanic whites. It is not possible at this time to accurately identify Hispanics in the MCSS, since ethnicity is poorly reported on the medical record.

Another factor affecting the comparability of SEER and MCSS data is that rates reported by the SEER program include cases that were diagnosed based on clinical observations, while the MCSS does not currently collect information on those cases. During 1995-1999, 3.7 percent of invasive cancers in the nine SEER Registries were coded as clinical diagnoses. If all other factors were the same, one would therefore expect the overall cancer rate in Minnesota to be 3.7 percent lower than SEER simply because of the exclusion of these cases, and not because Minnesotans have a lower risk of cancer. However, there are several factors that indicate that excluding clinically diagnosed cancers from the SEER database may not make SEER and MCSS rates more comparable. First, the quality of health care in Minnesota is high, and the proportion of clinically diagnosed cancers that are sent to a laboratory for confirmation appears to be higher than in other geographic areas. Second, some cases that are originally reported to SEER based on clinical observations may eventually be confirmed microscopically, but the information not updated on the registry. And third, audits of MCSS operations have indicated that case ascertainment is extremely high. The MCSS began collecting clinically diagnosed cancers in 2002, and future analyses will evaluate the impact of this change in policy.

Nonetheless, certain types of cancer typically have a substantial proportion of clinical diagnoses, and Minnesota incidence rates may be artificially low for these sites. These include cancers of the liver (20% of cases reported as clinically diagnosed on the SEER database), pancreas (20%), brain (9%), kidney (8%), and lung (7%), and multiple myeloma (7%). For these sites, mortality rates should be used to compare SEER and Minnesota.

Race- and ethnic-specific rates

The ability of MCSS to evaluate race and ethnic differences in cancer risk in Minnesota is limited by several factors, as discussed in Chapter I. Despite these limitations, identifying race and ethnic disparities in cancer is an important function of the MCSS, and is important in developing policies and interventions directed at cancer control and overcoming these disparities. Data have therefore been aggregated over the 5-year period 1995-1999 when presented by race and ethnicity, and rates based on fewer than ten cases or deaths are not presented. Nonetheless, the shortcomings discussed in Chapter I should be kept in mind when evaluating race and ethnic differences in cancer rates presented in this report.

Other Cancer Statistics

The *median age at diagnosis or death* is the midpoint of the age distribution of persons diagnosed with or dying from cancer in Minnesota during the 5-year period 1995-1999; that is, the age at which 50 percent of cancer cases or deaths are younger (or older).

The *lifetime risk* of being diagnosed with or dying from cancer was calculated using the software program DevCan, from SEER. It represents the estimated percentage of newborns in Minnesota in 1995-1999 who would develop cancer during their lifetimes, if cancer incidence and mortality rates and all cause mortality rates in the state do not change from those in 1995-1999.

The *annual percent change (APC)* is the average percent change each year in the age-adjusted rate from 1988 to 1999. For example, an APC of +1.8 percent means that the cancer rate increased, on average, by 1.8 percent per year over the 12-year period. Similarly, an APC of –2.3 percent means that the cancer rate decreased, on average, by 2.3 percent per year. The calculation of the APC assumes that the rate of change has been constant. For some cancers, such as prostate cancer, the rate

of change has not been constant, and the APC does not accurately reflect trends.

Stage at diagnosis is the extent to which the cancer has spread at the time of diagnosis. *In situ* cancers are the earliest stage, in which the cancer cells have not yet invaded the tissues of the organ in which they are growing. A localized tumor has invaded the tissue, but has not spread beyond the organ of origin. At the regional stage, the tumor has spread beyond the organ in which it began to adjacent tissues or lymph nodes. The latest stage tumors are distant, and have spread or metastasized to organs or tissues in other parts of the body.

Five-year relative survival rates are as reported by SEER for cases diagnosed in 1992-1998 and followed through the end of 1999. Five-year relative survival is the estimated proportion of persons who will be alive five years following diagnosis, after adjusting for expected mortality. For example, a 5-year relative survival rate of 80 percent means that 20 percent (100% - 80%) fewer persons were alive five years after diagnosis than would be expected, given mortality rates in persons of the same age, gender, and race.

All Cancer Sites Combined

Table III-1.1: Number of new cases and deaths and incidence and mortality rates§ by year, Minnesota, 1988-1999, All Cancer Sites Combined

Year of Diagnosis or Death	Incidence				Mortality			
	New Cases		Annual Rate		Deaths		Annual Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
1988	9,135	8,858	527.1	397.7	4,205	3,895	251.8	167.0
1989	9,332	8,594	533.1	382.1	4,220	3,789	252.5	160.5
1990	9,712	8,946	546.8	394.0	4,256	3,857	250.4	161.9
1991	10,684	8,981	590.5	391.8	4,361	4,014	253.2	165.2
1992	11,384	9,246	621.8	397.7	4,422	4,112	252.5	166.8
1993	10,643	9,217	568.8	392.2	4,317	4,088	242.9	162.9
1994	10,209	9,446	536.9	396.6	4,487	4,055	249.4	160.9
1995	10,460	9,605	544.0	398.3	4,463	4,209	244.0	164.5
1996	10,342	9,769	529.1	400.4	4,539	4,309	243.4	166.8
1997	10,794	10,102	546.5	408.6	4,556	4,178	240.5	158.9
1998	10,874	10,520	541.1	419.9	4,479	4,311	232.9	161.0
1999	11,353	10,654	556.6	419.9	4,574	4,301	233.1	158.9

Table III-1.2: Number of new cases and deaths and average annual incidence and mortality rates§ by age, Minnesota, 1995-1999, All Cancer Sites Combined

Age at Diagnosis or Death (years)	Incidence 1995-1999				Mortality 1995-1999			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
0 – 19	596	537	16.8	15.9	103	83	2.9	2.5
20 – 34	1,406	1,760	57.5	71.4	221	206	9.0	8.3
35 – 49	4,255	7,435	153.1	269.5	1,225	1,462	44.3	53.2
50 – 64	13,729	13,086	884.5	816.8	4,378	4,086	282.1	253.7
65 – 74	17,878	11,893	2651.6	1488.0	6,654	5,090	988.5	636.5
75 – 84	12,804	11,191	3143.6	1808.4	6,972	6,198	1714.3	992.2
85 and older	3,155	4,748	2735.4	1647.5	3,058	4,183	2651.3	1451.5

Table III-1.3: Number of new cases and deaths and average annual incidence and mortality rates§ by race and ethnicity, Minnesota, 1995-1999, All Cancer Sites Combined

Race and Ethnicity†	Incidence 1995-1999				Mortality 1995-1999			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
All Races	53,823	50,650	543.5	409.6	22,611	21,308	238.6	161.9
American Indian	257	236	494.7	317.8	146	136	308.9	204.2
Asian/Pacific Isl.	309	382	304.5	256.3	158	155	177.3	130.7
Black	899	640	687.0	388.6	408	300	377.2	210.5
White	51,730	48,871	537.6	407.7	21,890	20,706	236.9	161.1
White Hispanic	~	~	~	~	156	110	246.1	141.0

Source: All cases were either microscopically confirmed (1988-1999) or Death Certificate Only (1995-1999) and were reported to the MCSS by October 2002. Excludes *in situ* cancers except *in situ* bladder cancers. Deaths are from the Minnesota Center for Health Statistics, and include all deaths with the specified cancer as the underlying cause of death during the time period, regardless of year of diagnosis. All rates were calculated by MCSS.

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.
† White includes persons of Hispanic ethnicity. Persons reported with unknown or other race are included in all races combined, but are excluded from race-specific data. See text for comments on the accuracy of race- and ethnic-specific cancer rates.
~ Hispanic incidence data are not available. Race-specific rates based on fewer than 10 cases or deaths are not presented.

All Cancer Sites Combined

Table III-1.4: Other Minnesota statistics,† All Cancer Sites Combined

	Males	Females
Median Age at Diagnosis	69.0	67.0
Median Age at Death	73.0	74.0
Lifetime Risk of Diagnosis	51.6%	44.7%
Lifetime Risk of Death	24.4%	21.2%
Annual Percent Change‡		
Incidence 1988-1999	-0.2%	**0.7%**
Mortality 1988-1999	**-0.8%**	-0.2%

† See introduction for definition of terms.
‡ The average *annual percent change* in the age-adjusted rate over the time period. Statistically significant ($P < 0.05$) trends are in **bold.**

Table III-1.5: Average annual incidence and mortality rates§ in the United States, 1995-1999, All Cancer Sites Combined

	Males	Females
Incidence		
All Races	562.6	424.1
White†	560.1	433.5
Mortality		
All Races	259.1	171.4
White†	253.0	169.8

Source: *SEER Cancer Statistics Review, 1973-1999.* Incidence data represent 10% of the U.S. population, while mortality data are for the entire nation.
§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.
† All white persons, including those of Hispanic ethnicity.

Table III-1.6: Causes of death, Minnesota, 1995-1999

Rank	Cause of Death	Deaths per Year*	% Deaths
1	Heart Disease	9,760	26.1
2	Cancer	8,785	23.5
3	Cerebrovascular Disease	2,990	8.0
4	Accidents/Suicide/Homicide	2,320	6.2
5	Chronic Lung Disease	1,740	4.7
6	Pneumonia and Flu	1,310	3.5
7	Diabetes	1,070	2.9
8	Alzheimer's Disease	590	1.6
9	Other Infections	510	1.4
10	Other Causes	8,340	22.3
	Total Deaths	37,415	100.0

* Average, rounded to nearest 5.

Descriptive Epidemiology

Incidence and Mortality: Cancer is very common, even after excluding cancers that are rarely life threatening, such as basal and squamous cell carcinomas of the skin and most *in situ* cancers. Based on current rates, nearly one out of two Minnesotans will be diagnosed with a potentially serious cancer during his or her lifetime. Although heart disease is still more common, one in four Minnesotans die of cancer. Cancer rates in Minnesota are about five percent lower than reported nationally, primarily due to lower rates of cancers caused by tobacco.

Trends: The overall cancer incidence rate in Minnesota increased sharply among men from 1988 to 1992, and then decreased. The temporary increase was primarily due to increases in the diagnosis of prostate cancer following the widespread adoption of a new, highly sensitive screening test. The incidence rate among women, on the other hand, rose significantly by 0.7 percent per year, for a total increase of nearly eight percent over the twelve-year period. This was largely due to substantial increases in lung cancer incidence and modest increases in breast cancer incidence. The cancer mortality rate declined among both men and women, but more sharply among men. For women, continuing increases in lung cancer mortality largely offset decreasing mortality rates for other sites, including breast cancer. The trends seen in Minnesota are similar to those reported for the rest of the nation.

Even though the overall cancer mortality rate is declining, the number of persons dying of cancer is increasing. This apparent contradiction results from the fact that the population, especially the elderly among whom cancer mortality rates are the highest, is growing at a faster rate than the cancer mortality rate is decreasing. This means the burden of cancer, both in Minnesota and nationally, will continue to increase for the foreseeable future.

Age: The likelihood of being diagnosed with cancer increases with age. Approximately 60 percent of cancers in Minnesota occur among persons age 65 years and older, and nearly 75 percent of cancer deaths are in this age group. However, as discussed in the sections which follow, the age at which cancer is most likely to occur depends on the type of cancer.

Gender: The overall cancer incidence rate in Minnesota is 33 percent higher among men than women. Men are at greater risk than women for developing most types of

All Cancer Sites Combined

cancer; the only common cancers that occur more frequently among women are those of the breast, gallbladder, and thyroid. The overall cancer mortality rate in Minnesota is 47 percent higher among men than women. The gender differences in Minnesota are similar to those reported for the nation.

Race: Cancer risk varies by race and ethnicity. The overall cancer incidence rate in Minnesota is highest among black males, followed by white males, and is somewhat higher among white women than black women (Figures II-4 and II-5). This is consistent with what is seen nationally, and for each of these race/gender groups, overall cancer incidence is lower in Minnesota than nationally. However, cancer incidence among American Indians is more than 50 percent higher in Minnesota than in the geographic areas covered by SEER, where the majority of American Indians are from the Southwest. On the other hand, rates among Asian/Pacific Islanders are about 20 percent lower in Minnesota than reported by SEER, where the majority of Asian/Pacific Islanders are from California and the Pacific Northwest. In Minnesota, Asian/Pacific Islanders have the lowest cancer rates; in SEER, American Indians have the lowest rates. The reasons for these differences are not clear.

Risk Factors

Cancer deaths in the United States are thought to be caused by:

- Tobacco use (approximately 30%);
- Diet and obesity in adults (another 30%). A diet that reduces cancer risk is high in fruits and vegetables, high in legumes and grains (including bread, pasta, and cereals), and low in red meat, salt, and saturated animal fat;
- Sedentary lifestyle, occupational factors, a family history of cancer, infectious agents, and prenatal factors and growth (about 5% each);
- Reproductive factors, socioeconomic status, and alcohol (about 3% each);
- Environmental pollution and ionizing and ultraviolet radiation (about 2% each);
- Prescription drugs and medical procedures (about 1%); and
- Salt and other food additives or contaminants (about 1%).

Early Detection/Prevention

Cancers detected at an early stage of development are more likely to be cured. However, there are relatively few types of cancer for which screening has been shown to be effective in reducing mortality among asymptomatic persons with an average risk of developing the cancer, and not all organizations are in agreement about screening recommendations. The U.S. Preventive Services Task Force (http://www.ahcpr.gov/clinic/uspstfix.htm), an independent panel of experts, recommends routine screening for cancers of the colon and rectum, female breast, and cervix. The American Cancer Society (ACS) (http://www.cancer.org) also recommends having a cancer-related checkup every three years from ages 20-39, and annually after age 40, and suggests that men age 50 and older should discuss screening for prostate cancer with their physician. Recommended screening ages and intervals can be found on the ACS web site. Information can also be obtained from the National Cancer Institute's Cancer Information Service at http://cis.nih.nci.gov or by calling 1-800-4-CANCER.

Prompt reporting of symptoms may also lead to earlier diagnosis of cancer. The resources above also provide information on the early warning signs of cancer.

Table III-2.1: Number of new cases and deaths and incidence and mortality rates§ by year, Minnesota, 1988-1999, Cancers among Children less than 15 Years Old

Year of Diagnosis or Death	Incidence				Mortality			
	New Cases		Annual Rate		Deaths		Annual Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
1988	95	70	18.8	14.5	19	10	3.7	2.1
1989	91	74	17.9	15.4	17	12	3.3	2.4
1990	93	68	17.9	13.6	15	12	2.9	2.5
1991	80	70	15.3	14.0	16	13	3.1	2.6
1992	80	65	15.2	12.9	12	13	2.3	2.6
1993	85	66	16.1	13.1	12	10	2.3	2.0
1994	98	75	18.5	14.9	12	13	2.3	2.6
1995	84	58	15.9	11.7	15	9	2.8	1.8
1996	89	68	17.0	13.6	19	7	3.6	1.4
1997	78	71	14.9	14.3	15	13	2.9	2.6
1998	90	69	17.2	13.8	9	12	1.7	2.4
1999	74	70	13.9	13.8	12	7	2.3	1.4

Table III-2.2: Number of new cases and deaths and average annual incidence and mortality rates§ by age, Minnesota, 1995-1999, Cancers among Children less than 15 Years Old

Age at Diagnosis or Death (years)	Incidence 1995-1999				Mortality 1995-1999			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
0 – 4	160	165	19.7	21.2	22	23	2.7	3.0
5 – 9	126	72	14.2	8.6	30	14	3.4	1.7
10 – 14	129	99	13.6	11.0	18	11	1.9	1.2

Table III-2.3: Number of new cases and deaths and average annual incidence and mortality rates§ by race and ethnicity, Minnesota, 1995-1999, Cancers among Children less than 15 Years Old

Race and Ethnicity†	Incidence 1995-1999				Mortality 1995-1999			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
All Races	415	336	15.8	13.4	70	48	2.7	1.9
American Indian	4	3	~	~	0	0	~	~
Asian/Pacific Isl.	11	17	10.3	15.2	3	3	~	~
Black	21	12	18.6	10.9	2	5	~	~
White	372	294	15.8	13.2	65	40	2.8	1.8
White Hispanic	~	~	~	~	2	2	~	~

Source: All cases were either microscopically confirmed (1988-1999) or Death Certificate Only (1995-1999) and were reported to the MCSS by October 2002. Excludes *in situ* cancers except *in situ* bladder cancers. Deaths are from the Minnesota Center for Health Statistics, and include all deaths with the specified cancer as the underlying cause of death during the time period, regardless of year of diagnosis. All rates were calculated by MCSS.

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.
† White includes persons of Hispanic ethnicity. Persons reported with unknown or other race are included in all races combined, but are excluded from race-specific data. See text for comments on the accuracy of race- and ethnic-specific cancer rates.
~ Hispanic incidence data are not available. Race-specific rates based on fewer than 10 cases or deaths are not presented.

Childhood Cancers

Table III-2.4: Number of new cases and deaths and average annual incidence and mortality rates§ by type of cancer, Minnesota, 1995-1999, Cancers among Children less than 15 Years Old

Cancer Type†	Incidence 1995-1999				Mortality 1995-1999			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
Bone and Joint	26	14	1.0	0.5	2	0	0.1	0.0
Brain	78	67	2.9	2.7	18	14	0.7	0.6
Hodgkin's Lymphoma	20	15	0.7	0.6	0	0	0.0	0.0
Kidney	15	26	0.6	1.1	2	2	0.1	0.1
Leukemia	132	80	5.1	3.2	26	17	1.0	0.7
Acute Lymphocytic	107	60	4.1	2.4	11	7	0.4	0.3
NHL	39	15	1.5	0.6	4	4	0.2	0.2
Soft Tissue	23	23	0.9	0.9	4	0	0.1	0.0

Source: All cases were either microscopically confirmed (1988-1999) or Death Certificate Only (1995-1999) and were reported to the MCSS by October 2002. Excludes *in situ* cancers except *in situ* bladder cancers. Deaths are from the Minnesota Center for Health Statistics, and include all deaths with the specified cancer as the underlying cause of death during the time period, regardless of year of diagnosis. All rates were calculated by MCSS.

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.
† Brain includes other nervous system; Kidney includes renal pelvis; NHL is non-Hodgkin's lymphoma.

Table III-2.5: Other Minnesota statistics,† Cancers among Children less than 15 Years Old

	Males	Females
Risk of Diagnosis by Age 15	0.24%	0.20%
Risk of Death by Age 15	0.04%	0.03%
Annual Percent Change‡		
Incidence 1988-1999	- 1.4%	- 0.5%
Mortality 1988-1999	- 3.0%	- 2.0%

† See introduction for definition of terms.
‡ The average *annual percent change* in the age-adjusted rate over the time period. Statistically significant ($P < 0.05$) trends are in **bold.**

Table III-2.6: Five-year relative survival, Cancers among Children less than 15 Years Old

Cancer Type	5-Year Relative Survival (%)‡
Bone and Joint	72.5
Brain and Other Nervous System	69.9
Hodgkin's Lymphoma	93.5
Leukemia	77.9
Acute Lymphocytic	85.3
Non-Hodgkin's Lymphoma	81.0
All Childhood Cancers	77.2

‡ Among SEER cases diagnosed 1992-1998 followed through 1999, from *SEER Cancer Statistics Review, 1973-1999.*

Table III-2.7: Average annual incidence and mortality rates§ in the United States, 1995-1999, Cancers among Children less than 15 Years Old

	Males	Females
Incidence‡		
All Childhood Cancers		
All Races	15.7	13.6
White†	16.0	14.1
Bone and Joint	0.8	0.6
Brain	3.5	2.8
Hodgkin's Lymphoma	0.7	0.6
Kidney	0.8	1.0
Leukemia	5.1	4.1
Acute Lymphocytic	4.1	3.2
NHL	1.3	0.4
Soft Tissue	1.0	1.0
Mortality		
All Races	2.9	2.4
White†	2.9	2.4

Source: *SEER Cancer Statistics Review, 1973-1999.* Incidence data represent 10% of the U.S. population, while mortality data are for the entire nation.

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.
† All white persons, including those of Hispanic ethnicity.
‡ Brain includes other nervous system; Kidney includes renal pelvis; NHL is non-Hodgkin's lymphoma.

Childhood Cancers

Descriptive Epidemiology

Incidence and Mortality: Each year, about 150 children under 15 years of age are diagnosed with cancer in Minnesota, and 25 children die of cancer each year. Of all cancers diagnosed in the state, 0.7 percent, or seven out of every 1,000, are in children. Based on current incidence and mortality rates in Minnesota, it is estimated that one of every 450 children will be diagnosed with cancer before age 15. Cancer is the leading cause of death from disease among children. Overall childhood incidence and mortality rates in Minnesota are very similar to what is reported nationally.

Cancer Types: The cancers diagnosed among children are different than those diagnosed among adults. While breast, prostate, colorectal, and lung cancer are the most common among adults, children with cancer are more likely to be diagnosed with leukemia (28% of childhood cancers), brain cancer (19%), or lymphomas (12%). The rates and distribution of specific cancer types among children in Minnesota are similar to what is seen nationally.

Trends: The overall childhood cancer incidence rate in Minnesota has been fairly stable since cancer reporting was implemented in 1988. The incidence rate of leukemia, the most common childhood cancer, decreased significantly by about three percent per year. The overall mortality rate for childhood cancers has been decreasing by about two to three percent per year in Minnesota, and the decline is statistically significant when data for both sexes are combined. Nationally, the childhood cancer incidence rate has been stable since 1987, and the mortality rate has decreased significantly by 2.6 percent per year since 1987, almost identical to decreases observed in Minnesota.

Nonetheless, long-term trends from SEER indicate that many types of childhood cancer became more common during the 1970s and 1980s. Incidence rates increased significantly from 1975-1986 for childhood cancers as a whole, bone and joint cancer, and leukemia. Despite these increases, the childhood cancer mortality rate in the U.S. has decreased by nearly 70 percent since 1950, reflecting major improvements in treatment and survival. The 5-year relative survival rate for childhood cancer increased from only 20 percent in 1950-1954 to nearly 80 percent in 1992-1998.

Age: The overall cancer incidence rate is nearly twice as high among children under five years of age compared to those five to 14 years old. However, the age distribution varies by cancer type.

Gender: Boys are somewhat more likely to develop childhood cancer than girls.

Race: There are too few cases of childhood cancer among children of color in Minnesota to meaningfully assess race differences in childhood cancer rates in the state. Based on cancers among children reported to the SEER program from 1995-1999, white children had the highest overall cancer rates (15.4 new cases per 100,000), followed by children of Asian/Pacific Islander origin (13.8), black children (11.6), and American Indian children (8.2). However, 5-year survival was poorer among black and American Indian children compared to white and Asian/Pacific Islander children for the most common cancers.

Risk Factors

Despite active research, the causes of most childhood cancers remain unknown. Although genetics and ionizing radiation have been associated with increased risk for certain childhood cancers, it is likely that these factors only account for a small percentage of cases. Burkitt's lymphoma, a form of non-Hodgkin's lymphoma that is common among children in Africa, has been associated with Epstein-Barr virus. Because childhood leukemia has sometimes been reported to cluster geographically and temporally, it too, has been suspected of being associated directly or indirectly with exposure to a virus. However, a viral agent has yet to be identified, and the theory remains controversial. Recent research funded by the National Cancer Institute has not found an association between childhood cancer and radon, ultrasound during pregnancy, residential magnetic field exposure from power lines, or specific occupational exposures of parents.

Early Detection/Prevention

There are no screening methods to detect cancer in asymptomatic children, and cancer is often difficult to diagnose in children until they are quite ill. Sudden, unexplained symptoms such as loss of energy, bruising, persistent localized pain or limping, rapid weight loss, or frequent headaches with vomiting should be brought to the attention of a physician.

Brain and Other Nervous System

Table III-3.1: Number of new cases and deaths and incidence and mortality rates§ by year, Minnesota, 1988-1999, Brain and Other Nervous System Cancer

Year of Diagnosis or Death	Incidence				Mortality			
	New Cases		Annual Rate		Deaths		Annual Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
1988	158	130	8.2	6.0	129	103	7.0	4.7
1989	146	115	7.4	5.1	100	94	5.4	4.3
1990	168	137	8.4	6.3	124	96	6.6	4.2
1991	165	124	8.3	5.6	119	100	6.5	4.4
1992	172	114	8.5	5.0	122	104	6.4	4.5
1993	170	135	8.4	5.9	126	120	6.5	5.1
1994	178	113	8.4	4.9	129	100	6.5	4.3
1995	172	128	7.9	5.5	114	103	5.7	4.4
1996	162	112	7.7	4.8	118	90	5.8	3.8
1997	164	135	7.5	5.6	119	96	5.8	3.9
1998	185	132	8.5	5.4	130	103	6.3	4.0
1999	198	147	8.9	6.1	139	104	6.5	4.2

Table III-3.2: Number of new cases and deaths and average annual incidence and mortality rates§ by age, Minnesota, 1995-1999, Brain and Other Nervous System Cancer

Age at Diagnosis or Death (years)	Incidence 1995-1999				Mortality 1995-1999			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
0 – 19	104	86	2.9	2.5	28	22	0.8	0.6
20 – 34	126	67	5.2	2.7	36	20	1.4	0.8
35 – 49	172	124	6.1	4.4	90	75	3.2	2.7
50 – 64	214	153	13.8	9.6	185	129	12.0	8.1
65 – 74	172	116	25.5	14.5	162	117	24.1	14.6
75 – 84	82	96	20.1	15.7	97	104	23.8	16.7
85 and older	11	12	9.5	4.2	22	29	19.1	10.1

Table III-3.3: Number of new cases and deaths and average annual incidence and mortality rates§ by race and ethnicity, Minnesota, 1995-1999, Brain and Other Nervous System Cancer

Race and Ethnicity†	Incidence 1995-1999				Mortality 1995-1999			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
All Races	881	654	8.1	5.5	620	496	6.0	4.1
American Indian	1	0	~	~	0	0	~	~
Asian/Pacific Isl.	7	4	~	~	3	0	~	~
Black	14	8	5.7	~	10	7	7.0	~
White	852	639	8.2	5.6	607	489	6.1	4.1
White Hispanic	~	~	~	~	3	2	~	~

Source: All cases were either microscopically confirmed (1988-1999) or Death Certificate Only (1995-1999) and were reported to the MCSS by October 2002. Includes invasive tumors only. Deaths are from the Minnesota Center for Health Statistics, and include all deaths with the specified cancer as the underlying cause of death during the time period, regardless of year of diagnosis. All rates were calculated by MCSS.

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.
† White includes persons of Hispanic ethnicity. Persons reported with unknown or other race are included in all races combined, but are excluded from race-specific data. See text for comments on the accuracy of race- and ethnic-specific cancer rates.
~ Hispanic incidence data are not available. Race-specific rates based on fewer than 10 cases or deaths are not presented.

Brain and Other Nervous System

Table III-3.4: Other Minnesota statistics,† Brain and Other Nervous System Cancer

	Males	Females
Median Age at Diagnosis	53.0	54.0
Median Age at Death	62.0	65.0
Lifetime Risk of Diagnosis	0.7%	0.5%
Lifetime Risk of Death	0.6%	0.4%
Annual Percent Change‡		
Incidence 1988-1999	0.3%	-0.3%
Mortality 1988-1999	-0.5%	-1.2%

† See introduction for definition of terms.
‡ The average *annual percent change* in the age-adjusted rate over the time period. Statistically significant ($P < 0.05$) trends are in **bold.**

Table III-3.5: Average annual incidence and mortality rates§ in the United States, 1995-1999 Brain and Other Nervous System Cancer

	Males	Females
Incidence		
All Races	8.0	5.4
White†	8.7	5.9
Mortality		
All Races	5.7	3.9
White†	6.1	4.2

Source: *SEER Cancer Statistics Review, 1973-1999.* Incidence data represent 10% of the U.S. population, while mortality data are for the entire nation.
§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.
† All white persons, including those of Hispanic ethnicity.

Table III-3.6: Distribution of Brain and Other Nervous System Cancer cell types, Minnesota, 1995-1999

Cell Type	(Histology Codes)*	Cases	%
Glioblastoma	(9440-9442)	618	40.3
Astrocytoma (all)	(9400,9401, 9410,9411, 9420,9421, 9423-9430)	430	28.0
Oligodendroglioma	(9450,9451,9460)	207	13.5
Ependymoma	(9391-9394)	62	4.0
Mixed glioma	(9382)	50	3.3
Medulloblastoma	(9470-9472)	40	2.6
Other glioma	(9380,9381)	20	1.3
All Others		108	7.0
Total		1,535	100.0

* International Classification of Diseases for Oncology, 2nd edition.

Descriptive Epidemiology

Incidence and Mortality: Approximately 300 cases of invasive brain and other nervous system cancer are diagnosed in Minnesota each year, and 225 deaths are caused by these cancers. They account for 1.5 percent of all new cancers diagnosed and 2.5 percent of cancer deaths in the state. Mortality rates in Minnesota are similar to those for the U.S. Based on SEER data, the 5-year relative survival for brain cancers diagnosed between 1992 and 1998 was 32.2 percent, but was considerably higher among children (70%).
Trends: Rates of invasive brain and other nervous system cancers in Minnesota have been stable or declining slightly since cancer reporting was implemented in 1988. This is consistent with national trends, which show that incidence rates increased steadily from 1973 to 1987 and then stabilized, while mortality rates generally increased through 1991 and then began declining somewhat.
Age: Incidence rates for brain and nervous system cancers increase only modestly with age. Unlike most cancers, the majority are diagnosed among persons less than 65 years of age. Approximately 12 percent of diagnoses are among those less than 20 years of age, and 56 percent are diagnosed between ages 20 and 64.
Gender: Brain and nervous system cancers are about 50 percent more common among males than females.
Race: There are too few cases of brain cancer in Minnesota among persons of color to assess racial disparities. National data indicate that whites are at greater risk of developing and dying from these cancers than persons from other racial/ethnic groups.

Risk Factors

The causes of most brain cancers are unknown. Ionizing radiation is the only well-established environmental risk factor for brain and nervous system cancers. Cell phone use has been studied as a possible risk factor, but has not been confirmed by the most recent studies. Occupational exposure to vinyl chloride and exposure to electromagnetic fields have been proposed as potential risk factors for brain cancer, but research is not conclusive.

Early Detection/Prevention

Brain cancer is usually detected once it becomes symptomatic. There are no tests to detect brain cancer early before symptoms develop. In most cases, early detection is less important than the type and location of the tumor.

Breast

Table III-4.1: Number of new cases and deaths and incidence and mortality rates§ by year, Minnesota, 1988-1999, Breast Cancer

Year of Diagnosis or Death	Incidence				Mortality			
	New Cases		Annual Rate		Deaths		Annual Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
1988	16	2,860	0.9	132.3	6	765	0.4	34.3
1989	13	2,774	0.7	127.3	5	716	0.3	32.0
1990	15	2,908	0.9	132.4	2	746	0.1	32.8
1991	18	2,925	1.0	131.2	6	786	0.4	33.9
1992	12	2,947	0.6	131.1	3	726	0.2	30.5
1993	15	3,022	0.8	132.2	5	732	0.3	30.2
1994	24	2,977	1.3	128.0	9	708	0.5	29.1
1995	24	3,167	1.3	135.0	4	773	0.2	31.3
1996	19	3,154	1.0	131.9	7	725	0.4	28.9
1997	17	3,240	0.9	133.9	11	678	0.6	26.4
1998	23	3,512	1.2	142.4	5	720	0.2	27.3
1999	20	3,503	1.0	140.7	4	670	0.2	25.3

Table III-4.2: Number of new cases and deaths and average annual incidence and mortality rates§ by age, Minnesota, 1995-1999, Breast Cancer

Age at Diagnosis or Death (years)	Incidence 1995-1999				Mortality 1995-1999			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
0 – 19	0	0	0.0	0.0	0	0	0.0	0.0
20 – 34	0	291	0.0	11.5	0	43	0.0	1.7
35 – 49	10	3,281	0.4	119.4	3	478	0.1	17.4
50 – 64	27	5,111	1.8	320.0	7	854	0.5	53.2
65 – 74	27	3,567	4.0	446.3	10	723	1.5	90.4
75 – 84	28	3,083	6.9	499.3	9	827	2.2	132.6
85 and older	11	1,243	9.5	431.3	2	641	1.7	222.4

Table III-4.3: Number of new cases and deaths and average annual incidence and mortality rates§ by race and ethnicity, Minnesota, 1995-1999, Breast Cancer

Race and Ethnicity†	Incidence 1995-1999				Mortality 1995-1999			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
All Races	103	16,576	1.1	136.9	31	3,566	0.3	27.8
American Indian	0	44	~	55.5	0	16	~	23.2
Asian/Pacific Isl.	0	105	~	70.3	0	21	~	15.3
Black	4	194	~	109.7	0	64	~	38.7
White	98	16,086	1.1	137.2	31	3,463	0.3	27.7
White Hispanic	~	~	~	~	0	20	~	24.1

Source: All cases were either microscopically confirmed (1988-1999) or Death Certificate Only (1995-1999) and were reported to the MCSS by October 2002. Excludes *in situ* cancers except *in situ* bladder cancers. Deaths are from the Minnesota Center for Health Statistics, and include all deaths with the specified cancer as the underlying cause of death during the time period, regardless of year of diagnosis. All rates were calculated by MCSS.

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.
† White includes persons of Hispanic ethnicity. Persons reported with unknown or other race are included in all races combined, but are excluded from race-specific data. See text for comments on the accuracy of race- and ethnic-specific cancer rates.
~ Hispanic incidence data are not available. Race-specific rates based on fewer than 10 cases or deaths are not presented.

Breast

Table III-4.4: Other Minnesota statistics,† Breast Cancer

	Males	Females
Median Age at Diagnosis	72.0	63.0
Median Age at Death	72.0	71.0
Lifetime Risk of Diagnosis	0.1%	14.4%
Lifetime Risk of Death	<0.1%	3.4%
Annual Percent Change‡		
Incidence 1988-1999	2.8%	**0.7%**
Mortality 1988-1999	2.2%	**-2.4%**

† See introduction for definition of terms.
‡ The average *annual percent change* in the age-adjusted rate over the time period. Statistically significant ($P < 0.05$) trends are in **bold.**

Table III-4.5: Average annual incidence and mortality rates§ in the United States, 1995-1999, Breast Cancer

	Males	Females
Incidence		
All Races	1.1	136.7
White†	1.1	140.9
Mortality		
All Races	0.3	28.8
White†	0.3	28.2

Source: *SEER Cancer Statistics Review, 1973-1999.* Incidence data represent 10% of the U.S. population, while mortality data are for the entire nation.
§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.
† All white persons, including those of Hispanic ethnicity.

Table III-4.6: Extent of disease at diagnosis and 5-year relative survival, Breast Cancer

Stage at Diagnosis	Percent of Cases†(%)	5-Year Relative Survival‡ (%)
In Situ	13.8	-
Localized	57.0	96.8
Regional	24.0	78.4
Distant	3.2	22.5
Unknown	2.0	55.2

† Among Minnesota cases diagnosed 1995-1999.
‡ Among SEER cases diagnosed 1992-1998 followed through 1999, from *SEER Cancer Statistics Review, 1973-1999.*

Descriptive Epidemiology

Incidence and Mortality: Approximately 3,300 invasive breast cancers are diagnosed in Minnesota each year and 710 deaths are caused by this cancer. It accounts for 30 percent of cancers and 17 percent of cancer deaths among women in this state. Incidence rates in Minnesota are similar to those reported by SEER, and mortality rates are slightly lower than in the U.S.

Trends: The invasive breast cancer incidence rate among Minnesota women increased significantly by 0.7 percent per year from 1988 to 1999, while the mortality rate decreased significantly by 2.4 percent per year. This is similar to national trends. Incidence rates may continue to increase as women born after World War II, who have a higher prevalence of known risk factors for breast cancer than the previous generation, reach an age where breast cancer becomes more common. The sharp decrease in mortality has resulted from a combination of increased breast cancer screening with mammography and improvement in the medical management of this disease.

Age: Breast cancer risk increases with age. Most cases are diagnosed after age 50 years.

Gender: Male breast cancer is relatively rare.

Race: White women have the highest incidence rate. Although the incidence rate is 25 percent lower among black compared to white women, their mortality rate is 40 percent higher. The breast cancer incidence rate among American Indian women is less than half that of white women in Minnesota, but their mortality rate is only 20 percent lower. This indicates that there are marked disparities in survival from breast cancer.

Risk Factors

Cumulative exposure of the breast tissue to estrogen is a strong predictor of risk. Therefore, early age at menarche, late onset of menopause, late childbearing, and having fewer children increase risk. Recent studies have indicated that use of hormone replacement therapy increases risk for breast cancer, while use of tamoxifen, an antiestrogen, reduces risk among high-risk women. Other risk factors include benign breast disease with atypical hyperplasia, obesity, alcohol consumption, physical inactivity, and higher socioeconomic status. Family history, especially of premenopausal breast cancer, is strongly associated with increased breast cancer risk. Mutations in the BRCA1 or BRCA2 gene are specific inherited risk factors. Known risk factors account for only 30 to 50 percent of breast cancers.

Early Detection/Prevention

In 2002, the U.S. Preventive Services Task Force endorsed mammography every 1-2 years for women ages 40 years and over. Screening mammography improves the likelihood for early diagnosis, increases treatment options, and improves overall survival.

Cervix Uteri

Table III-5.1: Number of new cases and deaths and incidence and mortality rates§ by year, Minnesota, 1988-1999, Cervix Uteri Cancer

Year of Diagnosis or Death	Incidence				Mortality			
	New Cases		Annual Rate		Deaths		Annual Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
1988	-	213	-	9.9	-	46	-	2.1
1989	-	204	-	9.3	-	43	-	1.9
1990	-	248	-	11.1	-	51	-	2.4
1991	-	202	-	9.2	-	41	-	1.8
1992	-	169	-	7.4	-	44	-	1.9
1993	-	199	-	8.8	-	36	-	1.5
1994	-	205	-	9.0	-	46	-	2.0
1995	-	200	-	8.5	-	51	-	2.2
1996	-	201	-	8.4	-	61	-	2.6
1997	-	176	-	7.4	-	45	-	1.8
1998	-	145	-	6.0	-	37	-	1.5
1999	-	177	-	7.2	-	49	-	2.0

Table III-5.2: Number of new cases and deaths and average annual incidence and mortality rates§ by age, Minnesota, 1995-1999, Cervix Uteri Cancer

Age at Diagnosis or Death (years)	Incidence 1995-1999				Mortality 1995-1999			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
0 – 19	-	1	-	0.0	-	0	-	0.0
20 – 34	-	173	-	7.0	-	13	-	0.5
35 – 49	-	360	-	12.9	-	63	-	2.3
50 – 64	-	181	-	11.4	-	71	-	4.5
65 – 74	-	92	-	11.5	-	41	-	5.1
75 – 84	-	65	-	10.3	-	35	-	5.5
85 and older	-	27	-	9.4	-	20	-	6.9

Table III-5.3: Number of new cases and deaths and average annual incidence and mortality rates§ by race and ethnicity, Minnesota, 1995-1999, Cervix Uteri Cancer

Race and Ethnicity†	Incidence 1995-1999				Mortality 1995-1999			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
All Races	-	899	-	7.5	-	243	-	2.0
American Indian	-	15	-	14.2	-	6	-	~
Asian/Pacific Isl.	-	23	-	15.2	-	17	-	11.7
Black	-	44	-	21.4	-	11	-	5.2
White	-	800	-	7.0	-	209	-	1.8
White Hispanic	-	~	-	~	-	6	-	~

Source: All cases were either microscopically confirmed (1988-1999) or Death Certificate Only (1995-1999) and were reported to the MCSS by October 2002. Excludes *in situ* cancers except *in situ* bladder cancers. Deaths are from the Minnesota Center for Health Statistics, and include all deaths with the specified cancer as the underlying cause of death during the time period, regardless of year of diagnosis. All rates were calculated by MCSS.

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.
† White includes persons of Hispanic ethnicity. Persons reported with unknown or other race are included in all races combined, but are excluded from race-specific data. See text for comments on the accuracy of race- and ethnic-specific cancer rates.
~ Hispanic incidence data are not available. Race-specific rates based on fewer than 10 cases or deaths are not presented.

Cervix Uteri

Table III-5.4: Other Minnesota statistics,† Cervix Uteri Cancer

	Males	Females
Median Age at Diagnosis	-	45.0
Median Age at Death	-	58.0
Lifetime Risk of Diagnosis	-	0.6%
Lifetime Risk of Death	-	0.2%
Annual Percent Change‡		
Incidence 1988-1999	-	**-3.5%**
Mortality 1988-1999	-	-0.6%

† See introduction for definition of terms.
‡ The average *annual percent change* in the age-adjusted rate over the time period. Statistically significant ($P < 0.05$) trends are in **bold.**

Table III-5.5: Average annual incidence and mortality rates§ in the United States, 1995-1999, Cervix Uteri Cancer

	Males	Females
Incidence		
All Races	-	9.0
White†	-	8.1
Mortality		
All Races	-	3.1
White†	-	2.8

Source: *SEER Cancer Statistics Review, 1973-1999.* Incidence data represent 10% of the U.S. population, while mortality data are for the entire nation.
§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.
† All white persons, including those of Hispanic ethnicity.

Table III-5.6: Extent of disease at diagnosis and 5-year relative survival, Cervix Uteri Cancer

Stage at Diagnosis	Percent of Cases†(%)	5-Year Relative Survival‡ (%)
In Situ	~	-
Localized	62.5	92.2
Regional	25.6	50.6
Distant	10.1	15.2
Unknown	1.8	52.0

† Among Minnesota cases diagnosed 1995-1999.
‡ Among SEER cases diagnosed 1992-1998 followed through 1999, from *SEER Cancer Statistics Review, 1973-1999.*
~ *In situ* cervical cancers are not collected.

Descriptive Epidemiology

Incidence and Mortality: Invasive cervical cancer accounts for approximately 1.8 percent of all new cancers diagnosed among Minnesota women. Each year, an average of 180 cases are diagnosed, and nearly 50 deaths occur. Incidence and mortality rates are somewhat lower than nationally.

Trends: The invasive cervical cancer incidence rate has decreased significantly by 3.5 percent per year in Minnesota since reporting was implemented in 1988. A slight but not statistically significant decrease was also observed in the mortality rate. Nationally, both incidence and mortality rates declined 40-50 percent since 1973. These declines are attributed to the widespread adoption of cervical cancer screening with the Pap test.
Age: The incidence rate for invasive cervical cancer increases with age beginning at age 20, and starts to decrease after age 50. Approximately 60 percent of diagnoses are among women less than 50 years of age. The median age at diagnosis for cervical cancer is one of the youngest of all common cancers.
Race: Cervical cancer incidence is highest among women of color, both in Minnesota and nationally. Although based on relatively small numbers of cases, women of color in Minnesota are two to three times more likely to be diagnosed with invasive cervical cancer than white women, and disparities in the mortality rate may be even greater. Women of color are also less likely than white women to be diagnosed before the cancer has spread to lymph nodes or other organs.

Risk Factors

Up to 95 percent of cervical cancers are caused by the human papilloma virus (HPV), a sexually transmitted infection. HPV infections appear to be very common, usually regressing without any symptoms. However, in a small percentage of women the infection becomes persistent, and abnormalities develop that can eventually become malignant. Because Pap tests can identify lesions in a premalignant stage when they can be removed with minimally invasive procedures, any factors interfering with routine screening, such as low socioeconomic status and lack of access to medical care, increase risk for this cancer.

Early Detection/Prevention

Efforts to develop a vaccine for the most common HPV strain appear to be meeting with success, but it is unlikely that a vaccine will be available for several more years. Although cervical cancer is relatively uncommon in the U.S., a vaccine would save millions of lives worldwide. Cervical cancer can be prevented through screening with the Pap test. The U.S. Preventive Services Task Force issued guidelines in January 2003 recommending that women should receive regular Pap tests starting at age 21 or within three years of the onset of sexual activity, whichever comes first.

Colon and Rectum

Table III-6.1: Number of new cases and deaths and incidence and mortality rates§ by year, Minnesota, 1988-1999, Colon and Rectum Cancer

Year of Diagnosis or Death	Incidence				Mortality			
	New Cases		Annual Rate		Deaths		Annual Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
1988	1,254	1,233	73.9	52.0	507	482	31.0	19.6
1989	1,289	1,180	75.3	48.9	515	518	30.9	20.6
1990	1,221	1,230	70.6	50.5	497	462	29.4	18.4
1991	1,231	1,217	69.9	49.7	482	496	28.6	19.3
1992	1,289	1,181	72.5	47.7	464	522	27.4	20.1
1993	1,176	1,175	64.4	46.7	416	473	23.6	17.7
1994	1,180	1,192	63.3	46.6	446	432	24.9	15.9
1995	1,243	1,179	66.3	45.5	470	517	25.7	18.8
1996	1,119	1,181	58.6	45.6	454	461	24.6	16.6
1997	1,249	1,259	65.0	47.9	466	461	24.9	16.6
1998	1,217	1,307	61.8	49.3	462	497	24.3	17.6
1999	1,257	1,226	62.8	45.4	426	475	22.1	16.8

Table III-6.2: Number of new cases and deaths and average annual incidence and mortality rates§ by age, Minnesota, 1995-1999, Colon and Rectum Cancer

Age at Diagnosis or Death (years)	Incidence 1995-1999				Mortality 1995-1999			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
0 – 19	3	5	0.1	0.1	0	1	0.0	0.0
20 – 34	52	37	2.1	1.5	12	6	0.5	0.2
35 – 49	416	348	15.1	12.7	103	93	3.7	3.4
50 – 64	1,531	1,112	98.7	68.9	478	319	30.8	19.7
65 – 74	1,850	1,523	274.8	190.4	616	498	91.4	62.3
75 – 84	1,670	2,058	410.4	330.0	700	751	172.1	119.5
85 and older	563	1,069	488.1	370.9	369	743	319.9	257.8

Table III-6.3: Number of new cases and deaths and average annual incidence and mortality rates§ by race and ethnicity, Minnesota, 1995-1999, Colon and Rectum Cancer

Race and Ethnicity†	Incidence 1995-1999				Mortality 1995-1999			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
All Races	6,085	6,152	62.9	46.8	2,278	2,411	24.3	17.3
American Indian	35	30	69.3	48.3	19	18	36.3	29.9
Asian/Pacific Isl.	32	33	28.0	21.8	12	10	12.6	8.3
Black	92	65	82.2	44.7	31	24	31.3	17.5
White	5,893	5,984	62.5	46.5	2,216	2,358	24.2	17.2
White Hispanic	~	~	~	~	13	8	23.0	~

Source: All cases were either microscopically confirmed (1988-1999) or Death Certificate Only (1995-1999) and were reported to the MCSS by October 2002. Excludes *in situ* cancers except *in situ* bladder cancers. Deaths are from the Minnesota Center for Health Statistics, and include all deaths with the specified cancer as the underlying cause of death during the time period, regardless of year of diagnosis. All rates were calculated by MCSS.

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.
† White includes persons of Hispanic ethnicity. Persons reported with unknown or other race are included in all races combined, but are excluded from race-specific data. See text for comments on the accuracy of race- and ethnic-specific cancer rates.
~ Hispanic incidence data are not available. Race-specific rates based on fewer than 10 cases or deaths are not presented.

Table III-6.4: Other Minnesota statistics,† Colon and Rectum Cancer

	Males	Females
Median Age at Diagnosis	71.0	75.0
Median Age at Death	74.0	79.0
Lifetime Risk of Diagnosis	6.1%	5.9%
Lifetime Risk of Death	2.5%	2.5%
Annual Percent Change‡		
Incidence 1988-1999	**-1.8%**	**-0.8%**
Mortality 1988-1999	**-2.7%**	**-1.7%**

† See introduction for definition of terms.
‡ The average *annual percent change* in the age-adjusted rate over the time period. Statistically significant ($P < 0.05$) trends are in **bold.**

Table III-6.5: Average annual incidence and mortality rates§ in the United States, 1995-1999, Colon and Rectum Cancer

	Males	Females
Incidence		
All Races	65.1	47.6
White†	65.0	47.1
Mortality		
All Races	26.3	18.5
White†	25.8	18.0

Source: *SEER Cancer Statistics Review, 1973-1999.* Incidence data represent 10% of the U.S. population, while mortality data are for the entire nation.
§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.
† All white persons, including those of Hispanic ethnicity.

Table III-6.6: Extent of disease at diagnosis and 5-year relative survival, Colon and Rectum Cancer

Stage at Diagnosis	Percent of Cases†(%)	5-Year Relative Survival‡ (%)
In Situ	7.3	-
Localized	32.4	90.1
Regional	41.9	65.2
Distant	14.7	8.8
Unknown	3.8	36.2

† Among Minnesota cases diagnosed 1995-1999.
‡ Among SEER cases diagnosed 1992-1998 followed through 1999, from *SEER Cancer Statistics Review, 1973-1999.*

Descriptive Epidemiology

Incidence and Mortality: About 2,500 cases of invasive colon and rectum cancer are diagnosed annually in Minnesota, and 900 deaths occur each year. Rates in Minnesota are slightly lower than national rates. Colorectal cancer kills more Minnesotans than breast or prostate cancer.

Trends: Colon and rectal cancer rates have declined sharply by 2 to 3 percent per year over the last decade in Minnesota and nationally. Data from SEER show that incidence rates were gradually increasing until the mid-1980s, but mortality rates started decreasing in the late 1970s. The reasons for these decreases are not fully understood. Colorectal cancer screening can identify and remove precancerous lesions, and so improved screening may decrease both incidence and mortality rates, and decrease mortality by identifying cancerous lesions at an earlier stage. Increased use of aspirin to prevent heart disease, and increased use of hormone replacement therapy by women may also have resulted in lower colorectal cancer rates.

Age: About 70 percent of diagnoses and 80 percent of deaths occur among persons 65 years and older.

Gender: Colorectal cancer rates are about 30 percent higher among men than women.

Race: In Minnesota, black males and American Indian males have the highest incidence and mortality rates, while Asian/Pacific Islanders have the lowest. In SEER data, American Indian men and women have lower rates of colorectal cancer than Asian/Pacific Islanders. This may reflect differences in dietary patterns and other lifestyle factors of American Indians and Asian/Pacific Islanders in Minnesota compared to persons of the same race in geographic areas covered by SEER.

Risk Factors

A family or personal history of colon and rectum cancer or adenomatous polyposis coli increases the likelihood of developing this disease. A personal history of irritable bowel disease or of breast or other reproductive cancers may also increase risk. The protective effects of physical activity, diets low in fat and high in fiber, antioxidants, and fruits and vegetables have been demonstrated in several studies. Aspirin use, calcium intake, and hormone replacement therapy may also reduce risk.

Early Detection/Prevention

Colorectal cancer screening is recommended for all persons starting at age 50 years, or earlier for persons at high risk. Several screening strategies are effective in reducing colorectal cancer mortality: 1) an annual fecal occult blood test (FOBT), **or** 2) flexible sigmoidoscopy (FS) every 5 years, **or** 3) a combination FOBT and FS, **or** 4) a double contrast barium enema every 5-10 years, **or** 5) a colonoscopy every 5 years. Despite a broad consensus on the value of colorectal cancer screening, less than half of age-eligible Minnesotans are screened.

Corpus Uteri

Table III-7.1: Number of new cases and deaths and incidence and mortality rates§ by year, Minnesota, 1988-1999, Corpus Uteri Cancer

Year of Diagnosis or Death	Incidence				Mortality			
	New Cases		Annual Rate		Deaths		Annual Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
1988	-	560	-	26.1	-	115	-	4.8
1989	-	550	-	25.5	-	96	-	4.0
1990	-	552	-	25.3	-	82	-	3.3
1991	-	588	-	27.0	-	117	-	4.8
1992	-	585	-	25.9	-	104	-	4.1
1993	-	588	-	25.6	-	97	-	3.8
1994	-	596	-	25.5	-	89	-	3.5
1995	-	638	-	27.4	-	99	-	3.9
1996	-	637	-	27.0	-	114	-	4.2
1997	-	646	-	26.8	-	96	-	3.5
1998	-	648	-	26.7	-	112	-	4.2
1999	-	673	-	27.2	-	122	-	4.6

Table III-7.2: Number of new cases and deaths and average annual incidence and mortality rates§ by age, Minnesota, 1995-1999, Corpus Uteri Cancer

Age at Diagnosis or Death (years)	Incidence 1995-1999				Mortality 1995-1999			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
0 – 19	-	1	-	0.0	-	0	-	0.0
20 – 34	-	37	-	1.5	-	2	-	0.1
35 – 49	-	391	-	14.3	-	20	-	0.7
50 – 64	-	1,163	-	72.6	-	104	-	6.4
65 – 74	-	822	-	102.9	-	129	-	16.1
75 – 84	-	635	-	103.2	-	174	-	28.1
85 and older	-	193	-	67.0	-	114	-	39.6

Table III-7.3: Number of new cases and deaths and average annual incidence and mortality rates§ by race and ethnicity, Minnesota, 1995-1999, Corpus Uteri Cancer

Race and Ethnicity†	Incidence 1995-1999				Mortality 1995-1999			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
All Races	-	3,242	-	27.0	-	543	-	4.1
American Indian	-	12	-	16.8	-	2	-	~
Asian/Pacific Isl.	-	16	-	11.6	-	3	-	~
Black	-	27	-	18.2	-	5	-	~
White	-	3,145	-	27.0	-	533	-	4.1
White Hispanic	-	~	-	~	-	6	-	~

Source: All cases were either microscopically confirmed (1988-1999) or Death Certificate Only (1995-1999) and were reported to the MCSS by October 2002. Excludes *in situ* cancers except *in situ* bladder cancers. Deaths are from the Minnesota Center for Health Statistics, and include all deaths with the specified cancer as the underlying cause of death during the time period, regardless of year of diagnosis. All rates were calculated by MCSS.

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.
† White includes persons of Hispanic ethnicity. Persons reported with unknown or other race are included in all races combined, but are excluded from race-specific data. See text for comments on the accuracy of race- and ethnic-specific cancer rates.
~ Hispanic incidence data are not available. Race-specific rates based on fewer than 10 cases or deaths are not presented.

Corpus Uteri

Table III-7.4: Other Minnesota statistics,† Corpus Uteri Cancer

	Males	Females
Median Age at Diagnosis	-	65.0
Median Age at Death	-	75.0
Lifetime Risk of Diagnosis	-	3.0%
Lifetime Risk of Death	-	0.6%
Annual Percent Change‡		
Incidence 1988-1999	-	**0.5%**
Mortality 1988-1999	-	-0.3%

† See introduction for definition of terms.
‡ The average *annual percent change* in the age-adjusted rate over the time period. Statistically significant ($P < 0.05$) trends are in **bold.**

Table III-7.5: Average annual incidence and mortality rates§ in the United States, 1995-1999, Corpus Uteri Cancer

	Males	Females
Incidence		
All Races	-	25.4
White†	-	26.5
Mortality		
All Races	-	4.1
White†	-	3.9

Source: *SEER Cancer Statistics Review, 1973-1999.* Incidence data represent 10% of the U.S. population, while mortality data are for the entire nation.
§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.
† All white persons, including those of Hispanic ethnicity.

Table III-7.6: Extent of disease at diagnosis and 5-year relative survival, Corpus Uteri Cancer

Stage at Diagnosis	Percent of Cases†(%)	5-Year Relative Survival‡ (%)
In Situ	2.7	-
Localized	75.4	96.1
Regional	11.2	63.5
Distant	7.8	26.1
Unknown	2.9	52.6

† Among Minnesota cases diagnosed 1995-1999.
‡ Among SEER cases diagnosed 1992-1998 followed through 1999, from *SEER Cancer Statistics Review, 1973-1999.*

Descriptive Epidemiology

Incidence and Mortality: Cancer of the corpus uteri, or uterus, is the fourth most commonly diagnosed cancer among women. It is sometimes referred to as endometrial cancer, since the cells of the lining of the uterus, or endometrium, are the most likely to become malignant. About 650 cases of uterine cancer are diagnosed each year among women in Minnesota, and about 110 women die from the disease. Rates in Minnesota are very similar to what is reported nationally. Five-year relative survival, estimated from SEER data, is 96.1 percent for localized tumors and nearly 65 percent for regional tumors. Most cases in Minnesota are localized. It should be noted that the risk of developing uterine cancer among women with a uterus is actually higher than rates reported for all women because the number of women who have had hysterectomies is unknown, and has, therefore, not been subtracted from the denominator for calculating rates.

Trends: A statistically significant increase in incidence of uterine cancer was observed in Minnesota since 1988, accompanied by a small but not statistically significant decrease in mortality. Similar trends were reported nationally. Long-term trends from SEER showed a marked increase in uterine cancer incidence rates in the early 1970s, caused by the widespread use of unopposed estrogen replacement therapy. When this was discovered and progesterone was added, rates dropped sharply.

Age: About 50 percent of diagnoses and 75 percent of deaths occur among women 65 years of age or older.

Race: In Minnesota, uterine cancer incidence rates are about 75 percent higher among white women than women of color, and race-specific incidence rates are similar to those reported by SEER. There are too few deaths due to uterine cancer among women of color in Minnesota to assess disparities. However, black women in the U.S. have the highest mortality rate, reflecting a marked disparity in survival between white and black women. Based on SEER data, the 5-year relative survival rate for uterine cancer is 86 percent for white women, and only 60.5 percent for black women.

Risk Factors

Exposure to a relative excess of estrogen over a lifetime increases risk for uterine cancer. Contributing factors include early age at menarche, late onset of menopause, history of infertility, and nulliparity. Increased production of endogenous estrogens due to estrogen-secreting ovarian tumors or polycystic ovarian syndrome also increases risk. Obesity, high body mass, and a high fat diet have been associated with an increased likelihood of developing uterine cancer.

Early Detection/Prevention

There are no proven screening methods for detecting asymptomatic uterine cancer. However, vaginal bleeding or other abnormal discharge after menopause is a warning sign and should be promptly reported to a physician.

Esophagus

Table III-8.1: Number of new cases and deaths and incidence and mortality rates§ by year, Minnesota, 1988-1999, Esophagus Cancer

Year of Diagnosis or Death	Incidence				Mortality			
	New Cases		Annual Rate		Deaths		Annual Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
1988	106	31	6.1	1.4	94	46	5.5	2.0
1989	110	50	6.1	2.1	129	31	7.6	1.2
1990	123	44	7.0	1.8	98	44	5.6	1.8
1991	106	37	5.9	1.5	129	41	7.2	1.6
1992	104	41	5.6	1.6	110	47	6.0	1.8
1993	118	29	6.3	1.2	116	29	6.3	1.2
1994	120	37	6.4	1.5	116	32	6.2	1.2
1995	139	51	7.2	2.0	155	40	8.1	1.6
1996	149	46	7.7	1.8	138	43	7.2	1.6
1997	142	47	7.2	1.7	145	46	7.4	1.6
1998	156	41	7.8	1.6	160	44	8.1	1.7
1999	175	55	8.6	2.0	140	40	7.0	1.4

Table III-8.2: Number of new cases and deaths and average annual incidence and mortality rates§ by age, Minnesota, 1995-1999, Esophagus Cancer

Age at Diagnosis or Death (years)	Incidence 1995-1999				Mortality 1995-1999			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
0 – 19	0	0	0.0	0.0	0	0	0.0	0.0
20 – 34	2	0	0.1	0.0	3	0	0.1	0.0
35 – 49	57	8	2.1	0.3	57	5	2.1	0.2
50 – 64	217	37	14.0	2.3	173	30	11.1	1.9
65 – 74	274	78	40.6	9.8	258	57	38.2	7.1
75 – 84	172	75	42.2	12.3	189	80	46.4	12.8
85 and older	39	42	33.8	14.6	58	41	50.3	14.2

Table III-8.3: Number of new cases and deaths and average annual incidence and mortality rates§ by race and ethnicity, Minnesota, 1995-1999, Esophagus Cancer

Race and Ethnicity†	Incidence 1995-1999				Mortality 1995-1999			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
All Races	761	240	7.7	1.8	738	213	7.6	1.6
American Indian	4	2	~	~	2	2	~	~
Asian/Pacific Isl.	2	2	~	~	2	0	~	~
Black	16	5	12.2	~	12	6	7.4	~
White	737	228	7.7	1.8	722	204	7.6	1.5
White Hispanic	~	~	~	~	2	3	~	~

Source: All cases were either microscopically confirmed (1988-1999) or Death Certificate Only (1995-1999) and were reported to the MCSS by October 2002. Excludes *in situ* cancers except *in situ* bladder cancers. Deaths are from the Minnesota Center for Health Statistics, and include all deaths with the specified cancer as the underlying cause of death during the time period, regardless of year of diagnosis. All rates were calculated by MCSS.

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.
† White includes persons of Hispanic ethnicity. Persons reported with unknown or other race are included in all races combined, but are excluded from race-specific data. See text for comments on the accuracy of race- and ethnic-specific cancer rates.
~ Hispanic incidence data are not available. Race-specific rates based on fewer than 10 cases or deaths are not presented.

Esophagus

Table III-8.4: Other Minnesota statistics,† Esophagus Cancer

	Males	Females
Median Age at Diagnosis	69.0	74.0
Median Age at Death	70.0	77.0
Lifetime Risk of Diagnosis	0.8%	0.2%
Lifetime Risk of Death	0.8%	0.2%
Annual Percent Change‡		
Incidence 1988-1999	**3.0%**	0.9%
Mortality 1988-1999	2.0%	-0.9%

† See introduction for definition of terms.
‡ The average *annual percent change* in the age-adjusted rate over the time period. Statistically significant ($P < 0.05$) trends are in **bold.**

Table III-8.5: Average annual incidence and mortality rates§ in the United States, 1995-1999, Esophagus Cancer

	Males	Females
Incidence		
All Races	7.9	2.1
White†	7.6	2.0
Mortality		
All Races	7.6	1.8
White†	7.2	1.7

Source: *SEER Cancer Statistics Review, 1973-1999.* Incidence data represent 10% of the U.S. population, while mortality data are for the entire nation.
§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.
† All white persons, including those of Hispanic ethnicity.

Table III-8.6: Extent of disease at diagnosis and 5-year relative survival, Esophagus Cancer

Stage at Diagnosis	Percent of Cases†(%)	5-Year Relative Survival‡ (%)
In Situ	2.8	-
Localized	28.3	27.1
Regional	29.1	12.6
Distant	23.7	2.2
Unknown	16.0	11.2

† Among Minnesota cases diagnosed 1995-1999.
‡ Among SEER cases diagnosed 1992-1998 followed through 1999, from *SEER Cancer Statistics Review, 1973-1999.*

Descriptive Epidemiology

Incidence and Mortality: In Minnesota, about 200 cases of esophageal cancer are diagnosed each year, and 200 deaths occur. Incidence rates in Minnesota are similar to those reported by SEER, and mortality rates are similar to those for the U.S. Based on SEER data, the 5-year relative survival rate for esophageal cancer is less than 30 percent, even when diagnosed at the localized stage. In Minnesota, most esophageal cancers are diagnosed when the tumor has already spread to adjacent tissues (29.1%) or distant (23.7%) organs.

Trends: The incidence rate among Minnesota males has significantly increased by an average of 3 percent per year since cancer reporting was initiated in 1988, and mortality has increased as well. Rates among females remained relatively stable. These trends are consistent with national data, which show steady and statistically significant increases since 1973 in both incidence and mortality rates among males but not females. A marked increase in adenocarcinomas of the esophagus has been seen nationally.

Age: Less than 10 percent of esophageal cancer cases are diagnosed among persons less than 50 years of age.

Gender: Rates of esophageal cancer in Minnesota are four times higher among males than females.

Race: There are too few cases among persons of color in Minnesota to assess differences in rates, particularly among women. Nationally, black men and women are twice as likely to develop or die of esophageal cancer than non-Hispanic white men and women.

Risk Factors

Cigarette smoking and long-term alcohol consumption are major risk factors for this disease, and are thought to be responsible for 80 to 90 percent of squamous cell carcinomas of the esophagus in the U.S. Chronic gastric reflux, including Barrett's esophagus, is a major risk factor as well, especially for adenocarcinomas of the esophagus. Chronic injury to the esophagus through ingestion of hot food or beverages or accidental ingestion of caustic substances like lye may also increase risk. Research suggests that nutritional deficiencies related to lack of fresh fruits and vegetables and overall deficiencies of certain vitamins and minerals, including vitamins A and C, iron, and riboflavin are associated with increased risk of disease, and may explain some of the wide international variation in the occurrence of this cancer.

Early Detection/Prevention

No screening tests for esophageal cancer are recommended for the general population. However, persons with Barrett's esophagus or other medical conditions which place them at high risk for esophageal cancer should discuss with their physicians the advisability of having regular endoscopic examinations.

Hodgkin's Lymphoma

Table III-9.1: Number of new cases and deaths and incidence and mortality rates§ by year, Minnesota, 1988-1999, Hodgkin's Lymphoma

Year of Diagnosis or Death	Incidence				Mortality			
	New Cases		Annual Rate		Deaths		Annual Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
1988	77	69	3.9	2.9	14	15	0.7	0.6
1989	72	58	3.3	2.6	18	13	1.0	0.6
1990	87	54	4.1	2.3	14	16	0.8	0.7
1991	74	69	3.5	3.0	17	12	0.9	0.5
1992	74	73	3.4	3.1	23	11	1.1	0.4
1993	78	72	3.6	3.1	22	18	1.2	0.7
1994	86	64	3.9	2.7	13	13	0.7	0.5
1995	78	49	3.5	2.1	8	13	0.4	0.5
1996	75	67	3.3	2.8	11	11	0.6	0.5
1997	72	63	3.2	2.6	7	15	0.3	0.6
1998	84	68	3.7	2.8	19	9	0.9	0.3
1999	82	79	3.6	3.2	18	12	0.9	0.5

Table III-9.2: Number of new cases and deaths and average annual incidence and mortality rates§ by age, Minnesota, 1995-1999, Hodgkin's Lymphoma

Age at Diagnosis or Death (years)	Incidence 1995-1999				Mortality 1995-1999			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
0 – 19	46	57	1.3	1.6	0	2	0.0	0.1
20 – 34	139	118	5.8	5.0	8	9	0.3	0.4
35 – 49	100	61	3.5	2.2	14	11	0.5	0.4
50 – 64	43	30	2.8	1.9	9	9	0.6	0.6
65 – 74	39	30	5.8	3.7	18	11	2.7	1.4
75 – 84	17	20	4.2	3.3	9	12	2.2	2.0
85 and older	7	10	6.1	3.5	5	6	4.3	2.1

Table III-9.3: Number of new cases and deaths and average annual incidence and mortality rates§ by race and ethnicity, Minnesota, 1995-1999, Hodgkin's Lymphoma

Race and Ethnicity†	Incidence 1995-1999				Mortality 1995-1999			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
All Races	391	326	3.4	2.7	63	60	0.6	0.5
American Indian	2	0	~	~	0	1	~	~
Asian/Pacific Isl.	3	2	~	~	1	0	~	~
Black	8	5	~	~	2	0	~	~
White	370	313	3.5	2.8	60	59	0.6	0.5
White Hispanic	~	~	~	~	0	1	~	~

Source: All cases were either microscopically confirmed (1988-1999) or Death Certificate Only (1995-1999) and were reported to the MCSS by October 2002. Excludes *in situ* cancers except *in situ* bladder cancers. Deaths are from the Minnesota Center for Health Statistics, and include all deaths with the specified cancer as the underlying cause of death during the time period, regardless of year of diagnosis. All rates were calculated by MCSS.

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.
† White includes persons of Hispanic ethnicity. Persons reported with unknown or other race are included in all races combined, but are excluded from race-specific data. See text for comments on the accuracy of race- and ethnic-specific cancer rates.
~ Hispanic incidence data are not available. Race-specific rates based on fewer than 10 cases or deaths are not presented.

Table III-9.4: Other Minnesota statistics,† Hodgkin's Lymphoma

	Males	Females
Median Age at Diagnosis	36.0	33.0
Median Age at Death	65.0	63.0
Lifetime Risk of Diagnosis	0.3%	0.2%
Lifetime Risk of Death	0.1%	0.1%
Annual Percent Change‡		
Incidence 1988-1999	-0.7%	0.3%
Mortality 1988-1999	-2.1%	-2.7%

† See introduction for definition of terms.
‡ The average *annual percent change* in the age-adjusted rate over the time period. Statistically significant ($P < 0.05$) trends are in **bold.**

Table III-9.5: Average annual incidence and mortality rates§ in the United States, 1995-1999, Hodgkin's Lymphoma

	Males	Females
Incidence		
All Races	3.1	2.5
White†	3.4	2.8
Mortality		
All Races	0.6	0.4
White†	0.7	0.4

Source: *SEER Cancer Statistics Review, 1973-1999.* Incidence data represent 10% of the U.S. population, while mortality data are for the entire nation.
§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.
† All white persons, including those of Hispanic ethnicity.

Table III-9.6: Five-year relative survival‡ by gender and age at diagnosis, Hodgkin's Lymphoma

Age at Diagnosis (years)	Male(%)	Female(%)
< 45	86.8	93.2
45-54	78.3	84.3
55-64	74.0	72.3
65-74	58.8	59.0
75+	33.2	37.4
All Ages	81.7	86.1

‡ Among SEER cases diagnosed 1992-1998 followed through 1999, from *SEER Cancer Statistics Review, 1973-1999.*

Descriptive Epidemiology

Incidence and Mortality: Lymphomas are malignancies of the white blood cells, or lymphocytes. These malignancies are of two types: Hodgkin's lymphoma, which contain Reed-Sternberg cells, and non-Hodgkin's lymphomas, which do not. Lymphomas are relatively common, accounting for more than 12 percent of cancer diagnoses in Minnesota. However, Hodgkin's lymphoma is less common, accounting for only one out of seven lymphomas, or 1.6 percent of cancer diagnoses. Approximately 140 cases of Hodgkin's lymphoma are diagnosed each year in Minnesota, and 25 people die from the disease. Minnesota rates are similar to those reported nationally. The SEER 5-year relative survival rate for Hodgkin's lymphoma is over 80 percent for both males and females, increasing from about 70 percent among cases diagnosed in the early 1970s. **Trends:** Rates of Hodgkin's lymphoma in Minnesota have declined slightly since 1988, although this trend is not statistically significant. Incidence rates decreased steadily from 1973 to 1999 in the geographic areas covered by SEER. U.S. mortality rates from 1992 to 1999 decreased significantly, particularly among those less than 65 years of age.

Age: Approximately 75 percent of newly diagnosed cases of Hodgkin's lymphoma occur in persons under the age of 50 years. Hodgkin's lymphoma has a unique age-incidence curve, such that incidence peaks between 15-34 years and again after age 45, indicating that there may be two different disease etiologies.

Gender: Hodgkin's lymphoma incidence rates are about 25 percent higher among males than females.

Race: Based on cases reported to SEER, incidence rates are highest among whites, and rates among blacks and Hispanics are about half that of whites.

Risk Factors

No major risk factors for Hodgkin's lymphoma have been identified. The unusual epidemiological patterns of Hodgkin's lymphoma suggest that the pathogenesis of the disease likely involves an infectious agent. Numerous studies support an association between the Epstein-Barr virus, which causes infectious mononucleosis, and Hodgkin's lymphoma, but the increase in risk is modest, and appears to return to normal about five years after infection. Research suggests that risk is also increased among individuals with certain primary immunodeficiencies. Siblings of persons with Hodgkin's lymphoma have an increased risk of disease, which does not appear to be genetic. There is some evidence of a positive association between occupational exposure in wood-related industries and exposure to certain chemicals.

Early Detection/Prevention

No clear strategies for early detection of Hodgkin's lymphoma have been identified.

Kaposi's Sarcoma (all sites)

Table III-10.1: Number of new cases and deaths and incidence and mortality rates§ by year, Minnesota, 1988-1999, Kaposi's Sarcoma (all sites)

Year of Diagnosis or Death	Incidence				Mortality			
	New Cases		Annual Rate		Deaths		Annual Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
1988	24	4	1.2	0.1	~	~	~	~
1989	35	2	1.6	0.1	~	~	~	~
1990	35	3	1.5	0.1	~	~	~	~
1991	39	0	1.8	0.0	~	~	~	~
1992	48	2	2.2	0.1	~	~	~	~
1993	37	1	1.6	0.0	~	~	~	~
1994	36	1	1.5	0.0	~	~	~	~
1995	36	6	1.5	0.2	~	~	~	~
1996	16	0	0.8	0.0	~	~	~	~
1997	19	0	0.8	0.0	~	~	~	~
1998	9	1	0.4	0.0	~	~	~	~
1999	8	0	0.3	0.0	~	~	~	~

Table III-10.2: Number of new cases and deaths and average annual incidence and mortality rates§ by age, Minnesota, 1995-1999, Kaposi's Sarcoma (all sites)

Age at Diagnosis or Death (years)	Incidence 1995-1999				Mortality 1995-1999			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
0 – 19	0	0	0.0	0.0	~	~	~	~
20 – 34	27	2	1.1	0.1	~	~	~	~
35 – 49	31	1	1.1	0.0	~	~	~	~
50 – 64	18	0	1.2	0.0	~	~	~	~
65 – 74	3	1	0.5	0.1	~	~	~	~
75 – 84	8	2	2.0	0.3	~	~	~	~
85 and older	1	1	0.9	0.3	~	~	~	~

Table III-10.3: Number of new cases and deaths and average annual incidence and mortality rates§ by race and ethnicity, Minnesota, 1995-1999, Kaposi's Sarcoma (all sites)

Race and Ethnicity†	Incidence 1995-1999				Mortality 1995-1999			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
All Races	88	7	0.8	0.1	~	~	~	~
American Indian	1	0	~	~	~	~	~	~
Asian/Pacific Isl.	0	0	~	~	~	~	~	~
Black	13	1	4.4	~	~	~	~	~
White	69	5	0.6	~	~	~	~	~
White Hispanic	~	~	~	~	~	~	~	~

Source: All cases were either microscopically confirmed (1988-1999) or Death Certificate Only (1995-1999) and were reported to the MCSS by October 2002. Excludes *in situ* cancers except *in situ* bladder cancers. Deaths are from the Minnesota Center for Health Statistics, and include all deaths with the specified cancer as the underlying cause of death during the time period, regardless of year of diagnosis. All rates were calculated by MCSS.

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.
† White includes persons of Hispanic ethnicity. Persons reported with unknown or other race are included in all races combined, but are excluded from race-specific data. See text for comments on the accuracy of race- and ethnic-specific cancer rates.
~ Hispanic incidence data and morality data are not available. Race-specific rates based on fewer than 10 cases or deaths are not presented.

Table III-10.4: Other Minnesota statistics,† Kaposi's Sarcoma (all sites)

	Males	Females
Median Age at Diagnosis	41.0	68.0
Median Age at Death	~	~
Lifetime Risk of Diagnosis	~	~
Lifetime Risk of Death	~	~
Annual Percent Change‡		
Incidence 1988-1999	**-8.2%**	~
Mortality 1988-1999	~	~

† See introduction for definition of terms.
‡ The average *annual percent change* in the age-adjusted rate over the time period. Statistically significant ($P < 0.05$) trends are in **bold.**
~ Data not available.

Table III-10.5: Average annual incidence and mortality rates§ in the United States, 1995-1999, Kaposi's Sarcoma (all sites)

	Males	Females
Incidence		
All Races	3.2	0.1
White†	2.9	0.1
Mortality		
All Races	~	~
White†	~	~

Source: *SEER Cancer Statistics Review, 1973-1999.* Incidence data represent 10% of the U.S. population, while mortality data are for the entire nation.
§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.
† All white persons, including those of Hispanic ethnicity.
~ Data not available.

Table III-10.6: Extent of disease at diagnosis and 5-year relative survival, Kaposi's Sarcoma (all sites)

Stage at Diagnosis	Percent of Cases†(%)	5-Year Relative Survival‡ (%)
In Situ	0.0	-
Localized	23.2	~
Regional	2.1	~
Distant	3.2	~
Unknown	71.6	~

† Among Minnesota cases diagnosed 1995-1999.
‡ Among SEER cases diagnosed 1992-1998 followed through 1999, from *SEER Cancer Statistics Review, 1973-1999.*
~ Data not available.

Descriptive Epidemiology

Incidence and Mortality: Kaposi's sarcoma (KS) is a cancer of the connective tissue that typically causes raised, dark lesions on the skin. When these become widespread and affect other organs, the disease can be fatal. KS used to be extremely rare, primarily occurring in elderly men of Jewish or Italian descent or in persons taking immunosuppressive medications. However, infection with the human immunodeficiency virus (HIV) greatly increases the risk of developing KS, and in fact, the unusual development of KS among young men was one of the first signs of the AIDS epidemic. Over the most recent 5-year period, an average of 19 cases of KS have been diagnosed in Minnesota each year. Deaths from KS cannot be readily assessed because those associated with AIDS are likely to have AIDS listed as the underlying cause of death rather than KS. Incidence rates among white males in Minnesota are 80 percent lower than reported by SEER.

Trends: The incidence of KS has been dramatically affected by the AIDS epidemic. In the geographic areas covered by SEER, incidence rates increased 24-fold from 0.4 new cases per 100,000 men per year in 1973-1979 to 9.6 in 1989, and then decreased to 1.5 in 1999. Recent decreases in incidence are thought to be due to the introduction of medications that better protect the immune system once HIV infection has occurred. KS incidence rates in Minnesota have followed a somewhat similar pattern, peaking at 2.2 new cases per 100,000 males in 1992 and declining to 0.3 in 1999.

Age: About 80 percent of KS cases in Minnesota are diagnosed among males between 20 and 64 years of age.

Gender: In Minnesota, KS incidence rates are eight times higher among men than women.

Race: Based on a fairly limited number of cases, it appears that KS incidence rates in Minnesota are considerably higher among black males than white males. Race-specific rates have not been published by SEER.

Risk Factors

Research indicates that the vast majority of KS cases are caused by infection with a virus in the herpes family, called human herpesvirus 8 (HHV-8). This virus is spread by sexual contact, as is HIV. Although as many as 10 percent of the U.S. population are infected with HHV-8, researchers believe that only those with suppressed immune systems will go on to develop KS.

Early Detection/Prevention

There is no test to identify persons with KS before the lesions develop. The best protection against KS is to avoid behaviors that increase risk for HIV infection, such as unprotected sexual intercourse and needle-sharing.

Kidney and Renal Pelvis

Table III-11.1: Number of new cases and deaths and incidence and mortality rates§ by year, Minnesota, 1988-1999, Kidney and Renal Pelvis Cancer

Year of Diagnosis or Death	Incidence				Mortality			
	New Cases		Annual Rate		Deaths		Annual Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
1988	284	159	16.1	7.2	136	65	7.8	2.8
1989	257	147	14.5	6.5	90	70	5.3	2.9
1990	290	164	15.9	7.0	116	72	6.8	2.9
1991	309	148	16.8	6.3	141	86	8.0	3.5
1992	311	200	16.7	8.6	132	98	7.4	4.0
1993	282	159	14.9	6.7	128	78	7.1	3.1
1994	335	176	17.4	7.4	114	79	6.2	3.1
1995	346	192	17.8	8.0	113	76	6.1	2.9
1996	303	161	15.2	6.7	126	87	6.6	3.3
1997	286	209	14.3	8.5	141	90	7.3	3.4
1998	324	213	15.7	8.5	102	89	5.2	3.3
1999	342	224	16.3	9.0	128	68	6.4	2.4

Table III-11.2: Number of new cases and deaths and average annual incidence and mortality rates§ by age, Minnesota, 1995-1999, Kidney and Renal Pelvis Cancer

Age at Diagnosis or Death (years)	Incidence 1995-1999				Mortality 1995-1999			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
0 – 19	18	29	0.5	0.9	2	3	0.1	0.1
20 – 34	14	22	0.6	0.9	2	1	0.1	0.0
35 – 49	229	103	8.3	3.7	44	21	1.6	0.8
50 – 64	523	259	33.8	16.1	173	68	11.2	4.2
65 – 74	454	301	67.4	37.6	162	107	24.1	13.4
75 – 84	311	217	76.2	35.1	170	120	41.8	18.9
85 and older	52	68	45.1	23.6	57	90	49.4	31.2

Table III-11.3: Number of new cases and deaths and average annual incidence and mortality rates§ by race and ethnicity, Minnesota, 1995-1999, Kidney and Renal Pelvis Cancer

Race and Ethnicity†	Incidence 1995-1999				Mortality 1995-1999			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
All Races	1,601	999	15.8	8.2	610	410	6.3	3.1
American Indian	14	7	22.2	~	9	6	~	~
Asian/Pacific Isl.	4	5	~	~	2	1	~	~
Black	24	13	14.6	8.0	6	1	~	~
White	1,549	968	15.8	8.1	593	402	6.3	3.1
White Hispanic	~	~	~	~	6	3	~	~

Source: All cases were either microscopically confirmed (1988-1999) or Death Certificate Only (1995-1999) and were reported to the MCSS by October 2002. Excludes *in situ* cancers except *in situ* bladder cancers. Deaths are from the Minnesota Center for Health Statistics, and include all deaths with the specified cancer as the underlying cause of death during the time period, regardless of year of diagnosis. All rates were calculated by MCSS.

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.
† White includes persons of Hispanic ethnicity. Persons reported with unknown or other race are included in all races combined, but are excluded from race-specific data. See text for comments on the accuracy of race- and ethnic-specific cancer rates.
~ Hispanic incidence data are not available. Race-specific rates based on fewer than 10 cases or deaths are not presented.

Table III-11.4: Other Minnesota statistics,† Kidney and Renal Pelvis Cancer

	Males	Females
Median Age at Diagnosis	65.0	68.0
Median Age at Death	70.0	75.0
Lifetime Risk of Diagnosis	1.5%	0.9%
Lifetime Risk of Death	0.6%	0.4%
Annual Percent Change‡		
Incidence 1988-1999	0.0%	**2.3%**
Mortality 1988-1999	-1.4%	-0.2%

† See introduction for definition of terms.
‡ The average *annual percent change* in the age-adjusted rate over the time period. Statistically significant ($P < 0.05$) trends are in **bold.**

Table III-11.5: Average annual incidence and mortality rates§ in the United States, 1995-1999, Kidney and Renal Pelvis Cancer

	Males	Females
Incidence		
All Races	15.5	7.8
White†	15.6	7.8
Mortality		
All Races	6.1	2.9
White†	6.2	2.9

Source: *SEER Cancer Statistics Review, 1973-1999.* Incidence data represent 10% of the U.S. population, while mortality data are for the entire nation.
§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.
† All white persons, including those of Hispanic ethnicity.

Table III-11.6: Extent of disease at diagnosis and 5-year relative survival, Kidney and Renal Pelvis Cancer

Stage at Diagnosis	Percent of Cases†(%)	5-Year Relative Survival‡ (%)
In Situ	2.0	-
Localized	55.2	89.6
Regional	21.7	60.3
Distant	17.6	8.9
Unknown	3.4	28.8

† Among Minnesota cases diagnosed 1995-1999.
‡ Among SEER cases diagnosed 1992-1998 followed through 1999, from *SEER Cancer Statistics Review, 1973-1999.*

Descriptive Epidemiology

Incidence and Mortality: In Minnesota, approximately 500 cases of kidney and renal pelvis cancer are diagnosed each year, and 200 deaths result from this disease, representing 2.5 percent of all cancers and cancer-related deaths in the state. Minnesota mortality rates are about the same as for the U.S. The SEER 5-year relative survival rate for kidney and renal pelvis cancers is close to 90 percent for localized tumors. The rate drops to 60.3 percent for tumors diagnosed at the regional stage. More than half of all kidney and renal pelvis cancers are diagnosed while in the localized stage in Minnesota.

Trends: Incidence rates among Minnesota females increased 2.3 percent per year from 1988 to 1999. No significant change was observed for males. National data show that incidence rates rose about 2 percent annually from 1973 to 1994 and then stabilized, and that mortality increased by 1 percent per year from 1973 to 1995, and then began decreasing slightly.

Age: About 85 percent of kidney and renal pelvis cancer cases are diagnosed among persons age 50 years or older.

Gender: Rates of kidney and renal pelvis cancer are about twice as high in men as in women in Minnesota.

Race: In Minnesota, rate comparisons across race and ethnicity cannot be made due to small case numbers among people of color. SEER data show that incidence is highest among blacks, followed closely by American Indians and whites. Rates are about 50 percent lower among Asian/Pacific Islanders.

Risk Factors

Cigarette smoking is strongly related to kidney and renal pelvis cancers. Smokers have twice the risk for kidney cancer and four times the risk for renal pelvis cancer compared to nonsmokers. Obesity is also positively associated with kidney cancer, but relationships to dietary factors are not well established. Occupationally-related risks for renal pelvis cancers resemble those of bladder cancer and include exposure to certain dyes. People with advanced kidney disease and with certain inherited medical conditions may be at higher risk for kidney cancer.

Early Detection/Prevention

No screening tests for kidney cancer are recommended. It is often difficult for a physical examination to detect asymptomatic tumors until they are quite large. Smoking cessation is the best step in preventing cancers of the kidney and renal pelvis. It is estimated that smoking reduction may lower rates by 50 percent and nearly one-third for renal pelvis and kidney cancers, respectively.

Larynx

Table III-12.1: Number of new cases and deaths and incidence and mortality rates§ by year, Minnesota, 1988-1999, Larynx Cancer

Year of Diagnosis or Death	Incidence				Mortality			
	New Cases		Annual Rate		Deaths		Annual Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
1988	153	24	8.6	1.2	33	4	1.9	0.2
1989	151	26	8.5	1.2	31	8	1.8	0.3
1990	134	38	7.3	1.7	38	12	2.3	0.5
1991	132	28	7.1	1.3	35	11	1.9	0.4
1992	137	24	7.4	1.1	30	9	1.6	0.4
1993	123	26	6.6	1.2	38	7	2.1	0.3
1994	149	39	7.7	1.8	32	13	1.8	0.5
1995	134	30	7.0	1.3	27	4	1.5	0.2
1996	122	33	6.2	1.4	33	7	1.8	0.3
1997	157	31	7.8	1.2	36	9	1.8	0.3
1998	138	31	6.8	1.3	51	8	2.6	0.3
1999	137	30	6.7	1.2	45	10	2.2	0.4

Table III-12.2: Number of new cases and deaths and average annual incidence and mortality rates§ by age, Minnesota, 1995-1999, Larynx Cancer

Age at Diagnosis or Death (years)	Incidence 1995-1999				Mortality 1995-1999			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
0 – 19	0	0	0.0	0.0	0	0	0.0	0.0
20 – 34	3	4	0.1	0.2	0	0	0.0	0.0
35 – 49	47	19	1.7	0.7	8	1	0.3	0.0
50 – 64	257	55	16.6	3.4	52	8	3.4	0.5
65 – 74	218	46	32.3	5.8	62	13	9.1	1.6
75 – 84	141	24	34.6	3.9	57	13	14.0	2.2
85 and older	22	7	19.1	2.4	13	3	11.3	1.0

Table III-12.3: Number of new cases and deaths and average annual incidence and mortality rates§ by race and ethnicity, Minnesota, 1995-1999, Larynx Cancer

Race and Ethnicity†	Incidence 1995-1999				Mortality 1995-1999			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
All Races	688	155	6.9	1.3	192	38	2.0	0.3
American Indian	2	1	~	~	1	1	~	~
Asian/Pacific Isl.	1	1	~	~	1	0	~	~
Black	10	3	8.7	~	7	2	~	~
White	671	150	6.9	1.3	183	35	1.9	0.3
White Hispanic	~	~	~	~	3	0	~	~

Source: All cases were either microscopically confirmed (1988-1999) or Death Certificate Only (1995-1999) and were reported to the MCSS by October 2002. Excludes *in situ* cancers except *in situ* bladder cancers. Deaths are from the Minnesota Center for Health Statistics, and include all deaths with the specified cancer as the underlying cause of death during the time period, regardless of year of diagnosis. All rates were calculated by MCSS.

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.
† White includes persons of Hispanic ethnicity. Persons reported with unknown or other race are included in all races combined, but are excluded from race-specific data. See text for comments on the accuracy of race- and ethnic-specific cancer rates.
~ Hispanic incidence data are not available. Race-specific rates based on fewer than 10 cases or deaths are not presented.

Larynx

Table III-12.4: Other Minnesota statistics,† Larynx Cancer

	Males	Females
Median Age at Diagnosis	66.0	64.0
Median Age at Death	69.0	72.0
Lifetime Risk of Diagnosis	0.7%	0.1%
Lifetime Risk of Death	0.2%	< 0.1%
Annual Percent Change‡		
Incidence 1988-1999	**-1.7%**	-0.2%
Mortality 1988-1999	1.5%	-0.7%

† See introduction for definition of terms.
‡ The average *annual percent change* in the age-adjusted rate over the time period. Statistically significant ($P < 0.05$) trends are in **bold.**

Table III-12.5: Average annual incidence and mortality rates§ in the United States, 1995-1999, Larynx Cancer

	Males	Females
Incidence		
All Races	7.3	1.7
White†	7.1	1.6
Mortality		
All Races	2.7	0.6
White†	2.4	0.5

Source: *SEER Cancer Statistics Review, 1973-1999.* Incidence data represent 10% of the U.S. population, while mortality data are for the entire nation.
§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.
† All white persons, including those of Hispanic ethnicity.

Table III-12.6: Extent of disease at diagnosis and 5-year relative survival, Larynx Cancer

Stage at Diagnosis	Percent of Cases†(%)	5-Year Relative Survival‡ (%)
In Situ	8.1	-
Localized	59.1	82.0
Regional	26.2	51.0
Distant	4.1	37.7
Unknown	2.5	49.2

† Among Minnesota cases diagnosed 1995-1999.
‡ Among SEER cases diagnosed 1992-1998 followed through 1999, from *SEER Cancer Statistics Review, 1973-1999.*

Descriptive Epidemiology

Incidence and Mortality: About 170 cases of laryngeal cancer are diagnosed in Minnesota each year, and 50 deaths are caused by this cancer. It accounts for less than 1 percent of all cancer diagnoses and deaths in the state. Incidence and mortality rates in Minnesota are somewhat lower than nationally. Based on SEER data, the 5-year relative survival rate for laryngeal cancer is 82 percent when diagnosed in the early stages. Survival decreases significantly when the cancer has progressed to involve nearby tissues or lymph nodes.

Trends: The laryngeal cancer incidence rate among Minnesota males decreased significantly by 1.7 percent per year from 1988 to 1999. Rates were stable among females in Minnesota. Incidence rates for laryngeal cancer remained relatively unchanged in the U.S. since the mid-1970s, but decreased significantly by 2.6 percent per year from 1992 to 1999. Mortality rates generally decreased within the same time period.

Age: Incidence rates for laryngeal cancer generally increase with age, with over 90 percent of cases occurring among those age 50 years and older.

Gender: Incidence and mortality rates for laryngeal cancer are five to six times higher among males than females in Minnesota.

Race: The laryngeal cancer incidence rate in black men in Minnesota is slightly higher than white men, but in general, there are too few cases among people of color in the state to assess racial disparities. National data indicate that incidence rates are almost 50 percent higher among blacks than whites.

Risk Factors

Smoking and alcohol use are the best established risk factors for laryngeal cancer, and research shows that these exposures act synergistically to increase risk. Smokers have an almost a ten-fold greater risk of developing this cancer than nonsmokers, and risk increases with increased smoking. Heavy drinkers have two to five times greater risk of laryngeal cancer than nondrinkers. Occupational exposure to asbestos, nickel, and mustard gas can increase risk of laryngeal cancer.

Early Detection/Prevention

There are no methods to detect laryngeal cancer early in asymptomatic individuals. However, risk of developing the disease can be reduced by cessation of smoking and heavy alcohol use.

Leukemia

Table III-13.1: Number of new cases and deaths and incidence and mortality rates§ by year, Minnesota, 1988-1999, Leukemia

Year of Diagnosis or Death	Incidence				Mortality			
	New Cases		Annual Rate		Deaths		Annual Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
1988	301	256	17.0	11.0	167	154	10.2	6.4
1989	312	208	17.5	8.8	191	174	11.0	7.2
1990	333	247	18.2	10.5	212	169	12.3	6.9
1991	298	254	16.0	10.7	214	166	12.3	6.5
1992	365	242	19.8	9.9	222	171	12.7	6.7
1993	311	245	16.4	10.1	213	155	11.9	5.8
1994	377	266	19.5	10.9	211	155	11.6	6.1
1995	365	245	18.7	9.8	260	170	14.2	6.2
1996	357	265	18.2	10.4	226	191	12.1	7.3
1997	368	257	18.6	9.6	211	166	11.1	6.1
1998	352	284	17.2	11.0	192	163	10.0	5.8
1999	366	287	17.8	11.0	244	192	12.3	6.8

Table III-13.2: Number of new cases and deaths and average annual incidence and mortality rates§ by age, Minnesota, 1995-1999, Leukemia

Age at Diagnosis or Death (years)	Incidence 1995-1999				Mortality 1995-1999			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
0 – 19	160	98	4.6	2.9	39	26	1.1	0.8
20 – 34	70	46	2.9	1.9	35	26	1.5	1.1
35 – 49	175	118	6.2	4.3	71	54	2.5	1.9
50 – 64	351	240	22.6	15.0	155	115	10.0	7.1
65 – 74	472	291	70.3	36.4	302	157	45.1	19.6
75 – 84	439	313	107.9	50.3	371	264	91.2	41.8
85 and older	141	232	122.2	80.5	160	240	138.7	83.3

Table III-13.3: Number of new cases and deaths and average annual incidence and mortality rates§ by race and ethnicity, Minnesota, 1995-1999, Leukemia

Race and Ethnicity†	Incidence 1995-1999				Mortality 1995-1999			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
All Races	1,808	1,338	18.1	10.4	1,133	882	11.9	6.4
American Indian	10	6	10.0	~	5	2	~	~
Asian/Pacific Isl.	16	17	14.1	6.9	9	8	~	~
Black	25	13	12.1	5.5	11	11	6.0	5.0
White	1,727	1,271	17.9	10.2	1,108	861	12.0	6.4
White Hispanic	~	~	~	~	7	3	~	~

Source: All cases were either microscopically confirmed (1988-1999) or Death Certificate Only (1995-1999) and were reported to the MCSS by October 2002. Excludes *in situ* cancers except *in situ* bladder cancers. Deaths are from the Minnesota Center for Health Statistics, and include all deaths with the specified cancer as the underlying cause of death during the time period, regardless of year of diagnosis. All rates were calculated by MCSS.

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.
† White includes persons of Hispanic ethnicity. Persons reported with unknown or other race are included in all races combined, but are excluded from race-specific data. See text for comments on the accuracy of race- and ethnic-specific cancer rates.
~ Hispanic incidence data are not available. Race-specific rates based on fewer than 10 cases or deaths are not presented.

Leukemia

Table III-13.4: Other Minnesota statistics,† Leukemia

	Males	Females
Median Age at Diagnosis	68.0	71.0
Median Age at Death	74.0	78.0
Lifetime Risk of Diagnosis	1.8%	1.2%
Lifetime Risk of Death	1.2%	0.9%
Annual Percent Change‡		
Incidence 1988-1999	0.4%	0.4%
Mortality 1988-1999	0.2%	-0.6%

† See introduction for definition of terms.
‡ The average *annual percent change* in the age-adjusted rate over the time period. Statistically significant ($P < 0.05$) trends are in **bold.**

Table III-13.5: Average annual incidence and mortality rates§ in the United States, 1995-1999, Leukemia

	Males	Females
Incidence		
All Races	16.0	9.4
White†	16.7	9.8
Mortality		
All Races	1.6	1.2
White†	1.6	1.2

Source: *SEER Cancer Statistics Review, 1973-1999.* Incidence data represent 10% of the U.S. population, while mortality data are for the entire nation.
§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.
† All white persons, including those of Hispanic ethnicity.

Table III-13.6: Distribution of cancer type and 5-year relative survival, Leukemia

	Percent of Cases†(%)	5-Year Relative Survival‡(%)
Acute lymphocytic	9.4	63.5
Chronic lymphocytic	38.0	73.1
Acute myeloid	24.5	18.7
Chronic myeloid	14.0	34.5
All other leukemia	14.1	
Total	100.0	45.9

† Among Minnesota cases diagnosed 1995-1999.
‡ Among SEER cases diagnosed 1992-1998 followed through 1999, from *SEER Cancer Statistics Review, 1973-1999.*

Descriptive Epidemiology

Incidence and Mortality: About 630 cases of leukemia are diagnosed each year in Minnesota, and 400 deaths occur as a result of the disease. Leukemia accounts for 3 percent of all new cancers and 4.6 percent of cancer deaths in the state. The most common types among adults are chronic lymphocytic (CLL) and acute myeloid leukemias. Acute lymphocytic leukemia is the most common type of leukemia among children. Incidence and mortality rates in Minnesota are about 5 percent higher than national rates. Almost all of the excess is due to higher rates of CLL in Minnesota. Geographic variation in CLL is very hard to interpret, since rates are strongly affected by medical practices. About 20 percent of CLL is discovered while the person has no symptoms and is being evaluated for another, unrelated illness. The MCSS will continue to monitor rates of CLL in Minnesota. Based on SEER cases of leukemia diagnosed between 1992 and 1998, the overall 5-year relative survival rate is 45.9 percent. Leukemias are a diverse group of cancers which should be considered individually based on histopathologic type. Each subtype has different etiology, treatment, and prognosis.

Trends: Rates of leukemia in Minnesota have been stable since reporting was initiated in 1988. This is consistent with national trends, which show little change in rates of leukemia overall. Mortality rates among children decreased dramatically since the 1960s, primarily due to treatment advances.

Age: While leukemia is the most common childhood cancer, over 90 percent of cases occur in adults. Leukemia incidence is higher among children aged 19 and under than persons age 20-34 years. Incidence increases with age after 35 years.

Gender: Incidence and mortality rates of leukemia are 75 percent higher among males than females, but this may vary according to subtype.

Race: Leukemia rates are somewhat higher among whites than persons of color, both in Minnesota and nationally.

Risk Factors

The causes of most of these cancers are unknown. Occupational exposures to benzene and radiation are the most established risk factors for leukemia. Persons with certain chromosomal abnormalities, especially Down's syndrome, are more likely to be diagnosed with leukemia. Cigarette smoking may be associated with leukemia. Certain leukemias may be caused by a retrovirus, human T-cell lymphotropic virus type I (HTLV-I).

Early Detection/Prevention

Symptoms of leukemia often resemble those of less serious health conditions, making early detection difficult.

Liver and Bile Duct

Table III-14.1: Number of new cases and deaths and incidence and mortality rates§ by year, Minnesota, 1988-1999, Liver and Bile Duct Cancer

Year of Diagnosis or Death	Incidence				Mortality			
	New Cases		Annual Rate		Deaths		Annual Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
1988	57	32	3.1	1.4	59	44	3.4	1.9
1989	65	46	3.6	2.0	71	24	4.1	1.0
1990	73	32	4.0	1.5	86	57	4.9	2.4
1991	75	31	4.1	1.3	58	51	3.3	2.1
1992	79	45	4.3	1.9	74	52	4.1	2.1
1993	55	38	3.0	1.5	85	52	4.8	2.0
1994	71	38	3.6	1.5	87	57	4.6	2.3
1995	77	38	4.0	1.5	95	49	5.0	1.9
1996	85	42	4.3	1.6	96	52	4.9	2.0
1997	78	44	3.9	1.8	105	61	5.4	2.3
1998	82	40	4.0	1.6	85	71	4.4	2.6
1999	108	52	5.1	2.0	103	53	5.0	1.9

Table III-14.2: Number of new cases and deaths and average annual incidence and mortality rates§ by age, Minnesota, 1995-1999, Liver and Bile Duct Cancer

Age at Diagnosis or Death (years)	Incidence 1995-1999				Mortality 1995-1999			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
0 – 19	5	7	0.1	0.2	3	3	0.1	0.1
20 – 34	8	9	0.3	0.4	5	5	0.2	0.2
35 – 49	71	17	2.6	0.6	56	15	2.0	0.5
50 – 64	115	44	7.4	2.8	100	53	6.5	3.3
65 – 74	124	56	18.4	7.0	156	59	23.1	7.4
75 – 84	91	58	22.3	9.6	127	99	31.1	15.7
85 and older	16	25	13.9	8.7	37	52	32.1	18.0

Table III-14.3: Number of new cases and deaths and average annual incidence and mortality rates§ by race and ethnicity, Minnesota, 1995-1999, Liver and Bile Duct Cancer

Race and Ethnicity†	Incidence 1995-1999				Mortality 1995-1999			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
All Races	430	216	4.3	1.7	484	286	4.9	2.2
American Indian	3	2	~	~	7	4	~	~
Asian/Pacific Isl.	35	10	27.4	7.1	35	13	31.7	10.7
Black	27	6	16.2	~	24	7	17.3	~
White	359	195	3.7	1.6	418	262	4.4	2.0
White Hispanic	~	~	~	~	13	3	17.7	~

Source: All cases were either microscopically confirmed (1988-1999) or Death Certificate Only (1995-1999) and were reported to the MCSS by October 2002. Excludes *in situ* cancers except *in situ* bladder cancers. Deaths are from the Minnesota Center for Health Statistics, and include all deaths with the specified cancer as the underlying cause of death during the time period, regardless of year of diagnosis. All rates were calculated by MCSS.

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.
† White includes persons of Hispanic ethnicity. Persons reported with unknown or other race are included in all races combined, but are excluded from race-specific data. See text for comments on the accuracy of race- and ethnic-specific cancer rates.
~ Hispanic incidence data are not available. Race-specific rates based on fewer than 10 cases or deaths are not presented.

Table III-14.4: Other Minnesota statistics,† Liver and Bile Duct Cancer

	Males	Females
Median Age at Diagnosis	66.0	71.0
Median Age at Death	70.0	75.0
Lifetime Risk of Diagnosis	0.4%	0.2%
Lifetime Risk of Death	0.5%	0.3%
Annual Percent Change‡		
Incidence 1988-1999	2.2%	1.2%
Mortality 1988-1999	**2.5%**	2.0%

† See introduction for definition of terms.
‡ The average *annual percent change* in the age-adjusted rate over the time period. Statistically significant ($P < 0.05$) trends are in **bold.**

Table III-14.5: Average annual incidence and mortality rates§ in the United States, 1995-1999, Liver and Bile Duct Cancer

	Males	Females
Incidence		
All Races	7.9	3.1
White†	6.4	2.5
Mortality		
All Races	6.5	3.0
White†	5.9	2.8

Source: *SEER Cancer Statistics Review, 1973-1999.* Incidence data represent 10% of the U.S. population, while mortality data are for the entire nation.
§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.
† All white persons, including those of Hispanic ethnicity.

Table III-14.6: Extent of disease at diagnosis and 5-year relative survival, Liver and Bile Duct Cancer

Stage at Diagnosis	Percent of Cases†(%)	5-Year Relative Survival‡ (%)
In Situ	0.0	-
Localized	31.4	15.4
Regional	22.8	5.8
Distant	27.1	2.0
Unknown	18.7	2.3

† Among Minnesota cases diagnosed 1995-1999.
‡ Among SEER cases diagnosed 1992-1998 followed through 1999, from *SEER Cancer Statistics Review, 1973-1999.*

Descriptive Epidemiology

Incidence and Mortality: About 130 cases of primary liver and bile duct cancer are diagnosed in Minnesota each year, and 150 deaths occur as a result of this cancer. Liver cancer incidence rates among whites in Minnesota are more than a third lower than reported by SEER. This may reflect the fact that the MCSS does not currently collect information on non-microscopically confirmed cancers. Liver cancer mortality rates are about 25 percent lower in Minnesota than in the U.S. The liver is a common site of metastasis for tumors originating in other tissues. Mortality rates should be interpreted with caution because secondary liver cancers can be misclassified in cause of death. Based on SEER data, the 5-year relative survival rate for liver cancer is 15 percent or lower, even if diagnosed early.

Trends: Mortality rates for liver cancer among Minnesota males increased significantly by 2.5 percent per year since 1988. Incidence rates increased by a similar amount for both sexes from 1988-1999, but trends were not statistically significant. SEER data from 1992-1999 indicate significant increases in liver cancer of 2 to 4 percent per year, and increasing rates among all race/ethnic groups except American Indians.

Age: Approximately 60 percent of liver cancers are diagnosed among persons aged 65 years or older.

Gender: Rates of liver and bile duct cancer are two to three times higher among males than females.

Race: In Minnesota, incidence and mortality rates for liver and bile duct cancer are highest among people of color. Rates among Asian/Pacific Islanders are almost twice that of blacks and seven times that of whites. This is similar to rates reported nationally.

Risk Factors

Hepatitis B and C infections are the most important risk factors for liver cancer worldwide. Cirrhosis, often caused by chronic alcohol intake or infection with hepatitis B and C, increases risk. Aflatoxins are produced by a fungus that contaminates wheat, peanuts, soybeans, corn, and rice, and are strongly associated with liver cancer. Industrial exposure to vinyl chloride or exposure to thorium dioxide (previously used in X-ray dye) increase risk of developing liver and bile duct cancer. Studies examining drinking water contaminated with arsenic have also reported elevated risk of liver cancer.

Early Detection/Prevention

There are no screening tests for liver cancer in asymptomatic individuals. In the U.S., the Environmental Protection Agency, the Occupational Safety and Health Administration, the Department of Agriculture, and the Food and Drug Administration have worked to reduce exposure to certain chemicals and aflatoxins. Vaccination against hepatitis B is recommended, particularly in early infancy. There is currently no vaccine for hepatitis C.

Lung and Bronchus

Table III-15.1: Number of new cases and deaths and incidence and mortality rates§ by year, Minnesota, 1988-1999, Lung and Bronchus Cancer

Year of Diagnosis or Death	Incidence				Mortality			
	New Cases		Annual Rate		Deaths		Annual Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
1988	1,397	776	78.9	35.4	1,193	618	69.0	27.9
1989	1,344	780	75.4	35.3	1,182	627	68.4	27.6
1990	1,414	834	77.6	37.7	1,223	684	69.5	29.7
1991	1,348	865	73.9	38.3	1,222	708	68.7	30.5
1992	1,402	918	76.1	40.5	1,233	772	68.4	32.5
1993	1,418	885	75.4	38.4	1,244	797	68.1	33.3
1994	1,360	1,024	71.6	43.8	1,226	812	66.3	33.7
1995	1,451	954	75.4	40.2	1,228	839	65.4	34.3
1996	1,401	1,073	71.7	44.8	1,238	884	64.9	35.7
1997	1,477	1,036	75.4	42.9	1,259	859	65.1	34.3
1998	1,471	1,102	73.6	44.6	1,242	929	63.3	36.6
1999	1,493	1,149	73.7	45.8	1,293	906	64.9	34.9

Table III-15.2: Number of new cases and deaths and average annual incidence and mortality rates§ by age, Minnesota, 1995-1999, Lung and Bronchus Cancer

Age at Diagnosis or Death (years)	Incidence 1995-1999				Mortality 1995-1999			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
0 – 19	5	3	0.1	0.1	0	0	0.0	0.0
20 – 34	20	32	0.8	1.3	8	7	0.3	0.3
35 – 49	371	337	13.6	12.3	232	216	8.5	7.9
50 – 64	2,015	1,559	129.7	96.6	1,490	1,079	95.8	66.8
65 – 74	2,738	1,826	406.2	228.5	2,238	1,425	332.1	178.3
75 – 84	1,852	1,297	454.4	211.8	1,840	1,262	451.9	203.9
85 and older	292	260	253.2	90.2	452	428	391.9	148.5

Table III-15.3: Number of new cases and deaths and average annual incidence and mortality rates§ by race and ethnicity, Minnesota, 1995-1999, Lung and Bronchus Cancer

Race and Ethnicity†	Incidence 1995-1999				Mortality 1995-1999			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
All Races	7,293	5,314	74.0	43.7	6,260	4,417	64.7	35.1
American Indian	56	52	114.3	76.3	53	49	113.0	75.1
Asian/Pacific Isl.	37	23	44.1	19.4	30	14	43.4	13.6
Black	169	85	136.0	60.7	125	61	112.4	44.2
White	7,015	5,134	73.0	43.3	6,047	4,290	64.0	35.0
White Hispanic	~	~	~	~	34	15	54.6	20.4

Source: All cases were either microscopically confirmed (1988-1999) or Death Certificate Only (1995-1999) and were reported to the MCSS by October 2002. Excludes *in situ* cancers except *in situ* bladder cancers. Deaths are from the Minnesota Center for Health Statistics, and include all deaths with the specified cancer as the underlying cause of death during the time period, regardless of year of diagnosis. All rates were calculated by MCSS.

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.
† White includes persons of Hispanic ethnicity. Persons reported with unknown or other race are included in all races combined, but are excluded from race-specific data. See text for comments on the accuracy of race- and ethnic-specific cancer rates.
~ Hispanic incidence data are not available. Race-specific rates based on fewer than 10 cases or deaths are not presented.

Table III-15.4: Other Minnesota statistics,† Lung and Bronchus Cancer

	Males	Females
Median Age at Diagnosis	69.0	69.0
Median Age at Death	71.0	71.0
Lifetime Risk of Diagnosis	7.5%	5.1%
Lifetime Risk of Death	6.7%	4.4%
Annual Percent Change‡		
Incidence 1988-1999	**-0.5%**	**2.4%**
Mortality 1988-1999	**-0.8%**	**2.4%**

† See introduction for definition of terms.
‡ The average *annual percent change* in the age-adjusted rate over the time period. Statistically significant ($P < 0.05$) trends are in **bold.**

Table III-15.5: Average annual incidence and mortality rates§ in the United States, 1995-1999, Lung and Bronchus Cancer

	Males	Females
Incidence		
All Races	86.0	51.4
White†	84.4	53.3
Mortality		
All Races	81.2	41.0
White†	79.7	41.7

Source: *SEER Cancer Statistics Review, 1973-1999.* Incidence data represent 10% of the U.S. population, while mortality data are for the entire nation.
§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.
† All white persons, including those of Hispanic ethnicity.

Table III-15.6: Extent of disease at diagnosis and 5-year relative survival, Lung and Bronchus Cancer

Stage at Diagnosis	Percent of Cases†(%)	5-Year Relative Survival‡ (%)
In Situ	0.0	-
Localized	21.2	48.5
Regional	29.3	21.7
Distant	42.2	2.5
Unknown	7.2	8.4

† Among Minnesota cases diagnosed 1995-1999.
‡ Among SEER cases diagnosed 1992-1998 followed through 1999, from *SEER Cancer Statistics Review, 1973-1999.*

Descriptive Epidemiology

Incidence and Mortality: Lung and bronchus cancer is the second most commonly diagnosed cancer among men and women in Minnesota, and is the leading cause of cancer death. It accounts for 12 percent of cancers and 24 percent of cancer deaths in Minnesota. Each year, an average of 2,500 cases of lung and bronchus cancer are diagnosed, and 2,100 deaths occur. Mortality rates among whites in Minnesota are 15 to 20 percent lower than national rates. Based on SEER data, the 5-year relative survival rate for lung and bronchus cancer is 48.5 percent for localized tumors, 21.7 percent for regional tumors, and 2.5 percent for distant tumors. Most cases are diagnosed at a regional or distant stage.
Trends: Lung and bronchus cancer incidence and mortality rates showed a statistically significant decrease from 1988 to 1999 among Minnesota males, while rates increased significantly among women. While rates in Minnesota are currently lower, national rates are declining at a faster rate for men (about -2% per year, statistically significant), and appear to be leveling off for women (+0.1% per year, not statistically significant).
Age: Incidence rates for lung and bronchus cancer increase with age. About 90 percent of cases of lung and bronchus cancer are diagnosed between 50 and 85 years of age.
Gender: Lung and bronchus cancer incidence rates are about 40 percent higher among men than women.
Race: In Minnesota, black males and American Indian males and females have the highest incidence and mortality rates of lung and bronchus cancer, while Asian/Pacific Islander men and women have the lowest. Nationally, incidence rates among men are lowest among American Indian and Hispanic males and highest in black males.

Risk Factors

Smoking is the leading cause of lung and bronchus cancer worldwide, accounting for 80 to 90 percent of all lung cancers. Radon, and invisible, odorless gas has recently been recognized by the National Academy of Sciences as the second leading cause of lung cancer in the U.S. Passive smoking also contributes to development of the disease among nonsmokers. Occupational exposure to asbestos, arsenic, chromium, and metal dust, and environmental exposures to air pollution also increase risk of lung and bronchus cancer.

Early Detection/Prevention

Smoking cessation is the best way to prevent lung and bronchus cancer. About 35 percent of homes in Minnesota have elevated levels of radon. Homeowners are encouraged to test their homes for radon. If it is present, a qualified contractor can usually mitigate the problem. For more information, contact the MDH Indoor Air Unit at (651) 215-0909.Screening for lung and bronchus cancer has not yet been proven to improve survival, even among smokers.

Melanoma of the Skin

Table III-16.1: Number of new cases and deaths and incidence and mortality rates§ by year, Minnesota, 1988-1999, Melanoma of the Skin

Year of Diagnosis or Death	Incidence				Mortality			
	New Cases		Annual Rate		Deaths		Annual Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
1988	259	254	14.2	11.7	49	52	2.8	2.4
1989	249	252	13.3	11.6	61	42	3.6	1.9
1990	260	253	14.0	11.1	51	45	2.8	2.1
1991	225	237	11.7	10.7	62	32	3.5	1.4
1992	290	231	14.8	10.0	54	43	3.0	1.9
1993	328	277	16.8	12.0	59	44	3.1	1.8
1994	302	268	15.4	11.5	58	36	3.0	1.5
1995	348	298	17.4	12.5	72	38	3.7	1.5
1996	413	274	19.9	11.3	80	36	4.1	1.4
1997	391	345	18.9	14.3	69	43	3.6	1.7
1998	357	356	16.9	14.6	72	56	3.6	2.1
1999	425	388	19.7	15.8	67	52	3.2	1.9

Table III-16.2: Number of new cases and deaths and average annual incidence and mortality rates§ by age, Minnesota, 1995-1999, Melanoma of the Skin

Age at Diagnosis or Death (years)	Incidence 1995-1999				Mortality 1995-1999			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
0 – 19	9	20	0.2	0.6	0	0	0.0	0.0
20 – 34	145	277	5.9	11.3	16	11	0.7	0.4
35 – 49	483	528	17.2	18.9	67	45	2.4	1.6
50 – 64	511	352	33.1	22.1	84	37	5.5	2.3
65 – 74	423	217	62.7	27.2	79	39	11.8	4.9
75 – 84	295	166	72.5	26.8	83	50	20.4	7.9
85 and older	68	101	59.0	35.0	31	43	26.9	14.9

Table III-16.3: Number of new cases and deaths and average annual incidence and mortality rates§ by race and ethnicity, Minnesota, 1995-1999, Melanoma of the Skin

Race and Ethnicity†	Incidence 1995-1999				Mortality 1995-1999			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
All Races	1,934	1,661	18.6	13.7	360	225	3.6	1.7
American Indian	1	0	~	~	0	0	~	~
Asian/Pacific Isl.	0	4	~	~	0	0	~	~
Black	1	1	~	~	0	1	~	~
White	1,862	1,594	18.5	13.8	360	224	3.7	1.8
White Hispanic	~	~	~	~	0	3	~	~

Source: All cases were either microscopically confirmed (1988-1999) or Death Certificate Only (1995-1999) and were reported to the MCSS by October 2002. Excludes *in situ* cancers except *in situ* bladder cancers. Deaths are from the Minnesota Center for Health Statistics, and include all deaths with the specified cancer as the underlying cause of death during the time period, regardless of year of diagnosis. All rates were calculated by MCSS.

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.
† White includes persons of Hispanic ethnicity. Persons reported with unknown or other race are included in all races combined, but are excluded from race-specific data. See text for comments on the accuracy of race- and ethnic-specific cancer rates.
~ Hispanic incidence data are not available. Race-specific rates based on fewer than 10 cases or deaths are not presented.

Melanoma of the Skin

Table III-16.4: Other Minnesota statistics,† Melanoma of the Skin

	Males	Females
Median Age at Diagnosis	59.0	50.0
Median Age at Death	67.0	70.0
Lifetime Risk of Diagnosis	1.7%	1.3%
Lifetime Risk of Death	0.3%	0.2%
Annual Percent Change‡		
Incidence 1988-1999	**3.9%**	**3.1%**
Mortality 1988-1999	1.6%	-1.2%

† See introduction for definition of terms.
‡ The average *annual percent change* in the age-adjusted rate over the time period. Statistically significant ($P < 0.05$) trends are in **bold.**

Table III-16.5: Average annual incidence and mortality rates§ in the United States, 1995-1999, Melanoma of the Skin

	Males	Females
Incidence		
All Races	21.3	14.3
White†	24.4	16.8
Mortality		
All Races	4.0	1.8
White†	4.4	2.1

Source: *SEER Cancer Statistics Review, 1973-1999.* Incidence data represent 10% of the U.S. population, while mortality data are for the entire nation.
§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.
† All white persons, including those of Hispanic ethnicity.

Table III-16.6: Extent of disease at diagnosis and 5-year relative survival, Melanoma of the Skin

Stage at Diagnosis	Percent of Cases†(%)	5-Year Relative Survival‡ (%)
In Situ	35.7	-
Localized	57.1	96.2
Regional	2.8	59.8
Distant	1.7	14.1
Unknown	2.7	75.3

† Among Minnesota cases diagnosed 1995-1999.
‡ Among SEER cases diagnosed 1992-1998 followed through 1999, from *SEER Cancer Statistics Review, 1973-1999.*

Descriptive Epidemiology

Incidence and Mortality: Invasive melanoma of the skin accounts for 3.4 percent of cancer diagnoses and 1.3 percent of cancer deaths in Minnesota. About 720 new cases are diagnosed each year, and 115 deaths are caused by melanoma. Incidence and mortality rates are somewhat lower in Minnesota than in areas covered by SEER and for the U.S.

Trends: Statistically significant increases in the incidence of melanoma were observed in Minnesota since 1988. A small but not statistically significant increase for males and decrease for females was seen for mortality rates. Nationally, the incidence rate for melanoma has more than doubled since 1973, and continues to rise steadily, while mortality rates have remained stable over the past decade.
Age: About 60 percent of melanoma cases are diagnosed among persons 50 years of age or older. Even so, melanoma is one of the most common cancers among persons ages 20-49 years.
Gender: Rates of melanoma are generally a third higher among men. However, among those less than 50 years of age incidence rates are higher among women.
Race: Melanoma of the skin is primarily a cancer of white populations. Ethnic background is a determinant of melanoma incidence among white populations.

Risk Factors

Excessive exposure to sunlight and other sources of ultraviolet radiation, particularly intense intermittent exposure early in life, is the primary risk factor for melanoma. Pigmentary traits, such as fair skin and light eyes, and genetic conditions of dysplastic nevi are associated with melanoma. Individuals with a personal or family history of melanoma or who are immunosuppressed also have increased risk of developing melanomas.

Early Detection/Prevention

The most effective way to identify early melanoma is through the recognition of changes in skin growth or appearance of new growths. The American Cancer Society recommends a cancer-related checkup, including a skin examination, every three years for people ages 20 to 40 years, and annually for people 40 years and older. The ABCD rule can outline warning signals of melanoma: **A**symmetry: one half of the mole does not match the other half; **B**order irregularity: mole edges are ragged or notched; **C**olor: mole pigmentation is not uniform; and, **D**iameter: diameter of the mole is greater than six millimeters. Sudden or progressive changes in the size, shape, or color of moles should be examined by a physician. The risk of developing melanoma is reduced by avoiding prolonged exposure to intense sunlight. If it isn't possible to stay in the shade, wear protective clothing, sunglasses, and sunscreen. It is especially important that parents protect their children from excess sun exposure.

Mesothelioma (all sites)

Table III-17.1: Number of new cases and deaths and incidence and mortality rates§ by year, Minnesota, 1988-1999, Mesothelioma (all sites)

Year of Diagnosis or Death	Incidence				Mortality			
	New Cases		Annual Rate		Deaths		Annual Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
1988	26	8	1.5	0.4	~	~	~	~
1989	34	8	1.9	0.3	~	~	~	~
1990	33	11	1.9	0.5	~	~	~	~
1991	39	13	2.1	0.6	~	~	~	~
1992	33	15	1.8	0.6	~	~	~	~
1993	41	14	2.2	0.6	~	~	~	~
1994	39	9	2.1	0.4	~	~	~	~
1995	47	9	2.5	0.4	~	~	~	~
1996	48	5	2.4	0.2	~	~	~	~
1997	38	17	1.9	0.7	~	~	~	~
1998	58	12	2.9	0.4	~	~	~	~
1999	57	9	2.9	0.4	~	~	~	~

Table III-17.2: Number of new cases and deaths and average annual incidence and mortality rates§ by age, Minnesota, 1995-1999, Mesothelioma (all sites)

Age at Diagnosis or Death (years)	Incidence 1995-1999				Mortality 1995-1999			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
0 – 19	0	0	0.0	0.0	~	~	~	~
20 – 34	0	2	0.0	0.1	~	~	~	~
35 – 49	15	8	0.5	0.3	~	~	~	~
50 – 64	55	9	3.5	0.6	~	~	~	~
65 – 74	103	14	15.3	1.7	~	~	~	~
75 – 84	61	13	15.0	2.1	~	~	~	~
85 and older	14	6	12.1	2.1	~	~	~	~

Table III-17.3: Number of new cases and deaths and average annual incidence and mortality rates§ by race and ethnicity, Minnesota, 1995-1999, Mesothelioma (all sites)

Race and Ethnicity†	Incidence 1995-1999				Mortality 1995-1999			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
All Races	248	52	2.5	0.4	~	~	~	~
American Indian	3	0	~	~	~	~	~	~
Asian/Pacific Isl.	1	0	~	~	~	~	~	~
Black	1	0	~	~	~	~	~	~
White	243	52	2.5	0.4	~	~	~	~
White Hispanic	~	~	~	~	~	~	~	~

Source: All cases were either microscopically confirmed (1988-1999) or Death Certificate Only (1995-1999) and were reported to the MCSS by October 2002. Excludes *in situ* cancers except *in situ* bladder cancers. Deaths are from the Minnesota Center for Health Statistics, and include all deaths with the specified cancer as the underlying cause of death during the time period, regardless of year of diagnosis. All rates were calculated by MCSS.

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.
† White includes persons of Hispanic ethnicity. Persons reported with unknown or other race are included in all races combined, but are excluded from race-specific data. See text for comments on the accuracy of race- and ethnic-specific cancer rates.
~ Hispanic incidence data and mortality data are not available. Race-specific rates based on fewer than 10 cases or deaths are not presented.

Mesothelioma (all sites)

Table III-17.4: Other Minnesota statistics,† Mesothelioma (all sites)

	Males	Females
Median Age at Diagnosis	71	70
Median Age at Death	~	~
Lifetime Risk of Diagnosis	~	~
Lifetime Risk of Death	~	~
Annual Percent Change‡		
Incidence 1988-1999	**4.7%**	-0.3%
Mortality 1988-1999	~	~

† See introduction for definition of terms.
‡ The average *annual percent change* in the age-adjusted rate over the time period. Statistically significant ($P < 0.05$) trends are in **bold.**
~ Data not available.

Table III-17.5: Average annual incidence and mortality rates§ in the United States, 1995-1999, Mesothelioma (all sites)

	Males	Females
Incidence		
All Races	2.0	0.4
White†	2.2	0.4
Mortality		
All Races	~	~
White†	~	~

Source: *SEER Cancer Statistics Review, 1973-1999.* Incidence data represent 10% of the U.S. population, while mortality data are for the entire nation.
§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.
† All white persons, including those of Hispanic ethnicity.
~ Data not available.

Table III-17.6: Extent of disease at diagnosis and 5-year relative survival, Mesothelioma (all sites)

Stage at Diagnosis	Percent of Cases†(%)	5-Year Relative Survival‡ (%)
In Situ	0.0	-
Localized	25.0	~
Regional	29.7	~
Distant	15.7	~
Unknown	29.7	~

† Among Minnesota cases diagnosed 1995-1999.
‡ Among SEER cases diagnosed 1992-1998 followed through 1999, from *SEER Cancer Statistics Review, 1973-1999.*
~ Data not available.

Descriptive Epidemiology

Incidence and Mortality: Mesothelioma is a cancer of the lining of the chest and abdominal cavity. About 60 Minnesotans are diagnosed with mesothelioma each year. The average survival time after diagnosis with mesothelioma is about one year. Mesothelioma incidence rates in Minnesota are somewhat higher than those reported by SEER for men, but not for women.
Trends: The incidence of mesothelioma has increased significantly among men in Minnesota by an average of 4.7 percent per year since statewide cancer reporting was implemented in 1988. Rates among males were 70 percent higher in 1998-1999 than in 1988-1989. Because the delay between exposure to asbestos and development of mesothelioma is 30-50 years, it is likely that increasing rates reflect exposures that occurred before the hazards of asbestos were well known. Rates have not increased among women in Minnesota. In the geographic areas covered by SEER, mesothelioma incidence rates among white males increased from 1.1 new cases per 100,000 men in 1977 to 2.1 in 1999.
Age: About 70 percent of mesotheliomas diagnosed in Minnesota are among persons age 65 years and older. This reflects both the long delay between exposure and diagnosis, and the fact that asbestos use in the U.S. has dropped by 98 percent since the early 1970s.
Gender: Mesothelioma is about six times more common among men than women, reflecting that most exposures to asbestos occurred occupationally in jobs primarily held by men.
Race: National data indicate that mesothelioma incidence rates are lower among blacks than among whites.

Risk Factors

Mesothelioma is thought to be caused almost exclusively by inhalation of asbestos fibers, which can damage mesothelial tissues. Asbestos was widely used in manufacturing during and following World War II. Occupations which may have involved exposure to asbestos include mining, ship building, and railroad, factory, and construction work. Family members of people working with asbestos are also at increased risk because fibers may be brought into the home on work clothes. Persons exposed to asbestos are also at greater risk of developing lung cancer. The combination of exposure to asbestos and smoking is associated with a 50-90 fold increase in the risk of lung cancer. More asbestos information can be found on the Minnesota Department of Health web site (http://www.health.state.mn.us/divs/eh/asbestos) and on fact sheets developed by the National Cancer Institute (http://cis.nci.nih.gov).

Early Detection/Prevention

There are no effective screening tests for mesothelioma in the general population.

Multiple Myeloma

Table III-18.1: Number of new cases and deaths and incidence and mortality rates§ by year, Minnesota, 1988-1999, Multiple Myeloma

Year of Diagnosis or Death	Incidence				Mortality			
	New Cases		Annual Rate		Deaths		Annual Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
1988	135	89	7.9	3.7	77	72	4.6	3.0
1989	112	84	6.5	3.6	74	70	4.4	2.9
1990	105	85	6.1	3.6	99	80	6.2	3.3
1991	126	104	7.0	4.4	98	72	5.8	2.9
1992	136	103	7.7	4.2	120	81	6.9	3.2
1993	124	110	6.8	4.4	89	94	5.0	3.6
1994	113	96	6.3	3.8	111	89	6.4	3.3
1995	109	92	5.8	3.7	86	90	4.7	3.5
1996	133	94	7.1	3.8	89	96	4.9	3.6
1997	120	133	6.2	5.2	107	77	5.7	2.9
1998	124	102	6.2	4.0	73	94	3.9	3.5
1999	125	101	6.1	3.8	86	91	4.5	3.3

Table III-18.2: Number of new cases and deaths and average annual incidence and mortality rates§ by age, Minnesota, 1995-1999, Multiple Myeloma

Age at Diagnosis or Death (years)	Incidence 1995-1999				Mortality 1995-1999			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
0 – 19	0	0	0.0	0.0	0	0	0.0	0.0
20 – 34	1	3	0.0	0.1	1	1	0.0	0.0
35 – 49	55	33	2.0	1.2	18	15	0.7	0.5
50 – 64	142	130	9.2	8.1	71	73	4.6	4.5
65 – 74	191	140	28.4	17.5	125	106	18.6	13.2
75 – 84	176	158	43.3	25.3	155	169	38.2	27.4
85 and older	46	58	39.9	20.1	71	84	61.6	29.1

Table III-18.3: Number of new cases and deaths and average annual incidence and mortality rates§ by race and ethnicity, Minnesota, 1995-1999, Multiple Myeloma

Race and Ethnicity†	Incidence 1995-1999				Mortality 1995-1999			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
All Races	611	522	6.3	4.1	441	448	4.7	3.4
American Indian	7	4	~	~	2	2	~	~
Asian/Pacific Isl.	2	4	~	~	0	1	~	~
Black	15	15	14.6	11.3	12	13	14.5	10.5
White	584	497	6.2	4.0	427	432	4.7	3.3
White Hispanic	~	~	~	~	2	4	~	~

Source: All cases were either microscopically confirmed (1988-1999) or Death Certificate Only (1995-1999) and were reported to the MCSS by October 2002. Excludes *in situ* cancers except *in situ* bladder cancers. Deaths are from the Minnesota Center for Health Statistics, and include all deaths with the specified cancer as the underlying cause of death during the time period, regardless of year of diagnosis. All rates were calculated by MCSS.

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.
† White includes persons of Hispanic ethnicity. Persons reported with unknown or other race are included in all races combined, but are excluded from race-specific data. See text for comments on the accuracy of race- and ethnic-specific cancer rates.
~ Hispanic incidence data are not available. Race-specific rates based on fewer than 10 cases or deaths are not presented.

Table III-18.4: Other Minnesota statistics,† Multiple Myeloma

	Males	Females
Median Age at Diagnosis	71.0	72.0
Median Age at Death	75.0	76.0
Lifetime Risk of Diagnosis	0.6%	0.5%
Lifetime Risk of Death	0.5%	0.5%
Annual Percent Change‡		
Incidence 1988-1999	-1.4%	1.0%
Mortality 1988-1999	-1.4%	1.1%

† See introduction for definition of terms.
‡ The average *annual percent change* in the age-adjusted rate over the time period. Statistically significant ($P < 0.05$) trends are in **bold.**

Table III-18.5: Average annual incidence and mortality rates§ in the United States, 1995-1999, Multiple Myeloma

	Males	Females
Incidence		
All Races	6.9	4.6
White†	6.5	4.2
Mortality		
All Races	4.9	3.3
White†	4.5	3.0

Source: *SEER Cancer Statistics Review, 1973-1999.* Incidence data represent 10% of the U.S. population, while mortality data are for the entire nation.
§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.
† All white persons, including those of Hispanic ethnicity.

Table III-18.6: Five-year relative survival‡ by gender and age at diagnosis, Multiple Myeloma

Age at Diagnosis (years)	Male(%)	Female(%)
< 45	46.7	49.2
45-54	44.3	44.5
55-64	37.2	34.6
65-74	26.9	27.3
75+	20.1	18.2
All Ages	31.5	28.8

‡ Among SEER cases diagnosed 1992-1998 followed through 1999, from *SEER Cancer Statistics Review, 1973-1999.*

Descriptive Epidemiology

Incidence and Mortality: Multiple myeloma is a malignancy of the plasma cells, a component of the immune system, which can lead to the formation of multiple tumors in the bone marrow. About 225 cases of multiple myeloma are diagnosed in Minnesota each year, and 175 deaths are caused by this cancer. Mortality rates in Minnesota are somewhat higher than those reported nationally. Based on SEER data for multiple myeloma cases diagnosed between 1992 and 1998, the 5-year relative survival rate was 31.5 percent for males and 28.8 percent for females.

Trends: Incidence and mortality rates of multiple myeloma have decreased somewhat among males and increased somewhat among females in Minnesota since cancer reporting was initiated in 1988, but none of the trends are statistically significant. Nationally, rates of multiple myeloma appear to have peaked in the mid-1990s after increasing steadily since the early 1970s. The reasons for the recent decline are not known.

Age: Multiple myeloma incidence rates increase dramatically with age, with only eight percent of cases occurring among those less than 50 years of age. The median age at diagnosis is about 70 years.

Gender: Rates of multiple myeloma are about 30 percent higher among males than females.

Race: Incidence and mortality rates are two to three times higher among blacks than whites in Minnesota. This is consistent with data from SEER, which also demonstrate that Hispanics, Asian/Pacific Islanders, and American Indians have somewhat lower rates than whites. Although blacks are at greater risk of developing multiple myeloma than other races, their survival rates are as high as, or higher than, whites.

Risk Factors

Very little is known about the etiology of this cancer. Approximately 20 percent of individuals with monoclonal gammopathy of unknown significance or extramedullary plasmacytoma will go on to develop multiple myeloma. Certain autoimmune conditions and chronic immune system stimulation may increase risk of multiple myeloma. Exposure to ionizing radiation and various occupational exposures have been linked with this cancer, but are likely to account for only a small percentage of cases.

Early Detection/Prevention

There are currently no proven screening methods for detecting multiple myeloma. The manifestations of multiple myeloma are variable and can be very difficult to diagnose. There are often no symptoms in the early stages of the disease. However, some common early symptoms of multiple myeloma include bone pain, anemia, kidney failure, and increased susceptibility to infection.

Non-Hodgkin's Lymphoma

Table III-19.1: Number of new cases and deaths and incidence and mortality rates§ by year, Minnesota, 1988-1999, Non-Hodgkin's Lymphoma

Year of Diagnosis or Death	Incidence				Mortality			
	New Cases		Annual Rate		Deaths		Annual Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
1988	399	347	22.9	15.1	174	183	10.3	7.4
1989	388	364	21.8	15.6	177	179	10.5	7.2
1990	388	371	21.4	16.0	179	163	10.7	6.5
1991	439	376	23.8	15.7	187	189	10.8	7.5
1992	438	390	23.8	15.9	192	216	10.9	8.3
1993	462	401	24.0	16.6	223	213	12.1	8.3
1994	503	417	26.0	17.3	216	210	11.8	8.2
1995	478	412	24.3	16.5	215	210	11.6	8.0
1996	499	418	25.2	16.7	232	261	12.1	9.8
1997	501	452	24.8	17.9	234	218	12.3	8.1
1998	521	454	25.8	17.7	259	204	13.3	7.4
1999	519	463	25.2	17.9	215	219	11.0	7.9

Table III-19.2: Number of new cases and deaths and average annual incidence and mortality rates§ by age, Minnesota, 1995-1999, Non-Hodgkin's Lymphoma

Age at Diagnosis or Death (years)	Incidence 1995-1999				Mortality 1995-1999			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
0 – 19	52	26	1.5	0.8	4	6	0.1	0.2
20 – 34	137	71	5.6	2.9	22	13	0.9	0.5
35 – 49	348	267	12.5	9.7	96	54	3.4	2.0
50 – 64	621	447	40.1	27.9	220	161	14.2	10.0
65 – 74	621	533	91.8	66.7	314	237	46.7	29.6
75 – 84	583	591	143.3	95.0	366	385	90.1	61.7
85 and older	156	264	135.3	91.6	133	256	115.3	88.8

Table III-19.3: Number of new cases and deaths and average annual incidence and mortality rates§ by race and ethnicity, Minnesota, 1995-1999, Non-Hodgkin's Lymphoma

Race and Ethnicity†	Incidence 1995-1999				Mortality 1995-1999			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
All Races	2,518	2,199	25.1	17.3	1,155	1,112	12.1	8.2
American Indian	8	10	~	14.3	3	1	~	~
Asian/Pacific Isl.	26	15	28.1	11.3	11	10	16.0	9.6
Black	43	21	23.6	10.0	14	11	6.9	7.2
White	2,409	2,130	24.8	17.3	1,126	1,089	12.1	8.2
White Hispanic	~	~	~	~	10	6	14.2	~

Source: All cases were either microscopically confirmed (1988-1999) or Death Certificate Only (1995-1999) and were reported to the MCSS by October 2002. Excludes *in situ* cancers except *in situ* bladder cancers. Deaths are from the Minnesota Center for Health Statistics, and include all deaths with the specified cancer as the underlying cause of death during the time period, regardless of year of diagnosis. All rates were calculated by MCSS.

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.
† White includes persons of Hispanic ethnicity. Persons reported with unknown or other race are included in all races combined, but are excluded from race-specific data. See text for comments on the accuracy of race- and ethnic-specific cancer rates.
~ Hispanic incidence data are not available. Race-specific rates based on fewer than 10 cases or deaths are not presented.

Table III-19.4: Other Minnesota statistics,† Non-Hodgkin's Lymphoma

	Males	Females
Median Age at Diagnosis	66.0	70.0
Median Age at Death	72.0	77.0
Lifetime Risk of Diagnosis	2.4%	2.1%
Lifetime Risk of Death	1.2%	1.1%
Annual Percent Change‡		
Incidence 1988-1999	**1.4%**	**1.5%**
Mortality 1988-1999	**1.6%**	1.2%

† See introduction for definition of terms.
‡ The average *annual percent change* in the age-adjusted rate over the time period. Statistically significant ($P < 0.05$) trends are in **bold.**

Table III-19.5: Average annual incidence and mortality rates§ in the United States, 1995-1999, Non-Hodgkin's Lymphoma

	Males	Females
Incidence		
All Races	23.9	15.8
White†	24.5	16.5
Mortality		
All Races	10.8	7.2
White†	11.2	7.5

Source: *SEER Cancer Statistics Review, 1973-1999.* Incidence data represent 10% of the U.S. population, while mortality data are for the entire nation.
§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.
† All white persons, including those of Hispanic ethnicity.

Table III-19.6: Five-year relative survival‡ by gender and age at diagnosis, Non-Hodgkin's Lymphoma

Age at Diagnosis (years)	Male(%)	Female(%)
< 45	48.2	71.1
45-54	58.3	73.2
55-64	57.2	66.6
65-74	53.8	55.9
75+	38.2	43.7
All Ages	51.4	59.5

‡ Among SEER cases diagnosed 1992-1998 followed through 1999, from *SEER Cancer Statistics Review, 1973-1999.*

Descriptive Epidemiology

Incidence and Mortality: Lymphomas are malignancies of white blood cells, called lymphocytes. These malignancies are of two types: Hodgkin's lymphoma and non-Hodgkin's lymphomas (NHL). NHL is more common, accounting for 85 percent of lymphomas. Many subtypes of NHL have been identified which vary in both the specific type of lymphocyte involved and in prognosis. Approximately 940 cases of NHL are diagnosed in Minnesota each year, and 450 deaths occur. It accounts for 4.5 percent of all new cancers and 5.2 percent of cancer deaths in the state. Incidence and mortality rates in Minnesota are somewhat higher than those reported nationally.

Trends: NHL rates increased significantly among men and women in Minnesota by about 1.5 percent per year from 1988 to 1999. Nationally, NHL incidence rates increased by about 75 percent from 1973 to the mid-1990s, making it one of the fastest increasing cancers. However, rates appear to have stabilized. Some of the increase may be due to the AIDS epidemic (see below).

Age: The majority (58%) of NHL is diagnosed among persons ages 65 years and older. However, it is one of the most common forms of childhood cancer.

Gender: NHL rates are about 45 percent higher among men than women.

Race: In Minnesota, NHL incidence rates do not vary significantly by race. Nationally, NHL rates are highest among whites, about 25 percent lower than whites among Asian/Pacific Islanders, blacks, and Hispanics, and 65 percent lower among American Indians.

Risk Factors

The causes of NHL are relatively unknown, and most patients with NHL have no known risk factors. Congenital immunodeficiency, immunosuppression following organ transplantation, and certain autoimmune diseases are associated with increased risk for NHL. Similarly, persons with immunodeficiency caused by infection with the human immunodeficiency virus, the cause of AIDS, are 60 times more likely to develop certain types of NHL. Other infectious agents have been associated with NHL in Japan, the Caribbean, and Africa, but appear to play a minor role in the U.S. *Helicobacter pylori* bacteria has been identified as causing some lymphomas of the stomach. Chemotherapy and radiation therapy for other cancers may also increase risk for NHL. Herbicides, pesticides, and nitrates in drinking water have been studied, but their causal association with NHL is still unclear.

Early Detection/Prevention

There are no established methods to detect NHL early through population-based screening.

Oral Cavity and Pharynx

Table III-20.1: Number of new cases and deaths and incidence and mortality rates§ by year, Minnesota, 1988-1999, Oral Cavity and Pharynx Cancer

Year of Diagnosis or Death	Incidence				Mortality			
	New Cases		Annual Rate		Deaths		Annual Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
1988	339	169	19.4	7.6	70	44	4.0	1.8
1989	371	169	21.2	7.5	59	38	3.3	1.7
1990	382	177	21.1	7.5	83	41	4.7	1.6
1991	360	167	19.9	7.2	69	57	3.8	2.3
1992	327	160	17.5	7.0	72	44	4.0	1.8
1993	327	144	17.6	6.1	64	43	3.5	1.8
1994	329	194	17.3	8.2	66	39	3.5	1.5
1995	352	154	18.1	6.3	66	37	3.5	1.4
1996	330	184	16.7	7.6	67	39	3.4	1.5
1997	343	147	16.9	5.9	77	50	3.8	2.0
1998	334	158	16.3	6.4	80	43	4.0	1.6
1999	350	157	16.7	6.2	60	33	3.0	1.3

Table III-20.2: Number of new cases and deaths and average annual incidence and mortality rates§ by age, Minnesota, 1995-1999, Oral Cavity and Pharynx Cancer

Age at Diagnosis or Death (years)	Incidence 1995-1999				Mortality 1995-1999			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
0 – 19	7	7	0.2	0.2	0	1	0.0	0.0
20 – 34	32	34	1.3	1.4	6	2	0.2	0.1
35 – 49	277	99	10.0	3.6	38	15	1.4	0.5
50 – 64	571	209	36.9	13.1	101	49	6.5	3.1
65 – 74	445	213	65.9	26.7	108	55	16.0	6.9
75 – 84	291	165	71.6	26.8	69	43	17.0	7.0
85 and older	86	73	74.6	25.3	28	37	24.3	12.8

Table III-20.3: Number of new cases and deaths and average annual incidence and mortality rates§ by race and ethnicity, Minnesota, 1995-1999, Oral Cavity and Pharynx Cancer

Race and Ethnicity†	Incidence 1995-1999				Mortality 1995-1999			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
All Races	1,709	800	16.9	6.5	350	202	3.5	1.6
American Indian	14	10	25.7	15.0	4	3	~	~
Asian/Pacific Isl.	19	9	14.8	~	11	3	10.4	~
Black	31	20	17.6	11.8	4	4	~	~
White	1,626	746	16.6	6.2	331	191	3.5	1.5
White Hispanic	~	~	~	~	2	2	~	~

Source: All cases were either microscopically confirmed (1988-1999) or Death Certificate Only (1995-1999) and were reported to the MCSS by October 2002. Excludes *in situ* cancers except *in situ* bladder cancers. Deaths are from the Minnesota Center for Health Statistics, and include all deaths with the specified cancer as the underlying cause of death during the time period, regardless of year of diagnosis. All rates were calculated by MCSS.

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.
† White includes persons of Hispanic ethnicity. Persons reported with unknown or other race are included in all races combined, but are excluded from race-specific data. See text for comments on the accuracy of race- and ethnic-specific cancer rates.
~ Hispanic incidence data are not available. Race-specific rates based on fewer than 10 cases or deaths are not presented.

Table III-20.4: Other Minnesota statistics,† Oral Cavity and Pharynx Cancer

	Males	Females
Median Age at Diagnosis	64.0	67.0
Median Age at Death	67.0	72.0
Lifetime Risk of Diagnosis	1.6%	0.7%
Lifetime Risk of Death	0.4%	0.2%
Annual Percent Change‡		
Incidence 1988-1999	**-2.2%**	-1.7%
Mortality 1988-1999	-1.4%	-1.9%

† See introduction for definition of terms.
‡ The average *annual percent change* in the age-adjusted rate over the time period. Statistically significant ($P < 0.05$) trends are in **bold.**

Table III-20.5: Average annual incidence and mortality rates§ in the United States, 1995-1999, Oral Cavity and Pharynx Cancer

	Males	Females
Incidence		
All Races	16.8	6.8
White†	16.5	6.7
Mortality		
All Races	4.6	1.8
White†	4.2	1.7

Source: *SEER Cancer Statistics Review, 1973-1999.* Incidence data represent 10% of the U.S. population, while mortality data are for the entire nation.
§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.
† All white persons, including those of Hispanic ethnicity.

Table III-20.6: Extent of disease at diagnosis and 5-year relative survival, Oral Cavity and Pharynx Cancer

Stage at Diagnosis	Percent of Cases†(%)	5-Year Relative Survival‡ (%)
In Situ	3.3	-
Localized	51.3	81.9
Regional	36.5	46.7
Distant	5.2	23.4
Unknown	3.7	42.5

† Among Minnesota cases diagnosed 1995-1999.
‡ Among SEER cases diagnosed 1992-1998 followed through 1999, from *SEER Cancer Statistics Review, 1973-1999.*

Descriptive Epidemiology

Incidence and Mortality: About 500 cases of oral cavity and pharynx cancer are diagnosed each year in Minnesota, and 110 people die from this cancer annually. It accounts for 2.4 percent of all cancers and 1.3 percent of cancer deaths in the state. Incidence rates of oral cavity and pharynx cancer in Minnesota are similar to those reported by SEER, and mortality rates are slightly lower than U.S. rates. Based on SEER data, the 5-year relative survival rate for oral cavity and pharynx cancer is 81.9 percent for localized tumors. In Minnesota, most cases of this cancer (51.3%) are diagnosed when still localized.

Trends: Rates of oral cavity and pharynx cancer in Minnesota declined by about two percent per year from 1988 to 1999. Nationally, incidence and mortality rates have steadily declined since the early 1980s.

Age: Less than 20 percent of cases of oral cavity and pharynx cancer are diagnosed among those less than 50 years of age. Incidence rates steadily increase with age.

Gender: Rates of oral cavity and pharynx cancer are two to three times higher among males than females.

Race: In Minnesota, American Indian males and females have the highest incidence rates of cancer of the oral cavity and pharynx, followed by blacks, whites, and Asian/Pacific Islanders. Rates among American Indians are twice as high in Minnesota as in the geographic areas covered by SEER. This may reflect different levels of tobacco use among Northern Plains Indians compared to those in the Southwest U.S., where the majority of American Indians reported by SEER are located.

Risk Factors

Tobacco use and heavy alcohol consumption are the most important risk factors for development of oral cavity and pharynx cancer, accounting for nearly 75 percent of cases in the U.S. Diets low in fruits and vegetables are also associated with increased risk of disease.

Early Detection/Prevention

Most cases of oral cavity and pharynx cancer are preventable. The single most effective measure to lowering risk of developing this cancer is to reduce exposure to tobacco and alcohol.

Ovary

Table III-21.1: Number of new cases and deaths and incidence and mortality rates§ by year, Minnesota, 1988-1999, Ovary Cancer

Year of Diagnosis or Death	Incidence				Mortality			
	New Cases		Annual Rate		Deaths		Annual Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
1988	-	345	-	16.0	-	238	-	10.5
1989	-	357	-	16.5	-	239	-	10.3
1990	-	337	-	15.5	-	198	-	8.7
1991	-	357	-	16.0	-	240	-	9.9
1992	-	415	-	18.3	-	230	-	9.8
1993	-	406	-	17.8	-	221	-	9.2
1994	-	434	-	18.9	-	237	-	9.7
1995	-	453	-	19.5	-	217	-	8.9
1996	-	422	-	18.0	-	252	-	10.1
1997	-	416	-	17.2	-	218	-	8.5
1998	-	421	-	17.3	-	252	-	9.6
1999	-	449	-	18.2	-	225	-	8.7

Table III-21.2: Number of new cases and deaths and average annual incidence and mortality rates§ by age, Minnesota, 1995-1999, Ovary Cancer

Age at Diagnosis or Death (years)	Incidence 1995-1999				Mortality 1995-1999			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
0 – 19	-	25	-	0.7	-	1	-	0.0
20 – 34	-	120	-	4.9	-	6	-	0.2
35 – 49	-	461	-	16.7	-	90	-	3.3
50 – 64	-	635	-	39.8	-	260	-	16.2
65 – 74	-	432	-	54.1	-	317	-	39.6
75 – 84	-	384	-	62.0	-	338	-	54.5
85 and older	-	104	-	36.1	-	152	-	52.7

Table III-21.3: Number of new cases and deaths and average annual incidence and mortality rates§ by race and ethnicity, Minnesota, 1995-1999, Ovary Cancer

Race and Ethnicity†	Incidence 1995-1999				Mortality 1995-1999			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
All Races	-	2,161	-	18.0	-	1,164	-	9.1
American Indian	-	10	-	13.3	-	6	-	~
Asian/Pacific Isl.	-	16	-	10.7	-	6	-	~
Black	-	13	-	5.8	-	6	-	~
White	-	2,085	-	18.0	-	1,145	-	9.2
White Hispanic	-	~	-	~	-	6	-	~

Source: All cases were either microscopically confirmed (1988-1999) or Death Certificate Only (1995-1999) and were reported to the MCSS by October 2002. Excludes *in situ* cancers except *in situ* bladder cancers. Deaths are from the Minnesota Center for Health Statistics, and include all deaths with the specified cancer as the underlying cause of death during the time period, regardless of year of diagnosis. All rates were calculated by MCSS.

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.
† White includes persons of Hispanic ethnicity. Persons reported with unknown or other race are included in all races combined, but are excluded from race-specific data. See text for comments on the accuracy of race- and ethnic-specific cancer rates.
~ Hispanic incidence data are not available. Race-specific rates based on fewer than 10 cases or deaths are not presented.

Table III-21.4: Other Minnesota statistics,† Ovary Cancer

	Males	Females
Median Age at Diagnosis	-	61.0
Median Age at Death	-	72.0
Lifetime Risk of Diagnosis	-	1.9%
Lifetime Risk of Death	-	1.1%
Annual Percent Change‡		
Incidence 1988-1999	-	1.1%
Mortality 1988-1999	-	-1.0%

† See introduction for definition of terms.
‡ The average *annual percent change* in the age-adjusted rate over the time period. Statistically significant ($P < 0.05$) trends are in **bold.**

Table III-21.5: Average annual incidence and mortality rates§ in the United States, 1995-1999, Ovary Cancer

	Males	Females
Incidence		
All Races	-	17.1
White†	-	18.1
Mortality		
All Races	-	9.0
White†	-	9.3

Source: *SEER Cancer Statistics Review, 1973-1999.* Incidence data represent 10% of the U.S. population, while mortality data are for the entire nation.
§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.
† All white persons, including those of Hispanic ethnicity.

Table III-21.6: Extent of disease at diagnosis and 5-year relative survival, Ovary Cancer

Stage at Diagnosis	Percent of Cases†(%)	5-Year Relative Survival‡ (%)
In Situ	0.0	-
Localized	34.6	94.6
Regional	16.1	81.3
Distant	44.5	30.9
Unknown	4.6	27.9

† Among Minnesota cases diagnosed 1995-1999.
‡ Among SEER cases diagnosed 1992-1998 followed through 1999, from *SEER Cancer Statistics Review, 1973-1999.*

Descriptive Epidemiology

Incidence and Mortality: Ovarian cancer accounts for 4.3 percent of cancers and 5.5 percent of cancer deaths among Minnesota women. Each year, an average of 430 cases are diagnosed, and 230 deaths occur. Incidence and mortality rates in Minnesota are very similar to national rates. Based on SEER cases diagnosed in 1992-1998, the 5-year relative survival rate is 94.6 percent for localized tumors and 81.3 percent for regional tumors. However, many (44.5%) ovarian cancers are diagnosed when the tumor has already spread to other organs, when 5-year survival is lower (30.9%).

Trends: Ovarian cancer incidence rates in Minnesota increased somewhat over the 12-year period, with most of the increase occurring between 1991 and 1992. It is likely that this resulted from changes in the definition of invasive ovarian cancer adopted by cancer registries in 1992. Mortality rates declined somewhat in Minnesota, but the decrease was not statistically significant. Nationally, incidence and mortality rates of ovarian cancer have declined significantly by 1 percent per year or less since the early 1990s.

Age: The majority of ovarian cancers develop after menopause. About 72 percent of cases in Minnesota are diagnosed in women age 50 years or older.

Race: In Minnesota, ovarian cancer incidence rates are highest among white women and somewhat lower among American Indian and Asian/Pacific Islander women, similar to what is reported nationally. However, rates for black women are about 50 percent lower in Minnesota than reported by SEER. It is possible that this reflects random variation due to small numbers of cases. Too few deaths from ovarian cancer occurred among women of color in Minnesota to calculate reliable mortality rates. Based on mortality rates in the U.S., white women are the most likely to die of ovarian cancer.

Risk Factors

As with breast cancer, the risk for ovarian cancer is somewhat higher among women who begin menstruating at an early age, have no children or have their first child after the age of 30 years, or begin menopause after the age of 50 years. Infertility, use of fertility drugs, and use of unopposed estrogen replacement therapy may also increase risk for ovarian cancer, but research studies have shown conflicting results. On the other hand, long-term use of oral contraceptives reduces risk. Women who have had breast cancer or have a family history of breast or ovarian cancer are at increased risk, which may be linked to mutations in the BRCA1 or BRCA2 genes.

Early Detection/Prevention

Routine pelvic examination can help detect abnormalities in the size, shape, and consistency of the ovaries, and is recommended for all women age 18 years and older. However, most early stage ovarian tumors cannot be palpated. Screening is not recommended for women without strong known risk factors.

Pancreas

Table III-22.1: Number of new cases and deaths and incidence and mortality rates§ by year, Minnesota, 1988-1999, Pancreas Cancer

Year of Diagnosis or Death	Incidence				Mortality			
	New Cases		Annual Rate		Deaths		Annual Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
1988	177	155	10.1	6.8	201	221	11.9	9.1
1989	158	159	8.9	6.9	211	211	12.4	8.5
1990	153	137	8.8	5.8	200	223	11.9	8.9
1991	161	142	8.7	6.0	187	220	10.6	8.8
1992	207	172	11.2	7.2	231	236	13.0	9.3
1993	167	154	9.0	6.4	217	228	12.3	8.9
1994	174	151	9.1	6.3	242	238	13.2	9.1
1995	180	163	9.3	6.7	211	240	11.3	9.1
1996	208	181	10.7	7.1	234	233	12.4	8.8
1997	184	169	9.3	6.7	230	247	11.9	9.1
1998	210	191	10.5	7.3	261	258	13.4	9.2
1999	214	184	10.4	7.0	232	268	11.6	9.5

Table III-22.2: Number of new cases and deaths and average annual incidence and mortality rates§ by age, Minnesota, 1995-1999, Pancreas Cancer

Age at Diagnosis or Death (years)	Incidence 1995-1999				Mortality 1995-1999			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
0 – 19	0	0	0.0	0.0	0	0	0.0	0.0
20 – 34	4	3	0.2	0.1	3	3	0.1	0.1
35 – 49	105	55	3.8	2.0	91	40	3.3	1.5
50 – 64	270	189	17.4	11.7	254	182	16.4	11.3
65 – 74	328	258	48.7	32.3	377	303	56.0	37.9
75 – 84	236	280	57.9	45.1	321	409	78.9	64.9
85 and older	53	103	46.0	35.7	122	309	105.8	107.2

Table III-22.3: Number of new cases and deaths and average annual incidence and mortality rates§ by race and ethnicity, Minnesota, 1995-1999, Pancreas Cancer

Race and Ethnicity†	Incidence 1995-1999				Mortality 1995-1999			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
All Races	996	888	10.1	7.0	1,168	1,246	12.1	9.1
American Indian	4	0	~	~	2	1	~	~
Asian/Pacific Isl.	6	6	~	~	7	9	~	~
Black	22	14	17.6	9.8	21	14	18.1	10.6
White	961	866	10.0	7.0	1,137	1,222	12.1	9.1
White Hispanic	~	~	~	~	12	8	21.4	~

Source: All cases were either microscopically confirmed (1988-1999) or Death Certificate Only (1995-1999) and were reported to the MCSS by October 2002. Excludes *in situ* cancers except *in situ* bladder cancers. Deaths are from the Minnesota Center for Health Statistics, and include all deaths with the specified cancer as the underlying cause of death during the time period, regardless of year of diagnosis. All rates were calculated by MCSS.

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.
† White includes persons of Hispanic ethnicity. Persons reported with unknown or other race are included in all races combined, but are excluded from race-specific data. See text for comments on the accuracy of race- and ethnic-specific cancer rates.
~ Hispanic incidence data are not available. Race-specific rates based on fewer than 10 cases or deaths are not presented.

Pancreas

Table III-22.4: Other Minnesota statistics,† Pancreas Cancer

	Males	Females
Median Age at Diagnosis	69.0	73.0
Median Age at Death	71.0	77.0
Lifetime Risk of Diagnosis	1.0%	0.9%
Lifetime Risk of Death	1.2%	1.3%
Annual Percent Change‡		
Incidence 1988-1999	0.9%	0.8%
Mortality 1988-1999	0.3%	0.4%

† See introduction for definition of terms.
‡ The average *annual percent change* in the age-adjusted rate over the time period. Statistically significant ($P < 0.05$) trends are in **bold.**

Table III-22.5: Average annual incidence and mortality rates§ in the United States, 1995-1999, Pancreas Cancer

	Males	Females
Incidence		
All Races	12.6	9.9
White†	12.3	9.5
Mortality		
All Races	12.2	9.3
White†	12.0	9.0

Source: *SEER Cancer Statistics Review, 1973-1999.* Incidence data represent 10% of the U.S. population, while mortality data are for the entire nation.
§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.
† All white persons, including those of Hispanic ethnicity.

Table III-22.6: Extent of disease at diagnosis and 5-year relative survival, Pancreas Cancer

Stage at Diagnosis	Percent of Cases†(%)	5-Year Relative Survival‡ (%)
In Situ	0.1	-
Localized	9.8	17.0
Regional	36.4	6.9
Distant	41.9	1.5
Unknown	11.9	3.7

† Among Minnesota cases diagnosed 1995-1999.
‡ Among SEER cases diagnosed 1992-1998 followed through 1999, from *SEER Cancer Statistics Review, 1973-1999.*

Descriptive Epidemiology

Incidence and Mortality: About 375 cases of pancreatic cancer are diagnosed and microscopically confirmed in Minnesota each year, and 480 Minnesotans die from this disease each year. Incidence rates in Minnesota are about 20 percent lower than those reported by SEER, most likely because clinically diagnosed cases are not included in MCSS rates. Mortality rates in Minnesota are similar to those in the U.S. Pancreatic cancer is one of the most rapidly fatal cancers and generally remains asymptomatic until well advanced. Based on SEER cases diagnosed in 1992-1998, the 5-year relative survival rate is 17.0 percent for localized tumors, and 6.9 percent for regional tumors. Most pancreatic cancers are diagnosed at the regional (36.4%) or distant stage (41.9%).

Trends: Rates of pancreatic cancer in Minnesota have remained relatively stable since cancer reporting began in 1988. Nationally, rates have slightly declined in males over the past 20 years, but have remained stable for females.

Age: Pancreatic cancer is extremely rare in early life. Incidence rates increase sharply after age 50 years and continue to increase steadily with age. The median age at diagnosis is 69 years for men and 73 years for women in Minnesota.

Gender: Rates are about 30 percent higher among males than females.

Race: In Minnesota, pancreas cancer incidence and mortality rates are higher among blacks than among whites. This is consistent with national data, which show that blacks are 50 percent more likely to be diagnosed and 40 percent more likely to die of this cancer than whites. There are too few cases among other persons of color in Minnesota to make meaningful comparisons. However, national data indicate that the risk of pancreas cancer is lower among Hispanics and Asian/Pacific Islanders than among whites, and lowest among American Indians.

Risk Factors

Cigarette smoking is the most consistent risk factor for pancreatic cancer, with a two-fold risk for smokers relative to nonsmokers. Little is known about the etiology of this disease, but research has suggested that obesity, diabetes mellitus, high-fat diets, and occupational exposures to certain chemicals and petroleum can increase risk of developing pancreatic cancer.

Early Detection/Prevention

There are currently no screening tests that can accurately detect early stage pancreatic cancer in asymptomatic individuals.

Prostate

Table III-23.1: Number of new cases and deaths and incidence and mortality rates§ by year, Minnesota, 1988-1999, Prostate Cancer

Year of Diagnosis or Death	Incidence				Mortality			
	New Cases		Annual Rate		Deaths		Annual Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
1988	2,453	-	146.9	-	586	-	38.2	-
1989	2,629	-	155.1	-	636	-	41.5	-
1990	2,969	-	172.7	-	607	-	38.6	-
1991	3,829	-	215.0	-	646	-	41.0	-
1992	4,242	-	234.3	-	611	-	37.5	-
1993	3,775	-	204.1	-	604	-	37.1	-
1994	3,206	-	170.9	-	673	-	40.7	-
1995	3,274	-	172.4	-	653	-	39.2	-
1996	3,228	-	167.1	-	681	-	39.2	-
1997	3,454	-	176.4	-	596	-	34.0	-
1998	3,425	-	172.6	-	598	-	33.5	-
1999	3,642	-	181.1	-	565	-	31.0	-

Table III-23.2: Number of new cases and deaths and average annual incidence and mortality rates§ by age, Minnesota, 1995-1999, Prostate Cancer

Age at Diagnosis or Death (years)	Incidence 1995-1999				Mortality 1995-1999			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
0 – 19	1	-	0.0	-	0	-	0.0	-
20 – 34	0	-	0.0	-	0	-	0.0	-
35 – 49	260	-	9.7	-	5	-	0.2	-
50 – 64	4,525	-	290.7	-	189	-	12.1	-
65 – 74	7,115	-	1054.7	-	681	-	101.5	-
75 – 84	4,257	-	1044.3	-	1,291	-	318.0	-
85 and older	865	-	750.0	-	927	-	803.7	-

Table III-23.3: Number of new cases and deaths and average annual incidence and mortality rates§ by race and ethnicity, Minnesota, 1995-1999, Prostate Cancer

Race and Ethnicity†	Incidence 1995-1999				Mortality 1995-1999			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
All Races	17,023	-	174.0	-	3,093	-	35.3	-
American Indian	54	-	134.7	-	16	-	42.1	-
Asian/Pacific Isl.	41	-	52.0	-	1	-	~	-
Black	251	-	224.2	-	59	-	82.3	-
White	16,384	-	171.5	-	3,015	-	35.0	-
White Hispanic	~	-	~	-	18	-	35.4	-

Source: All cases were either microscopically confirmed (1988-1999) or Death Certificate Only (1995-1999) and were reported to the MCSS by October 2002. Excludes *in situ* cancers except *in situ* bladder cancers. Deaths are from the Minnesota Center for Health Statistics, and include all deaths with the specified cancer as the underlying cause of death during the time period, regardless of year of diagnosis. All rates were calculated by MCSS.

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.
† White includes persons of Hispanic ethnicity. Persons reported with unknown or other race are included in all races combined, but are excluded from race-specific data. See text for comments on the accuracy of race- and ethnic-specific cancer rates.
~ Hispanic incidence data are not available. Race-specific rates based on fewer than 10 cases or deaths are not presented.

Table III-23.4: Other Minnesota statistics,† Prostate Cancer

	Males	Females
Median Age at Diagnosis	70.0	-
Median Age at Death	80.0	-
Lifetime Risk of Diagnosis	17.8%	-
Lifetime Risk of Death	3.7%	-
Annual Percent Change‡		
Incidence 1988-1999	-0.1%	-
Mortality 1988-1999	**-1.7%**	-

† See introduction for definition of terms.
‡ The average *annual percent change* in the age-adjusted rate over the time period. Statistically significant ($P < 0.05$) trends are in **bold.**

Table III-23.5: Average annual incidence and mortality rates§ in the United States, 1995-1999, Prostate Cancer

	Males	Females
Incidence		
All Races	168.9	-
White†	163.2	-
Mortality		
All Races	33.9	-
White†	31.2	-

Source: *SEER Cancer Statistics Review, 1973-1999.* Incidence data represent 10% of the U.S. population, while mortality data are for the entire nation.
§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.
† All white persons, including those of Hispanic ethnicity.

Table III-23.6: Extent of disease at diagnosis and 5-year relative survival, Prostate Cancer

Stage at Diagnosis	Percent of Cases†(%)	5-Year Relative Survival‡ (%)
In Situ	0.2	-
Localized/Regional	88.7	100.0
Distant	5.7	33.6
Unknown	5.7	88.2

† Among Minnesota cases diagnosed 1995-1999.
‡ Among SEER cases diagnosed 1992-1998 followed through 1999, from *SEER Cancer Statistics Review, 1973-1999.*

Descriptive Epidemiology

Incidence and Mortality: Prostate cancer is the most common cancer among Minnesota men, accounting for 32 percent of cancer diagnoses and 14 percent of cancer deaths among males. Approximately 3,400 cases of prostate cancer are diagnosed in the state each year, and 620 deaths are caused by this cancer. Rates in Minnesota are somewhat higher than those reported nationally.

Trends: The prostate cancer incidence rate in Minnesota varied considerably from 1988 to 1999, while mortality decreased significantly by 1.7 percent per year. As in Minnesota, SEER incidence rates increased dramatically from 1988 and 1992, primarily due to diagnosis of prostate cancer with the prostate-specific antigen (PSA) test. The U.S. prostate cancer mortality rate decreased significantly by four percent per year from 1994 and 1999. Whether this decrease can be attributed to early diagnosis with PSA screening is controversial.

Age: About 70 percent of all newly diagnosed prostate cancer cases and over 90 percent of deaths occur among men aged 65 years and older.

Race: Prostate cancer rates are highest among black men. Both in Minnesota and nationally, their incidence rate is more than 30 percent higher and their mortality rate is more than double that of white men, who have the next highest rates. In Minnesota, Asian/Pacific Islander men have the lowest rates, while American Indians have rates that are intermediate between whites and Asian/Pacific Islanders. However, in geographic areas reporting to SEER, American Indians have the lowest prostate cancer rates, about 50 percent lower than American Indians in Minnesota.

Risk Factors

Men with a family history of prostate cancer are at increased risk for developing the disease. It is unknown whether this association is genetically related or due to shared environmental exposures. Research suggests that diets high in fat can increase risk, while lycopene, intake of fruits and vegetables, and certain antioxidants may offer protection against prostate cancer.

Early Detection/Prevention

Prostate cancer can often be detected early by measuring the amount of PSA in the blood. Widespread use of the PSA test started in about 1990, but it has yet to be shown to lower the prostate cancer mortality rate. The dilemma is that the PSA test cannot distinguish between slow-growing tumors that would never become life-threatening and aggressive tumors that would become symptomatic. Treatment for prostate cancer can result in a marked decrease in quality of life because of incontinence and impotence. The American Cancer Society recommends that men 50 years of age or older discuss the risks and benefits of PSA testing with their physicians before deciding whether or not to be screened.

Soft Tissues

Table III-24.1: Number of new cases and deaths and incidence and mortality rates§ by year, Minnesota, 1988-1999, Cancer of the Soft Tissues, including Heart

Year of Diagnosis or Death	Incidence				Mortality			
	New Cases		Annual Rate		Deaths		Annual Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
1988	76	56	4.2	2.5	26	26	1.5	1.0
1989	61	44	3.2	2.0	24	26	1.3	1.3
1990	70	58	3.6	2.6	33	34	1.8	1.5
1991	87	67	4.5	2.9	27	20	1.4	0.9
1992	73	48	3.8	2.0	23	36	1.4	1.5
1993	90	59	4.7	2.5	39	26	2.0	1.1
1994	77	68	3.8	2.8	26	44	1.4	1.8
1995	63	45	3.2	1.8	27	31	1.4	1.2
1996	73	60	3.5	2.5	37	41	2.0	1.6
1997	77	66	3.7	2.7	32	35	1.6	1.4
1998	73	77	3.4	3.1	35	33	1.7	1.3
1999	59	61	2.8	2.4	33	21	1.5	0.8

Table III-24.2: Number of new cases and deaths and average annual incidence and mortality rates§ by age, Minnesota, 1995-1999, Cancer of the Soft Tissues, including Heart

Age at Diagnosis or Death (years)	Incidence 1995-1999				Mortality 1995-1999			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
0 – 19	28	26	0.8	0.8	8	4	0.2	0.1
20 – 34	36	32	1.5	1.3	10	9	0.4	0.4
35 – 49	67	49	2.3	1.8	27	14	1.0	0.5
50 – 64	67	65	4.3	4.1	35	39	2.3	2.4
65 – 74	71	48	10.6	6.0	30	27	4.5	3.4
75 – 84	50	55	12.3	8.9	34	45	8.4	7.3
85 and older	26	34	22.5	11.8	20	23	17.3	8.0

Table III-24.3: Number of new cases and deaths and average annual incidence and mortality rates§ by race and ethnicity, Minnesota, 1995-1999, Cancer of the Soft Tissues, including Heart

Race and Ethnicity†	Incidence 1995-1999				Mortality 1995-1999			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
All Races	345	309	3.3	2.5	164	161	1.7	1.3
American Indian	1	2	~	~	1	1	~	~
Asian/Pacific Isl.	5	3	~	~	2	0	~	~
Black	13	3	4.2	~	3	5	~	~
White	318	294	3.2	2.5	158	155	1.7	1.3
White Hispanic	~	~	~	~	4	1	~	~

Source: All cases were either microscopically confirmed (1988-1999) or Death Certificate Only (1995-1999) and were reported to the MCSS by October 2002. Excludes *in situ* cancers except *in situ* bladder cancers. Deaths are from the Minnesota Center for Health Statistics, and include all deaths with the specified cancer as the underlying cause of death during the time period, regardless of year of diagnosis. All rates were calculated by MCSS.

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.
† White includes persons of Hispanic ethnicity. Persons reported with unknown or other race are included in all races combined, but are excluded from race-specific data. See text for comments on the accuracy of race- and ethnic-specific cancer rates.
~ Hispanic incidence data are not available. Race-specific rates based on fewer than 10 cases or deaths are not presented.

Soft Tissues

Table III-24.4: Other Minnesota statistics,† Cancer of the Soft Tissues, including Heart

	Males	Females
Median Age at Diagnosis	61.0	61.0
Median Age at Death	67.0	69.0
Lifetime Risk of Diagnosis	0.3%	0.3%
Lifetime Risk of Death	0.2%	0.2%
Annual Percent Change‡		
Incidence 1988-1999	-1.9%	1.2%
Mortality 1988-1999	1.1%	0.3%

† See introduction for definition of terms.
‡ The average *annual percent change* in the age-adjusted rate over the time period. Statistically significant ($P < 0.05$) trends are in **bold.**

Table III-24.5: Average annual incidence and mortality rates§ in the United States, 1995-1999, Cancer of the Soft Tissues, including Heart

	Males	Females
Incidence		
All Races	3.4	2.4
White†	3.4	2.4
Mortality		
All Races	1.6	1.4
White†	1.6	1.3

Source: *SEER Cancer Statistics Review, 1973-1999.* Incidence data represent 10% of the U.S. population, while mortality data are for the entire nation.
§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.
† All white persons, including those of Hispanic ethnicity.

Table III-24.6: Extent of Disease at diagnosis and 5-year relative survival, Cancer of the Soft Tissues, including Heart

Stage at Diagnosis	Percent of Cases†(%)	5-Year Relative Survival‡ (%)
In Situ	0.0	-
Localized	56.1	~
Regional	12.2	~
Distant	11.0	~
Unknown	20.6	~

† Among Minnesota cases diagnosed 1995-1999.
‡ Among SEER cases diagnosed 1992-1998 followed through 1999, from *SEER Cancer Statistics Review, 1973-1999.*
~ Data not available.

Descriptive Epidemiology

Incidence and Mortality: Cancers of the soft tissues are malignant tumors that develop from mesenchymal tissues such as fat, muscle, nerve, joint, blood vessel, and deep skin tissues, and are predominately sarcomas. About 50 percent of these tumors develop in the extremities. Soft tissue cancers are relatively uncommon. Approximately 130 cancers of the soft tissues are diagnosed in Minnesota each year, and 65 deaths are caused by these cancers. The incidence and mortality rates of soft tissue sarcoma in Minnesota are similar to those reported nationally. Most of these cancers are diagnosed while the tumors are localized (56.1%).

Trends: Rates of soft tissue sarcomas have been fairly stable since cancer reporting was implemented in Minnesota in 1988, with a slight, but not statistically significant, decline in incidence of 1.9 percent per year among Minnesota males. Incidence and mortality rates for cancer of the soft tissue have been stable since 1992 nationally, but diagnostic rules and reporting practices may have affected long-term trends.

Age: Incidence rates for soft tissue sarcomas increase with age. Unlike many cancers, the majority of soft tissue sarcomas are diagnosed among persons less than 65 years of age. Approximately 8.3 percent are diagnosed among persons less than 20 years of age, and 48.3 percent between 20 and 64 years. Rhabdomyosarcoma is the most common type of soft tissue sarcoma in children.

Gender: Rates of soft tissue sarcomas are similar between males and females until 65 years of age, when rates are higher among males than females.

Race: There are too few cases of soft tissue sarcomas among persons of color in Minnesota to assess racial disparities. National data indicate that incidence rates are generally higher among blacks than whites, and mortality rates are higher among nonwhites compared to whites.

Risk Factors

Ionizing radiation accounts for a small number, less than five percent, of soft tissue sarcomas. Research has linked occupational exposures of dioxin, phenoxyacetic acid, which is found in herbicides, and chlorophenols in wood preservatives to increased risk of disease, particularly angiosarcomas. Genetic conditions can lead to development of soft tissue sarcomas. Researchers have investigated the role of retroviruses in the development of sarcomas, particularly Kaposi's sarcoma which often occurs in AIDS patients, and found that immunosuppression increases disease risk.

Early Detection/Prevention

There are no direct measures currently available to detect soft tissue sarcomas early in development.

Stomach

Table III-25.1: Number of new cases and deaths and incidence and mortality rates§ by year, Minnesota, 1988-1999, Stomach Cancer

Year of Diagnosis or Death	Incidence				Mortality			
	New Cases		Annual Rate		Deaths		Annual Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
1988	204	122	12.0	5.1	143	100	8.7	4.1
1989	210	114	12.7	4.7	116	99	7.1	3.9
1990	176	110	10.2	4.4	120	85	7.2	3.4
1991	187	102	10.8	4.1	103	89	6.0	3.5
1992	226	125	12.9	5.0	141	82	7.9	3.1
1993	196	94	10.9	3.8	120	87	6.8	3.3
1994	206	116	11.4	4.5	130	82	7.4	3.0
1995	173	99	9.3	3.7	123	88	6.7	3.3
1996	195	98	10.2	3.6	115	77	6.3	2.8
1997	185	105	9.7	4.1	114	57	6.2	2.1
1998	191	103	9.7	3.9	91	76	4.8	2.8
1999	205	115	10.3	4.0	106	74	5.3	2.6

Table III-25.2: Number of new cases and deaths and average annual incidence and mortality rates§ by age, Minnesota, 1995-1999, Stomach Cancer

Age at Diagnosis or Death (years)	Incidence 1995-1999				Mortality 1995-1999			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
0 – 19	0	1	0.0	0.0	0	0	0.0	0.0
20 – 34	10	11	0.4	0.4	4	6	0.2	0.2
35 – 49	84	30	3.0	1.1	38	20	1.4	0.7
50 – 64	224	80	14.4	5.0	108	50	7.0	3.1
65 – 74	252	122	37.3	15.2	133	75	19.8	9.4
75 – 84	276	161	67.9	25.9	184	120	45.3	19.1
85 and older	103	115	89.3	39.9	82	101	71.1	35.0

Table III-25.3: Number of new cases and deaths and average annual incidence and mortality rates§ by race and ethnicity, Minnesota, 1995-1999, Stomach Cancer

Race and Ethnicity†	Incidence 1995-1999				Mortality 1995-1999			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
All Races	949	520	9.9	3.9	549	372	5.8	2.7
American Indian	7	3	~	~	3	3	~	~
Asian/Pacific Isl.	24	20	27.8	13.8	12	17	12.8	12.7
Black	24	13	20.9	10.9	15	7	14.1	~
White	889	481	9.5	3.6	519	344	5.7	2.5
White Hispanic	~	~	~	~	6	4	~	~

Source: All cases were either microscopically confirmed (1988-1999) or Death Certificate Only (1995-1999) and were reported to the MCSS by October 2002. Excludes *in situ* cancers except *in situ* bladder cancers. Deaths are from the Minnesota Center for Health Statistics, and include all deaths with the specified cancer as the underlying cause of death during the time period, regardless of year of diagnosis. All rates were calculated by MCSS.

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.
† White includes persons of Hispanic ethnicity. Persons reported with unknown or other race are included in all races combined, but are excluded from race-specific data. See text for comments on the accuracy of race- and ethnic-specific cancer rates.
~ Hispanic incidence data are not available. Race-specific rates based on fewer than 10 cases or deaths are not presented.

Table III-25.4: Other Minnesota statistics,† Stomach Cancer

	Males	Females
Median Age at Diagnosis	71.0	76.0
Median Age at Death	74.0	78.0
Lifetime Risk of Diagnosis	1.0%	0.5%
Lifetime Risk of Death	0.6%	0.4%
Annual Percent Change‡		
Incidence 1988-1999	**-2.0%**	**-2.1%**
Mortality 1988-1999	**-3.5%**	**-4.1%**

† See introduction for definition of terms.
‡ The average *annual percent change* in the age-adjusted rate over the time period. Statistically significant ($P < 0.05$) trends are in **bold.**

Table III-25.5: Average annual incidence and mortality rates§ in the United States, 1995-1999, Stomach Cancer

	Males	Females
Incidence		
All Races	12.3	5.6
White†	10.7	4.6
Mortality		
All Races	7.1	3.5
White†	6.3	3.0

Source: *SEER Cancer Statistics Review, 1973-1999.* Incidence data represent 10% of the U.S. population, while mortality data are for the entire nation.
§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.
† All white persons, including those of Hispanic ethnicity.

Table III-25.6: Extent of disease at diagnosis and 5-year relative survival, Stomach Cancer

Stage at Diagnosis	Percent of Cases†(%)	5-Year Relative Survival‡ (%)
In Situ	1.2	-
Localized	18.4	58.9
Regional	36.3	22.0
Distant	28.4	2.3
Unknown	15.7	12.8

† Among Minnesota cases diagnosed 1995-1999.
‡ Among SEER cases diagnosed 1992-1998 followed through 1999, from *SEER Cancer Statistics Review, 1973-1999.*

Descriptive Epidemiology

Incidence and Mortality: Stomach cancer accounts for 1.4 percent of all cancers diagnosed in Minnesota, and 2.1 percent of cancer deaths. Rates in Minnesota are 10 to 20 percent lower than those reported by SEER and for the U.S. Based on SEER data, the 5-year relative survival rate for stomach cancer is 58.9 percent for localized tumors, 22.0 percent for regional tumors, and 2.3 percent for distant tumors. Most cases in Minnesota are diagnosed at the regional (36.3%) or distant (28.4%) stage.

Trends: Rates of stomach cancer in Minnesota decreased significantly by 2.0 percent to 4.1 percent each year from 1988 to 1999. This is similar to national data. The most dramatic change has been in mortality. Stomach cancer was the leading cause of cancer-related deaths in the U.S. in 1930. Since then, mortality has dropped to one-fifth that rate.

Age: Rates of stomach cancer increase steadily with age. A sharp increase in stomach cancer incidence rates is observed at age 50 years. The median age at diagnosis is 71 years for men and 76 years for women.

Gender: Stomach cancer rates are two to three times higher among males than females.

Race: Incidence rates of stomach cancer are highest among people of color in Minnesota. Incidence among Asian/Pacific Islanders is four times that of whites, and rates among blacks are about three times that of whites. Blacks have the highest mortality rates of stomach cancer, followed by Asian/Pacific Islanders. This is similar to what is seen for the U.S.

Risk Factors

Several medical conditions have been linked to the development of stomach cancer. Infection with *Helicobacter pylori*, chronic active gastritis, and gastric adenomatous polyps can increase risk of disease. Individuals with a family history of stomach cancer are at greater risk of developing this cancer than those without a family history. Increased risk of stomach cancer is associated with consumption of salted, smoked, or pickled foods and diets low in fruits and vegetables. Cigarette smoking has also been shown to increase risk of stomach cancer. The sharp decline in stomach cancer since the 1940s is thought to be associated with widespread use of refrigeration and freezing to preserve foods, rather than pickling, salting, and smoking.

Early Detection/Prevention

Endoscopy is sometimes used to screen for stomach cancer. However, there is insufficient evidence to show that screening would result in a decrease in mortality from stomach cancer in a population such as the U.S., where the disease is relatively rare.

Testis

Table III-26.1: Number of new cases and deaths and incidence and mortality rates§ by year, Minnesota, 1988-1999, Testis Cancer

Year of Diagnosis or Death	Incidence				Mortality			
	New Cases		Annual Rate		Deaths		Annual Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
1988	122	-	5.2	-	10	-	0.5	-
1989	152	-	6.6	-	6	-	0.3	-
1990	115	-	4.9	-	6	-	0.3	-
1991	136	-	5.8	-	7	-	0.3	-
1992	141	-	6.0	-	5	-	0.2	-
1993	128	-	5.3	-	4	-	0.2	-
1994	151	-	6.3	-	3	-	0.1	-
1995	138	-	5.7	-	3	-	0.1	-
1996	150	-	6.3	-	6	-	0.3	-
1997	151	-	6.2	-	9	-	0.4	-
1998	156	-	6.5	-	6	-	0.3	-
1999	172	-	7.2	-	6	-	0.3	-

Table III-26.2: Number of new cases and deaths and average annual incidence and mortality rates§ by age, Minnesota, 1995-1999, Testis Cancer

Age at Diagnosis or Death (years)	Incidence 1995-1999				Mortality 1995-1999			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
0 – 19	31	-	0.9	-	0	-	0.0	-
20 – 34	399	-	16.4	-	13	-	0.5	-
35 – 49	290	-	10.0	-	8	-	0.3	-
50 – 64	25	-	1.6	-	3	-	0.2	-
65 – 74	17	-	2.5	-	3	-	0.5	-
75 – 84	4	-	1.0	-	1	-	0.2	-
85 and older	1	-	0.9	-	2	-	1.7	-

Table III-26.3: Number of new cases and deaths and average annual incidence and mortality rates§ by race and ethnicity, Minnesota, 1995-1999, Testis Cancer

Race and Ethnicity†	Incidence 1995-1999				Mortality 1995-1999			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
All Races	767	-	6.4	-	30	-	0.3	-
American Indian	5	-	~	-	0	-	~	-
Asian/Pacific Isl.	5	-	~	-	0	-	~	-
Black	7	-	~	-	0	-	~	-
White	732	-	6.5	-	30	-	0.3	-
White Hispanic	~	-	~	-	1	-	~	-

Source: All cases were either microscopically confirmed (1988-1999) or Death Certificate Only (1995-1999) and were reported to the MCSS by October 2002. Excludes *in situ* cancers except *in situ* bladder cancers. Deaths are from the Minnesota Center for Health Statistics, and include all deaths with the specified cancer as the underlying cause of death during the time period, regardless of year of diagnosis. All rates were calculated by MCSS.

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.
† White includes persons of Hispanic ethnicity. Persons reported with unknown or other race are included in all races combined, but are excluded from race-specific data. See text for comments on the accuracy of race- and ethnic-specific cancer rates.
~ Hispanic incidence data are not available. Race-specific rates based on fewer than 10 cases or deaths are not presented.

Testis

Table III-26.4: Other Minnesota statistics,† Testis Cancer

	Males	Females
Median Age at Diagnosis	33.0	-
Median Age at Death	36.5	-
Lifetime Risk of Diagnosis	0.4%	-
Lifetime Risk of Death	<0.1%	-
Annual Percent Change‡		
Incidence 1988-1999	**1.9%**	-
Mortality 1988-1999	-2.4%	-

† See introduction for definition of terms.
‡ The average *annual percent change* in the age-adjusted rate over the time period. Statistically significant ($P < 0.05$) trends are in **bold.**

Table III-26.5: Average annual incidence and mortality rates§ in the United States, 1995-1999, Testis Cancer

	Males	Females
Incidence		
All Races	5.4	-
White†	6.2	-
Mortality		
All Races	0.3	-
White†	0.3	-

Source: *SEER Cancer Statistics Review, 1973-1999.* Incidence data represent 10% of the U.S. population, while mortality data are for the entire nation.
§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.
† All white persons, including those of Hispanic ethnicity.

Table III-26.6: Extent of disease at diagnosis and 5-year relative survival, Testis Cancer

Stage at Diagnosis	Percent of Cases†(%)	5-Year Relative Survival‡ (%)
In Situ	0.3	-
Localized	74.1	98.8
Regional	15.6	94.6
Distant	8.7	74.0
Unknown	1.3	93.2

† Among Minnesota cases diagnosed 1995-1999.
‡ Among SEER cases diagnosed 1992-1998 followed through 1999, from *SEER Cancer Statistics Review, 1973-1999.*

Descriptive Epidemiology

Incidence and Mortality: Testicular cancer accounts for 1.4 percent of cancer diagnoses among Minnesota men. About 150 cases are diagnosed each year, while six deaths occur as a result of testicular cancer. Incidence and mortality rates in Minnesota are about the same as those reported by SEER and in the U.S. SEER 5-year relative survival rates for testicular cancer are 98.8 percent for localized tumors and 94.6 percent for regional tumors. Most cases in Minnesota are diagnosed while the tumor is localized (74.1%).

Trends: A statistically significant increase of 1.9 percent per year in incidence of testicular cancer was observed among Minnesota men since 1988, accompanied by a modest, but not statistically significant, decrease in mortality. This is consistent with national trends. The decrease in mortality can be attributed to advances in the treatment of testicular cancer.

Age: Testicular cancer is most commonly diagnosed between the ages of 20 and 49 years, with the median age at diagnosis being 33 years. About 52 percent of cancers are diagnosed among those 20 to 34 years of age.

Race: There are too few cases among men of color in Minnesota to assess racial/ethnic disparities in testicular cancer. In the U.S., white men have about five times the risk of developing testicular cancer compared to blacks, and more than two times the risk of Asian-American men.

Risk Factors

Cryptochidism, or undescended testicle(s), is the main risk factor for testicular cancer, accounting for about 14 percent of cases. Personal or family history of testicular cancer and exposure to exogenous hormones in utero have been linked to increased risk of disease. Excesses of testicular cancer have been reported among men with certain occupations, including miners, leather or utility workers, and oil and gas workers. However, studies have not yet defined specific chemicals related to risk. Several studies have examined injury and vasectomy as risk factors for testicular cancer, but have not found any increased risk associated with these exposures.

Early Detection/Prevention

Testicular cancer can be found in the early stages of development, and most cancers are found through self-examination. The American Cancer Society recommends testicular examination at routine cancer-related checkups.

Thyroid

Table III-27.1: Number of new cases and deaths and incidence and mortality rates§ by year, Minnesota, 1988-1999, Thyroid Cancer

Year of Diagnosis or Death	Incidence				Mortality			
	New Cases		Annual Rate		Deaths		Annual Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
1988	55	158	2.9	7.1	5	11	0.3	0.4
1989	60	136	3.2	5.9	4	10	0.3	0.4
1990	66	156	3.3	6.8	9	12	0.6	0.5
1991	61	145	2.9	6.3	9	13	0.5	0.5
1992	70	180	3.6	7.8	8	11	0.5	0.4
1993	69	173	3.2	7.5	8	15	0.4	0.5
1994	66	178	3.1	7.7	9	14	0.5	0.6
1995	58	179	2.8	7.7	7	11	0.4	0.4
1996	66	201	3.0	8.3	6	17	0.3	0.6
1997	87	227	3.9	9.4	13	21	0.6	0.7
1998	84	231	3.7	9.7	4	9	0.2	0.3
1999	89	234	4.0	9.7	7	19	0.4	0.7

Table III-27.2: Number of new cases and deaths and average annual incidence and mortality rates§ by age, Minnesota, 1995-1999, Thyroid Cancer

Age at Diagnosis or Death (years)	Incidence 1995-1999				Mortality 1995-1999			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
0 – 19	3	42	0.1	1.2	0	0	0.0	0.0
20 – 34	67	273	2.7	11.1	1	1	0.0	0.0
35 – 49	138	402	4.8	14.4	2	4	0.1	0.1
50 – 64	78	183	5.1	11.5	4	11	0.3	0.7
65 – 74	60	94	8.8	11.8	11	15	1.6	1.9
75 – 84	34	55	8.3	8.8	13	26	3.2	4.1
85 and older	4	23	3.5	8.0	6	20	5.2	6.9

Table III-27.3: Number of new cases and deaths and average annual incidence and mortality rates§ by race and ethnicity, Minnesota, 1995-1999, Thyroid Cancer

Race and Ethnicity†	Incidence 1995-1999				Mortality 1995-1999			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
All Races	384	1,072	3.5	9.0	37	77	0.4	0.6
American Indian	2	5	~	~	0	0	~	~
Asian/Pacific Isl.	5	22	~	11.5	1	2	~	~
Black	8	13	~	4.1	0	1	~	~
White	367	1,015	3.5	9.0	36	74	0.4	0.5
White Hispanic	~	~	~	~	0	1	~	~

Source: All cases were either microscopically confirmed (1988-1999) or Death Certificate Only (1995-1999) and were reported to the MCSS by October 2002. Excludes *in situ* cancers except *in situ* bladder cancers. Deaths are from the Minnesota Center for Health Statistics, and include all deaths with the specified cancer as the underlying cause of death during the time period, regardless of year of diagnosis. All rates were calculated by MCSS.

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.
† White includes persons of Hispanic ethnicity. Persons reported with unknown or other race are included in all races combined, but are excluded from race-specific data. See text for comments on the accuracy of race- and ethnic-specific cancer rates.
~ Hispanic incidence data are not available. Race-specific rates based on fewer than 10 cases or deaths are not presented.

Table III-27.4: Other Minnesota statistics,† Thyroid Cancer

	Males	Females
Median Age at Diagnosis	47.0	42.0
Median Age at Death	75.0	78.0
Lifetime Risk of Diagnosis	0.3%	0.7%
Lifetime Risk of Death	< 0.1%	0.1%
Annual Percent Change‡		
Incidence 1988-1999	**2.1%**	**4.2%**
Mortality 1988-1999	0.8%	3.8%

† See introduction for definition of terms.
‡ The average *annual percent change* in the age-adjusted rate over the time period. Statistically significant ($P < 0.05$) trends are in **bold.**

Table III-27.5: Average annual incidence and mortality rates§ in the United States, 1995-1999, Thyroid Cancer

	Males	Females
Incidence		
All Races	3.6	9.7
White†	3.8	10.0
Mortality		
All Races	0.4	0.5
White†	0.4	0.5

Source: *SEER Cancer Statistics Review, 1973-1999.* Incidence data represent 10% of the U.S. population, while mortality data are for the entire nation.
§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.
† All white persons, including those of Hispanic ethnicity.

Table III-27.6: Extent of Disease at Diagnosis and Five-Year Relative Survival, Thyroid Cancer

Stage at Diagnosis	Percent of Cases†(%)	5-Year Relative Survival‡ (%)
In Situ	0.1	-
Localized	65.3	99.3
Regional	29.0	94.5
Distant	4.5	43.7
Unknown	1.2	83.5

† Among Minnesota cases diagnosed 1995-1999.
‡ Among SEER cases diagnosed 1992-1998 followed through 1999, from *SEER Cancer Statistics Review, 1973-1999.*

Descriptive Epidemiology

Incidence and Mortality: Thyroid cancer accounts for 1.4 percent of cancers in Minnesota, and 0.3 percent of cancer-related deaths. About 290 cases are diagnosed each year, and about 20 deaths occur as a result of thyroid cancer. Based on SEER data, the 5-year relative survival rate for thyroid cancer is 99.3 percent for localized tumors and 94.5 percent for regional tumors. Most cases in Minnesota are diagnosed while the tumor is localized (65.3%). Rates in Minnesota are similar to those reported nationally. In general, incidence rates reflect young women with papillary or follicular carcinomas, while mortality reflects elderly persons with undifferentiated carcinomas.

Trends: A statistically significant increase in thyroid cancer incidence rates was observed in Minnesota since cancer reporting was implemented in 1988. This increase was accompanied by a modest, but not statistically significant, increase in mortality rates among females. Nationally, incidence rates have increased by more than two percent per year among both men and women since 1980, while mortality raters have remained stable for women and increased slightly among men.

Age: Thyroid cancer can occur in people of all ages. In Minnesota, 78.3 percent of cases were diagnosed among persons 20 to 64 years of age.

Gender: Thyroid cancer is one of the few cancers that occurs more often in women than men. Until age 65, rates among women are two to three times higher than those of men in the same age category.

Race: The incidence rate of thyroid cancer in Minnesota is highest among Asian/Pacific Islander women, compared to white and black women. Black women have about half the rate of white women. There are too few deaths among people of color in Minnesota to assess racial or ethnic disparities in thyroid cancer mortality. This is similar to national data which show that the highest incidence rates for thyroid cancer occur among Asian/Pacific Islander women, and are lowest among black women.

Risk Factors

Several studies report associations with thyroid cancer and radiation exposure, particularly exposure during childhood. Deficiencies in dietary iodine, which is essential in thyroid gland regulation, can increase risk of developing thyroid cancer. Heritable conditions and family history of thyroid cancer also increase risk.

Early Detection/Prevention

The American Cancer Society recommends routine health checkups, including examination of the thyroid, every three years for those between the ages of 20 and 39 years, and annually for those 40 years and older.

Urinary Bladder

Table III-28.1: Number of new cases and deaths and incidence and mortality rates§ by year, Minnesota, 1988-1999, Urinary Bladder Cancer‡

Year of Diagnosis or Death	Incidence				Mortality			
	New Cases		Annual Rate		Deaths		Annual Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
1988	603	220	35.3	9.4	130	68	8.4	2.7
1989	639	223	37.5	9.3	123	51	8.0	2.0
1990	616	240	35.7	10.0	97	56	6.0	2.1
1991	730	213	42.0	8.8	110	74	6.7	2.8
1992	683	269	38.4	11.0	132	60	7.9	2.1
1993	677	235	37.3	9.3	116	40	7.1	1.4
1994	673	240	36.7	9.5	132	62	7.8	2.2
1995	681	227	36.7	8.7	113	63	6.7	2.2
1996	661	274	34.9	10.7	159	60	8.9	2.2
1997	729	231	38.0	8.8	136	84	7.6	2.8
1998	752	268	38.5	10.2	133	63	7.3	2.1
1999	748	262	37.9	9.9	129	70	6.8	2.2

Table III-28.2: Number of new cases and deaths and average annual incidence and mortality rates§ by age, Minnesota, 1995-1999, Urinary Bladder Cancer‡

Age at Diagnosis or Death (years)	Incidence 1995-1999				Mortality 1995-1999			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
0 – 19	8	2	0.2	0.1	0	0	0.0	0.0
20 – 34	23	7	0.9	0.3	4	0	0.2	0.0
35 – 49	171	69	6.2	2.5	18	6	0.7	0.2
50 – 64	776	248	50.0	15.4	72	23	4.6	1.4
65 – 74	1,189	331	176.3	41.4	170	58	25.4	7.2
75 – 84	1,062	382	261.1	61.3	233	112	57.4	17.6
85 and older	342	223	296.5	77.4	173	141	150.0	48.9

Table III-28.3: Number of new cases and deaths and average annual incidence and mortality rates§ by race and ethnicity, Minnesota, 1995-1999, Urinary Bladder Cancer‡

Race and Ethnicity†	Incidence 1995-1999				Mortality 1995-1999			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
All Races	3,571	1,262	37.2	9.7	670	340	7.5	2.3
American Indian	8	5	~	~	1	0	~	~
Asian/Pacific Isl.	9	6	~	~	2	2	~	~
Black	26	10	29.1	6.6	7	3	~	~
White	3,502	1,233	37.3	9.7	660	335	7.5	2.3
White Hispanic	~	~	~	~	3	0	~	~

Source: All cases were either microscopically confirmed (1988-1999) or Death Certificate Only (1995-1999) and were reported to the MCSS by October 2002. Excludes *in situ* cancers except *in situ* bladder cancers. Deaths are from the Minnesota Center for Health Statistics, and include all deaths with the specified cancer as the underlying cause of death during the time period, regardless of year of diagnosis. All rates were calculated by MCSS.

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.
† White includes persons of Hispanic ethnicity. Persons reported with unknown or other race are included in all races combined, but are excluded from race-specific data. See text for comments on the accuracy of race- and ethnic-specific cancer rates.
~ Hispanic incidence data are not available. Race-specific rates based on fewer than 10 cases or deaths are not presented.
‡ Includes *in situ* cancers.

Table III-28.4: Other Minnesota statistics,† Urinary Bladder Cancer

	Males	Females
Median Age at Diagnosis	72.0	74.0
Median Age at Death	78.0	82.5
Lifetime Risk of Diagnosis	3.8%	1.3%
Lifetime Risk of Death	0.8%	0.4%
Annual Percent Change‡		
Incidence 1988-1999	0.1%	0.3%
Mortality 1988-1999	-0.2%	-0.3%

† See introduction for definition of terms.
‡ The average *annual percent change* in the age-adjusted rate over the time period. Statistically significant ($P < 0.05$) trends are in **bold.**

Table III-28.5: Average annual incidence and mortality rates§ in the United States, 1995-1999, Urinary Bladder Cancer

	Males	Females
Incidence		
All Races	36.6	9.6
White†	39.8	10.2
Mortality		
All Races	7.7	2.4
White†	8.0	2.3

Source: *SEER Cancer Statistics Review, 1973-1999.* Incidence data represent 10% of the U.S. population, while mortality data are for the entire nation.
§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.
† All white persons, including those of Hispanic ethnicity.

Table III-28.6: Extent of disease at diagnosis and 5-year relative survival, Urinary Bladder Cancer

Stage at Diagnosis	Percent of Cases†(%)	5-Year Relative Survival‡ (%)
In Situ/Localized	84.0	94.3
Regional	9.7	47.6
Distant	2.7	5.5
Unknown	3.5	58.2

† Among Minnesota cases diagnosed 1995-1999.
‡ Among SEER cases diagnosed 1992-1998 followed through 1999, from *SEER Cancer Statistics Review, 1973-1999.*

Descriptive Epidemiology

Incidence and Mortality: Cancer of the urinary bladder accounts for 4.6 percent of all cancers diagnosed in Minnesota, and 2.3 percent of cancer deaths. It is the fourth most common cancer in the state. Approximately 965 cases of urinary bladder cancer are diagnosed annually, and 200 deaths occur each year as a result of this cancer. Incidence and mortality rates in Minnesota are similar to those reported by SEER and for the U.S. Based on SEER data, the 5-year relative survival rate is 94.3 percent for urinary bladder cancers diagnosed in the *in situ* or localized tumor stage. Most cases are diagnosed at these stages in Minnesota.

Trends: Rates of urinary bladder cancer have remained stable in Minnesota since reporting began in 1988. This is consistent with national data.

Age: Urinary bladder cancer incidence rates increase sharply with age. About 60 percent of cancers are diagnosed among those 65 to 84 years of age.

Gender: Incidence rates of urinary bladder cancer are three to four times higher in men than women in Minnesota. Mortality rates among men are two to three times those of women.

Race: Urinary bladder cancer rates appear to be highest among whites in Minnesota, although there are too few cases among people of color in the state to adequately assess disparities. Nationally, the highest rates among men are in non-Hispanic whites. Black men and Hispanic men have similar rates, which are about half that of whites. Asians have the lowest rates. Among women, non-Hispanic whites have the highest rates, followed by blacks and Hispanics. Mortality rates are similar between white and black men, while black women have higher mortality than white women. This suggests that a larger proportion of urinary bladder cancers among whites are diagnosed at an early and more treatable state.

Risk Factors

Cigarette smoking is a strongly established risk factor for urinary bladder cancer. It accounts for 50 percent of cases among men and about 25 percent among women. Occupational exposures to cyclic chemicals, such as benzene derivatives and arylamines, are known to increase risk of urinary bladder cancer. Diets low in fruits and/or vegetables have also been linked to this disease. Chronic bladder inflammation, personal history of bladder cancer, and certain birth defects involving the bladder increase the risk of developing urinary bladder cancer.

Early Detection/Prevention

Screening for cancer of the urinary bladder in the general population is currently not recommended because research has not shown a clear benefit. The most effective way of preventing development of urinary bladder cancer or decreasing risk of disease is cessation of smoking.

Chapter IV:

Occurrence of Cancer in Minnesota Counties and Regions, 1995-1999

Chapter IV: Cancer in Minnesota Counties and Regions, 1995-1999

This chapter contains a profile of cancer incidence for 1995-1999 for each county and each region in Minnesota. A precise definition of these cancers is given in Appendix A. The profile is given for males and females separately. The “observed” number of cancers are those that were first diagnosed in residents of the county during the 5-year period, 1995-1999. The “expected” number of cancers is calculated by applying the 1995-1999 age- and sex-specific incidence rates for the entire state to the estimated 5-year population of the county. Another way of stating this is that the expected number of cancers for a county is the number that would have occurred if the incidence rates for the county and the state were identical.

The county/region-specific results represent nearly 5,000 different analyses. It is informative to quickly page through these data noting the large number of occasions in which fewer than five cancers were observed, and the extremely variable relationship between the observed and expected numbers. There are many combinations of observed and expected cancers that are very similar, many combinations where the observed number appears larger than expected, and many others where the expected number appears larger than the observed. This variability is inherent in cancer incidence data for areas with smaller populations.

The purpose of these data is to provide the reader with a description of cancer occurrence in each county; to provide a quantitative indication about how many cancers, on average, would be expected to occur; and to reinforce the sense of natural variability of these data. Therefore, no statistical tests of differences between the observed and expected numbers are provided.

Table IV-1: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Aitkin County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	297	286.0	231	216.2
Brain and Other Nervous System	3	3.6	2	2.4
Breast	1	0.5	80	70.1
Cervix Uteri	0	0.0	5	2.9
Colon and Rectum	29	32.8	27	27.9
Corpus Uteri	0	0.0	15	14.2
Esophagus	7	4.1	1	1.1
Hodgkin's Lymphoma	0	1.2	2	0.9
Kaposi’s Sarcoma (all sites)	0	0.3	0	0.0
Kidney and Renal Pelvis	10	8.1	2	4.4
Larynx	6	3.7	2	0.7
Leukemias	9	8.9	7	5.7
Liver and Bile Duct	1	2.2	0	0.9
Lung and Bronchus	47	40.8	26	24.7
Melanomas of the Skin	3	8.7	6	5.8
Mesothelioma (all sites)	3	1.4	0	0.2
Multiple Myeloma	2	3.3	2	2.4
Non-Hodgkin's Lymphoma	13	12.3	12	9.5
Oral Cavity and Pharynx	7	8.4	4	3.5
Ovary	0	0.0	9	8.7
Pancreas	4	5.3	5	4.1
Prostate	109	97.8	0	0.0
Soft Tissues	3	1.5	1	1.2
Stomach	3	5.0	3	2.3
Testis	3	1.7	0	0.0
Thyroid	1	1.4	3	3.3
Urinary Bladder	24	19.7	5	5.8

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-2: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Anoka County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	2323	2511.4	2168	2387.3
Brain and Other Nervous System	40	49.9	35	35.6
Breast	3	4.6	712	813.7
Cervix Uteri	0	0.0	40	52.3
Colon and Rectum	220	269.9	209	249.5
Corpus Uteri	0	0.0	131	153.5
Esophagus	44	35.6	8	9.7
Hodgkin's Lymphoma	27	23.6	18	19.0
Kaposi’s Sarcoma (all sites)	1	5.3	1	0.3
Kidney and Renal Pelvis	63	79.6	54	46.7
Larynx	28	33.0	13	7.4
Leukemias	85	85.7	45	59.9
Liver and Bile Duct	15	21.5	7	9.8
Lung and Bronchus	313	334.9	258	240.6
Melanomas of the Skin	79	102.8	82	91.8
Mesothelioma (all sites)	11	11.2	1	2.3
Multiple Myeloma	24	27.5	23	22.3
Non-Hodgkin's Lymphoma	105	122.8	95	99.2
Oral Cavity and Pharynx	74	85.7	35	37.8
Ovary	0	0.0	99	110.0
Pancreas	43	47.1	21	37.6
Prostate	771	760.7	0	0.0
Soft Tissues	23	17.9	12	15.4
Stomach	38	41.8	22	20.8
Testis	45	49.6	0	0.0
Thyroid	17	22.4	75	64.0
Urinary Bladder	161	154.9	60	51.7

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-3: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Becker County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	473	423.3	342	363.4
Brain and Other Nervous System	3	6.1	3	4.4
Breast	1	0.8	108	117.9
Cervix Uteri	0	0.0	4	5.6
Colon and Rectum	50	49.1	45	46.3
Corpus Uteri	0	0.0	21	23.3
Esophagus	10	6.0	1	1.8
Hodgkin's Lymphoma	7	2.4	5	1.9
Kaposi’s Sarcoma (all sites)	0	0.5	0	0.0
Kidney and Renal Pelvis	10	12.3	9	7.3
Larynx	7	5.4	2	1.1
Leukemias	13	14.0	10	9.7
Liver and Bile Duct	3	3.3	1	1.6
Lung and Bronchus	68	58.2	47	39.3
Melanomas of the Skin	12	14.0	9	10.7
Mesothelioma (all sites)	2	2.0	0	0.4
Multiple Myeloma	10	4.9	4	3.9
Non-Hodgkin's Lymphoma	27	19.3	13	16.0
Oral Cavity and Pharynx	17	13.0	9	5.7
Ovary	0	0.0	7	15.0
Pancreas	3	7.8	4	6.6
Prostate	162	137.6	0	0.0
Soft Tissues	2	2.5	2	2.1
Stomach	4	7.7	5	3.9
Testis	6	4.2	0	0.0
Thyroid	2	2.5	5	6.5
Urinary Bladder	28	29.1	10	9.5

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-4: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Beltrami County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	393	419.7	348	375.5
Brain and Other Nervous System	3	6.9	0	5.1
Breast	0	0.8	96	122.2
Cervix Uteri	0	0.0	12	6.6
Colon and Rectum	45	47.7	58	45.3
Corpus Uteri	0	0.0	19	23.8
Esophagus	4	5.9	4	1.8
Hodgkin's Lymphoma	2	3.2	0	2.7
Kaposi’s Sarcoma (all sites)	0	0.6	0	0.1
Kidney and Renal Pelvis	22	12.4	6	7.4
Larynx	5	5.3	1	1.2
Leukemias	10	14.4	8	10.0
Liver and Bile Duct	4	3.3	4	1.6
Lung and Bronchus	66	56.7	42	39.6
Melanomas of the Skin	9	14.8	8	12.4
Mesothelioma (all sites)	2	1.9	1	0.4
Multiple Myeloma	3	4.8	5	3.9
Non-Hodgkin's Lymphoma	9	19.7	16	16.3
Oral Cavity and Pharynx	9	13.2	3	5.9
Ovary	0	0.0	19	16.1
Pancreas	4	7.7	2	6.6
Prostate	140	132.4	0	0.0
Soft Tissues	2	2.7	2	2.3
Stomach	5	7.5	8	3.8
Testis	5	5.9	0	0.0
Thyroid	4	2.9	6	8.1
Urinary Bladder	22	28.1	5	9.3

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-5: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Benton County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	344	339.6	251	315.8
Brain and Other Nervous System	10	5.9	6	4.3
Breast	1	0.7	77	102.0
Cervix Uteri	0	0.0	3	5.9
Colon and Rectum	44	38.9	41	38.8
Corpus Uteri	0	0.0	12	19.5
Esophagus	7	4.7	0	1.5
Hodgkin's Lymphoma	1	2.8	2	2.4
Kaposi’s Sarcoma (all sites)	0	0.6	0	0.1
Kidney and Renal Pelvis	12	10.0	7	6.1
Larynx	4	4.2	3	0.9
Leukemias	4	11.9	5	8.7
Liver and Bile Duct	3	2.7	4	1.4
Lung and Bronchus	48	44.9	25	31.7
Melanomas of the Skin	4	12.4	9	10.8
Mesothelioma (all sites)	2	1.5	1	0.3
Multiple Myeloma	6	3.9	3	3.2
Non-Hodgkin's Lymphoma	19	16.3	8	13.8
Oral Cavity and Pharynx	9	10.8	1	5.0
Ovary	0	0.0	11	13.4
Pancreas	3	6.2	5	5.5
Prostate	114	104.6	0	0.0
Soft Tissues	0	2.3	0	2.0
Stomach	7	6.2	1	3.3
Testis	6	5.6	0	0.0
Thyroid	1	2.5	2	7.2
Urinary Bladder	18	22.8	8	8.0

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-6: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Big Stone County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	136	108.2	93	96.5
Brain and Other Nervous System	1	1.3	1	1.0
Breast	1	0.2	31	30.3
Cervix Uteri	0	0.0	0	1.2
Colon and Rectum	24	12.9	14	13.7
Corpus Uteri	0	0.0	7	6.0
Esophagus	0	1.5	1	0.5
Hodgkin's Lymphoma	1	0.5	2	0.4
Kaposi’s Sarcoma (all sites)	0	0.1	0	0.0
Kidney and Renal Pelvis	6	3.0	2	1.9
Larynx	0	1.3	0	0.3
Leukemias	3	3.5	7	2.7
Liver and Bile Duct	2	0.8	1	0.4
Lung and Bronchus	20	14.9	3	10.4
Melanomas of the Skin	4	3.3	1	2.5
Mesothelioma (all sites)	0	0.5	0	0.1
Multiple Myeloma	1	1.3	0	1.1
Non-Hodgkin's Lymphoma	7	4.8	6	4.4
Oral Cavity and Pharynx	6	3.2	1	1.5
Ovary	0	0.0	1	3.7
Pancreas	5	2.0	2	1.9
Prostate	30	36.0	0	0.0
Soft Tissues	0	0.6	0	0.5
Stomach	2	2.0	1	1.2
Testis	0	0.7	0	0.0
Thyroid	1	0.5	3	1.3
Urinary Bladder	19	7.8	3	2.8

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-7: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Blue Earth County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	534	596.9	529	579.5
Brain and Other Nervous System	9	9.7	9	7.3
Breast	1	1.1	173	183.8
Cervix Uteri	0	0.0	6	9.3
Colon and Rectum	60	67.5	82	74.5
Corpus Uteri	0	0.0	28	36.0
Esophagus	9	8.4	5	2.9
Hodgkin's Lymphoma	2	4.9	5	4.3
Kaposi’s Sarcoma (all sites)	0	0.9	0	0.1
Kidney and Renal Pelvis	15	17.2	7	11.4
Larynx	7	7.5	0	1.7
Leukemias	14	20.2	16	15.8
Liver and Bile Duct	2	4.6	5	2.5
Lung and Bronchus	66	80.7	44	61.3
Melanomas of the Skin	24	20.6	19	18.2
Mesothelioma (all sites)	6	2.8	0	0.6
Multiple Myeloma	5	6.8	2	6.2
Non-Hodgkin's Lymphoma	27	27.6	22	25.8
Oral Cavity and Pharynx	16	18.3	8	9.2
Ovary	0	0.0	21	24.1
Pancreas	16	10.9	11	10.6
Prostate	163	190.2	0	0.0
Soft Tissues	1	3.8	2	3.6
Stomach	13	10.5	8	6.3
Testis	9	9.2	0	0.0
Thyroid	3	4.2	10	11.6
Urinary Bladder	41	40.0	15	15.3

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-8: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Brown County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	364	402.4	346	366.9
Brain and Other Nervous System	3	5.6	3	4.3
Breast	0	0.8	97	116.6
Cervix Uteri	0	0.0	3	5.3
Colon and Rectum	48	47.0	48	48.8
Corpus Uteri	0	0.0	27	23.1
Esophagus	4	5.7	3	1.9
Hodgkin's Lymphoma	2	2.2	5	1.9
Kaposi’s Sarcoma (all sites)	1	0.5	0	0.0
Kidney and Renal Pelvis	15	11.4	9	7.3
Larynx	0	5.0	1	1.1
Leukemias	16	13.4	11	10.0
Liver and Bile Duct	3	3.1	1	1.6
Lung and Bronchus	33	55.3	28	40.1
Melanomas of the Skin	8	13.0	12	10.4
Mesothelioma (all sites)	1	1.9	1	0.4
Multiple Myeloma	10	4.7	3	4.0
Non-Hodgkin's Lymphoma	12	18.2	22	16.4
Oral Cavity and Pharynx	7	12.1	6	5.8
Ovary	0	0.0	9	14.8
Pancreas	8	7.4	10	6.9
Prostate	128	131.5	0	0.0
Soft Tissues	1	2.4	2	2.1
Stomach	13	7.4	7	4.1
Testis	4	3.8	0	0.0
Thyroid	1	2.3	6	6.2
Urinary Bladder	23	28.1	6	9.9

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-9: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Carlton County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	449	431.2	380	370.4
Brain and Other Nervous System	7	6.4	4	4.6
Breast	1	0.8	114	121.0
Cervix Uteri	0	0.0	2	5.9
Colon and Rectum	54	49.3	47	45.7
Corpus Uteri	0	0.0	23	24.0
Esophagus	11	6.1	3	1.8
Hodgkin's Lymphoma	8	2.6	1	2.0
Kaposi’s Sarcoma (all sites)	0	0.6	0	0.0
Kidney and Renal Pelvis	12	12.6	4	7.4
Larynx	6	5.5	3	1.2
Leukemias	9	14.2	7	9.6
Liver and Bile Duct	2	3.4	0	1.6
Lung and Bronchus	54	59.4	50	40.7
Melanomas of the Skin	12	14.6	23	11.2
Mesothelioma (all sites)	7	2.0	0	0.4
Multiple Myeloma	8	4.9	3	3.9
Non-Hodgkin's Lymphoma	13	19.6	17	16.1
Oral Cavity and Pharynx	14	13.3	5	5.9
Ovary	0	0.0	22	15.5
Pancreas	10	8.0	1	6.7
Prostate	137	140.0	0	0.0
Soft Tissues	2	2.6	6	2.1
Stomach	6	7.7	2	3.8
Testis	8	4.7	0	0.0
Thyroid	1	2.7	3	6.9
Urinary Bladder	37	29.2	11	9.4

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-10: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Carver County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	510	544.8	465	526.3
Brain and Other Nervous System	11	10.8	11	7.7
Breast	0	1.0	150	177.1
Cervix Uteri	0	0.0	8	11.4
Colon and Rectum	60	60.0	54	57.9
Corpus Uteri	0	0.0	39	33.3
Esophagus	6	7.6	1	2.2
Hodgkin's Lymphoma	7	5.2	4	4.1
Kaposi’s Sarcoma (all sites)	0	1.2	0	0.1
Kidney and Renal Pelvis	13	17.1	7	10.2
Larynx	6	7.1	0	1.6
Leukemias	14	19.2	10	13.7
Liver and Bile Duct	1	4.6	1	2.2
Lung and Bronchus	50	71.4	40	51.6
Melanomas of the Skin	23	22.3	19	20.0
Mesothelioma (all sites)	3	2.4	0	0.5
Multiple Myeloma	4	6.0	5	5.0
Non-Hodgkin's Lymphoma	30	27.0	18	22.1
Oral Cavity and Pharynx	9	18.6	2	8.2
Ovary	0	0.0	20	23.8
Pancreas	12	10.1	5	8.4
Prostate	174	161.9	0	0.0
Soft Tissues	3	4.0	5	3.5
Stomach	7	9.4	4	4.9
Testis	16	11.1	0	0.0
Thyroid	7	4.9	19	13.8
Urinary Bladder	29	34.3	11	11.9

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-11: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Cass County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	439	450.7	351	336.7
Brain and Other Nervous System	6	6.0	3	4.0
Breast	1	0.9	119	110.5
Cervix Uteri	0	0.0	6	5.1
Colon and Rectum	39	51.9	50	41.6
Corpus Uteri	0	0.0	23	22.3
Esophagus	7	6.5	3	1.7
Hodgkin's Lymphoma	4	2.1	0	1.6
Kaposi’s Sarcoma (all sites)	0	0.5	0	0.0
Kidney and Renal Pelvis	22	13.0	10	6.8
Larynx	8	5.8	1	1.1
Leukemias	8	14.4	3	8.6
Liver and Bile Duct	2	3.5	1	1.4
Lung and Bronchus	88	63.2	42	38.0
Melanomas of the Skin	11	14.2	11	9.6
Mesothelioma (all sites)	1	2.2	1	0.3
Multiple Myeloma	3	5.2	1	3.6
Non-Hodgkin's Lymphoma	18	19.9	8	14.6
Oral Cavity and Pharynx	14	13.6	6	5.3
Ovary	0	0.0	18	14.0
Pancreas	9	8.4	4	6.2
Prostate	132	150.8	0	0.0
Soft Tissues	3	2.5	4	1.9
Stomach	8	8.0	4	3.4
Testis	2	3.4	0	0.0
Thyroid	3	2.4	2	5.8
Urinary Bladder	27	30.9	8	8.6

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-12: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Chippewa County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	211	215.0	182	191.1
Brain and Other Nervous System	0	2.8	2	2.1
Breast	0	0.4	52	60.6
Cervix Uteri	0	0.0	2	2.7
Colon and Rectum	31	25.4	25	26.0
Corpus Uteri	0	0.0	16	12.0
Esophagus	3	3.1	0	1.0
Hodgkin's Lymphoma	1	1.1	1	0.9
Kaposi’s Sarcoma (all sites)	0	0.2	0	0.0
Kidney and Renal Pelvis	7	6.0	7	3.8
Larynx	0	2.7	0	0.6
Leukemias	10	7.1	1	5.3
Liver and Bile Duct	3	1.6	1	0.8
Lung and Bronchus	27	29.6	12	20.8
Melanomas of the Skin	8	6.8	9	5.2
Mesothelioma (all sites)	0	1.0	0	0.2
Multiple Myeloma	4	2.5	2	2.1
Non-Hodgkin's Lymphoma	14	9.7	5	8.6
Oral Cavity and Pharynx	5	6.4	4	3.0
Ovary	0	0.0	14	7.6
Pancreas	3	4.0	1	3.7
Prostate	64	70.6	0	0.0
Soft Tissues	0	1.2	0	1.1
Stomach	6	4.0	1	2.2
Testis	1	1.8	0	0.0
Thyroid	1	1.2	7	3.0
Urinary Bladder	9	15.3	8	5.3

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-13: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Chisago County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	445	433.4	389	374.7
Brain and Other Nervous System	6	7.4	10	5.1
Breast	1	0.8	126	124.8
Cervix Uteri	0	0.0	8	7.1
Colon and Rectum	57	49.1	40	43.6
Corpus Uteri	0	0.0	21	23.9
Esophagus	2	6.1	2	1.7
Hodgkin's Lymphoma	4	3.2	3	2.5
Kaposi’s Sarcoma (all sites)	0	0.7	0	0.0
Kidney and Renal Pelvis	13	13.2	11	7.3
Larynx	5	5.6	1	1.1
Leukemias	17	14.8	5	9.8
Liver and Bile Duct	0	3.5	1	1.6
Lung and Bronchus	70	58.4	42	38.3
Melanomas of the Skin	19	16.1	20	12.9
Mesothelioma (all sites)	1	2.0	0	0.4
Multiple Myeloma	13	4.9	4	3.7
Non-Hodgkin's Lymphoma	15	20.6	19	16.0
Oral Cavity and Pharynx	12	14.1	5	5.9
Ovary	0	0.0	15	16.4
Pancreas	6	8.1	11	6.3
Prostate	125	134.8	0	0.0
Soft Tissues	4	2.9	2	2.3
Stomach	3	7.7	3	3.7
Testis	9	6.2	0	0.0
Thyroid	6	3.2	7	8.5
Urinary Bladder	30	28.6	10	9.0

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-14: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Clay County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	654	591.4	523	542.6
Brain and Other Nervous System	9	9.4	9	7.0
Breast	1	1.1	161	174.8
Cervix Uteri	0	0.0	15	9.1
Colon and Rectum	86	67.2	72	67.3
Corpus Uteri	0	0.0	40	34.2
Esophagus	4	8.3	3	2.6
Hodgkin's Lymphoma	3	4.3	3	4.1
Kaposi’s Sarcoma (all sites)	0	0.8	0	0.1
Kidney and Renal Pelvis	13	17.3	17	10.7
Larynx	5	7.5	2	1.7
Leukemias	20	19.9	10	14.6
Liver and Bile Duct	4	4.6	2	2.3
Lung and Bronchus	87	80.5	41	57.1
Melanomas of the Skin	21	20.4	11	17.5
Mesothelioma (all sites)	2	2.7	1	0.6
Multiple Myeloma	8	6.7	5	5.7
Non-Hodgkin's Lymphoma	25	27.3	15	23.7
Oral Cavity and Pharynx	17	18.3	9	8.6
Ovary	0	0.0	21	23.0
Pancreas	10	10.9	7	9.6
Prostate	239	189.4	0	0.0
Soft Tissues	7	3.7	7	3.4
Stomach	8	10.5	4	5.7
Testis	7	7.9	0	0.0
Thyroid	3	4.0	20	11.4
Urinary Bladder	47	39.7	16	13.8

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-15: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Clearwater County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	155	136.1	99	102.2
Brain and Other Nervous System	1	1.8	1	1.2
Breast	0	0.3	35	33.1
Cervix Uteri	0	0.0	0	1.5
Colon and Rectum	18	16.4	18	13.3
Corpus Uteri	0	0.0	11	6.5
Esophagus	3	1.9	1	0.5
Hodgkin's Lymphoma	1	0.7	1	0.5
Kaposi’s Sarcoma (all sites)	0	0.2	0	0.0
Kidney and Renal Pelvis	4	3.8	4	2.0
Larynx	0	1.7	0	0.3
Leukemias	10	4.6	0	2.8
Liver and Bile Duct	2	1.0	1	0.4
Lung and Bronchus	21	18.5	10	10.8
Melanomas of the Skin	5	4.3	1	3.0
Mesothelioma (all sites)	0	0.6	0	0.1
Multiple Myeloma	3	1.6	2	1.1
Non-Hodgkin's Lymphoma	3	6.2	2	4.5
Oral Cavity and Pharynx	4	4.1	0	1.6
Ovary	0	0.0	5	4.2
Pancreas	1	2.5	1	1.9
Prostate	57	44.0	0	0.0
Soft Tissues	1	0.8	0	0.6
Stomach	3	2.6	0	1.1
Testis	0	1.1	0	0.0
Thyroid	0	0.7	1	1.8
Urinary Bladder	8	9.8	0	2.7

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-16: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Cook County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	70	73.6	51	61.3
Brain and Other Nervous System	1	1.1	0	0.7
Breast	0	0.1	11	20.0
Cervix Uteri	0	0.0	1	1.0
Colon and Rectum	8	8.4	6	7.6
Corpus Uteri	0	0.0	2	4.0
Esophagus	0	1.1	0	0.3
Hodgkin's Lymphoma	0	0.4	0	0.3
Kaposi’s Sarcoma (all sites)	0	0.1	0	0.0
Kidney and Renal Pelvis	5	2.2	1	1.2
Larynx	0	1.0	0	0.2
Leukemias	2	2.4	2	1.6
Liver and Bile Duct	2	0.6	0	0.3
Lung and Bronchus	7	10.2	9	6.8
Melanomas of the Skin	2	2.5	1	1.8
Mesothelioma (all sites)	0	0.3	1	0.1
Multiple Myeloma	1	0.8	0	0.7
Non-Hodgkin's Lymphoma	0	3.3	4	2.7
Oral Cavity and Pharynx	4	2.3	0	1.0
Ovary	0	0.0	2	2.6
Pancreas	1	1.4	1	1.1
Prostate	23	24.2	0	0.0
Soft Tissues	0	0.4	1	0.3
Stomach	1	1.3	0	0.6
Testis	0	0.7	0	0.0
Thyroid	0	0.5	1	1.1
Urinary Bladder	6	5.0	1	1.6

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-17: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Cottonwood County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	227	221.9	206	195.0
Brain and Other Nervous System	2	2.8	2	2.1
Breast	1	0.5	72	61.3
Cervix Uteri	0	0.0	2	2.5
Colon and Rectum	37	26.6	31	27.2
Corpus Uteri	0	0.0	21	12.2
Esophagus	0	3.1	0	1.1
Hodgkin's Lymphoma	2	1.0	1	0.8
Kaposi’s Sarcoma (all sites)	0	0.2	0	0.0
Kidney and Renal Pelvis	4	6.1	4	3.9
Larynx	2	2.7	0	0.6
Leukemias	7	7.3	6	5.4
Liver and Bile Duct	2	1.7	0	0.9
Lung and Bronchus	30	30.6	12	21.4
Melanomas of the Skin	6	6.8	7	5.1
Mesothelioma (all sites)	1	1.1	0	0.2
Multiple Myeloma	2	2.7	1	2.2
Non-Hodgkin's Lymphoma	9	9.9	6	8.9
Oral Cavity and Pharynx	6	6.5	2	3.1
Ovary	0	0.0	9	7.6
Pancreas	5	4.1	3	3.8
Prostate	86	73.2	0	0.0
Soft Tissues	0	1.2	1	1.1
Stomach	0	4.2	1	2.3
Testis	4	1.6	0	0.0
Thyroid	0	1.1	4	2.8
Urinary Bladder	9	16.0	5	5.5

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-18: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Crow Wing County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	818	772.4	639	661.5
Brain and Other Nervous System	6	10.8	4	8.0
Breast	1	1.5	217	215.5
Cervix Uteri	0	0.0	7	10.2
Colon and Rectum	77	88.6	72	82.6
Corpus Uteri	0	0.0	42	43.0
Esophagus	13	11.1	3	3.3
Hodgkin's Lymphoma	7	4.2	5	3.5
Kaposi’s Sarcoma (all sites)	0	0.9	0	0.1
Kidney and Renal Pelvis	14	22.4	13	13.3
Larynx	12	9.9	0	2.1
Leukemias	29	25.1	11	17.3
Liver and Bile Duct	6	6.0	1	2.8
Lung and Bronchus	119	107.5	80	73.3
Melanomas of the Skin	17	25.1	18	19.4
Mesothelioma (all sites)	3	3.7	0	0.7
Multiple Myeloma	7	8.9	6	7.1
Non-Hodgkin's Lymphoma	43	34.6	27	28.8
Oral Cavity and Pharynx	28	23.4	13	10.5
Ovary	0	0.0	36	27.5
Pancreas	16	14.3	10	12.1
Prostate	292	255.1	0	0.0
Soft Tissues	7	4.4	6	3.8
Stomach	12	13.7	7	6.9
Testis	6	7.1	0	0.0
Thyroid	4	4.5	16	11.8
Urinary Bladder	62	52.6	18	17.0

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-19: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Dakota County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	2582	2668.0	2711	2626.3
Brain and Other Nervous System	51	55.6	47	40.4
Breast	2	5.0	950	896.6
Cervix Uteri	0	0.0	61	61.7
Colon and Rectum	276	288.2	274	269.8
Corpus Uteri	0	0.0	162	166.4
Esophagus	30	37.4	7	10.2
Hodgkin's Lymphoma	32	27.1	30	22.4
Kaposi’s Sarcoma (all sites)	5	6.3	0	0.4
Kidney and Renal Pelvis	84	85.4	53	50.7
Larynx	38	34.8	12	8.1
Leukemias	88	93.8	66	66.4
Liver and Bile Duct	17	23.1	11	10.7
Lung and Bronchus	306	349.0	262	255.3
Melanomas of the Skin	133	113.6	97	106.6
Mesothelioma (all sites)	14	11.6	3	2.6
Multiple Myeloma	37	29.2	22	24.0
Non-Hodgkin's Lymphoma	133	133.7	117	108.6
Oral Cavity and Pharynx	90	92.6	41	41.3
Ovary	0	0.0	125	122.5
Pancreas	46	49.9	49	40.2
Prostate	741	783.9	0	0.0
Soft Tissues	11	20.1	12	17.5
Stomach	55	45.0	18	22.8
Testis	71	59.3	0	0.0
Thyroid	28	25.4	80	75.9
Urinary Bladder	174	163.9	52	55.7

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-20: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Dodge County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	199	201.7	170	172.0
Brain and Other Nervous System	2	3.2	2	2.3
Breast	0	0.4	53	56.3
Cervix Uteri	0	0.0	3	3.0
Colon and Rectum	19	23.2	26	20.9
Corpus Uteri	0	0.0	11	10.9
Esophagus	2	2.8	0	0.8
Hodgkin's Lymphoma	0	1.4	0	1.1
Kaposi’s Sarcoma (all sites)	0	0.3	0	0.0
Kidney and Renal Pelvis	10	5.9	8	3.4
Larynx	3	2.5	0	0.5
Leukemias	12	6.9	4	4.7
Liver and Bile Duct	0	1.6	1	0.7
Lung and Bronchus	32	27.3	11	17.8
Melanomas of the Skin	13	7.0	5	5.6
Mesothelioma (all sites)	0	0.9	0	0.2
Multiple Myeloma	3	2.3	2	1.8
Non-Hodgkin's Lymphoma	6	9.4	8	7.5
Oral Cavity and Pharynx	10	6.3	4	2.7
Ovary	0	0.0	10	7.3
Pancreas	2	3.7	0	3.0
Prostate	65	63.9	0	0.0
Soft Tissues	2	1.3	1	1.1
Stomach	4	3.6	4	1.8
Testis	0	2.6	0	0.0
Thyroid	0	1.4	2	3.6
Urinary Bladder	9	13.7	1	4.3

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-21: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Douglas County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	514	485.4	384	409.9
Brain and Other Nervous System	8	6.6	3	4.8
Breast	1	1.0	132	131.3
Cervix Uteri	0	0.0	6	6.0
Colon and Rectum	73	56.7	55	53.9
Corpus Uteri	0	0.0	20	26.0
Esophagus	6	6.9	1	2.1
Hodgkin's Lymphoma	2	2.6	2	2.1
Kaposi’s Sarcoma (all sites)	0	0.6	1	0.0
Kidney and Renal Pelvis	7	13.7	5	8.2
Larynx	4	6.1	1	1.3
Leukemias	19	16.0	14	11.1
Liver and Bile Duct	3	3.7	2	1.8
Lung and Bronchus	63	66.9	35	44.8
Melanomas of the Skin	18	15.4	2	11.6
Mesothelioma (all sites)	2	2.3	0	0.4
Multiple Myeloma	14	5.7	8	4.5
Non-Hodgkin's Lymphoma	20	21.8	20	18.2
Oral Cavity and Pharynx	14	14.5	8	6.5
Ovary	0	0.0	14	16.6
Pancreas	6	9.0	2	7.7
Prostate	173	159.6	0	0.0
Soft Tissues	1	2.8	3	2.4
Stomach	12	8.9	5	4.6
Testis	3	4.3	0	0.0
Thyroid	2	2.7	4	6.9
Urinary Bladder	44	34.0	9	11.0

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-22: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Faribault County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	295	284.0	241	265.6
Brain and Other Nervous System	5	3.6	6	2.9
Breast	0	0.6	67	83.9
Cervix Uteri	0	0.0	3	3.5
Colon and Rectum	39	33.6	37	36.6
Corpus Uteri	0	0.0	14	16.8
Esophagus	4	4.0	0	1.4
Hodgkin's Lymphoma	1	1.3	2	1.1
Kaposi’s Sarcoma (all sites)	0	0.3	0	0.0
Kidney and Renal Pelvis	9	8.0	2	5.3
Larynx	2	3.6	1	0.8
Leukemias	11	9.3	7	7.3
Liver and Bile Duct	4	2.1	1	1.2
Lung and Bronchus	37	39.4	19	29.6
Melanomas of the Skin	6	8.8	7	6.9
Mesothelioma (all sites)	0	1.4	1	0.3
Multiple Myeloma	4	3.4	8	3.0
Non-Hodgkin's Lymphoma	11	12.7	10	12.0
Oral Cavity and Pharynx	12	8.4	4	4.2
Ovary	0	0.0	13	10.4
Pancreas	7	5.2	3	5.2
Prostate	115	94.1	0	0.0
Soft Tissues	0	1.6	2	1.5
Stomach	4	5.3	3	3.1
Testis	2	2.1	0	0.0
Thyroid	0	1.5	8	3.8
Urinary Bladder	13	20.1	8	7.4

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-23: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Fillmore County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	328	350.6	262	292.7
Brain and Other Nervous System	3	4.5	0	3.3
Breast	0	0.7	70	92.9
Cervix Uteri	0	0.0	4	4.1
Colon and Rectum	38	41.7	43	39.7
Corpus Uteri	0	0.0	17	18.4
Esophagus	5	5.0	2	1.6
Hodgkin's Lymphoma	3	1.7	1	1.4
Kaposi’s Sarcoma (all sites)	0	0.4	0	0.0
Kidney and Renal Pelvis	14	9.8	12	5.8
Larynx	3	4.3	0	0.9
Leukemias	13	11.7	8	8.2
Liver and Bile Duct	1	2.6	3	1.3
Lung and Bronchus	45	48.2	23	31.7
Melanomas of the Skin	14	10.9	7	8.0
Mesothelioma (all sites)	1	1.7	1	0.3
Multiple Myeloma	1	4.1	5	3.2
Non-Hodgkin's Lymphoma	18	15.7	6	13.2
Oral Cavity and Pharynx	11	10.4	5	4.6
Ovary	0	0.0	12	11.6
Pancreas	6	6.4	4	5.6
Prostate	114	115.3	0	0.0
Soft Tissues	0	2.0	1	1.7
Stomach	7	6.6	4	3.4
Testis	2	2.8	0	0.0
Thyroid	1	1.9	4	4.6
Urinary Bladder	12	25.0	10	8.1

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-24: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Freeborn County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	490	515.6	402	458.6
Brain and Other Nervous System	7	7.0	5	5.2
Breast	0	1.0	124	147.0
Cervix Uteri	0	0.0	6	6.5
Colon and Rectum	52	59.4	71	60.6
Corpus Uteri	0	0.0	16	29.3
Esophagus	4	7.4	1	2.4
Hodgkin's Lymphoma	4	2.6	1	2.2
Kaposi’s Sarcoma (all sites)	0	0.6	0	0.1
Kidney and Renal Pelvis	9	14.7	9	9.2
Larynx	8	6.5	3	1.4
Leukemias	15	16.7	14	12.3
Liver and Bile Duct	2	4.0	1	2.0
Lung and Bronchus	73	71.9	42	50.6
Melanomas of the Skin	15	16.5	9	12.7
Mesothelioma (all sites)	0	2.5	1	0.5
Multiple Myeloma	8	6.0	7	5.0
Non-Hodgkin's Lymphoma	15	23.0	18	20.5
Oral Cavity and Pharynx	19	15.5	5	7.3
Ovary	0	0.0	14	18.5
Pancreas	16	9.6	5	8.7
Prostate	163	171.1	0	0.0
Soft Tissues	2	2.9	1	2.6
Stomach	10	9.2	1	5.1
Testis	8	4.5	0	0.0
Thyroid	0	2.9	6	7.4
Urinary Bladder	37	35.5	10	12.4

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-25: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Goodhue County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	523	573.4	521	533.5
Brain and Other Nervous System	6	8.5	3	6.3
Breast	0	1.1	170	171.4
Cervix Uteri	0	0.0	11	8.3
Colon and Rectum	51	66.8	74	70.0
Corpus Uteri	0	0.0	43	33.3
Esophagus	8	8.1	3	2.7
Hodgkin's Lymphoma	6	3.5	4	2.9
Kaposi’s Sarcoma (all sites)	1	0.8	0	0.1
Kidney and Renal Pelvis	13	16.6	7	10.5
Larynx	12	7.2	1	1.6
Leukemias	24	19.3	16	14.7
Liver and Bile Duct	3	4.4	4	2.3
Lung and Bronchus	66	78.0	38	56.2
Melanomas of the Skin	18	19.5	19	15.9
Mesothelioma (all sites)	2	2.7	0	0.6
Multiple Myeloma	1	6.7	6	5.7
Non-Hodgkin's Lymphoma	24	26.5	26	23.8
Oral Cavity and Pharynx	19	17.8	8	8.4
Ovary	0	0.0	14	21.8
Pancreas	7	10.6	9	9.8
Prostate	179	183.4	0	0.0
Soft Tissues	3	3.5	4	3.2
Stomach	13	10.5	7	6.0
Testis	10	6.4	0	0.0
Thyroid	4	3.6	6	9.6
Urinary Bladder	33	39.6	14	14.3

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-26: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Grant County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	138	116.1	106	100.5
Brain and Other Nervous System	5	1.4	1	1.1
Breast	0	0.2	33	31.7
Cervix Uteri	0	0.0	0	1.3
Colon and Rectum	18	13.9	20	14.0
Corpus Uteri	0	0.0	5	6.3
Esophagus	3	1.7	0	0.6
Hodgkin's Lymphoma	0	0.5	1	0.4
Kaposi’s Sarcoma (all sites)	0	0.1	0	0.0
Kidney and Renal Pelvis	3	3.2	4	2.0
Larynx	1	1.4	0	0.3
Leukemias	1	3.8	3	2.8
Liver and Bile Duct	0	0.9	0	0.4
Lung and Bronchus	15	16.1	7	11.1
Melanomas of the Skin	3	3.5	5	2.6
Mesothelioma (all sites)	1	0.6	0	0.1
Multiple Myeloma	0	1.4	1	1.1
Non-Hodgkin's Lymphoma	3	5.1	3	4.6
Oral Cavity and Pharynx	6	3.4	0	1.6
Ovary	0	0.0	6	3.9
Pancreas	2	2.1	1	2.0
Prostate	52	38.6	0	0.0
Soft Tissues	0	0.6	1	0.6
Stomach	4	2.2	0	1.2
Testis	1	0.8	0	0.0
Thyroid	1	0.6	3	1.4
Urinary Bladder	10	8.3	2	2.8

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-27: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Hennepin County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	11326	10896.0	11937	11304.5
Brain and Other Nervous System	194	191.4	150	147.4
Breast	28	20.5	4105	3712.7
Cervix Uteri	0	0.0	212	214.0
Colon and Rectum	1179	1211.7	1201	1349.6
Corpus Uteri	0	0.0	720	713.6
Esophagus	159	153.6	54	52.3
Hodgkin's Lymphoma	87	90.2	71	76.9
Kaposi’s Sarcoma (all sites)	53	20.5	2	1.7
Kidney and Renal Pelvis	353	329.7	202	221.0
Larynx	147	140.1	37	34.6
Leukemias	369	365.5	325	296.1
Liver and Bile Duct	119	88.5	58	47.8
Lung and Bronchus	1546	1460.9	1328	1165.4
Melanomas of the Skin	505	413.7	416	389.4
Mesothelioma (all sites)	38	49.4	13	11.6
Multiple Myeloma	95	121.6	120	114.5
Non-Hodgkin's Lymphoma	610	519.1	480	488.2
Oral Cavity and Pharynx	377	354.6	211	178.4
Ovary	0	0.0	532	488.0
Pancreas	226	201.4	207	194.4
Prostate	3438	3385.9	0	0.0
Soft Tissues	72	73.2	59	70.0
Stomach	182	189.1	129	114.7
Testis	159	190.2	0	0.0
Thyroid	79	86.7	244	256.6
Urinary Bladder	760	705.1	293	277.1

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-28: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Houston County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	245	271.0	226	236.0
Brain and Other Nervous System	3	3.9	2	2.8
Breast	1	0.5	69	76.2
Cervix Uteri	0	0.0	1	3.7
Colon and Rectum	33	31.4	34	30.3
Corpus Uteri	0	0.0	10	15.0
Esophagus	1	3.8	1	1.2
Hodgkin's Lymphoma	1	1.6	1	1.3
Kaposi’s Sarcoma (all sites)	0	0.4	0	0.0
Kidney and Renal Pelvis	5	7.8	5	4.7
Larynx	3	3.4	0	0.7
Leukemias	12	9.0	3	6.4
Liver and Bile Duct	1	2.1	1	1.0
Lung and Bronchus	39	37.2	19	25.2
Melanomas of the Skin	9	9.0	6	7.1
Mesothelioma (all sites)	2	1.3	0	0.2
Multiple Myeloma	2	3.1	3	2.5
Non-Hodgkin's Lymphoma	18	12.4	8	10.4
Oral Cavity and Pharynx	6	8.3	5	3.7
Ovary	0	0.0	14	9.7
Pancreas	3	5.0	8	4.3
Prostate	62	87.8	0	0.0
Soft Tissues	2	1.6	2	1.4
Stomach	7	4.9	1	2.6
Testis	3	2.9	0	0.0
Thyroid	7	1.7	8	4.3
Urinary Bladder	13	18.6	6	6.2

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-29: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Hubbard County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	305	280.5	245	217.4
Brain and Other Nervous System	4	3.8	5	2.6
Breast	1	0.5	75	71.5
Cervix Uteri	0	0.0	2	3.3
Colon and Rectum	36	32.4	36	26.9
Corpus Uteri	0	0.0	14	14.3
Esophagus	3	4.0	2	1.1
Hodgkin's Lymphoma	4	1.4	1	1.1
Kaposi’s Sarcoma (all sites)	0	0.3	0	0.0
Kidney and Renal Pelvis	12	8.1	3	4.4
Larynx	4	3.6	2	0.7
Leukemias	11	9.0	6	5.6
Liver and Bile Duct	1	2.2	0	0.9
Lung and Bronchus	47	39.2	30	24.1
Melanomas of the Skin	8	9.0	7	6.3
Mesothelioma (all sites)	1	1.3	1	0.2
Multiple Myeloma	4	3.3	2	2.3
Non-Hodgkin's Lymphoma	11	12.5	12	9.4
Oral Cavity and Pharynx	12	8.5	2	3.5
Ovary	0	0.0	5	9.1
Pancreas	3	5.2	4	4.0
Prostate	103	93.2	0	0.0
Soft Tissues	3	1.6	2	1.2
Stomach	4	5.0	1	2.2
Testis	3	2.2	0	0.0
Thyroid	1	1.6	5	3.8
Urinary Bladder	20	19.3	11	5.5

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-30: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Isanti County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	288	316.8	269	285.8
Brain and Other Nervous System	5	5.4	1	3.9
Breast	0	0.6	97	95.0
Cervix Uteri	0	0.0	9	5.4
Colon and Rectum	22	36.4	30	33.9
Corpus Uteri	0	0.0	23	18.0
Esophagus	6	4.5	0	1.3
Hodgkin's Lymphoma	3	2.4	2	1.9
Kaposi’s Sarcoma (all sites)	1	0.5	0	0.0
Kidney and Renal Pelvis	6	9.6	3	5.6
Larynx	2	4.0	0	0.9
Leukemias	9	11.0	6	7.6
Liver and Bile Duct	4	2.6	1	1.2
Lung and Bronchus	39	42.2	24	28.8
Melanomas of the Skin	15	11.8	7	9.8
Mesothelioma (all sites)	1	1.4	1	0.3
Multiple Myeloma	5	3.6	2	2.9
Non-Hodgkin's Lymphoma	20	15.3	10	12.3
Oral Cavity and Pharynx	8	10.4	4	4.5
Ovary	0	0.0	10	12.5
Pancreas	2	5.9	6	4.9
Prostate	94	97.3	0	0.0
Soft Tissues	2	2.1	1	1.8
Stomach	4	5.8	2	2.9
Testis	3	4.5	0	0.0
Thyroid	0	2.3	8	6.4
Urinary Bladder	23	21.2	7	6.9

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-31: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Itasca County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	589	666.7	562	543.0
Brain and Other Nervous System	14	9.4	7	6.7
Breast	1	1.3	172	177.7
Cervix Uteri	0	0.0	9	8.6
Colon and Rectum	77	76.0	86	66.7
Corpus Uteri	0	0.0	43	35.4
Esophagus	8	9.6	3	2.7
Hodgkin's Lymphoma	4	3.6	0	2.9
Kaposi’s Sarcoma (all sites)	1	0.8	0	0.1
Kidney and Renal Pelvis	17	19.4	7	11.0
Larynx	6	8.6	2	1.7
Leukemias	20	21.6	13	13.9
Liver and Bile Duct	3	5.2	1	2.3
Lung and Bronchus	90	93.2	68	60.5
Melanomas of the Skin	15	21.8	11	16.1
Mesothelioma (all sites)	5	3.2	2	0.6
Multiple Myeloma	9	7.7	6	5.8
Non-Hodgkin's Lymphoma	22	29.8	29	23.6
Oral Cavity and Pharynx	23	20.2	11	8.6
Ovary	0	0.0	18	22.8
Pancreas	13	12.4	11	9.9
Prostate	171	220.6	0	0.0
Soft Tissues	4	3.8	1	3.1
Stomach	14	11.7	1	5.5
Testis	3	6.1	0	0.0
Thyroid	4	4.0	7	9.9
Urinary Bladder	40	45.1	21	13.7

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-32: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Jackson County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	142	193.4	107	165.3
Brain and Other Nervous System	3	2.6	2	1.9
Breast	0	0.4	32	52.7
Cervix Uteri	0	0.0	1	2.3
Colon and Rectum	23	22.7	14	22.2
Corpus Uteri	0	0.0	6	10.5
Esophagus	3	2.7	0	0.9
Hodgkin's Lymphoma	1	1.0	0	0.8
Kaposi’s Sarcoma (all sites)	0	0.2	1	0.0
Kidney and Renal Pelvis	3	5.4	1	3.3
Larynx	0	2.4	0	0.5
Leukemias	6	6.4	4	4.5
Liver and Bile Duct	1	1.4	1	0.7
Lung and Bronchus	17	26.7	9	18.0
Melanomas of the Skin	4	6.1	5	4.5
Mesothelioma (all sites)	1	0.9	0	0.2
Multiple Myeloma	1	2.3	1	1.8
Non-Hodgkin's Lymphoma	4	8.6	7	7.4
Oral Cavity and Pharynx	1	5.7	0	2.6
Ovary	0	0.0	1	6.6
Pancreas	7	3.6	2	3.1
Prostate	38	63.9	0	0.0
Soft Tissues	0	1.1	1	0.9
Stomach	4	3.6	3	1.9
Testis	0	1.6	0	0.0
Thyroid	2	1.0	3	2.6
Urinary Bladder	14	13.6	3	4.5

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-33: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Kanabec County

	Males		Females	
Cancer Site	Observed	Expected*	Observed	Expected*
All Sites	161	196.3	145	155.8
Brain and Other Nervous System	3	2.9	2	2.0
Breast	0	0.4	44	51.2
Cervix Uteri	0	0.0	1	2.6
Colon and Rectum	18	22.5	15	18.9
Corpus Uteri	0	0.0	15	10.1
Esophagus	3	2.8	0	0.7
Hodgkin's Lymphoma	0	1.1	2	0.9
Kaposi’s Sarcoma (all sites)	0	0.3	0	0.0
Kidney and Renal Pelvis	9	5.7	4	3.1
Larynx	0	2.5	0	0.5
Leukemias	3	6.5	4	4.1
Liver and Bile Duct	2	1.5	1	0.7
Lung and Bronchus	24	27.1	12	16.9
Melanomas of the Skin	5	6.5	8	4.8
Mesothelioma (all sites)	1	0.9	1	0.2
Multiple Myeloma	0	2.3	2	1.6
Non-Hodgkin's Lymphoma	9	8.9	7	6.7
Oral Cavity and Pharynx	7	6.0	0	2.5
Ovary	0	0.0	4	6.6
Pancreas	2	3.6	4	2.8
Prostate	57	64.0	0	0.0
Soft Tissues	3	1.2	2	0.9
Stomach	5	3.5	1	1.6
Testis	0	2.0	0	0.0
Thyroid	1	1.2	2	3.0
Urinary Bladder	3	13.3	3	3.9

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-34: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Kandiyohi County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	500	543.6	496	475.2
Brain and Other Nervous System	11	8.0	4	5.9
Breast	0	1.1	168	153.5
Cervix Uteri	0	0.0	9	7.7
Colon and Rectum	54	62.9	60	60.1
Corpus Uteri	0	0.0	38	30.1
Esophagus	6	7.7	2	2.4
Hodgkin's Lymphoma	1	3.4	1	2.8
Kaposi’s Sarcoma (all sites)	0	0.7	0	0.1
Kidney and Renal Pelvis	21	15.6	17	9.5
Larynx	8	6.8	1	1.5
Leukemias	15	18.3	11	12.8
Liver and Bile Duct	4	4.2	1	2.1
Lung and Bronchus	81	74.2	39	50.9
Melanomas of the Skin	16	18.1	19	14.5
Mesothelioma (all sites)	4	2.6	1	0.5
Multiple Myeloma	7	6.3	7	5.0
Non-Hodgkin's Lymphoma	15	24.8	21	20.9
Oral Cavity and Pharynx	8	16.6	5	7.5
Ovary	0	0.0	24	19.7
Pancreas	10	10.0	10	8.6
Prostate	161	175.4	0	0.0
Soft Tissues	4	3.3	4	2.8
Stomach	7	9.8	7	5.1
Testis	4	6.0	0	0.0
Thyroid	1	3.4	12	9.0
Urinary Bladder	30	37.3	13	12.3

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-35: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Kittson County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	81	101.4	74	80.6
Brain and Other Nervous System	0	1.2	1	0.9
Breast	0	0.2	24	25.5
Cervix Uteri	0	0.0	1	1.1
Colon and Rectum	12	12.1	13	11.0
Corpus Uteri	0	0.0	8	5.1
Esophagus	0	1.4	0	0.4
Hodgkin's Lymphoma	0	0.5	0	0.4
Kaposi’s Sarcoma (all sites)	0	0.1	0	0.0
Kidney and Renal Pelvis	2	2.8	0	1.6
Larynx	0	1.2	0	0.2
Leukemias	6	3.4	1	2.2
Liver and Bile Duct	2	0.8	0	0.4
Lung and Bronchus	7	14.0	8	8.9
Melanomas of the Skin	3	3.1	2	2.1
Mesothelioma (all sites)	0	0.5	0	0.1
Multiple Myeloma	2	1.2	2	0.9
Non-Hodgkin's Lymphoma	3	4.5	4	3.6
Oral Cavity and Pharynx	5	2.9	0	1.3
Ovary	0	0.0	1	3.2
Pancreas	1	1.9	3	1.6
Prostate	24	33.6	0	0.0
Soft Tissues	2	0.6	0	0.5
Stomach	2	1.9	1	0.9
Testis	0	0.7	0	0.0
Thyroid	0	0.5	1	1.2
Urinary Bladder	5	7.3	0	2.3

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-36: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Koochiching County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	208	235.2	206	192.5
Brain and Other Nervous System	1	3.3	1	2.3
Breast	0	0.5	63	62.9
Cervix Uteri	0	0.0	7	3.0
Colon and Rectum	24	26.9	18	23.8
Corpus Uteri	0	0.0	15	12.6
Esophagus	3	3.4	2	1.0
Hodgkin's Lymphoma	2	1.3	1	1.0
Kaposi’s Sarcoma (all sites)	0	0.3	0	0.0
Kidney and Renal Pelvis	1	6.8	2	3.9
Larynx	2	3.0	1	0.6
Leukemias	12	7.6	7	4.9
Liver and Bile Duct	0	1.8	0	0.8
Lung and Bronchus	22	32.6	34	21.6
Melanomas of the Skin	9	7.7	3	5.6
Mesothelioma (all sites)	3	1.1	0	0.2
Multiple Myeloma	4	2.7	4	2.1
Non-Hodgkin's Lymphoma	6	10.6	11	8.4
Oral Cavity and Pharynx	7	7.2	3	3.1
Ovary	0	0.0	6	8.1
Pancreas	4	4.4	3	3.5
Prostate	71	77.3	0	0.0
Soft Tissues	2	1.4	1	1.1
Stomach	3	4.2	6	2.0
Testis	3	2.3	0	0.0
Thyroid	0	1.4	1	3.4
Urinary Bladder	14	16.0	6	4.9

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-37: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Lac Qui Parle County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	147	161.1	111	128.7
Brain and Other Nervous System	2	1.9	0	1.4
Breast	0	0.3	34	40.6
Cervix Uteri	0	0.0	1	1.7
Colon and Rectum	16	19.3	13	17.9
Corpus Uteri	0	0.0	13	8.1
Esophagus	3	2.3	0	0.7
Hodgkin's Lymphoma	1	0.7	2	0.5
Kaposi’s Sarcoma (all sites)	0	0.2	0	0.0
Kidney and Renal Pelvis	2	4.4	0	2.6
Larynx	2	2.0	0	0.4
Leukemias	7	5.3	3	3.6
Liver and Bile Duct	1	1.2	1	0.6
Lung and Bronchus	18	22.3	13	14.3
Melanomas of the Skin	3	4.8	4	3.3
Mesothelioma (all sites)	1	0.8	0	0.1
Multiple Myeloma	2	1.9	1	1.5
Non-Hodgkin's Lymphoma	5	7.1	3	5.8
Oral Cavity and Pharynx	7	4.7	5	2.0
Ovary	0	0.0	4	5.0
Pancreas	3	3.0	0	2.5
Prostate	47	53.7	0	0.0
Soft Tissues	0	0.9	2	0.7
Stomach	2	3.0	1	1.5
Testis	2	1.1	0	0.0
Thyroid	2	0.8	2	1.8
Urinary Bladder	13	11.6	4	3.6

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-38: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Lake County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	196	196.4	163	156.2
Brain and Other Nervous System	3	2.6	0	1.8
Breast	1	0.4	51	50.9
Cervix Uteri	0	0.0	1	2.2
Colon and Rectum	22	22.4	26	19.8
Corpus Uteri	0	0.0	10	10.3
Esophagus	4	2.8	0	0.8
Hodgkin's Lymphoma	0	0.9	1	0.7
Kaposi’s Sarcoma (all sites)	0	0.2	0	0.0
Kidney and Renal Pelvis	3	5.7	5	3.2
Larynx	3	2.6	1	0.5
Leukemias	4	6.1	5	4.0
Liver and Bile Duct	2	1.5	2	0.7
Lung and Bronchus	35	27.8	20	17.7
Melanomas of the Skin	7	6.2	3	4.3
Mesothelioma (all sites)	0	0.9	0	0.2
Multiple Myeloma	0	2.2	1	1.7
Non-Hodgkin's Lymphoma	12	8.6	4	6.8
Oral Cavity and Pharynx	8	6.0	3	2.5
Ovary	0	0.0	8	6.4
Pancreas	3	3.6	3	2.9
Prostate	55	66.3	0	0.0
Soft Tissues	0	1.1	0	0.9
Stomach	5	3.4	1	1.6
Testis	0	1.5	0	0.0
Thyroid	1	1.1	2	2.5
Urinary Bladder	13	13.3	3	4.1

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-39: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Lake of the Woods County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	65	70.0	52	53.4
Brain and Other Nervous System	3	1.0	1	0.7
Breast	0	0.1	15	17.6
Cervix Uteri	0	0.0	1	0.9
Colon and Rectum	9	8.0	6	6.5
Corpus Uteri	0	0.0	3	3.5
Esophagus	2	1.0	0	0.3
Hodgkin's Lymphoma	0	0.4	1	0.3
Kaposi’s Sarcoma (all sites)	0	0.1	0	0.0
Kidney and Renal Pelvis	0	2.0	1	1.1
Larynx	1	0.9	0	0.2
Leukemias	3	2.3	1	1.4
Liver and Bile Duct	1	0.5	0	0.2
Lung and Bronchus	8	9.7	2	5.8
Melanomas of the Skin	1	2.3	2	1.6
Mesothelioma (all sites)	1	0.3	0	0.1
Multiple Myeloma	2	0.8	0	0.6
Non-Hodgkin's Lymphoma	2	3.1	3	2.3
Oral Cavity and Pharynx	0	2.1	1	0.8
Ovary	0	0.0	4	2.3
Pancreas	0	1.3	4	1.0
Prostate	23	23.0	0	0.0
Soft Tissues	0	0.4	0	0.3
Stomach	0	1.2	1	0.5
Testis	1	0.7	0	0.0
Thyroid	0	0.4	0	1.0
Urinary Bladder	6	4.8	2	1.3

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-40: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Le Sueur County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	307	340.9	260	294.2
Brain and Other Nervous System	5	5.0	3	3.6
Breast	0	0.7	98	95.7
Cervix Uteri	0	0.0	3	4.7
Colon and Rectum	27	39.5	32	37.1
Corpus Uteri	0	0.0	19	18.8
Esophagus	7	4.8	1	1.5
Hodgkin's Lymphoma	1	2.1	1	1.6
Kaposi’s Sarcoma (all sites)	0	0.5	0	0.0
Kidney and Renal Pelvis	5	9.9	9	5.9
Larynx	9	4.3	0	0.9
Leukemias	13	11.4	6	7.9
Liver and Bile Duct	0	2.7	1	1.3
Lung and Bronchus	48	46.5	25	31.7
Melanomas of the Skin	5	11.5	5	8.8
Mesothelioma (all sites)	2	1.6	0	0.3
Multiple Myeloma	1	4.0	4	3.1
Non-Hodgkin's Lymphoma	14	15.6	10	12.9
Oral Cavity and Pharynx	10	10.5	2	4.6
Ovary	0	0.0	7	12.2
Pancreas	11	6.3	3	5.3
Prostate	104	109.8	0	0.0
Soft Tissues	0	2.1	1	1.7
Stomach	7	6.2	1	3.1
Testis	4	3.7	0	0.0
Thyroid	3	2.1	5	5.4
Urinary Bladder	21	23.4	4	7.6

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-41: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Lincoln County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	108	133.6	87	106.6
Brain and Other Nervous System	1	1.6	2	1.1
Breast	0	0.3	21	33.6
Cervix Uteri	0	0.0	0	1.3
Colon and Rectum	16	16.0	23	14.9
Corpus Uteri	0	0.0	7	6.7
Esophagus	1	1.9	1	0.6
Hodgkin's Lymphoma	0	0.6	0	0.4
Kaposi’s Sarcoma (all sites)	0	0.1	0	0.0
Kidney and Renal Pelvis	4	3.7	2	2.1
Larynx	1	1.7	0	0.3
Leukemias	2	4.4	3	3.0
Liver and Bile Duct	0	1.0	0	0.5
Lung and Bronchus	11	18.6	7	11.7
Melanomas of the Skin	2	4.0	1	2.7
Mesothelioma (all sites)	0	0.6	0	0.1
Multiple Myeloma	3	1.6	1	1.2
Non-Hodgkin's Lymphoma	3	5.9	6	4.9
Oral Cavity and Pharynx	4	3.9	0	1.7
Ovary	0	0.0	2	4.1
Pancreas	5	2.5	1	2.1
Prostate	35	44.6	0	0.0
Soft Tissues	1	0.7	1	0.6
Stomach	3	2.5	2	1.3
Testis	1	0.8	0	0.0
Thyroid	2	0.6	0	1.5
Urinary Bladder	9	9.6	1	3.0

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-42: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Lyon County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	294	330.2	263	296.5
Brain and Other Nervous System	2	4.8	6	3.6
Breast	0	0.7	73	94.4
Cervix Uteri	0	0.0	8	4.5
Colon and Rectum	34	38.4	38	38.7
Corpus Uteri	0	0.0	19	18.6
Esophagus	6	4.6	0	1.5
Hodgkin's Lymphoma	3	2.1	0	1.8
Kaposi’s Sarcoma (all sites)	0	0.4	0	0.0
Kidney and Renal Pelvis	13	9.4	8	5.9
Larynx	1	4.1	1	0.9
Leukemias	10	11.1	7	8.1
Liver and Bile Duct	0	2.5	1	1.3
Lung and Bronchus	43	45.0	23	31.9
Melanomas of the Skin	13	10.8	5	8.8
Mesothelioma (all sites)	0	1.6	0	0.3
Multiple Myeloma	2	3.8	2	3.2
Non-Hodgkin's Lymphoma	22	15.1	11	13.2
Oral Cavity and Pharynx	4	10.0	6	4.7
Ovary	0	0.0	13	12.1
Pancreas	4	6.1	3	5.5
Prostate	94	106.8	0	0.0
Soft Tissues	2	2.0	0	1.8
Stomach	3	6.0	5	3.3
Testis	3	3.6	0	0.0
Thyroid	3	2.0	8	5.4
Urinary Bladder	24	22.9	5	7.9

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-43: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Mcleod County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	407	433.7	381	395.1
Brain and Other Nervous System	10	6.6	6	4.9
Breast	0	0.9	120	127.8
Cervix Uteri	0	0.0	6	6.4
Colon and Rectum	52	50.1	53	50.3
Corpus Uteri	0	0.0	23	24.9
Esophagus	4	6.1	3	2.0
Hodgkin's Lymphoma	5	2.8	4	2.2
Kaposi’s Sarcoma (all sites)	0	0.6	0	0.1
Kidney and Renal Pelvis	15	12.6	10	7.8
Larynx	4	5.5	0	1.2
Leukemias	20	14.7	10	10.7
Liver and Bile Duct	3	3.4	1	1.7
Lung and Bronchus	40	59.0	31	42.0
Melanomas of the Skin	14	14.8	12	12.1
Mesothelioma (all sites)	1	2.0	1	0.4
Multiple Myeloma	5	5.0	4	4.2
Non-Hodgkin's Lymphoma	16	20.1	25	17.4
Oral Cavity and Pharynx	14	13.4	5	6.2
Ovary	0	0.0	18	16.4
Pancreas	6	8.0	8	7.2
Prostate	140	138.5	0	0.0
Soft Tissues	7	2.7	1	2.4
Stomach	8	7.9	3	4.3
Testis	7	5.2	0	0.0
Thyroid	2	2.8	7	7.5
Urinary Bladder	22	29.7	10	10.3

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-44: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Mahnomen County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	111	82.2	62	62.4
Brain and Other Nervous System	2	1.1	0	0.8
Breast	0	0.2	13	20.2
Cervix Uteri	0	0.0	2	0.9
Colon and Rectum	17	9.6	11	7.9
Corpus Uteri	0	0.0	5	4.0
Esophagus	1	1.2	1	0.3
Hodgkin's Lymphoma	0	0.4	0	0.3
Kaposi’s Sarcoma (all sites)	0	0.1	0	0.0
Kidney and Renal Pelvis	4	2.3	0	1.3
Larynx	1	1.0	0	0.2
Leukemias	2	2.7	2	1.7
Liver and Bile Duct	1	0.6	0	0.3
Lung and Bronchus	14	11.4	8	6.9
Melanomas of the Skin	1	2.6	1	1.8
Mesothelioma (all sites)	1	0.4	0	0.1
Multiple Myeloma	1	1.0	0	0.7
Non-Hodgkin's Lymphoma	5	3.7	2	2.7
Oral Cavity and Pharynx	5	2.5	1	1.0
Ovary	0	0.0	5	2.6
Pancreas	1	1.5	0	1.2
Prostate	36	27.1	0	0.0
Soft Tissues	2	0.5	0	0.4
Stomach	6	1.5	0	0.7
Testis	2	0.7	0	0.0
Thyroid	0	0.4	1	1.1
Urinary Bladder	4	5.7	4	1.6

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-45: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Marshall County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	172	177.5	139	136.2
Brain and Other Nervous System	3	2.4	2	1.6
Breast	0	0.3	52	44.0
Cervix Uteri	0	0.0	1	2.0
Colon and Rectum	23	20.7	21	17.6
Corpus Uteri	0	0.0	9	8.8
Esophagus	4	2.5	0	0.7
Hodgkin's Lymphoma	1	0.9	0	0.7
Kaposi’s Sarcoma (all sites)	0	0.2	0	0.0
Kidney and Renal Pelvis	3	5.0	0	2.7
Larynx	1	2.2	0	0.4
Leukemias	9	5.8	6	3.6
Liver and Bile Duct	1	1.3	0	0.6
Lung and Bronchus	18	24.6	15	15.0
Melanomas of the Skin	0	5.6	3	3.8
Mesothelioma (all sites)	0	0.9	0	0.1
Multiple Myeloma	2	2.1	2	1.5
Non-Hodgkin's Lymphoma	7	7.9	5	6.0
Oral Cavity and Pharynx	7	5.3	1	2.2
Ovary	0	0.0	5	5.6
Pancreas	4	3.3	4	2.5
Prostate	58	58.9	0	0.0
Soft Tissues	0	1.0	0	0.8
Stomach	8	3.2	2	1.5
Testis	3	1.4	0	0.0
Thyroid	1	1.0	6	2.3
Urinary Bladder	10	12.4	0	3.6

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-46: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Martin County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	375	363.5	333	326.7
Brain and Other Nervous System	4	4.8	3	3.6
Breast	0	0.7	97	103.8
Cervix Uteri	0	0.0	9	4.6
Colon and Rectum	38	42.6	55	44.2
Corpus Uteri	0	0.0	24	20.6
Esophagus	2	5.1	0	1.7
Hodgkin's Lymphoma	1	1.8	4	1.5
Kaposi’s Sarcoma (all sites)	0	0.4	0	0.0
Kidney and Renal Pelvis	9	10.2	8	6.5
Larynx	5	4.5	0	1.0
Leukemias	11	12.0	10	9.0
Liver and Bile Duct	4	2.8	0	1.4
Lung and Bronchus	48	50.4	28	35.8
Melanomas of the Skin	15	11.5	12	8.9
Mesothelioma (all sites)	2	1.7	0	0.3
Multiple Myeloma	2	4.3	1	3.6
Non-Hodgkin's Lymphoma	9	16.3	11	14.7
Oral Cavity and Pharynx	9	10.8	4	5.2
Ovary	0	0.0	18	13.0
Pancreas	5	6.7	4	6.2
Prostate	150	119.6	0	0.0
Soft Tissues	0	2.1	3	1.9
Stomach	7	6.7	2	3.8
Testis	4	3.1	0	0.0
Thyroid	2	2.0	7	5.1
Urinary Bladder	28	25.6	8	9.0

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-47: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Meeker County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	292	318.1	226	269.4
Brain and Other Nervous System	3	4.5	4	3.2
Breast	0	0.6	71	87.2
Cervix Uteri	0	0.0	3	4.1
Colon and Rectum	34	36.9	36	34.5
Corpus Uteri	0	0.0	10	17.3
Esophagus	0	4.5	2	1.4
Hodgkin's Lymphoma	1	1.8	0	1.4
Kaposi’s Sarcoma (all sites)	0	0.4	0	0.0
Kidney and Renal Pelvis	13	9.1	4	5.4
Larynx	3	4.0	0	0.8
Leukemias	10	10.5	3	7.2
Liver and Bile Duct	2	2.4	0	1.2
Lung and Bronchus	39	43.8	19	29.4
Melanomas of the Skin	11	10.4	6	7.8
Mesothelioma (all sites)	3	1.5	1	0.3
Multiple Myeloma	4	3.7	7	2.9
Non-Hodgkin's Lymphoma	11	14.4	15	11.9
Oral Cavity and Pharynx	4	9.7	2	4.3
Ovary	0	0.0	8	11.1
Pancreas	9	5.9	5	5.0
Prostate	100	103.9	0	0.0
Soft Tissues	4	1.9	1	1.6
Stomach	5	5.8	4	2.9
Testis	3	3.0	0	0.0
Thyroid	2	1.9	8	4.7
Urinary Bladder	20	22.0	4	7.1

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-48: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Mille Lacs County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	373	312.7	320	267.0
Brain and Other Nervous System	7	4.3	3	3.2
Breast	0	0.6	84	85.9
Cervix Uteri	0	0.0	7	4.0
Colon and Rectum	31	36.3	40	34.8
Corpus Uteri	0	0.0	19	17.0
Esophagus	7	4.5	3	1.4
Hodgkin's Lymphoma	2	1.7	2	1.4
Kaposi’s Sarcoma (all sites)	1	0.4	0	0.0
Kidney and Renal Pelvis	13	8.9	4	5.3
Larynx	5	4.0	1	0.8
Leukemias	10	10.3	6	7.2
Liver and Bile Duct	2	2.4	0	1.2
Lung and Bronchus	57	43.2	42	29.0
Melanomas of the Skin	10	10.1	13	7.7
Mesothelioma (all sites)	1	1.5	1	0.3
Multiple Myeloma	3	3.6	3	2.9
Non-Hodgkin's Lymphoma	16	14.1	14	11.8
Oral Cavity and Pharynx	9	9.4	4	4.2
Ovary	0	0.0	18	10.9
Pancreas	12	5.8	4	5.0
Prostate	128	102.7	0	0.0
Soft Tissues	2	1.8	4	1.6
Stomach	7	5.7	5	2.9
Testis	5	2.8	0	0.0
Thyroid	2	1.8	12	4.6
Urinary Bladder	26	21.7	7	7.1

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-49: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Morrison County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	467	430.7	345	360.9
Brain and Other Nervous System	7	6.2	9	4.4
Breast	1	0.8	79	116.6
Cervix Uteri	0	0.0	10	5.6
Colon and Rectum	69	49.8	44	45.7
Corpus Uteri	0	0.0	21	23.2
Esophagus	8	6.1	2	1.8
Hodgkin's Lymphoma	2	2.5	2	2.0
Kaposi’s Sarcoma (all sites)	1	0.5	0	0.0
Kidney and Renal Pelvis	12	12.3	4	7.3
Larynx	4	5.4	1	1.1
Leukemias	7	14.4	12	9.6
Liver and Bile Duct	1	3.3	1	1.6
Lung and Bronchus	64	59.3	50	39.6
Melanomas of the Skin	13	14.0	10	10.6
Mesothelioma (all sites)	3	2.0	0	0.4
Multiple Myeloma	6	5.0	1	3.9
Non-Hodgkin's Lymphoma	21	19.5	18	15.8
Oral Cavity and Pharynx	19	13.0	4	5.7
Ovary	0	0.0	19	14.9
Pancreas	13	7.9	10	6.6
Prostate	139	140.8	0	0.0
Soft Tissues	3	2.6	3	2.1
Stomach	1	7.8	6	3.8
Testis	7	4.3	0	0.0
Thyroid	2	2.5	9	6.5
Urinary Bladder	29	29.6	8	9.4

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-50: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Mower County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	697	625.7	578	563.8
Brain and Other Nervous System	7	8.3	8	6.3
Breast	1	1.2	150	179.6
Cervix Uteri	0	0.0	8	7.7
Colon and Rectum	106	72.3	109	75.2
Corpus Uteri	0	0.0	27	36.2
Esophagus	8	9.0	2	3.0
Hodgkin's Lymphoma	1	3.1	3	2.6
Kaposi’s Sarcoma (all sites)	1	0.7	0	0.1
Kidney and Renal Pelvis	16	17.8	13	11.4
Larynx	7	8.0	1	1.7
Leukemias	18	20.2	15	15.1
Liver and Bile Duct	4	4.7	1	2.5
Lung and Bronchus	103	87.5	73	63.3
Melanomas of the Skin	17	19.5	24	15.1
Mesothelioma (all sites)	1	3.0	1	0.6
Multiple Myeloma	6	7.2	3	6.3
Non-Hodgkin's Lymphoma	33	27.7	23	25.2
Oral Cavity and Pharynx	20	18.6	13	8.9
Ovary	0	0.0	23	22.5
Pancreas	11	11.5	6	10.8
Prostate	225	209.2	0	0.0
Soft Tissues	2	3.5	4	3.2
Stomach	18	11.2	5	6.3
Testis	6	5.0	0	0.0
Thyroid	4	3.4	11	8.7
Urinary Bladder	52	43.3	19	15.4

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-51: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Murray County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	153	171.0	129	139.9
Brain and Other Nervous System	5	2.2	4	1.6
Breast	0	0.3	39	44.9
Cervix Uteri	0	0.0	2	1.9
Colon and Rectum	22	19.8	18	18.4
Corpus Uteri	0	0.0	13	9.1
Esophagus	0	2.5	0	0.7
Hodgkin's Lymphoma	1	0.8	1	0.6
Kaposi’s Sarcoma (all sites)	0	0.2	0	0.0
Kidney and Renal Pelvis	7	4.9	4	2.8
Larynx	3	2.2	0	0.4
Leukemias	3	5.5	4	3.7
Liver and Bile Duct	0	1.3	0	0.6
Lung and Bronchus	20	24.1	10	15.7
Melanomas of the Skin	3	5.3	3	3.8
Mesothelioma (all sites)	0	0.8	1	0.1
Multiple Myeloma	3	2.0	2	1.5
Non-Hodgkin's Lymphoma	6	7.5	4	6.2
Oral Cavity and Pharynx	3	5.0	1	2.2
Ovary	0	0.0	6	5.6
Pancreas	2	3.2	2	2.7
Prostate	57	57.5	0	0.0
Soft Tissues	1	0.9	1	0.8
Stomach	0	3.0	0	1.5
Testis	0	1.3	0	0.0
Thyroid	0	0.9	3	2.1
Urinary Bladder	13	11.8	1	3.8

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-52: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Nicollet County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	298	291.7	249	272.3
Brain and Other Nervous System	4	5.2	5	3.8
Breast	1	0.6	83	89.9
Cervix Uteri	0	0.0	2	5.2
Colon and Rectum	30	32.8	30	31.8
Corpus Uteri	0	0.0	18	17.3
Esophagus	7	4.1	0	1.2
Hodgkin's Lymphoma	1	2.5	6	2.2
Kaposi’s Sarcoma (all sites)	0	0.5	0	0.0
Kidney and Renal Pelvis	11	8.9	7	5.3
Larynx	5	3.8	1	0.8
Leukemias	4	10.0	6	7.2
Liver and Bile Duct	0	2.4	1	1.1
Lung and Bronchus	46	39.0	22	27.6
Melanomas of the Skin	5	11.0	15	9.5
Mesothelioma (all sites)	2	1.3	0	0.3
Multiple Myeloma	3	3.3	3	2.7
Non-Hodgkin's Lymphoma	20	14.0	9	11.7
Oral Cavity and Pharynx	10	9.5	3	4.3
Ovary	0	0.0	5	12.0
Pancreas	4	5.4	3	4.6
Prostate	93	89.8	0	0.0
Soft Tissues	1	2.0	4	1.8
Stomach	5	5.1	2	2.7
Testis	4	4.9	0	0.0
Thyroid	4	2.3	5	6.4
Urinary Bladder	21	19.0	7	6.5

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-53: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Nobles County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	292	305.8	253	276.2
Brain and Other Nervous System	1	4.2	4	3.1
Breast	0	0.6	89	88.3
Cervix Uteri	0	0.0	6	3.9
Colon and Rectum	42	35.5	41	36.7
Corpus Uteri	0	0.0	21	17.6
Esophagus	0	4.4	1	1.5
Hodgkin's Lymphoma	0	1.6	0	1.3
Kaposi’s Sarcoma (all sites)	0	0.4	0	0.0
Kidney and Renal Pelvis	9	8.7	9	5.5
Larynx	4	3.9	0	0.8
Leukemias	11	10.0	5	7.5
Liver and Bile Duct	1	2.3	3	1.2
Lung and Bronchus	28	42.3	18	30.3
Melanomas of the Skin	4	9.8	5	7.6
Mesothelioma (all sites)	0	1.5	0	0.3
Multiple Myeloma	5	3.6	2	3.0
Non-Hodgkin's Lymphoma	15	13.7	9	12.3
Oral Cavity and Pharynx	8	9.2	4	4.4
Ovary	0	0.0	10	11.1
Pancreas	4	5.7	1	5.2
Prostate	102	100.5	0	0.0
Soft Tissues	1	1.8	1	1.6
Stomach	12	5.5	2	3.1
Testis	4	2.8	0	0.0
Thyroid	4	1.7	5	4.5
Urinary Bladder	20	21.2	4	7.5

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-54: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Norman County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	149	142.6	121	113.1
Brain and Other Nervous System	2	1.8	1	1.2
Breast	0	0.3	29	35.9
Cervix Uteri	0	0.0	3	1.5
Colon and Rectum	19	17.0	15	15.6
Corpus Uteri	0	0.0	9	7.1
Esophagus	3	2.0	1	0.6
Hodgkin's Lymphoma	0	0.6	1	0.5
Kaposi’s Sarcoma (all sites)	0	0.2	0	0.0
Kidney and Renal Pelvis	2	4.0	2	2.2
Larynx	0	1.8	1	0.3
Leukemias	3	4.7	7	3.1
Liver and Bile Duct	1	1.1	1	0.5
Lung and Bronchus	23	19.7	9	12.2
Melanomas of the Skin	4	4.4	2	3.0
Mesothelioma (all sites)	0	0.7	0	0.1
Multiple Myeloma	0	1.7	4	1.3
Non-Hodgkin's Lymphoma	5	6.4	6	5.1
Oral Cavity and Pharynx	6	4.2	1	1.8
Ovary	0	0.0	4	4.5
Pancreas	2	2.6	4	2.2
Prostate	63	47.1	0	0.0
Soft Tissues	0	0.8	3	0.6
Stomach	3	2.7	2	1.3
Testis	2	1.0	0	0.0
Thyroid	2	0.7	1	1.7
Urinary Bladder	3	10.3	2	3.2

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-55: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Olmsted County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	1460	1145.3	1223	1173.7
Brain and Other Nervous System	20	20.5	18	15.6
Breast	3	2.2	408	386.9
Cervix Uteri	0	0.0	18	22.4
Colon and Rectum	126	128.0	147	139.9
Corpus Uteri	0	0.0	50	73.7
Esophagus	18	16.2	9	5.4
Hodgkin's Lymphoma	15	9.3	7	8.0
Kaposi’s Sarcoma (all sites)	4	2.2	0	0.2
Kidney and Renal Pelvis	51	35.0	27	22.8
Larynx	15	14.8	2	3.5
Leukemias	57	39.0	50	31.2
Liver and Bile Duct	27	9.4	2	5.0
Lung and Bronchus	184	153.1	122	118.7
Melanomas of the Skin	71	43.7	52	40.7
Mesothelioma (all sites)	6	5.2	0	1.2
Multiple Myeloma	16	12.9	10	11.8
Non-Hodgkin's Lymphoma	87	55.0	49	50.7
Oral Cavity and Pharynx	42	37.8	23	18.5
Ovary	0	0.0	39	50.9
Pancreas	29	21.3	25	20.0
Prostate	460	352.7	0	0.0
Soft Tissues	9	7.8	11	7.4
Stomach	25	20.0	9	11.9
Testis	27	19.2	0	0.0
Thyroid	15	9.0	45	26.8
Urinary Bladder	86	74.3	32	28.7

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-56: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Otter Tail County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	943	907.8	756	753.4
Brain and Other Nervous System	22	12.1	7	8.7
Breast	4	1.8	234	242.6
Cervix Uteri	0	0.0	15	10.8
Colon and Rectum	119	106.3	113	98.8
Corpus Uteri	0	0.0	52	48.3
Esophagus	11	12.9	6	3.9
Hodgkin's Lymphoma	10	4.5	4	3.6
Kaposi’s Sarcoma (all sites)	0	1.0	0	0.1
Kidney and Renal Pelvis	23	25.8	21	15.1
Larynx	7	11.5	4	2.3
Leukemias	29	29.7	17	20.2
Liver and Bile Duct	4	6.9	2	3.3
Lung and Bronchus	117	125.7	71	82.7
Melanomas of the Skin	17	28.8	29	21.1
Mesothelioma (all sites)	3	4.3	0	0.8
Multiple Myeloma	9	10.6	13	8.2
Non-Hodgkin's Lymphoma	31	40.6	30	33.4
Oral Cavity and Pharynx	31	27.3	12	11.9
Ovary	0	0.0	27	30.5
Pancreas	18	16.8	15	14.1
Prostate	351	299.3	0	0.0
Soft Tissues	6	5.2	5	4.3
Stomach	15	16.6	7	8.3
Testis	8	7.5	0	0.0
Thyroid	5	5.0	9	12.3
Urinary Bladder	54	63.4	14	20.2

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-57: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Pennington County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	179	182.3	174	168.0
Brain and Other Nervous System	6	2.7	2	2.0
Breast	1	0.4	63	54.1
Cervix Uteri	0	0.0	0	2.6
Colon and Rectum	27	21.4	29	22.0
Corpus Uteri	0	0.0	17	10.5
Esophagus	2	2.6	0	0.9
Hodgkin's Lymphoma	0	1.1	1	0.9
Kaposi’s Sarcoma (all sites)	0	0.2	0	0.0
Kidney and Renal Pelvis	0	5.2	4	3.3
Larynx	2	2.3	0	0.5
Leukemias	7	6.2	4	4.6
Liver and Bile Duct	0	1.4	2	0.7
Lung and Bronchus	27	24.7	14	17.7
Melanomas of the Skin	1	6.1	6	5.0
Mesothelioma (all sites)	0	0.9	0	0.2
Multiple Myeloma	3	2.1	1	1.8
Non-Hodgkin's Lymphoma	10	8.4	4	7.5
Oral Cavity and Pharynx	9	5.6	2	2.6
Ovary	0	0.0	7	6.9
Pancreas	5	3.4	3	3.1
Prostate	55	58.1	0	0.0
Soft Tissues	2	1.1	1	1.0
Stomach	2	3.4	1	1.9
Testis	0	2.0	0	0.0
Thyroid	1	1.1	5	3.0
Urinary Bladder	11	12.7	3	4.5

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-58: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Pine County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	379	351.5	277	277.6
Brain and Other Nervous System	8	5.2	4	3.4
Breast	1	0.7	80	90.7
Cervix Uteri	0	0.0	5	4.3
Colon and Rectum	34	40.3	41	34.6
Corpus Uteri	0	0.0	20	18.1
Esophagus	5	5.0	1	1.4
Hodgkin's Lymphoma	4	2.1	2	1.5
Kaposi’s Sarcoma (all sites)	0	0.5	0	0.0
Kidney and Renal Pelvis	11	10.2	14	5.6
Larynx	3	4.5	2	0.9
Leukemias	14	11.5	11	7.3
Liver and Bile Duct	3	2.7	2	1.2
Lung and Bronchus	68	48.5	38	30.5
Melanomas of the Skin	12	11.7	7	8.2
Mesothelioma (all sites)	3	1.6	0	0.3
Multiple Myeloma	4	4.0	0	2.9
Non-Hodgkin's Lymphoma	17	16.0	9	12.1
Oral Cavity and Pharynx	1	10.9	5	4.4
Ovary	0	0.0	6	11.6
Pancreas	5	6.5	8	5.0
Prostate	133	114.5	0	0.0
Soft Tissues	1	2.1	0	1.6
Stomach	8	6.3	3	2.9
Testis	4	3.7	0	0.0
Thyroid	4	2.2	1	5.0
Urinary Bladder	19	23.8	4	7.1

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-59: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Pipestone County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	167	165.4	134	150.9
Brain and Other Nervous System	3	2.2	2	1.7
Breast	0	0.3	51	47.6
Cervix Uteri	0	0.0	2	2.0
Colon and Rectum	15	19.4	16	20.7
Corpus Uteri	0	0.0	11	9.5
Esophagus	0	2.3	0	0.8
Hodgkin's Lymphoma	2	0.8	3	0.7
Kaposi’s Sarcoma (all sites)	0	0.2	0	0.0
Kidney and Renal Pelvis	7	4.6	4	3.0
Larynx	2	2.1	0	0.5
Leukemias	8	5.5	1	4.2
Liver and Bile Duct	1	1.2	1	0.7
Lung and Bronchus	20	22.9	5	16.5
Melanomas of the Skin	2	5.1	8	4.0
Mesothelioma (all sites)	1	0.8	0	0.2
Multiple Myeloma	2	1.9	3	1.7
Non-Hodgkin's Lymphoma	8	7.3	6	6.8
Oral Cavity and Pharynx	4	4.9	1	2.4
Ovary	0	0.0	2	5.9
Pancreas	5	3.0	2	2.9
Prostate	62	55.0	0	0.0
Soft Tissues	1	0.9	1	0.9
Stomach	4	3.0	2	1.8
Testis	3	1.3	0	0.0
Thyroid	1	0.9	2	2.3
Urinary Bladder	14	11.7	3	4.2

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-60: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Polk County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	500	463.5	437	406.6
Brain and Other Nervous System	5	6.5	2	4.8
Breast	1	0.9	128	130.3
Cervix Uteri	0	0.0	7	6.0
Colon and Rectum	71	54.1	66	53.5
Corpus Uteri	0	0.0	29	25.7
Esophagus	13	6.6	4	2.1
Hodgkin's Lymphoma	3	2.6	5	2.1
Kaposi’s Sarcoma (all sites)	0	0.6	0	0.1
Kidney and Renal Pelvis	7	13.2	10	8.1
Larynx	7	5.8	2	1.2
Leukemias	22	15.5	17	11.1
Liver and Bile Duct	3	3.5	1	1.8
Lung and Bronchus	77	63.6	42	43.7
Melanomas of the Skin	13	15.1	7	11.7
Mesothelioma (all sites)	3	2.2	0	0.4
Multiple Myeloma	3	5.4	6	4.4
Non-Hodgkin's Lymphoma	18	21.0	19	18.1
Oral Cavity and Pharynx	22	14.0	8	6.4
Ovary	0	0.0	35	16.5
Pancreas	9	8.5	8	7.6
Prostate	139	150.9	0	0.0
Soft Tissues	0	2.7	1	2.4
Stomach	8	8.5	4	4.5
Testis	6	4.5	0	0.0
Thyroid	5	2.7	6	7.0
Urinary Bladder	30	32.2	10	10.9

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-61: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Pope County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	181	201.2	157	163.1
Brain and Other Nervous System	3	2.5	1	1.8
Breast	0	0.4	46	51.8
Cervix Uteri	0	0.0	3	2.2
Colon and Rectum	30	23.8	24	22.1
Corpus Uteri	0	0.0	12	10.4
Esophagus	0	2.9	0	0.9
Hodgkin's Lymphoma	1	0.9	1	0.7
Kaposi’s Sarcoma (all sites)	0	0.2	0	0.0
Kidney and Renal Pelvis	4	5.6	2	3.3
Larynx	1	2.5	0	0.5
Leukemias	7	6.6	9	4.4
Liver and Bile Duct	0	1.5	0	0.7
Lung and Bronchus	25	27.9	16	18.1
Melanomas of the Skin	6	6.1	10	4.3
Mesothelioma (all sites)	2	1.0	0	0.2
Multiple Myeloma	3	2.4	1	1.8
Non-Hodgkin's Lymphoma	6	8.9	11	7.3
Oral Cavity and Pharynx	6	5.9	0	2.6
Ovary	0	0.0	6	6.5
Pancreas	2	3.7	1	3.1
Prostate	60	67.1	0	0.0
Soft Tissues	3	1.1	1	0.9
Stomach	4	3.7	1	1.9
Testis	0	1.4	0	0.0
Thyroid	0	1.0	1	2.4
Urinary Bladder	12	14.3	1	4.5

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-62: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Ramsey County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	5033	5281.7	5612	5581.3
Brain and Other Nervous System	77	87.6	58	70.5
Breast	16	10.0	1851	1800.7
Cervix Uteri	0	0.0	111	96.3
Colon and Rectum	499	593.0	669	695.9
Corpus Uteri	0	0.0	351	350.7
Esophagus	88	74.5	27	27.4
Hodgkin's Lymphoma	27	40.1	33	36.2
Kaposi’s Sarcoma (all sites)	11	8.8	0	0.8
Kidney and Renal Pelvis	148	156.2	117	110.5
Larynx	71	67.1	15	17.0
Leukemias	176	177.7	160	149.3
Liver and Bile Duct	53	42.0	27	24.2
Lung and Bronchus	737	714.8	621	590.1
Melanomas of the Skin	180	189.8	157	180.1
Mesothelioma (all sites)	26	24.4	4	5.8
Multiple Myeloma	77	59.5	62	58.3
Non-Hodgkin's Lymphoma	244	246.6	259	245.1
Oral Cavity and Pharynx	160	166.2	106	88.4
Ovary	0	0.0	236	234.4
Pancreas	96	97.2	103	99.8
Prostate	1480	1673.4	0	0.0
Soft Tissues	42	34.2	24	34.1
Stomach	86	92.3	62	59.1
Testis	84	81.0	0	0.0
Thyroid	37	38.4	95	115.4
Urinary Bladder	343	348.7	146	142.5

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-63: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Red Lake County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	58	69.3	53	54.3
Brain and Other Nervous System	1	0.9	0	0.6
Breast	0	0.1	17	17.4
Cervix Uteri	0	0.0	0	0.8
Colon and Rectum	8	8.1	7	7.1
Corpus Uteri	0	0.0	2	3.5
Esophagus	1	1.0	1	0.3
Hodgkin's Lymphoma	1	0.4	0	0.3
Kaposi’s Sarcoma (all sites)	0	0.1	0	0.0
Kidney and Renal Pelvis	1	2.0	1	1.1
Larynx	0	0.9	0	0.2
Leukemias	2	2.3	1	1.5
Liver and Bile Duct	1	0.5	0	0.2
Lung and Bronchus	4	9.5	6	6.0
Melanomas of the Skin	0	2.2	2	1.5
Mesothelioma (all sites)	1	0.3	0	0.1
Multiple Myeloma	0	0.8	1	0.6
Non-Hodgkin's Lymphoma	1	3.1	4	2.4
Oral Cavity and Pharynx	3	2.1	2	0.9
Ovary	0	0.0	2	2.2
Pancreas	1	1.3	2	1.0
Prostate	18	22.7	0	0.0
Soft Tissues	0	0.4	1	0.3
Stomach	0	1.3	0	0.6
Testis	0	0.6	0	0.0
Thyroid	1	0.4	1	0.9
Urinary Bladder	10	4.9	1	1.4

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-64: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Redwood County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	279	277.4	231	240.1
Brain and Other Nervous System	6	3.7	4	2.7
Breast	1	0.5	75	76.1
Cervix Uteri	0	0.0	2	3.3
Colon and Rectum	41	32.6	32	32.8
Corpus Uteri	0	0.0	13	15.1
Esophagus	3	3.9	2	1.3
Hodgkin's Lymphoma	2	1.4	0	1.1
Kaposi’s Sarcoma (all sites)	0	0.3	0	0.0
Kidney and Renal Pelvis	6	7.8	5	4.8
Larynx	3	3.5	0	0.7
Leukemias	6	9.2	7	6.7
Liver and Bile Duct	1	2.1	2	1.1
Lung and Bronchus	36	38.4	17	26.0
Melanomas of the Skin	10	8.7	8	6.5
Mesothelioma (all sites)	1	1.3	0	0.3
Multiple Myeloma	6	3.3	3	2.7
Non-Hodgkin's Lymphoma	13	12.4	11	10.8
Oral Cavity and Pharynx	7	8.2	4	3.8
Ovary	0	0.0	5	9.5
Pancreas	3	5.1	5	4.6
Prostate	89	91.7	0	0.0
Soft Tissues	3	1.6	2	1.4
Stomach	2	5.1	2	2.8
Testis	3	2.3	0	0.0
Thyroid	1	1.5	6	3.7
Urinary Bladder	16	19.5	8	6.7

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-65: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Renville County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	255	295.2	234	245.2
Brain and Other Nervous System	1	3.8	0	2.7
Breast	0	0.6	77	77.9
Cervix Uteri	0	0.0	3	3.4
Colon and Rectum	33	34.8	33	33.1
Corpus Uteri	0	0.0	22	15.6
Esophagus	7	4.2	0	1.3
Hodgkin's Lymphoma	2	1.4	3	1.1
Kaposi’s Sarcoma (all sites)	0	0.3	0	0.0
Kidney and Renal Pelvis	9	8.3	3	4.9
Larynx	0	3.7	1	0.7
Leukemias	3	9.7	8	6.7
Liver and Bile Duct	3	2.2	2	1.1
Lung and Bronchus	34	40.9	17	27.0
Melanomas of the Skin	6	9.1	7	6.6
Mesothelioma (all sites)	1	1.4	0	0.3
Multiple Myeloma	0	3.5	2	2.7
Non-Hodgkin's Lymphoma	12	13.2	11	11.0
Oral Cavity and Pharynx	13	8.7	2	3.9
Ovary	0	0.0	7	9.7
Pancreas	5	5.4	1	4.7
Prostate	82	97.7	0	0.0
Soft Tissues	0	1.7	0	1.4
Stomach	4	5.4	2	2.8
Testis	5	2.3	0	0.0
Thyroid	0	1.6	10	3.8
Urinary Bladder	25	20.9	4	6.8

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-66: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Rice County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	566	569.7	496	535.0
Brain and Other Nervous System	4	9.6	10	7.0
Breast	2	1.1	169	174.3
Cervix Uteri	0	0.0	3	9.4
Colon and Rectum	74	64.9	71	65.5
Corpus Uteri	0	0.0	32	33.6
Esophagus	11	8.0	3	2.5
Hodgkin's Lymphoma	4	4.6	4	3.9
Kaposi’s Sarcoma (all sites)	1	0.9	0	0.1
Kidney and Renal Pelvis	16	16.9	5	10.4
Larynx	12	7.2	1	1.6
Leukemias	26	19.6	16	14.4
Liver and Bile Duct	5	4.6	3	2.3
Lung and Bronchus	83	76.2	55	55.0
Melanomas of the Skin	20	20.7	9	17.7
Mesothelioma (all sites)	2	2.6	0	0.5
Multiple Myeloma	8	6.5	8	5.5
Non-Hodgkin's Lymphoma	18	27.0	15	23.3
Oral Cavity and Pharynx	12	18.2	7	8.4
Ovary	0	0.0	23	22.9
Pancreas	13	10.5	8	9.3
Prostate	169	177.2	0	0.0
Soft Tissues	1	3.8	6	3.3
Stomach	12	10.2	5	5.6
Testis	9	8.8	0	0.0
Thyroid	8	4.2	6	11.6
Urinary Bladder	35	38.0	11	13.5

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-67: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Rock County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	139	161.8	146	144.8
Brain and Other Nervous System	1	2.1	1	1.6
Breast	1	0.3	53	45.9
Cervix Uteri	0	0.0	1	2.0
Colon and Rectum	21	18.8	15	19.6
Corpus Uteri	0	0.0	9	9.2
Esophagus	2	2.3	0	0.8
Hodgkin's Lymphoma	0	0.8	0	0.7
Kaposi’s Sarcoma (all sites)	0	0.2	0	0.0
Kidney and Renal Pelvis	3	4.6	1	2.9
Larynx	2	2.0	0	0.4
Leukemias	3	5.3	6	4.0
Liver and Bile Duct	0	1.2	1	0.6
Lung and Bronchus	21	22.5	7	16.0
Melanomas of the Skin	6	5.0	2	3.9
Mesothelioma (all sites)	0	0.8	0	0.2
Multiple Myeloma	2	1.9	3	1.6
Non-Hodgkin's Lymphoma	7	7.2	13	6.5
Oral Cavity and Pharynx	1	4.8	4	2.3
Ovary	0	0.0	5	5.7
Pancreas	3	3.0	8	2.8
Prostate	49	53.8	0	0.0
Soft Tissues	1	0.9	1	0.8
Stomach	0	2.9	1	1.7
Testis	1	1.3	0	0.0
Thyroid	1	0.9	3	2.2
Urinary Bladder	5	11.3	2	4.0

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-68: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Roseau County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	160	198.6	133	157.2
Brain and Other Nervous System	2	3.1	0	2.1
Breast	0	0.4	48	51.3
Cervix Uteri	0	0.0	2	2.7
Colon and Rectum	23	22.8	24	19.2
Corpus Uteri	0	0.0	4	10.0
Esophagus	2	2.8	0	0.7
Hodgkin's Lymphoma	0	1.4	1	1.0
Kaposi’s Sarcoma (all sites)	0	0.3	0	0.0
Kidney and Renal Pelvis	3	5.8	5	3.1
Larynx	1	2.5	2	0.5
Leukemias	6	6.8	4	4.2
Liver and Bile Duct	4	1.6	0	0.7
Lung and Bronchus	19	26.9	7	16.5
Melanomas of the Skin	4	6.9	1	5.1
Mesothelioma (all sites)	0	0.9	0	0.2
Multiple Myeloma	0	2.3	1	1.6
Non-Hodgkin's Lymphoma	3	9.2	6	6.8
Oral Cavity and Pharynx	11	6.2	1	2.5
Ovary	0	0.0	8	6.7
Pancreas	6	3.7	1	2.8
Prostate	47	63.0	0	0.0
Soft Tissues	3	1.3	0	1.0
Stomach	3	3.6	0	1.6
Testis	3	2.6	0	0.0
Thyroid	0	1.3	4	3.3
Urinary Bladder	10	13.5	4	3.9

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-69: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- St. Louis County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	2914	2757.7	2654	2578.4
Brain and Other Nervous System	49	40.1	29	30.6
Breast	3	5.2	842	831.6
Cervix Uteri	0	0.0	47	39.4
Colon and Rectum	368	313.9	325	330.3
Corpus Uteri	0	0.0	182	164.9
Esophagus	47	39.4	23	13.1
Hodgkin's Lymphoma	6	16.3	10	13.8
Kaposi’s Sarcoma (all sites)	0	3.6	0	0.3
Kidney and Renal Pelvis	66	80.6	47	51.7
Larynx	50	35.4	10	8.0
Leukemias	87	89.7	58	67.8
Liver and Bile Duct	16	21.6	5	11.2
Lung and Bronchus	436	382.5	329	283.8
Melanomas of the Skin	93	92.3	71	75.4
Mesothelioma (all sites)	24	13.0	5	2.7
Multiple Myeloma	33	31.6	26	27.9
Non-Hodgkin's Lymphoma	150	124.6	120	113.7
Oral Cavity and Pharynx	100	84.4	36	40.8
Ovary	0	0.0	115	106.2
Pancreas	46	51.2	60	47.8
Prostate	859	902.8	0	0.0
Soft Tissues	13	16.2	17	14.8
Stomach	56	48.5	30	27.7
Testis	28	29.3	0	0.0
Thyroid	20	17.2	40	45.7
Urinary Bladder	202	186.0	70	67.5

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-70: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Scott County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	591	603.1	542	573.1
Brain and Other Nervous System	14	12.8	10	8.8
Breast	0	1.1	182	195.7
Cervix Uteri	0	0.0	13	13.4
Colon and Rectum	62	65.6	45	59.8
Corpus Uteri	0	0.0	33	36.1
Esophagus	9	8.4	2	2.2
Hodgkin's Lymphoma	6	6.3	6	4.9
Kaposi’s Sarcoma (all sites)	0	1.5	0	0.1
Kidney and Renal Pelvis	18	19.4	11	11.0
Larynx	7	7.9	0	1.7
Leukemias	19	21.5	13	14.8
Liver and Bile Duct	3	5.2	2	2.3
Lung and Bronchus	67	78.2	50	54.5
Melanomas of the Skin	30	25.9	24	23.2
Mesothelioma (all sites)	4	2.6	0	0.6
Multiple Myeloma	8	6.6	8	5.3
Non-Hodgkin's Lymphoma	20	30.6	25	23.7
Oral Cavity and Pharynx	19	21.2	9	9.0
Ovary	0	0.0	33	26.6
Pancreas	10	11.3	10	8.7
Prostate	191	174.7	0	0.0
Soft Tissues	6	4.6	1	3.9
Stomach	16	10.3	8	5.1
Testis	12	13.6	0	0.0
Thyroid	5	5.8	20	16.4
Urinary Bladder	29	37.2	11	12.3

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-71: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Sherburne County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	511	446.8	415	420.3
Brain and Other Nervous System	14	9.5	4	6.5
Breast	0	0.8	139	142.5
Cervix Uteri	0	0.0	16	9.6
Colon and Rectum	59	48.5	47	44.3
Corpus Uteri	0	0.0	19	26.3
Esophagus	4	6.2	1	1.7
Hodgkin's Lymphoma	4	4.8	4	3.8
Kaposi’s Sarcoma (all sites)	0	1.0	0	0.1
Kidney and Renal Pelvis	25	14.3	4	8.1
Larynx	5	5.8	4	1.3
Leukemias	12	16.1	12	11.0
Liver and Bile Duct	4	3.9	0	1.7
Lung and Bronchus	56	57.8	35	40.2
Melanomas of the Skin	11	19.1	13	16.9
Mesothelioma (all sites)	0	1.9	0	0.4
Multiple Myeloma	2	4.9	4	3.9
Non-Hodgkin's Lymphoma	23	22.6	17	17.5
Oral Cavity and Pharynx	16	15.6	2	6.6
Ovary	0	0.0	21	19.4
Pancreas	3	8.3	6	6.5
Prostate	166	129.5	0	0.0
Soft Tissues	6	3.4	5	2.9
Stomach	13	7.6	3	3.8
Testis	15	10.2	0	0.0
Thyroid	7	4.3	16	12.0
Urinary Bladder	44	27.6	14	9.1

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-72: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Sibley County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	216	228.8	183	190.5
Brain and Other Nervous System	1	3.2	2	2.2
Breast	1	0.5	63	61.6
Cervix Uteri	0	0.0	3	2.8
Colon and Rectum	28	26.7	28	24.6
Corpus Uteri	0	0.0	14	12.2
Esophagus	2	3.2	0	1.0
Hodgkin's Lymphoma	1	1.2	2	1.0
Kaposi’s Sarcoma (all sites)	0	0.3	0	0.0
Kidney and Renal Pelvis	8	6.6	5	3.8
Larynx	3	2.9	1	0.6
Leukemias	10	7.6	6	5.1
Liver and Bile Duct	1	1.7	1	0.8
Lung and Bronchus	30	31.6	9	20.7
Melanomas of the Skin	3	7.4	5	5.4
Mesothelioma (all sites)	0	1.1	0	0.2
Multiple Myeloma	1	2.7	1	2.1
Non-Hodgkin's Lymphoma	10	10.3	8	8.4
Oral Cavity and Pharynx	9	6.9	4	3.0
Ovary	0	0.0	4	7.8
Pancreas	1	4.2	4	3.5
Prostate	75	74.8	0	0.0
Soft Tissues	1	1.3	0	1.1
Stomach	3	4.2	1	2.1
Testis	2	2.1	0	0.0
Thyroid	1	1.3	5	3.2
Urinary Bladder	10	15.9	6	5.1

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-73: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Stearns County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	1343	1398.0	1127	1208.9
Brain and Other Nervous System	21	23.2	16	16.5
Breast	3	2.6	372	392.5
Cervix Uteri	0	0.0	20	21.5
Colon and Rectum	156	157.3	103	144.2
Corpus Uteri	0	0.0	79	76.9
Esophagus	13	19.6	5	5.7
Hodgkin's Lymphoma	12	11.1	6	9.4
Kaposi’s Sarcoma (all sites)	1	2.1	2	0.2
Kidney and Renal Pelvis	63	40.9	25	24.0
Larynx	22	17.7	2	3.7
Leukemias	45	47.6	31	32.0
Liver and Bile Duct	13	11.0	7	5.2
Lung and Bronchus	163	189.4	113	128.1
Melanomas of the Skin	40	49.0	36	40.4
Mesothelioma (all sites)	9	6.4	2	1.2
Multiple Myeloma	10	15.8	8	12.4
Non-Hodgkin's Lymphoma	59	65.0	71	52.3
Oral Cavity and Pharynx	40	43.3	15	19.2
Ovary	0	0.0	35	52.1
Pancreas	25	25.6	29	21.0
Prostate	414	444.4	0	0.0
Soft Tissues	7	9.0	13	7.6
Stomach	26	24.5	14	12.1
Testis	20	20.9	0	0.0
Thyroid	7	9.8	16	26.8
Urinary Bladder	100	92.8	38	29.7

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-74: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Steele County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	408	400.5	345	364.3
Brain and Other Nervous System	7	6.1	3	4.6
Breast	2	0.8	115	118.5
Cervix Uteri	0	0.0	4	6.0
Colon and Rectum	53	45.8	52	45.5
Corpus Uteri	0	0.0	24	23.2
Esophagus	5	5.7	1	1.8
Hodgkin's Lymphoma	7	2.6	2	2.1
Kaposi’s Sarcoma (all sites)	0	0.6	0	0.0
Kidney and Renal Pelvis	14	11.7	8	7.3
Larynx	4	5.1	1	1.1
Leukemias	16	13.4	11	9.7
Liver and Bile Duct	2	3.2	5	1.6
Lung and Bronchus	43	54.7	33	38.9
Melanomas of the Skin	18	13.7	19	11.3
Mesothelioma (all sites)	1	1.9	0	0.4
Multiple Myeloma	4	4.6	3	3.8
Non-Hodgkin's Lymphoma	15	18.4	11	15.9
Oral Cavity and Pharynx	7	12.4	5	5.8
Ovary	0	0.0	15	15.3
Pancreas	7	7.4	3	6.5
Prostate	148	128.6	0	0.0
Soft Tissues	4	2.5	0	2.2
Stomach	6	7.1	5	3.8
Testis	4	4.9	0	0.0
Thyroid	0	2.6	1	7.0
Urinary Bladder	23	27.1	13	9.3

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-75: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Stevens County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	133	142.8	147	126.0
Brain and Other Nervous System	1	2.0	0	1.5
Breast	0	0.3	41	39.7
Cervix Uteri	0	0.0	2	1.8
Colon and Rectum	26	16.7	28	16.7
Corpus Uteri	0	0.0	19	7.9
Esophagus	2	2.0	2	0.7
Hodgkin's Lymphoma	1	0.9	1	0.8
Kaposi’s Sarcoma (all sites)	0	0.2	0	0.0
Kidney and Renal Pelvis	5	4.0	5	2.5
Larynx	2	1.8	0	0.4
Leukemias	5	4.8	5	3.5
Liver and Bile Duct	1	1.1	1	0.6
Lung and Bronchus	14	19.6	10	13.7
Melanomas of the Skin	4	4.5	6	3.6
Mesothelioma (all sites)	0	0.7	0	0.1
Multiple Myeloma	2	1.7	0	1.4
Non-Hodgkin's Lymphoma	4	6.4	9	5.6
Oral Cavity and Pharynx	3	4.2	0	2.0
Ovary	0	0.0	2	5.1
Pancreas	2	2.6	4	2.4
Prostate	39	46.7	0	0.0
Soft Tissues	1	0.8	0	0.8
Stomach	3	2.6	1	1.4
Testis	1	1.5	0	0.0
Thyroid	3	0.8	1	2.2
Urinary Bladder	8	10.0	1	3.4

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-76: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Swift County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	220	190.6	177	156.0
Brain and Other Nervous System	3	2.6	4	1.7
Breast	2	0.4	47	49.5
Cervix Uteri	0	0.0	7	2.1
Colon and Rectum	22	22.4	27	21.1
Corpus Uteri	0	0.0	12	9.9
Esophagus	4	2.7	2	0.8
Hodgkin's Lymphoma	2	1.0	0	0.7
Kaposi’s Sarcoma (all sites)	0	0.2	0	0.0
Kidney and Renal Pelvis	4	5.3	3	3.1
Larynx	2	2.4	0	0.5
Leukemias	4	6.3	6	4.2
Liver and Bile Duct	1	1.4	1	0.7
Lung and Bronchus	28	26.2	16	17.4
Melanomas of the Skin	13	6.1	7	4.2
Mesothelioma (all sites)	1	0.9	0	0.2
Multiple Myeloma	2	2.2	3	1.7
Non-Hodgkin's Lymphoma	8	8.6	7	7.0
Oral Cavity and Pharynx	9	5.7	3	2.5
Ovary	0	0.0	6	6.2
Pancreas	4	3.5	3	3.0
Prostate	81	62.4	0	0.0
Soft Tissues	1	1.1	1	0.9
Stomach	1	3.5	2	1.8
Testis	1	1.8	0	0.0
Thyroid	1	1.1	2	2.4
Urinary Bladder	16	13.4	5	4.3

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-77: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Todd County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	287	353.2	258	287.0
Brain and Other Nervous System	2	5.0	6	3.5
Breast	0	0.7	78	93.3
Cervix Uteri	0	0.0	5	4.4
Colon and Rectum	42	41.1	34	36.3
Corpus Uteri	0	0.0	22	18.5
Esophagus	6	5.0	0	1.4
Hodgkin's Lymphoma	1	2.0	2	1.5
Kaposi’s Sarcoma (all sites)	0	0.4	0	0.0
Kidney and Renal Pelvis	10	10.2	4	5.7
Larynx	4	4.5	1	0.9
Leukemias	7	11.7	5	7.6
Liver and Bile Duct	2	2.7	2	1.2
Lung and Bronchus	28	48.6	23	31.3
Melanomas of the Skin	10	11.5	6	8.4
Mesothelioma (all sites)	1	1.7	0	0.3
Multiple Myeloma	4	4.1	1	3.1
Non-Hodgkin's Lymphoma	15	16.0	13	12.6
Oral Cavity and Pharynx	10	10.8	4	4.5
Ovary	0	0.0	12	11.9
Pancreas	8	6.5	7	5.2
Prostate	90	115.1	0	0.0
Soft Tissues	0	2.1	1	1.7
Stomach	7	6.4	1	3.0
Testis	7	3.3	0	0.0
Thyroid	2	2.1	2	5.1
Urinary Bladder	13	24.4	5	7.4

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-78: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Traverse County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	83	89.5	83	73.9
Brain and Other Nervous System	0	1.0	1	0.8
Breast	0	0.2	30	23.2
Cervix Uteri	0	0.0	0	0.9
Colon and Rectum	8	10.7	18	10.4
Corpus Uteri	0	0.0	4	4.7
Esophagus	0	1.3	0	0.4
Hodgkin's Lymphoma	1	0.4	1	0.3
Kaposi’s Sarcoma (all sites)	0	0.1	0	0.0
Kidney and Renal Pelvis	2	2.4	1	1.5
Larynx	1	1.1	0	0.2
Leukemias	3	2.9	1	2.0
Liver and Bile Duct	0	0.7	1	0.3
Lung and Bronchus	12	12.5	6	8.2
Melanomas of the Skin	3	2.6	3	1.8
Mesothelioma (all sites)	0	0.4	0	0.1
Multiple Myeloma	0	1.1	2	0.9
Non-Hodgkin's Lymphoma	0	3.9	0	3.4
Oral Cavity and Pharynx	2	2.6	3	1.2
Ovary	0	0.0	3	2.9
Pancreas	1	1.6	2	1.5
Prostate	34	30.1	0	0.0
Soft Tissues	2	0.5	0	0.4
Stomach	3	1.7	0	0.9
Testis	1	0.5	0	0.0
Thyroid	0	0.4	2	1.0
Urinary Bladder	5	6.5	2	2.1

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-79: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Wabasha County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	278	294.0	272	245.6
Brain and Other Nervous System	2	4.3	3	3.0
Breast	1	0.6	86	79.8
Cervix Uteri	0	0.0	6	3.9
Colon and Rectum	30	33.9	45	31.0
Corpus Uteri	0	0.0	16	15.6
Esophagus	1	4.2	1	1.2
Hodgkin's Lymphoma	1	1.7	0	1.4
Kaposi’s Sarcoma (all sites)	1	0.4	0	0.0
Kidney and Renal Pelvis	4	8.5	3	4.9
Larynx	5	3.7	2	0.7
Leukemias	11	9.7	10	6.6
Liver and Bile Duct	1	2.3	0	1.1
Lung and Bronchus	32	40.3	31	26.3
Melanomas of the Skin	20	9.8	8	7.4
Mesothelioma (all sites)	2	1.4	0	0.3
Multiple Myeloma	4	3.4	0	2.6
Non-Hodgkin's Lymphoma	13	13.4	13	10.8
Oral Cavity and Pharynx	9	9.1	1	3.9
Ovary	0	0.0	7	10.2
Pancreas	6	5.4	4	4.5
Prostate	86	95.4	0	0.0
Soft Tissues	0	1.8	2	1.5
Stomach	7	5.3	1	2.6
Testis	2	3.1	0	0.0
Thyroid	6	1.8	5	4.6
Urinary Bladder	20	20.1	5	6.3

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-80: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Wadena County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	235	218.9	187	185.3
Brain and Other Nervous System	4	2.8	2	2.1
Breast	1	0.4	53	59.1
Cervix Uteri	0	0.0	3	2.6
Colon and Rectum	32	25.9	34	24.8
Corpus Uteri	0	0.0	17	11.8
Esophagus	4	3.1	1	1.0
Hodgkin's Lymphoma	1	1.1	0	0.9
Kaposi’s Sarcoma (all sites)	0	0.2	0	0.0
Kidney and Renal Pelvis	8	6.1	1	3.7
Larynx	3	2.7	0	0.6
Leukemias	3	7.3	3	5.1
Liver and Bile Duct	0	1.7	1	0.8
Lung and Bronchus	33	30.2	18	20.4
Melanomas of the Skin	1	6.8	3	5.1
Mesothelioma (all sites)	1	1.0	0	0.2
Multiple Myeloma	2	2.6	0	2.0
Non-Hodgkin's Lymphoma	12	9.8	10	8.3
Oral Cavity and Pharynx	9	6.5	2	2.9
Ovary	0	0.0	8	7.4
Pancreas	3	4.0	5	3.5
Prostate	91	71.9	0	0.0
Soft Tissues	1	1.2	1	1.1
Stomach	1	4.1	3	2.1
Testis	0	1.7	0	0.0
Thyroid	2	1.2	6	2.9
Urinary Bladder	15	15.5	6	5.1

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-81: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Waseca County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	242	248.0	207	219.1
Brain and Other Nervous System	2	3.7	3	2.7
Breast	0	0.5	65	70.5
Cervix Uteri	0	0.0	3	3.5
Colon and Rectum	32	28.5	27	28.2
Corpus Uteri	0	0.0	9	13.9
Esophagus	2	3.5	0	1.1
Hodgkin's Lymphoma	3	1.5	3	1.2
Kaposi’s Sarcoma (all sites)	0	0.3	0	0.0
Kidney and Renal Pelvis	13	7.1	4	4.4
Larynx	2	3.1	1	0.7
Leukemias	12	8.3	6	5.9
Liver and Bile Duct	1	1.9	2	0.9
Lung and Bronchus	27	33.9	26	23.6
Melanomas of the Skin	8	8.3	8	6.6
Mesothelioma (all sites)	0	1.2	0	0.2
Multiple Myeloma	4	2.9	0	2.3
Non-Hodgkin's Lymphoma	12	11.3	8	9.7
Oral Cavity and Pharynx	3	7.6	5	3.5
Ovary	0	0.0	10	9.0
Pancreas	7	4.6	5	4.0
Prostate	85	80.3	0	0.0
Soft Tissues	1	1.5	0	1.3
Stomach	5	4.4	3	2.4
Testis	1	2.9	0	0.0
Thyroid	2	1.6	1	4.0
Urinary Bladder	9	16.9	5	5.8

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-82: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Washington County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	1482	1566.9	1516	1515.5
Brain and Other Nervous System	40	32.7	28	23.1
Breast	7	3.0	551	528.0
Cervix Uteri	0	0.0	35	35.5
Colon and Rectum	161	169.9	141	152.3
Corpus Uteri	0	0.0	88	97.4
Esophagus	19	22.2	3	5.7
Hodgkin's Lymphoma	14	15.4	9	12.2
Kaposi’s Sarcoma (all sites)	3	3.7	0	0.2
Kidney and Renal Pelvis	40	51.5	22	28.9
Larynx	24	20.9	2	4.7
Leukemias	55	54.4	28	37.7
Liver and Bile Duct	18	13.9	6	6.0
Lung and Bronchus	180	205.1	157	145.5
Melanomas of the Skin	71	68.3	59	61.2
Mesothelioma (all sites)	9	6.8	1	1.5
Multiple Myeloma	17	17.2	12	13.7
Non-Hodgkin's Lymphoma	59	79.2	74	62.0
Oral Cavity and Pharynx	54	56.4	21	23.7
Ovary	0	0.0	59	71.5
Pancreas	30	29.7	27	22.8
Prostate	438	456.4	0	0.0
Soft Tissues	14	11.7	16	9.9
Stomach	20	26.7	16	12.8
Testis	38	32.6	0	0.0
Thyroid	14	15.0	40	43.1
Urinary Bladder	93	95.6	36	31.5

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-83: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Watonwan County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	167	183.2	164	166.3
Brain and Other Nervous System	2	2.5	3	1.9
Breast	0	0.4	45	52.8
Cervix Uteri	0	0.0	1	2.3
Colon and Rectum	18	21.4	36	22.4
Corpus Uteri	0	0.0	3	10.6
Esophagus	1	2.6	3	0.9
Hodgkin's Lymphoma	1	1.0	1	0.8
Kaposi’s Sarcoma (all sites)	0	0.2	0	0.0
Kidney and Renal Pelvis	6	5.2	2	3.3
Larynx	3	2.3	1	0.5
Leukemias	4	6.0	6	4.5
Liver and Bile Duct	3	1.4	1	0.7
Lung and Bronchus	34	25.3	14	18.3
Melanomas of the Skin	7	5.8	1	4.5
Mesothelioma (all sites)	0	0.9	0	0.2
Multiple Myeloma	3	2.1	2	1.9
Non-Hodgkin's Lymphoma	7	8.3	5	7.5
Oral Cavity and Pharynx	2	5.5	2	2.6
Ovary	0	0.0	12	6.6
Pancreas	1	3.4	4	3.2
Prostate	61	60.2	0	0.0
Soft Tissues	3	1.1	2	0.9
Stomach	2	3.4	3	1.9
Testis	1	1.6	0	0.0
Thyroid	0	1.0	2	2.6
Urinary Bladder	5	12.8	6	4.6

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-84: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Wilkin County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	92	105.6	87	96.5
Brain and Other Nervous System	0	1.5	3	1.1
Breast	0	0.2	32	31.0
Cervix Uteri	0	0.0	0	1.4
Colon and Rectum	14	12.3	12	12.7
Corpus Uteri	0	0.0	8	6.1
Esophagus	0	1.5	0	0.5
Hodgkin's Lymphoma	0	0.6	0	0.5
Kaposi’s Sarcoma (all sites)	1	0.1	0	0.0
Kidney and Renal Pelvis	2	3.0	1	1.9
Larynx	0	1.4	0	0.3
Leukemias	6	3.5	3	2.6
Liver and Bile Duct	0	0.8	0	0.4
Lung and Bronchus	17	14.5	5	10.4
Melanomas of the Skin	1	3.5	5	2.7
Mesothelioma (all sites)	1	0.5	0	0.1
Multiple Myeloma	2	1.2	2	1.1
Non-Hodgkin's Lymphoma	1	4.8	1	4.3
Oral Cavity and Pharynx	5	3.2	0	1.5
Ovary	0	0.0	4	3.9
Pancreas	1	1.9	2	1.8
Prostate	26	34.4	0	0.0
Soft Tissues	2	0.6	0	0.6
Stomach	2	1.9	3	1.1
Testis	0	1.1	0	0.0
Thyroid	0	0.6	1	1.6
Urinary Bladder	9	7.3	3	2.6

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-85: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Winona County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	574	575.8	547	522.2
Brain and Other Nervous System	19	8.9	8	6.6
Breast	0	1.1	168	167.3
Cervix Uteri	0	0.0	10	8.5
Colon and Rectum	82	66.2	81	66.4
Corpus Uteri	0	0.0	39	32.7
Esophagus	15	8.1	5	2.6
Hodgkin's Lymphoma	2	4.2	3	3.7
Kaposi’s Sarcoma (all sites)	0	0.8	0	0.1
Kidney and Renal Pelvis	16	16.7	6	10.3
Larynx	5	7.2	1	1.6
Leukemias	20	19.5	11	14.2
Liver and Bile Duct	6	4.5	1	2.3
Lung and Bronchus	72	78.0	57	55.0
Melanomas of the Skin	9	19.8	14	16.4
Mesothelioma (all sites)	3	2.7	0	0.5
Multiple Myeloma	7	6.6	6	5.5
Non-Hodgkin's Lymphoma	21	26.7	27	23.1
Oral Cavity and Pharynx	16	17.7	7	8.2
Ovary	0	0.0	32	21.8
Pancreas	4	10.6	5	9.4
Prostate	200	183.2	0	0.0
Soft Tissues	4	3.6	3	3.2
Stomach	11	10.4	2	5.6
Testis	4	7.6	0	0.0
Thyroid	3	3.8	18	10.5
Urinary Bladder	39	39.2	12	13.6

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-86: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Wright County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	807	805.6	678	703.4
Brain and Other Nervous System	21	14.7	12	10.2
Breast	1	1.6	217	235.3
Cervix Uteri	0	0.0	7	14.3
Colon and Rectum	98	90.4	80	79.0
Corpus Uteri	0	0.0	35	44.6
Esophagus	5	11.3	2	3.0
Hodgkin's Lymphoma	5	6.7	6	5.3
Kaposi’s Sarcoma (all sites)	0	1.5	0	0.1
Kidney and Renal Pelvis	22	24.6	12	13.7
Larynx	13	10.3	3	2.1
Leukemias	31	28.1	16	18.4
Liver and Bile Duct	4	6.6	3	2.9
Lung and Bronchus	105	107.1	86	70.7
Melanomas of the Skin	31	30.9	29	25.5
Mesothelioma (all sites)	4	3.6	2	0.7
Multiple Myeloma	12	9.1	4	6.9
Non-Hodgkin's Lymphoma	44	39.0	25	29.9
Oral Cavity and Pharynx	17	26.6	12	11.0
Ovary	0	0.0	25	31.4
Pancreas	13	15.0	12	11.6
Prostate	264	245.6	0	0.0
Soft Tissues	4	5.6	9	4.5
Stomach	12	14.2	3	6.6
Testis	10	13.5	0	0.0
Thyroid	8	6.4	11	17.4
Urinary Bladder	47	52.5	15	16.2

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-87: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Yellow Medicine County

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	176	201.4	182	169.7
Brain and Other Nervous System	0	2.6	0	1.9
Breast	0	0.4	54	54.1
Cervix Uteri	0	0.0	1	2.3
Colon and Rectum	26	24.0	35	23.0
Corpus Uteri	0	0.0	17	10.8
Esophagus	4	2.8	1	0.9
Hodgkin's Lymphoma	0	1.0	0	0.8
Kaposi’s Sarcoma (all sites)	0	0.2	0	0.0
Kidney and Renal Pelvis	6	5.6	4	3.4
Larynx	4	2.5	0	0.5
Leukemias	2	6.7	5	4.7
Liver and Bile Duct	0	1.5	1	0.7
Lung and Bronchus	25	27.7	16	18.6
Melanomas of the Skin	2	6.2	5	4.6
Mesothelioma (all sites)	0	1.0	1	0.2
Multiple Myeloma	0	2.4	3	1.9
Non-Hodgkin's Lymphoma	9	9.0	11	7.6
Oral Cavity and Pharynx	10	5.9	1	2.7
Ovary	0	0.0	8	6.7
Pancreas	1	3.7	5	3.2
Prostate	53	66.3	0	0.0
Soft Tissues	3	1.1	2	1.0
Stomach	2	3.8	2	2.0
Testis	2	1.5	0	0.0
Thyroid	2	1.0	2	2.6
Urinary Bladder	19	14.4	3	4.7

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-88: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Northwestern Region

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	2328	2323.7	1937	1926.9
Brain and Other Nervous System	32	33.3	15	23.5
Breast	3	4.6	595	623.1
Cervix Uteri	0	0.0	31	30.1
Colon and Rectum	308	270.4	304	245.9
Corpus Uteri	0	0.0	130	122.8
Esophagus	38	32.9	14	9.6
Hodgkin's Lymphoma	12	13.5	11	10.8
Kaposi’s Sarcoma (all sites)	0	3.0	0	0.2
Kidney and Renal Pelvis	60	66.6	36	38.4
Larynx	22	29.2	8	5.9
Leukemias	91	77.6	57	51.9
Liver and Bile Duct	21	17.9	9	8.3
Lung and Bronchus	331	318.6	193	207.2
Melanomas of the Skin	49	76.3	42	57.4
Mesothelioma (all sites)	9	10.9	2	2.0
Multiple Myeloma	23	27.1	26	20.6
Non-Hodgkin's Lymphoma	77	105.8	83	84.9
Oral Cavity and Pharynx	93	70.7	22	30.4
Ovary	0	0.0	100	79.7
Pancreas	37	42.8	36	35.2
Prostate	763	753.9	0	0.0
Soft Tissues	15	13.8	10	11.4
Stomach	44	42.4	20	20.7
Testis	25	23.5	0	0.0
Thyroid	15	13.8	37	35.1
Urinary Bladder	139	160.9	42	50.3

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-89: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Northeastern Region

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	4723	4646.9	4247	4118.0
Brain and Other Nervous System	78	66.5	43	49.2
Breast	7	8.8	1333	1334.3
Cervix Uteri	0	0.0	72	63.1
Colon and Rectum	582	529.7	535	521.8
Corpus Uteri	0	0.0	290	265.4
Esophagus	80	66.6	32	20.8
Hodgkin's Lymphoma	20	26.3	15	21.6
Kaposi’s Sarcoma (all sites)	1	5.9	0	0.5
Kidney and Renal Pelvis	114	135.5	68	82.8
Larynx	73	59.7	19	12.8
Leukemias	143	150.5	99	107.5
Liver and Bile Duct	26	36.3	8	17.8
Lung and Bronchus	691	646.6	536	455.8
Melanomas of the Skin	141	153.7	118	120.2
Mesothelioma (all sites)	42	22.1	8	4.3
Multiple Myeloma	57	53.3	42	44.3
Non-Hodgkin's Lymphoma	216	208.8	197	180.8
Oral Cavity and Pharynx	163	141.7	62	65.3
Ovary	0	0.0	180	170.3
Pancreas	81	86.4	84	76.0
Prostate	1425	1528.9	0	0.0
Soft Tissues	24	26.9	27	23.5
Stomach	88	81.8	43	43.5
Testis	45	46.3	0	0.0
Thyroid	27	28.3	57	72.8
Urinary Bladder	336	314.3	117	106.8

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-90: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- West Central Region

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	3211	3063.2	2585	2629.2
Brain and Other Nervous System	51	42.6	28	31.2
Breast	7	6.0	817	844.1
Cervix Uteri	0	0.0	45	39.2
Colon and Rectum	424	356.5	387	342.0
Corpus Uteri	0	0.0	181	167.4
Esophagus	36	43.5	13	13.4
Hodgkin's Lymphoma	25	17.1	18	14.4
Kaposi’s Sarcoma (all sites)	1	3.7	1	0.3
Kidney and Renal Pelvis	69	87.4	65	52.4
Larynx	28	38.6	9	8.0
Leukemias	103	101.4	72	71.0
Liver and Bile Duct	15	23.4	9	11.4
Lung and Bronchus	418	421.9	238	285.5
Melanomas of the Skin	85	98.8	80	76.0
Mesothelioma (all sites)	13	14.5	1	2.8
Multiple Myeloma	48	35.6	36	28.6
Non-Hodgkin's Lymphoma	117	138.2	102	116.5
Oral Cavity and Pharynx	101	92.4	41	41.6
Ovary	0	0.0	90	107.3
Pancreas	45	56.4	38	48.8
Prostate	1136	1002.7	0	0.0
Soft Tissues	24	17.9	19	15.4
Stomach	55	55.7	26	28.9
Testis	27	29.2	0	0.0
Thyroid	16	17.7	46	45.7
Urinary Bladder	217	212.5	58	70.0

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-91: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Central Region

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	6897	6826.7	5651	5840.8
Brain and Other Nervous System	120	109.4	82	77.1
Breast	11	13.2	1782	1915.0
Cervix Uteri	0	0.0	107	102.5
Colon and Rectum	778	777.0	671	703.0
Corpus Uteri	0	0.0	368	373.1
Esophagus	90	96.5	23	27.5
Hodgkin's Lymphoma	50	47.8	38	38.4
Kaposi’s Sarcoma (all sites)	4	10.4	2	0.8
Kidney and Renal Pelvis	240	201.5	116	115.8
Larynx	90	87.1	19	18.0
Leukemias	199	230.7	130	154.4
Liver and Bile Duct	46	54.0	25	24.9
Lung and Bronchus	962	927.4	630	616.8
Melanomas of the Skin	199	239.3	190	190.2
Mesothelioma (all sites)	31	31.6	9	6.0
Multiple Myeloma	77	77.9	39	60.1
Non-Hodgkin's Lymphoma	331	317.4	256	252.7
Oral Cavity and Pharynx	199	214.6	77	92.3
Ovary	0	0.0	238	250.1
Pancreas	120	126.1	121	102.1
Prostate	2239	2171.0	0	0.0
Soft Tissues	43	43.1	51	35.8
Stomach	114	121.3	56	59.1
Testis	94	89.4	0	0.0
Thyroid	49	46.4	110	122.9
Urinary Bladder	456	457.3	151	144.3

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-92: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Southwestern Region

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	4145	4427.6	3638	3842.3
Brain and Other Nervous System	55	60.2	48	44.3
Breast	6	8.7	1159	1226.3
Cervix Uteri	0	0.0	56	55.2
Colon and Rectum	543	518.6	524	510.9
Corpus Uteri	0	0.0	278	243.1
Esophagus	46	62.7	15	20.2
Hodgkin's Lymphoma	25	23.6	18	19.0
Kaposi’s Sarcoma (all sites)	0	5.3	1	0.5
Kidney and Renal Pelvis	139	125.2	88	76.8
Larynx	41	55.4	3	11.7
Leukemias	130	146.8	97	105.1
Liver and Bile Duct	25	33.6	18	16.8
Lung and Bronchus	538	609.7	274	418.5
Melanomas of the Skin	127	141.2	114	107.8
Mesothelioma (all sites)	15	21.0	5	4.1
Multiple Myeloma	51	51.9	47	42.2
Non-Hodgkin's Lymphoma	184	199.3	177	171.7
Oral Cavity and Pharynx	114	132.5	50	60.8
Ovary	0	0.0	143	154.4
Pancreas	84	81.5	62	72.4
Prostate	1370	1451.6	0	0.0
Soft Tissues	29	25.7	20	22.2
Stomach	65	81.2	41	43.4
Testis	44	40.1	0	0.0
Thyroid	26	24.9	87	63.2
Urinary Bladder	297	309.9	86	104.4

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-93: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- South Central Region

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	2798	2939.6	2512	2681.1
Brain and Other Nervous System	35	43.3	37	32.2
Breast	3	5.7	788	858.6
Cervix Uteri	0	0.0	33	41.0
Colon and Rectum	320	339.5	375	348.2
Corpus Uteri	0	0.0	156	169.2
Esophagus	38	41.5	12	13.7
Hodgkin's Lymphoma	13	18.6	29	15.6
Kaposi’s Sarcoma (all sites)	1	4.0	0	0.3
Kidney and Renal Pelvis	91	84.5	53	53.3
Larynx	36	37.0	6	8.1
Leukemias	95	98.3	74	72.7
Liver and Bile Duct	18	22.7	13	11.7
Lung and Bronchus	369	402.1	215	288.6
Melanomas of the Skin	81	97.9	84	79.2
Mesothelioma (all sites)	13	13.8	2	2.8
Multiple Myeloma	33	34.0	24	29.0
Non-Hodgkin's Lymphoma	122	134.3	105	119.1
Oral Cavity and Pharynx	78	89.6	38	42.3
Ovary	0	0.0	99	109.9
Pancreas	60	54.1	47	49.6
Prostate	974	950.3	0	0.0
Soft Tissues	8	17.7	16	15.9
Stomach	59	53.1	30	29.5
Testis	31	33.4	0	0.0
Thyroid	16	18.3	49	48.4
Urinary Bladder	171	201.8	65	71.2

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-94: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Southeastern Region

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	5768	5523.3	5042	5097.4
Brain and Other Nervous System	80	84.9	62	63.1
Breast	10	10.7	1582	1650.1
Cervix Uteri	0	0.0	74	83.5
Colon and Rectum	664	633.6	753	645.2
Corpus Uteri	0	0.0	285	321.9
Esophagus	78	78.1	28	25.2
Hodgkin's Lymphoma	44	36.3	26	30.5
Kaposi’s Sarcoma (all sites)	8	8.1	0	0.7
Kidney and Renal Pelvis	168	161.4	103	100.6
Larynx	77	70.1	12	15.4
Leukemias	224	185.0	158	137.5
Liver and Bile Duct	52	43.3	22	22.0
Lung and Bronchus	772	752.3	504	538.7
Melanomas of the Skin	224	190.2	172	158.0
Mesothelioma (all sites)	20	25.7	3	5.3
Multiple Myeloma	60	63.5	53	53.9
Non-Hodgkin's Lymphoma	268	255.2	204	224.4
Oral Cavity and Pharynx	171	172.0	83	80.4
Ovary	0	0.0	203	212.4
Pancreas	104	102.1	77	91.9
Prostate	1871	1767.8	0	0.0
Soft Tissues	29	34.2	35	30.6
Stomach	120	99.0	44	54.8
Testis	75	67.7	0	0.0
Thyroid	48	36.2	112	98.7
Urinary Bladder	359	374.4	133	132.1

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Table IV-95: 1995 - 1999 Observed and expected numbers of cancers for selected sites -- Metropolitan Region

Cancer Site	Males		Females	
	Observed	Expected*	Observed	Expected*
All Sites	23847	24071.9	24951	24514.4
Brain and Other Nervous System	427	440.8	339	333.4
Breast	56	45.2	8501	8124.5
Cervix Uteri	0	0.0	480	484.5
Colon and Rectum	2457	2658.3	2593	2834.7
Corpus Uteri	0	0.0	1524	1551.0
Esophagus	355	339.3	102	109.7
Hodgkin's Lymphoma	200	207.8	171	175.6
Kaposi’s Sarcoma (all sites)	73	47.2	3	3.6
Kidney and Renal Pelvis	719	738.9	466	479.0
Larynx	321	310.9	79	75.0
Leukemias	806	817.7	647	637.8
Liver and Bile Duct	226	198.8	112	103.0
Lung and Bronchus	3199	3214.4	2716	2503.0
Melanomas of the Skin	1021	936.5	854	872.3
Mesothelioma (all sites)	105	108.4	22	24.9
Multiple Myeloma	262	267.6	252	243.2
Non-Hodgkin's Lymphoma	1201	1159.0	1068	1048.9
Oral Cavity and Pharynx	783	795.5	425	386.9
Ovary	0	0.0	1104	1076.9
Pancreas	463	446.6	422	411.9
Prostate	7233	7396.8	0	0.0
Soft Tissues	171	165.7	129	154.2
Stomach	404	414.6	259	240.1
Testis	425	437.4	0	0.0
Thyroid	187	198.4	573	585.2
Urinary Bladder	1589	1539.9	609	582.8

*Expected number of cancers based on State 1995 - 1999 cancer incidence

Appendices

Appendix A: Definitions for Cancer Incidence Data

MCSS collects information on all microscopically confirmed malignant and *in situ* tumors diagnosed in Minnesota residents, with the exception of basal and squamous cell carcinomas of non-genital skin sites and *in situ* cancers of the cervix. *In situ* cancers except those of the bladder are only included in stage-specific tables in Chapter III, and are excluded from all other tables. *In situ* bladder cancers are included with invasive bladder cancers and counts of all cancers sites combined because the distinction between *in situ* and invasive bladder cancers is often unclear, and some *in situ* bladder cancers can be life-threatening.

The anatomic site and histologic type reported for the cancer in the medical record or pathology report is coded according to the International Classification of Diseases for Oncology (ICD-O), developed by the World Health Organization. Cases diagnosed in 1988-1992 were coded to the first edition of ICD-O, and those diagnosed in 1993-1999 according to the second edition (ICD-O-2). These codes were then grouped according to conventions developed by the Surveillance, Epidemiology, and End Results (SEER) program of the National Cancer Registry, given below.

Cancer	Anatomic site (ICD-O-2)	Histologic type (ICD-O-2)
Oral Cavity and Pharynx		Excluding 9590-9989
Lip	C00.0 – C00.9	
Tongue	C01.9 – C02.9	
Salivary gland	C07.9 – C08.9	
Floor of mouth	C04.0 – C04.9	
Gum and other mouth	C03.0-C03.9, C05.0-C05.9, C06.0-C06.9	
Nasopharynx	C11.0 – C11.9	
Tonsil	C09.0 – C09.9	
Oropharynx	C10.0 – C10.9	
Hypopharynx	C12.9, C13.0 – C13.9	
Other oral cavity and pharynx	C14.0, C14.2 – C14.8	
Digestive System		Excluding 9590-9989
Esophagus	C15.0 – C15.9	
Stomach	C16.0 – C16.9	
Small intestine	C17.0 – C17.9	
Colon excluding rectum	C18.0 – C18.9, C26.0	
Rectum & rectosigmoid junction	C19.9, C20.9	
Anus, anal canal, anorectum	C21.0 – C21.2, C21.8	
Liver	C22.0	
Intrahepatic bile duct	C22.1	
Gallbladder	C23.9	
Other biliary	C24.0 – C24.9	
Pancreas	C25.0 – C25.9	
Retroperitoneum	C48.0	
Peritoneum, omentum, mesentery	C48.1 – C48.2	
Other digestive organs	C26.8 – C26.9, C48.8	

Cancer	Anatomic site (ICD-O-2)	Histologic type (ICD-O-2)
Respiratory System		Excluding 9590-9989
Nasal cavity, middle ear, sinuses	C30.0, C30.1, C31.0 – C31.9	
Larynx	C32.0 – C32.9	
Lung and bronchus	C34.0 – C34.9	
Pleura	C38.4	
Trachea, mediastinum, and other respiratory organs	C33.9, C38.1-C38.3, C38.8, C39.0, C39.8, C39.9	
Mesothelioma	All sites	9050 - 9055
Bones and Joints	C40.0 – C41.9	Excluding 9590-9989
Soft Tissue (including Heart)	C38.0, C47.0 – C47.9, C49.0-C49.9	Excluding 9590-9989
Skin		
Melanoma of the skin	C44.0 – C44.9	8720 – 8790
Other non-epithelial skin	C44.0 – C44.9	Excluding 8000-8004, 8010-8045, 8050-8082, 8090-8110, 8720-8790, 9590-9989
Kaposi's Sarcoma	All sites	9140
Breast	C50.0 – C50.9	Excluding 9590-9989
Female Genital System		Excluding 9590-9989
Cervix	C53.0 – C53.9	
Corpus and uterus, NOS	C54.0 – C54.9, C55.9	
Ovary	C56.9	
Vagina	C52.9	
Vulva	C51.0 – C51.9	
Other female genital organs	C57.0 – C58.9	
Male Genital System		Excluding 9590-9989
Prostate	C61.9	
Testis	C62.0 – C62.9	
Penis	C60.0 – C60.9	
Other male genital organs	C63.0 – C63.9	
Urinary System		Excluding 9590-9989
Bladder	C67.0 – C67.9	
Kidney and renal pelvis	C64.9, C65.9	
Ureter	C66.9	
Other urinary organs	C68.0 – C68.9	
Eye and Orbit	C69.0 – C69.9	Excluding 9590-9989

Cancer	Anatomic site (ICD-O-2)	Histologic type (ICD-O-2)
Brain and Other Nervous System		
Brain	C71.0 – C71.9	Excluding 9530-9539, 9590-9989
Other nervous system	C71.0 – C71.9	9530-9539
	and	
	C70.0 – C70.9, C72.0 – C72.9	Excluding 9590-9989
Endocrine System		Excluding 9590-9989
Thyroid	C73.9	
Other endocrine, including thymus	C37.9, C74.0 – C74.9, C75.0 – C75.9	
Lymphomas		
Hodgkin's lymphoma	All sites	9650-9667
Non-Hodgkin's lymphoma	All sites	9590-9595, 9670-9717
	and	
	Excluding C42.0,C42.1,C42.4	9823, 9827
Multiple Myeloma	All sites	9731-9732
Leukemia		
Lymphocytic leukemia		
Acute lymphocytic leukemia	All sites	9821, 9828
Chronic lymphocytic leukemia	C42.0, C42.1, C42.4	9823
Other lymphocytic leukemia	All sites	9820, 9822. 9824, 9825, 9826
Myeloid leukemia		
Acute myeloid leukemia	All sites	9840, 9861, 9866, 9867, 9871-9874
Chronic myeloid leukemia	All sites	9863, 9868
Other myeloid leukemia	All sites	9860, 9862, 9864
Monocytic leukemia		
Acute monocytic leukemia	All sites	9891
Chronic monocytic leukemia	All sites	9893
Other monocytic leukemia	All sites	9890, 9892, 9894
Other leukemia	All sites	9800-9804, 9830, 9841, 9842, 9850, 9870, 9880, 9900, 9910, 9930-9932, 9940, 9941
	and	
	C42.0,C42.1,C42.4	9827
Ill Defined and Unspecified Sites	All sites	9720-9723, 9740, 9741, 9760-9764, 9950-9989
	and	
	C76.0 – C76.8, C80.9, C42.0 – C42.4, C77.0 – C77.9	8000-9589

Appendix B: Definitions for Cancer Mortality Data

Cancer mortality data on Minnesota residents were obtained from death certificates reported to the Minnesota Center for Health Statistics. The underlying cause of death was coded according to the Manual of the International Classification of Diseases (ICD), developed by the World Health Organization. From 1988 to 1998, the ninth revision of ICD was used, and starting with deaths occurring in 1999, the tenth revision was used (ICD-10). These codes are then grouped according to conventions developed by the Surveillance, Epidemiology, and End Results (SEER) program of the National Cancer Registry, given below.

Cancer	Anatomic site (ICD-10)
Oral Cavity and Pharynx	
Lip	C00.0 – C00.6, C00.8 – C00.9
Tongue	C01.0 – C01.9, C02.0 – C02.4, C02.8 – C02.9
Salivary gland	C07.0 – C07.9, C08.0 – C08.1, C08.8 – C08.9
Floor of mouth	C04.0 – C04.1, C04.8 – C04.9
Gum and other mouth	C03.0 - C03.1, C03.9, C05.0 - C05.2, C05.8 – C05.9, C06.0 - C06.2, C06.8 – C06.9
Nasopharynx	C11.0 – C11.3, C11.8 – 11.9
Tonsil	C09.0 – C09.1, C09.8 – C09.9
Oropharynx	C10.0 – C10.4, C10.8 – C10.9
Hypopharynx	C12.0 – C12.9, C13.0 – C13.2, C13.8 – C13.9
Other oral cavity and pharynx	C14.0 - C14.2, C14.8
Digestive System	
Esophagus	C15.0 – C15.5, C15.8 – C15.9
Stomach	C16.0 – C16.6, C16.8 – C16.9
Small intestine	C17.0 – C17.3, C17.8 – C17.9
Colon excluding rectum	C18.0 – C18.9, C26.0
Rectum & rectosigmoid junction	C19.0 – C19.9, C20.0 – C20.9
Anus, anal canal, anorectum	C21.0 – C21.2, C21.8
Liver	C22.0, C22.2 – C22.4, C22.7, C22.9
Intrahepatic bile duct	C22.1
Gallbladder	C23.0 – C23.9
Other biliary	C24.0 – C24.1, C24.8 – C24.9
Pancreas	C25.0 – C25.4, C25.7 – C25.9
Retroperitoneum	C48.0
Peritoneum, omentum, mesentery	C45.1, C48.1 – C48.2
Other digestive organs	C26.8 – C26.9, C48.8
Respiratory System	
Nasal cavity, middle ear, sinuses	C30.0, C30.1, C31.0 – C31.3, C31.8 – C31.9
Larynx	C32.0 – C32.3, C32.8 – C32.9
Lung and bronchus	C34.0 – C34.3, C34.8 – C34.9
Pleura	C38.4, C45.0
Trachea, mediastinum, and other respiratory organs	C33.0 – C33.9, C38.1-C38.3, C38.8,C39.0, C39.8, C39.9

Cancer	Anatomic site (ICD-10)
Bones and Joints	C40.0 – C40.3, C40.8 – C40.9, C41.0 – C41.4, C41.8 – C41.9
Soft Tissue (including Heart)	C38.0, C45.2, C47.0 – C47.6, C47.8 – C47.9, C49.0-C49.6, C49.8 – C49.9
Skin	
Melanoma of the skin	C43.0 – C43.9
Other non-epithelial skin	C44.0 – C44.9, C46.0 – C46.3, C46.7 – C46.9
Breast	C50.0 – C50.6, C50.8 – C50.9
Female Genital System	
Cervix	C53.0 – C53.1, C53.8 – C53.9
Corpus and uterus, NOS	C54.0 – C54.3, C54.8 – C54.9, C55.0 – C55..9
Ovary	C56.0 - C56.9
Vagina	C52.0 – C52.9
Vulva	C51.0 – C51.2, C51.8 – C51.9
Other female genital organs	C57.0 – C57.4, C57.7 – C57.9, C58.0 – C58.9
Male Genital System	
Prostate	C61.0 –C61.9
Testis	C62.0 – C62.1, C62.9
Penis	C60.0 – C60.2, C60.8 – C60.9
Other male genital organs	C63.0 – C63.2, C63.7 – C63.9
Urinary System	
Bladder	C67.0 – C67.9
Kidney and renal pelvis	C64.0 – C64.9, C65.0 – C65.9
Ureter	C66.0 – C66.9
Other urinary organs	C68.0 – C68.1, C68.8 – C68.9
Eye and Orbit	C69.0 – C69.6, C69.8 – C69.9
Brain and Other Nervous System	
Brain	C71.0 – C71.9
Other nervous system	C70.0 – C70.1, C70.9, C72.0 – C72.5, C72.8 – C72.9
Endocrine System	
Thyroid	C73.0 – C73.9
Other endocrine, including thymus	C37.0 – C37.9, C74.0 – C74.1, C74.9, C75.0 – C75.5, C75.8 – C75.9
Lymphomas	
Hodgkin's lymphoma	C81.0 – C81.3, C81.7, C81.9
Non-Hodgkin's lymphoma	C82.0 – C82.2, C82.7, C82.9, C83.0 – C83.9, C84.0 – C84.5, C85.0 – C85.1, C85.7, C85.9, C96.3
Multiple Myeloma	C90.0. C90.2
Leukemia	
Lymphocytic leukemia	
Acute lymphocytic leukemia	C91.0
Chronic lymphocytic leukemia	C91.1
Other lymphocytic leukemia	C91.2, C91.3, C91.7, C91.9

Cancer	Anatomic site (ICD-10)
Myeloid leukemia	
Acute myeloid leukemia	C92.0, C92.4 – C92.5
Chronic myeloid leukemia	C92.1
Other myeloid leukemia	C92.2, C92.3, C92.7, C92.9
Monocytic leukemia	
Acute monocytic leukemia	C93.0
Chronic monocytic leukemia	C93.1
Other monocytic leukemia	C93.2, C93.7, C93.9
Other leukemia	C90.1, C91.4, C91.5, C94.0 – C94.5, C94.7, C95.0 – C95.2, C95.7, C95.9
Ill Defined and Unspecified Sites	C26.1, C45.7, C45.9, C76.0 – C76.5, C76.7, C76.8, C77.0 – C77.5, C77.8 – C77.9, C78.0 – C78.8, C79.0 – C79.8, C80.0 – C80.9, C88.0 – C88.3, C88.7, C88.9, C96.0 – C96.2, C96.7, C96.9, C97.0 – C97.9

Appendix C: Definition of Minnesota Regions

For purposes of evaluating geographic variation in cancer rates, Minnesota counties have been grouped into regions as shown below. The abbreviations adopted in the text and graphs are shown in parentheses.

Region	Counties		
Metropolitan Minnesota (Metro)	Anoka	Hennepin	Washington
	Carver	Ramsey	
	Dakota	Scott	
Southeastern Minnesota (SE)	Dodge	Houston	Steele
	Fillmore	Mower	Wabasha
	Freeborn	Olmsted	Winona
	Goodhue	Rice	
South Central Minnesota (SC)	Blue Earth	Le Sueur	Sibley
	Brown	Martin	Waseca
	Faribault	Nicollet	Watonwan
Southwestern Minnesota (SW)	Big Stone	Lincoln	Pipestone
	Chippewa	Lyon	Redwood
	Cottonwood	McLeod	Renville
	Jackson	Meeker	Rock
	Kandiyohi	Murray	Swift
	Lac Qui Parle	Nobles	Yellow Medicine
Central Minnesota (Central)	Benton	Kanabec	Stearns
	Cass	Mille Lacs	Todd
	Chisago	Morrison	Wadena
	Crow Wing	Pine	Wright
	Isanti	Sherburne	
West Central Minnesota (WC)	Becker	Grant	Stevens
	Clay	Otter Tail	Traverse
	Douglas	Pope	Wilkin
Northwestern Minnesota (NW)	Beltrami	Lake of the Woods	Pennington
	Clearwater	Mahnomen	Polk
	Hubbard	Marshall	Red Lake
	Kittson	Norman	Roseau
Northeastern Minnesota (NE)	Aitkin	Itasca	Lake
	Carlton	Koochiching	St. Louis
	Cook		

Appendix D: Glossary

Age-Specific Rate: The rate of occurrence of a cancer for a specific age group (the number of cancers occurring during a specified period of time in a particular age group divided by the total number of individuals in the age group and time period).

Age-Standardized Rate (age-adjusted rate): Refers to a rate that has been adjusted to control for differences in age distribution between populations. It is a weighted average of age-specific rates, with the proportion of individuals in the corresponding age groups of the standard population functioning as the weights. The 200 U.S. population is used as the standard in this report.

ALL: Acute lymphocytic leukemia.

Artifact: Any artificial product. In epidemiology, any observation that has been introduced by the methods used for data collection or data analysis.

Ascertainment: The collection of information; the process of finding desired information.

ATSDR: Agency for Toxic Substances and Disease Registries, an agency within the U.S. Centers for Disease Control and Prevention.

Benign: Not malignant, not likely to metastasize.

Biopsy: The removal and examination, usually microscopic, of tissue from the living body, performed to establish precise diagnosis.

Cancer: Diseases characterized by rapid, uncontrolled cell growth, with a tendency to spread throughout the body.

Cancer-Directed Treatment: As defined by SEER, this is therapy specifically undertaken to affect, control, change, remove, or destroy cancer tissue, or to induce remission in leukemias.

Cancer Registry: An ongoing system for the registration and follow-up of patients who develop cancer.

- **Hospital-Based Cancer Registry:** A cancer registry that uses hospital records as the primary data source for identification of cases.
- **Pathology-Based Cancer Registry:** A cancer registry that uses pathology laboratory records as the primary data source for identification of cases.
- **Population-Based Cancer Registry:** A cancer registry that attempts to collect information on at least 95 percent of the incident cancers occurring in the individuals residing within a defined geopolitical region.

Carcinoma: A malignant tumor of epithelial origin.

Case-Control Study: A study in which individuals with a particular condition such as cancer (referred to as cases) are selected for comparison with individuals in whom the condition is absent (controls). Cases and controls are compared with respect to past exposures, risk factors, or attributes thought to be relevant to the development of the condition under study.

Cell Type: See Histologic Type.

Central Nervous System (CNS): Brain, meninges, spinal cord and cranial nerves.

Clinically Diagnosed: Refers to cancers which are not histologically confirmed, but are instead diagnosed through other means—for example, through imaging procedures such as CT scans. Cancers which are only clinically diagnosed and have no microscopic confirmation are not collected by MCSS.

Cohort: In this report, cohort refers to a group of people with one or more common characteristics. Researchers follow cohorts over time, often to see if certain members are at higher risk than others of developing a disease like cancer.

Completeness: In the context of cancer surveillance, it is the ascertainment of all newly diagnosed cases of cancer occurring in Minnesota residents.

Death Clearance: A quality control activity that links MCSS' database of incident cancers with Minnesota cancer-related death certificates. Any death certificates that do not have a corresponding match in the MCSS database indicate a cancer that may have been missed. MCSS staff members follow up each of these cases to see if the cancer should have been included in the database.

Demographic Data: Descriptive information such as name, social security number, address, age, and sex, that is useful in identifying individuals or their geographical location of residence.

Epidemiology: The study of health conditions (e.g., cancers, injuries, etc.) by looking for patterns of occurrence by time, place, or person in the hopes of finding causes or identifying control measures for the condition.

Etiology: The study or theory of the causation of any disease; the sum of knowledge regarding causes.

Expected Number of Cases: The number of cases (of a cancer) expected in a given population in a given time period if the incident rates for that cancer were the same as the rates in a comparison population, adjusting for age differences of the two populations.

Histologic Type: "Histo" refers to tissue, and histologic type refers to the type of tissue in which a tumor originated, e.g., glandular tissue, connective tissue, etc.

Histologically Confirmed: Refers to a tumor of which at least a piece has been examined microscopically and diagnosed by a pathologist or other specialist.

Hospital-Based: See Cancer Registry.

In Situ: Preinvasive cancer; a cancer that is diagnosed before it penetrates too deeply.

Incidence Rate: The rate at which new events (in this case, cancers) occur in a population. It is usually expressed as a number per 100,000 persons per year.

Incident: A newly-diagnosed cancer from a defined population, within a specified period of time.

Invasive: The tendency to spread to adjacent healthy tissues. Technically, "invasive" means the carcinoma has penetrated the basement membranes and is close to blood vessels.

Lifetime Risk of Cancer: An approximate measure of the chance of developing cancer in an individual's lifetime.

Malignant: Tending to become progressively worse, to spread, and invade other tissues.

MCHS: Minnesota Center for Health Statistics.

MCSS: Minnesota Cancer Surveillance System.

MDH: Minnesota Department of Health.

Metro (Metropolitan): In this report the metro area refers to Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, and Washington counties.

Minnesota Resident: Defines the population of individuals on whom cancer occurrence information is being collected by the MCSS.

Mortality Rate: A measure of the rate at which deaths occur in a population (the number of deaths occurring in a defined period of time divided by the total number of people in the population during that period of time).

NCI: National Cancer Institute.

Non-Metro (Non-metropolitan): In this report, non-Metro refers to all Minnesota counties except Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, and Washington.

Non-Identified File: A set of electronic records from which the identity of any one individual cannot be deduced.

Observed Number of Cases: The actual (also called crude) number of cases of a cancer recorded for a given population for a given time period.

Pathology: The branch of medicine that studies the essential nature of disease, especially the structural changes in tissues or organs associated with disease.

Pathology-Based: See Cancer Registry.

Population: All the inhabitants of a given area considered together; the number of inhabitants of a given area.

Population-Based: Pertaining to a population defined by geopolitical boundaries; this population is used as the denominator in calculating rates. For the MCSS, this is the State of Minnesota. (Also see Cancer Registry.)

Primary Site (Site): The place in the body where the cancer first arose.

Quality Control: The steps taken to avoid making errors and to find and correct errors before the data are added to the master database.

Rapid Ascertainment: The process by which cases are reported within a shorter time than through the routine process.

Record Linkage: The process of comparing two records from different sources, deciding if the records correspond to the same individual or entity, and then taking some action based on that decision.

Risk Factor: An attribute or exposure that is associated with an increased probability of developing a condition or disease, but does not necessarily imply cause and effect.

SEER (Surveillance, Epidemiology and End Results): An ongoing, population-based cancer surveillance system sponsored by the National Cancer Institute that monitors cancer incidence, treatment, and follow-up in nine or eleven U.S. regions comprising approximately 10 or 14 percent of the U.S. population depending on which years of data are examined.

Stage (of a tumor): Stage at diagnosis classifies how far a cancer has progressed, in order to determine the best course of treatment and to predict a patient's prognosis. Although there are various staging systems in use, two of the most well-known are:

- General Summary Stage (GSS), developed for the National Cancer Institute's SEER Program, which categorizes tumors as in situ, localized, regional, distant (see specific terms for further definitions); and
- The American Joint Committee on Cancer's TNM system, which incorporates information on the size of the tumor; which (if any) lymph nodes are affected; and whether the tumor has spread to distant organs, and then assigns a cancer-specific stage (e.g., Stage IIA breast cancer).

Certain cancers, such as leukemias, may be staged differently. Clinicians use prognostic factors specific to these cancers to determine the appropriate course of action.

Surveillance: The systematic collection, analysis, and interpretation of data pertaining to the occurrence of specific diseases (in this report, cancer).

- **Active Surveillance:** The reporters of disease are contacted at regular intervals and specifically asked about the occurrence of the disease under surveillance. This is considered the most ideal and complete form of surveillance.

- **Passive Surveillance:** Reporting of the disease in question is initiated by the reporting source.

Tumor: A mass resulting from the abnormal growth of cells. Tumors may either be benign (with little tendency to spread throughout the body) or malignant (with a tendency to spread throughout the body). Malignant tumors are synonymous with cancer.

Underlying Cause of Death: The disease or injury that initiated events resulting in death.

Appendix E: Statistical Methods

Estimated Annual Percent Change (EAPC)

The EAPC was calculated using the same method as employed by the NCI's SEER program. A regression line was fit to the natural logarithm of the rates (*r*) using the calendar year as the independent variable. That is, $y = mx + b$ where $y = ln(r)$, x = the calendar year, and m is the slope of the line. The EAPC was estimated as 100 (e^m - *1).* The determination of whether the EAPC was different than zero was made by testing whether the slope of the regression line was statistically different than zero.

Regression

There are many models for creating a regression line that "best fits" empirical data. The purpose of modeling the data is to smooth out random variation from an underlying relationship and to enhance the parsimonious interpretation of that relationship.

Least square regression used in the report is one of the methods used to model data (e.g. cancer incidence rates as a function of calendar year). A straight line is estimated that minimizes the square of the difference between the observed and expected values. In this context, the best fitting straight line is the one that minimizes this difference. Once the characteristics of the best fitting line are determined, analytic parameters, such as slope and intercept required for specific estimates, can be easily defined.

Standard Error of Age Standardized Rates

Age-standardized rates are computed from weighted averages of the age-specific rates. The weights were calculated from the 2000 U.S. census as the proportion of the total census that the specific age group represents. Age-standardized rates are then considered age-adjusted in that differences in age distributions of two populations will not distort the comparison of the (directly) age-standardized rates.

The statistical inference whether the rates are different requires consideration of the variability (standard error) of the age-standardized rates. Keyfitz (Human Biology 26:301-7, 1966) developed estimates of the standard error using the Poisson probability distribution. The larger the population and the resultant number of cases, the smaller the standard error of the estimated rate.