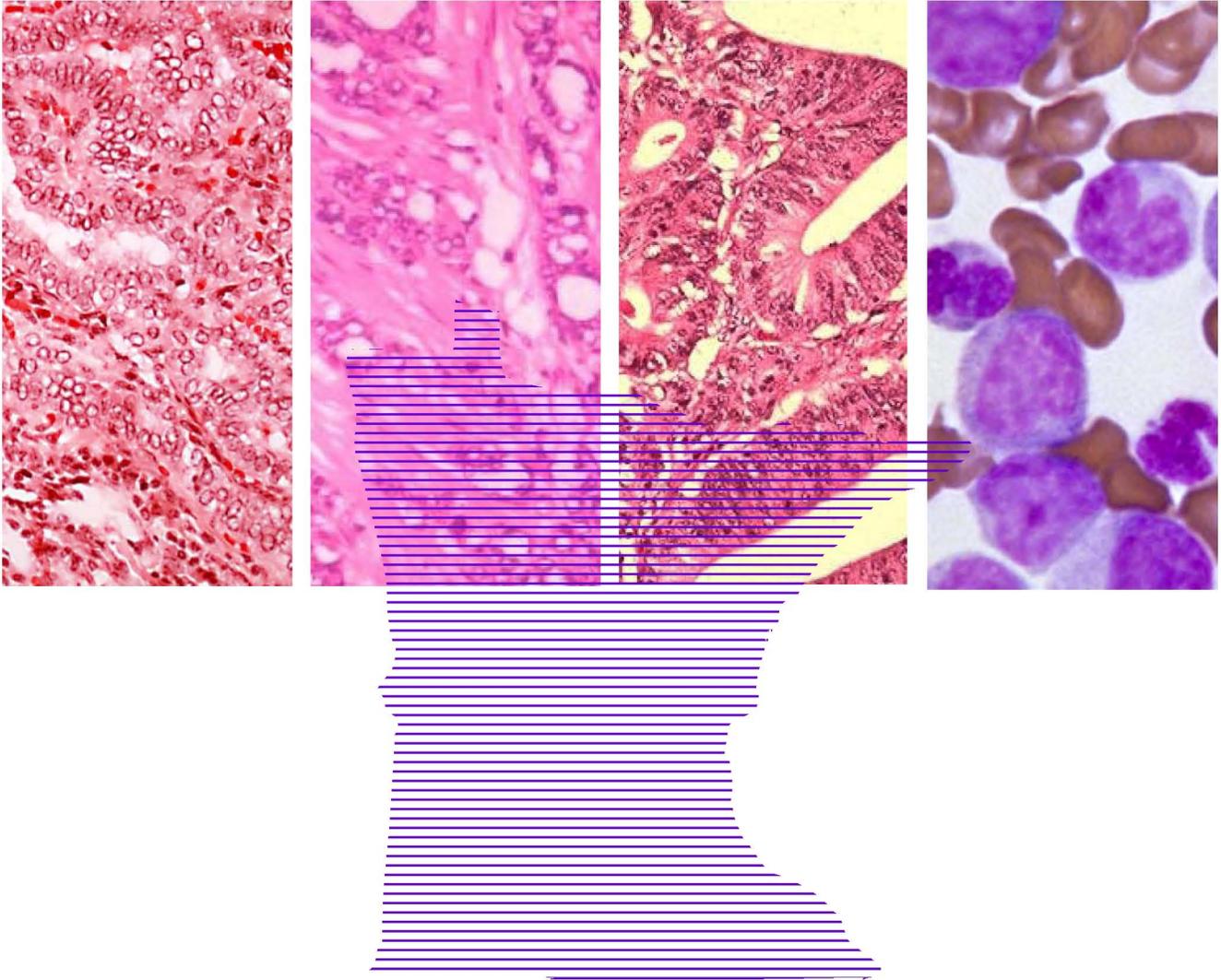


Cancer in Minnesota 1988 – 2002



Minnesota Department of Health
Minnesota Cancer Surveillance System





Protecting, maintaining and improving the health of all Minnesotans

October 7, 2005

Dear Colleague:

We are very pleased to present the eighth 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 half of all Minnesotans will be diagnosed with a potentially serious cancer at some point during their lives. This report documents important successes – decreasing rates of smoking-related cancers and prostate cancer mortality 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 and thyroid cancer among both men and women, prostate cancer among men, and lung and breast cancer among women. In addition, this report makes evident the 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 United States 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. Over the last two years, MCSS has collaborated with public, private and non-profit organizations to develop *Cancer Plan Minnesota 2005-2010*, our state's first comprehensive cancer control plan. Planning partners have formed a new coalition, the Minnesota Cancer Alliance, to provide a forum through which cancer control activities can be better coordinated to make optimal use of limited resources and to more fully realize opportunities for innovation. We encourage all organizations and individuals dedicated to reducing the burden of cancer for all Minnesotans to join the Alliance.

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 (651) 201-5900.

Sincerely,

A handwritten signature in cursive script that reads "Dianne Mandernach". The signature is written in a dark ink and is positioned below the word "Sincerely,".

Dianne M. Mandernach
Commissioner
P.O. Box 64975
St. Paul, MN 55164-0975

Cancer in Minnesota, 1988-2002

Report to the Minnesota Legislature 2005

October 2005

For more information, contact:

Minnesota Cancer Surveillance System

Health Promotion & Chronic Disease Division

Health Improvement Bureau

Minnesota Department of Health

85 East Seventh Place

P.O. Box 64882

Saint Paul, Minnesota 55164

<http://www.health.state.mn.us/divs/hpcd/cdee/mcss/>

Phone: (651) 201-5900

Fax: (651) 201-5926

TDD: (651) 201-5797

As requested by Minnesota Statute 3.197: This report cost approximately \$25,000.00 to prepare, including staff time, printing, and mailing expenses.

Upon request, this publication will be made available in alternative formats, such as large print, Braille, or cassette tape.

Printed on recycled paper.

ACKNOWLEDGEMENTS

MINNESOTA DEPARTMENT OF HEALTH
Dianne M. Mandernach, Commissioner
Lynda Boudreau, Deputy Commissioner

Minnesota Cancer Surveillance System Staff

Vickie Assad, RHIT	Shannon McNamara
Jerryn Ballard, CTR	Jenny Neuman, RHIT
JoAnn Bitker, RHIT, CTR	Carin Perkins, PhD
Jane Braun, MS, CTR	Kristi Randall
Margee Brown, MPH	Alex Ryabinin
Sally Bushhouse, DVM, PhD	Mila Ryabinin
Elaine Collins, MS, RHIA, CTR	Wendy Scharber, RHIT, CTR
Lynda Diedrich, CTR	Ed Schneider, JD
Carol Forbes-Manske, RHIT, CTR	Erin Seaverson, MPH
Jackie Harte	Gene Senger
Donna Hattenberger, RHIT, CTR	John Soler, MPH
Troy Johnson	Kirsti Taipale, CTR
Cheryl Korpela, RHIT	Chris Wein
Gail Kvernmoe, RHIT, CTR	Sue Wozniak
Kristine Lenser, CTR	

Minnesota Cancer Surveillance System Advisory Group Members

Alan P. Bender, DVM, PhD	Aaron Folsom, MD
David Benson	Kathleen McKeen
James R. Cerhan, MD, PhD	Charles Murray, MD
Gretchen S. Crary, MD	Leslie Robison, PhD
Robert Dalton, MD	John L. Young, Jr, DrPH, CTR
Charles Fazio, MD	Jo Zwilling, RN, MBA

Chronic Disease & Environmental Epidemiology Staff who contributed to this report:

Dianna Roerig, Sally Sabathier

Sincere thanks to the cancer registrars, laboratory personnel, and health care providers throughout Minnesota and neighboring states whose diligence in data collection and reporting make this report possible. The MCSS, including preparation of this report, was supported by Cooperative Agreement Number UC75/CCU510693 from the Centers for Disease Control and Prevention. The contents of this work are solely the responsibility of the authors and do not necessarily represent the official views of the Centers for Disease Control and Prevention.

On the Cover

Images courtesy of the Centers of Disease Control and Prevention Public Health Image Library.
Left to right, 1) Histopathology of papillary carcinoma, thyroid; 2) Histopathology of adenocarcinoma, prostate; 3) Histopathology of adenocarcinoma, colon (images 1-3 provided by Dr. Edwin P. Ewing, Jr.); 4) Blast crisis of chronic myelogenous leukemia (image 4 provided by Stacy Howard).

SUGGESTED CITATION:

Seaverson E, Perkins C, Soler J, Brown M, Bushhouse S. *Cancer in Minnesota, 1988-2002*. Minneapolis, Minnesota: Minnesota Cancer Surveillance System, Minnesota Department of Health, October 2005.

Table of Contents

Summary	vii
Minnesota Cancer Alliance	viii
Questions and Answers about MCSS Data Privacy	ix
Chapter I: Introduction	
Data Sources	3
Data Presentation and Interpretation	4
Completeness and Quality of Data.....	6
Data on Race and Ethnicity.....	7
Uses of MCSS Data	9
Statistical Methods.....	10
Protection of Individual Privacy	10
Table I-1: North American Association of Central Cancer Registries certification results: quality, completeness, and timeliness of 2002 data, Minnesota Cancer Surveillance System	11
Table I-2: Publications (2003-2004)	11
Table I-3: Applications requesting data for research as of January 2005	16
Chapter II: Overview	
Cancer Incidence and Mortality in Minnesota by Gender and Age.....	21
Race and Ethnic Disparities in Cancer in Minnesota.....	22
Cancer Trends in Minnesota	25
Geographic Variation in the Occurrence of Cancer in Minnesota.....	28
Minnesota Cancer Prevalence	30
Table II-1: Number of new cases and deaths and average annual incidence and mortality rates by anatomic site and gender, all races combined, Minnesota, 1998-2002	33
Table II-2: Age-specific rates of newly diagnosed cancers by anatomic site, males, all races combined, Minnesota, 1998-2002.....	36
Table II-3: Age-specific rates of newly diagnosed cancers by anatomic site, females, all races combined, Minnesota, 1998-2002.....	39
Table II-4: Age-specific rates of cancer deaths by anatomic site, males, all races combined, Minnesota, 1998-2002	42
Table II-5: Age-specific rates of cancer deaths by anatomic site, females, all races combined, Minnesota, 1998-2002	45
Table II-6: The five most commonly diagnosed cancers by race and ethnicity and gender, Minnesota, 1998-2002	48
Table II-7: Cancer incidence and mortality rates by race and ethnicity for selected cancers, Minnesota, 1998-2002	49
Table II-8: Estimated complete cancer prevalence by anatomic site and gender, Minnesota, January 1, 2002 ...	50
Table II-9: Estimated five-year cancer prevalence by anatomic site and gender, Minnesota, January 1, 2002....	51
Figure II-1: Ten Most Common Cancer Diagnoses and Deaths among Males, Minnesota, 1998-2002	53

Table of Contents

Figure II-2:	Ten Most Common Cancer Diagnoses and Deaths among Females, Minnesota, 1998-2002	53
Figure II-3:	Percent of Cancers Diagnosed by Age Category among Selected Cancers, Minnesota, 1998-2002	54
Figure II-4:	Cancer Incidence and Mortality Rates by Race and Ethnicity, Minnesota, 1998-2002, All Cancer Sites Combined	55
Figure II-5:	Cancer Incidence and Mortality Rates by Race and Ethnicity, SEER Program, 1998-2002, All Cancer Sites Combined	55
Figure II-6:	Cancer Incidence in Minnesota by Year, 1988-2002	56
Figure II-7:	Cancer Mortality in Minnesota by Year, 1988-2002	56
Figure II-8:	Trends in Cancer Incidence by Gender, Minnesota and SEER, 1975-2002	57
Figure II-9:	Trends in Cancer Mortality by Gender, Minnesota and the U.S., 1975-2002	57
Figure II-10:	Average Annual Percent Change in Cancer Incidence among Males, Minnesota, 1988-2002	58
Figure II-11:	Average Annual Percent Change in Cancer Mortality among Males, Minnesota, 1988-2002	59
Figure II-12:	Average Annual Percent Change in Cancer Incidence among Females, Minnesota, 1988-2002	60
Figure II-13:	Average Annual Percent Change in Cancer Mortality among Females, Minnesota, 1988-2002	61
Figure II-14:	Trends in Lung and Bronchus Cancer Mortality by Gender, Minnesota, 1988-2002	62
Figure II-15:	Trends in Colon and Rectum Cancer Incidence by Gender, Minnesota, 1988-2002	62
Figure II-16:	Trends in Female Breast Cancer Incidence and Mortality, Minnesota, 1988-2002	63
Figure II-17:	Trends in Prostate Cancer Incidence and Mortality, Minnesota, 1988-2002	63
Figure II-18:	Cancer Incidence among Non-Hispanic Whites by Region, Minnesota, 1998-2002, All Cancer Sites Combined	64
Figure II-19:	Lung and Bronchus Cancer Incidence among Non-Hispanic Whites by Region, Minnesota, 1998-2002	64
Figure II-20:	Lung and Bronchus Cancer Incidence among Non-Hispanic Whites by Gender and Region, Minnesota, 1998-2002	65
Figure II-21:	Colon and Rectum Cancer Incidence among Non-Hispanic Whites by Region, Minnesota, 1998-2002	65
Figure II-22:	Female Breast Cancer Incidence among Non-Hispanic Whites by Region, Minnesota, 1998-2002	66
Figure II-23:	Prostate Cancer Incidence Trends by Region, All Races Combined, Minnesota, 1988-2002	66
Figure II-24:	Mesothelioma Incidence among Non-Hispanic Whites by Gender and Region, Minnesota, 1998-2002	67

Chapter III: Summary of Data for Specific Cancers

Introduction	71
Specific Cancers	
All Cancer Sites Combined	72
Childhood Cancers	75
Brain and Other Nervous System	78
Breast	80
Cervix Uteri	82
Colon and Rectum	84
Corpus Uteri	86
Esophagus	88
Hodgkin Lymphoma	90
Kaposi Sarcoma	92
Kidney and Renal Pelvis	94

Larynx	96
Leukemia	98
Liver and Bile Duct	100
Lung and Bronchus	102
Melanoma of the Skin	104
Mesothelioma	106
Multiple Myeloma	108
Non-Hodgkin Lymphoma	110
Oral Cavity and Pharynx	112
Ovary	114
Pancreas	116
Prostate	118
Soft Tissues	120
Stomach	122
Testis	124
Thyroid	126
Urinary Bladder	128

Chapter IV: Cancer in Minnesota Counties and Regions, 1998-2002

Introduction	133
--------------------	-----

Tables IV-1– IV-87:

1998-2002 observed and expected number of cancers and average annual incidence rates for selected sites, all races combined

Aitkin County.....	134
Anoka County.....	135
Becker County	136
Beltrami County.....	137
Benton County	138
Big Stone County	139
Blue Earth County	140
Brown County.....	141
Carlton County.....	142
Carver County	143
Cass County	144
Chippewa County	145
Chisago County.....	146
Clay County.....	147
Clearwater County.....	148
Cook County.....	149
Cottonwood County.....	150
Crow Wing County.....	151
Dakota County.....	152
Dodge County	153
Douglas County.....	154
Faribault County	155
Fillmore County	156

Table of Contents

Freeborn County	157
Goodhue County	158
Grant County	159
Hennepin County.....	160
Houston County	161
Hubbard County.....	162
Isanti County	163
Itasca County.....	164
Jackson County	165
Kanabec County.....	166
Kandiyohi County.....	167
Kittson County.....	168
Koochiching County	169
Lac Qui Parle County	170
Lake County	171
Lake of the Woods County	172
Le Sueur County	173
Lincoln County.....	174
Lyon County	175
McLeod County.....	176
Mahnomen County	177
Marshall County	178
Martin County	179
Meeker County	180
Mille Lacs County	181
Morrison County.....	182
Mower County	183
Murray County.....	184
Nicollet County	185
Nobles County.....	186
Norman County.....	187
Olmsted County	188
Otter Tail County	189
Pennington County	190
Pine County	191
Pipestone County	192
Polk County	193
Pope County.....	194
Ramsey County	195
Red Lake County.....	196
Redwood County.....	197
Renville County.....	198
Rice County	199
Rock County.....	200
Roseau County.....	201
St. Louis County.....	202

Scott County	203
Sherburne County	204
Sibley County	205
Stearns County	206
Steele County.....	207
Stevens County.....	208
Swift County	209
Todd County	210
Traverse County	211
Wabasha County	212
Wadena County	213
Waseca County.....	214
Washington County.....	215
Watonwan County	216
Wilkin County	217
Winona County	218
Wright County	219
Yellow Medicine County.....	220

Tables IV-88 – IV-95:

1998-2002 observed and expected number of cancers and average annual incidence rates for selected sites, all races combined	
Northeastern Region	221
Northwestern Region	222
West Central Region	223
Central Region.....	224
Southwestern Region.....	225
South Central Region.....	226
Southeastern Region	227
Metropolitan Region	228

Appendices

Appendix A: Definitions for Cancer Incidence Data.....	231
Appendix B: Definitions for Cancer Mortality Data	235
Appendix C: Definitions of Minnesota Regions	239
Appendix D: Glossary	241
Appendix E: Statistical Methods.....	245

[This page left intentionally blank.]

Summary

This report summarizes the status of cancer in Minnesota, using cases reported to the Minnesota Cancer Surveillance System and deaths reported to the Minnesota Center for Health Statistics. These data enable the Minnesota Department of Health 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.

- In 2002, 23,384 Minnesotans were diagnosed with cancer, and 9,198 Minnesotans died of this disease.
- More Minnesotans now die of cancer than heart disease. Heart disease mortality is declining at a substantially faster rate than cancer mortality, both in Minnesota and nationally. Minnesota was the first state with cancer as the leading cause of death because the heart disease mortality rate in Minnesota is 30 percent lower than the national average, while our cancer mortality rate is only six percent lower.
- About one out of two Minnesotans will be diagnosed with a potentially serious cancer during his or her lifetime, and one out of four will die of cancer.
- An estimated 167,310 Minnesotans, or 3.3 percent of the population, were living with a history of cancer on January 1, 2002.
- In 2002, more Minnesotans died of lung cancer (2,327 deaths) than the next three most common cancers combined: colorectal (932 deaths), breast (642 deaths), and prostate (601 deaths). Lung cancer mortality among Minnesota women continues to increase by more than two percent each year, in contrast to stabilizing rates nationally.
- The overall cancer incidence rate increased by 1.1 percent per year among Minnesotans between 1995 and 2002. This was largely due to a significant increase in prostate cancer incidence among men and significant increases in lung and breast cancer incidence among women.
- The number of Minnesotans diagnosed with cancer increased by 32 percent between 1988 and 2002, reflecting the growth and aging of the Minnesota population as well as the increases in incidence described above.
- Despite an increase in the overall risk of developing cancer, the cancer mortality rate steadily declined by less than one percent each year among both men and women in Minnesota between 1988 and 2002. Mortality rates declined significantly for breast, prostate, and colorectal cancer, and for lung cancer among males.
- Even though the overall cancer mortality rate decreased over the 15-year period 1988-2002, the number of Minnesotans dying of cancer increased by approximately 13.5 percent because of the growth and aging of the Minnesota population.
- The overall cancer incidence rate in Minnesota is similar to the national rate for all races combined, and is five percent lower among non-Hispanic whites.
- Minnesotans have significantly higher incidence and mortality rates for leukemia (about 5% higher) and prostate cancer (about 10% higher) than reported nationally. The mesothelioma incidence rate among men is 24 percent higher in Minnesota than nationally, but is the same for women.
- Racial and ethnic differences in the burden of cancer are evident in Minnesota. Of special concern are cancer rates among American Indians in Minnesota. Nationally, American Indians have the lowest overall cancer rate, but in Minnesota they have the highest. They were 14 percent more likely to be diagnosed with cancer than non-Hispanic white Minnesotans and 46 percent more likely to die of the disease. The majority of the excess in cancer risk among American Indians in Minnesota was due to lung and colorectal cancer.

Minnesota Cancer Alliance to Implement Cancer Plan Minnesota 2005-2010

Cancer Plan Minnesota 2005-2010 is the state's first comprehensive cancer control plan. Developed over a two-year period through a broad-based collaboration of public, private and non-profit organizations, the plan was released in April 2005 and now serves as a common framework for action to reduce the burden of cancer for all Minnesotans.

The Minnesota Cancer Surveillance System (MCSS) was essential in the development of data-driven objectives for *Cancer Plan Minnesota*. The plan includes 24 objectives and numerous strategies covering all facets of cancer control: prevention, early detection, treatment, quality of life, cancer disparities, and data and research needs. Over the long run, MCSS will be the key source of population-based data to assess the outcome of cancer control efforts in Minnesota.

Now that *Cancer Plan Minnesota* is complete, planning partners have formed a coalition, the Minnesota Cancer Alliance, to provide a forum through which cancer control activities can be better coordinated to make optimal use of limited resources and to more fully realize opportunities for innovation. Alliance members are committed

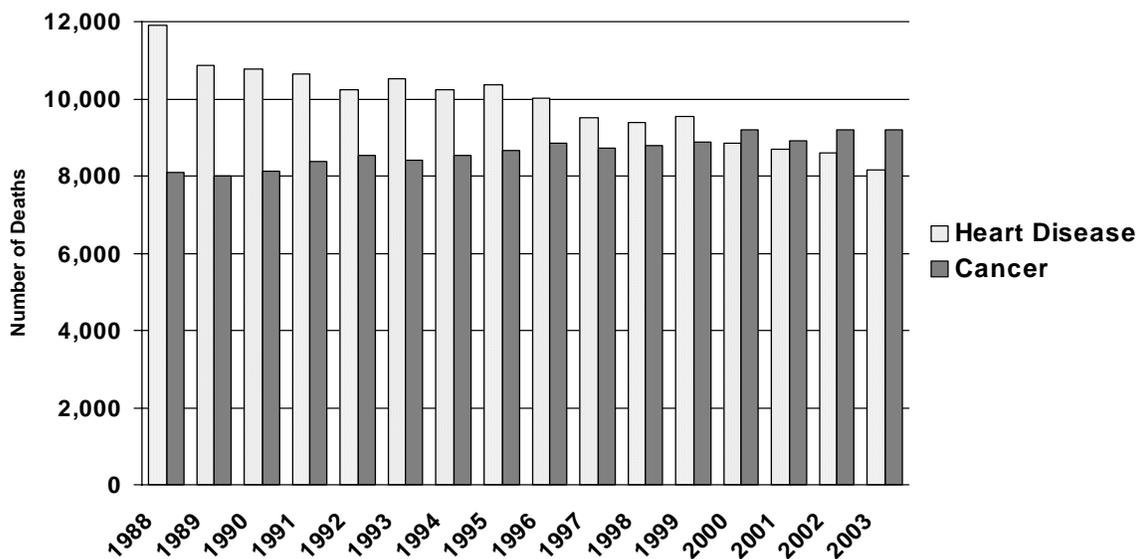
to supporting the plan's implementation.

Minnesota Cancer Alliance task forces are currently addressing the cancer plan's four priorities:

1. Increase the tobacco excise tax and expand clean indoor air policies.
2. Reduce racial, ethnic, and geographic disparities in cancer screening and treatment.
3. Improve access to information about services for cancer patients and their families.
4. Increase colorectal cancer screening.

The importance of working together to reduce the suffering caused by cancer is underscored by the fact that cancer became the leading cause of death in Minnesota in 2000. Volunteers representing a broad base of stakeholders are working together in project teams to take specific action to help achieve the cancer plan's objectives. If you are interested in joining the Minnesota Cancer Alliance or one of its project teams, or to order a copy of *Cancer Plan Minnesota*, go to <http://www.cancerplanmn.org> or contact Elizabeth Moe, Project Coordinator, at (651) 201-3608.

**Deaths due to Heart Disease and Cancer,
Minnesota, 1988-2003**



Source: Minnesota Center for Health Statistics. All analyses were conducted by MCSS.

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 data would undermine the public's investment in cancer registration and render it ineffective in protecting public health.
2. No single 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 two 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 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 more than 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 into consideration when the legislature mandated the creation of 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 require 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 and 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, given the challenges facing patients coping with new cancer diagnoses, and the physician'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 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 (www.health.state.mn.us/divs/hpcd/cdee/mcss), by telephoning the MCSS office at (651) 201-5900, or by writing to MCSS, P.O. Box 64882, St. Paul, MN 55164-0882.

[This page left intentionally blank.]

Chapter I: Introduction

Chapter I: Introduction

This report contains information on the incidence and mortality of cancer in Minnesota over the 15-year period 1988-2002. 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 are collected by the Minnesota Cancer Surveillance System (MCSS), and mortality data are collected by the Minnesota Center for Health Statistics (MCHS). MCSS prepared the analyses included in this report.

MCSS is an ongoing program within the Chronic Disease and Environmental Epidemiology Section of the MDH. The primary objectives of 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 six-year process which included consensus building, development of methods, and a feasibility study, legislation (Minnesota Statutes 144.671-144.69) was passed to establish MCSS. MCSS began operations on January 1, 1988.

MCSS receives part of its funding from 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 enables 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 seven 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*; *The Occurrence of Cancer in Minnesota 1992-1997*; and *Cancer in Minnesota 1988-1999*. These reports will be referenced as MCSS 1991, MCSS 1993, MCSS 1995, MCSS 1997, MCSS 1999, MCSS 2001, and MCSS 2003, respectively; they are available from the MCSS. MCSS 1999, MCSS 2001, and MCSS 2003 are available on the MCSS web site at www.health.state.mn.us/divs/hpcd/cdee/mcss.

Data Sources

Incidence Data

MCSS collects information on microscopically confirmed invasive and *in situ* tumors, as well as benign tumors occurring in the head and spinal cord diagnosed in Minnesota residents. MCSS does not collect information on the most common forms of skin cancer (basal and squamous cell carcinomas) or *in situ* cervical cancers. Starting in 1995, cancers reported on death certificates that could not be identified from any other source, including pathology reports, were also included in the MCSS. These cases (Death Certificate Only

Introduction

cases) account for less than 1.5 percent of cancers in the MCSS.

Enough information is collected so that MCSS can classify each new diagnosis by type of tumor (primary site, histologic 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 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 664,500 reports of cancer representing approximately 396,000 different cancers were registered with MCSS as of March 2005. For the period covered by this report, January 1, 1988 to December 31, 2002, 308,427 newly diagnosed, invasive cancers were registered. *In situ* cancers of the urinary bladder are included with invasive cancers so that Minnesota data are 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 MCSS' first legislative report (MCSS 1991), filed 14 years ago, 17,728 cancers were included in the analyses of 1988 data. The current database for 1988 contains information on 18,008 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 are consistent throughout the report. The date of closure for 1988-2002 data included in this report was March 31, 2005.

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 were obtained from the National Cancer Institute's Surveillance, Epidemiology, and End Results (SEER) Program web site at <http://seer.cancer.gov/popdata>. These represent intercensal estimates for the years 1988 through 1999. For the years 2000 through 2002, the population estimates incorporate bridged single-race estimates, which are derived from the original multiple race categories in the 2000 Census. Because of a directive from the federal Office of Management and Budget, the 2000 Census collected race information in a new way – people could select more than one race, instead of being forced to select only one. Bridged estimates attempt to re-categorize those selecting more than one race to a single race based on data from other surveys (what they would have chosen if only given one choice). A description of the methodology used to develop the bridged single-race estimates is available on the National Center for Health Statistics web site www.cdc.gov/nchs/about/major/dvs/popbridge/popbridge.htm.

Data Presentation and Interpretation

Incidence Data

Cancers diagnosed prior to 1992 were originally coded according to the 1987 Field Trial Edition of the International Classification of Diseases for Oncology (ICD-O-FT), cancers diagnosed between 1992 and 2000 were originally coded according to the 2nd edition (ICD-O-2), and

cancers diagnosed from 2001 forward were coded according to the 3rd edition (ICD-O-3). All the diagnoses have been translated, using a computer algorithm either alone or in combination with review, into the ICD-O-3 standard. Cancers are presented according to grouping definitions developed by the SEER program. Following SEER reporting practices in *SEER Cancer Statistics Review, 1975-2002*, cases with histology defined as a “borderline malignancy” under ICD-O-2 coding rules and “invasive” under ICD-O-3 were not included under data for All Cancer Sites Combined or Miscellaneous cancers. These histologies (9950, 9960-9962, and 9980-9989) are miscellaneous myeloproliferative disorders, lymphoproliferative disorders and myelodysplastic syndromes; they accounted for a total of 736 diagnoses over the two-year period 2001-2002. In addition, histologies that were coded as “invasive” under ICD-O-2 but as having “uncertain behavior” under ICD-O-FT and ICD-O-3 are not included in the current rates. Most of them are borderline ovarian tumors and account for 701 diagnoses that were included in MCSS 2003 but not this report. Data are available upon request.

Most tables included in this chapter present incidence data for invasive cancers only, with the exception of *in situ* bladder cancers. Following SEER reporting practices, *in situ* bladder cancers are included in data on invasive bladder cancers and in data on all cancer sites combined because the distinction between *in situ* and invasive bladder cancer is often unclear, and some *in situ* bladder cancers may be life threatening. *In situ* cancers for other sites are only included in tables showing stage distribution for that specific site.

Mortality data

The information presented in this report includes all deaths with cancer specified as the underlying cause of death during the specified time period, regardless of the year of diagnosis. The underlying cause of death for reports from 1988-1998 were coded to International Classification of Diseases, Ninth Revision; for reports occurring in 1999-2002, the International Classification of Diseases, Tenth Revision was used. Cancers were grouped according to SEER’s algorithm, using the

ICD version that was in use at the time the death occurred.

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, provided in Appendix E. A number of different population standards have been utilized in the past. 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 MCSS reports using other standards.

Comparisons to SEER

The SEER program has collected population-based cancer incidence data from nine selected geographic areas in the U.S. since 1973 and from an additional four areas since 1992. Because 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 in Chapter III for comparison to Minnesota are for the 13 SEER areas covering about 14% of the U.S. population, as presented in race-specific tables in their most recent report *SEER Cancer Statistics Review, 1975-2002*. Consistent with SEER reporting practices, national cancer mortality rates are for the entire U.S.

Introduction

For brevity, SEER/U.S. rates (except those for all cancer sites combined) are only presented for all races combined and for non-Hispanic whites. Caution should be used in comparing Minnesota and SEER/U.S. cancer rates for all races combined. Because cancer rates vary markedly by race and ethnicity, the overall risk of developing cancer in a geographic area depends in part on the relative proportion of race and ethnic groups in the population. The race and ethnic distributions of Minnesota and the 13 SEER areas are very different. In particular, Hispanics, who tend to have considerably lower cancer rates than non-Hispanic whites, comprise three percent of the Minnesota population and approximately 25 percent of the overall population in the 13 SEER areas. This means that for many sites, Minnesota rates for all races combined will be higher than that reported by the 13 SEER areas. Comparison of rates among non-Hispanic whites better reflects the difference in risk of developing cancer in the two areas.

When comparing Minnesota and SEER, it is also important to recognize 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 1998-2002, 3.3 percent of invasive cancers in the 13 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 3.3 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 geographical areas. Second, some cases that are originally reported to SEER based on clinical observations may eventually be confirmed microscopically, but the information is not updated in the registry. And third, audits of MCSS operations have indicated that case ascertainment is extremely high.

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 (22% of cases reported as clinically diagnosed in SEER), pancreas (18%), brain (10%), kidney (8%), and lung and bronchus (7%). For these sites, mortality rates should be used to assess how Minnesota compares to national data.

Completeness and Quality of Data

MCSS Field Service staff first identified 9.7 percent of all the cancer diagnoses reportable to 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 1988-2002, 4.8 percent would have been missed without this review. It is estimated that more than 8.6 million pathology reports were reviewed during the 15-year period included in this report.

MCSS data are very complete and of very high quality. This is documented by several measures of data quality. First, 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. Of all the cancers diagnosed between 1995 and 2002 (the years for which death clearance has been performed), 1.2 percent were based solely on a death certificate (DCO), and an additional 0.2 percent would not have been identified without the death certificate. A high-quality cancer registry should have between one percent and three percent of its cases as DCO.

Second, in December 2005 MCSS submitted a nonidentified file of its provisional data for 2002 to the Registry Certification Committee of the North American Association of Central Cancer Registries (NAACCR). NAACCR is the organization in North America that develops standards and models for the collection of cancer data in central cancer registries. Table I-1 contains the results of the certification process. MCSS achieved the highest rating, the Gold Standard, for all criteria.

Third, in July 2002 a contractor of the NPCR performed an external audit of the completeness and quality of MCSS data. 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 SEER program.

Fourth, 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, 2001:1, and 2004:1). Special attention has been paid to the data fields that were new to MCSS in 1995, stage at diagnosis and the information on the first course of cancer therapy.

Data on Race and Ethnicity

Race is an important variable for cancer surveillance. The risk of cancer varies by race and ethnicity – the reasons for the variations have yet to be fully delineated, but most likely include cultural, economic, societal, and genetic factors – so it is important to be able to compute race-specific cancer rates. Calculating a cancer rate requires two sets of numbers: numerators, or counts of events; and denominators, or the number of people at risk. In Minnesota, there are race-and/or ethnicity-specific challenges to the accuracy of both the numerators and the denominators. MCSS has done much work to reduce the problems with numerators.

Race is not always included in the reports submitted to MCSS, and prior to the 1995 diagnosis year 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 eight percent of the cancers diagnosed during the period 1988-1994. The percentage can be improved by assuming that individuals of unknown race are white if they live in counties that had more than 95 percent of residents listed as white in the Census. After making this assumption, race was “unknown” for only 3.4 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 (3.1% before and 1.5% after making an assumption based on county of residence).

Another challenge with incidence data is the fact that American Indians are often not identified as such in the medical record. Beginning in 2003, NPCR has supported the linkage of state cancer registry data with the roster of American Indians enrolled in the Indian Health Service (IHS). With appropriate data privacy protections in place, MCSS participated in this linkage project, and cancers newly diagnosed through 2002 have been linked with the IHS roster. The number of American Indians in the MCSS database increased by 37 percent as a result of the linkage. Minnesota death certificates were also linked with the IHS roster, increasing the number of cancer deaths among American Indians by 14 percent.

Ethnicity (Hispanic origin) for cancer incidence is still more difficult to collect accurately in Minnesota. Even when medical records are reviewed, usually no mention is found of whether or not a person is of Hispanic origin. Because of this problem, data on cancer incidence in Minnesota Hispanics have not been included in any previous legislative report. Over the course of the past two years MCSS investigated how to apply Hispanic surname matching to improve the available data on cancer in the Minnesota Hispanic population. MCSS adapted the NAACCR Hispanic Identification Algorithm (NHIA) to work in Minnesota. Briefly, NHIA,

Introduction

which is described on the NAACCR web site (www.naacccr.org/filesystem/pdf/Packet_5_2005_CFD.pdf), was followed except that Hispanic name matching was applied only in counties that had at least four percent Hispanics in the 2000 Census. Eleven counties, representing 90 percent of Hispanics in Minnesota, met this criterion. NHIA excludes individuals from Hispanic name matching if their race is Filipino or American Indian, or if they were born in a country with a high prevalence of Spanish surnames but low probability of Hispanic ethnicity. The resulting cancer incidence rates for Hispanics were more consistent both with other states' Hispanic cancer incidence data and with mortality data for Minnesota Hispanics and are therefore included in this report for the first time. After examining the effects of applying NHIA to Minnesota mortality data, it was decided that reporting of Hispanic ethnicity on the death certificate appeared complete enough without additional manipulation.

Despite recent improvements in the completeness of data on the patient's race, the ability of MCSS to evaluate racial and ethnic differences in cancer risk among Minnesotans remains limited by several factors. First, 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 and 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.

Second, race and ethnicity as recorded in the medical record may or may not match what the individual would report on the Census form. In order to match the Census definition of race, individuals should be allowed to report their own race(s) and ethnicity. Admissions practices and forms at health care facilities do not always follow

this practice; thus the race as recorded in the medical record might be from the patient's self-report, or it might be based on assumptions made by an observer at the facility.

Finally, the population estimates that are available to calculate rates may be inaccurate because they represent (1) undercounts of persons of color during the national census, (2) inaccurate population estimates during the intercensal period, and/or (3) inappropriate recoding of individuals who report more than one race into single-race categories. An example of the second, "intercensal," problem was the discovery, following completion of Census 2000, that the estimates of the Hispanic population in Minnesota for the late 1990's had been nearly 75 percent too low. Population estimates for the years between the 1990 and 2000 Censuses were subsequently revised, and thus the Minnesota Hispanic cancer mortality rates published this year are different from those published in MCSS 2003. A potential example of the third, "recoding to single-race," problem relates to the data on American Indians. Although only 1.2 percent of Minnesotans overall reported more than one race in the 2000 Census, 32 percent of American Indians reported at least one race in addition to American Indian. The MCSS database contains no cases with more than one reported race. Thus, there is a mismatch between how race is identified in the numerator (MCSS) and how it was identified in the denominator (Census), especially for American Indians. As previously stated, the bridged census estimates attempt to re-categorize individuals selecting more than one race to the single race they would have chosen if only given one choice. It is not known how American Indian individuals enrolled in IHS would report their racial identity on a Census form, nor whether IHS-enrolled American Indians are any different in this respect from American Indians not enrolled in the IHS, and thus it is unknown whether the current bridging method is the appropriate one to use when calculating American Indian cancer rates after incorporating an IHS linkage.

All of these factors limit our confidence in race- and ethnic-specific cancer rates in Minnesota, and make it challenging 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 MCSS, and is important in developing policies and interventions directed at cancer control. We have, therefore, aggregated data over the five-year period 1998-2002 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.

Persons of unknown or “other” race who were not Hispanic were not assigned to a race group, but were included in data for all races combined. The category “Hispanic” used in this report combined data for the entire Hispanic population in Minnesota, regardless of race. This was done because a substantial proportion of Hispanics were not identified by race on the medical record and frequently reported themselves as “other” race on the census. Although the category “non-Hispanic white” excludes Hispanics reported as white race, Hispanics were not excluded from the other race groups. Therefore, Hispanics are not mutually exclusive from race and ethnic categories other than “non-Hispanic white”. In rare instances, the sum of counts by race and ethnicity could therefore exceed the total number of cases or deaths.

It should also be noted that cancer mortality data presented here differs somewhat from cancer mortality data reported by the MCHS. For data presented here, race and ethnicity reported on death certificates was supplemented with information from the Indian Health Service to better identify cancer deaths among American Indians. This process increased the overall cancer mortality rate among American Indians by approximately 14 percent, and decreased rates among other race and ethnic groups (primarily non-Hispanic whites) by a small percent. To our knowledge, MCHS has not similarly updated race classification on electronic death certificate files.

Uses of MCSS Data

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

Monitoring the occurrence of cancer in Minnesota and describing the risks of developing cancer. Using a variety of tools, some developed in-house and some obtained from SEER, (see <http://seer.cancer.gov/software>), epidemiologists in the MCSS have analyzed data and produced a series of publications describing cancer occurrence and risks (Table I-2b). Cancer mortality data have also been analyzed and included in this description of cancer occurrence in Minnesota. An estimate of cancer prevalence (the number of persons living with a diagnosis of cancer) in Minnesota was produced; this entailed developing a methodology for applying national data to Minnesota. Also for the first time, MCSS developed projections of future cancer mortality.

MCSS provides data files without personal identifiers to NPCR, NAACCR, and the Central Brain Tumor Registry of the United States. These organizations combine data from multiple registries to produce publications describing cancer incidence and trends in the United States and/or North America (included in Table I-2c).

Informing health professionals and educating citizens regarding specific cancers. In 2003 - 2004, 13 formal presentations were made before local public health, community, academic, and regulatory groups on the occurrence of cancer in Minnesota and related topics. Examples of other activities to inform and educate are the quarterly MCSS newsletter, *MCSS Notes* (www.health.state.mn.us/divs/hpcd/cdee/mcss/MCSSNotes.html), the first-ever *Minnesota Cancer Facts & Figures* (www.cancerplanmn.org), authored by an MCSS epidemiologist and published by the American Cancer Society, and articles in the *Disease Control Newsletter* (www.health.state.mn.us/divs/idepc/newsletters/dc), which is published bimonthly by the MDH and is distributed to thousands of health care providers statewide. A list of publications (2003 - 2004) authored by MCSS staff is found in Table I-2a, b.

Answering the public’s questions and concerns about cancer. 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

Introduction

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. In addition, MCSS data served as the basis for one legislative report related to the mining industry (www.health.state.mn.us/divs/hpcd/cdee/occhealth). A list of 70,000 individuals who had worked in the mining industry was linked with the list of Minnesotans who had developed mesothelioma. Work histories were examined for the 17 miners with mesothelioma, and 15 had sufficiently complete histories to allow evaluation of potential exposures to asbestos; two did not. Of the 15, all but one had jobs (e.g. brake mechanic, pipe fitter, electrician, boiler operator, etc.) that would expose them to asbestos regardless of the industry. The explanation most consistent with these findings is that commercial asbestos exposure, rather than taconite dust, is the most likely cause for the occurrence of mesothelioma in men employed in the mining industry. However, at least one miner had no obvious source of exposure to commercial asbestos and other sources could not be ruled out. Because of the inability to rule out other explanations, additional study was recommended.

Promoting cancer research. MCSS has assisted cancer researchers by providing information and data needed for the planning and support of grant applications. MCSS has also received 29 data use applications since 1988, which are described in Table I-3. The involvement of 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. Many scientific articles related to cancer etiology and prevention have been published based on these studies (Table I-2c).

Guiding decisions about how to target cancer control activities. MCSS epidemiologists were heavily involved in the development of Cancer Plan Minnesota, which was released in April 2005

(www.cancerplanmn.org). This evidence-based strategic plan is intended to be a framework for action to effectively reduce the burden of cancer among all Minnesotans. It is a five-year plan, with the majority of its measurable objectives written for 2010. 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 that could identify an individual (e.g., name and address) is strictly protected by Minnesota law. Furthermore, this information is considered privileged in that the MDH cannot be compelled by court order to release any personal data collected by 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 2002 data, Minnesota Cancer Surveillance System

Registry Element	Gold Standard	Silver Standard	MCSS Measure	Standard Achieved
1.Completeness of case ascertainment	95%	90%	102.5%	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 %	2.3 %	Gold
• Missing/unknown “county”	<= 2 %	<= 3 %	0.5 %	Gold
3.Death certificate only cases	<= 3 %	<= 5 %	1.7 %	Gold
4.Duplicate primary cases	<= 0.1 %	<= 0.2 %	0.03 %	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: Publications (2003-2004)**Table I-2a: Peer-Reviewed Publications co-authored by MCSS/MDH staff**

Pagidipala S, Bushhouse S. Screening mammography in Minnesota cancer patients. *Cancer Detection and Prevention* 2005; 29(2):116-123.

Perkins CI, Hotes J, Kohler BA, Howe HL. Association between breast cancer laterality and tumor location, United States, 1994-1998. *Cancer Causes Control*. 2004 Sep;15(7):637-45.

Miller N, Bushhouse S. Treatment patterns for female breast cancer in Minnesota, 1995-1996. *Minn Med* 2003; 86(12): 26-31.

Boland LL, Mink PJ, Bushhouse SA, Folsom AR. Weight and length at birth and risk of early-onset prostate cancer (United States). *Cancer Causes and Control* May 2003; 14:335-338.

Ross JA, Xie Y, Kiffmeyer WR, Bushhouse S, Robison LL. Cancer in the Minnesota Hmong population. *Cancer* 2003; 94:3076-9.

Table I-2b: Other Publications co-authored by MCSS/MDH staff

Perkins C, Bushhouse S. Cancer in Minnesota, 2002: Preliminary report. 2004 Dec; Minneapolis, MN: Minnesota Department of Health.

Minnesota Department of Health. Community concerns about cancer in northeast Minneapolis fact sheet. 2004 Nov; Minneapolis, MN: Minnesota Department of Health.

Minnesota Department of Health. Progress and challenges in reducing cancer deaths among women in Minnesota. *Minnesota Department of Health Disease Control Newsletter*. 2004 Sep/Oct; 32(5):56-7.

Table I-2b: Other Publications co-authored by MCSS/MDH staff

Minnesota Department of Health. Cancer Plan Minnesota will address cancer survivorship in Minnesota. Minnesota Department of Health Disease Control Newsletter. 2004 Sep/Oct; 32(5):58.

Minnesota Department of Health. Cancer rates among American Indians in Minnesota. Minnesota Department of Health Disease Control Newsletter. 2004 May/June; 32(3):29-30.

Perkins C, Bushhouse S. Estimated Minnesota cancer prevalence, January 1, 2000. Minnesota Department of Health. Minneapolis, MN, April 2004.

Minnesota Department of Health. Colorectal cancer control in Minnesota. Minnesota Department of Health Disease Control Newsletter. 2004 Mar/Apr; 32(2):18.

Perkins C, Bushhouse S. Cancer in Minnesota, 2001: Preliminary Report. Minneapolis, MN: Minnesota Cancer Surveillance System, March 2004.

Brunner W, Williams AN, Bender AP. Exposures to commercial asbestos in northeastern Minnesota iron miners who developed mesothelioma. Minneapolis, MN: Minnesota Department of Health, November 2003.

Minnesota Department of Health. Breast cancer incidence is increasing among women 50-64 years of age. Minnesota Department of Health Disease Control Newsletter. 2003 Nov/Dec; 31(7):73.

Minnesota Department of Health. Cancer is the new leading cause of death in Minnesota as deaths from heart disease decrease. Minnesota Department of Health Disease Control Newsletter. 2003 Nov/Dec; 31(7):74.

Minnesota Department of Health. Cancer surveillance in Minnesota, 1988-1999. Minnesota Department of Health Disease Control Newsletter. 2003 Nov/Dec; 31(3):26.

American Cancer Society, Midwest Division. Minnesota Cancer Facts & Figures 2003. Edina, MN: American Cancer Society, Midwest Division, 2003.

Minnesota Cancer Surveillance System. Cancer incidence rates in northeastern Minnesota with an emphasis on mesothelioma. MCSS Epidemiology Report 03:1, Minnesota Department of Health, 2003.

Table I-2c: Publications incorporating/based on data from MCSS

U.S. Cancer Statistics Working Group. United States Cancer Statistics: 2001 Incidence and Mortality. Atlanta (GA): Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; 2004

Steenland K, Rodriguez C, Mondul A, Calle EE. Prostate cancer incidence and survival in relation to education (United States). Cancer Causes Control. 2004 Nov;15(9):939-45.

Neuwirth RS, Loffer FD, Trenhaile T, Levin B. The incidence of endometrial cancer after endometrial ablation in a low-risk population. J Am Assoc Gynecol Laparosc. 2004 Nov;11(4):492-4.

Huang K, Whelan EA, Ruder AM, Ward EM, Deddens JA, Davis-King KE, Carreon T, Waters MA, Butler MA, Calvert GM, Schulte PA, Zivkovich Z, Heineman EF, Mandel JS, Morton RF, Reding DJ, Rosenman KD; The Brain Cancer Collaborative Study Group. Reproductive factors and risk of glioma in women. Cancer Epidemiol Biomarkers Prev. 2004 Oct;13(10):1583-8.

Table I-2c: Publications incorporating/based on data from MCSS

- Jemal A, Clegg LX, Ward E, Ries LA, Wu X, Jamison PM, Wingo PA, Howe HL, Anderson RN, Edwards BK. Annual report to the nation on the status of cancer, 1975-2001, with a special feature regarding survival. *Cancer*. 2004 Jul 1;101(1):3-27.
- Lindor NM. Recognition of genetic syndromes in families with suspected hereditary colon cancer syndromes. *Clinical Gastroenterology & Hepatology* 2004 May;2(5):366-75.
- Slattery M; Ballard-Barbash R; Potter J; Ma K; Caan B; Anderson K; Samowitz W. Sex-specific differences in colon cancer associated with p53 mutations. *Nutr Cancer*. 2004;49(1):41-8.
- McLaughlin CC, Hotes JL, XC Wu, Lake A, Firth R, Roney D, Cormier M, Fulton JP, Holowaty E, Kosary C, Chen VW, Howe HL (eds). *Cancer in North America, 1997-2001. Volume Three:NAACCR Combined Incidence Rates*. Springfield, IL:North American Association of Central Cancer Registries, April 2004.
- McLaughlin CC, Hotes JL, XC Wu, Lake A, Firth R, Roney D, Cormier M, Fulton JP, Holowaty E, Kosary C, Chen VW, Howe HL (eds). *Cancer in North America, 1997-2001. Volume One:Incidence*. Springfield, IL:North American Association of Central Cancer Registries, April 2004.
- Rodriguez C, Jacobs EJ, Mondul AM, Calle EE, McCullough ML, Thun MJ. Vitamin E supplements and risk of prostate cancer in U.S. men. *Cancer Epidemiol Biomarkers Prev*. 2004 Mar;13(3):378-82.
- Curtin K; Bigler J, Slattery M, Caan B, Potter J, Ulrich C. MTHFR C677T and A1298C polymorphisms: diet, estrogen, and risk of colon cancer. *Cancer Epidemiol Biomarkers Prev*. 2004 Feb;13(2):285-92.
- Feigelson HS, Jonas CR, Teras LR, Thun MJ, Calle EE. Weight gain, body mass index, hormone replacement therapy, and postmenopausal breast cancer in a large prospective study. *Cancer Epidemiol Biomarkers Prev*. 2004 Feb;13(2):220-4.
- Thyagarajan B, Brott M, Mink P, Folsom AR, Anderson KE, Oetting WS, Gross M. CYP1B1 and CYP19 gene polymorphisms and breast cancer incidence: no association in the ARIC study. *Cancer Letters*. 2004; 207:183-89.
- Stein KD, Denniston M, Baker F, Dent M, Hann DM, Bushhouse S, West M. Validation of a modified Rotterdam Symptom Checklist for use with cancer patients in the United States. *J Pain Symptom Manage*. 2003 Nov;26(5):975-89.
- McCullough ML, Robertson AS, Chao A, Jacobs EJ, Stampfer MJ, Jacobs DR, Diver WR, Calle EE, Thun MJ. A prospective study of whole grains, fruits, vegetables and colon cancer risk. *Cancer Causes Control*. 2003 Dec;14(10):959-70.
- Hahnloser D, Petersen GM, Rabe K, Snow K, Boardman L, Lindor NM, Koch B, Wang L, Thibodeau SN. APC E1317Q variant is not associated with increased colorectal neoplasia risk. *Cancer Epidemiology Biomarkers & Prevention* 2003 Oct;12(10):1023-8.
- McCullough ML, Robertson AS, Rodriguez C, Jacobs EJ, Chao A, Jonas C, Calle EE, Willett WC, Thun MJ. Calcium, vitamin D, dairy products, and risk of colorectal cancer in the Cancer Prevention Study II Nutrition Cohort (United States). *Cancer Causes and Control* 2003; 14:1-12.
- Weir HK, Thun MJ, Hankey BF, Ries LA, Howe HL, Wingo PA, Jemal A, Ward E, Anderson RN, Edwards BK. Annual report to the nation on the status of cancer, 1975-2000, featuring the uses of surveillance data for cancer prevention and control. *J Natl Cancer Inst*. 2003 Sep 3;95(17):1276-99. Review. Erratum in: *J Natl Cancer Inst*. 2003 Nov 5;95(21):1641.

Table I-2c: Publications incorporating/based on data from MCSS

- Patel AV, Calle EE, Bernstein L, Wu AH, Thun MJ. Recreational physical activity and risk of postmenopausal breast cancer in a large cohort of US women. *Cancer Causes Control*. 2003 Aug;14(6):519-29.
- Jacobs EJ, Connell CJ, Chao A, McCullough ML, Rodriguez C, Thun MJ, Calle EE. Multivitamin use and colorectal cancer incidence in a US cohort: does timing matter? *Am J Epidemiol* 2003;158:621-628.
- Rodriguez C, McCullough ML, Mondul AM, Jacobs EJ, Fakhrabadi-Shokoohi D, Giovannucci EL, Thun MJ, Calle EE. Calcium, dairy products, and risk of prostate cancer in a prospective cohort of United States men. *Cancer Epidemiol Biomarkers Prev*. 2003 Jul;12(7):597-603.
- Goodman MT, Howe HL. Descriptive epidemiology of ovarian cancer in the United States, 1992-1997. *Cancer*. 2003 May 15;97(10 Suppl):2615-30.
- Howe HL, Weinstein R, Hotes J, Kohler B, Roffers SD, Goodman MT. Multiple primary cancers of the ovary in the United States, 1992-1997. *Cancer*. 2003 May 15;97(10 Suppl):2660-75.
- Hall HI, Tung KH, Hotes J, Logan P. Regional variations in ovarian cancer incidence in the United States, 1992-1997. *Cancer*. 2003 May 15;97(10 Suppl):2701-6.
- Young JL Jr, Cheng Wu X, Roffers SD, Howe HL, Correa C, Weinstein R. Ovarian cancer in children and young adults in the United States, 1992-1997. *Cancer*. 2003 May 15;97(10 Suppl):2694-700.
- Howe HL, Tung KH, Coughlin S, Jean-Baptiste R, Hotes J. Race/ethnic variations in ovarian cancer mortality in the United States, 1992-1997. *Cancer*. 2003 May 15;97(10 Suppl):2686-93.
- Goodman MT, Howe HL, Tung KH, Hotes J, Miller BA, Coughlin SS, Chen VW. Incidence of ovarian cancer by race and ethnicity in the United States, 1992-1997. *Cancer*. 2003 May 15;97(10 Suppl):2676-85.
- Howe HL, Weinstein R, Hotes J, Kohler B, Roffers SD, Goodman MT. Multiple primary cancers of the ovary in the United States, 1992-1997. *Cancer*. 2003 May 15;97(10 Suppl):2660-75.
- Goodman MT, Correa CN, Tung KH, Roffers SD, Cheng Wu X, Young JL Jr, Wilkens LR, Carney ME, Howe HL. Stage at diagnosis of ovarian cancer in the United States, 1992-1997. *Cancer*. 2003 May 15;97(10 Suppl):2648-59.
- Roffers SD, Wu XC, Johnson CH, Correa CN. Incidence of extraovarian primary cancers in the United States, 1992-1997. *Cancer*. 2003 May 15;97(10 Suppl):2643-7.
- Chen VW, Ruiz B, Killeen JL, Cote TR, Wu XC, Correa CN. Pathology and classification of ovarian tumors. *Cancer*. 2003 May 15;97(10 Suppl):2631-42.
- Kakar S, Burgart LJ, Thibodeau SN, Rabe KG, Petersen GM, Goldberg RM, Lindor NM. Frequency of loss of hMLH1 expression in colorectal carcinoma increases with advancing age. *Cancer* 2003 March 97(6):1421-7.
- Slattery M, Samowitz W, Hoffman M, Ma K, Levin T, Neuhausen S. Aspirin, NSAIDs, and colorectal cancer: possible involvement in an insulin-related pathway. *Cancer Epidemiol Biomarkers Prev*. 2004 Apr;13(4):538-45.
- Slattery ML, Ballard-Barbash R, Edwards S, Caan BJ, Potter JD. Body mass index and colon cancer: an evaluation of the modifying effects of estrogen (United States). *Cancer Causes Control*. 2003 Feb;14(1):75-84.

Table I-2c: Publications incorporating/based on data from MCSS

Feigelson HS, Jonas CR, Robertson AS, McCullough ML, Thun MJ, Calle EE. Alcohol, folate, methionine, and risk of incident breast cancer in the American Cancer Society Cancer Prevention Study II Nutrition Cohort. *Cancer Epidemiol Biomarkers Prev.* 2003 Feb;12(2):161-4.

Thomas A, Carlin BP. Late detection of breast and colorectal cancer in Minnesota counties: an application of spatial smoothing and clustering. *Stat Med.* 2003 Jan 15;22(1):113-27.

Coates A, Potter J, Caan B, Edwards S, Slattery M. Eating frequency and the risk of colon cancer. *Nutr Cancer.* 2002;43(2):121-6.

Lindor NM, Burgart LJ, Leontovich O, Goldberg RM, Cunningham JM, Sargent DJ, Walsh-Vockley C, Petersen GM, Walsh MD, Leggett BA, Young JP, Barker MA, Jass JR, Hopper J, Gallinger S, Bapat B, Redston M, Thibodeau SN. Immunohistochemistry versus microsatellite instability testing in phenotyping colorectal tumors. *Journal of Clinical Oncology* 2002 Feb 15;20(4):1043-8.

Table 1-3: Applications requesting data for research as of January 2005

Year	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 completed fall 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 Fall 2004. (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)

* Year application submitted

Introduction

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)
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, 2002	Identification and recruitment of families at high risk of colorectal cancer into a Familial Colorectal Cancer Registry (Re-applied in 2002 for extension of funding)	In process: MCSS is identifying individuals diagnosed with colorectal cancer between 1997 and 2007, 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)

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	Completed: MCSS identified and invited 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	Completed: The MCSS assisted 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	Completed: MCSS assisted with assessing the validity of self-reported family history of cancer. (National Cancer Institute)
2003	Statistical Models for Cancer Control and Epidemiology	In Process: MCSS is improving its geocoding information so that cancer treatment and survival can be assessed in relationship to distance from appropriate medical facilities. (University of Minnesota)
2004	Relationship of Increasing Indoor Tanning Use to Melanoma Risk	In Process: MCSS is identifying patients diagnosed with melanoma skin cancer between April 2003 and March 2008. The study is looking for associations between genetic markers, indoor tanning booth use, and other known risk factors and melanoma skin cancer. (University of Minnesota)
2005	Predictors of Adult Leukemia	In Process: MCSS is using rapid ascertainment to identify patients diagnosed with chronic or acute myelogenous or monocytic leukemia between June 2005 and November 2009. The study is looking for associations with farming exposures, nonsteroidal antiinflammatory drug use, and genetic markers. (University of Minnesota)

[This page left intentionally blank.]

Chapter II: Overview

Chapter II: Overview

This chapter provides an overview of 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 (MCHS). The first section highlights the relative importance of various cancers by gender and age. Following this is a section that provides an assessment of the cancer burden in Minnesota by race and ethnicity. Changes in cancer incidence and mortality rates over the 15-year period 1988-2002 are summarized in the third section, and geographical variation in cancer occurrence is discussed in the next section. The final section presents estimates of Minnesota cancer prevalence.

Cancer surveillance plays a crucial role in the protection and improvement of public health. The data presented in this report enable the Minnesota Department of Health to identify health concerns, to target and evaluate goals for cancer control, and to inform the public and medical professionals about cancer risks.

The total number of new cases and deaths due to cancer in Minnesota over the five-year period 1998-2002 and the corresponding average annual incidence and mortality rates per 100,000 persons are presented in Table II-1. To calculate the average number of cases or deaths per year, divide the total number of cases or deaths over the five-year period by five. Annual counts and rates by year for the most common cancers may be found in Chapter III.

On average, 22,500 Minnesotans (11,700 males and 10,800 females) were diagnosed each year with a potentially serious cancer over the five-year period 1998-2002 (Table II-1). These figures do not include common skin cancers or *in situ* cancers for sites other than the urinary bladder. The actual number of persons diagnosed with cancer was about 4.5 percent lower because some individuals were diagnosed with more than one cancer. The overall average annual age-adjusted incidence rate over the same five-year period was 472.1 new cases per 100,000 persons (557.7 and 413.2 for males and females, respectively).

Over the five-year period 1998-2002, approximately 9,000 Minnesotans died each year with cancer listed as the underlying cause of death on the death certificate, including about 4,600 males and 4,400 females (Table II-1). The age-adjusted mortality rate over the same five-year period was 185.9 deaths per 100,000 persons (230.8 for males and 157.2 for females). For the first time in 2000, cancer became the leading cause of death in Minnesota, surpassing heart disease, and is responsible for about one in every four deaths.

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.

Cancer Incidence and Mortality in Minnesota by Gender and Age

The risk of being diagnosed with and dying from cancer varies by both gender and age. In general, males are at greater risk of both developing and dying from cancer than females. The overall cancer incidence rate is 35 percent higher among males than females, and the overall cancer mortality rate is 47 percent higher. Men are at two to four times greater risk than women for a number of cancers, including cancers of the urinary bladder, esophagus, larynx, oral cavity and kidney. The higher risk among men may be directly attributable to historically higher smoking rates among men or to occupational exposures. For many cancers, the reason for the higher rates among men is not known. Excluding the sex-specific cancers, women are at greater risk than men for only a few common cancers: breast, thyroid, and gallbladder.

Despite these differences in risk, the most common cancers diagnosed among men and women in Minnesota are similar (Figures II-1 and II-2). Prostate cancer is the most commonly diagnosed cancer among men, and breast cancer is the most commonly diagnosed among women. Each of these cancers accounts for one third of

Overview

cancers diagnosed among men and women, respectively. Lung and bronchus cancer and cancers of the colon and rectum are the next two most commonly diagnosed cancers, and together account for about one in four cancers diagnosed among men and women in Minnesota. Although prostate cancer and breast cancer are more common, lung and bronchus cancer is the leading cause of cancer mortality for both males and females, and accounts for 25 percent of cancer deaths in the state.

The fourth most commonly diagnosed cancer in Minnesota is urinary bladder cancer for men and uterine cancer in women. They account for about six percent of cancers among men and women, respectively. Non-Hodgkin lymphoma is the fifth most common cancer, accounting for nearly five percent of diagnosed cancers in Minnesota. Melanoma and leukemia are among the leading cancers, and together account for seven percent of cancers. Cancers of the brain and pancreas are relatively uncommon, but are among the ten leading causes of cancer death because survival is poor.

In general, cancer is a disease of the elderly. Tables II-2 through II-5 show the age-specific incidence and mortality rates for the five-year period 1998-2002 for males and females in Minnesota. The overall cancer rate increases by 80- to 150-fold with age, from approximately 20 new cases per year for each 100,000 children less than five years of age, to more than 3,000 and 1,600 per 100,000 men and women 70 years of age and older, respectively. Similarly, the overall cancer mortality rate increases by more than 500-fold from two deaths per year for each 100,000 children less than five years of age to more than 1,900 and 1,100 deaths per 100,000 men and women 80 years of age and older, respectively.

The relationship between cancer risk and age varies with the type of cancer (Figure II-3). While only a small percentage of prostate, lung, and colorectal cancers are diagnosed among persons under the age of 50 years, 20 percent of breast cancers, 40 percent of melanomas and brain cancers, 60 percent of cervical cancers, 70 percent of Hodgkin lymphomas, and more than 80 percent of acute lymphocytic leukemias are diagnosed

among persons less than 50 years of age.

Race and Ethnic Disparities in Cancer in Minnesota

It is clear from national data that race and ethnic differences exist in the risk of developing and dying from cancer, and data from Minnesota are consistent with that picture. However, assessing race and ethnic disparities in the burden of cancer in Minnesota is limited by the relatively small size of populations of color in our state, incomplete or inaccurate reporting of race and ethnicity on the medical record and death certificate, and differences in the way race and ethnicity are defined and collected for cases and deaths (the numerator for rates) and population estimates (the denominator for rates). These difficulties are not unique to Minnesota and are well recognized in cancer registration.

As discussed in Chapter I, several steps to improve the classification of race and ethnicity in the MCSS have been undertaken since the last biennial report (MCSS 2003), and cancer incidence and mortality can now be reported for the five major race and ethnic groups in Minnesota: American Indian/Alaska Native, Asian/Pacific Islander, black/African American including African-born, non-Hispanic white, and Hispanic (all races). Despite improvements, it is likely that an unknown degree of misclassification and inconsistency between numerators and denominators still exists. For small populations, this may result in substantial error; therefore, race and ethnic differences in cancer rates should be interpreted cautiously.

Tables in Chapter III show the total number of cases and deaths over the five-year period 1998-2002 by race and ethnicity and gender. This section provides an overview of race and ethnic disparities in the occurrence of cancer in Minnesota. To simplify the presentation, the rates referred to are for both sexes combined except for breast, cervix, uterus, and prostate cancer.

American Indian/Alaska Native

Each year during the five-year period 1998-2002, an average of 151 American Indians in Minnesota

were diagnosed with cancer and 70 died of the disease (Table II-6). After adjusting for population size and age distribution, American Indians had the highest overall cancer incidence and mortality rates compared to other race/ethnic groups in the state (Table II-7 and Figure II-4). American Indians were 14 percent more likely to be diagnosed with cancer than non-Hispanic whites and 46 percent more likely to die of the disease. Although overall cancer incidence and mortality rates were somewhat higher for American Indians than blacks, these differences were not statistically significant.

The overall cancer incidence rate among American Indians was significantly higher in Minnesota than in the geographic areas reporting to the SEER Program, where the majority of American Indian cancer cases are from cancer registries in New Mexico and Alaska. The overall cancer mortality rate among American Indians was also significantly higher in Minnesota than in the U.S. as a whole. During 1998-2002 in the SEER Program, American Indian/Alaska Native populations had the lowest overall cancer incidence rate compared to other race and ethnic groups (Figure II-5). The overall cancer incidence rate among American Indians was more than two times higher in Minnesota than among American Indians in the SEER Program, and the overall cancer mortality rate was two times higher in Minnesota than in the U.S. as a whole. In contrast, overall cancer rates among other race and ethnic groups in Minnesota were similar to or lower than comparable rates reported by the SEER Program (Figures II-4 and II-5).

The majority of the excess in cancer incidence among American Indians in Minnesota compared to non-Hispanic whites was due to lung cancer. The lung cancer incidence rate was more than twice as high among American Indians as among non-Hispanic whites, and the lung cancer mortality rate was similarly elevated (Table II-7). Colorectal cancer also contributed significantly to the excess burden of cancer in the American Indian population in Minnesota. American Indians had the highest incidence and mortality rates for colorectal cancer in Minnesota, more than 50 percent higher than among non-Hispanic whites (Table II-7).

Asian/Pacific Islander

Each year during the five-year period 1998-2002, an average of 182 Asian/Pacific Islanders in Minnesota were diagnosed with cancer and 79 died of the disease (Table II-6). After adjusting for population size and age distribution, Asian/Pacific Islanders had the lowest overall cancer incidence and mortality rates compared to other race and ethnic groups in the state (Table II-7 and Figure II-4). Asian/Pacific Islanders were 44 percent less likely to be diagnosed with cancer than non-Hispanic whites and 23 percent less likely to die of the disease.

The overall cancer incidence rate among Asian/Pacific Islanders over this period was 22 percent lower in Minnesota than in the SEER Program, while mortality was 18 percent higher than in the U.S. as a whole (Figures II-4 and II-5). Both comparisons were statistically significant.

Asian/Pacific Islanders in Minnesota and nationally have a significantly lower risk than non-Hispanic whites of being diagnosed with many common cancers such as prostate, female breast, lung, and colorectal cancer. However, they have the highest rates of liver and stomach cancers, for which survival tends to be poor. Asian/Pacific Islanders in Minnesota were five times more likely than non-Hispanic whites to be diagnosed with liver cancer and three times more likely to be diagnosed with stomach cancer (Table II-7). Mortality rates for these sites were similarly elevated. Asian/Pacific Islander women in Minnesota had the highest incidence rate of cervical cancer, more than twice as high as the rate among non-Hispanic white women. Cervical cancer rates were also elevated among black, American Indian, and Hispanic women, and the rates among these women were not statistically different from those among Asian/Pacific Islander women.

Black/African American

Each year during the five-year period 1998-2002, an average of 377 blacks in Minnesota were diagnosed with cancer and 157 died of the disease (Table II-6). After adjusting for population size and age distribution, blacks had the second

Overview

highest overall cancer incidence and mortality rates compared to other race and ethnic groups in the state (Table II-7 and Figure II-4), just slightly lower than among American Indians. Blacks were only 10 percent more likely to be diagnosed with cancer than non-Hispanic whites but 33 percent more likely to die of the disease. Although overall cancer incidence and mortality rates were somewhat higher for American Indians than blacks, the differences were not statistically significant.

The overall cancer incidence and mortality rates among blacks in Minnesota over this period were nearly identical to the rates in the SEER Program (Figures II-4 and II-5).

Unlike nationally, where blacks had the highest incidence rate of many specific types of cancer compared to other race and ethnic groups, in Minnesota blacks only had the highest rate for prostate cancer (Table II-7). However, with the exception of lung cancer, cancer incidence rates in American Indians and blacks in Minnesota were not significantly different. The prostate cancer incidence rate among blacks in Minnesota was 27 percent higher than among non-Hispanic whites, and 28 percent higher than among American Indians; the prostate cancer mortality rate among blacks in Minnesota was 82 percent higher than among non-Hispanic whites, and 11 percent higher than among American Indians. The cancer incidence rate among blacks compared to non-Hispanic whites was significantly higher for three other common sites: four times higher for liver cancer, 84 percent higher for stomach cancer, and 57 percent higher for lung cancer.

Non-Hispanic White

Each year during the five-year period 1998-2002, an average of 21,279 non-Hispanic white Minnesotans were diagnosed with cancer and 8,635 died of the disease (Table II-6). After adjusting for population size and age distribution, cancer rates among non-Hispanic whites were intermediate between American Indians and blacks, who had significantly higher overall cancer incidence and mortality rates, and Asian/Pacific Islanders and Hispanics, who had significantly lower overall cancer incidence and

mortality rates (Table II-7 and Figure II-4).

Over the five-year period 1998-2002, the overall cancer incidence and mortality rates among non-Hispanic whites were five and seven percent lower, respectively, in Minnesota than nationally (Figures II-4 and II-5). Although these differences are modest, both are statistically significant.

Compared to other race and ethnic groups in Minnesota, non-Hispanic whites had the highest incidence of female breast cancer, cancer of the uterus, and bladder cancer. However, blacks had the highest mortality rate for all three of these sites. Non-Hispanic whites had the lowest incidence and mortality rates for cervix, liver, and stomach cancer.

Hispanic (all races)

Each year during the five-year period 1998-2002, an average of 143 Hispanics in Minnesota were diagnosed with cancer and 50 died of the disease (Table II-6). After adjusting for population size and age distribution, Hispanics had the second lowest overall cancer incidence and mortality rates compared to other race and ethnic groups in the state (Table II-7 and Figure II-4), just slightly higher than among Asian/Pacific Islanders. Hispanics were 28 percent less likely to be diagnosed with cancer than non-Hispanic whites and 20 percent less likely to die of the disease.

The overall cancer incidence rate among Hispanics was about five percent lower in Minnesota than in the SEER Program, while the overall cancer mortality rate was nine percent higher than in the US as a whole (Figures II-4 and II-5). However, neither difference was statistically significant.

Hispanics in Minnesota and nationally have a significantly lower risk than non-Hispanic whites of being diagnosed with prostate and female breast cancer, which are among the most common cancers diagnosed, as well as bladder cancer and oral cavity and pharynx cancers. In Minnesota, cancer rates were somewhat lower among Hispanics compared to non-Hispanic whites for many other cancers, although the differences were not statistically significant (Table II-7). However,

similar to Asian/Pacific Islanders, Hispanic Minnesotans had significantly elevated rates for liver and stomach cancers, for which survival tends to be poor. Hispanics in Minnesota were 2.5 times more likely than non-Hispanic whites to be diagnosed with liver cancer, and two times more likely to be diagnosed with stomach cancer; mortality rates for these sites were similarly elevated. Hispanic women in Minnesota had a significantly elevated incidence of cervical cancer; the rate was nearly twice as high as among non-Hispanic white women.

Conclusions

Many of the same race and ethnic disparities in cancer that occur nationally exist in Minnesota. The most notable exception is that American Indians have the lowest cancer rates nationally, but the highest cancer rates in Minnesota. Much remains to be learned about what causes these differences in cancer incidence and mortality. It is likely that a combination of behavioral, cultural, socioeconomic, and genetic differences are involved, but the relative importance of each factor is controversial and is likely to vary by cancer site. For some cancers, research has shown that disparities are eliminated when access to quality care is equal.

Despite the marked disparities in the occurrence of cancer discussed above, many similarities exist. Cancer is the leading cause of death for each major race and ethnic group in Minnesota except American Indians, for whom heart disease is still the leading cause. Breast cancer is the most commonly diagnosed cancer among women, regardless of race and ethnicity; prostate cancer is the most commonly diagnosed cancer among men, regardless of race and ethnicity (Table II-6). Lung and colorectal cancers are among the top four cancers, regardless of race and ethnicity.

Eliminating disparities in health is a priority for MDH, and a number of interventions funded by the MDH Office of Minority and Multicultural Health (OMMH) are directed toward reducing disparities in the burden of cancer described above. More information on these projects can be found on the OMMH web site <http://www.health.state.mn.us/ommh/index.html>.

In addition, the statewide comprehensive cancer control plan, *Cancer Plan Minnesota*, has identified reducing disparities in cancer screening and treatment as one of four top priorities. More information on *Cancer Plan Minnesota*, activities related to priorities, and the Minnesota Cancer Alliance can be found at <http://www.cancerplanmn.org>.

Cancer Trends in Minnesota

The MCSS is now able to review the 15-year period 1988-2002 to assess whether cancer rates are changing over time in Minnesota. Long-term trends in cancer incidence and mortality rates were assessed by using Joinpoint regression analysis, as discussed in Appendix E. 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; prostate; and female breast cancer. Where Joinpoint regression identified changes in trends, only the average annual percent change (APC) for the interval ending in 2002 is presented.

The overall cancer incidence rate in Minnesota increased by a total of nearly seven percent over the 15-year period, from 445.3 new cases per 100,000 persons in 1988 to 474.5 per 100,000 persons in 2002 (Figure II-6). Between 1995 and 2002, the overall incidence rate increased significantly by an average of 1.1 percent per year. This primarily reflects an increasing incidence of prostate cancer among males and increases in lung and breast cancer incidence among females. Despite the relatively modest increase in the incidence rates, the number of persons diagnosed with cancer increased by nearly 32 percent, from about 18,000 cases in 1988 to 23,700 cases in 2002, due to growth in and aging of the Minnesota population in addition to increasing risk.

The overall cancer mortality rate decreased by a total of nearly eight percent over the 15-year period, from 199.5 deaths per 100,000 persons in 1988 to 184.1 in 2002 (Figure II-7). The overall mortality rate in Minnesota declined significantly

Overview

by about 0.6 percent per year. However, the number of persons dying of cancer increased approximately 13.5 percent from 8,100 deaths in 1988 to 9,200 deaths in 2002, due to growth in and aging of the Minnesota population.

Among males, the overall cancer incidence rate increased by 1.1 percent per year between 1995 and 2002. The incidence rate also increased from 1990 to 1993 because of the large number of prostate cancers detected during that time due to the introduction of the prostate-specific antigen (PSA) screening test (Figure II-8). In women, the cancer incidence rate increased significantly by 0.5 percent per year over the entire 15-year period primarily due to substantial increases in lung cancer and modest increases in breast cancer. Historically, the overall cancer incidence rate in Minnesota has been lower than that of the white population in the nine geographical regions of the SEER program (Figure II-8). However, rates in Minnesota and the nine SEER regions have gradually become more similar, and in 2002 were nearly the same for both males and females. Following national trends, the cancer mortality rate has decreased significantly by 0.8 and 0.4 percent per year from 1988-2002 among men and women in Minnesota, respectively (Figure II-9).

For males, incidence rates increased significantly over the 15-year period 1988-2002 for nine cancer sites, and for all cancer sites combined and prostate cancer over the period 1995-2002 (Figure II-10). Although breast cancer showed the largest increase in incidence rates among males, this is a rare cancer among men, and the increase, although significant, could be due to random variation of small numbers. Incidence and mortality rates for male breast cancer in Minnesota remain very similar to national rates. Other sites showing statistically significant increases in incidence among males were melanoma of the skin, liver and prostate cancers, mesothelioma, cancers of the esophagus, testis, and thyroid, non-Hodgkin lymphoma, and cancers of the kidney and renal pelvis. These increases were partially offset by significant decreases in incidence rates of lung and colorectal cancers. Rates also decreased significantly for Kaposi sarcoma and cancers of the larynx, stomach, and oral cavity and pharynx.

Despite an increase in the overall incidence rate, the overall cancer mortality rate in men decreased significantly by an average of 0.8 percent per year in Minnesota (Figure II-11). 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 were prostate cancer and non-Hodgkin lymphoma, where mortality decreased significantly despite increasing incidence.

Over the 15-year period 1988-2002, the overall cancer incidence rate increased significantly by 0.5 percent per year among women in Minnesota (Figure II-12). Significant increases were observed for eight cancers: melanoma of the skin, non-Hodgkin lymphoma, and cancers of the thyroid, breast, kidney, liver, pancreas, and lung. Lung cancer incidence among women appears to be stabilizing nationally, but not in Minnesota. These increases were only partially offset by significant decreases in cancers of the colon and rectum, ovary, stomach, and cervix.

The overall cancer mortality rate among Minnesota women decreased significantly by an average of 0.4 percent per year over the 15-year period 1988-2002 (Figure II-13). Similar to men, many sites that showed a significant change in incidence among women also showed a matching change in mortality, although the trend was not always statistically significant. The exceptions to this generalization include melanoma of the skin, non-Hodgkin lymphoma and breast cancer, each of which showed a significant increase in the cancer incidence rate and a decrease in the cancer mortality rate.

Trends for lung and bronchus cancer mortality are very different for men and women in Minnesota (Figure II-14). Lung cancer is the leading cause of cancer-related deaths among both men and women in Minnesota and the observed trends have a major impact on the overall cancer mortality rate. Among men, lung cancer mortality has steadily and significantly decreased by an average of 1.1 percent per year over the 15-year period 1988-2002. The rate decreased by a total of 13.4 percent from 1988 to 2002. However, among women, lung cancer mortality has increased

significantly by 2.1 percent per year over the same time period. Between 1988 and 2002, the lung cancer mortality rate increased by 39 percent from 27.9 deaths per 100,000 women to 38.8 per 100,000 women. Because of the significant delay between exposure to tobacco smoke and development of lung cancer, it is likely that these trends are due to changes in smoking behavior that took place decades ago. The difference in lung cancer mortality trends between men and women may reflect the fact that smoking rates began decreasing among women at a later date than among men. Trends for lung mortality among men are similar to what is observed nationally. However, lung cancer mortality among women has begun to stabilize nationally, but this has not yet occurred in Minnesota.

Colon and rectum cancer incidence rates in Minnesota decreased significantly among both men and women since statewide cancer reporting was initiated in 1988 by an average of 1.6 percent per year and 0.8 percent per year, respectively (Figure II-15). Between 1988 and 2002, the incidence rate decreased by about 20 percent among men and by 13 percent among women. Cancer mortality rates for colorectal cancer also decreased significantly over this 15-year period for both men and women in Minnesota. Trends in Minnesota are similar to what is seen nationally. The reason for the decline in colorectal cancer incidence is not clear, but it has been suggested that an increase in colorectal cancer screening may account for some of the decrease.

Over the 15-year period 1988-2002, the invasive female breast cancer incidence rate increased by an average of 0.6 percent per year and, although gradual, was statistically significant (Figure II-16), while mortality rates decreased significantly by 2.6 percent per year. Rates for breast cancer among women in Minnesota are similar to what is seen nationally. The moderate increase in breast cancer incidence may reflect that a higher proportion of women born after World War II are at risk of developing breast cancer than their mothers, mainly due to earlier menarche, delayed childbearing, and having fewer children. The breast cancer mortality rate is now lower than it has been for several decades. Recent studies indicate that decreases in breast cancer mortality

are due to more effective breast cancer treatment as well as increased use of mammography.

Incidence rates for prostate cancer have been strongly influenced by the PSA screening test (Figure II-17). After its widespread implementation in the late 1980s, the incidence rate among Minnesota men increased sharply between 1990 and 1992. Because prostate cancer tends to grow slowly, many tumors found during the initial years of PSA screening may not have become symptomatic or otherwise identified until years later, or may not have become apparent before the person died of other causes. After this peak, the prostate cancer incidence rate dropped, and has increased an average of 2.6 percent per year since 1995. Prostate cancer mortality among Minnesota men decreased by nearly 19 percent between 1988 and 2002. It is not clear whether this decrease in mortality can be attributed to PSA screening. Clinical trials are currently underway to test the efficacy of PSA testing and should help to resolve this question.

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. In addition, regions better reflect economic, topographical and occasionally cultural differences in the state than do individual counties.

The regional names given in Appendix C are abbreviated in the text 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

Overview

Geographic variation was assessed for the five most common cancer sites and mesotheliomas, aggregating data over the 5-year period 1998-2002. Comparisons were made using rates for non-Hispanic whites, who constitute about 90 percent of the Minnesota population and about 95 percent of the cancer cases reported to the MCSS. As discussed in a previous section, cancer rates for specific sites vary considerably by race and ethnicity. Comparing regional variation in cancer incidence and mortality among non-Hispanic whites minimizes 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 variations observed nationally and certainly internationally. Over the five-year period 1998-2002, the overall cancer incidence rate among states varied by as much as 30 percent among females and by 36 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 10 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.

It should also be noted that the MCSS only records microscopically confirmed cancers. Therefore, regional variations in medical practices pertaining to the likelihood of obtaining tissue from suspected cancer cases will produce differences in cancer rates from region to region. With very few exceptions, this does not appear to be a significant factor in most cancer rates.

In Minnesota, there is a consistent difference in regional cancer rates of lung and bronchus cancer. Lung cancer incidence rates vary by 35 percent when comparing the highest to the lowest regional rate (Figure II-19). For both sexes combined, lung cancer rates in SW and SC Minnesota are 14 to 17 percent below the statewide rate. This is primarily due to lower female lung cancer rates in these regions (22 to 28 percent lower), although male rates (7 to 8 percent lower) also contribute to the reduction (Figure II-20). In contrast, higher female and male lung cancer rates in NE

Minnesota (12 percent higher than the statewide rate for each) give that region the highest lung cancer rate of the eight regions. Although there is a higher lung cancer rate among females in the Metro region compared to the state as a whole (13 percent higher), the Metro region male lung cancer rate differs very little from the state average. The regional differences in lung cancer incidence are very likely to be real (not an artifact of reporting or biopsy rates), since Minnesota lung cancer mortality rates closely parallel those of the incidence rates. These differences are consistent with differences in the measured smoking behaviors among the regions' populations as noted in previous reports.

Colon and rectum cancer incidence rates vary by 26 percent among Minnesota regions, and show a statistically significant difference between the Metro and non-Metro areas of Minnesota (Figure II-21). The Metro rate is ten percent lower than the state average. Incidence in the WC region (14 percent), the NW region (14 percent), the SW region (11 percent) and the SE region (10 percent) are all statistically significantly higher than the state average. Colorectal cancer mortality and incidence have been declining since the 1980s both in Minnesota and nationally. Some of the decline may be 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 observed differences between the Metro and non-Metro regions.

Female breast cancer incidence rates show only small geographic differences, varying by about 17 percent comparing the highest to the lowest regional rate (Figure II-22). Rates range from five percent above the state average in the Metro area to nine to ten percent below the state average in SC and SW Minnesota. However, breast cancer mortality rates in SW and SC Minnesota are not significantly different than the state average. Breast cancer mortality in the Metro region is seven 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 also correlated with breast cancer risk and may explain some portion of the slightly higher rates in the Metro area.

Incidence rates for prostate cancer have varied considerably over time, and have been strongly influenced by the PSA screening test that was widely implemented starting in the late 1980s (Figure II-23). Prostate cancer incidence rates vary by 35 percent among Minnesota regions. The incidence rate in the Metro area was significantly lower than the state average (9 percent lower), and the WC region and the Central region were significantly higher (23 and 22 percent, respectively). This contrasts with data from 1988-1994, when prostate cancer incidence rates were five percent higher than the state average in the Metro area and lower in both WC and Central Minnesota. Again, this is likely due to varying medical practices among the regions, specifically in the use of the PSA 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 as a screening device was disproportionately used in the Metro region in the early 1990s and by the late 1990s the reverse was true.

Another notable and consistent regional pattern in cancer occurrence has been an increased incidence of mesothelioma, or cancer of the pleura, pericardium, and peritoneum, especially in the NE region (Figure II-24). The only known cause of mesothelioma is exposure to asbestos. Latency periods for mesothelioma are typically 30 to 50 years. Between 1998 and 2002, 43 men and 4 women in the NE region were diagnosed with mesothelioma, giving this region a significantly higher rate than the Minnesota rate. A higher mesothelioma rate had also been noted from 1988-1994 for males (75 percent higher than the statewide rate, based on 39 cases) but not for females (75 percent lower than the statewide rate, based on two cases), suggesting an exposure unique to males, most likely occupational exposures.

While differences noted in this report may or may not reflect real differences in etiologic factors by region, they certainly demonstrate a number of cautions that should be taken 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 consistent over time, are evident for both sexes (when appropriate) and across similar regions, and when the increase is found for mortality (when appropriate) as well as incidence.
- 2) Differences may result from regional coding practices. Although MCSS, local cancer registrars and national organizations work 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. However, even with small numbers regional differences can be informative for certain cancers with clearly delineated causes, for example, mesotheliomas and Kaposi sarcomas.
- 4) Some differences may be the result of variations in regional medical practices and screening rates (for example, 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 striking geographic variation in Minnesota, lung cancer and mesothelioma, have well-known causes (smoking and asbestos exposure, respectively). It is likely that the observed geographic variation in these cancers can be explained by past geographic differences in smoking rates and work-related exposure to asbestos. Cancers of the colon and rectum, prostate, and breast also vary significantly across regions of the state. 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.

Overview

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.

Minnesota Cancer Prevalence

Cancer prevalence is the number of persons alive in a population on a specified date who were previously diagnosed with cancer. Because individuals continue to require services, support, and care beyond the year in which they were diagnosed, it is an important measure of the burden of cancer in society. The SEER Program estimates that 10.1 million Americans, or 3.5% of the U.S. population, were living with a history of cancer on January 1, 2002. This is eight times larger than the 1.3 million Americans estimated by the American Cancer Society to have been newly diagnosed with cancer during 2002.

Cancer prevalence estimates typically exclude people diagnosed with common skin cancers or *in situ* disease. Prevalent cancers include both newly diagnosed cases and individuals who have survived their disease, whether they are considered cancer-free or are still undergoing treatment. It is affected by present and past cancer incidence, cancer survival rates, and death from other causes. Because these factors vary by age, race/ethnicity, and gender, prevalence is also affected by the demographic characteristics of the population.

Prevalence can count persons ever diagnosed with cancer and still alive (complete prevalence), or those who were diagnosed during a specified time period such as the previous five, ten, or twenty-five years (limited duration prevalence). Prevalence percents are calculated by dividing the number of prevalent cases by the total number of people in the population at the given point in time. People can be diagnosed with and survive more than one cancer. The prevalence counts presented here count a person only once, for the first cancer he or she was diagnosed with, ignoring any cancer(s) that might have developed after the first diagnosis.

Because people with a history of cancer can live a normal lifespan, few cancer registries have registered cancer patients for a sufficient length of time to directly measure complete prevalence. In the U.S., the Connecticut cancer registry has registered cancer patients since 1940, and is the source used to approximate complete prevalence. The SEER Program has registered cancer patients in nine geographic regions covering about ten percent of the U.S. population since 1975, and has nearly complete (95%) follow-up on the vital status of patients. Prevalence percents from the nine SEER regions can be used to estimate limited duration cancer prevalence in geographic areas such as Minnesota where cancer registries have operated for a shorter period of time or where follow-up is incomplete.

As of January 1, 2002, an estimated 167,310 Minnesotans were living with a history of cancer (Table II-8), or 3.3% of the Minnesota population. An estimated 63,110 of these survivors had been diagnosed in the previous five years (Table II-9), or 1.3% of Minnesotans. By comparison, a total of 23,384 Minnesotans were diagnosed with cancer in 2002.

The number of persons living with a history of cancer for up to five years is very similar for men and women (31,930 and 31,180, respectively). However, the number of women ever diagnosed with cancer and alive on January 1, 2002 (92,500) is 24 percent larger than the number of men (74,810). This reflects the fact that women live on average more than five years longer than men, and that breast cancer tends to be diagnosed at a younger age.

Among Minnesota female cancer survivors, two out of five (42% or 38,900 women) have a history of breast cancer; among male cancer survivors, two out of five (43% or 31,900 men) have a history of prostate cancer. These large numbers reflect the facts that breast and prostate cancer account for about a third of all cancers diagnosed among men and women, and that survival is very high. Lung cancer, on the other hand, accounts for 12% of cancers diagnosed but only 3% of cancer survivors because survival is poor.

The number of Minnesotans diagnosed with cancer in a given year is only a fraction of those who are living with a history of cancer. It is hoped that these estimates will be useful for those involved in planning and policy related to cancer control.

[This page left intentionally blank.]

Table II-1: Number of new cases and deaths and average annual incidence and mortality rates[§] by anatomic site and gender, all races combined, Minnesota, 1998-2002

Cancer Site	Incidence						Mortality					
	New Cases 1998-2002			Average Annual Rate			Deaths 1998-2002			Average Annual Rate		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
All Cancer Sites Combined	58,587	53,989	112,576	557.7	413.2	472.1	23,104	21,868	44,972	230.8	157.2	185.9
Oral Cavity & Pharynx	1,719	868	2,587	15.8	6.6	10.8	359	202	561	3.4	1.4	2.3
Lip	344	86	430	3.3	0.6	1.8	6	0	6	0.1	0.0	0.0
Tongue	389	204	593	3.5	1.6	2.5	87	45	132	0.8	0.3	0.6
Salivary Gland	152	143	295	1.4	1.1	1.2	35	23	58	0.3	0.2	0.2
Floor of Mouth	109	71	180	1.0	0.6	0.8	6	5	11	0.1	0.0	0.0
Gum & Other Mouth	228	192	420	2.1	1.4	1.7	50	50	100	0.5	0.3	0.4
Nasopharynx	52	35	87	0.5	0.3	0.4	17	25	42	0.2	0.2	0.2
Tonsil	243	66	309	2.1	0.5	1.3	40	10	50	0.4	0.1	0.2
Oropharynx	38	18	56	0.4	0.1	0.2	35	9	44	0.3	0.1	0.2
Hypopharynx	132	41	173	1.2	0.3	0.7	23	11	34	0.2	0.1	0.1
Other Oral Cavity & Pharynx	32	12	44	0.3	0.1	0.2	60	24	84	0.6	0.2	0.4
Digestive System	10,362	9,444	19,806	99.9	69.0	82.6	5,515	5,074	10,589	54.6	35.1	43.6
Esophagus	844	256	1,100	8.0	1.9	4.7	792	244	1,036	7.7	1.7	4.4
Stomach	921	553	1,474	9.0	3.9	6.1	496	377	873	5.0	2.6	3.6
Small Intestine	253	229	482	2.4	1.7	2.0	63	57	120	0.6	0.4	0.5
Colon & Rectum	6,280	6,314	12,594	60.9	45.7	52.4	2,178	2,408	4,586	21.9	16.4	18.7
Colon excl. Rectum	4,360	4,957	9,317	42.7	35.6	38.7	1,801	2,107	3,908	18.2	14.3	15.9
Rectum & Rectosigmoid Junction	1,920	1,357	3,277	18.2	10.1	13.7	377	301	678	3.7	2.1	2.8
Anus, Anal Canal & Anorectum	97	155	252	0.9	1.2	1.0	14	18	32	0.1	0.1	0.1
Liver & Intrahepatic Bile Duct	550	245	795	5.1	1.9	3.3	566	320	886	5.4	2.3	3.7
Liver	478	177	655	4.4	1.3	2.8	426	175	601	4.1	1.2	2.5
Intrahepatic Bile Duct	72	68	140	0.7	0.5	0.6	140	145	285	1.4	1.1	1.2
Gallbladder	84	190	274	0.8	1.4	1.1	55	150	205	0.6	1.0	0.8
Other Biliary	174	144	318	1.7	1.1	1.3	72	77	149	0.8	0.5	0.6
Pancreas	1,055	1,031	2,086	10.1	7.7	8.8	1,229	1,308	2,537	12.1	9.1	10.5
Retroperitoneum	33	37	70	0.3	0.3	0.3	5	4	9	0.0	0.0	0.0
Peritoneum, Omentum, Mesentery	12	240	252	0.1	1.9	1.1	6	69	75	0.1	0.5	0.3
Other Digestive Organs	59	50	109	0.6	0.4	0.5	39	42	81	0.4	0.3	0.3

(Continues on next page)

Source: MCSS (April 2005). All cases were either microscopically confirmed or Death Certificate Only. *In situ* cancers except those of the bladder were excluded. Deaths were 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 analyses were conducted by MCSS.

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

- Not applicable; site is sex-specific or not available.

Table II-1: Number of new cases and deaths and average annual incidence and mortality rates[§] by anatomic site and gender, all races combined, Minnesota, 1998-2002 (continued)

Cancer Site	Incidence						Mortality					
	New Cases 1998-2002			Average Annual Rate			Deaths 1998-2002			Average Annual Rate		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Respiratory System	8,317	6,199	14,516	79.8	48.3	61.8	6,533	4,944	11,477	64.1	37.2	48.5
Nose, Nasal Cavity & Middle Ear	97	68	165	0.9	0.5	0.7	34	21	55	0.3	0.2	0.2
Larynx	638	157	795	6.0	1.2	3.4	198	46	244	2.0	0.4	1.0
Lung & Bronchus	7,530	5,965	13,495	72.5	46.4	57.5	6,283	4,868	11,151	61.7	36.6	47.1
Pleura†	6	3	9	0.1	0.0	0.0	-	-	-	-	-	-
Trachea, Mediastinum & Other	46	6	52	0.4	0.1	0.2	12	6	18	0.1	0.0	0.1
Mesothelioma (all sites)‡	262	55	317	2.6	0.4	1.3	165	33	198	2.0	0.3	1.0
Bones & Joints	142	109	251	1.2	0.8	1.0	52	40	92	0.5	0.3	0.4
Soft Tissue incl. Heart	379	350	729	3.4	2.7	3.0	175	157	332	1.6	1.1	1.4
Skin	2,444	2,195	4,639	22.2	17.1	19.1	489	290	779	4.7	2.1	3.2
Melanoma of the Skin	2,182	1,986	4,168	19.7	15.6	17.2	364	235	599	3.4	1.7	2.5
Other Non-Epithelial Skin	262	209	471	2.5	1.5	1.9	125	55	180	1.3	0.4	0.7
Kaposi Sarcoma (all sites)‡	56	5	61	0.5	0.0	0.2	1	0	1	0.0	0.0	0.0
Breast	133	17,902	18,035	1.3	139.0	74.9	29	3,444	3,473	0.3	25.2	14.2
Female Genital System	-	6,517	-	-	50.9	-	-	2,105	-	-	15.4	-
Cervix Uteri	-	843	-	-	6.7	-	-	197	-	-	1.5	-
Corpus & Uterus, NOS	-	3,410	-	-	26.7	-	-	558	-	-	4.0	-
Ovary	-	1,733	-	-	13.5	-	-	1,203	-	-	8.9	-
Vagina	-	84	-	-	0.6	-	-	28	-	-	0.2	-
Vulva	-	352	-	-	2.6	-	-	68	-	-	0.4	-
Other Female Genital Organs	-	95	-	-	0.7	-	-	51	-	-	0.4	-
Male Genital System	20,531	-	-	196.6	-	-	3,008	-	-	32.5	-	-
Prostate	19,482	-	-	188.1	-	-	2,960	-	-	32.1	-	-
Testis	910	-	-	7.2	-	-	31	-	-	0.3	-	-
Penis	104	-	-	1.0	-	-	12	-	-	0.1	-	-
Other Male Genital Organs	35	-	-	0.3	-	-	5	-	-	0.1	-	-

(Continues on next page)

Source: MCSS (April 2005). All cases were either microscopically confirmed or Death Certificate Only. *In situ* cancers except those of the bladder were excluded. Deaths were 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 analyses were conducted by MCSS.

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Mesotheliomas of the pleura are included in the separate group Mesothelioma for incidence. Data are not shown for mortality due to a coding change that occurred in 1999.

‡ Mortality for Mesotheliomas and Kaposi Sarcomas are for the 4-year period 1999-2002. Category did not exist in mortality coding until 1999.

- Not applicable; site is sex-specific or not available.

Table II-1: Number of new cases and deaths and average annual incidence and mortality rates[§] by anatomic site and gender, all races combined, Minnesota, 1998-2002 (continued)

Cancer Site	Incidence						Mortality					
	New Cases 1998-2002			Average Annual Rate			Deaths 1998-2002			Average Annual Rate		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Urinary System	5,906	2,584	8,490	57.1	19.4	35.7	1,386	765	2,151	14.0	5.2	8.8
Urinary Bladder	3,891	1,353	5,244	38.3	9.9	22.0	718	324	1,042	7.5	2.1	4.2
Kidney & Renal Pelvis	1,885	1,156	3,041	17.4	8.9	12.8	629	416	1,045	6.1	2.9	4.3
Ureter	92	62	154	0.9	0.4	0.6	19	13	32	0.2	0.1	0.1
Other Urinary Organs	38	13	51	0.4	0.1	0.2	20	12	32	0.2	0.1	0.1
Eye & Orbit	90	72	162	0.8	0.6	0.7	9	8	17	0.1	0.1	0.1
Brain & Other Nervous System	967	707	1,674	8.4	5.6	7.0	701	512	1,213	6.4	4.0	5.1
Brain	911	665	1,576	8.0	5.3	6.5	-	-	-	-	-	-
Other Nervous System	56	42	98	0.5	0.3	0.4	-	-	-	-	-	-
Endocrine System	541	1,307	1,848	4.6	10.5	7.5	84	82	166	0.8	0.6	0.7
Thyroid	461	1,256	1,717	3.9	10.1	7.0	37	60	97	0.4	0.4	0.4
Other Endocrine incl. Thymus	80	51	131	0.7	0.4	0.5	47	22	69	0.4	0.2	0.3
Lymphoma	3,125	2,738	5,863	28.9	20.7	24.3	1,243	1,096	2,339	12.3	7.6	9.6
Hodgkin Lymphoma	421	338	759	3.5	2.7	3.1	80	45	125	0.7	0.3	0.5
Non-Hodgkin Lymphoma	2,704	2,400	5,104	25.4	18.1	21.3	1,163	1,051	2,214	11.6	7.3	9.1
Multiple Myeloma	652	533	1,185	6.3	4.0	5.0	471	445	916	4.8	3.2	3.8
Leukemia	1,941	1,402	3,343	18.4	10.4	13.9	1,121	892	2,013	11.3	6.2	8.2
Lymphocytic Leukemia	1,018	665	1,683	9.6	5.0	7.0	384	255	639	3.9	1.7	2.6
Acute Lymphocytic Leukemia	203	129	332	1.7	1.1	1.4	68	40	108	0.6	0.3	0.4
Chronic Lymphocytic Leukemia	731	503	1,234	7.1	3.7	5.2	293	203	496	3.1	1.3	2.0
Other Lymphocytic Leukemia	84	33	117	0.8	0.3	0.5	23	12	35	0.2	0.1	0.1
Myeloid & Monocytic Leukemia	855	654	1,509	8.2	4.8	6.3	544	476	1,020	5.4	3.4	4.2
Acute Myeloid Leukemia	512	414	926	4.9	3.1	3.8	389	344	733	3.8	2.5	3.0
Acute Monocytic Leukemia	52	39	91	0.5	0.3	0.4	6	10	16	0.1	0.1	0.1
Chronic Myeloid Leukemia	274	189	463	2.6	1.4	1.9	107	72	179	1.0	0.5	0.7
Other Myeloid/Monocytic Leukemia	17	12	29	0.2	0.1	0.1	42	50	92	0.4	0.4	0.4
Other Leukemia	68	83	151	0.7	0.6	0.6	193	161	354	2.0	1.1	1.4
Miscellaneous	1,022	1,024	2,046	9.9	7.4	8.5	1,762	1,779	3,541	17.7	12.4	14.5

Source: MCSS (April 2005). All cases were either microscopically confirmed or Death Certificate Only. *In situ* cancers except those of the bladder were excluded. Deaths were 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 analyses were conducted by MCSS.

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

- Not applicable; site is sex-specific or not available.

Table II-2: Age-specific rates[§] of newly diagnosed cancers by anatomic site, males, all races combined, Minnesota, 1998-2002

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 Cancer Sites Combined [^]	28	13	13	24	25	61	69	97	136	252	487	940	1588	2330	3042	3278	3269	2765
Oral Cavity & Pharynx	0.2	0.0	0.1	0.3	0.5	1.7	1.8	4.4	8.1	15.1	29.3	38.6	43.2	50.7	71.6	57.4	69.6	77.4
Lip	0.0	0.0	0.0	0.0	0.0	0.1	0.2	1.2	0.9	1.2	3.3	4.7	8.4	9.6	16.2	20.2	26.0	29.5
Tongue	0.0	0.0	0.0	0.0	0.2	0.4	0.1	0.7	1.7	3.8	7.6	12.8	10.5	12.4	13.7	8.9	11.2	12.0
Salivary Gland	0.0	0.0	0.1	0.1	0.0	0.5	0.6	0.5	1.1	1.2	1.2	2.1	3.0	3.6	4.7	7.0	10.6	12.8
Floor of Mouth	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.1	2.4	2.8	3.2	5.2	4.0	3.5	3.5	0.8
Gum & Other Mouth	0.0	0.0	0.0	0.1	0.0	0.4	0.3	0.6	1.0	1.5	3.5	4.4	5.7	5.8	12.1	7.8	10.0	13.6
Nasopharynx	0.1	0.0	0.0	0.1	0.2	0.1	0.2	0.4	0.2	0.5	1.2	0.7	0.9	0.8	1.9	1.6	1.8	0.8
Tonsil	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.8	2.3	4.8	6.6	6.3	5.9	5.0	5.9	3.9	1.2	1.6
Oropharynx	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.5	1.2	0.9	1.9	2.8	0.8	0.6	0.8
Hypopharynx	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.8	2.6	2.8	3.2	5.8	8.4	3.5	4.7	4.0
Other Oral Cavity & Pharynx	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.2	0.2	0.4	0.7	1.6	0.6	1.9	0.4	0.0	1.6
Digestive System	1.3	0.2	0.2	0.9	1.6	4.1	6.7	13.4	24.1	50.1	99.6	156.7	267.9	376.7	515.5	596.3	659.2	694.9
Esophagus	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	1.4	3.9	8.8	15.2	23.2	37.7	49.2	45.8	44.8	33.5
Stomach	0.0	0.0	0.0	0.0	0.1	0.2	0.6	1.8	2.2	3.5	8.0	11.2	25.9	27.8	40.8	59.0	67.9	80.6
Small Intestine	0.0	0.0	0.0	0.0	0.0	0.4	0.3	0.6	0.9	2.1	2.6	5.1	5.7	7.7	12.1	12.0	12.4	16.0
Colon & Rectum	0.0	0.0	0.0	0.5	1.2	3.0	3.5	7.0	13.0	27.0	56.6	93.1	166.1	228.3	309.9	356.2	430.2	469.1
Colon excl. Rectum	0.0	0.0	0.0	0.2	0.7	2.0	2.2	3.8	6.4	16.2	35.7	61.7	105.6	156.4	222.7	264.2	325.7	363.0
Rectum & Rectosigmoid Junction	0.0	0.0	0.0	0.3	0.5	1.0	1.3	3.2	6.5	10.8	20.9	31.4	60.4	71.9	87.2	92.0	104.5	106.1
Anus, Anal Canal & Anorectum	0.0	0.0	0.0	0.0	0.0	0.1	0.2	1.0	1.1	1.3	1.1	1.6	2.0	4.1	2.2	1.9	2.4	3.2
Liver & Intrahepatic Bile Duct	1.1	0.2	0.2	0.4	0.0	0.1	0.6	1.2	2.3	4.5	7.6	9.1	12.3	17.4	25.2	33.8	21.8	13.6
Liver	1.1	0.2	0.2	0.3	0.0	0.1	0.4	1.0	1.9	4.4	6.8	7.9	11.6	14.9	21.8	27.9	15.3	12.8
Intrahepatic Bile Duct	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.2	0.4	0.1	0.8	1.2	0.7	2.5	3.4	5.8	6.5	0.8
Gallbladder	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.1	1.1	1.6	2.2	4.0	5.4	8.9	10.4
Other Biliary	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.6	0.8	1.7	2.8	3.4	5.2	9.3	10.5	8.9	17.6
Pancreas	0.0	0.0	0.0	0.0	0.0	0.1	0.9	1.1	2.1	5.7	12.6	17.0	25.2	43.0	57.9	62.9	53.7	48.7
Retroperitoneum	0.2	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.3	0.3	0.0	0.7	0.8	1.2	3.1	1.8	1.6
Peritoneum, Omentum, & Mesentery	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.2	0.3	0.0	0.5	0.3	0.9	0.0	0.6	0.0
Other Digestive Organs	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.2	0.4	0.0	0.5	1.4	2.2	2.5	5.8	5.9	0.8

(Continues on next page)

Source: MCSS (April 2005). All cases were either microscopically confirmed or Death Certificate Only. *In situ* cancers except those of the bladder were excluded. All analyses were conducted by MCSS.

§ Rates are per 100,000 persons.

^ All Cancer Sites Combined rounded to nearest whole number.

- Not applicable; site is sex-specific or not available.

Table II-2: Age-specific rates[§] of newly diagnosed cancers by anatomic site, males, all races combined, Minnesota, 1998-2002 (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	0.5	0.1	0.1	0.8	1.0	2.4	2.2	5.5	11.1	31.0	60.7	132.0	246.7	369.9	502.1	534.6	473.3	288.0
Nose, Nasal Cavity & Middle Ear	0.2	0.0	0.0	0.0	0.0	0.1	0.1	0.6	0.4	0.5	1.3	1.1	3.2	2.2	4.4	5.0	4.7	4.0
Larynx	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.4	1.2	3.9	6.0	14.9	22.5	27.3	35.8	29.5	25.4	15.2
Lung & Bronchus	0.0	0.1	0.1	0.3	0.1	1.0	1.4	4.4	9.2	26.3	52.9	115.7	221.1	339.8	460.7	498.2	442.6	268.1
Pleura [‡]	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.3	0.3	0.8	0.0	0.0
Trachea, Mediastinum & Other	0.2	0.0	0.0	0.5	0.7	1.1	0.3	0.2	0.3	0.2	0.4	0.4	0.0	0.3	0.9	1.2	0.6	0.8
Mesothelioma (all sites)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.2	0.9	0.9	3.0	7.7	10.5	16.5	16.7	21.2	15.2
Bones & Joints	0.2	0.7	1.5	2.1	1.3	0.6	0.8	0.5	0.6	1.7	0.5	1.9	1.4	3.6	3.1	0.4	2.4	0.8
Soft Tissue incl. Heart	1.6	0.9	0.5	1.0	1.4	1.6	2.0	1.7	2.8	3.5	3.8	5.3	6.1	7.7	12.1	12.8	12.4	11.2
Skin	0.2	0.0	0.2	1.2	3.5	4.6	8.7	14.8	18.3	25.2	29.4	37.3	53.4	68.3	74.1	92.3	109.8	101.3
Melanoma of the Skin	0.0	0.0	0.2	1.0	3.4	4.2	7.2	13.3	17.6	23.3	27.4	35.1	48.6	59.5	64.8	79.1	89.7	83.8
Other Non-Epithelial Skin	0.2	0.0	0.0	0.1	0.1	0.4	1.5	1.5	0.7	1.9	2.0	2.3	4.8	8.8	9.3	13.2	20.1	17.6
Kaposi Sarcoma (all sites)	0.0	0.0	0.0	0.1	0.2	0.5	0.1	1.1	1.3	0.4	1.1	0.2	0.2	0.6	0.3	1.2	1.8	0.8
Breast	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.4	0.7	0.5	1.1	2.3	2.3	3.0	5.0	8.9	8.9	15.2
Female Genital System	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cervix Uteri	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Corpus & Uterus, NOS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ovary	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vagina	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vulva	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other Female Genital Organs	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Male Genital System	1.2	0.3	0.4	4.1	10.5	21.6	17.6	16.9	18.7	44.5	138.1	353.7	642.3	996.4	1235.3	1201.9	1012.1	782.7
Prostate	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.7	5.9	36.3	133.2	347.2	637.3	986.8	1227.2	1193.8	1005.0	773.9
Testis	1.1	0.2	0.3	4.0	10.4	21.6	17.4	15.8	12.6	7.4	4.2	2.6	2.5	2.5	2.2	0.8	1.2	0.0
Penis	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.1	0.3	0.4	3.3	1.8	5.8	4.7	5.8	4.7	5.6
Other Male Genital Organs	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.4	0.3	0.5	0.7	1.4	1.2	1.6	1.2	3.2

(Continues on next page)

Source: MCSS (April 2005). All cases were either microscopically confirmed or Death Certificate Only. *In situ* cancers except those of the bladder were excluded. All analyses were conducted by MCSS.

[§] Rates are per 100,000 persons.

[‡] Mesotheliomas of the pleura are included in the separate group Mesothelioma for incidence.

- Not applicable; site is sex-specific or not available.

Table II-2: Age-specific rates[§] of newly diagnosed cancers by anatomic site, males, all races combined, Minnesota, 1998-2002 (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	2.9	0.6	0.1	0.3	0.8	1.4	2.9	7.2	14.9	26.5	47.7	91.3	144.5	217.8	298.1	357.7	414.9	368.6
Urinary Bladder	0.4	0.0	0.1	0.2	0.5	0.5	1.8	2.5	6.5	11.4	25.1	49.4	90.2	147.3	214.6	251.8	309.8	314.3
Kidney & Renal Pelvis	2.5	0.6	0.0	0.1	0.4	0.9	1.1	4.7	8.4	14.7	22.1	40.5	50.2	65.3	80.4	97.4	89.7	39.1
Ureter	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.3	1.2	3.0	3.9	2.8	6.6	9.4	8.0
Other Urinary Organs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.2	1.1	1.4	0.3	1.9	5.9	7.2
Eye & Orbit	1.1	0.0	0.1	0.0	0.0	0.2	0.3	0.2	0.3	0.5	0.7	1.1	2.0	2.8	3.7	3.1	5.3	4.8
Brain & Other Nervous System	4.4	3.8	3.0	3.7	2.2	4.3	4.0	5.6	5.2	9.3	10.1	18.2	17.9	20.4	26.2	29.1	23.6	9.6
Brain	3.8	3.3	2.9	3.7	1.9	4.0	3.9	5.0	4.7	8.2	9.8	17.9	17.3	19.0	25.5	27.5	23.6	9.6
Other Nervous System	0.6	0.4	0.1	0.0	0.2	0.4	0.1	0.7	0.5	1.1	0.3	0.4	0.7	1.4	0.6	1.6	0.0	0.0
Endocrine System	1.4	0.3	0.4	1.0	2.4	3.8	5.0	4.7	6.6	5.7	5.8	7.5	7.3	10.2	9.3	14.7	11.2	2.4
Thyroid	0.1	0.1	0.2	0.5	1.9	3.3	5.0	4.6	6.1	5.1	5.1	6.1	6.6	8.5	7.5	12.8	8.3	1.6
Other Endocrine incl. Thymus	1.3	0.2	0.2	0.5	0.5	0.5	0.0	0.1	0.6	0.6	0.7	1.4	0.7	1.7	1.9	1.9	3.0	0.8
Lymphoma	1.1	1.6	3.5	5.1	6.8	9.4	12.4	13.3	13.9	20.7	30.3	44.9	66.6	84.8	107.1	147.0	178.8	150.8
Hodgkin Lymphoma	0.0	0.3	1.7	3.0	4.0	5.2	7.0	4.6	2.9	3.5	2.8	3.0	3.6	5.8	7.2	4.7	4.1	7.2
Non-Hodgkin Lymphoma	1.1	1.2	1.8	2.1	2.9	4.2	5.4	8.7	11.0	17.2	27.6	41.9	62.9	79.0	100.0	142.4	174.7	143.6
Multiple Myeloma	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.7	1.3	4.4	6.0	8.8	15.9	25.3	34.6	31.8	51.3	39.1
Leukemia	10.1	4.7	2.6	3.7	3.0	3.8	3.0	4.7	5.8	6.4	12.7	23.7	36.6	54.0	78.8	109.0	136.3	120.5
Lymphocytic Leukemia	8.0	3.7	1.8	2.5	0.4	1.1	0.6	1.8	2.9	4.3	6.3	13.0	22.5	33.3	41.7	46.9	62.6	54.3
Acute Lymphocytic Leukemia	8.0	3.7	1.8	2.5	0.4	1.1	0.3	0.5	0.8	0.9	0.4	0.2	1.4	1.7	1.2	1.2	1.2	0.8
Chronic Lymphocytic Leukemia	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.8	1.3	2.7	4.7	11.2	18.4	30.3	38.3	41.9	56.7	52.7
Other Lymphocytic Leukemia	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.6	0.9	0.8	1.2	1.6	2.7	1.4	2.2	3.9	4.7	0.8
Myeloid & Monocytic Leukemia	1.9	0.7	0.8	1.0	2.5	2.6	2.3	2.6	2.7	1.8	5.9	10.3	13.9	20.4	35.5	58.6	64.9	52.7
Acute Myeloid Leukemia	1.4	0.3	0.8	1.0	1.7	1.4	0.9	1.1	1.3	1.0	3.8	6.8	8.9	11.8	22.7	33.4	34.2	36.7
Acute Monocytic Leukemia	0.5	0.1	0.0	0.0	0.1	0.2	0.2	0.1	0.3	0.2	0.7	0.5	0.7	1.4	0.9	3.9	3.5	0.8
Chronic Myeloid Leukemia	0.0	0.2	0.0	0.0	0.7	1.0	1.1	1.5	1.1	0.5	1.4	2.8	4.1	7.2	11.2	20.2	24.2	13.6
Other Myeloid/Monocytic Leukemia	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.0	0.2	0.2	0.0	0.6	1.2	3.0	1.6
Other Leukemia	0.1	0.3	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.5	0.4	0.2	0.3	1.6	3.5	8.9	13.6
Miscellaneous	1.3	0.2	0.5	0.0	0.0	0.4	1.0	1.1	2.3	5.1	8.9	13.7	25.9	27.3	48.6	62.9	76.7	82.2

Source: MCSS (April 2005). All cases were either microscopically confirmed or Death Certificate Only. *In situ* cancers except those of the bladder were excluded. All analyses were conducted by MCSS.

§ Rates are per 100,000 persons.

- Not applicable; site is sex-specific or not available.

Table II-3: Age-specific rates[§] of newly diagnosed cancers by anatomic site, females, all races combined, Minnesota, 1998-2002

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 Cancer Sites Combined [^]	20	10	13	21	38	65	106	157	259	395	593	861	1133	1424	1641	1831	1882	1623
Oral Cavity & Pharynx	0.0	0.0	0.7	0.3	0.5	1.4	1.7	2.3	4.6	5.3	9.9	11.5	18.1	20.1	30.6	25.9	33.6	31.1
Lip	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.4	0.9	0.7	1.5	1.0	2.6	3.9	3.2	6.4
Tongue	0.0	0.0	0.0	0.0	0.1	0.0	0.3	0.6	1.8	1.4	2.2	3.6	4.7	4.2	6.7	5.9	8.1	5.1
Salivary Gland	0.0	0.0	0.6	0.1	0.0	1.0	0.9	0.4	0.7	1.1	1.8	1.0	2.6	2.5	4.1	3.7	5.3	4.5
Floor of Mouth	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.9	1.9	2.4	3.5	2.3	1.4	1.1	2.2
Gum & Other Mouth	0.0	0.0	0.0	0.0	0.1	0.3	0.1	0.7	0.5	0.9	1.8	1.0	3.2	4.5	6.7	6.8	11.9	9.9
Nasopharynx	0.0	0.0	0.1	0.2	0.2	0.1	0.1	0.2	0.2	0.1	0.5	0.5	0.9	0.7	1.0	0.8	0.4	0.3
Tonsil	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.3	0.3	1.3	1.7	1.3	0.7	3.6	1.4	1.4	1.0
Oropharynx	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.2	0.4	0.7	0.3	0.8	1.4	0.3
Hypopharynx	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.2	0.1	0.7	0.6	1.7	2.8	1.1	0.7	1.0
Other Oral Cavity & Pharynx	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.2	0.4	0.5	0.5	0.0	0.4	0.3
Digestive System	0.4	0.1	0.0	0.8	0.7	2.4	5.9	10.3	20.5	36.1	61.0	107.2	160.5	249.4	335.2	436.2	515.3	497.6
Esophagus	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.4	0.7	0.8	3.1	5.2	9.7	10.3	11.5	12.3	13.1
Stomach	0.0	0.0	0.0	0.2	0.0	0.6	0.9	1.0	1.4	2.0	3.4	5.2	7.3	10.2	18.5	22.2	33.6	37.8
Small Intestine	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.3	0.5	1.5	2.2	2.9	4.5	7.4	5.9	9.0	11.2	10.3
Colon & Rectum	0.0	0.0	0.0	0.2	0.5	1.4	3.7	6.9	12.7	22.8	39.8	68.5	99.9	159.0	218.6	289.9	370.6	356.9
Colon excl. Rectum	0.0	0.0	0.0	0.1	0.4	1.1	2.4	4.7	8.4	14.3	26.8	47.8	77.2	116.9	178.2	236.1	309.3	299.1
Rectum & Rectosigmoid Junction	0.0	0.0	0.0	0.1	0.1	0.3	1.4	2.2	4.3	8.5	13.0	20.8	22.7	42.1	40.4	53.8	61.3	57.7
Anus, Anal Canal & Anorectum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.4	2.0	1.8	3.3	0.6	3.7	3.6	7.3	4.9	4.8
Liver & Intrahepatic Bile Duct	0.1	0.1	0.0	0.2	0.1	0.1	0.0	0.8	0.7	1.5	2.8	2.2	4.5	5.4	8.2	13.8	10.5	7.1
Liver	0.1	0.1	0.0	0.2	0.1	0.1	0.0	0.5	0.6	1.1	2.5	1.5	2.8	3.0	6.2	10.4	6.7	5.5
Intrahepatic Bile Duct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.4	0.3	0.7	1.7	2.5	2.1	3.4	3.9	1.6
Gallbladder	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.3	0.9	2.9	1.9	7.2	8.0	10.4	7.4	10.9
Other Biliary	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.3	0.5	0.8	1.0	3.7	4.2	6.4	7.3	7.0	5.8
Pancreas	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.6	2.7	3.3	5.8	10.6	22.9	32.7	41.2	52.9	47.6	43.3
Retroperitoneum	0.3	0.0	0.0	0.1	0.0	0.0	0.2	0.1	0.1	0.3	0.3	0.7	1.1	1.2	0.3	0.8	1.1	1.3
Peritoneum, Omentum, & Mesentery	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.2	0.9	2.2	6.4	8.0	6.7	11.8	9.3	6.3	3.8
Other Digestive Organs	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.2	0.1	0.3	0.9	2.0	2.3	1.7	2.8	2.6

(Continues on next page)

Source: MCSS (April 2005). All cases were either microscopically confirmed or Death Certificate Only. *In situ* cancers except those of the bladder were excluded. All analyses were conducted by MCSS.

[§] Rates are per 100,000 persons.

[^] All Cancer Sites Combined rounded to nearest whole number.

- Not applicable; site is sex-specific or not available.

Table II-3: Age-specific rates[§] of newly diagnosed cancers by anatomic site, females, all races combined, Minnesota, 1998-2002 (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	0.3	0.1	0.0	0.2	0.2	0.6	2.1	5.6	10.7	25.1	51.2	101.3	174.3	234.5	282.2	267.6	233.3	104.2
Nose, Nasal Cavity & Middle Ear	0.1	0.0	0.0	0.0	0.1	0.0	0.3	0.3	0.2	0.1	0.9	1.0	0.9	2.2	2.1	2.5	2.8	1.9
Larynx	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.6	0.4	1.6	0.9	2.6	5.6	6.2	7.0	3.9	3.5	1.6
Lung & Bronchus	0.0	0.1	0.0	0.2	0.1	0.6	1.5	4.7	10.1	23.2	49.3	97.7	167.2	225.9	273.2	260.9	227.0	100.4
Pleura [‡]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.3
Trachea, Mediastinum & Other	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.6	0.2	0.0	0.0	0.0	0.0
Mesothelioma (all sites)	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.2	0.3	0.0	0.9	1.3	1.5	2.1	1.4	3.9	2.2
Bones & Joints	0.3	0.6	0.6	1.9	0.9	0.6	0.7	0.6	0.1	0.5	1.1	1.0	0.4	1.2	1.3	2.3	2.5	2.9
Soft Tissue incl. Heart	1.9	0.6	0.4	0.8	2.4	1.3	1.0	2.0	1.9	2.9	2.8	3.8	5.4	6.7	8.2	7.3	12.3	9.0
Skin	0.0	0.2	0.4	2.5	8.9	14.1	18.7	19.9	22.7	25.2	27.1	23.4	30.4	36.7	32.7	38.3	36.4	50.3
Melanoma of the Skin	0.0	0.1	0.0	1.9	8.1	13.3	17.5	18.7	21.4	23.9	26.1	21.3	28.3	32.9	28.6	33.5	30.1	37.2
Other Non-Epithelial Skin	0.0	0.1	0.4	0.7	0.9	0.9	1.1	1.2	1.4	1.3	0.9	2.1	2.2	3.7	4.1	4.8	6.3	13.1
Kaposi Sarcoma (all sites)	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.3
Breast	0.0	0.0	0.0	0.0	0.2	9.0	24.1	56.9	116.5	185.3	268.6	352.6	418.9	455.7	467.0	499.0	470.8	433.2
Female Genital System	0.3	0.2	0.8	1.9	4.6	10.3	16.7	24.4	35.5	56.4	90.8	134.3	159.9	172.9	167.6	174.8	180.1	128.6
Cervix Uteri	0.0	0.0	0.0	0.4	1.9	6.2	9.7	12.2	12.4	10.2	10.0	11.2	10.6	10.4	10.3	6.5	9.8	7.4
Corpus & Uterus, NOS	0.0	0.0	0.0	0.0	0.2	1.5	3.1	6.2	11.1	25.5	50.5	84.0	103.1	102.5	95.5	98.5	93.9	66.0
Ovary	0.1	0.2	0.7	1.3	2.2	1.9	2.8	4.5	9.4	18.1	24.4	32.1	36.7	47.3	48.7	50.4	50.8	32.1
Vagina	0.1	0.0	0.1	0.0	0.0	0.1	0.3	0.1	0.2	0.4	0.9	2.2	2.2	2.0	2.8	2.3	1.8	2.9
Vulva	0.0	0.0	0.0	0.0	0.2	0.3	0.5	1.1	2.0	1.8	3.8	3.6	5.2	7.9	8.0	13.8	21.0	16.4
Other Female Genital Organs	0.0	0.0	0.0	0.1	0.0	0.3	0.3	0.3	0.5	0.3	1.2	1.2	2.2	2.7	2.3	3.4	2.8	3.8
Male Genital System	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Prostate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Testis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Penis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other Male Genital Organs	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

(Continues on next page)

Source: MCSS (April 2005). All cases were either microscopically confirmed or Death Certificate Only. *In situ* cancers except those of the bladder were excluded. All analyses were conducted by MCSS.

[§] Rates are per 100,000 persons.

[‡] Mesotheliomas of the pleura are included in the separate group Mesothelioma for incidence.

- Not applicable; site is sex-specific or not available.

Table II-3: Age-specific rates[§] of newly diagnosed cancers by anatomic site, females, all races combined, Minnesota, 1998-2002 (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	2.6	0.6	0.1	0.2	0.6	1.0	2.0	2.7	6.2	11.1	20.2	33.3	49.4	81.2	99.6	106.7	118.1	103.9
Urinary Bladder	0.0	0.0	0.0	0.2	0.2	0.5	0.6	0.7	2.7	3.8	8.7	17.5	23.9	40.6	48.7	60.2	67.3	74.4
Kidney & Renal Pelvis	2.6	0.6	0.1	0.0	0.4	0.5	1.5	2.0	3.4	7.3	11.4	15.6	24.2	38.4	48.1	42.8	44.8	24.4
Ureter	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.3	1.7	2.1	3.1	5.6	4.2
Other Urinary Organs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.5	0.8	0.6	0.4	1.0
Eye & Orbit	1.1	0.0	0.1	0.0	0.1	0.1	0.3	0.4	0.6	0.7	0.3	0.7	0.4	1.0	2.8	2.0	0.7	2.9
Brain & Other Nervous System	2.9	2.9	3.6	2.4	2.1	2.0	4.0	4.2	3.4	4.2	8.8	10.5	9.9	15.6	14.9	20.0	13.7	5.1
Brain	2.6	2.6	3.4	2.3	2.1	1.8	3.8	3.8	3.0	4.1	8.3	9.6	9.5	14.4	14.7	18.9	13.3	5.1
Other Nervous System	0.3	0.4	0.2	0.1	0.0	0.3	0.1	0.4	0.4	0.1	0.5	0.9	0.4	1.2	0.3	1.1	0.4	0.0
Endocrine System	1.3	0.2	0.7	3.2	8.4	12.2	17.9	16.7	17.8	16.2	13.4	14.8	14.7	14.6	11.6	10.4	7.0	7.4
Thyroid	0.0	0.1	0.6	3.1	8.3	11.6	17.6	16.4	17.4	15.8	13.4	13.7	13.8	13.9	10.6	9.9	6.7	7.4
Other Endocrine incl. Thymus	1.3	0.1	0.1	0.1	0.1	0.6	0.2	0.3	0.4	0.3	0.0	1.0	0.9	0.7	1.0	0.6	0.4	0.0
Lymphoma	1.1	0.8	3.0	4.8	7.4	7.0	8.3	6.6	11.9	15.4	19.6	34.9	41.0	66.4	81.6	114.8	114.6	87.2
Hodgkin Lymphoma	0.0	0.0	2.0	3.4	4.7	4.3	4.8	2.4	3.0	2.1	1.2	2.9	2.2	2.7	3.6	4.2	4.6	3.8
Non-Hodgkin Lymphoma	1.1	0.8	1.0	1.4	2.7	2.7	3.5	4.2	8.9	13.3	18.4	31.9	38.8	63.6	78.0	110.6	110.0	83.4
Multiple Myeloma	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.7	1.1	2.2	3.9	8.8	10.8	12.9	23.9	23.1	26.3	19.6
Leukemia	6.8	3.1	2.4	2.2	0.9	1.4	2.5	3.0	3.3	5.3	10.8	13.6	21.8	31.0	43.0	51.5	57.8	72.5
Lymphocytic Leukemia	5.2	2.2	1.3	0.8	0.1	0.4	0.6	0.5	1.0	2.2	5.1	6.9	10.4	17.3	21.9	23.4	25.9	33.0
Acute Lymphocytic Leukemia	5.2	2.2	1.3	0.8	0.1	0.4	0.5	0.3	0.3	0.5	0.7	0.3	0.4	0.5	2.3	1.4	0.7	1.3
Chronic Lymphocytic Leukemia	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.6	1.3	3.8	6.0	9.5	16.1	18.5	20.3	24.5	30.8
Other Lymphocytic Leukemia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.3	0.7	0.5	0.4	0.7	1.0	1.7	0.7	1.0
Myeloid & Monocytic Leukemia	1.5	0.7	1.0	1.3	0.7	0.8	1.8	2.4	2.1	3.0	4.6	6.4	10.1	12.1	19.1	26.7	27.3	31.7
Acute Myeloid Leukemia	1.3	0.1	0.8	1.0	0.5	0.6	1.5	1.8	1.1	1.9	2.8	3.3	6.3	8.2	11.6	16.9	15.4	21.8
Acute Monocytic Leukemia	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.4	0.1	0.3	0.3	1.1	1.0	0.8	2.0	1.4	1.0
Chronic Myeloid Leukemia	0.1	0.5	0.1	0.2	0.1	0.1	0.3	0.6	0.6	1.0	1.6	2.6	2.8	3.0	6.4	7.3	9.8	7.7
Other Myeloid/Monocytic Leukemia	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.2	0.0	0.0	0.3	0.6	0.7	1.3
Other Leukemia	0.1	0.1	0.1	0.1	0.0	0.3	0.1	0.1	0.2	0.1	1.1	0.3	1.3	1.5	2.1	1.4	4.6	7.7
Miscellaneous	1.0	0.6	0.1	0.0	0.2	0.6	0.5	1.0	2.3	3.4	4.1	9.3	16.4	23.3	36.8	49.5	54.6	65.4

Source: MCSS (April 2005). All cases were either microscopically confirmed or Death Certificate Only. *In situ* cancers except those of the bladder were excluded. All analyses were conducted by MCSS.

§ Rates are per 100,000 persons.

- Not applicable; site is sex-specific or not available.

Table II-4: Age-specific rates[§] of cancer deaths by anatomic site, males, all races combined, Minnesota, 1998-2002

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 Cancer Sites Combined [^]	2	3	2	4	6	7	12	21	34	73	135	268	471	747	1131	1510	1952	2690
Oral Cavity & Pharynx	0.0	0.0	0.1	0.0	0.1	0.1	0.2	0.3	0.6	1.9	4.1	6.7	8.9	12.4	20.9	15.1	20.7	26.3
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	0.0	0.3	0.3	0.0	0.0	3.2
Tongue	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.1	0.5	1.1	1.9	1.8	1.9	5.9	4.3	5.3	4.0
Salivary Gland	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.3	0.4	0.7	0.0	1.4	1.9	1.6	1.8	4.8
Floor of Mouth	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.5	0.0	0.6	0.0	0.6	0.0
Gum & Other Mouth	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.2	0.3	0.5	0.9	2.8	2.8	3.5	4.1	1.6
Nasopharynx	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.2	0.1	0.4	0.2	0.0	0.3	0.3	0.8	1.8	0.8
Tonsil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5	1.2	1.1	1.4	0.3	1.6	1.2	0.0	3.2
Oropharynx	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.7	1.6	1.9	0.9	0.8	2.4	4.0
Hypopharynx	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1.4	0.8	1.6	1.6	0.6	0.8
Other Oral Cavity & Pharynx	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.7	0.9	1.4	2.8	5.0	1.6	4.1	4.0
Digestive System	0.2	0.0	0.1	0.2	0.7	1.0	2.3	4.3	8.2	21.2	41.5	74.8	123.1	184.2	261.0	359.7	410.1	587.2
Esophagus	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.4	0.8	3.0	7.0	13.1	22.9	34.1	42.4	49.7	44.3	45.5
Stomach	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.6	1.0	1.7	4.1	5.6	11.1	12.7	20.6	33.8	41.3	63.0
Small Intestine	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.6	0.4	1.1	1.4	2.2	3.1	3.9	3.0	4.8
Colon & Rectum	0.0	0.0	0.0	0.0	0.2	0.5	1.0	1.4	2.9	6.5	13.1	26.8	45.4	71.1	91.6	141.6	187.7	296.0
Colon excl. Rectum	0.0	0.0	0.0	0.0	0.2	0.0	0.8	1.0	2.1	5.1	11.2	20.9	36.4	57.8	73.2	122.2	154.0	261.7
Rectum & Rectosigmoid Junction	0.0	0.0	0.0	0.0	0.0	0.5	0.2	0.4	0.8	1.4	2.0	6.0	9.1	13.2	18.4	19.4	33.6	34.3
Anus, Anal Canal & Anorectum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.1	0.2	0.2	0.6	0.3	0.8	0.6	0.8
Liver & Intrahepatic Bile Duct	0.2	0.0	0.1	0.2	0.4	0.0	0.2	1.1	1.5	4.0	5.5	8.2	11.1	17.6	27.4	37.2	36.0	35.9
Liver	0.2	0.0	0.1	0.2	0.4	0.0	0.2	0.9	1.3	3.1	4.9	5.3	9.3	12.7	19.6	27.9	26.6	24.7
Intrahepatic Bile Duct	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.9	0.7	3.0	1.8	5.0	7.8	9.3	9.4	11.2
Gallbladder	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.3	0.5	1.1	1.4	1.6	3.9	5.3	10.4
Other Biliary	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.9	0.2	0.8	4.0	7.0	4.7	16.0
Pancreas	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.7	1.7	4.4	10.6	17.9	27.9	41.6	67.9	79.9	83.8	107.7
Retroperitoneum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.2	0.3	0.3	0.0	0.6	0.0
Peritoneum, Omentum, & Mesentery	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.3	0.3	0.4	0.0	0.0
Other Digestive Organs	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.4	1.1	1.7	1.6	1.6	3.0	7.2

(Continues on next page)

Source: Deaths were 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 analyses were conducted by MCSS.

[§] Rates are per 100,000 persons.

[^] All Cancer Sites Combined rounded to nearest whole number.

- Not applicable; site is sex-specific or not available.

Table II-4: Age-specific rates[§] of cancer deaths by anatomic site, males, all races combined, Minnesota, 1998-2002 (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	0.2	3.4	6.4	18.7	36.9	86.9	172.0	267.7	381.9	452.8	491.6	418.1
Nose, Nasal Cavity & Middle Ear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.5	0.2	0.2	0.6	1.2	2.7	3.0	4.0
Larynx	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.5	1.1	3.9	5.0	8.8	7.5	14.4	14.8	17.6
Lung & Bronchus	0.0	0.0	0.0	0.0	0.0	0.1	0.2	3.3	6.1	17.5	35.2	82.7	166.8	257.2	372.5	434.9	473.9	393.3
Pleura†	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trachea, Mediastinum & Other	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.2	0.0	0.8	0.3	0.0	0.0	3.2
Mesothelioma (all sites) ‡	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.5	0.9	1.1	5.5	6.6	8.1	11.3	15.3	12.0
Bones & Joints	0.0	0.1	0.2	0.5	0.6	0.6	0.1	0.1	0.3	0.4	0.5	0.5	0.5	0.3	1.2	1.6	3.0	1.6
Soft Tissue incl. Heart	0.1	0.3	0.0	0.3	0.2	1.0	0.8	0.9	1.1	1.8	2.2	2.5	2.7	3.0	4.4	7.4	8.9	9.6
Skin	0.0	0.0	0.0	0.0	0.2	0.4	1.2	1.7	2.5	3.0	3.4	6.7	9.3	15.1	20.6	26.0	21.8	56.6
Melanoma of the Skin	0.0	0.0	0.0	0.0	0.2	0.4	1.0	1.7	2.2	2.9	3.0	5.3	7.3	9.9	16.5	17.5	14.2	31.1
Other Non-Epithelial Skin	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.3	0.1	0.4	1.4	2.0	5.2	4.0	8.5	7.7	25.5
Kaposi Sarcoma (all sites) ‡	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Breast	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	1.1	1.1	1.1	0.9	0.8	2.4	3.2
Female Genital System	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cervix Uteri	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Corpus & Uterus, NOS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ovary	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vagina	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vulva	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other Female Genital Organs	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Male Genital System	0.0	0.0	0.0	0.0	0.2	0.4	0.6	0.3	0.8	0.6	3.8	9.3	24.8	59.8	120.2	216.9	388.3	773.9
Prostate	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.4	3.5	8.6	24.3	59.2	119.6	215.7	385.3	768.3
Testis	0.0	0.0	0.0	0.0	0.2	0.4	0.6	0.3	0.6	0.2	0.1	0.5	0.2	0.3	0.6	0.4	0.6	0.0
Penis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.3	0.0	0.8	1.8	3.2
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	0.2	0.0	0.0	0.0	0.0	0.6	2.4

(Continues on next page)

Source: Deaths were 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 analyses were conducted by MCSS.

§ Rates are per 100,000 persons.

† Data are not shown for mortality due to a coding change that occurred in 1999.

‡ Mortality for Mesotheliomas and Kaposi Sarcomas are for the 4-year period 1999-2002. Category did not exist in mortality coding until 1999.

- Not applicable; site is sex-specific or not available.

Table II-4: Age-specific rates[§] of cancer deaths by anatomic site, males, all races combined, Minnesota, 1998-2002 (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+
Urinary System	0.0	0.4	0.0	0.0	0.1	0.1	0.1	0.3	1.3	5.4	7.5	16.1	26.4	43.5	61.4	92.0	115.7	206.6
Urinary Bladder	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.9	2.1	5.1	8.6	20.7	30.8	52.0	70.8	149.2
Kidney & Renal Pelvis	0.0	0.4	0.0	0.0	0.1	0.1	0.1	0.2	1.1	3.4	5.1	10.9	17.5	22.0	29.6	37.6	40.7	47.1
Ureter	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.3	0.9	1.6	3.0	4.0
Other Urinary Organs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.3	0.2	0.2	0.6	0.0	0.8	1.2	6.4
Eye & Orbit	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.2	0.0	0.6	0.3	0.0	0.0	0.8
Brain & Other Nervous System	0.4	0.9	0.7	0.6	0.8	0.9	2.3	3.3	4.6	4.5	8.0	16.0	14.8	19.6	29.0	22.5	33.6	17.6
Endocrine System	0.4	0.2	0.0	0.0	0.2	0.5	0.1	0.2	0.1	0.8	0.5	1.1	1.4	1.7	2.2	5.8	6.5	5.6
Thyroid	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.3	0.5	0.5	0.6	0.9	3.9	5.3	3.2
Other Endocrine incl. Thymus	0.4	0.2	0.0	0.0	0.2	0.4	0.1	0.2	0.1	0.6	0.3	0.5	0.9	1.1	1.2	1.9	1.2	2.4
Lymphoma	0.1	0.1	0.2	0.4	1.0	0.2	2.4	2.7	2.4	4.9	7.4	12.1	22.5	36.9	60.1	73.7	116.8	132.4
Hodgkin Lymphoma	0.0	0.0	0.0	0.2	0.5	0.1	0.7	0.5	0.2	0.6	0.4	1.1	1.6	1.1	4.0	3.5	3.0	5.6
Non-Hodgkin Lymphoma	0.1	0.1	0.2	0.2	0.5	0.1	1.8	2.2	2.2	4.2	7.0	11.0	20.9	35.8	56.1	70.2	113.9	126.9
Multiple Myeloma	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.5	1.5	1.7	3.5	7.7	17.1	22.7	33.0	55.5	55.8
Leukemia	0.5	1.1	0.1	1.5	1.8	1.4	0.9	1.8	2.3	2.9	3.9	10.3	15.2	26.4	49.8	82.3	106.8	146.0
Lymphocytic Leukemia	0.0	0.9	0.1	0.7	1.0	0.1	0.2	0.6	0.8	0.6	0.7	3.0	3.6	9.1	19.0	24.1	37.2	63.8
Acute Lymphocytic Leukemia	0.0	0.9	0.1	0.7	1.0	0.1	0.2	0.3	0.5	0.4	0.4	0.0	0.7	0.8	2.2	1.6	3.5	2.4
Chronic Lymphocytic Leukemia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.2	0.3	2.6	3.0	7.2	15.9	20.6	32.5	57.4
Other Lymphocytic Leukemia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.4	0.0	1.1	0.9	1.9	1.2	4.0
Myeloid & Monocytic Leukemia	0.2	0.2	0.0	0.4	0.7	1.1	0.6	1.2	1.3	1.7	2.9	6.1	8.4	11.8	23.4	44.2	48.4	53.5
Acute Myeloid Leukemia	0.2	0.2	0.0	0.3	0.7	0.9	0.4	0.4	0.8	1.2	2.2	4.2	6.4	8.0	17.4	32.6	34.8	35.9
Acute Monocytic Leukemia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.4	0.6	0.8
Chronic Myeloid Leukemia	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.7	0.3	0.5	0.5	1.6	1.6	1.4	5.6	7.8	8.3	9.6
Other Myeloid/ Monocytic Leukemia	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.4	0.5	2.5	0.3	3.5	4.7	7.2
Other Leukemia	0.2	0.0	0.0	0.3	0.1	0.1	0.1	0.1	0.3	0.5	0.4	1.2	3.2	5.5	7.5	14.0	21.2	28.7
Miscellaneous	0.2	0.1	0.3	0.3	0.2	0.5	0.8	1.3	2.6	4.4	12.3	18.8	35.4	50.7	86.0	109.4	155.2	237.0

Source: Deaths were 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 analyses were conducted by MCSS.

§ Rates are per 100,000 persons.

- Not applicable; site is sex-specific or not available.

Table II-5: Age-specific rates[§] of cancer deaths by anatomic site, females, all races combined, Minnesota, 1998-2002

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 Cancer Sites Combined [^]	2	2	2	4	4	6	13	25	40	81	130	246	366	524	745	939	1133	1443
Oral Cavity & Pharynx	0.0	0.0	0.0	0.1	0.0	0.1	0.2	0.6	0.3	0.8	2.2	2.9	1.9	4.0	6.7	7.9	7.0	15.7
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	0.0	0.0	0.0	0.0	0.0	0.0
Tongue	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.3	0.5	0.4	1.5	1.0	2.0	2.8	3.2
Salivary Gland	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.2	0.1	0.2	0.4	0.0	0.5	1.1	0.7	1.9
Floor of Mouth	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.3	0.3	0.4	0.0
Gum & Other Mouth	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.4	0.2	0.4	1.2	1.8	1.1	2.1	6.4
Nasopharynx	0.0	0.0	0.0	0.1	0.0	0.0	0.2	0.2	0.2	0.0	0.7	0.5	0.2	0.0	0.5	0.3	0.4	1.6
Tonsil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.0	0.0	0.2	0.5	0.6	0.4	0.3
Oropharynx	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.2	0.0	0.3	0.6	0.0	0.6
Hypopharynx	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.3	0.0	0.2	0.8	0.6	0.0	0.6
Other Oral Cavity & Pharynx	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.5	0.2	0.7	1.0	1.4	0.4	1.0
Digestive System	0.1	0.1	0.0	0.4	0.1	0.6	1.8	2.4	6.1	12.6	18.9	41.7	72.5	110.2	159.1	224.9	297.4	452.1
Esophagus	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.3	0.7	1.7	3.9	6.7	9.0	12.1	14.7	18.3
Stomach	0.0	0.0	0.0	0.2	0.0	0.3	0.5	0.3	0.6	1.2	1.6	2.7	3.9	6.7	11.1	16.9	24.5	33.0
Small Intestine	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.5	0.9	1.1	1.0	1.5	2.5	1.1	5.5
Colon & Rectum	0.0	0.0	0.0	0.1	0.1	0.3	1.0	1.0	3.0	5.6	8.8	21.8	31.3	48.5	73.4	99.6	132.4	240.8
Colon excl. Rectum	0.0	0.0	0.0	0.1	0.1	0.0	0.7	1.0	2.5	4.4	6.8	19.4	26.3	40.6	64.9	90.3	114.9	215.1
Rectum & Rectosigmoid Junction	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.0	0.5	1.2	2.0	2.4	5.0	7.9	8.5	9.3	17.5	25.7
Anus, Anal Canal & Anorectum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.3	0.2	0.5	0.5	0.8	0.7	1.0
Liver & Intrahepatic Bile Duct	0.1	0.1	0.0	0.1	0.0	0.1	0.0	0.2	0.3	1.1	2.0	1.9	6.3	6.2	10.3	16.3	23.5	18.0
Liver	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.9	1.2	1.4	2.4	3.2	5.1	7.9	13.0	11.5
Intrahepatic Bile Duct	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.2	0.2	0.8	0.5	3.9	3.0	5.1	8.4	10.5	6.4
Gallbladder	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.1	0.5	1.2	1.9	5.2	3.6	7.3	9.5	12.2
Other Biliary	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.5	1.7	1.8	3.7	4.9	7.4
Pancreas	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.6	1.6	3.5	4.5	9.6	20.1	31.0	42.7	59.7	80.9	107.4
Retroperitoneum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.3	0.0	0.4	0.3
Peritoneum, Omentum, & Mesentery	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.1	0.5	1.9	2.5	3.1	3.9	3.5	1.9
Other Digestive Organs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.2	0.2	1.8	2.0	1.4	6.4

(Continues on next page)

Source: Deaths were 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 analyses were conducted by MCSS.

[§] Rates are per 100,000 persons.

[^] All Cancer Sites Combined rounded to nearest whole number.

- Not applicable; site is sex-specific or not available.

Table II-5: Age-specific rates[§] of cancer deaths by anatomic site, females, all races combined, Minnesota, 1998-2002 (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	0.1	0.1	0.2	3.0	6.4	14.4	29.7	61.3	113.7	162.0	221.9	242.0	245.2	169.0
Nose, Nasal Cavity & Middle Ear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.0	0.1	0.3	0.2	0.5	0.5	0.8	0.7	1.0
Larynx	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.5	1.1	2.0	2.6	2.8	1.4	1.3
Lung & Bronchus	0.0	0.0	0.0	0.0	0.1	0.1	0.2	2.8	6.1	14.3	29.3	60.3	112.4	159.5	218.3	238.1	242.4	166.1
Pleura†	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trachea, Mediastinum & Other	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.3	0.3	0.4	0.6
Mesothelioma (all sites) ‡	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.5	1.1	0.5	0.5	1.4	1.8	2.9
Bones & Joints	0.0	0.0	0.2	0.3	0.4	0.0	0.3	0.0	0.0	0.0	0.1	0.9	0.0	0.2	1.3	0.8	1.8	2.9
Soft Tissue incl. Heart	0.1	0.1	0.0	0.2	0.5	0.3	0.1	0.0	0.5	0.7	1.3	3.1	2.4	4.2	4.1	2.8	8.1	9.6
Skin	0.0	0.0	0.0	0.0	0.6	0.3	0.6	0.9	1.6	2.3	1.8	4.0	2.8	6.4	7.0	8.4	10.9	21.8
Melanoma of the Skin	0.0	0.0	0.0	0.0	0.6	0.3	0.6	0.9	1.6	2.1	1.6	3.4	2.2	5.2	5.4	7.0	8.4	14.7
Other Non-Epithelial Skin	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.5	0.6	1.2	1.5	1.4	2.5	7.1
Kaposi Sarcoma (all sites) ‡	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	0.0	0.0	0.0
Breast	0.0	0.0	0.0	0.0	0.0	0.5	4.8	8.3	13.3	24.3	34.7	49.1	64.1	72.8	93.2	112.3	140.8	209.4
Female Genital System	0.0	0.0	0.0	0.0	0.2	1.1	1.2	3.1	4.3	9.7	16.3	29.5	33.7	51.3	79.6	84.4	99.1	118.3
Cervix Uteri	0.0	0.0	0.0	0.0	0.0	0.6	0.5	1.4	1.6	2.4	2.8	2.9	3.5	3.2	5.4	2.8	4.6	8.0
Corpus & Uterus, NOS	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.3	1.4	3.2	7.7	10.6	13.4	20.3	24.2	27.3	39.4
Ovary	0.0	0.0	0.0	0.0	0.2	0.4	0.6	1.1	2.2	5.6	9.2	17.9	18.3	31.9	47.9	52.3	60.3	56.4
Vagina	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.3	0.2	0.4	0.5	1.0	1.1	0.7	3.2
Vulva	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.3	0.3	0.6	1.2	2.1	3.1	2.8	8.7
Other Female Genital Organs	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.1	0.7	0.5	0.2	1.0	2.8	0.8	3.5	2.6
Male Genital System	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Prostate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Testis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Penis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other Male Genital Organs	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

(Continues on next page)

Source: Deaths were 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 analyses were conducted by MCSS.

§ Rates are per 100,000 persons.

† Data are not shown for mortality due to a coding change that occurred in 1999.

‡ Mortality for Mesotheliomas and Kaposi Sarcomas are for the 4-year period 1999-2002. Category did not exist in mortality coding until 1999.

- Not applicable; site is sex-specific or not available.

Table II-5: Age-specific rates[§] of cancer deaths by anatomic site, females, all races combined, Minnesota, 1998-2002 (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+
Urinary System	0.3	0.0	0.0	0.2	0.0	0.1	0.1	0.3	0.7	1.5	3.5	5.3	7.8	16.3	25.0	28.1	47.3	77.9
Urinary Bladder	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.4	0.9	1.9	2.2	5.0	9.0	9.0	22.4	44.2
Kidney & Renal Pelvis	0.3	0.0	0.0	0.2	0.0	0.1	0.1	0.2	0.5	1.1	2.6	3.4	5.6	11.1	14.7	17.2	23.8	30.8
Ureter	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	0.2	0.8	0.3	1.1	1.6
Other Urinary Organs	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	0.5	1.7	0.0	1.3
Eye & Orbit	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.6	0.0	0.3	0.0	0.0	0.3
Brain & Other Nervous System	0.3	1.3	0.9	1.2	0.1	0.9	1.1	2.7	1.3	3.8	6.3	8.6	8.4	12.1	12.6	18.6	17.9	11.2
Endocrine System	0.4	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.2	0.3	0.0	0.9	1.3	2.5	1.8	3.9	3.5	5.8
Thyroid	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.2	0.0	0.7	1.1	1.5	1.0	3.1	3.2	5.1
Other Endocrine incl. Thymus	0.4	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.2	0.2	1.0	0.8	0.8	0.4	0.6
Lymphoma	0.1	0.1	0.1	0.2	0.6	1.0	0.3	0.6	1.1	3.3	5.5	9.6	11.4	17.8	33.0	56.0	72.2	87.2
Hodgkin Lymphoma	0.0	0.0	0.0	0.0	0.1	0.5	0.0	0.1	0.1	0.4	0.7	0.7	0.2	0.7	0.5	2.5	2.1	1.3
Non-Hodgkin Lymphoma	0.1	0.1	0.1	0.2	0.5	0.5	0.3	0.5	1.0	2.9	4.9	8.9	11.2	17.1	32.4	53.5	70.1	85.9
Multiple Myeloma	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.2	0.5	1.4	5.2	7.1	10.2	14.7	23.6	29.8	29.8
Leukemia	0.6	0.0	0.7	1.1	0.6	1.3	0.9	2.0	2.0	2.1	2.6	6.5	12.5	14.9	22.7	40.0	48.7	77.9
Lymphocytic Leukemia	0.1	0.0	0.1	0.3	0.5	0.4	0.2	0.1	0.4	0.2	0.1	1.2	3.0	3.7	3.9	11.5	16.1	30.5
Acute Lymphocytic Leukemia	0.1	0.0	0.1	0.3	0.5	0.4	0.1	0.1	0.2	0.1	0.1	0.9	1.1	0.0	1.0	0.8	0.7	1.0
Chronic Lymphocytic Leukemia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.3	1.7	3.7	2.8	9.9	13.7	28.9
Other Lymphocytic Leukemia	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.8	1.8	0.6
Myeloid & Monocytic Leukemia	0.5	0.0	0.4	0.7	0.1	0.4	0.6	1.8	1.4	1.4	2.1	4.5	7.6	9.2	14.7	20.3	22.4	32.4
Acute Myeloid Leukemia	0.5	0.0	0.3	0.4	0.1	0.4	0.3	1.3	1.0	1.1	1.2	3.6	5.2	7.2	10.6	14.6	15.4	23.4
Acute Monocytic Leukemia	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.2	0.0	0.6	0.4	1.3
Chronic Myeloid Leukemia	0.0	0.0	0.1	0.1	0.0	0.0	0.2	0.5	0.3	0.2	0.9	0.2	1.3	0.7	2.3	1.7	4.6	4.2
Other Myeloid/Monocytic Leukemia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.7	1.1	1.0	1.8	3.4	2.1	3.5
Other Leukemia	0.0	0.0	0.1	0.1	0.0	0.5	0.1	0.1	0.3	0.4	0.4	0.9	1.9	2.0	4.1	8.2	10.2	15.1
Miscellaneous	0.0	0.0	0.0	0.0	0.1	0.0	0.8	0.8	1.8	4.7	5.6	16.8	24.4	38.1	61.5	83.3	101.2	150.7

Source: Deaths were 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 analyses were conducted by MCSS.

§ Rates are per 100,000 persons.

- Not applicable; site is sex-specific or not available.

Table II-6: The five most commonly diagnosed cancers by race and ethnicity and gender, Minnesota, 1998-2002

Race	Males				Females			
	Cancer Site	Cases	Percent	Rate§	Cancer Site	Cases	Percent	Rate§
American Indian	Prostate	89	22.1	182.2	Breast	85	23.7	96.8
	Lung and Bronchus	82	20.4	157.3	Lung and Bronchus	76	21.2	100.6
	Colon and Rectum	56	13.9	105.1	Colon and Rectum	46	12.8	62.6
	Oral Cavity and Pharynx	22	5.5	36.0	Non-Hodgkin Lymphoma	17	4.7	21.2
	Kidney and Renal Pelvis	16	4.0	29.2	Leukemia	15	4.2	14.6
	All Cancer Sites Combined	399		686.8	All Cancer Sites Combined	358		430.2
Asian/Pacific Islander	Prostate	65	15.4	59.3	Breast	135	27.3	65.3
	Liver and Bile Duct	50	11.9	27.9	Colon and Rectum	38	7.7	23.9
	Lung and Bronchus	45	10.7	37.5	Lung and Bronchus	33	6.7	21.9
	Colon and Rectum	44	10.5	28.2	Thyroid	33	6.7	11.1
	Stomach	33	7.8	22.6	Corpus and Uterus, NOS	29	5.9	15.0
	All Cancer Sites Combined	419		279.0	All Cancer Sites Combined	492		252.0
Black	Prostate	316	29.2	232.9	Breast	240	29.6	107.8
	Lung and Bronchus	180	16.6	123.1	Lung and Bronchus	112	13.8	63.3
	Colon and Rectum	96	8.9	67.4	Colon and Rectum	93	11.5	53.8
	Kidney and Renal Pelvis	50	4.6	25.2	Corpus and Uterus, NOS	34	4.2	17.5
	Non-Hodgkin Lymphoma	48	4.4	24.9	Cervix	30	3.7	10.3
	All Cancer Sites Combined	1,080		670.3	All Cancer Sites Combined	805		395.5
Non-Hispanic White	Prostate	18,388	33.1	184.1	Breast	17,076	33.1	139.3
	Lung and Bronchus	7,153	12.9	71.6	Colon and Rectum	6,035	11.7	45.2
	Colon and Rectum	5,976	10.8	60.3	Lung and Bronchus	5,686	11.0	46.0
	Urinary Bladder	3,772	6.8	38.5	Corpus & Uterus, NOS	3,245	6.3	26.6
	Non-Hodgkin Lymphoma	2,544	4.6	25.2	Non-Hodgkin Lymphoma	2,289	4.4	18.0
	All Cancer Sites Combined	55,218		549.8	All Cancer Sites Combined	51,177		410.8
Hispanic (all races)	Prostate	80	23.2	113.5	Breast	108	29.8	85.1
	Lung and Bronchus	38	11.0	61.7	Lung and Bronchus	32	8.8	42.1
	Colon and Rectum	33	9.6	46.4	Colon and Rectum	26	7.2	30.9
	Non-Hodgkin Lymphoma	20	5.8	18.4	Cervix	25	6.9	11.0
	Liver and Bile Duct	18	5.2	14.5	Non-Hodgkin Lymphoma	24	6.6	26.7
	All Cancer Sites Combined	349		373.7	All Cancer Sites Combined	367		313.4

Source: MCSS (April 2005). All cases were either microscopically confirmed or Death Certificate Only. *In situ* cancers except those of the bladder were excluded. All analyses were conducted by MCSS. See text for comments on the accuracy of race- and ethnic-specific cancer rates.

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

Table II-7: Cancer incidence and mortality rates by race and ethnicity for selected cancers, Minnesota, 1998-2002

Race/Ethnicity	Average Annual Incidence Rate§					Average Annual Mortality Rate§				
	Non-Hispanic White	American Indian	Asian/Pacific Islander	Black	Hispanic (all races)	Non-Hispanic White	American Indian	Asian/Pacific Islander	Black	Hispanic (all races)
All Cancer Sites Combined	467.3	532.8*	262.7*	513.8*	334.0*	184.9	269.7*	141.8*	246.6*	147.0*
Female Breast	139.3	96.8	65.3*	107.8*	85.1*	25.2	27.6	8.9*	30.0	20.8
Cervix	6.2	12.2	13.6*	10.3	11.0*	1.4	~	6.0*	~	~
Colon and Rectum	51.9	81.3*	26.3*	59.8	37.9	18.7	28.9	11.2*	21.8	11.8
Corpus Uteri	26.6	10.8*	15.0*	17.5*	20.8	4.0	~	~	~	~
Kidney and Renal Pevlis	12.6	19.8	7.3	17.0	9.4	4.3	12.1*	~	2.8	~
Leukemia	13.7	14.3	8.2*	6.6*	7.5	8.3	7.5	6.4	3.9*	2.7*
Liver and Intrahepatic Duct	2.9	~	15.1*	12.5*	7.7*	3.3	7.1*	14.5*	11.9*	8.3*
Lung and Bronchus	56.9	122.1*	28.5*	89.3*	49.9	46.8	99.6*	26.2*	70.4*	32.9*
Non-Hodgkin Lymphoma	21.1	18.2	14.3*	15.8	22.2	9.1	6.6	7.3	7.9	8.6
Oral Cavity and Pharynx	10.5	21.4*	8.7	12.4	5.4	2.3	~	3.3	3.5	~
Prostate	184.1	182.2	59.3*	232.9*	113.5*	31.9	52.1	~	57.9*	22.3
Stomach	5.8	9.1	18.7*	10.7*	12.9*	3.4	~	15.6*	~	5.9
Thyroid	7.0	~	7.2	3.2*	5.5	0.4	~	~	0.2	~
Urinary Bladder	22.1	19.0	5.9*	16.7	6.6*	4.2	~	~	5.1	~

Source: MCSS (April 2005). All cases were either microscopically confirmed or Death Certificate Only. *In situ* cancers except those of the bladder were excluded. Deaths were from the Minnesota Center for Health Statistics. Cancer sites selected were in the top five sites for any race/sex group listed in Table II-6. All analyses were conducted by MCSS. See text for comments on the accuracy of race- and ethnic-specific cancer rates.

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

* Rate is significantly different from rate among non-Hispanic whites ($p < 0.05$).

~ Rate is based on fewer than ten cases or deaths.

Table II-8. Estimated complete cancer prevalence[†] by anatomic site and gender, Minnesota, January 1, 2002

Cancer Site	Males		Females		Total	
	Count	Percent	Count	Percent	Count	Percent
All Cancer Sites Combined	74,810	100%	92,500	100%	167,310	100%
Brain and Other Nervous System	1,100	1.5%	900	1.0%	2,000	1.2%
Breast	190	0.3%	38,900	42.1%	39,090	23.4%
Cervix Uteri	0	0.0%	3,340	3.6%	3,340	2.0%
Colon and Rectum	8,540	11.4%	9,110	9.8%	17,650	10.5%
Corpus and Uterus, NOS	0	0.0%	10,035	10.8%	10,035	6.0%
Esophagus	290	0.4%	80	0.1%	380	0.2%
Hodgkin Lymphoma	1,470	2.0%	1,250	1.4%	2,720	1.6%
Kidney and Renal Pelvis	2,390	3.2%	1,570	1.7%	3,960	2.4%
Larynx	1,180	1.6%	250	0.3%	1,430	0.9%
Leukemia	2,060	2.8%	1,500	1.6%	3,550	2.1%
Liver and Intrahepatic Bile Duct	110	0.1%	80	0.1%	190	0.1%
Lung and Bronchus	2,430	3.2%	2,350	2.5%	4,790	2.9%
Melanoma of the Skin	4,320	5.8%	5,040	5.5%	9,370	5.6%
Myeloma	420	0.6%	320	0.3%	740	0.4%
Non-Hodgkin Lymphoma	3,260	4.4%	3,080	3.3%	6,340	3.8%
Oral Cavity and Pharynx	2,650	3.5%	1,430	1.5%	4,090	2.4%
Ovary	0	0.0%	2,880	3.1%	2,880	1.7%
Pancreas	180	0.2%	170	0.2%	340	0.2%
Prostate	31,990	42.8%	0	0.0%	31,990	19.1%
Stomach	480	0.6%	320	0.3%	800	0.5%
Testis	3,300	4.4%	0	0.0%	3,300	2.0%
Thyroid	1,240	1.7%	3,960	4.3%	5,200	3.1%
Urinary Bladder	6,270	8.4%	2,250	2.4%	8,520	5.1%

[†] Estimated number of Minnesotans ever diagnosed with an invasive cancer and alive on January 1, 2002, rounded to the nearest ten persons, using the first malignant primary for a person. Estimates are based on prevalence percentages on January 1, 2002, for the white population in the nine geographic areas participating in the SEER program since 1975, adjusted for differences in cancer incidence between Minnesota and SEER.

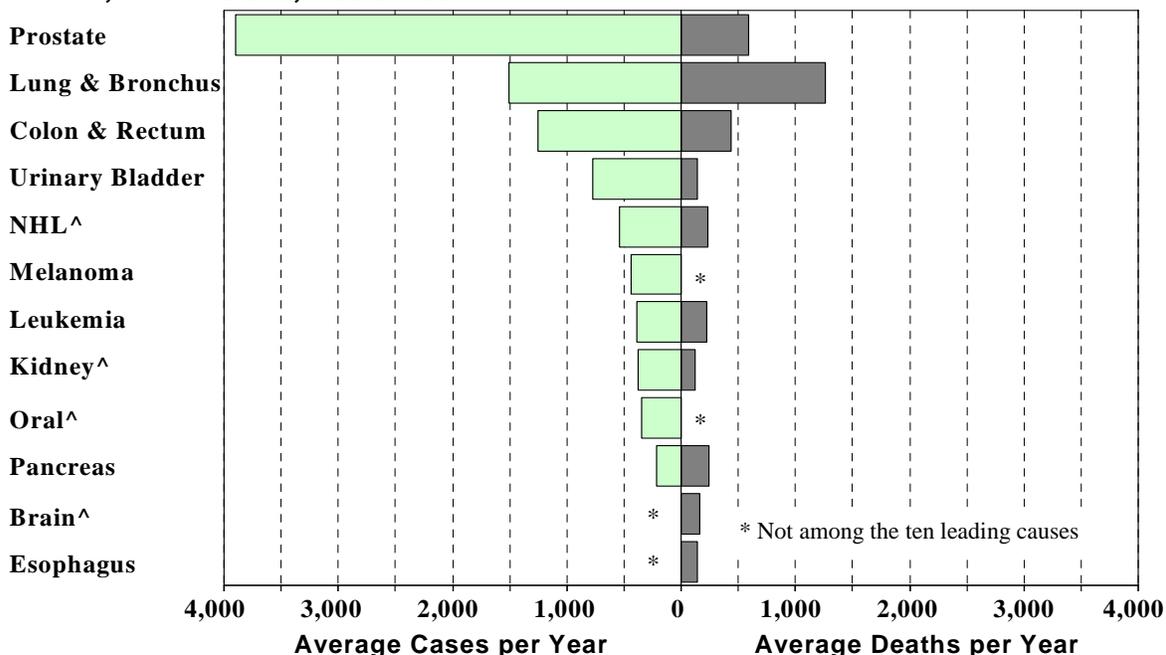
Table II-9. Estimated five-year cancer prevalence[†] by anatomic site and gender, Minnesota, January 1, 2002

	Males		Females		Total	
	Count	Percent	Count	Percent	Count	Percent
All Cancer Sites Combined	31,930	100%	31,180	100%	63,110	100%
Brain and Other Nervous System	380	1.2%	290	0.9%	670	1.1%
Breast	80	0.3%	13,680	43.9%	13,760	21.8%
Cervix Uteri	0	0.0%	690	2.2%	690	1.1%
Colon and Rectum	3,480	10.9%	3,360	10.8%	6,840	10.8%
Corpus and Uterus, NOS	0	0.0%	2,520	8.1%	2,520	4.0%
Esophagus	210	0.7%	50	0.2%	260	0.4%
Hodgkin Lymphoma	320	1.0%	280	0.9%	600	1.0%
Kidney and Renal Pelvis	980	3.1%	590	1.9%	1,570	2.5%
Larynx	390	1.2%	90	0.3%	480	0.8%
Leukemia	880	2.8%	600	1.9%	1,480	2.4%
Liver and Intrahepatic Bile Duct	80	0.3%	50	0.2%	130	0.2%
Lung and Bronchus	1,450	4.5%	1,390	4.5%	2,840	4.5%
Melanoma of the Skin	1,560	4.9%	1,520	4.9%	3,070	4.9%
Myeloma	300	0.9%	230	0.7%	520	0.8%
Non-Hodgkin Lymphoma	1,450	4.5%	1,350	4.3%	2,800	4.4%
Oral Cavity and Pharynx	960	3.0%	470	1.5%	1,430	2.3%
Ovary	0	0.0%	940	3.0%	940	1.5%
Pancreas	140	0.4%	120	0.4%	260	0.4%
Prostate	15,180	47.5%	0	0.0%	15,180	24.1%
Stomach	250	0.8%	140	0.5%	400	0.6%
Testis	770	2.4%	0	0.0%	770	1.2%
Thyroid	350	1.1%	1,070	3.4%	1,420	2.2%
Urinary Bladder	2,370	7.4%	780	2.5%	3,150	5.0%

[†] Estimated number of Minnesotans diagnosed with an invasive cancer during 1997-2001 and alive on January 1, 2002, rounded to the nearest ten persons, using the first malignant primary for a person. Estimates are based on prevalence percentages on January 1, 2002, for the white population in the nine geographic areas participating in the SEER program since 1975, adjusted for differences in cancer incidence between Minnesota and SEER.

[This page left intentionally blank]

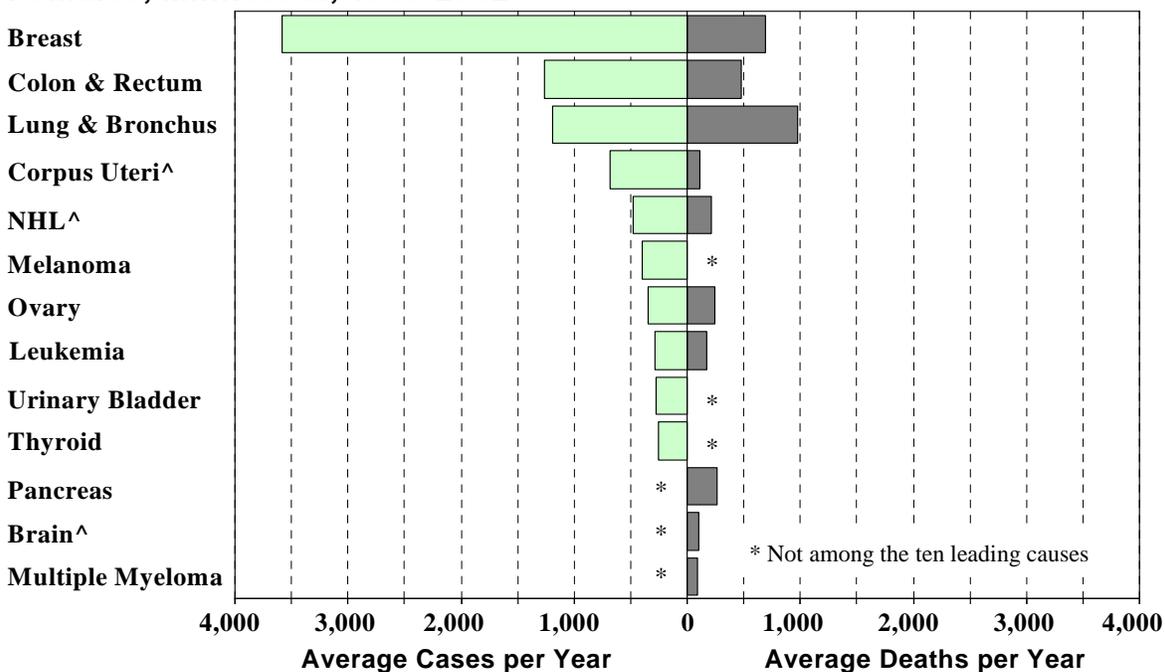
Figure II-1: Ten Most Common Cancer Diagnoses and Deaths among Males, Minnesota, 1998-2002



Source: MCSS (April 2005) and the Minnesota Center for Health Statistics. Cases were either microscopically confirmed or Death Certificate Only. *In situ* cancers except those of the bladder were excluded. All analyses were conducted by MCSS.

^ NHL=Non-Hodgkin Lymphoma, Kidney includes Renal Pelvis, Oral includes Oral Cavity & Pharynx, Brain includes Other Nervous System

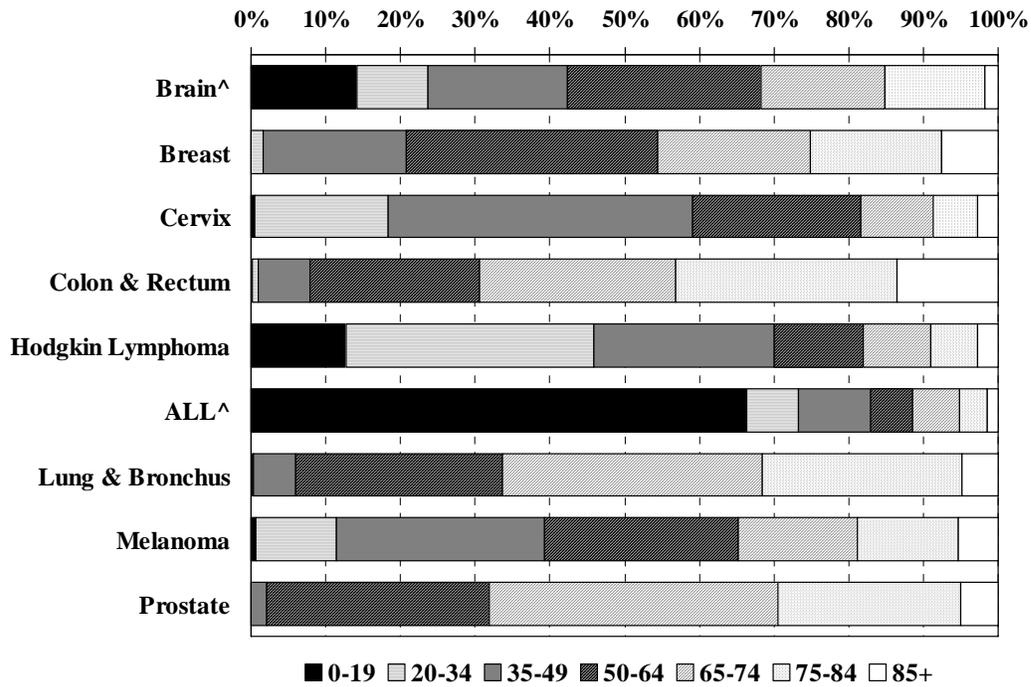
Figure II-2: Ten Most Common Cancer Diagnoses and Deaths among Females, Minnesota, 1998-2002



Source: MCSS (April 2005) and the Minnesota Center for Health Statistics. Cases were either microscopically confirmed or Death Certificate Only. *In situ* cancers except those of the bladder were excluded. All analyses were conducted by MCSS.

^ Corpus Uteri includes Uterus NOS, NHL=Non-Hodgkin Lymphoma, Brain includes Other Nervous System

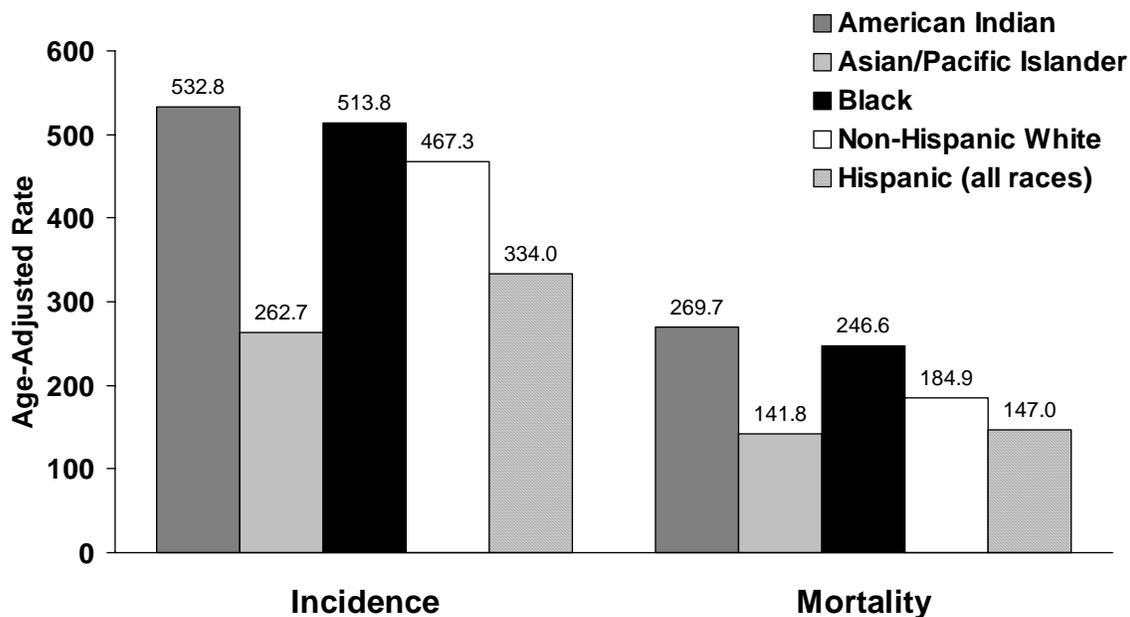
Figure II-3: Percent of Cancers Diagnosed by Age Category among Selected Cancers, Minnesota, 1998-2002



Source: MCSS (April 2005). Cases were either microscopically confirmed or Death Certificate Only. *In situ* cancers except those of the bladder were excluded. All analyses were conducted by MCSS.

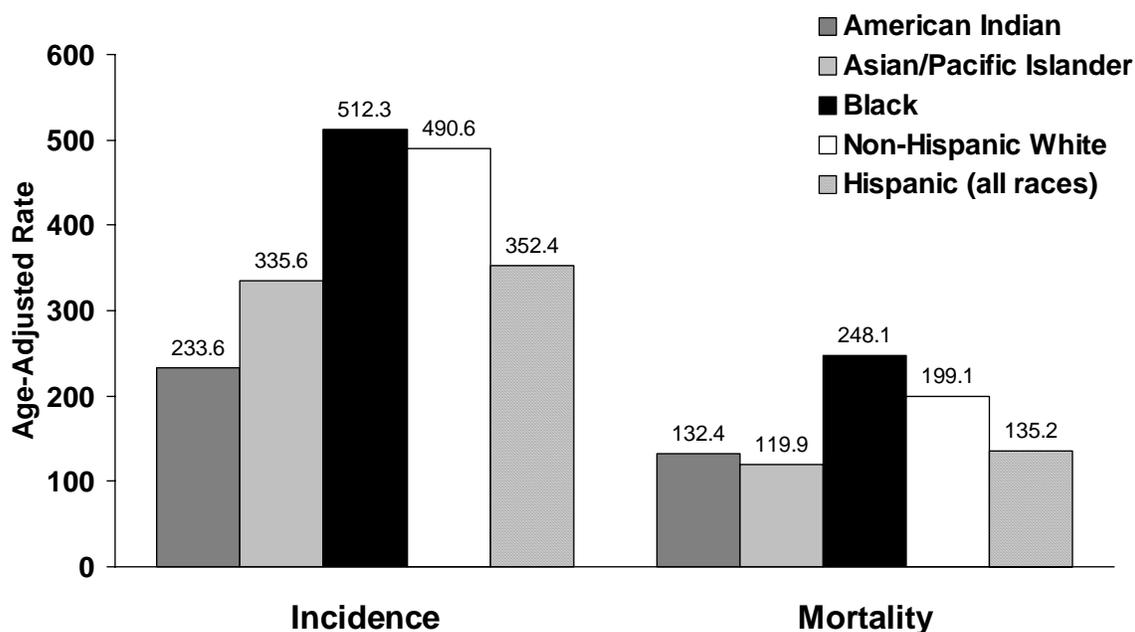
^Brain includes Other Nervous System, ALL=Acute Lymphocytic Leukemia

Figure II-4: Cancer Incidence and Mortality Rates by Race and Ethnicity, Minnesota, 1998-2002, All Cancer Sites Combined



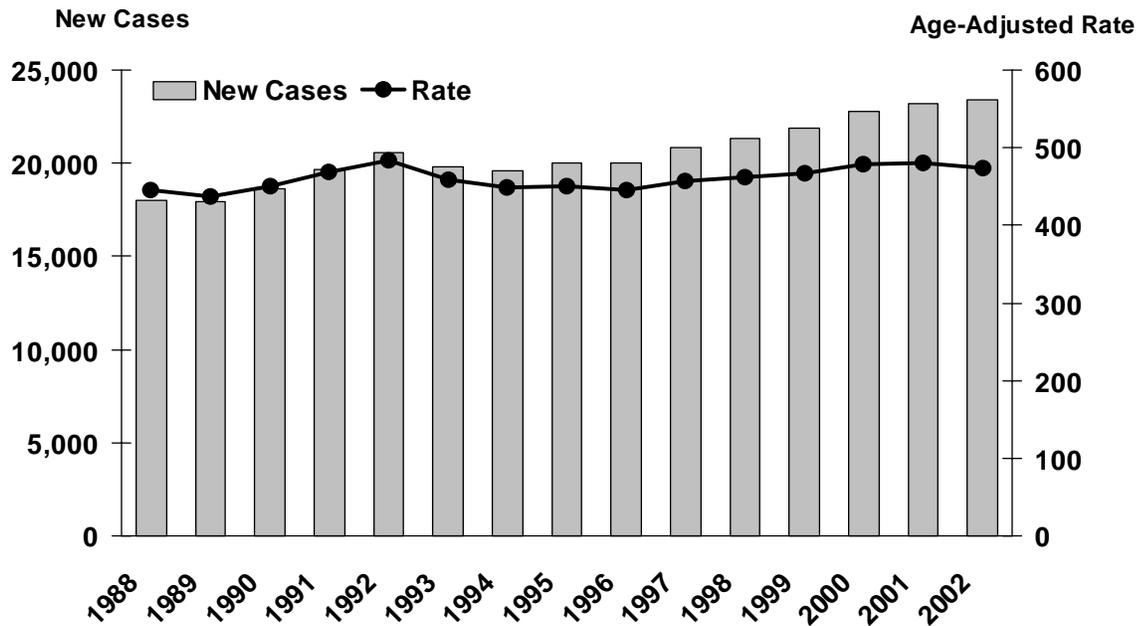
Source: MCSS (April 2005) and the Minnesota Center for Health Statistics. Cases were either microscopically confirmed or Death Certificate Only. *In situ* cancers except those of the bladder were excluded. All analyses were conducted by MCSS. See text for comments on the accuracy of race- and ethnic-specific cancer rates. Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

Figure II-5: Cancer Incidence and Mortality Rates by Race and Ethnicity, SEER Program, 1998-2002, All Cancer Sites Combined



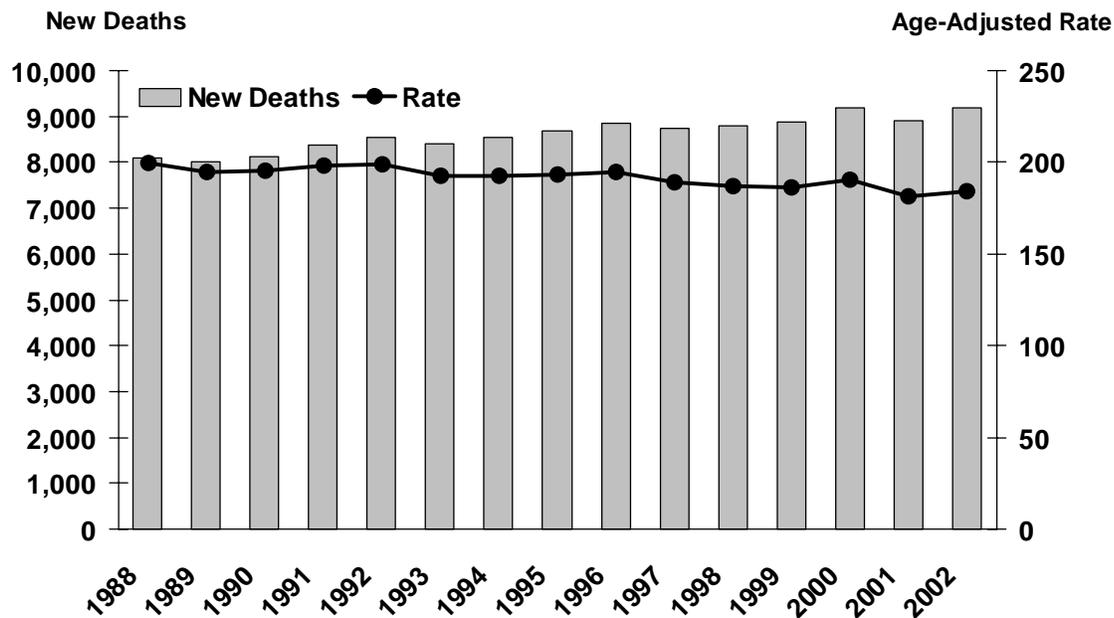
Source: *SEER Cancer Statistics Review 1975-2002*, Table II-9. Available online at http://seer.cancer.gov/csr/1975_2002. Incidence data are from the 13 SEER areas with exclusions for some race/ethnic groups. Mortality data are for the entire U.S., with exclusions for some race/ethnic groups. Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

Figure II-6: Cancer Incidence in Minnesota by Year, 1988-2002



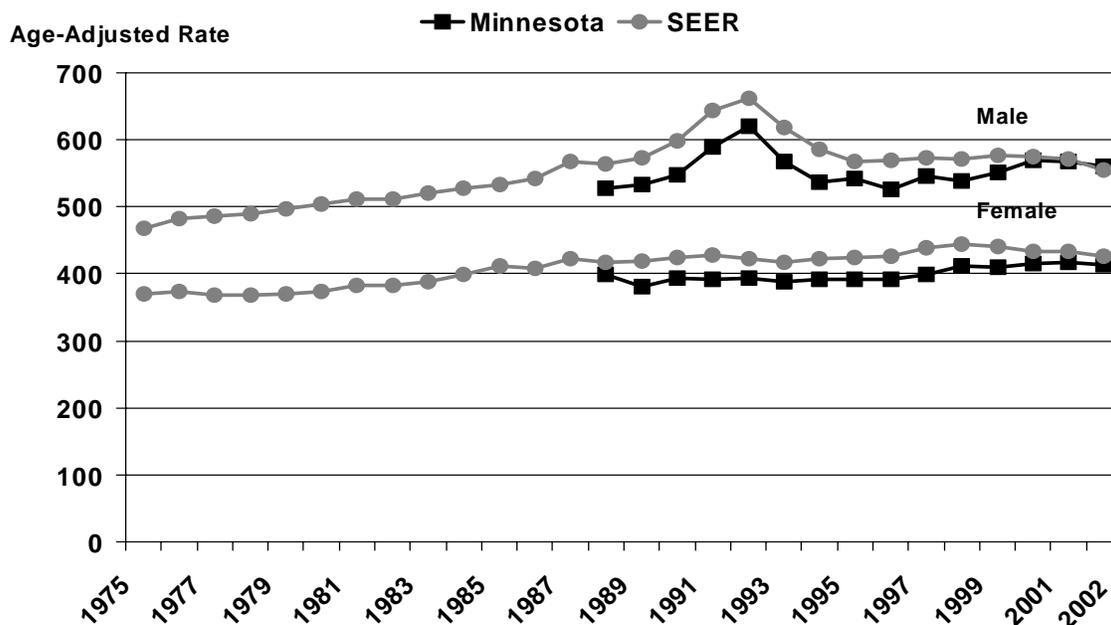
Source: MCSS (April 2005). All races combined. Cases were either microscopically confirmed or Death Certificate Only. *In situ* cancers except those of the bladder were excluded. All analyses were conducted by MCSS. Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

Figure II-7: Cancer Mortality in Minnesota by Year, 1988-2002



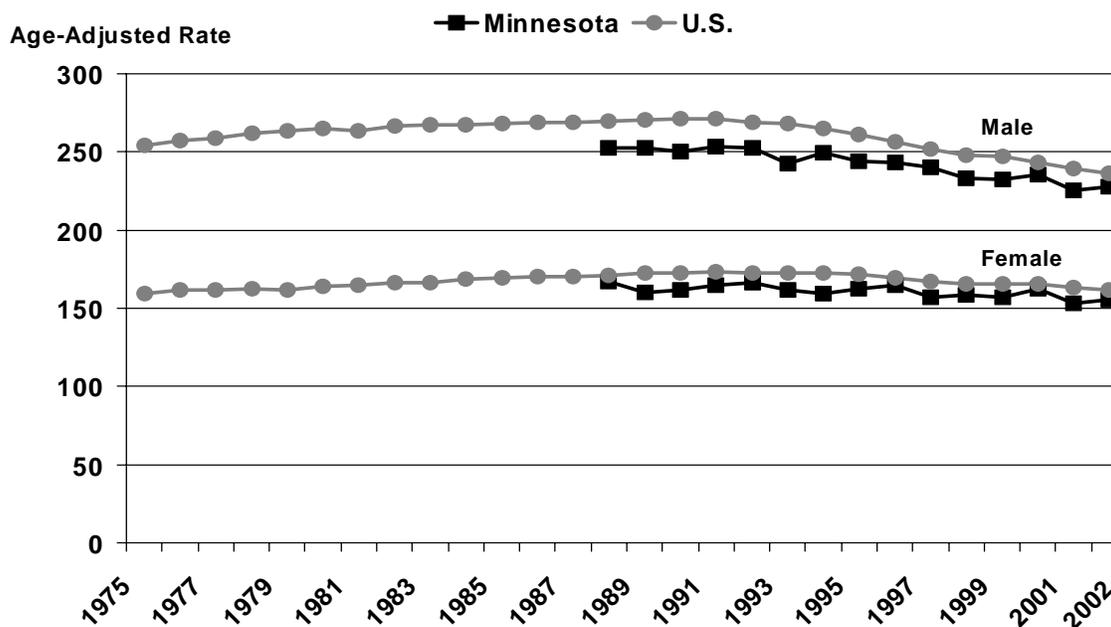
Source: Minnesota Center for Health Statistics. Deaths include all deaths with cancer specified as the underlying cause of death during the time period, regardless of year of diagnosis. All analyses were conducted by MCSS. Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

Figure II-8: Trends in Cancer Incidence by Gender, Minnesota and SEER, 1975-2002



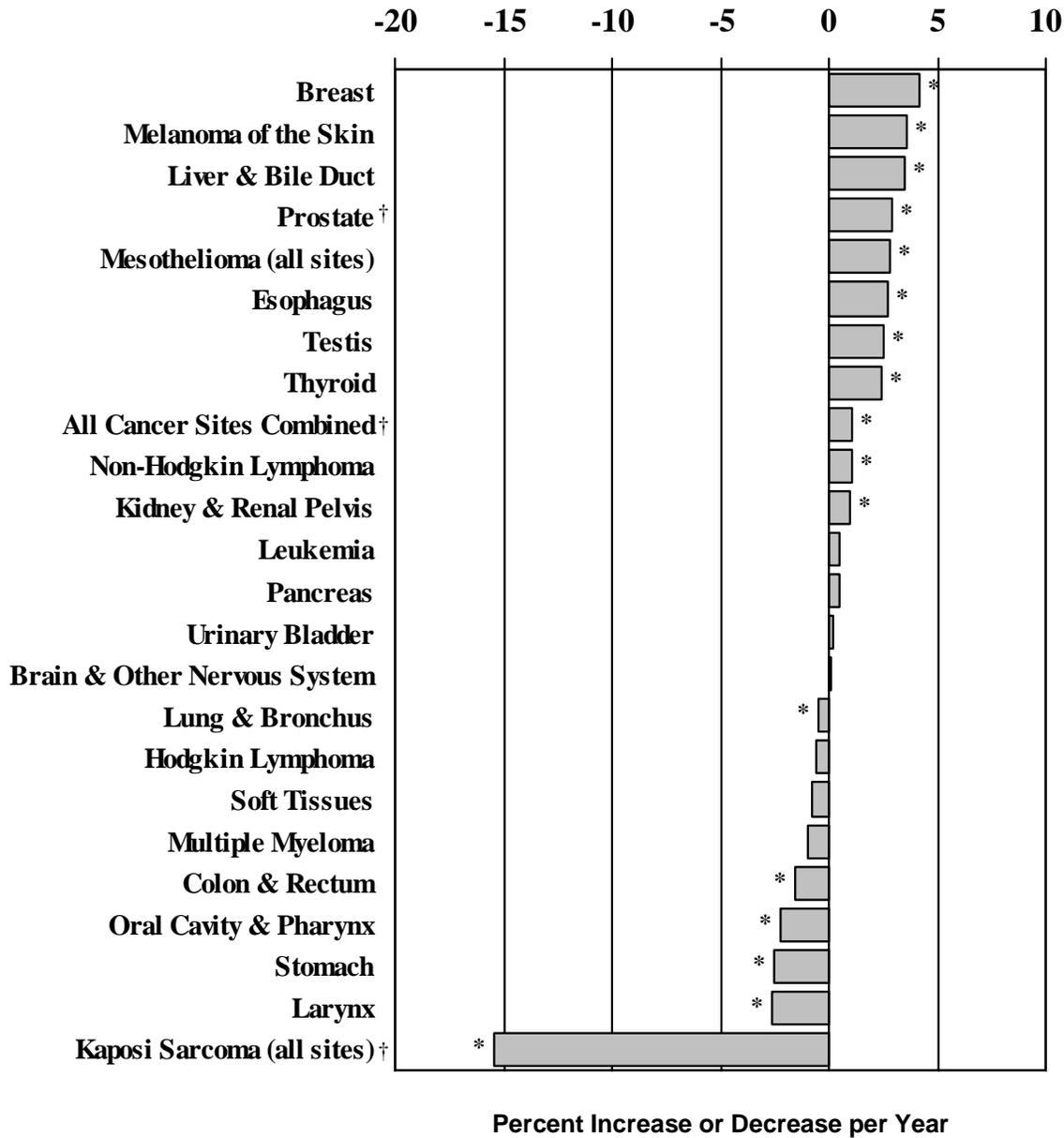
Source: MCSS (April 2005) and SEER Public Use (Nov 2004). For MCSS, cases were either microscopically confirmed or Death Certificate Only. *In situ* cancers except those of the bladder were excluded. Rates for MCSS are for all races combined. SEER is the Surveillance, Epidemiology and End Results Program. Rates for SEER are for white persons, including Hispanics. All analyses were conducted by MCSS. Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

Figure II-9: Trends in Cancer Mortality by Gender, Minnesota and the U.S., 1975-2002



Source: Minnesota Center for Health Statistics and U.S. mortality public use file. Deaths include all deaths with cancer specified as the underlying cause of death during the time period. Rates for MCSS are for all races combined. Rates for U.S. are for white persons, including Hispanics. All analyses were conducted by MCSS. Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

Figure II-10: Average Annual Percent Change in Cancer Incidence among Males, Minnesota, 1988-2002†

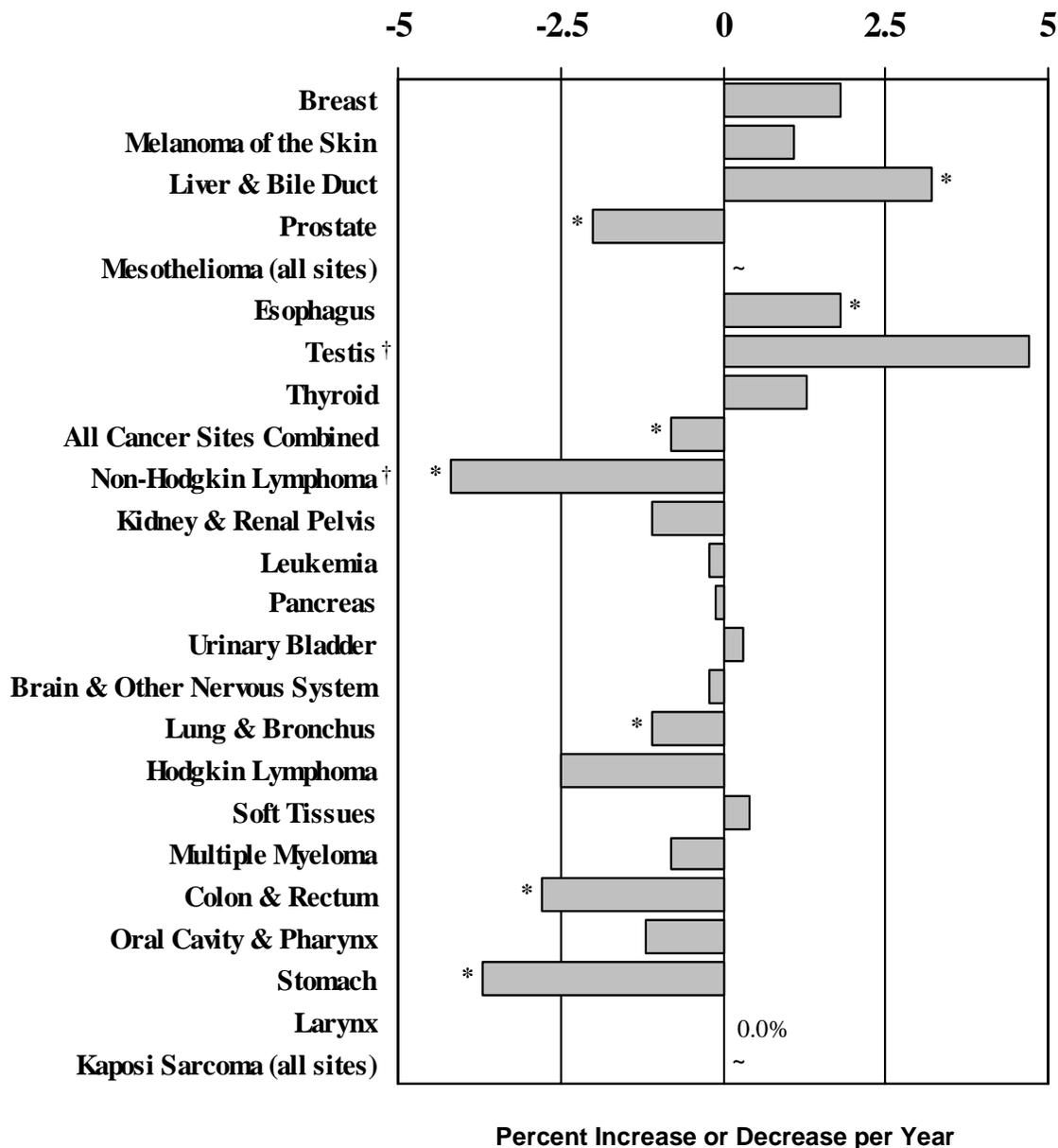


Source: MCSS (April 2005), all races combined. Cases were either microscopically confirmed or Death Certificate Only. *In situ* cancers except those of the bladder were excluded. All analyses were conducted by MCSS. Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Due to changes in the trends, the average annual percent change is for the period 1995-2002 for prostate cancer and all cancer sites combined, and from 1992-2002 for Kaposi sarcoma.

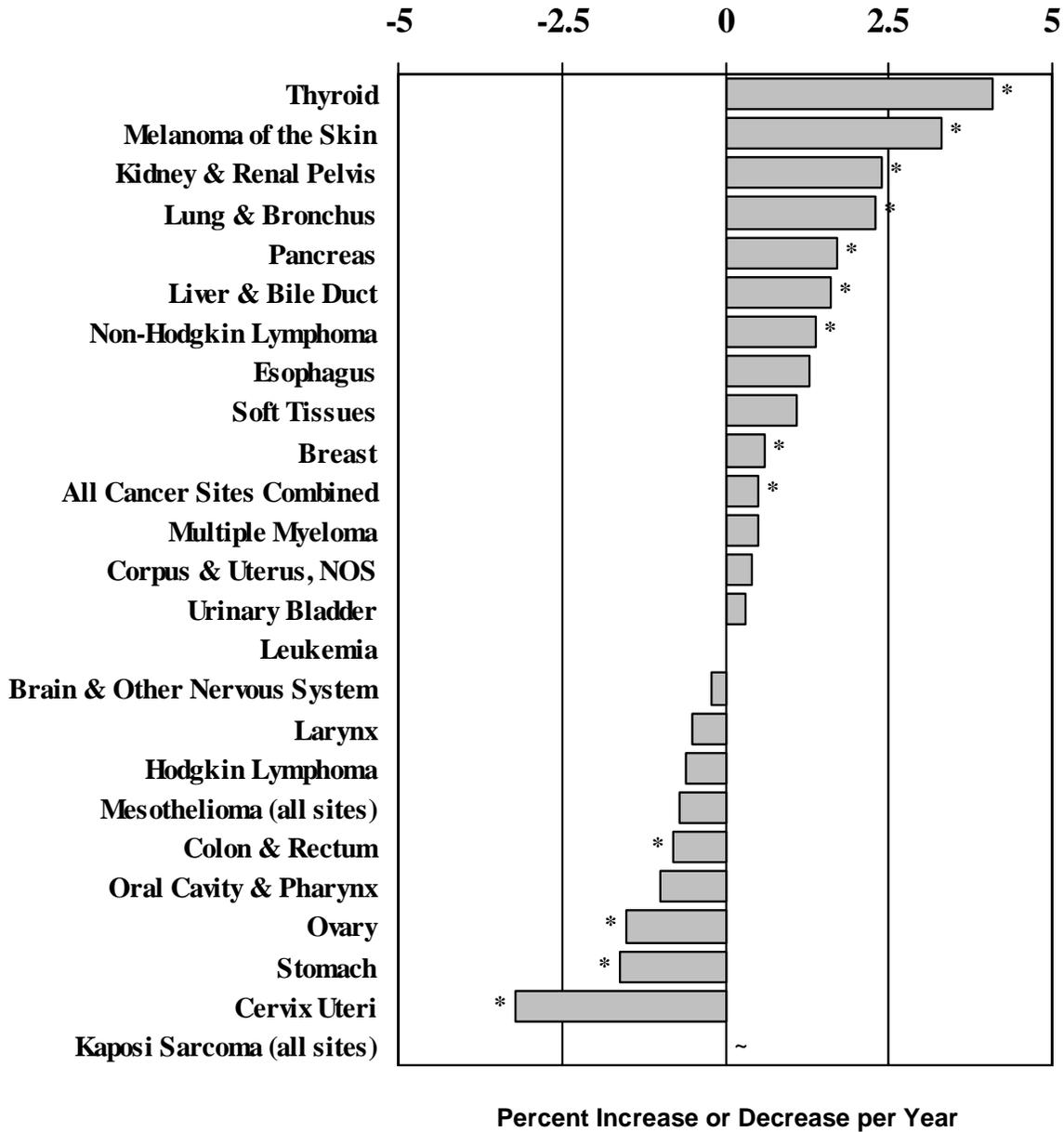
* Trend is statistically significant ($p < 0.05$).

Figure II-11: Average Annual Percent Change in Cancer Mortality among Males, Minnesota, 1988-2002[†]



Source: Minnesota Center for Health Statistics, all races combined. All analyses were conducted by MCSS. Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.
[†] Due to changes in the trends, the average annual percent change is for the period 1993-2002 for testis cancer, and from 1998-2002 for non-Hodgkin lymphoma.
 * Trend is statistically significant ($p < 0.05$).
 ~ Average annual percent change could not be calculated.

Figure II-12: Average Annual Percent Change in Cancer Incidence among Females, Minnesota, 1988-2002

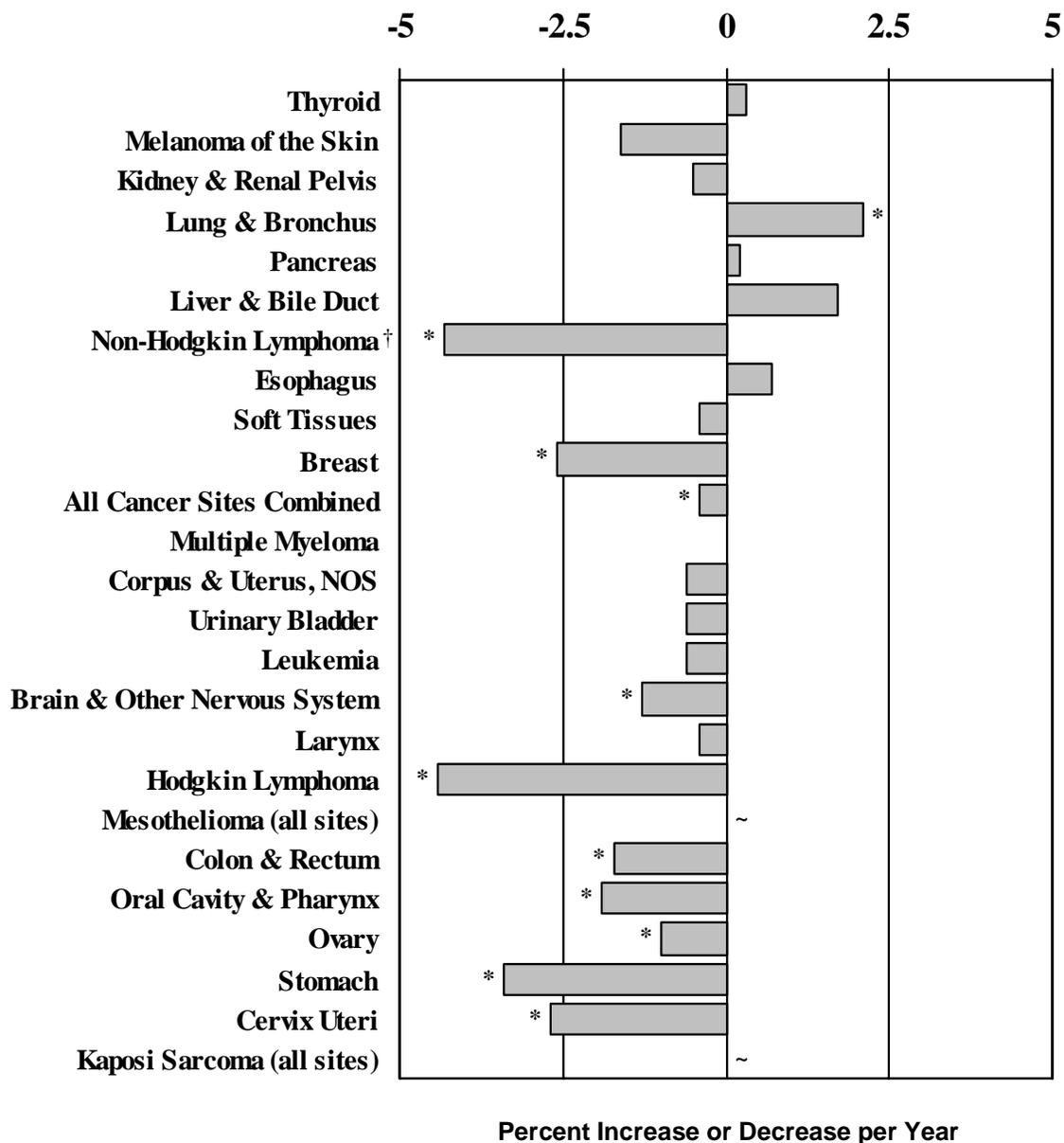


Source: MCSS (April 2005), all races combined. Cases were either microscopically confirmed or Death Certificate Only. *In situ* cancers except those of the bladder were excluded. All analyses were conducted by MCSS. Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

* Trend is statistically significant ($p < 0.05$).

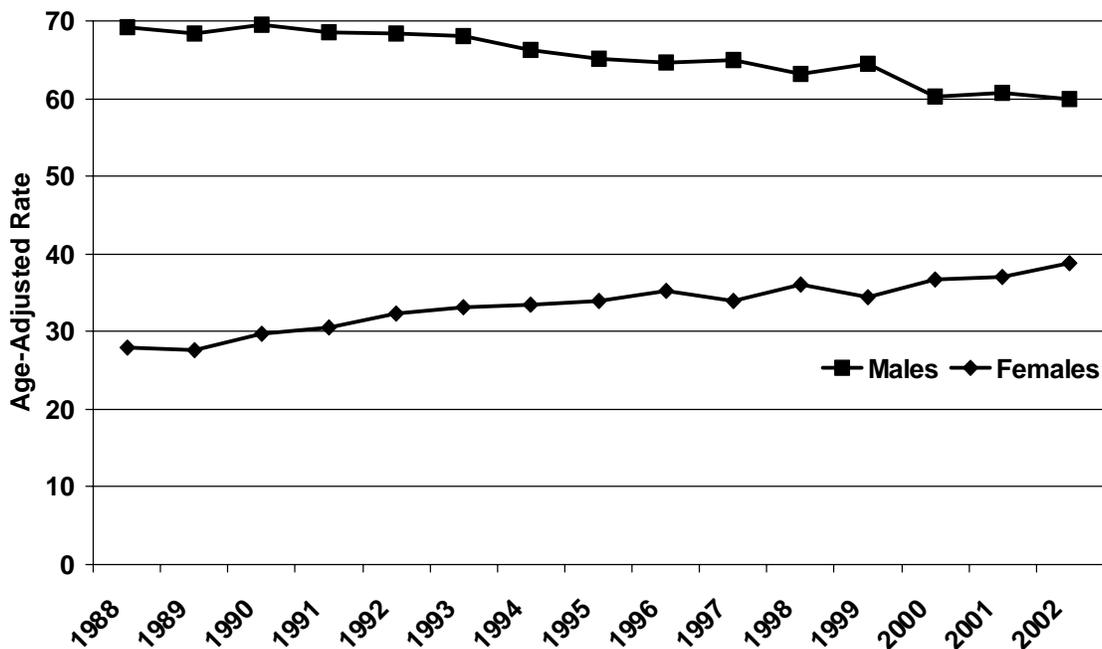
~ Average annual percent change could not be calculated.

Figure II-13: Average Annual Percent Change in Cancer Mortality among Females, Minnesota, 1988-2002†



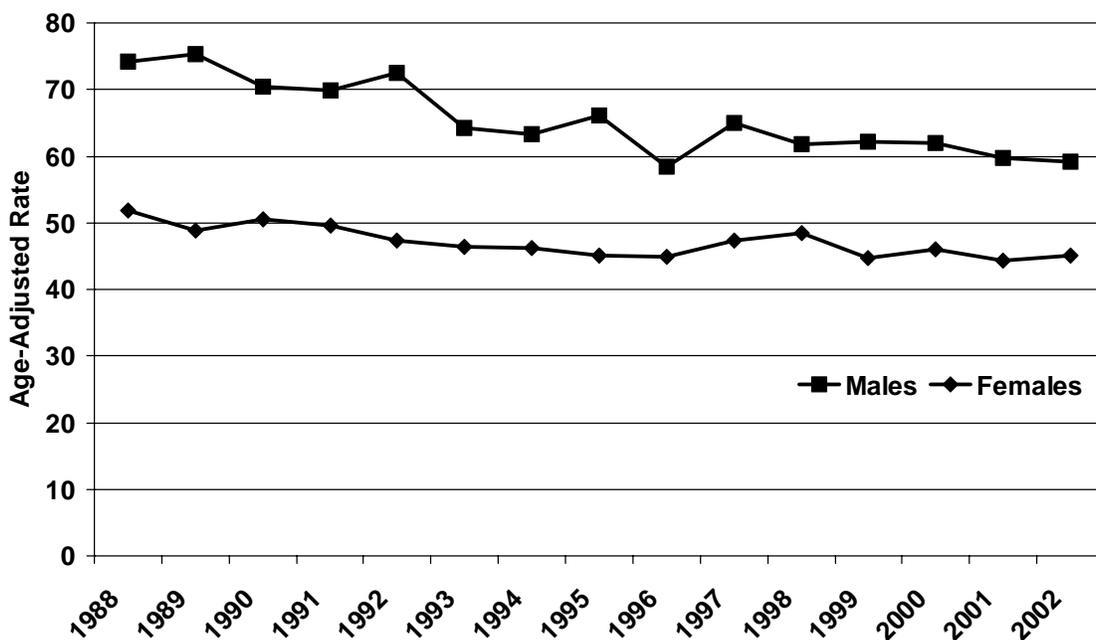
Source: Minnesota Center for Health Statistics, all races combined. All analyses were conducted by MCSS. Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.
 † Due to a change in the trend, the average annual percent change is for the period 1996-2002 for non-Hodgkin lymphoma.
 * Trend is statistically significant ($p < 0.05$).
 ~ Average annual percent change could not be calculated.

Figure II-14: Trends in Lung and Bronchus Cancer Mortality by Gender, Minnesota, 1988-2002



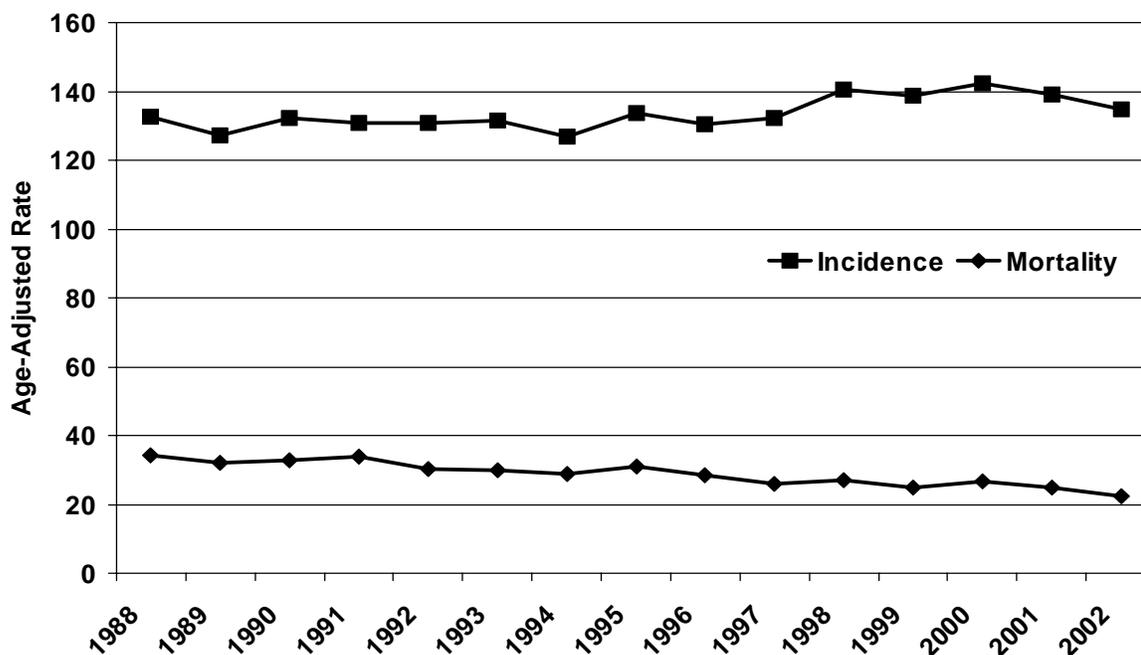
Source: Minnesota Center for Health Statistics, all races combined. All analyses were conducted by MCSS. Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

Figure II-15: Trends in Colon and Rectum Cancer Incidence by Gender, Minnesota, 1988-2002



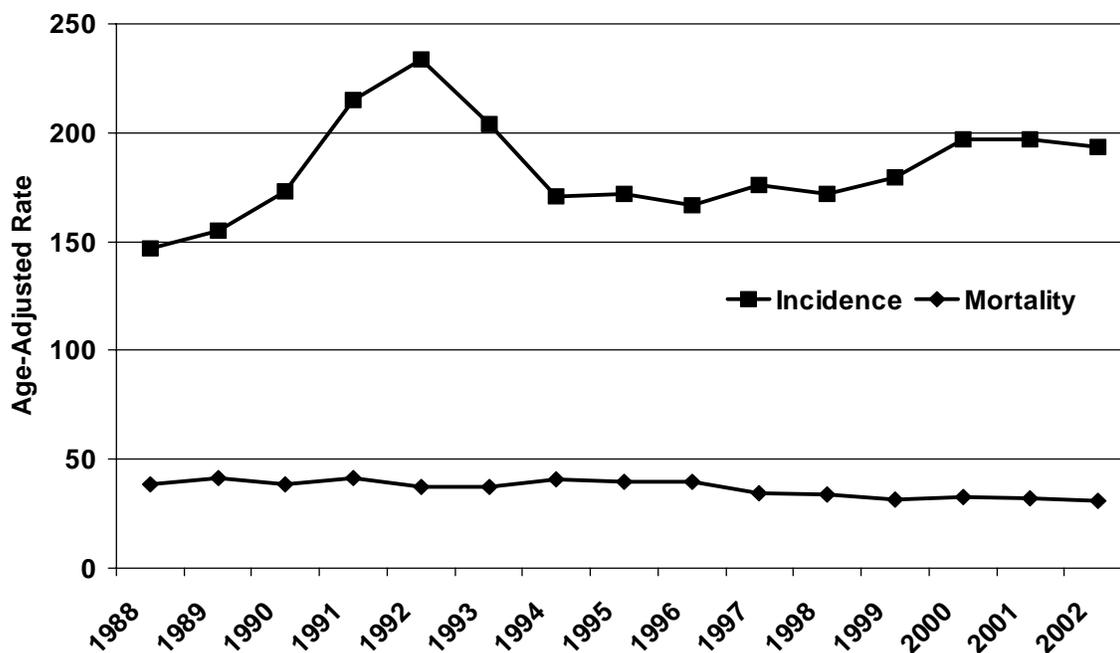
Source: MCSS (April 2005), all races combined. Cases were either microscopically confirmed or Death Certificate Only. *In situ* cancers were excluded. All analyses were conducted by MCSS. Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

Figure II-16: Trends in Female Breast Cancer Incidence and Mortality, Minnesota, 1988-2002



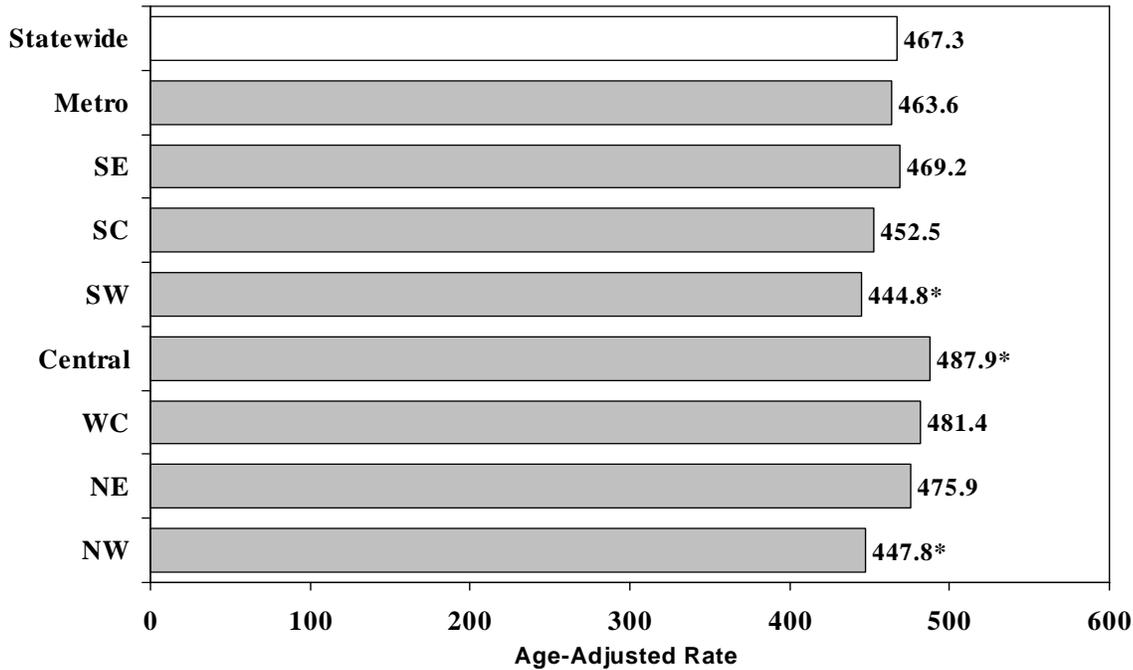
Source: MCSS (April 2005) and the Minnesota Center for Health Statistics, all races combined. Cases were either microscopically confirmed or Death Certificate Only. *In situ* cancers were excluded. All analyses were conducted by MCSS. Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

Figure II-17: Trends in Prostate Cancer Incidence and Mortality, Minnesota, 1988-2002



Source: MCSS (April 2005) and the Minnesota Center for Health Statistics, all races combined. Cases were either microscopically confirmed or Death Certificate Only. *In situ* cancers were excluded. All analyses were conducted by MCSS. Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

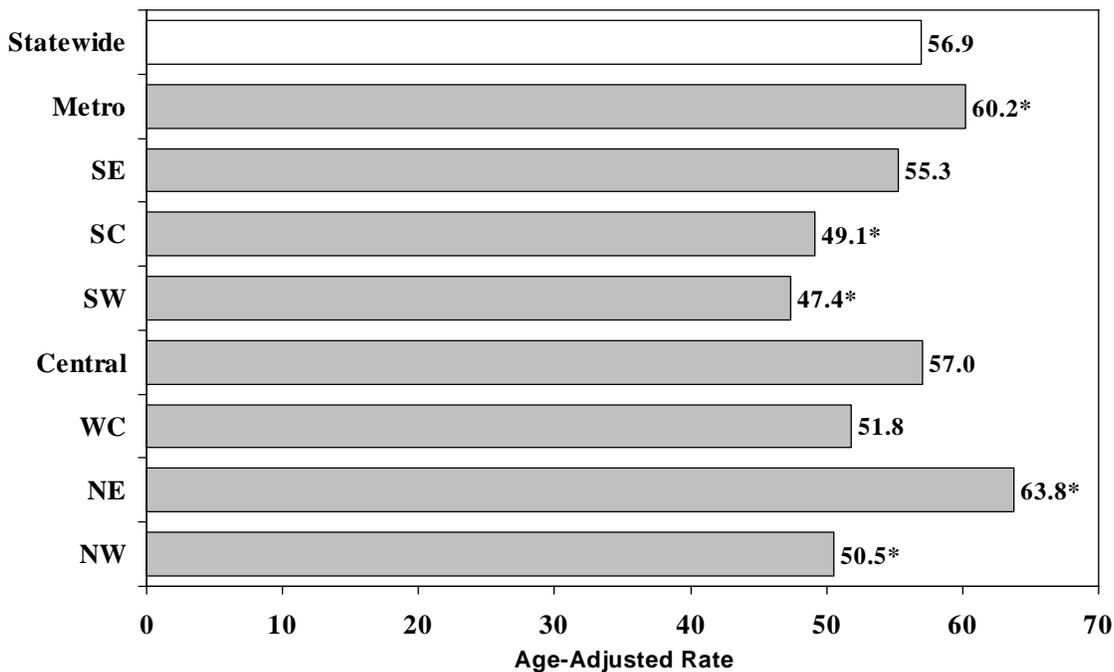
Figure II-18: Cancer Incidence among Non-Hispanic Whites by Region, Minnesota, 1998-2002, All Cancer Sites Combined



Source: MCSS (April 2005). All cases were either microscopically confirmed or Death Certificate Only. *In situ* cancers except those of the bladder were excluded. All analyses were conducted by MCSS. Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

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

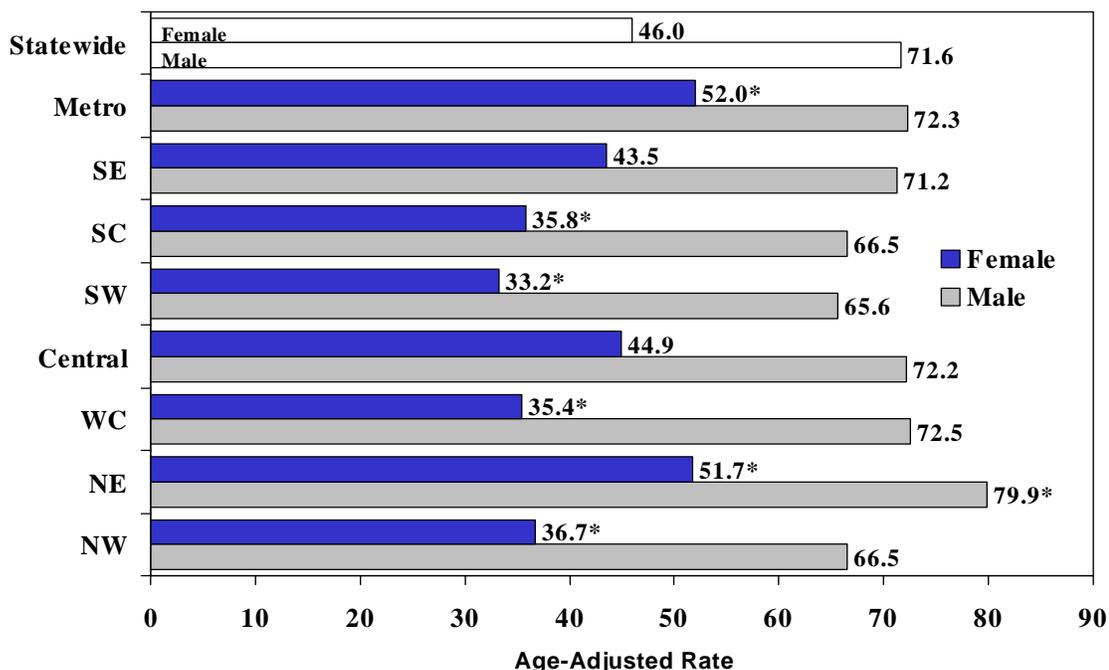
Figure II-19: Lung and Bronchus Cancer Incidence among Non-Hispanic Whites by Region, Minnesota, 1998-2002



Source: MCSS (April 2005). All cases were either microscopically confirmed or Death Certificate Only. *In situ* cancers were excluded. All analyses were conducted by MCSS. Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

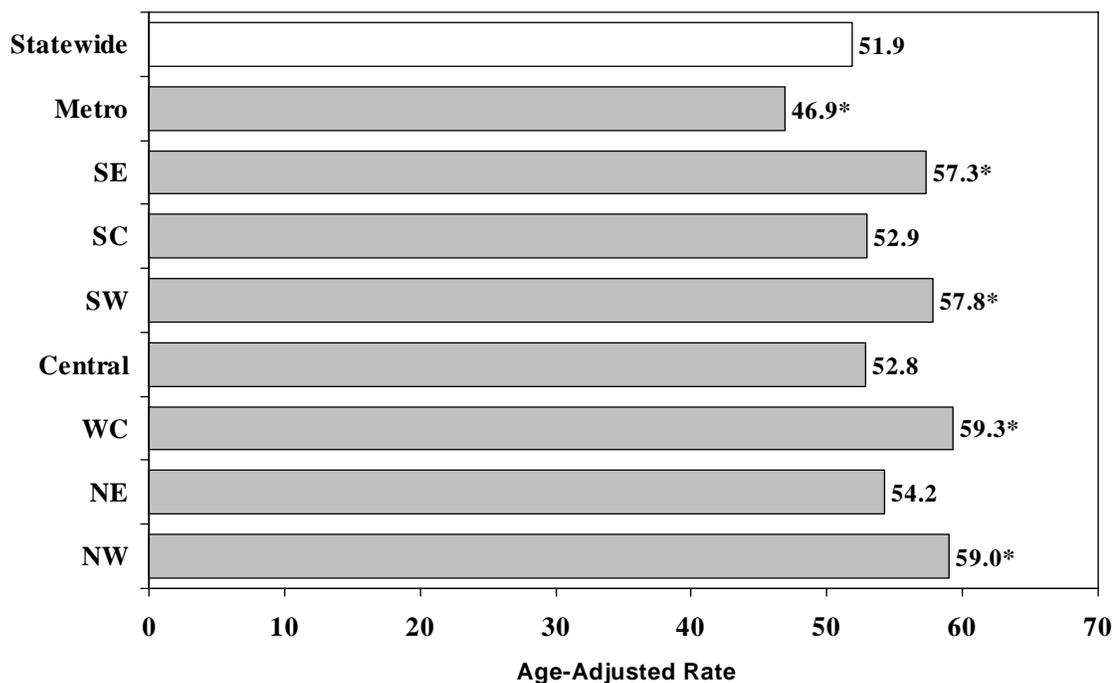
*Regional rate is significantly ($p < 0.05$) different from statewide rates.

Figure II-20: Lung and Bronchus Cancer Incidence among Non-Hispanic Whites by Gender and Region, Minnesota, 1998-2002



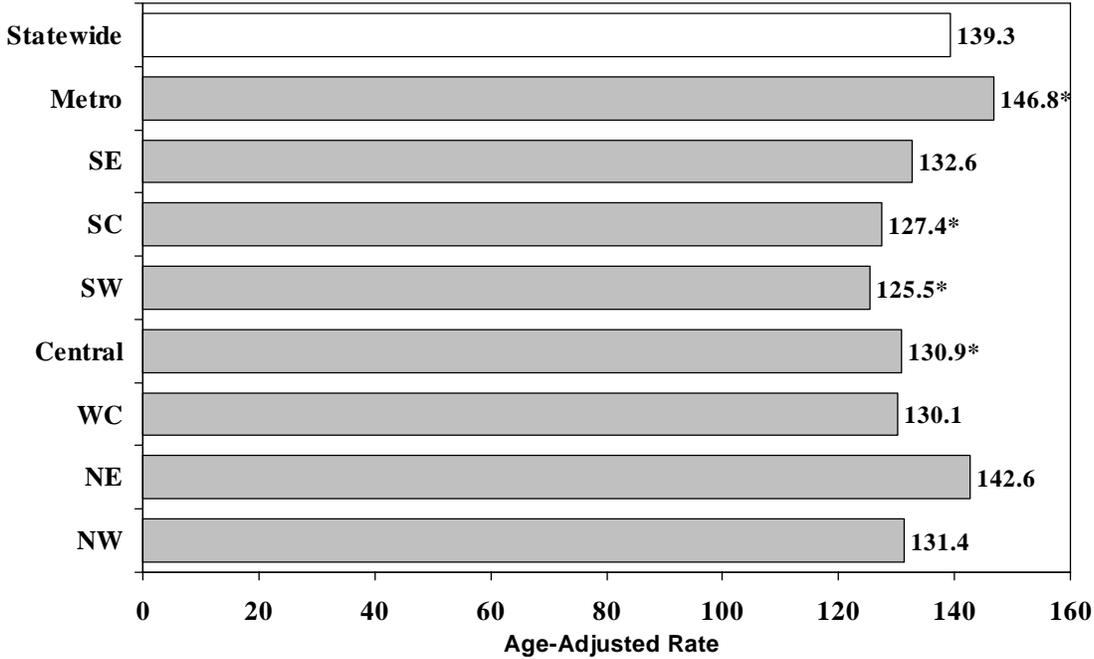
Source: MCSS (April 2005). All cases were either microscopically confirmed or Death Certificate Only. *In situ* cancers were excluded. All analyses were conducted by MCSS. Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population. *Sex-specific regional rate is significantly ($p < 0.05$) different from statewide rate.

Figure II-21: Colon and Rectum Cancer Incidence among Non-Hispanic Whites by Region, Minnesota, 1998-2002



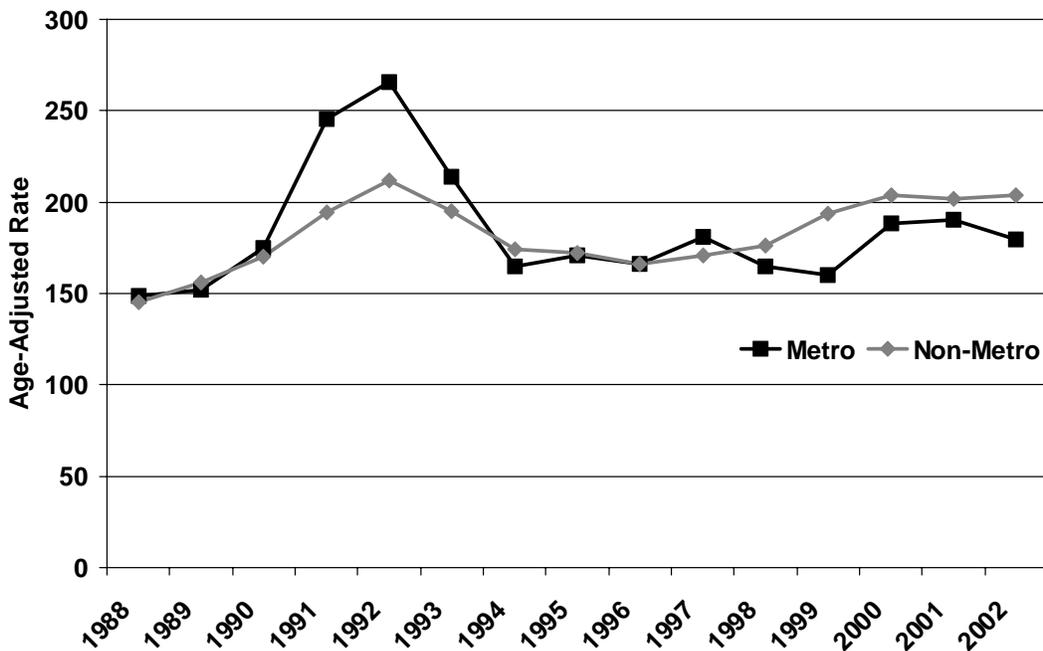
Source: MCSS (April 2005). All cases were either microscopically confirmed or Death Certificate Only. *In situ* cancers were excluded. All analyses were conducted by MCSS. Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population. *Regional rate is significantly ($p < 0.05$) different from statewide rate.

Figure II-22: Female Breast Cancer Incidence among Non-Hispanic Whites by Region, Minnesota, 1998-2002



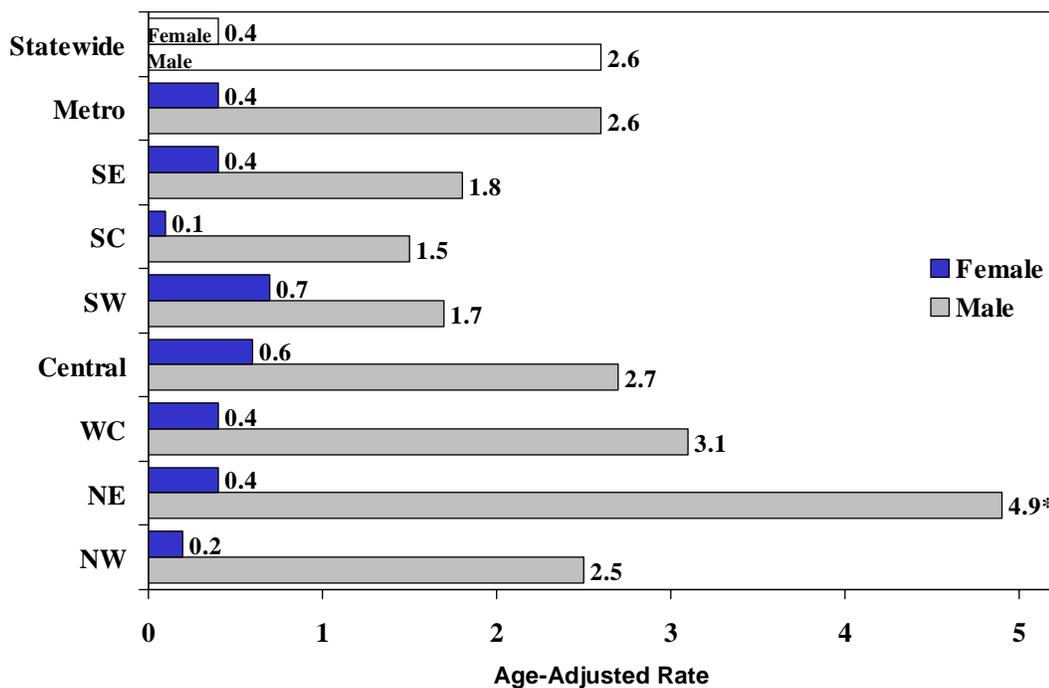
Source: MCSS (April 2005). All cases were either microscopically confirmed or Death Certificate Only. *In situ* cancers were excluded. All analyses were conducted by MCSS. Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population. *Regional rate is significantly ($p < 0.05$) different from statewide rate.

Figure II-23: Prostate Cancer Incidence Trends by Region, All Races Combined, Minnesota, 1988-2002



Source: MCSS (April 2005). All cases were either microscopically confirmed or Death Certificate Only. *In situ* cancers were excluded. All analyses were conducted by MCSS. Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

Figure II-24: Mesothelioma Incidence among Non-Hispanic Whites by Gender and Region, Minnesota, 1998-2002



Source: MCSS (April 2005). All cases were either microscopically confirmed or Death Certificate Only. *In situ* cancers were excluded. All analyses were conducted by MCSS. Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population. *Regional rate is significantly ($p < 0.05$) different from statewide rate.

[This page left intentionally blank]

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 (MCHS). For comparison, incidence rates from the National Cancer Institute's Surveillance, Epidemiology, and End Results (SEER) Program and mortality

rates for the United States are provided.

See Chapter I, Introduction, for more information about data sources and other information about interpreting the data. See also the Glossary (Appendix D) and Statistical Methods (Appendix E).

All Cancer Sites Combined

Table III-1.1: Number of new cases and deaths and incidence and mortality rates[§] by year, Minnesota, 1988-2002, 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	9,143	8,863	528.5	398.1	4,205	3,895	252.3	166.8
1989	9,332	8,589	533.1	381.7	4,220	3,789	252.5	160.4
1990	9,721	8,932	547.1	393.1	4,256	3,857	250.3	161.8
1991	10,691	8,994	590.1	391.4	4,362	4,014	253.1	164.8
1992	11,383	9,186	620.5	393.2	4,422	4,116	252.3	166.0
1993	10,646	9,162	567.6	387.4	4,317	4,088	242.7	161.7
1994	10,224	9,396	536.0	391.4	4,487	4,055	249.3	159.5
1995	10,464	9,538	542.2	391.7	4,463	4,209	243.9	162.8
1996	10,335	9,686	526.4	392.5	4,541	4,309	243.4	164.8
1997	10,823	9,998	545.4	399.1	4,556	4,178	240.5	156.7
1998	10,872	10,441	538.4	411.0	4,480	4,313	233.2	158.6
1999	11,337	10,546	550.7	410.1	4,575	4,301	232.5	156.9
2000	11,957	10,814	569.3	414.6	4,696	4,503	235.3	162.3
2001	12,160	11,065	568.0	417.8	4,610	4,296	225.6	153.1
2002	12,261	11,123	560.4	413.2	4,743	4,455	227.6	155.4

Table III-1.2: Number of new cases and deaths and average annual incidence and mortality rates[§] by age, Minnesota, 1998-2002, All Cancer Sites Combined

Age at Diagnosis or Death (years)	Incidence 1998-2002				Mortality 1998-2002			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
0 – 19	710	553	19.5	16.0	100	85	2.7	2.5
20 – 34	1,406	1,757	55.2	71.0	221	191	8.7	7.7
35 – 49	4,732	7,837	158.1	266.0	1,238	1,399	41.4	47.5
50 – 64	16,058	14,779	906.0	818.0	4,631	4,119	261.3	228.0
65 – 74	18,227	12,124	2664.1	1530.4	6,342	5,007	927.0	632.0
74 – 85	13,988	11,876	3274.3	1853.4	7,200	6,568	1685.4	1025.0
85 and older	3,466	5,063	2765.3	1623.3	3,372	4,499	2690.3	1442.5

Table III-1.3: Number of new cases and deaths and average annual incidence and mortality rates[§] by race and ethnicity, Minnesota, 1998-2002, All Cancer Sites Combined

Race and Ethnicity [†]	Incidence 1998-2002				Mortality 1998-2002			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
All Races	58,587	53,989	557.7	413.2	23,104	21,868	230.8	157.2
American Indian	399	358	686.8	430.2	185	164	329.0	229.9
Asian/Pacific Isl.	419	492	279.0	252.0	205	190	161.0	126.3
Black	1,080	805	670.3	395.5	454	330	325.1	189.5
Non-Hispanic White	55,218	51,177	549.8	410.8	22,109	21,065	229.3	156.7
Hispanic (All Races)	349	367	373.7	313.4	140	108	185.1	117.8

Source: MCSS (April 2005) and the Minnesota Center for Health Statistics. Cases were microscopically confirmed (1988-2002) or Death Certificate Only (1995-2002). *In situ* cancers except those of the bladder were excluded. All analyses were conducted by MCSS.

[§] Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

[†] Non-Hispanic persons reported with unknown or other race are included in all races combined, but are excluded from race-specific data. Hispanic includes persons of any race, including unknown. See Chapter I for comments on the accuracy of race- and ethnic-specific cancer rates.

~ Race-specific rates based on fewer than 10 cases or deaths are not presented.

All Cancer Sites Combined

Table III-1.4: Other Minnesota cancer statistics[†], 2000-2002, All Cancer Sites Combined

	Males	Females
Median Age at Diagnosis	68.0	66.0
Median Age at Death	74.0	75.0
Lifetime Risk of Diagnosis	58.4%	47.3%
Lifetime Risk of Death	25.1%	21.3%
Annual Percent Change [‡]		
Incidence (1995-2002 males; 1988-2002 females)	1.1%	0.5%
Mortality (1988-2002)	-0.8%	-0.4%

[†] See Appendix D or E for definition of terms.

[‡]The average *annual percent change* in the age-adjusted rate during the segment ending in 2002 from Joinpoint regression. Statistically significant ($P < 0.05$) trends are in **bold**.

Table III-1.5: Average annual incidence and mortality rates[§] by race and ethnicity, United States, 1998-2002, All Cancer Sites Combined

	Males	Females
Incidence		
All Races	553.3	413.5
American Indian	255.4	220.5
Asian/Pacific Islander	383.5	303.6
Black	682.6	398.5
Non-Hispanic White	562.4	443.0
Hispanic (All Races)	420.7	310.9
Mortality		
All Races	247.5	165.5
American Indian	159.7	113.8
Asian/Pacific Islander	148.0	99.4
Black	339.4	194.3
Non-Hispanic White	247.3	167.4
Hispanic (All Races)	171.4	111.0

Source: *SEER Cancer Statistics Review, 1975-2002*. Incidence data represent 14% 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.

Table III-1.6: Leading causes of death, Minnesota, 2000-2002

Rank	Cause of Death	Deaths per year [†]	% Deaths
1	Cancer	9,100	24.0
2	Heart Disease	8,705	23.0
3	Cerebrovascular Disease	2,730	7.2
4	Chronic Lung Disease	1,920	5.1
5	Accidents	1,805	4.8
6	Diabetes	1,245	3.3
7	Alzheimer's Disease	1,170	3.1
8	Pneumonia and Influenza	855	2.3
9	Nephritis	680	1.8
10	Suicide	470	1.2
	Other Causes and Conditions	9,170	24.2
	Total Deaths	37,850	100.0

[†]Rounded to the nearest 5.

Descriptive Epidemiology

Incidence and Mortality: In 2002, 23,384 Minnesotans were diagnosed with a potentially serious cancer, and 9,198 Minnesotans died of this disease. 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, about one out of two Minnesotans will be diagnosed with a potentially serious cancer during his or her lifetime, and one out of four will die of cancer. The overall cancer incidence rate in Minnesota is similar to that reported by the SEER Program for all races combined, and is five percent lower among non-Hispanic whites. The overall cancer mortality rate in Minnesota is six percent lower than in the U.S. as a whole.

Trends: The overall cancer incidence rate in Minnesota increased significantly among men by 1.1 percent per year from 1995-2002, and among women by 0.5 percent each year from 1988-2002. This was primarily due to increases in prostate cancer incidence in men and substantial increases in lung cancer and modest increases in breast cancer incidence in women. The cancer mortality rate declined steadily among both men and women in Minnesota over the 15-year period. Nonetheless, cancer became the leading cause of death in Minnesota in 2000 due to substantially larger decreases in heart disease mortality. While trends in heart disease and cancer mortality in Minnesota are similar to national trends, Minnesota was the only state in 2000 with cancer as the leading cause of death. The crossover between cancer and heart disease mortality occurred earlier in Minnesota than in other states primarily because heart disease mortality is about 30 percent lower in Minnesota than in the U.S., while cancer mortality is only slightly lower.

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 occurred among persons age 65 years and older, and nearly 75 percent of cancer deaths occurred in this age group. However, as discussed in the sections that follow, the age at which cancer is most likely to occur depends on the type of cancer.

All Cancer Sites Combined

Gender: The overall cancer incidence rate in Minnesota is 35 percent higher among men than women. Men are at greater risk than women for developing most types of cancer; the only common cancers that occur more frequently among women are those of breast, gallbladder, and thyroid. The overall cancer mortality rate in Minnesota is more than 45 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. For males, the overall cancer incidence rate in Minnesota is highest among American Indians and blacks. Non-Hispanic whites have the third highest incidence rate among males. American Indians also have the highest incidence rate among females, with non-Hispanic white women having the second highest rate. Cancer incidence among American Indians is about two times higher in Minnesota than in the geographic areas covered by the SEER Program, 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 reside in California and the Pacific Northwest. In Minnesota, Asian Pacific/Islanders have the lowest 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 perinatal 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/uspst-fix.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 ages 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.

Childhood Cancers

Table III-2.1: Number of new cases and deaths and incidence and mortality rates[§] by year, Minnesota, 1988-2002, Cancers among Children less than 15 Years of Age

Year of Diagnosis or Death	Incidence				Mortality			
	New Cases		Annual Rate		Deaths		Annual Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
1988	96	70	19.6	15.0	19	10	3.8	2.2
1989	92	74	18.3	15.6	17	12	3.4	2.4
1990	92	68	17.7	13.6	15	12	2.9	2.5
1991	82	81	15.6	16.3	16	13	3.1	2.6
1992	83	65	15.7	12.9	12	13	2.3	2.6
1993	87	69	16.4	13.7	12	10	2.2	2.0
1994	103	75	19.3	14.8	12	13	2.2	2.6
1995	85	58	16.0	11.7	15	9	2.8	1.8
1996	91	68	17.2	13.5	19	7	3.6	1.4
1997	78	71	14.7	14.2	15	13	2.8	2.6
1998	92	71	17.2	14.0	9	12	1.7	2.3
1999	78	70	14.5	13.6	12	7	2.2	1.4
2000	102	79	19.0	15.4	20	8	3.7	1.5
2001	99	75	18.7	14.8	9	11	1.7	2.2
2002	106	66	20.2	13.1	13	11	2.5	2.2

Table III-2.2: Number of new cases and deaths and average annual incidence and mortality rates[§] by age, Minnesota, 1998-2002, Cancers among Children less than 15 Years of Age

Age at Diagnosis or Death (years)	Incidence 1998-2002				Mortality 1998-2002			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
0 – 4	230	158	27.5	19.9	16	15	1.9	1.9
5 – 9	120	86	13.3	10.1	30	16	3.3	1.9
10 – 14	127	117	13.3	12.9	17	18	1.8	2.0

Table III-2.3: Number of new cases and deaths and average annual incidence and mortality rates[§] by race and ethnicity, Minnesota, 1998-2002, Cancers among Children less than 15 Years of Age

Race and Ethnicity [†]	Incidence 1998-2002				Mortality 1998-2002			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
All Races	477	361	17.9	14.2	63	49	2.3	1.9
American Indian	4	4	~	~	0	0	~	~
Asian/Pacific Isl.	21	16	17.3	13.4	4	2	~	~
Black	22	12	12.9	7.4	5	1	~	~
Non-Hispanic White	386	304	17.4	14.4	50	45	2.3	2.1
Hispanic (All Races)	17	12	13.0	10.8	3	1	~	~

Source: MCSS (April 2005) and the Minnesota Center for Health Statistics. Cases were microscopically confirmed (1988-2002) or Death Certificate Only (1995-2002). *In situ* cancers except those of the bladder were excluded. All analyses were conducted by MCSS.

[§] Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

[†] Non-Hispanic persons reported with unknown or other race are included in all races combined, but are excluded from race-specific data. Hispanic includes persons of any race, including unknown. See Chapter I for comments on the accuracy of race- and ethnic-specific cancer rates.

~ 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 incidence and mortality rates[§] by type of cancer, Minnesota, 1998-2002, Cancers among Children less than 15 Years of Age

Cancer Type [†]	Incidence				Mortality			
	New Cases		Annual Rate		Deaths		Annual Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
Bone & Joint	22	12	0.8	0.5	3	2	0.1	0.1
Brain	100	81	3.7	3.2	18	21	0.7	0.8
Hodgkin Lymphoma	19	18	0.7	0.7	0	0	0.0	0.0
Kidney	26	27	1.0	1.1	4	2	0.2	0.1
Leukemia	151	102	5.7	4.0	15	11	0.6	0.4
ALL	117	72	4.4	2.9	9	2	0.3	0.1
NHL	37	25	1.4	1.0	4	3	0.1	0.1
Soft Tissue	26	24	1.0	1.0	4	2	0.2	0.1

Source: MCSS (April 2005) and the Minnesota Center for Health Statistics. Cases were microscopically confirmed (1988-2002) or Death Certificate Only (1995-2002). *In situ* cancers except those of the bladder were excluded. All analyses were conducted 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; ALL is acute lymphocytic leukemia; NHL is non-Hodgkin lymphoma.

Table III-2.5: Other Minnesota cancer statistics[†], 2000-2002, Cancers among Children less than 15 Years of Age

	Males	Females
Risk of Diagnosis by Age 15	0.30%	0.22%
Risk of Death by Age 15	0.04%	0.03%
Annual Percent Change [‡]		
Incidence (1988-2002)	0.2%	-0.4%
Mortality (1988-2002)	-2.0%	-1.8%

† See Appendix D or E for definition of terms.

‡ The average *annual percent change* in the age-adjusted rate during the segment ending in 2002 from Joinpoint regression. Statistically significant (P < 0.05) trends are in **bold**.

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

Cancer Type	5-Year Relative Survival [‡] (%)
Bone and Joint	71.3
Brain and Other Nervous System	72.7
Hodgkin Lymphoma	95.1
Leukemia	80.2
Acute Lymphocytic	86.4
Non-Hodgkin Lymphoma	86.0
All Childhood Cancers	78.6

‡ Among SEER cases diagnosed 1995-2001 followed through 2002, from *SEER Cancer Statistics Review, 1975-2002*.

Table III-2.7: Average annual incidence and mortality rates[§] in the United States, 1998-2002, Cancers among Children less than 15 Years of Age

	Males	Females
Incidence		
All Childhood Cancers		
All Races	15.6	14.3
White [†]	16.7	15.5
Bone and Joint	0.6	0.6
Brain	3.6	3.3
Hodgkin Lymphoma	0.6	0.5
Kidney	0.8	1.0
Leukemia	4.9	4.2
Acute Lymphocytic	3.9	3.4
NHL	1.2	0.6
Soft Tissue	1.1	0.9
Mortality		
All Races	2.7	2.3
White [†]	2.7	2.4

Source: *SEER Cancer Statistics Review, 1975-2002*. Incidence data represent 14% 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 whites, including persons of Hispanic ethnicity.

Childhood Cancers

Descriptive Epidemiology

Incidence and Mortality: Each year, about 170 children under 15 years of age are diagnosed with cancer in Minnesota, and 20 children die of cancer. 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 333 children will be diagnosed with some form of cancer before age 15. Cancer is the leading cause of death from disease among children. Overall childhood incidence and mortality rates in Minnesota are 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 (30% of childhood cancers), brain cancer (22%), 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 stable since cancer reporting was implemented in 1988. The overall mortality rate for childhood cancers has been decreasing by about two percent each year in Minnesota from 1988-2002, although the decline is not statistically significant. Nationally, the cancer incidence rate in children ages 0-14 years was stable from 1989-2002, accompanied by a significant decline in mortality of 2.2 percent per year over the same time period.

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 1998-2002, white children had the highest overall cancer rates, followed by children of Asian/Pacific Islander origin, black children and American Indian children.

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 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, 1988-2002, 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	161	133	8.4	6.2	129	103	7.0	4.7
1989	147	115	7.4	5.1	100	94	5.4	4.3
1990	168	136	8.4	6.2	124	96	6.6	4.2
1991	168	136	8.4	6.1	119	100	6.5	4.4
1992	175	115	8.6	5.1	122	104	6.4	4.5
1993	172	139	8.4	6.0	126	120	6.4	5.1
1994	185	114	8.6	4.9	129	100	6.4	4.3
1995	173	130	7.9	5.6	114	103	5.7	4.3
1996	163	112	7.7	4.7	118	90	5.8	3.7
1997	166	134	7.5	5.5	119	96	5.7	3.9
1998	188	136	8.5	5.5	130	103	6.2	4.0
1999	198	151	8.7	6.2	139	104	6.4	4.2
2000	191	119	8.3	4.7	159	98	7.1	3.8
2001	187	141	8.0	5.5	147	99	6.5	3.8
2002	203	160	8.6	6.3	126	108	5.5	4.1

Table III-3.2: Number of new cases and deaths and average annual incidence and mortality rates[§] by age, Minnesota, 1998-2002, Brain and Other Nervous System Cancer

Age at Diagnosis or Death (years)	Incidence 1998-2002				Mortality 1998-2002			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
0 – 19	135	103	3.7	3.0	24	32	0.7	0.9
20 – 34	89	68	3.5	2.7	35	18	1.4	0.7
35 – 49	198	115	6.6	3.9	124	75	4.1	2.5
50 – 64	260	174	14.7	9.6	217	137	12.2	7.6
65 – 74	158	121	23.1	15.3	164	98	24.0	12.4
74 – 85	115	110	26.9	17.2	115	117	26.9	18.3
85 and older	12	16	9.6	5.1	22	35	17.6	11.2

Table III-3.3: Number of new cases and deaths and average annual incidence and mortality rates[§] by race and ethnicity, Minnesota, 1998-2002, Brain and Other Nervous System Cancer

Race and Ethnicity [†]	Incidence 1998-2002				Mortality 1998-2002			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
All Races	967	707	8.4	5.6	701	512	6.4	4.0
American Indian	6	1	~	~	1	0	~	~
Asian/Pacific Isl.	9	7	~	~	5	0	~	~
Black	12	9	3.1	~	9	5	~	~
Non-Hispanic White	915	679	8.6	5.9	678	502	6.5	4.1
Hispanic (All Races)	14	7	6.3	~	5	5	~	~

Source: MCSS (April 2005) and the Minnesota Center for Health Statistics. Cases were microscopically confirmed (1988-2002) or Death Certificate Only (1995-2002). *In situ* cancers were excluded. All analyses were conducted by MCSS.

[§] Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

[†] Non-Hispanic persons reported with unknown or other race are included in all races combined, but are excluded from race-specific data. Hispanic includes persons of any race, including unknown. See Chapter I for comments on the accuracy of race- and ethnic-specific cancer rates.

~ Race-specific rates based on fewer than 10 cases or deaths are not presented.

Brain and Other Nervous System

Descriptive Epidemiology

Table III-3.4: Other Minnesota cancer statistics[†], 2000-2002, Brain and Other Nervous System Cancer

	Males	Females
Median Age at Diagnosis	54.0	54.0
Median Age at Death	59.5	64.0
Lifetime Risk of Diagnosis	0.7%	0.5%
Lifetime Risk of Death	0.6%	0.4%
Annual Percent Change [‡]		
Incidence (1988-2002)	0.1%	-0.2%
Mortality (1988-2002)	-0.2%	-1.3%

[†] See Appendix D or E for definition of terms.

[‡]The average *annual percent change* in the age-adjusted rate during the segment ending in 2002 from Joinpoint regression. Statistically significant ($P < 0.05$) trends are in **bold**.

Table III-3.5: Average annual incidence and mortality rates[§] in the United States, 1998-2002, Brain and Other Nervous System Cancer

	Males	Females
Incidence		
All Races	7.6	5.3
Non-Hispanic White	9.0	6.2
Mortality		
All Races	5.6	3.7
Non-Hispanic White	6.2	4.1

Source: *SEER Cancer Statistics Review, 1975-2002*. Incidence data represent 14% 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.

Table III-3.6: Distribution of Brain and Other Nervous System cancer cell types, Minnesota, 1998-2002

Cell Type	Histology Codes [†]	Cases	%
Glioblastoma	9440-9442	718	42.9
Astrocytoma	9400, 9401, 9410-9411, 9420-9421, 9423-9430	437	26.1
Oligodendroglioma	9450-51, 9460	209	12.5
Ependymoma	9391-9394	68	4.1
Mixed glioma	9382	60	3.6
Medulloblastoma	9470-9472	35	2.1
Other glioma	9380, 9381	19	1.1
All others		128	7.6
Total		1,674	100.0

[†]International Classification of Diseases for Oncology, 3rd edition.

Incidence and Mortality: An average of 335 cases of invasive brain and other nervous system cancer are diagnosed in Minnesota each year, and 240 deaths are caused by these cancers. They account for 1.5 percent of all new cancers diagnosed and 2.7 percent of cancer deaths in the state. Incidence and mortality rates in Minnesota are similar to those for the U.S. Based on SEER data, the 5-year relative survival rate for brain cancers diagnosed between 1995-2001 was 33.3 percent, but was considerably higher among children ages 0-14 (72.7%).

Trends: The incidence rate of invasive brain and other nervous system cancer in Minnesota has been stable since cancer reporting was implemented in 1988. The mortality rate declined significantly by 1.3 percent per year among women over the same period.

Age: The incidence rate for brain and nervous system cancer increases only modestly with age. The majority of brain and nervous system cancers are diagnosed among persons between the ages of 20 and 64 years.

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 cancers, but research is not conclusive.

Early Detection / Prevention

Brain cancer is usually detected once it becomes symptomatic. In most cases, the type and location of the tumor is more important than early detection.

Specific Cancers

Breast

Table III-4.1: Number of new cases and deaths and incidence and mortality rates[§] by year, Minnesota, 1988-2002, 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	132.6	6	765	0.4	34.3
1989	13	2,772	0.7	127.2	5	716	0.3	32.0
1990	15	2,908	0.9	132.4	2	746	0.1	32.8
1991	18	2,923	1.0	130.8	6	786	0.4	33.8
1992	12	2,951	0.6	130.7	3	726	0.2	30.4
1993	15	3,025	0.8	131.6	5	732	0.3	30.0
1994	22	2,974	1.2	126.9	9	708	0.5	28.9
1995	24	3,164	1.3	133.7	4	773	0.2	31.0
1996	18	3,155	0.9	130.6	7	725	0.4	28.5
1997	17	3,236	0.9	132.1	11	678	0.6	26.1
1998	23	3,510	1.2	140.6	5	720	0.2	26.9
1999	21	3,495	1.0	138.7	4	670	0.2	24.9
2000	32	3,656	1.6	142.4	8	729	0.4	26.8
2001	27	3,644	1.3	139.1	10	685	0.5	24.8
2002	30	3,597	1.3	134.7	2	640	0.1	22.5

Table III-4.2: Number of new cases and deaths and average annual incidence and mortality rates[§] by age, Minnesota, 1998-2002, Breast Cancer

Age at Diagnosis or Death (years)	Incidence 1998-2002				Mortality 1998-2002			
	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	286	0.1	11.6	0	46	0.0	1.9
35 – 49	16	3,455	0.5	117.3	1	441	0.0	15.0
50 – 64	31	6,039	1.7	334.2	11	847	0.6	46.9
65 – 74	27	3,654	3.9	461.2	7	656	1.0	82.8
74 – 85	38	3,117	8.9	486.4	6	801	1.4	125.0
85 and older	19	1,351	15.2	433.2	4	653	3.2	209.4

Table III-4.3: Number of new cases and deaths and average annual incidence and mortality rates[§] by race and ethnicity, Minnesota, 1998-2002, Breast Cancer

Race and Ethnicity [†]	Incidence 1998-2002				Mortality 1998-2002			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
All Races	133	17,902	1.3	139.0	29	3,444	0.3	25.2
American Indian	0	85	~	96.8	0	19	~	27.6
Asian/Pacific Isl.	0	135	~	65.3	0	17	~	8.9
Black	4	240	~	107.8	0	65	~	30.0
Non-Hispanic White	125	17,076	1.3	139.3	29	3,317	0.3	25.2
Hispanic (All Races)	2	108	~	85.1	0	26	~	20.8

Source: MCSS (April 2005) and the Minnesota Center for Health Statistics. Cases were microscopically confirmed (1988-2002) or Death Certificate Only (1995-2002). *In situ* cancers were excluded. All analyses were conducted by MCSS.

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Non-Hispanic persons reported with unknown or other race are included in all races combined, but are excluded from race-specific data. Hispanic includes persons of any race, including unknown. See Chapter I for comments on the accuracy of race- and ethnic-specific cancer rates.

~ Race-specific rates based on fewer than 10 cases or deaths are not presented.

Breast

Table III-4.4: Other Minnesota cancer statistics[†], 2000-2002, Breast Cancer

	Males	Females
Median Age at Diagnosis	73.0	62.0
Median Age at Death	68.5	70.5
Lifetime Risk of Diagnosis	0.2%	15.0%
Lifetime Risk of Death	0.0%	3.1%
Annual Percent Change [‡]		
Incidence (1988-2002)	4.2%	0.6%
Mortality (1988-2002)	1.8%	-2.6%

[†] See Appendix D or E for definition of terms.

[‡]The average *annual percent change* in the age-adjusted rate during the segment ending in 2002 from Joinpoint regression. Statistically significant ($P < 0.05$) trends are in **bold**.

Table III-4.5: Average annual incidence and mortality rates[§] in the United States, 1998-2002, Breast Cancer

	Males	Females
Incidence		
All Races	1.2	134.4
Non-Hispanic White [†]	1.2	149.4
Mortality		
All Races	0.3	26.4
Non-Hispanic White [†]	0.3	26.2

Source: *SEER Cancer Statistics Review, 1975-2002*. Incidence data represent 14% 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.

[†]Data for males are based on all whites, including persons of Hispanic ethnicity.

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

Stage at Diagnosis	Percent of Cases [†] (%)	5-Year Relative Survival [‡] (%)
<i>In Situ</i>	16.3	-
Localized	52.9	97.9
Regional	25.7	81.3
Distant	3.2	26.1
Unknown	2.0	55.6

[†] Among Minnesota cases diagnosed 2001-2002.

[‡] Among SEER cases diagnosed 1995-2001 followed through 2002, from *SEER Cancer Statistics Review, 1975-2002*.

Descriptive Epidemiology

Incidence and Mortality: Approximately 3,500 invasive breast cancers are diagnosed in Minnesota each year, and 690 deaths are caused by this cancer. It accounts for 33 percent of cancers and 16 percent of cancer deaths among women in this state. In Minnesota, 1 out of 7 women will be diagnosed with

breast cancer and 1 out of 32 women will die of the disease. The breast cancer incidence rate among non-Hispanic white women is seven percent lower in Minnesota than reported by SEER, and the mortality rate is six percent lower than in the U.S.

Trends: Incidence rates for invasive breast cancer among Minnesota women increased significantly by 0.6 percent per year from 1988 to 2002, while the mortality rate decreased significantly by 2.6 percent per year during the same time period. This is similar to national trends. 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. Almost 80 percent of cases are diagnosed among women 50 years of age and older.

Gender: Male breast cancer is relatively rare.

Race: In Minnesota, white women have the highest incidence rate. Although the incidence rate is 23 percent lower among black compared to non-Hispanic white women, the mortality rate is 19 percent higher among black women. The breast cancer incidence rate among American Indian women is 31 percent lower than among non-Hispanic white women, but the mortality rate is 10 percent higher. These relationships indicate clear disparities in survival from breast cancer among populations of color.

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. 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, 1988-2002, 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	-	2.0
1990	-	248	-	11.1	-	51	-	2.4
1991	-	202	-	9.2	-	41	-	1.8
1992	-	168	-	7.3	-	44	-	1.9
1993	-	199	-	8.7	-	36	-	1.5
1994	-	206	-	8.9	-	46	-	2.0
1995	-	200	-	8.4	-	51	-	2.2
1996	-	200	-	8.2	-	61	-	2.6
1997	-	175	-	7.3	-	45	-	1.8
1998	-	144	-	5.9	-	37	-	1.5
1999	-	177	-	7.1	-	49	-	1.9
2000	-	174	-	6.9	-	42	-	1.5
2001	-	176	-	6.9	-	35	-	1.3
2002	-	172	-	6.8	-	34	-	1.3

Table III-5.2: Number of new cases and deaths and average annual incidence and mortality rates[§] by age, Minnesota, 1998-2002, Cervix Uteri Cancer

Age at Diagnosis or Death (years)	Incidence 1998-2002				Mortality 1998-2002			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
0 – 19	-	4	-	0.1	-	0	-	0.0
20 – 34	-	150	-	6.1	-	9	-	0.4
35 – 49	-	343	-	11.6	-	52	-	1.8
50 – 64	-	190	-	10.5	-	54	-	3.0
65 – 74	-	82	-	10.4	-	34	-	4.3
74 – 85	-	51	-	8.0	-	23	-	3.6
85 and older	-	23	-	7.4	-	25	-	8.0

Table III-5.3: Number of new cases and deaths and average annual incidence and mortality rates[§] by race and ethnicity, Minnesota, 1998-2002, Cervix Uteri Cancer

Race and Ethnicity [†]	Incidence 1998-2002				Mortality 1998-2002			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
All Races	-	843	-	6.7	-	197	-	1.5
American Indian	-	14	-	12.2	-	4	-	~
Asian/Pacific Isl.	-	29	-	13.6	-	11	-	6.0
Black	-	30	-	10.3	-	9	-	~
Non-Hispanic White	-	717	-	6.2	-	170	-	1.4
Hispanic (All Races)	-	25	-	11.0	-	3	-	~

Source: MCSS (April 2005) and the Minnesota Center for Health Statistics. Cases were microscopically confirmed (1988-2002) or Death Certificate Only (1995-2002). *In situ* cancers were excluded. All analyses were conducted by MCSS.

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Non-Hispanic persons reported with unknown or other race are included in all races combined, but are excluded from race-specific data. Hispanic includes persons of any race, including unknown. See Chapter I for comments on the accuracy of race- and ethnic-specific cancer rates.

~ Race-specific rates based on fewer than 10 cases or deaths are not presented.

Cervix Uteri

Table III-5.4: Other Minnesota cancer statistics[†], 2000-2002, Cervix Uteri Cancer

	Males	Females
Median Age at Diagnosis	-	44.0
Median Age at Death	-	60.0
Lifetime Risk of Diagnosis	-	0.6%
Lifetime Risk of Death	-	0.2%
Annual Percent Change [‡]		
Incidence (1988-2002)	-	-3.2%
Mortality (1988-2002)	-	-2.7%

[†] See Appendix D or E for definition of terms.

[‡]The average *annual percent change* in the age-adjusted rate during the segment ending in 2002 from Joinpoint regression. Statistically significant ($P < 0.05$) trends are in **bold**.

Table III-5.5: Average annual incidence and mortality rates[§] in the United States, 1998-2002, Cervix Uteri Cancer

	Males	Females
Incidence		
All Races	-	8.9
Non-Hispanic White	-	7.1
Mortality		
All Races	-	2.8
Non-Hispanic White	-	2.4

Source: *SEER Cancer Statistics Review, 1975-2002*. Incidence data represent 14% 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.

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

Stage at Diagnosis	Percent of Cases [†] (%)	5-Year Relative Survival [‡] (%)
<i>In Situ</i>	~	-
Localized	60.6	92.4
Regional	28.2	54.7
Distant	8.9	16.5
Unknown	2.3	61.4

[†] Among Minnesota cases diagnosed 2001-2002.

[‡] Among SEER cases diagnosed 1995-2001 followed through 2002, from *SEER Cancer Statistics Review, 1975-2002*.

~*In situ* cervical cancers are not collected.

Descriptive Epidemiology

Incidence and Mortality: Each year, an average of 170 Minnesota women are diagnosed with this preventable disease, and nearly 40 deaths occur. The incidence rate among non-Hispanic white women is 13 percent lower in Minnesota than reported by the SEER Program, and the overall mortality rate is more than 40 percent lower than the national average. Minnesota has

one of the lowest rates of cervical cancer mortality in the U.S.

Trends: The invasive cervical cancer incidence rate decreased significantly by an average of 3.2 percent each year in Minnesota from 1988 to 2002, and mortality decreased significantly by 2.7 percent each year over the same period. Nationally, cervical cancer incidence and mortality have declined by 40-50 percent since 1973, with a break in progress during the 1980s when rates were stable or declining less rapidly. 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 59 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 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 more than two times more likely to be diagnosed with invasive cervical cancer than non-Hispanic white women, and disparities in the mortality rate may be even greater. Women of color are also less likely than non-Hispanic white women to be diagnosed before the cancer has spread to lymph nodes or other organs (data not shown).

Risk Factors

More than 95 percent of cervical cancers are caused by the human papillomavirus (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. Clinical studies are currently underway to test the efficacy of an HPV vaccine, and it is likely that a vaccine will be available in the next few years. Because Pap tests can identify lesions in a pre-malignant state when they can be removed with minimally invasive procedures, lack of access to medical care increases risk for this cancer.

Early Detection / Prevention

Cervical cancer can be prevented through screening with the Pap test. The U.S. Preventive Services Task Force recommends that women should receive regular Pap tests starting at age 21 or within 3 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, 1988-2002, 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	1,255	1,233	74.1	51.9	507	482	31.0	19.5
1989	1,289	1,181	75.3	48.9	515	518	30.9	20.5
1990	1,218	1,229	70.4	50.5	497	462	29.4	18.3
1991	1,230	1,218	69.8	49.6	482	496	28.6	19.3
1992	1,291	1,179	72.5	47.3	464	522	27.4	20.0
1993	1,175	1,175	64.2	46.4	416	473	23.6	17.5
1994	1,182	1,190	63.3	46.2	446	432	24.9	15.7
1995	1,242	1,181	66.1	45.1	470	517	25.7	18.6
1996	1,117	1,178	58.4	44.9	454	461	24.6	16.3
1997	1,248	1,261	64.9	47.3	466	461	25.0	16.3
1998	1,216	1,305	61.7	48.5	462	497	24.3	17.4
1999	1,250	1,223	62.1	44.7	426	475	22.1	16.6
2000	1,277	1,275	61.9	46.1	429	497	21.7	17.0
2001	1,262	1,238	59.8	44.3	410	458	20.3	15.3
2002	1,275	1,273	59.1	45.1	451	481	21.4	15.9

Table III-6.2: Number of new cases and deaths and average annual incidence and mortality rates[§] by age, Minnesota, 1998-2002, Colon and Rectum Cancer

Age at Diagnosis or Death (years)	Incidence 1998-2002				Mortality 1998-2002			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
0 – 19	5	2	0.1	0.1	0	1	0.0	0.0
20 – 34	66	48	2.6	1.9	15	12	0.6	0.5
35 – 49	457	407	15.3	13.8	104	92	3.5	3.1
50 – 64	1,693	1,165	95.5	64.5	453	339	25.6	18.8
65 – 74	1,824	1,491	266.6	188.2	552	481	80.7	60.7
74 – 85	1,647	2,088	385.5	325.9	683	732	159.9	114.2
85 and older	588	1,113	469.1	356.9	371	751	296.0	240.8

Table III-6.3: Number of new cases and deaths and average annual incidence and mortality rates[§] by race and ethnicity, Minnesota, 1998-2002, Colon and Rectum Cancer

Race and Ethnicity [†]	Incidence 1998-2002				Mortality 1998-2002			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
All Races	6,280	6,314	60.9	45.7	2,178	2,408	21.9	16.4
American Indian	56	46	105.1	62.6	18	17	26.6	28.2
Asian/Pacific Isl.	44	38	28.2	23.9	10	20	5.9	14.7
Black	96	93	67.4	53.8	32	34	23.9	20.7
Non-Hispanic White	5,976	6,035	60.3	45.2	2,111	2,326	22.0	16.3
Hispanic (All Races)	33	26	46.4	30.9	7	10	~	11.6

Source: MCSS (April 2005) and the Minnesota Center for Health Statistics. Cases were microscopically confirmed (1988-2002) or Death Certificate Only (1995-2002). *In situ* cancers were excluded. All analyses were conducted by MCSS.

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Non-Hispanic persons reported with unknown or other race are included in all races combined, but are excluded from race-specific data. Hispanic includes persons of any race, including unknown. See Chapter I for comments on the accuracy of race- and ethnic-specific cancer rates.

~ Race-specific rates based on fewer than 10 cases or deaths are not presented.

Colon and Rectum

Table III-6.4: Other Minnesota cancer statistics[†], 2000-2002, Colon and Rectum Cancer

	Males	Females
Median Age at Diagnosis	70.0	75.0
Median Age at Death	74.0	79.0
Lifetime Risk of Diagnosis	6.3%	5.9%
Lifetime Risk of Death	2.3%	2.4%
Annual Percent Change [‡]		
Incidence (1988-2002)	-1.6%	-0.8%
Mortality (1988-2002)	-2.8%	-1.7%

[†] See Appendix D or E for definition of terms.

[‡]The average *annual percent change* in the age-adjusted rate during the segment ending in 2002 from Joinpoint regression. Statistically significant ($P < 0.05$) trends are in **bold**.

Table III-6.5: Average annual incidence and mortality rates[§] in the United States, 1998-2002, Colon and Rectum Cancer

	Males	Females
Incidence		
All Races	62.1	46.0
Non-Hispanic White	62.6	46.5
Mortality		
All Races	24.8	17.4
Non-Hispanic White	24.4	16.9

Source: SEER Cancer Statistics Review, 1975-2002. Incidence data represent 14% 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.

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

Stage at Diagnosis	Percent of Cases [†] (%)	5-Year Relative Survival [‡] (%)
<i>In Situ</i>	5.3	-
Localized	35.4	90.4
Regional	39.0	67.9
Distant	15.5	9.7
Unknown	4.7	35.4

[†] Among Minnesota cases diagnosed 2001-2002.

[‡] Among SEER cases diagnosed 1995-2001 followed through 2002, from SEER Cancer Statistics Review, 1975-2002.

Descriptive Epidemiology

Incidence and Mortality: Approximately 2,500 cases of invasive colon and rectum cancer are diagnosed and 900 deaths occur each year in Minnesota. Minnesota rates are slightly lower than national rates. Colorectal cancer is the second leading cause of cancer-related death in Minnesota.

Trends: Colon and rectum cancer rates have declined sharply over the last 15 years in Minnesota, similar to national trends. Incidence rates in the SEER Program began declining in 1985 and the decrease in mortality nationwide became sharper about that time as well. These declines may be due in part to increased screening and polyp removal, which may prevent the progression of polyps to invasive cancers. Other factors, such as increasing use of hormone replacement therapy among women and increased use of aspirin to prevent heart disease, may also have contributed to reductions in 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, American Indian men and black men have the highest incidence and mortality rates, while Asian/Pacific Islanders have the lowest. Colorectal cancer mortality among American Indians in Minnesota is twice that of American Indians in the U.S. as a whole.

Risk Factors

The primary risk factor for colorectal cancer is increasing age. A personal or family history of colorectal cancer, adenomatous polyposis coli or inflammatory bowel disease also increases colorectal cancer risk. Other risk factors include obesity, physical inactivity, alcohol consumption, high fat and low fiber diets, as well as a diet low in fruits and vegetables. Because screening can prevent colorectal cancer by removing precancerous polyps, not being screened is a risk factor for the disease.

Early Detection / Prevention

Many colorectal cancers can be prevented through screening. Examinations that view the interior of the colon and rectum (sigmoidoscopy and colonoscopy) can find polyps, the precursors of colorectal cancer. The American Cancer Society recommends that men and women at average risk for developing colorectal cancer should be screened beginning at age 50 using one of the following methods: 1) an annual fecal occult blood test (FOBT), or 2) flexible sigmoidoscopy (FS) every 5 years, or 3) a combination of FOBT and FS, or 4) a double contrast barium enema every 5-10 years, or 5) a colonoscopy every 10 years.

Corpus Uteri

Table III-7.1: Number of new cases and deaths and incidence and mortality rates[§] by year, Minnesota, 1988-2002, 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	-	547	-	25.3	-	96	-	4.0
1990	-	551	-	25.2	-	82	-	3.3
1991	-	588	-	27.0	-	117	-	4.8
1992	-	585	-	25.8	-	104	-	4.1
1993	-	586	-	25.4	-	97	-	3.7
1994	-	594	-	25.3	-	89	-	3.4
1995	-	633	-	26.9	-	99	-	3.9
1996	-	635	-	26.6	-	114	-	4.2
1997	-	648	-	26.6	-	96	-	3.5
1998	-	648	-	26.4	-	112	-	4.1
1999	-	669	-	26.7	-	122	-	4.6
2000	-	628	-	24.7	-	99	-	3.5
2001	-	707	-	27.1	-	111	-	4.0
2002	-	758	-	28.5	-	114	-	3.9

Table III-7.2: Number of new cases and deaths and average annual incidence and mortality rates[§] by age, Minnesota, 1998-2002, Corpus Uteri Cancer

Age at Diagnosis or Death (years)	Incidence 1998-2002				Mortality 1998-2002			
	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	-	41	-	1.7	-	1	-	0.0
35 – 49	-	409	-	13.9	-	19	-	0.6
50 – 64	-	1,351	-	74.8	-	118	-	6.5
65 – 74	-	785	-	99.1	-	133	-	16.8
74 – 85	-	618	-	96.4	-	164	-	25.6
85 and older	-	206	-	66.0	-	123	-	39.4

Table III-7.3: Number of new cases and deaths and average annual incidence and mortality rates[§] by race and ethnicity, Minnesota, 1998-2002, Corpus Uteri Cancer

Race and Ethnicity [†]	Incidence 1998-2002				Mortality 1998-2002			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
All Races	-	3,410	-	26.7	-	558	-	4.0
American Indian	-	10	-	10.8	-	1	-	~
Asian/Pacific Isl.	-	29	-	15.0	-	4	-	~
Black	-	34	-	17.5	-	8	-	~
Non-Hispanic White	-	3,245	-	26.6	-	542	-	4.0
Hispanic (All Races)	-	24	-	20.8	-	3	-	~

Source: MCSS (April 2005) and the Minnesota Center for Health Statistics. Cases were microscopically confirmed (1988-2002) or Death Certificate Only (1995-2002). *In situ* cancers were excluded. All analyses were conducted by MCSS.

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Non-Hispanic persons reported with unknown or other race are included in all races combined, but are excluded from race-specific data. Hispanic includes persons of any race, including unknown. See Chapter I for comments on the accuracy of race- and ethnic-specific cancer rates.

~ Race-specific rates based on fewer than 10 cases or deaths are not presented.

Corpus Uteri

Table III-7.4: Other Minnesota cancer statistics[†], 2000-2002, Corpus Uteri Cancer

	Males	Females
Median Age at Diagnosis	-	63.0
Median Age at Death	-	75.0
Lifetime Risk of Diagnosis	-	3.0%
Lifetime Risk of Death	-	0.5%
Annual Percent Change [‡]		
Incidence (1988-2002)	-	0.4%
Mortality (1988-2002)	-	-0.6%

[†] See Appendix D or E for definition of terms.

[‡]The average *annual percent change* in the age-adjusted rate during the segment ending in 2002 from Joinpoint regression. Statistically significant ($P < 0.05$) trends are in **bold**.

Table III-7.5: Average annual incidence and mortality rates[§] in the United States, 1998-2002, Corpus Uteri Cancer

	Males	Females
Incidence		
All Races	-	24.2
Non-Hispanic White	-	26.6
Mortality		
All Races	-	4.1
Non-Hispanic White	-	3.8

Source: *SEER Cancer Statistics Review, 1975-2002*. Incidence data represent 14% 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.

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

Stage at Diagnosis	Percent of Cases [†] (%)	5-Year Relative Survival [‡] (%)
<i>In Situ</i>	3.2	-
Localized	70.7	96.1
Regional	14.9	66.3
Distant	7.2	25.2
Unknown	4.0	57.3

[†] Among Minnesota cases diagnosed 2001-2002.

[‡] Among SEER cases diagnosed 1995-2001 followed through 2002, from *SEER Cancer Statistics Review, 1975-2002*.

Descriptive Epidemiology

Incidence and Mortality: Cancer of the corpus uteri is often referred to as endometrial cancer, since the cells of the lining of the uterus, or endometrium, are the most likely to become malignant. About 680 cases of uterine cancer are diagnosed among women in Minnesota each year and about 110 women die from the disease. Rates in Minnesota are similar to what is reported nationally. It should be noted that the risk of

developing uterine cancer among women with a uterus is actually higher than the rate presented because the number of women who have had hysterectomies is not known, and therefore has not been subtracted from the denominator used for calculating rates.

Trends: Uterine cancer rates in Minnesota have been stable since 1988, similar to national trends.

Age: Nearly 50 percent of diagnoses and 55 percent of deaths occur among women 65 years of age or older.

Race: In Minnesota, the uterine cancer incidence rate appears to be about 50 percent higher among non-Hispanic white women than women of color. 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 62 percent for black women.

Risk Factors

A high cumulative exposure to estrogen is the major risk factor for uterine cancer. Estrogen exposure may be increased by estrogen replacement therapy, tamoxifen, early menarche, late menopause, never having children, a history of failure to ovulate, and obesity. Increased production of endogenous estrogens due to estrogen-secreting ovarian tumors or polycystic ovarian syndrome also increases risk. Other factors associated with an increased likelihood of developing uterine cancer include obesity, high body mass, and a high fat diet. Hormone replacement therapy (HRT), which is a combination of progesterone and estrogen replacement therapy, is thought to largely offset the increased risk related to HRT using only estrogen. Research has not implicated estrogen exposures in the development of the other types of uterine corpus cancer, which are more aggressive and have a poorer prognosis.

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, 1988-2002, 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	6.2	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	1.5
1992	104	41	5.6	1.6	110	47	6.0	1.8
1993	118	29	6.2	1.2	116	29	6.3	1.2
1994	120	37	6.4	1.5	116	32	6.2	1.2
1995	139	51	7.1	2.0	155	40	8.1	1.6
1996	149	46	7.6	1.8	138	43	7.2	1.6
1997	142	46	7.2	1.7	145	46	7.3	1.6
1998	156	41	7.7	1.6	160	44	8.1	1.6
1999	173	55	8.4	1.9	140	40	6.9	1.4
2000	157	52	7.5	1.9	179	53	8.6	1.9
2001	158	61	7.4	2.2	140	51	6.6	1.7
2002	200	47	9.3	1.7	173	56	8.1	1.9

Table III-8.2: Number of new cases and deaths and average annual incidence and mortality rates[§] by age, Minnesota, 1998-2002, Esophagus Cancer

Age at Diagnosis or Death (years)	Incidence 1998-2002				Mortality 1998-2002			
	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	1	0.2	0.0	3	0	0.1	0.0
35 – 49	53	11	1.8	0.4	40	7	1.3	0.2
50 – 64	256	48	14.4	2.7	229	33	12.9	1.8
65 – 74	295	79	43.1	10.0	260	62	38.0	7.8
74 – 85	194	76	45.4	11.9	203	85	47.5	13.3
85 and older	42	41	33.5	13.1	57	57	45.5	18.3

Table III-8.3: Number of new cases and deaths and average annual incidence and mortality rates[§] by race and ethnicity, Minnesota, 1998-2002, Esophagus Cancer

Race and Ethnicity [†]	Incidence 1998-2002				Mortality 1998-2002			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
All Races	844	256	8.0	1.9	792	244	7.7	1.7
American Indian	6	3	~	~	7	3	~	~
Asian/Pacific Isl.	4	1	~	~	3	0	~	~
Black	11	5	11.0	~	17	6	12.0	~
Non-Hispanic White	815	243	8.1	1.9	762	232	7.6	1.7
Hispanic (All Races)	3	2	~	~	3	1	~	~

Source: MCSS (April 2005) and the Minnesota Center for Health Statistics. Cases were microscopically confirmed (1988-2002) or Death Certificate Only (1995-2002). *In situ* cancers were excluded. All analyses were conducted by MCSS.

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Non-Hispanic persons reported with unknown or other race are included in all races combined, but are excluded from race-specific data. Hispanic includes persons of any race, including unknown. See Chapter I for comments on the accuracy of race- and ethnic-specific cancer rates.

~ Race-specific rates based on fewer than 10 cases or deaths are not presented.

Esophagus

Table III-8.4: Other Minnesota cancer statistics[†], 2000-2002, Esophagus Cancer

	Males	Females
Median Age at Diagnosis	69.0	72.0
Median Age at Death	69.0	77.0
Lifetime Risk of Diagnosis	0.9%	0.3%
Lifetime Risk of Death	0.8%	0.3%
Annual Percent Change [‡]		
Incidence (1988-2002)	2.7%	1.3%
Mortality (1988-2002)	1.8%	0.7%

[†] See Appendix D or E for definition of terms.

[‡]The average *annual percent change* in the age-adjusted rate during the segment ending in 2002 from Joinpoint regression. Statistically significant ($P < 0.05$) trends are in **bold**.

Table III-8.5: Average annual incidence and mortality rates[§] in the United States, 1998-2002, Esophagus Cancer

	Males	Females
Incidence		
All Races	7.7	2.0
Non-Hispanic White	7.9	2.0
Mortality		
All Races	7.7	1.8
Non-Hispanic White	7.7	1.7

Source: *SEER Cancer Statistics Review, 1975-2002*. Incidence data represent 14% 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.

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

Stage at Diagnosis	Percent of Cases [†] (%)	5-Year Relative Survival [‡] (%)
<i>In Situ</i>	1.9	-
Localized	20.8	31.4
Regional	36.0	13.8
Distant	27.2	2.7
Unknown	14.1	11.0

[†] Among Minnesota cases diagnosed 2001-2002.

[‡] Among SEER cases diagnosed 1995-2001 followed through 2002, from *SEER Cancer Statistics Review, 1975-2002*.

Descriptive Epidemiology

Incidence and Mortality: Each year, about 220 cases of esophageal cancer are diagnosed in Minnesota and about 200 deaths result from this disease. Rates are similar to those reported by SEER. Based on SEER data, the five-year relative survival rate for esophageal cancer is less than 32 percent, even when diagnosed at the localized stage. In Minnesota, most esophageal cancers are diagnosed when the tumor has already

spread to adjacent tissues (36.0%) or distant (27.2%) organs.

Trends: The incidence rate among Minnesota males has significantly increased by an average of 2.7 percent per year since cancer reporting was initiated in 1988, accompanied by a statistically significant increase in mortality of 1.8 percent per year. These increases are larger than seen among males nationally (0.5% per year over 1975-2002 for incidence, and 0.5% per year over 1994-2002 for mortality). Rates among Minnesota females have been stable.

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

Gender: Esophageal cancer rates are four times higher among males than females.

Race: In Minnesota, black men are nearly 60 percent more likely to die of esophageal cancer than non-Hispanic white men. There are too few cases among women of color in Minnesota to assess differences in rates. 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

There are no early detection tests to screen the general population for esophageal cancer. However, persons who are at high risk for esophageal cancer, such as those with Barrett's esophagus, should be followed closely to determine the advisability of having regular endoscopic examinations.

Hodgkin Lymphoma

Table III-9.1: Number of new cases and deaths and incidence and mortality rates[§] by year, Minnesota, 1988-2002, Hodgkin Lymphoma

Year of Diagnosis or Death	Incidence				Mortality			
	New Cases		Annual Rate		Deaths		Annual Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
1988	78	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	88	53	4.1	2.3	14	16	0.8	0.7
1991	72	70	3.4	3.1	17	12	0.9	0.5
1992	74	73	3.4	3.1	23	11	1.1	0.4
1993	78	72	3.6	3.0	22	18	1.2	0.7
1994	85	62	3.8	2.6	13	13	0.7	0.5
1995	78	48	3.5	2.0	8	13	0.4	0.5
1996	75	67	3.2	2.8	11	11	0.6	0.4
1997	72	63	3.1	2.6	7	15	0.3	0.6
1998	82	68	3.5	2.8	19	9	0.9	0.3
1999	80	79	3.4	3.1	18	12	0.9	0.5
2000	112	67	4.7	2.7	12	12	0.6	0.5
2001	72	60	3.0	2.4	19	3	0.8	0.1
2002	75	64	3.0	2.5	12	9	0.5	0.3

Table III-9.2: Number of new cases and deaths and average annual incidence and mortality rates[§] by age, Minnesota, 1998-2002, Hodgkin Lymphoma

Age at Diagnosis or Death (years)	Incidence 1998-2002				Mortality 1998-2002			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
0 – 19	48	49	1.3	1.4	2	0	0.1	0.0
20 – 34	138	114	5.4	4.6	11	5	0.4	0.2
35 – 49	109	74	3.6	2.5	13	6	0.4	0.2
50 – 64	54	36	3.0	2.0	16	10	0.9	0.6
65 – 74	44	25	6.4	3.2	17	5	2.5	0.6
74 – 85	19	28	4.4	4.4	14	15	3.3	2.3
85 and older	9	12	7.2	3.8	7	4	5.6	1.3

Table III-9.3: Number of new cases and deaths and average annual incidence and mortality rates[§] by race and ethnicity, Minnesota, 1998-2002, Hodgkin Lymphoma

Race and Ethnicity [†]	Incidence 1998-2002				Mortality 1998-2002			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
All Races	421	338	3.5	2.7	80	45	0.7	0.3
American Indian	2	2	~	~	0	0	~	~
Asian/Pacific Isl.	4	4	~	~	1	0	~	~
Black	10	5	2.7	~	2	0	~	~
Non-Hispanic White	386	309	3.6	2.7	77	45	0.8	0.4
Hispanic (All Races)	6	7	~	~	0	0	~	~

Source: MCSS (April 2005) and the Minnesota Center for Health Statistics. Cases were microscopically confirmed (1988-2002) or Death Certificate Only (1995-2002). *In situ* cancers were excluded. All analyses were conducted by MCSS.

[§] Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

[†] Non-Hispanic persons reported with unknown or other race are included in all races combined, but are excluded from race-specific data. Hispanic includes persons of any race, including unknown. See Chapter I for comments on the accuracy of race- and ethnic-specific cancer rates.

~ Race-specific rates based on fewer than 10 cases or deaths are not presented.

Hodgkin Lymphoma

Table III-9.4: Other Minnesota cancer statistics[†], 2000-2002, Hodgkin Lymphoma

	Males	Females
Median Age at Diagnosis	37.0	33.0
Median Age at Death	57.0	72.0
Lifetime Risk of Diagnosis	0.3%	0.2%
Lifetime Risk of Death	0.1%	0.0%
Annual Percent Change [‡]		
Incidence (1988-2002)	-0.6%	-0.6%
Mortality (1988-2002)	-2.5%	-4.4%

[†] See Appendix D or E for definition of terms.

[‡]The average *annual percent change* in the age-adjusted rate during the segment ending in 2002 from Joinpoint regression. Statistically significant ($P < 0.05$) trends are in **bold**.

Table III-9.5: Average annual incidence and mortality rates[§] in the United States, 1998-2002, Hodgkin Lymphoma

	Males	Females
Incidence		
All Races	3.0	2.4
Non-Hispanic White	3.4	2.9
Mortality		
All Races	0.6	0.4
Non-Hispanic White	0.6	0.4

Source: SEER Cancer Statistics Review, 1975-2002. Incidence data represent 14% 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.

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

Age at Diagnosis (years)	Males (%)	Females (%)
< 45	89.6	93.0
45-54	76.9	89.9
55-64	72.0	73.2
65-74	59.2	58.1
75+	52.4	38.8
All Ages	83.8	87.0

[‡]Among SEER cases diagnosed 1995-2001 followed through 2002, from SEER Cancer Statistics Review, 1975-2002.

Descriptive Epidemiology

Incidence and Mortality: Lymphomas are malignancies of the white blood cells. There are two kinds of malignant lymphomas: Hodgkin lymphoma, which contains Reed-Sternberg cells, and non-Hodgkin lymphoma, which does not. Lymphomas are relatively common and account for about five percent of all cancers diagnosed in Minnesota. Hodgkin lymphoma is less common, accounting for only 13 percent of

lymphomas and less than one percent of all cancer diagnoses. Approximately 150 cases are diagnosed each year in Minnesota and 25 people die from the disease. Rates are similar to those reported nationally. The SEER five-year relative survival rate for Hodgkin lymphoma is over 80 percent for both males and females, and has increased from about 70 percent among cases diagnosed in the early 1970s.

Trends: The incidence rate of Hodgkin lymphoma in Minnesota has been stable over the past 15 years, with a significant decline in the mortality rate of 4.4 percent per year among women.

Age: Approximately 75 percent of newly diagnosed cases of Hodgkin lymphoma occur in persons under the age of 50 years. Hodgkin 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: The Hodgkin lymphoma incidence rate is about 30 percent higher among males than females.

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

Risk Factors

No major risk factors for Hodgkin lymphoma have been identified, although the unusual epidemiologic patterns of the disease suggest that Hodgkin lymphoma pathogenesis may involve an infectious agent. The risk of developing Hodgkin lymphoma appears to be as much as four times higher among people who have had infectious mononucleosis, an infection caused by the Epstein-Barr virus. Research suggests that risk is also increased among individuals with certain primary immunodeficiencies. Siblings of persons with Hodgkin lymphoma have an increased risk of the disease that does not appear to be genetic, but may be due to the same childhood exposures, such as infections. There does not appear to be a connection between Hodgkin lymphoma and lifestyle factors such as smoking, diet, exercise, and alcohol intake. No particular occupation is at higher risk, although there is some evidence of a positive association between occupational exposure in wood-related industries and exposures to certain chemicals. Hodgkin lymphoma occurs at a higher rate in people with a higher socioeconomic background.

Early Detection / Prevention

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

Kaposi Sarcoma (all sites)

Table III-10.1: Number of new cases and deaths and incidence and mortality rates[§] by year, Minnesota, 1988-2002, Kaposi 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	0.4	-	-	-	-
1989	35	2	1.6	0.1	-	-	-	-
1990	35	3	1.5	0.1	-	-	-	-
1991	40	0	1.9	0.0	-	-	-	-
1992	46	2	2.0	0.1	-	-	-	-
1993	37	1	1.5	0.0	-	-	-	-
1994	36	1	1.5	0.0	-	-	-	-
1995	36	6	1.5	0.2	-	-	-	-
1996	16	0	0.8	0.0	-	-	-	-
1997	20	0	0.9	0.0	-	-	-	-
1998	9	1	0.4	0.0	-	-	-	-
1999	8	0	0.3	0.0	0	0	0.0	0.0
2000	14	1	0.6	0.0	0	0	0.0	0.0
2001	14	1	0.6	0.0	1	0	0.0	0.0
2002	11	2	0.5	0.1	0	0	0.0	0.0

Table III-10.2: Number of new cases and deaths and average annual incidence and mortality rates[§] by age, Minnesota, selected years, Kaposi Sarcoma (all sites)

Age at Diagnosis or Death (years)	Incidence 1998-2002				Mortality 1999-2002 [^]			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
0 – 19	1	0	0.0	0.0	0	0	0.0	0.0
20 – 34	7	1	0.3	0.0	0	0	0.0	0.0
35 – 49	28	0	0.9	0.0	0	0	0.0	0.0
50 – 64	10	0	0.6	0.0	1	0	0.1	0.0
65 – 74	3	0	0.4	0.0	0	0	0.0	0.0
74 – 85	6	3	1.4	0.5	0	0	0.0	0.0
85 and older	1	1	0.8	0.3	0	0	0.0	0.0

Table III-10.3: Number of new cases and deaths and average annual incidence and mortality rates[§] by race and ethnicity, Minnesota, selected years, Kaposi Sarcoma (all sites)

Race and Ethnicity [†]	Incidence 1998-2002				Mortality 1999-2002 [^]			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
All Races	56	5	0.5	~	1	0	~	~
American Indian	2	0	~	~	0	0	~	~
Asian/Pacific Isl.	0	0	~	~	0	0	~	~
Black	13	0	3.0	~	1	0	~	~
Non-Hispanic White	32	4	0.3	~	0	0	~	~
Hispanic (All Races)	6	1	~	~	~	~	~	~

Source: MCSS (April 2005) and the Minnesota Center for Health Statistics. Cases were microscopically confirmed (1988-2002) or Death Certificate Only (1995-2002). *In situ* cancers were excluded. All analyses were conducted by MCSS.

[§] Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

[^] Mortality data are for the 4-year period 1999-2002. Category did not exist in mortality coding until 1999.

[†] Non-Hispanic persons reported with unknown or other race are included in all races combined, but are excluded from race-specific data. Hispanic includes persons of any race, including unknown. See Chapter I for comments on the accuracy of race- and ethnic-specific cancer rates.

~ Race-specific rates based on fewer than 10 cases or deaths are not presented.

Kaposi Sarcoma (all sites)

Table III-10.4: Other Minnesota cancer statistics[†], 2000-2002, Kaposi Sarcoma (all sites)

	Males	Females
Median Age at Diagnosis	42.0	82.5
Median Age at Death	~	~
Lifetime Risk of Diagnosis	0.04%	0.01%
Lifetime Risk of Death	0.0010%	0.0000%
Annual Percent Change [‡]		
Incidence (1992-2002)	-15.4%	~
Mortality (1988-2002)	~	~

[†] See Appendix D or E for definition of terms.

[‡]The average *annual percent change* in the age-adjusted rate during the segment ending in 2002 from Joinpoint regression. 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, 1998-2002, Kaposi Sarcoma (all sites)

	Males	Females
Incidence		
All Races	1.7	0.1
Non-Hispanic White	1.4	0.1
Mortality		
All Races	~	~
Non-Hispanic White	~	~

Source: *SEER Cancer Statistics Review, 1975-2002*. Incidence data represent 14% 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.

~ Data not available.

Table III-10.6: Five-year relative survival[‡] by gender and age at diagnosis, Kaposi Sarcoma (all sites)

Age at Diagnosis (years)	Males (%)	Females (%)
< 45	41.6	18.0
45-54	45.9	~
55-64	58.2	~
65-74	78.2	~
75+	85.6	71.5
All Ages	44.8	52.7

[‡] Among SEER cases diagnosed 1995-2001 followed through 2002, from *SEER Cancer Statistics Review, 1975-2002*.

~ Data not available.

Descriptive Epidemiology

Incidence and Mortality: Kaposi 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 five-year period, 1998-2002, an average of 12 cases of KS have been diagnosed in Minnesota each year. Incidence rates among non-Hispanic 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 almost 20-fold from 0.5 new cases per 100,000 men per year in 1975-1976 to 9.5 in 1989-1990, and then decreased to 1.3 in 2001-2002. 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 with a statistically significant decrease of 15.4 percent per year among males from 1992-2002.

Age: About 70 percent of KS cases in Minnesota are diagnosed among men between 20 and 64 years of age.

Gender: In Minnesota, greater than 10 times more cases of KS were diagnosed among males than among females from 1998-2002.

Race: Based on a fairly limited number of cases, it appears that KS incidence rates in Minnesota are considerably higher among black males than non-Hispanic white males.

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, 1988-2002, 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	160	16.2	7.3	136	65	7.9	2.8
1989	256	147	14.5	6.5	90	70	5.3	2.9
1990	291	164	15.9	7.0	116	72	6.8	2.9
1991	308	148	16.7	6.3	141	86	8.0	3.5
1992	311	200	16.7	8.6	132	98	7.4	4.0
1993	283	159	14.9	6.7	128	78	7.0	3.1
1994	335	176	17.3	7.3	114	79	6.2	3.1
1995	346	193	17.7	8.0	113	76	6.1	2.9
1996	303	160	15.2	6.6	126	87	6.6	3.2
1997	290	209	14.4	8.4	141	90	7.3	3.4
1998	323	213	15.5	8.4	102	89	5.2	3.2
1999	341	224	16.0	8.9	129	68	6.4	2.4
2000	388	238	17.9	9.2	134	103	6.4	3.7
2001	404	224	18.3	8.6	117	82	5.5	3.0
2002	429	257	19.1	9.6	147	74	6.9	2.5

Table III-11.2: Number of new cases and deaths and average annual incidence and mortality rates[§] by age, Minnesota, 1998-2002, Kidney and Renal Pelvis Cancer

Age at Diagnosis or Death (years)	Incidence 1998-2002				Mortality 1998-2002			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
0 – 19	27	27	0.7	0.8	4	4	0.1	0.1
20 – 34	20	20	0.8	0.8	3	2	0.1	0.1
35 – 49	271	121	9.1	4.1	44	17	1.5	0.6
50 – 64	620	290	35.0	16.1	178	66	10.0	3.7
65 – 74	495	342	72.4	43.2	175	102	25.6	12.9
74 – 85	403	280	94.3	43.7	166	129	38.9	20.1
85 and older	49	76	39.1	24.4	59	96	47.1	30.8

Table III-11.3: Number of new cases and deaths and average annual incidence and mortality rates[§] by race and ethnicity, Minnesota, 1998-2002, Kidney and Renal Pelvis Cancer

Race and Ethnicity [†]	Incidence 1998-2002				Mortality 1998-2002			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
All Races	1,885	1,156	17.4	8.9	629	416	6.1	2.9
American Indian	16	14	29.2	14.4	11	5	18.9	~
Asian/Pacific Isl.	11	9	8.0	~	5	3	~	~
Black	50	19	25.2	9.7	9	1	~	~
Non-Hispanic White	1,754	1,090	17.0	8.8	600	406	6.1	3.0
Hispanic (All Races)	13	10	9.7	9.0	4	1	~	~

Source: MCSS (April 2005) and the Minnesota Center for Health Statistics. Cases were microscopically confirmed (1988-2002) or Death Certificate Only (1995-2002). *In situ* cancers were excluded. All analyses were conducted by MCSS.

[§] Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

[†] Non-Hispanic persons reported with unknown or other race are included in all races combined, but are excluded from race-specific data. Hispanic includes persons of any race, including unknown. See Chapter I for comments on the accuracy of race- and ethnic-specific cancer rates.

~ Race-specific rates based on fewer than 10 cases or deaths are not presented.

Kidney and Renal Pelvis

Table III-11.4: Other Minnesota cancer statistics[†], 2000-2002, Kidney and Renal Pelvis Cancer

	Males	Females
Median Age at Diagnosis	65.0	68.0
Median Age at Death	69.0	76.0
Lifetime Risk of Diagnosis	1.8%	1.1%
Lifetime Risk of Death	0.7%	0.4%
Annual Percent Change [‡]		
Incidence (1988-2002)	1.0%	2.4%
Mortality (1988-2002)	-1.1%	-0.5%

[†] See Appendix D or E for definition of terms.

[‡]The average *annual percent change* in the age-adjusted rate during the segment ending in 2002 from Joinpoint regression. Statistically significant ($P < 0.05$) trends are in **bold**.

Table III-11.5: Average annual incidence and mortality rates[§] in the United States, 1998-2002, Kidney and Renal Pelvis Cancer

	Males	Females
Incidence		
All Races	16.2	8.0
Non-Hispanic White	16.4	8.0
Mortality		
All Races	6.1	2.8
Non-Hispanic White	6.3	2.8

Source: SEER Cancer Statistics Review, 1975-2002. Incidence data represent 14% 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.

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

Stage at Diagnosis	Percent of Cases [†] (%)	5-Year Relative Survival [‡] (%)
<i>In Situ</i>	3.2	-
Localized	56.8	90.6
Regional	21.2	60.3
Distant	14.1	9.7
Unknown	4.6	32.2

[†] Among Minnesota cases diagnosed 2001-2002.

[‡] Among SEER cases diagnosed 1995-2001 followed through 2002, from SEER Cancer Statistics Review, 1975-2002.

Descriptive Epidemiology

Incidence and Mortality: Approximately 600 cases of kidney and renal pelvis cancer are diagnosed each year in Minnesota, and 200 deaths result from this disease. The incidence rate in Minnesota is significantly higher (10% and 7% among all races combined and non-Hispanic whites, respectively), compared to the SEER Program, while the mortality rate is similar to the U.S.

average. The SEER five-year relative survival rate for kidney and renal pelvis cancers is 90.6 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 increased significantly by 1.0 percent per year among Minnesota men and by 2.4 percent per year among women. Mortality rates remained relatively stable for both genders. These trends are similar to those reported by the SEER Program.

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, incidence rates are approximately 1.5 times higher in American Indian and black males than in non-Hispanic white males. SEER data show that incidence is highest among blacks, followed by non-Hispanic whites, Hispanics, and American Indians. According to both SEER and Minnesota data, rates are at least 50 percent lower in 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, 1988-2002, 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	152	26	8.6	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	31	6.9	1.3	27	4	1.4	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	137	31	6.7	1.3	51	8	2.6	0.3
1999	135	30	6.5	1.2	45	10	2.2	0.4
2000	115	31	5.3	1.2	27	7	1.4	0.3
2001	125	32	5.7	1.3	45	12	2.2	0.5
2002	126	33	5.7	1.3	30	9	1.4	0.3

Table III-12.2: Number of new cases and deaths and average annual incidence and mortality rates[§] by age, Minnesota, 1998-2002, Larynx Cancer

Age at Diagnosis or Death (years)	Incidence 1998-2002				Mortality 1998-2002			
	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	0	0	0.0	0.0
35 – 49	52	25	1.7	0.8	6	1	0.2	0.0
50 – 64	230	48	13.0	2.7	52	9	2.9	0.5
65 – 74	214	52	31.3	6.6	56	18	8.2	2.3
74 – 85	119	24	27.9	3.7	62	14	14.5	2.2
85 and older	19	5	15.2	1.6	22	4	17.6	1.3

Table III-12.3: Number of new cases and deaths and average annual incidence and mortality rates[§] by race and ethnicity, Minnesota, 1998-2002, Larynx Cancer

Race and Ethnicity [†]	Incidence 1998-2002				Mortality 1998-2002			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
All Races	638	157	6.0	1.2	198	46	2.0	0.4
American Indian	8	0	~	~	2	0	~	~
Asian/Pacific Isl.	2	0	~	~	0	0	~	~
Black	14	8	9.5	~	7	1	~	~
Non-Hispanic White	595	147	5.8	1.2	186	45	1.9	0.4
Hispanic (All Races)	6	2	~	~	3	0	~	~

Source: MCSS (April 2005) and the Minnesota Center for Health Statistics. Cases were microscopically confirmed (1988-2002) or Death Certificate Only (1995-2002). *In situ* cancers were excluded. All analyses were conducted by MCSS.

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Non-Hispanic persons reported with unknown or other race are included in all races combined, but are excluded from race-specific data. Hispanic includes persons of any race, including unknown. See Chapter I for comments on the accuracy of race- and ethnic-specific cancer rates.

~ Race-specific rates based on fewer than 10 cases or deaths are not presented.

Larynx

Table III-12.4: Other Minnesota cancer statistics[†], 2000-2002, Larynx Cancer

	Males	Females
Median Age at Diagnosis	66.0	66.0
Median Age at Death	74.5	72.0
Lifetime Risk of Diagnosis	0.6%	0.2%
Lifetime Risk of Death	0.2%	0.1%
Annual Percent Change [‡]		
Incidence (1988-2002)	-2.6%	-0.5%
Mortality (1988-2002)	0.0%	-0.4%

[†] See Appendix D or E for definition of terms.

[‡]The average *annual percent change* in the age-adjusted rate during the segment ending in 2002 from Joinpoint regression. Statistically significant ($P < 0.05$) trends are in **bold**.

Table III-12.5: Average annual incidence and mortality rates[§] in the United States, 1998-2002, Larynx Cancer

	Males	Females
Incidence		
All Races	6.5	1.4
Non-Hispanic White	6.2	1.4
Mortality		
All Races	2.5	0.5
Non-Hispanic White	2.3	0.5

Source: *SEER Cancer Statistics Review, 1975-2002*. Incidence data represent 14% 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.

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

Stage at Diagnosis	Percent of Cases [†] (%)	5-Year Relative Survival [‡] (%)
<i>In Situ</i>	8.4	-
Localized	59.7	83.8
Regional	22.9	49.9
Distant	5.5	18.5
Unknown	3.5	57.1

[†] Among Minnesota cases diagnosed 2001-2002.

[‡] Among SEER cases diagnosed 1995-2001 followed through 2002, from *SEER Cancer Statistics Review, 1975-2002*.

Descriptive Epidemiology

Incidence and Mortality: About 160 cases of laryngeal cancer are diagnosed in Minnesota each year and 50 deaths are caused by this cancer. Incidence and mortality rates in Minnesota are somewhat lower than nationally. Based on SEER data, the five-year relative survival rate for laryngeal cancer is 83.8 percent when diagnosed at an early stage. Survival decreases

significantly when the cancer has progressed to involve nearby tissues or lymph nodes.

Trends: The laryngeal cancer incidence rate in Minnesota decreased significantly by 2.6 percent per year from 1988 to 2002 among males, but remained stable among women. The mortality rate was stable for both men and women. Nationally, incidence and mortality rates are both decreasing by about two percent per year.

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

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

Race: The laryngeal cancer incidence rate in black men in Minnesota is about 60 percent higher than non-Hispanic 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 about 70 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 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 may 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, 1988-2002, Leukemia

Year of Diagnosis or Death	Incidence				Mortality			
	New Cases		Annual Rate		Deaths		Annual Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
1988	302	258	17.1	11.2	167	154	10.2	6.4
1989	314	208	17.7	8.8	191	174	11.0	7.2
1990	335	250	18.3	10.6	212	169	12.3	6.9
1991	302	256	16.2	10.7	214	166	12.3	6.5
1992	372	243	20.1	9.9	222	171	12.7	6.7
1993	312	242	16.4	9.9	213	155	11.9	5.7
1994	385	271	19.9	11.1	211	155	11.6	6.0
1995	366	251	18.7	9.9	260	170	14.2	6.2
1996	359	267	18.3	10.4	226	191	12.1	7.2
1997	379	260	19.1	9.6	211	166	11.1	6.0
1998	362	289	17.7	11.0	192	163	10.0	5.7
1999	370	292	17.9	11.0	244	192	12.3	6.7
2000	375	268	17.7	9.9	229	185	11.7	6.6
2001	444	287	20.9	10.6	229	156	11.4	5.4
2002	390	266	17.9	9.6	227	196	10.9	6.5

Table III-13.2: Number of new cases and deaths and average annual incidence and mortality rates[§] by age, Minnesota, 1998-2002, Leukemia

Age at Diagnosis or Death (years)	Incidence 1998-2002				Mortality 1998-2002			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
0 – 19	186	122	5.1	3.5	29	21	0.8	0.6
20 – 34	83	40	3.3	1.6	34	23	1.3	0.9
35 – 49	167	112	5.6	3.8	70	60	2.3	2.0
50 – 64	393	262	22.2	14.5	156	116	8.8	6.4
65 – 74	449	292	65.6	36.9	256	148	37.4	18.7
74 – 85	512	348	119.8	54.3	393	281	92.0	43.9
85 and older	151	226	120.5	72.5	183	243	146.0	77.9

Table III-13.3: Number of new cases and deaths and average annual incidence and mortality rates[§] by race and ethnicity, Minnesota, 1998-2002, Leukemia

Race and Ethnicity [†]	Incidence 1998-2002				Mortality 1998-2002			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
All Races	1,941	1,402	18.4	10.4	1,121	892	11.3	6.2
American Indian	14	15	13.3	14.6	7	6	~	~
Asian/Pacific Isl.	25	16	11.6	5.6	12	10	8.8	4.8
Black	30	14	8.9	4.1	14	5	8.0	~
Non-Hispanic White	1,812	1,323	18.2	10.3	1,080	868	11.3	6.2
Hispanic (All Races)	16	11	9.5	5.8	6	2	~	~

Source: MCSS (April 2005) and the Minnesota Center for Health Statistics. Cases were microscopically confirmed (1988-2002) or Death Certificate Only (1995-2002). *In situ* cancers were excluded. All analyses were conducted by MCSS.

[§] Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

[†] Non-Hispanic persons reported with unknown or other race are included in all races combined, but are excluded from race-specific data. Hispanic includes persons of any race, including unknown. See Chapter I for comments on the accuracy of race- and ethnic-specific cancer rates.

~ Race-specific rates based on fewer than 10 cases or deaths are not presented.

Leukemia

Table III-13.4: Other Minnesota cancer statistics[†], 2000-2002, Leukemia

	Males	Females
Median Age at Diagnosis	69.0	71.0
Median Age at Death	76.0	77.0
Lifetime Risk of Diagnosis	1.9%	1.2%
Lifetime Risk of Death	1.2%	0.9%
Annual Percent Change [‡]		
Incidence (1988-2002)	0.5%	0.0%
Mortality (1988-2002)	-0.2%	-0.6%

[†] See Appendix D or E for definition of terms.

[‡]The average *annual percent change* in the age-adjusted rate during the segment ending in 2002 from Joinpoint regression. Statistically significant ($P < 0.05$) trends are in **bold**.

Table III-13.5: Average annual incidence and mortality rates[§] in the United States, 1998-2002, Leukemia

	Males	Females
Incidence		
All Races	15.9	9.4
Non-Hispanic White	17.1	9.7
Mortality		
All Races	10.2	5.8
Non-Hispanic White	10.6	6.0

Source: *SEER Cancer Statistics Review, 1975-2002*. Incidence data represent 14% 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.

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

	Percent of Cases [†] (%)	5-Year Relative Survival [‡] (%)
Acute lymphocytic	9.7	64.9
Chronic lymphocytic	39.7	74.2
Acute myeloid	26.2	19.8
Chronic myeloid	14.0	39.0
All other leukemia	10.3	~
Total	100.0	47.6

[†]Among Minnesota cases diagnosed 2001-2002.

[‡]Among SEER cases diagnosed 1995-2001 followed through 2002, from *SEER Cancer Statistics Review, 1975-2002*.

~Data not available.

Descriptive Epidemiology

Incidence and Mortality: About 670 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 4.5 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. The overall leukemia incidence rate is significantly higher in Minnesota than in the SEER Program (14% higher for all races combined and 6% higher for non-Hispanic whites). Mortality rates are approximately eight percent higher. 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. Leukemias are a diverse group of cancers that 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 or small decreases 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 ages 19 and under than in persons ages 20-34 years. Incidence increases with age after 35 years of age.

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 non-Hispanic 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 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, 1988-2002, 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	3.5	1.9
1989	66	45	3.7	2.0	71	24	4.1	1.0
1990	73	32	4.0	1.5	86	57	4.9	2.4
1991	74	32	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	4.2	1.6	96	52	4.9	2.0
1997	78	44	3.9	1.8	105	61	5.3	2.3
1998	82	41	3.9	1.6	85	71	4.3	2.6
1999	106	52	4.9	2.0	103	53	5.0	1.9
2000	118	51	5.5	2.0	119	64	5.8	2.3
2001	116	50	5.3	1.9	124	71	5.8	2.6
2002	128	51	5.8	1.9	135	61	6.2	2.1

Table III-14.2: Number of new cases and deaths and average annual incidence and mortality rates[§] by age, Minnesota, 1998-2002, Liver and Bile Duct Cancer

Age at Diagnosis or Death (years)	Incidence 1998-2002				Mortality 1998-2002			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
0 – 19	17	4	0.5	0.1	5	3	0.1	0.1
20 – 34	6	2	0.2	0.1	5	1	0.2	0.0
35 – 49	78	29	2.6	1.0	64	15	2.1	0.5
50 – 64	164	55	9.3	3.0	138	55	7.8	3.0
65 – 74	144	54	21.0	6.8	152	65	22.2	8.2
74 – 85	124	79	29.0	12.3	157	125	36.8	19.5
85 and older	17	22	13.6	7.1	45	56	35.9	18.0

Table III-14.3: Number of new cases and deaths and average annual incidence and mortality rates[§] by race and ethnicity, Minnesota, 1998-2002, Liver and Bile Duct Cancer

Race and Ethnicity [†]	Incidence 1998-2002				Mortality 1998-2002			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
All Races	550	245	5.1	1.9	566	320	5.4	2.3
American Indian	4	3	~	~	10	3	11.3	~
Asian/Pacific Isl.	50	9	27.9	~	40	9	26.1	~
Black	39	9	21.0	~	38	7	21.1	~
Non-Hispanic White	433	221	4.3	1.7	462	297	4.7	2.2
Hispanic (All Races)	18	1	14.5	~	14	4	14.9	~

Source: MCSS (April 2005) and the Minnesota Center for Health Statistics. Cases were microscopically confirmed (1988-2002) or Death Certificate Only (1995-2002). *In situ* cancers were excluded. All analyses were conducted by MCSS.

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Non-Hispanic persons reported with unknown or other race are included in all races combined, but are excluded from race-specific data. Hispanic includes persons of any race, including unknown. See Chapter I for comments on the accuracy of race- and ethnic-specific cancer rates.

~ Race-specific rates based on fewer than 10 cases or deaths are not presented.

Liver and Bile Duct

Table III-14.4: Other Minnesota cancer statistics[†], 2000-2002, Liver and Bile Duct Cancer

	Males	Females
Median Age at Diagnosis	66.5	71.5
Median Age at Death	70.0	77.0
Lifetime Risk of Diagnosis	0.6%	0.2%
Lifetime Risk of Death	0.6%	0.3%
Annual Percent Change [‡]		
Incidence (1988-2002)	3.5%	1.6%
Mortality (1988-2002)	3.2%	1.7%

[†] See Appendix D or E for definition of terms.

[‡]The average *annual percent change* in the age-adjusted rate during the segment ending in 2002 from Joinpoint regression. Statistically significant ($P < 0.05$) trends are in **bold**.

Table III-14.5: Average annual incidence and mortality rates[§] in the United States, 1998-2002, Liver and Bile Duct Cancer

	Males	Females
Incidence		
All Races	9.3	3.6
Non-Hispanic White	6.2	2.5
Mortality		
All Races	6.8	3.0
Non-Hispanic White	5.9	2.6

Source: SEER Cancer Statistics Review, 1975-2002. Incidence data represent 14% 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.

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

Stage at Diagnosis	Percent of Cases [†] (%)	5-Year Relative Survival [‡] (%)
<i>In Situ</i>	0.0	-
Localized	33.9	19.0
Regional	31.6	6.6
Distant	20.3	3.4
Unknown	14.2	3.3

[†] Among Minnesota cases diagnosed 2001-2002.

[‡] Among SEER cases diagnosed 1995-2001 followed through 2002, from SEER Cancer Statistics Review, 1975-2002.

Descriptive Epidemiology

Incidence and Mortality: About 160 cases of primary liver and bile duct cancer are diagnosed in Minnesota each year, and 180 deaths occur as a result of this cancer. Liver cancer incidence rates among non-Hispanic whites in Minnesota are nearly 50 percent lower than reported by SEER. This may reflect the fact 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 organs. Mortality rates should be interpreted with caution because cause of death can be misclassified in secondary liver cancers. Based on SEER data, the five-year relative survival rate for liver cancer is 19 percent or lower, even if diagnosed early.

Trends: Incidence rates for liver cancer among Minnesota males and females increased significantly from 1988-2002 by 3.5 percent per year and 1.6 percent per year, respectively. Mortality rates for males significantly increased by 3.2 percent per year. Rates also increased among women, but the trend was not statistically significant. SEER data showed similar or even larger increases in liver cancer incidence from 1984-1999, but this trend stabilized or decreased somewhat from 1999-2002. The liver cancer mortality rate for the U.S. is still increasing, but at a slower rate since 1995.

Age: Approximately 55 percent of liver cancers are diagnosed among persons age 65 years or older.

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

Race: In Minnesota, incidence and mortality rates for liver cancer are highest among people of color. For males, rates among Asian/Pacific Islanders are about 25 percent higher than rates for blacks and more than six times higher than non-Hispanic whites. This is similar to what is 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 produced by a fungus that contaminates wheat, peanuts, soybeans, corn, and rice are strongly associated with liver cancer. Industrial exposure to vinyl chloride or exposure to thorium dioxide (previously used in X-ray dye) increases the risk of developing liver 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., government agencies 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, 1988-2002, 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	1,395	775	78.9	35.3	1,193	618	69.2	27.9
1989	1,345	782	75.4	35.4	1,182	627	68.4	27.6
1990	1,420	829	77.9	37.4	1,223	684	69.5	29.7
1991	1,348	863	73.8	38.2	1,222	708	68.6	30.5
1992	1,397	924	75.7	40.6	1,233	772	68.3	32.3
1993	1,418	884	75.2	38.2	1,244	797	68.0	33.2
1994	1,359	1,023	71.3	43.4	1,226	812	66.2	33.4
1995	1,454	954	75.3	39.9	1,228	839	65.2	34.0
1996	1,403	1,072	71.5	44.4	1,238	884	64.7	35.3
1997	1,479	1,031	75.2	42.2	1,259	859	65.0	33.9
1998	1,470	1,098	73.2	43.9	1,242	929	63.2	36.1
1999	1,495	1,151	73.2	45.4	1,293	906	64.5	34.5
2000	1,510	1,173	72.8	45.8	1,224	971	60.3	36.7
2001	1,527	1,245	72.2	47.9	1,263	996	60.7	37.1
2002	1,528	1,298	71.3	49.2	1,261	1,066	59.9	38.8

Table III-15.2: Number of new cases and deaths and average annual incidence and mortality rates[§] by age, Minnesota, 1998-2002, Lung and Bronchus Cancer

Age at Diagnosis or Death (years)	Incidence 1998-2002				Mortality 1998-2002			
	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	22	19	0.9	0.8	3	4	0.1	0.2
35 – 49	384	363	12.8	12.3	259	221	8.7	7.5
50 – 64	2,036	1,719	114.9	95.1	1,474	1,095	83.2	60.6
65 – 74	2,713	1,973	396.5	249.1	2,130	1,492	311.3	188.3
74 – 85	2,034	1,575	476.1	245.8	1,924	1,538	450.4	240.0
85 and older	336	313	268.1	100.4	493	518	393.3	166.1

Table III-15.3: Number of new cases and deaths and average annual incidence and mortality rates[§] by race and ethnicity, Minnesota, 1998-2002, Lung and Bronchus Cancer

Race and Ethnicity [†]	Incidence 1998-2002				Mortality 1998-2002			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
All Races	7,530	5,965	72.5	46.4	6,283	4,868	61.7	36.6
American Indian	82	76	157.3	100.6	62	65	110.7	93.3
Asian/Pacific Isl.	45	33	37.5	21.9	40	25	37.6	17.9
Black	180	112	123.1	63.3	135	83	98.1	49.7
Non-Hispanic White	7,153	5,686	71.6	46.0	6,010	4,675	61.2	36.4
Hispanic (All Races)	38	32	61.7	42.1	32	16	47.0	21.3

Source: MCSS (April 2005) and the Minnesota Center for Health Statistics. Cases were microscopically confirmed (1988-2002) or Death Certificate Only (1995-2002). *In situ* cancers were excluded. All analyses were conducted by MCSS.

[§] Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

[†] Non-Hispanic persons reported with unknown or other race are included in all races combined, but are excluded from race-specific data. Hispanic includes persons of any race, including unknown. See Chapter I for comments on the accuracy of race- and ethnic-specific cancer rates.

~ Race-specific rates based on fewer than 10 cases or deaths are not presented.

Lung and Bronchus

Table III-15.4: Other Minnesota cancer statistics[†], 2000-2002, Lung and Bronchus Cancer

	Males	Females
Median Age at Diagnosis	70.0	69.0
Median Age at Death	72.0	73.0
Lifetime Risk of Diagnosis	7.7%	5.8%
Lifetime Risk of Death	6.6%	4.9%
Annual Percent Change [‡]		
Incidence (1988-2002)	-0.5%	2.3%
Mortality (1988-2002)	-1.1%	2.1%

[†] See Appendix D or E for definition of terms.

[‡]The average *annual percent change* in the age-adjusted rate during the segment ending in 2002 from Joinpoint regression. Statistically significant ($P < 0.05$) trends are in **bold**.

Table III-15.5: Average annual incidence and mortality rates[§] in the United States, 1998-2002, Lung and Bronchus Cancer

	Males	Females
Incidence		
All Races	77.8	48.9
Non-Hispanic White	77.7	53.2
Mortality		
All Races	76.3	40.9
Non-Hispanic White	78.6	43.8

Source: *SEER Cancer Statistics Review, 1975-2002*. Incidence data represent 14% 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.

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

Stage at Diagnosis	Percent of Cases [†] (%)	5-Year Relative Survival [‡] (%)
<i>In Situ</i>	0.0	-
Localized	20.6	49.5
Regional	28.0	16.2
Distant	44.7	2.1
Unknown	6.6	8.5

[†] Among Minnesota cases diagnosed 2001-2002.

[‡] Among SEER cases diagnosed 1995-2001 followed through 2002, from *SEER Cancer Statistics Review, 1975-2002*.

Descriptive Epidemiology

Incidence and Mortality: Lung and bronchus cancer is the second most commonly diagnosed cancer in Minnesota, and is the leading cause of cancer death. It accounts for 12 percent of cancers and 25 percent of cancer deaths in Minnesota. Each year, an average of 2,700 cases of lung and bronchus cancer are diagnosed, and 2,230 deaths occur. Mortality rates among non-

Hispanic whites in Minnesota are 15 to 20 percent lower than national rates. Based on SEER data, the five-year relative survival rate for lung and bronchus cancer is 49.5 percent for localized tumors, 16.2 percent for regional tumors, and 2.1 percent for distant tumors. Most cases are diagnosed at a regional or distant stage.

Trends: Lung and bronchus cancer rates showed a statistically significant decrease from 1988 to 2002 among Minnesota males, while rates increased significantly among women. Although rates in Minnesota are currently lower than those reported by SEER, national incidence rates are declining at a faster rate for men (-2.2% per year, statistically significant), and appear to be stabilizing for women (-0.2% per year, not statistically significant).

Age: Incidence rates for lung and bronchus cancer increase with age. About 90 percent of cases are diagnosed between 50 and 85 years of age.

Gender: Lung and bronchus cancer incidence rates are about 55 percent higher among men than women.

Race: In Minnesota, American Indian males and females and black males 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 Hispanic and Asian/Pacific Islander 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, an invisible, odorless gas, has 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

Not smoking 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) 201-4601. 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, 1988-2002, 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	14.3	11.7	49	52	2.8	2.4
1989	249	251	13.3	11.6	61	42	3.6	1.9
1990	261	253	14.0	11.1	51	45	2.8	2.1
1991	225	239	11.6	10.8	62	32	3.5	1.4
1992	290	232	14.7	10.0	54	43	3.0	1.9
1993	328	277	16.7	11.9	59	44	3.1	1.8
1994	303	271	15.4	11.5	58	36	3.0	1.5
1995	349	297	17.3	12.3	72	38	3.7	1.5
1996	412	276	19.7	11.3	80	36	4.1	1.4
1997	393	345	18.8	14.1	69	43	3.6	1.6
1998	355	358	16.7	14.5	72	56	3.6	2.1
1999	426	388	19.4	15.5	67	52	3.2	1.9
2000	474	400	21.4	15.7	71	48	3.3	1.8
2001	475	445	21.1	17.1	75	45	3.5	1.7
2002	452	395	19.7	15.1	79	34	3.7	1.3

Table III-16.2: Number of new cases and deaths and average annual incidence and mortality rates[§] by age, Minnesota, 1998-2002, Melanoma of the Skin

Age at Diagnosis or Death (years)	Incidence 1998-2002				Mortality 1998-2002			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
0 – 19	12	18	0.3	0.5	0	0	0.0	0.0
20 – 34	127	324	5.0	13.1	14	12	0.5	0.5
35 – 49	535	625	17.9	21.2	68	44	2.3	1.5
50 – 64	623	454	35.1	25.1	85	42	4.8	2.3
65 – 74	424	244	62.0	30.8	89	42	13.0	5.3
74 – 85	356	205	83.3	32.0	69	49	16.2	7.6
85 and older	105	116	83.8	37.2	39	46	31.1	14.7

Table III-16.3: Number of new cases and deaths and average annual incidence and mortality rates[§] by race and ethnicity, Minnesota, 1998-2002, Melanoma of the Skin

Race and Ethnicity [†]	Incidence 1998-2002				Mortality 1998-2002			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
All Races	2,182	1,986	19.7	15.6	364	235	3.4	1.7
American Indian	2	4	~	~	0	1	~	~
Asian/Pacific Isl.	1	2	~	~	0	0	~	~
Black	2	1	~	~	0	1	~	~
Non-Hispanic White	2,087	1,896	20.0	16.0	364	232	3.6	1.8
Hispanic (All Races)	4	8	~	~	0	1	~	~

Source: MCSS (April 2005) and the Minnesota Center for Health Statistics. Cases were microscopically confirmed (1988-2002) or Death Certificate Only (1995-2002). *In situ* cancers were excluded. All analyses were conducted by MCSS.

[§] Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

[†] Non-Hispanic persons reported with unknown or other race are included in all races combined, but are excluded from race-specific data. Hispanic includes persons of any race, including unknown. See Chapter I for comments on the accuracy of race- and ethnic-specific cancer rates.

~ Race-specific rates based on fewer than 10 cases or deaths are not presented.

Melanoma of the Skin

Table III-16.4: Other Minnesota cancer statistics[†], 2000-2002, Melanoma of the Skin

	Males	Females
Median Age at Diagnosis	60.0	50.0
Median Age at Death	67.0	68.0
Lifetime Risk of Diagnosis	2.0%	1.5%
Lifetime Risk of Death	0.4%	0.2%
Annual Percent Change [‡]		
Incidence (1988-2002)	3.6%	3.3%
Mortality (1988-2002)	1.1%	-1.6%

[†] See Appendix D or E for definition of terms.

[‡]The average *annual percent change* in the age-adjusted rate during the segment ending in 2002 from Joinpoint regression. Statistically significant ($P < 0.05$) trends are in **bold**.

Table III-16.5: Average annual incidence and mortality rates[§] in the United States, 1998-2002, Melanoma of the Skin

	Males	Females
Incidence		
All Races	21.8	14.0
Non-Hispanic White	29.1	19.9
Mortality		
All Races	3.9	1.8
Non-Hispanic White	4.7	2.1

Source: *SEER Cancer Statistics Review, 1975-2002*. Incidence data represent 14% 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.

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

Stage at Diagnosis	Percent of Cases [†] (%)	5-Year Relative Survival [‡] (%)
<i>In Situ</i>	39.8	-
Localized	51.4	98.3
Regional	5.5	63.8
Distant	1.4	16.0
Unknown	1.9	80.9

[†] Among Minnesota cases diagnosed 2001-2002.

[‡] Among SEER cases diagnosed 1995-2001 followed through 2002, from *SEER Cancer Statistics Review, 1975-2002*.

Descriptive Epidemiology

Incidence and Mortality: In Minnesota, about 830 new cases of invasive melanoma are diagnosed each year and about 120 deaths are caused by the disease. Incidence and mortality rates among non-Hispanic whites are significantly lower in Minnesota than reported by SEER.

Trends: Statistically significant increases in the incidence of melanoma of the skin were observed in

Minnesota since 1988, while mortality rates were stable. Nationally, the incidence rate for melanoma has more than doubled since 1973, and continues to rise at a similar rate to that seen in Minnesota, while the mortality rate has begun to decline.

Age: About 60 percent of melanoma cases are diagnosed among person 50 years of age or older. Even so, melanoma is one of the most common cancers among persons ages 20-49.

Gender: Rates of melanoma are generally about 25 percent 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 by recognizing changes in or the appearance of new skin growths, especially moles. 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, 1988-2002, 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	39	17	2.0	0.7	-	-	-	-
1998	57	12	2.9	0.4	-	-	-	-
1999	57	9	2.8	0.4	51	7	2.6	0.3
2000	58	14	2.9	0.5	44	8	2.2	0.3
2001	39	7	1.9	0.3	36	6	1.7	0.2
2002	51	13	2.4	0.5	34	12	1.6	0.4

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

Age at Diagnosis or Death (years)	Incidence 1998-2002				Mortality 1999-2002 [^]			
	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	2	0.0	0.1	0	0	0.0	0.0
35 – 49	15	5	0.5	0.2	8	2	0.3	0.1
50 – 64	58	11	3.3	0.6	37	8	2.6	0.5
65 – 74	91	14	13.3	1.8	50	4	9.1	0.6
74 – 85	79	16	18.5	2.5	55	10	16.0	1.9
85 and older	19	7	15.2	2.2	15	9	14.7	3.6

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

Race and Ethnicity [†]	Incidence 1998-2002				Mortality 1999-2002 [^]			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
All Races	262	55	2.6	0.4	165	33	2.0	0.3
American Indian	2	0	~	~	2	0	~	~
Asian/Pacific Isl.	2	0	~	~	2	0	~	~
Black	2	0	~	~	1	0	~	~
Non-Hispanic White	255	55	2.6	0.4	160	33	2.0	0.3
Hispanic (All Races)	0	0	~	~	~	~	~	~

Source: MCSS (April 2005) and the Minnesota Center for Health Statistics. Cases were microscopically confirmed (1988-2002) or Death Certificate Only (1995-2002). *In situ* cancers except those of the bladder were excluded. All analyses were conducted by MCSS.

[§] Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

[^] Mortality data are for the 4-year period 1999-2002. Category did not exist in mortality coding until 1999.

[†] Non-Hispanic persons reported with unknown or other race are included in all races combined, but are excluded from race-specific data. Hispanic includes persons of any race, including unknown. See Chapter I for comments on the accuracy of race- and ethnic-specific cancer rates.

~ Race-specific rates based on fewer than 10 cases or deaths are not presented.

Mesothelioma (all sites)

Table III-17.4: Other Minnesota cancer statistics[†], 2000-2002, Mesothelioma (all sites)

	Males	Females
Median Age at Diagnosis	71.5	70.5
Median Age at Death	73.0	76.0
Lifetime Risk of Diagnosis	0.26%	0.05%
Lifetime Risk of Death	0.20%	0.04%
Annual Percent Change [‡]		
Incidence (1988-2002)	2.8%	-0.7%
Mortality (1988-2002)	~	~

[†] See Appendix D or E for definition of terms.

[‡]The average *annual percent change* in the age-adjusted rate during the segment ending in 2002 from Joinpoint regression. 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, 1998-2002, Mesothelioma (all sites)

	Males	Females
Incidence		
All Races	1.9	0.4
Non-Hispanic White	2.1	0.4
Mortality		
All Races	~	~
Non-Hispanic White	~	~

Source: *SEER Cancer Statistics Review, 1975-2002*. Incidence data represent 14% 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.

~ Data not available.

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

Stage at Diagnosis	Percent of Cases [†] (%)	5-Year Relative Survival [‡] (%)
<i>In Situ</i>	0.0	-
Localized	31.8	16.7
Regional	26.4	11.7
Distant	21.8	5.9
Unknown	20.0	9.0

[†] Among Minnesota cases diagnosed 2001-2002.

[‡] Among SEER cases diagnosed 1995-2001 followed through 2002, from *SEER Cancer Statistics Review, 1975-2002*.

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 five-year relative survival rate is less than ten percent. Mesothelioma incidence rates among men are

24 percent higher in Minnesota than reported by SEER, but among women, rates are similar.

Trends: The incidence of mesothelioma has increased significantly among men in Minnesota by an average of 2.8 percent per year since statewide cancer reporting was implemented in 1988. Although statistical tests do not yet identify a change in trend, rates may have peaked in the late 1990s. 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 decreased significantly by 1.3 percent per year from 1992-2002.

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 is 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, located at <http://www.health.stat.mn.us/divs/eh/asbestos>, and on fact sheets developed by the National Cancer Institute (http://cis.nci.nih.gov/fact/3_21.htm).

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, 1988-2002, 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	3.5	74	70	4.4	2.9
1990	105	85	6.1	3.6	99	80	6.2	3.3
1991	126	103	7.0	4.4	98	72	5.8	2.9
1992	137	103	7.7	4.2	119	85	6.8	3.4
1993	122	114	6.6	4.6	89	92	4.9	3.5
1994	112	96	6.2	3.8	111	89	6.4	3.2
1995	109	91	5.8	3.7	86	90	4.7	3.5
1996	134	95	7.1	3.8	91	96	5.0	3.6
1997	121	132	6.2	5.1	107	77	5.7	2.9
1998	125	102	6.2	3.9	73	96	4.0	3.6
1999	126	101	6.1	3.8	86	91	4.5	3.2
2000	119	97	5.8	3.7	113	85	5.7	2.9
2001	148	124	7.0	4.5	89	88	4.4	3.1
2002	134	109	6.2	4.0	110	85	5.3	2.9

Table III-18.2: Number of new cases and deaths and average annual incidence and mortality rates[§] by age, Minnesota, 1998-2002, Multiple Myeloma

Age at Diagnosis or Death (years)	Incidence 1998-2002				Mortality 1998-2002			
	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	1	0.1	0.0	1	1	0.0	0.0
35 – 49	62	38	2.1	1.3	19	10	0.6	0.3
50 – 64	166	131	9.4	7.3	67	74	3.8	4.1
65 – 74	203	145	29.7	18.3	135	98	19.7	12.4
74 – 85	169	157	39.6	24.5	179	169	41.9	26.4
85 and older	49	61	39.1	19.6	70	93	55.8	29.8

Table III-18.3: Number of new cases and deaths and average annual incidence and mortality rates[§] by race and ethnicity, Minnesota, 1998-2002, Multiple Myeloma

Race and Ethnicity [†]	Incidence 1998-2002				Mortality 1998-2002			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
All Races	652	533	6.3	4.0	471	445	4.8	3.2
American Indian	8	5	~	~	3	2	~	~
Asian/Pacific Isl.	1	4	~	~	3	2	~	~
Black	19	24	13.5	14.6	12	17	11.1	11.4
Non-Hispanic White	612	493	6.1	3.8	447	424	4.7	3.1
Hispanic (All Races)	5	1	~	~	7	0	~	~

Source: MCSS (April 2005) and the Minnesota Center for Health Statistics. Cases were microscopically confirmed (1988-2002) or Death Certificate Only (1995-2002). *In situ* cancers were excluded. All analyses were conducted by MCSS.

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Non-Hispanic persons reported with unknown or other race are included in all races combined, but are excluded from race-specific data. Hispanic includes persons of any race, including unknown. See Chapter I for comments on the accuracy of race- and ethnic-specific cancer rates.

~ Race-specific rates based on fewer than 10 cases or deaths are not presented.

Multiple Myeloma

Table III-18.4: Other Minnesota cancer statistics[†], 2000-2002, Multiple Myeloma

	Males	Females
Median Age at Diagnosis	70.0	72.0
Median Age at Death	74.0	77.0
Lifetime Risk of Diagnosis	0.7%	0.5%
Lifetime Risk of Death	0.6%	0.4%
Annual Percent Change [‡]		
Incidence (1988-2002)	-1.0%	0.5%
Mortality (1988-2002)	-0.8%	0.0%

[†] See Appendix D or E for definition of terms.

[‡]The average *annual percent change* in the age-adjusted rate during the segment ending in 2002 from Joinpoint regression. Statistically significant ($P < 0.05$) trends are in **bold**.

Table III-18.5: Average annual incidence and mortality rates[§] in the United States, 1998-2002, Multiple Myeloma

	Males	Females
Incidence		
All Races	6.9	4.5
Non-Hispanic White	6.6	3.9
Mortality		
All Races	4.7	3.2
Non-Hispanic White	4.5	2.9

Source: SEER Cancer Statistics Review, 1975-2002. Incidence data represent 14% 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.

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

Age at Diagnosis (years)	Males (%)	Females (%)
< 45	51.7	47.3
45-54	51.8	44.4
55-64	38.8	35.8
65-74	34.9	27.2
75+	19.5	17.8
All Ages	36.1	28.4

[‡]Among SEER cases diagnosed 1995-2001 followed through 2002, from SEER Cancer Statistics Review, 1975-2002.

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 235 cases of multiple myeloma are diagnosed in Minnesota each year, and 180 deaths are caused by this cancer. Incidence and mortality rates in Minnesota are similar to those reported nationally. Based on SEER data for

multiple myeloma cases diagnosed between 1995 and 2001, the overall five-year relative survival rate was 36.1 percent for males and 28.4 percent for females.

Trends: Incidence and mortality rates of multiple myeloma have been stable in Minnesota since cancer reporting was initiated in 1988. Nationally, the multiple myeloma incidence rate has increased steadily since the early 1970s, but the mortality rate began declining modestly in the mid 1990s.

Age: Multiple myeloma incidence rates increase dramatically with age, with only nine 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 60 percent higher among males than females.

Race: Incidence and mortality rates are two to three times higher among blacks than non-Hispanic whites in Minnesota. This is consistent with data from SEER, which also demonstrate that Asian/Pacific Islanders and American Indians have somewhat lower rates than non-Hispanic 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 Lymphoma

Table III-19.1: Number of new cases and deaths and incidence and mortality rates[§] by year, Minnesota, 1988-2002, Non-Hodgkin Lymphoma

Year of Diagnosis or Death	Incidence				Mortality			
	New Cases		Annual Rate		Deaths		Annual Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
1988	401	346	23.0	15.0	174	183	10.3	7.4
1989	387	363	21.7	15.6	177	179	10.5	7.2
1990	387	371	21.4	16.0	179	163	10.7	6.5
1991	441	376	23.8	15.7	187	189	10.7	7.4
1992	430	387	23.3	15.7	192	216	10.9	8.3
1993	462	399	23.9	16.4	223	213	12.1	8.2
1994	504	418	26.0	17.2	216	210	11.8	8.1
1995	477	410	24.1	16.3	215	210	11.6	7.9
1996	496	417	24.9	16.4	232	261	12.1	9.7
1997	500	451	24.6	17.6	234	218	12.3	8.0
1998	525	455	25.9	17.5	259	204	13.3	7.3
1999	516	463	24.8	17.7	215	219	11.0	7.8
2000	522	486	24.4	18.3	243	216	12.0	7.6
2001	547	501	25.2	18.6	215	214	10.5	7.3
2002	594	495	26.8	18.3	231	198	11.1	6.5

Table III-19.2: Number of new cases and deaths and average annual incidence and mortality rates[§] by age, Minnesota, 1998-2002, Non-Hodgkin Lymphoma

Age at Diagnosis or Death (years)	Incidence 1998-2002				Mortality 1998-2002			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
0 – 19	57	38	1.6	1.1	6	5	0.2	0.1
20 – 34	107	74	4.2	3.0	21	11	0.8	0.4
35 – 49	363	255	12.1	8.7	85	41	2.8	1.4
50 – 64	726	506	41.0	28.0	208	141	11.7	7.8
65 – 74	608	560	88.9	70.7	310	195	45.3	24.6
74 – 85	663	707	155.2	110.3	374	390	87.5	60.9
85 and older	180	260	143.6	83.4	159	268	126.9	85.9

Table III-19.3: Number of new cases and deaths and average annual incidence and mortality rates[§] by race and ethnicity, Minnesota, 1998-2002, Non-Hodgkin Lymphoma

Race and Ethnicity [†]	Incidence 1998-2002				Mortality 1998-2002			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
All Races	2,704	2,400	25.4	18.1	1,163	1,051	11.6	7.3
American Indian	12	17	14.6	21.2	7	3	~	~
Asian/Pacific Isl.	31	20	19.9	10.0	9	11	~	7.4
Black	48	23	24.9	8.2	15	13	7.8	7.3
Non-Hispanic White	2,544	2,289	25.2	18.0	1,123	1,019	11.6	7.3
Hispanic (All Races)	20	24	18.4	26.7	11	4	11.5	~

Source: MCSS (April 2005) and the Minnesota Center for Health Statistics. Cases were microscopically confirmed (1988-2002) or Death Certificate Only (1995-2002). *In situ* cancers were excluded. All analyses were conducted by MCSS.

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Non-Hispanic persons reported with unknown or other race are included in all races combined, but are excluded from race-specific data. Hispanic includes persons of any race, including unknown. See Chapter I for comments on the accuracy of race- and ethnic-specific cancer rates.

~ Race-specific rates based on fewer than 10 cases or deaths are not presented.

Non-Hodgkin Lymphoma

Table III-19.4: Other Minnesota cancer statistics[†], 2000-2002, Non-Hodgkin Lymphoma

	Males	Females
Median Age at Diagnosis	66.0	71.0
Median Age at Death	73.0	79.0
Lifetime Risk of Diagnosis	2.6%	2.2%
Lifetime Risk of Death	1.2%	1.0%
Annual Percent Change [‡]		
Incidence (1988-2002)	1.1%	1.4%
Mortality (1998-2002 males; 1996-2002 females)	-4.2%	-4.3%

[†] See Appendix D or E for definition of terms.

[‡] The average *annual percent change* in the age-adjusted rate during the segment ending in 2002 from Joinpoint regression. Statistically significant ($P < 0.05$) trends are in **bold**.

Table III-19.5: Average annual incidence and mortality rates[§] in the United States, 1998-2002, Non-Hodgkin Lymphoma

	Males	Females
Incidence		
All Races	23.2	15.8
Non-Hispanic White	25.1	17.0
Mortality		
All Races	10.2	6.6
Non-Hispanic White	10.7	7.0

Source: *SEER Cancer Statistics Review, 1975-2002*. Incidence data represent 14% 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.

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

Age at Diagnosis (years)	Males (%)	Females (%)
< 45	60.6	74.5
45-54	64.7	77.2
55-64	62.8	69.3
65-74	55.8	61.4
75+	44.0	44.1
All Ages	58.2	62.6

[‡] Among SEER cases diagnosed 1995-2001 followed through 2002, from *SEER Cancer Statistics Review, 1975-2002*.

Descriptive Epidemiology

Incidence and Mortality: Lymphomas are of two types: Hodgkin lymphoma and non-Hodgkin lymphoma (NHL). NHL is more common, accounting for over 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 1,020 cases of NHL are diagnosed in Minnesota each year, and 440 deaths occur. Incidence and mortality rates in Minnesota are somewhat higher than those reported nationally.

Trends: Incidence rates for NHL in Minnesota increased significantly from 1988-2002 among both men and women, while mortality rates decreased significantly starting in 1998 for males and in 1996 for females. Nationally, the NHL incidence rate increased by almost 80 percent from 1975 to 1990, making it one of the most rapidly increasing cancers. However, the trend in incidence appears to have slowed down or stabilized, and the mortality rate in the U.S. has declined at a rate similar to that seen in Minnesota.

Age: The majority 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 40 percent higher among men than women.

Race: In Minnesota, NHL incidence rates are highest among Hispanic females, non-Hispanic white males and black males, followed closely by American Indian females and Asian/Pacific Islander males. This is considerably different than reported by the SEER program, where non-Hispanic whites have the highest rates among both men and women, followed with similar rates for Hispanics, blacks, and Asian/Pacific Islanders, and with the lowest rates among American Indians. Rates in Minnesota may reflect random variation due to the relatively small number of cases.

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 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 have 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, 1988-2002, 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	19.5	7.6	70	44	4.1	1.8
1989	364	170	20.9	7.6	59	38	3.3	1.7
1990	377	178	20.8	7.5	83	41	4.7	1.6
1991	358	167	19.8	7.2	69	57	3.8	2.3
1992	326	160	17.4	7.0	72	44	4.0	1.8
1993	327	143	17.6	6.0	64	43	3.5	1.8
1994	330	194	17.3	8.1	66	39	3.5	1.5
1995	349	154	17.8	6.3	66	37	3.5	1.4
1996	328	184	16.5	7.6	67	39	3.4	1.5
1997	342	147	16.8	5.8	77	50	3.8	1.9
1998	336	156	16.3	6.2	80	43	4.0	1.6
1999	346	157	16.3	6.2	60	33	3.0	1.3
2000	346	172	15.7	6.6	66	36	3.1	1.2
2001	346	176	15.6	6.5	72	45	3.4	1.6
2002	345	207	15.2	7.4	81	45	3.8	1.5

Table III-20.2: Number of new cases and deaths and average annual incidence and mortality rates[§] by age, Minnesota, 1998-2002, Oral Cavity and Pharynx Cancer

Age at Diagnosis or Death (years)	Incidence 1998-2002				Mortality 1998-2002			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
0 – 19	6	9	0.2	0.3	1	1	0.0	0.0
20 – 34	34	30	1.3	1.2	4	3	0.2	0.1
35 – 49	269	118	9.0	4.0	27	16	0.9	0.5
50 – 64	633	226	35.7	12.5	108	43	6.1	2.4
65 – 74	414	200	60.5	25.2	112	42	16.4	5.3
74 – 85	266	188	62.3	29.3	74	48	17.3	7.5
85 and older	97	97	77.4	31.1	33	49	26.3	15.7

Table III-20.3: Number of new cases and deaths and average annual incidence and mortality rates[§] by race and ethnicity, Minnesota, 1998-2002, Oral Cavity and Pharynx Cancer

Race and Ethnicity [†]	Incidence 1998-2002				Mortality 1998-2002			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
All Races	1,719	868	15.8	6.6	359	202	3.4	1.4
American Indian	22	7	36.0	~	4	2	~	~
Asian/Pacific Isl.	21	19	9.4	7.8	6	6	~	~
Black	38	24	15.2	9.8	10	4	5.5	~
Non-Hispanic White	1,607	796	15.6	6.3	338	187	3.4	1.4
Hispanic (All Races)	9	3	~	~	1	3	~	~

Source: MCSS (April 2005) and the Minnesota Center for Health Statistics. Cases were microscopically confirmed (1988-2002) or Death Certificate Only (1995-2002). *In situ* cancers were excluded. All analyses were conducted by MCSS.

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Non-Hispanic persons reported with unknown or other race are included in all races combined, but are excluded from race-specific data. Hispanic includes persons of any race, including unknown. See Chapter I for comments on the accuracy of race- and ethnic-specific cancer rates.

~ Race-specific rates based on fewer than 10 cases or deaths are not presented.

Oral Cavity and Pharynx

Table III-20.4: Other Minnesota cancer statistics[†], 2000-2002, Oral Cavity and Pharynx Cancer

	Males	Females
Median Age at Diagnosis	61.0	69.0
Median Age at Death	70.0	76.0
Lifetime Risk of Diagnosis	1.5%	0.8%
Lifetime Risk of Death	0.4%	0.2%
Annual Percent Change [‡]		
Incidence (1988-2002)	-2.2%	-1.0%
Mortality (1988-2002)	-1.2%	-1.9%

[†] See Appendix D or E for definition of terms.

[‡]The average *annual percent change* in the age-adjusted rate during the segment ending in 2002 from Joinpoint regression. Statistically significant ($P < 0.05$) trends are in **bold**.

Table III-20.5: Average annual incidence and mortality rates[§] in the United States, 1998-2002, Oral Cavity and Pharynx Cancer

	Males	Females
Incidence		
All Races	15.5	6.4
Non-Hispanic White	16.1	6.6
Mortality		
All Races	4.2	1.6
Non-Hispanic White	4.0	1.6

Source: *SEER Cancer Statistics Review, 1975-2002*. Incidence data represent 14% 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.

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

Stage at Diagnosis	Percent of Cases [†] (%)	5-Year Relative Survival [‡] (%)
<i>In Situ</i>	3.8	-
Localized	48.5	82.1
Regional	38.5	51.3
Distant	5.4	27.6
Unknown	3.8	46.6

[†] Among Minnesota cases diagnosed 2001-2002.

[‡] Among SEER cases diagnosed 1995-2001 followed through 2002, from *SEER Cancer Statistics Review, 1975-2002*.

Descriptive Epidemiology

Incidence and Mortality: About 520 cases of oral cavity and pharynx cancer are diagnosed each year in Minnesota, and 110 people die from this cancer annually. It accounts for 2.3 percent of all cancers and 1.2 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 five-year relative survival rate for oral cavity and pharynx cancer is 82.1 percent for localized tumors. In Minnesota, 48.5 percent of these cancers are diagnosed when still localized.

Trends: Incidence rates of oral cavity and pharynx cancer in Minnesota males declined significantly by 2.2 percent per year from 1988 to 2002. Mortality rates among female Minnesotans declined significantly by 1.9 percent per year. These are similar to national trends.

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 have the highest incidence rates of cancer of the oral cavity and pharynx, followed by non-Hispanic whites, blacks, and Asian/Pacific Islanders. Rates among American Indians are more than three times 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 residents.

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 lower the risk of developing this cancer is to reduce exposure to tobacco and alcohol.

Specific Cancers

Ovary

Table III-21.1: Number of new cases and deaths and incidence and mortality rates[§] by year, Minnesota, 1988-2002, 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	-	354	-	16.3	-	239	-	10.3
1990	-	328	-	15.0	-	198	-	8.7
1991	-	357	-	16.0	-	240	-	9.9
1992	-	352	-	15.4	-	230	-	9.7
1993	-	346	-	15.1	-	221	-	9.1
1994	-	377	-	16.4	-	237	-	9.6
1995	-	390	-	16.6	-	217	-	8.8
1996	-	345	-	14.6	-	252	-	10.0
1997	-	321	-	13.0	-	218	-	8.4
1998	-	337	-	13.6	-	252	-	9.4
1999	-	358	-	14.2	-	225	-	8.6
2000	-	326	-	12.7	-	240	-	8.8
2001	-	361	-	13.8	-	249	-	9.0
2002	-	351	-	13.3	-	237	-	8.7

Table III-21.2: Number of new cases and deaths and average annual incidence and mortality rates[§] by age, Minnesota, 1998-2002, Ovary Cancer

Age at Diagnosis or Death (years)	Incidence 1998-2002				Mortality 1998-2002			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
0 – 19	-	21	-	0.6	-	0	-	0.0
20 – 34	-	58	-	2.3	-	10	-	0.4
35 – 49	-	307	-	10.4	-	85	-	2.9
50 – 64	-	543	-	30.1	-	259	-	14.3
65 – 74	-	380	-	48.0	-	315	-	39.8
74 – 85	-	324	-	50.6	-	358	-	55.9
85 and older	-	100	-	32.1	-	176	-	56.4

Table III-21.3: Number of new cases and deaths and average annual incidence and mortality rates[§] by race and ethnicity, Minnesota, 1998-2002, Ovary Cancer

Race and Ethnicity [†]	Incidence 1998-2002				Mortality 1998-2002			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
All Races	-	1,733	-	13.5	-	1,203	-	8.9
American Indian	-	10	-	9.7	-	6	-	~
Asian/Pacific Isl.	-	16	-	8.4	-	8	-	~
Black	-	16	-	5.5	-	3	-	~
Non-Hispanic White	-	1,649	-	13.5	-	1,174	-	9.0
Hispanic (All Races)	-	8	-	~	-	9	-	~

Source: MCSS (April 2005) and the Minnesota Center for Health Statistics. Cases were microscopically confirmed (1988-2002) or Death Certificate Only (1995-2002). *In situ* cancers were excluded. All analyses were conducted by MCSS.

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Non-Hispanic persons reported with unknown or other race are included in all races combined, but are excluded from race-specific data. Hispanic includes persons of any race, including unknown. See Chapter I for comments on the accuracy of race- and ethnic-specific cancer rates.

~ Race-specific rates based on fewer than 10 cases or deaths are not presented.

Ovary

Table III-21.4: Other Minnesota cancer statistics[†], 2000-2002, Ovary Cancer

	Males	Females
Median Age at Diagnosis	-	62.0
Median Age at Death	-	73.0
Lifetime Risk of Diagnosis	-	1.4%
Lifetime Risk of Death	-	1.1%
Annual Percent Change [‡]		
Incidence (1988-2002)	-	-1.5%
Mortality (1988-2002)	-	-1.0%

[†] See Appendix D or E for definition of terms.

[‡]The average *annual percent change* in the age-adjusted rate during the segment ending in 2002 from Joinpoint regression. Statistically significant ($P < 0.05$) trends are in **bold**.

Table III-21.5: Average annual incidence and mortality rates[§] in the United States, 1998-2002, Ovary Cancer

	Males	Females
Incidence		
All Races	-	13.9
Non-Hispanic White	-	15.1
Mortality		
All Races	-	8.9
Non-Hispanic White	-	9.4

Source: *SEER Cancer Statistics Review, 1975-2002*. Incidence data represent 14% 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.

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

Stage at Diagnosis	Percent of Cases [†] (%)	5-Year Relative Survival [‡] (%)
<i>In Situ</i>	0.8	-
Localized	20.8	93.6
Regional	23.8	68.1
Distant	49.2	29.1
Unknown	5.4	24.7

[†] Among Minnesota cases diagnosed 2001-2002.

[‡] Among SEER cases diagnosed 1995-2001 followed through 2002, from *SEER Cancer Statistics Review, 1975-2002*.

Descriptive Epidemiology

Incidence and Mortality: Ovarian cancer accounts for 3.2 percent of cancers and 5.5 percent of cancer deaths among Minnesota women. Each year, an average of 350 cases are diagnosed, and 240 deaths occur. Minnesota rates are similar to national rates for all races combined, but incidence is eleven percent lower among non-Hispanic white women. Based on SEER cases diagnosed in 1995-2001, the five-year relative

survival rate is 93.6 percent for localized tumors and 68.1 percent for regional tumors. However, almost 50 percent of ovarian cancers are diagnosed when the tumor has already spread to other organs, when five-year survival is lower (29.1%).

Trends: Since 1988, ovarian cancer incidence and mortality rates have declined significantly in Minnesota by 1.5 percent per year and 1.0 percent per year, respectively. These are similar to national trends. A comparison of Table III-21.1 between this report and MCSS 2003 will reveal that smaller numbers of ovarian tumors are included in the current report. This is because of a coding change that occurred in 2001. See Chapter I for more information.

Age: The majority of ovarian cancers develop after menopause. About 78 percent of cases in Minnesota are diagnosed in women age 50 years or older.

Race: In Minnesota, ovarian cancer incidence rates are highest among non-Hispanic 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 45 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., non-Hispanic white women are the most likely to die of ovarian cancer.

Risk Factors

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. In contrast, 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, 1988-2002, 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	156	10.2	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	9.2
1993	167	154	9.0	6.4	217	228	12.3	8.8
1994	173	152	9.0	6.3	242	238	13.2	9.0
1995	180	163	9.3	6.6	211	240	11.2	9.0
1996	208	181	10.7	7.1	234	233	12.4	8.7
1997	184	169	9.3	6.6	230	247	11.9	8.9
1998	208	193	10.4	7.2	261	258	13.4	9.0
1999	212	184	10.2	6.9	232	268	11.6	9.4
2000	221	233	10.6	8.6	242	270	11.9	9.4
2001	207	207	9.8	7.8	237	243	11.6	8.4
2002	207	214	9.3	7.9	257	269	11.9	9.4

Table III-22.2: Number of new cases and deaths and average annual incidence and mortality rates[§] by age, Minnesota, 1998-2002, Pancreas Cancer

Age at Diagnosis or Death (years)	Incidence 1998-2002				Mortality 1998-2002			
	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	9	4	0.4	0.2	5	2	0.2	0.1
35 – 49	86	64	2.9	2.2	66	54	2.2	1.8
50 – 64	304	212	17.2	11.7	306	183	17.3	10.1
65 – 74	342	292	50.0	36.9	369	291	53.9	36.7
74 – 85	253	324	59.2	50.6	348	443	81.5	69.1
85 and older	61	135	48.7	43.3	135	335	107.7	107.4

Table III-22.3: Number of new cases and deaths and average annual incidence and mortality rates[§] by race and ethnicity, Minnesota, 1998-2002, Pancreas Cancer

Race and Ethnicity [†]	Incidence 1998-2002				Mortality 1998-2002			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
All Races	1,055	1,031	10.1	7.7	1,229	1,308	12.1	9.1
American Indian	11	6	16.2	~	11	8	17.9	~
Asian/Pacific Isl.	7	8	~	~	9	6	~	~
Black	35	26	24.3	14.6	28	19	18.6	12.4
Non-Hispanic White	988	978	9.8	7.5	1,167	1,270	11.9	9.1
Hispanic (All Races)	8	9	~	~	13	6	20.8	~

Source: MCSS (April 2005) and the Minnesota Center for Health Statistics. Cases were microscopically confirmed (1988-2002) or Death Certificate Only (1995-2002). *In situ* cancers were excluded. All analyses were conducted by MCSS.

[§] Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

[†] Non-Hispanic persons reported with unknown or other race are included in all races combined, but are excluded from race-specific data. Hispanic includes persons of any race, including unknown. See Chapter I for comments on the accuracy of race- and ethnic-specific cancer rates.

~ Race-specific rates based on fewer than 10 cases or deaths are not presented.

Pancreas

Table III-22.4: Other Minnesota cancer statistics[†], 2000-2002, Pancreas Cancer

	Males	Females
Median Age at Diagnosis	69.0	72.0
Median Age at Death	72.0	77.0
Lifetime Risk of Diagnosis	1.0%	1.1%
Lifetime Risk of Death	1.3%	1.3%
Annual Percent Change [‡]		
Incidence (1988-2002)	0.5%	1.7%
Mortality (1988-2002)	-0.1%	0.2%

[†] See Appendix D or E for definition of terms.

[‡]The average *annual percent change* in the age-adjusted rate during the segment ending in 2002 from Joinpoint regression. Statistically significant ($P < 0.05$) trends are in **bold**.

Table III-22.5: Average annual incidence and mortality rates[§] in the United States, 1998-2002, Pancreas Cancer

	Males	Females
Incidence		
All Races	12.5	9.8
Non-Hispanic White	12.6	9.3
Mortality		
All Races	12.2	9.2
Non-Hispanic White	12.1	8.9

Source: *SEER Cancer Statistics Review, 1975-2002*. Incidence data represent 14% 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.

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

Stage at Diagnosis	Percent of Cases [†] (%)	5-Year Relative Survival [‡] (%)
<i>In Situ</i>	0.4	-
Localized	7.2	16.4
Regional	28.6	7.0
Distant	54.1	1.8
Unknown	9.8	4.3

[†] Among Minnesota cases diagnosed 2001-2002.

[‡] Among SEER cases diagnosed 1995-2001 followed through 2002, from *SEER Cancer Statistics Review, 1975-2002*.

Descriptive Epidemiology

Incidence and Mortality: About 415 cases of pancreatic cancer are diagnosed and microscopically confirmed in Minnesota each year, and about 510 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 for 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 1995-2001, the five-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 (28.6%) or distant stage (54.1%).

Trends: Rates of pancreatic cancer have remained relatively stable in Minnesota since cancer reporting was initiated in 1988, although there was a statistically significant increase in rates among women during this time period. Nationally, rates have declined slightly in males over the past 20 years, and 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 72 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 non-Hispanic whites, but there are too few cases and deaths to calculate rates for all race and ethnic groups. This is consistent with national data, which shows that blacks are 40 percent more likely to be diagnosed and 35 percent more likely to die of pancreatic cancer than non-Hispanic whites. However, national data show that American Indians have the lowest rates of this disease, while they appear to be relatively high in Minnesota.

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, and occupational exposures to certain chemicals and petroleum can increase risk of developing pancreatic cancer.

Early Detection / Prevention

At present, only biopsy yields a certain diagnosis. Because of the “silent” early course of the disease, the need for biopsy may become obvious only with advanced disease. Researchers are focusing on ways to diagnose pancreatic cancer before symptoms occur.

Specific Cancers

Prostate

Table III-23.1: Number of new cases and deaths and incidence and mortality rates[§] by year, Minnesota, 1988-2002, 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	2,454	-	146.9	-	586	-	38.2	-
1989	2,626	-	154.8	-	636	-	41.5	-
1990	2,970	-	172.8	-	607	-	38.6	-
1991	3,829	-	214.9	-	646	-	41.1	-
1992	4,240	-	233.8	-	611	-	37.5	-
1993	3,776	-	203.9	-	604	-	37.2	-
1994	3,210	-	170.8	-	673	-	40.9	-
1995	3,278	-	172.2	-	653	-	39.4	-
1996	3,228	-	166.6	-	681	-	39.5	-
1997	3,454	-	175.7	-	596	-	34.3	-
1998	3,421	-	171.9	-	598	-	33.9	-
1999	3,637	-	179.3	-	565	-	31.2	-
2000	4,075	-	197.2	-	598	-	32.5	-
2001	4,162	-	197.2	-	598	-	31.8	-
2002	4,187	-	193.3	-	601	-	31.0	-

Table III-23.2: Number of new cases and deaths and average annual incidence and mortality rates[§] by age, Minnesota, 1998-2002, Prostate Cancer

Age at Diagnosis or Death (years)	Incidence 1998-2002				Mortality 1998-2002			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
0 - 19	3	-	0.1	-	0	-	0.0	-
20 - 34	1	-	0.0	-	0	-	0.0	-
35 - 49	404	-	13.5	-	6	-	0.2	-
50 - 64	5,801	-	327.3	-	183	-	10.3	-
65 - 74	7,523	-	1099.6	-	599	-	87.6	-
74 - 85	4,780	-	1118.9	-	1,209	-	283.0	-
85 and older	970	-	773.9	-	963	-	768.3	-

Table III-23.3: Number of new cases and deaths and average annual incidence and mortality rates[§] by race and ethnicity, Minnesota, 1998-2002, Prostate Cancer

Race and Ethnicity [†]	Incidence 1998-2002				Mortality 1998-2002			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
All Races	19,482	-	188.1	-	2,960	-	32.1	-
American Indian	89	-	182.2	-	16	-	52.1	-
Asian/Pacific Isl.	65	-	59.3	-	8	-	~	-
Black	316	-	232.9	-	52	-	57.9	-
Non-Hispanic White	18,388	-	184.1	-	2,870	-	31.9	-
Hispanic (All Races)	80	-	113.5	-	12	-	22.3	-

Source: MCSS (April 2005) and the Minnesota Center for Health Statistics. Cases were microscopically confirmed (1988-2002) or Death Certificate Only (1995-2002). *In situ* cancers were excluded. All analyses were conducted by MCSS.

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Non-Hispanic persons reported with unknown or other race are included in all races combined, but are excluded from race-specific data. Hispanic includes persons of any race, including unknown. See Chapter I for comments on the accuracy of race- and ethnic-specific cancer rates.

~ Race-specific rates based on fewer than 10 cases or deaths are not presented.

Prostate

Table III-23.4: Other Minnesota cancer statistics[†], 2000-2002, Prostate Cancer

	Males	Females
Median Age at Diagnosis	69.0	-
Median Age at Death	81.0	-
Lifetime Risk of Diagnosis	21.2%	-
Lifetime Risk of Death	3.7%	-
Annual Percent Change [‡]		
Incidence (1995-2002)	2.9%	-
Mortality (1988-2002)	-2.0%	-

[†] See Appendix D or E for definition of terms.

[‡]The average *annual percent change* in the age-adjusted rate during the segment ending in 2002 from Joinpoint regression. Statistically significant ($P < 0.05$) trends are in **bold**.

Table III-23.5: Average annual incidence and mortality rates[§] in the United States, 1998-2002, Prostate Cancer

	Males	Females
Incidence		
All Races	173.8	-
Non-Hispanic White	167.7	-
Mortality		
All Races	30.3	-
Non-Hispanic White	27.9	-

Source: SEER Cancer Statistics Review, 1975-2002. Incidence data represent 14% 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.

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

Stage at Diagnosis	Percent of Cases [†] (%)	5-Year Relative Survival [‡] (%)
<i>In Situ</i>	0.0	-
Localized/Regional	92.9	100.0
Distant	3.6	33.5
Unknown	3.5	82.7

[†] Among Minnesota cases diagnosed 2001-2002.

[‡] Among SEER cases diagnosed 1995-2001 followed through 2002, from SEER Cancer Statistics Review, 1975-2002.

Descriptive Epidemiology

Incidence and Mortality: Prostate cancer accounts for one-third of cancer diagnoses and 13 percent of cancer deaths among men in Minnesota. One out of five men will be diagnosed with prostate cancer in their lifetime and 1 out of 27 will die of the disease. About 3,900 cases of prostate cancer are diagnosed in the state each year and 590 deaths are caused by this cancer. Both incidence and mortality rates in Minnesota are significantly higher than those reported nationally.

Trends: Incidence rates for this cancer have been strongly influenced by the prostate-specific antigen (PSA) screening test. After its widespread introduction in the late 1980s, the prostate cancer incidence rate in the U.S. increased by an unprecedented 70 percent over a five-year period, peaking in 1992. Incidence in Minnesota followed a very similar pattern. The prostate cancer incidence rate in Minnesota has increased significantly by 2.9 percent per year from 1995-2002 while mortality decreased significantly by 2.0 percent per year since 1988. Nationally, incidence has increased by 1.3 percent per year since 1995 and mortality has decreased by 4.0 percent per year since 1994.

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

Race: Prostate cancer incidence and mortality rates are highest among black men, both in Minnesota and nationally. In Minnesota, the incidence rate for black men is almost 30 percent higher than in both non-Hispanic whites and American Indians. The mortality rate among black men in Minnesota is 80 percent higher than among non-Hispanic white men, but is similar to that of American Indians. In geographic areas reporting to SEER, American Indians have the lowest prostate cancer rates, more than 70 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 be detected early by measuring the amount of PSA in the blood, 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 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, 1988-2002, 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	74	57	4.1	2.6	26	26	1.5	1.0
1989	59	43	3.1	1.9	24	26	1.3	1.3
1990	68	57	3.5	2.5	33	34	1.8	1.5
1991	84	67	4.4	2.9	27	20	1.4	0.9
1992	72	48	3.7	2.0	23	36	1.4	1.5
1993	88	60	4.6	2.6	39	26	2.0	1.1
1994	77	67	3.8	2.8	26	44	1.4	1.8
1995	60	46	3.0	1.8	27	31	1.4	1.2
1996	72	61	3.4	2.5	37	41	2.0	1.6
1997	76	65	3.6	2.6	32	35	1.6	1.4
1998	72	76	3.3	3.0	35	33	1.7	1.3
1999	56	58	2.7	2.3	32	21	1.5	0.8
2000	68	72	3.0	2.8	43	42	1.9	1.5
2001	89	64	3.8	2.5	34	36	1.5	1.3
2002	94	80	4.0	3.0	31	25	1.4	0.9

Table III-24.2: Number of new cases and deaths and average annual incidence and mortality rates[§] by age, Minnesota, 1998-2002, Cancer of the Soft Tissues, including Heart

Age at Diagnosis or Death (years)	Incidence 1998-2002				Mortality 1998-2002			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
0 – 19	36	31	1.0	0.9	7	4	0.2	0.1
20 – 34	43	38	1.7	1.5	17	7	0.7	0.3
35 – 49	79	65	2.6	2.2	37	11	1.2	0.4
50 – 64	86	68	4.9	3.8	43	39	2.4	2.2
65 – 74	67	59	9.8	7.4	25	33	3.7	4.2
74 – 85	54	61	12.6	9.5	34	33	8.0	5.2
85 and older	14	28	11.2	9.0	12	30	9.6	9.6

Table III-24.3: Number of new cases and deaths and average annual incidence and mortality rates[§] by race and ethnicity, Minnesota, 1998-2002, Cancer of the Soft Tissues, including Heart

Race and Ethnicity [†]	Incidence 1998-2002				Mortality 1998-2002			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
All Races	379	350	3.4	2.7	175	157	1.6	1.1
American Indian	2	1	~	~	2	0	~	~
Asian/Pacific Isl.	6	6	~	~	3	1	~	~
Black	15	3	5.7	~	6	4	~	~
Non-Hispanic White	342	331	3.3	2.7	162	151	1.6	1.2
Hispanic (All Races)	5	3	~	~	2	0	~	~

Source: MCSS (April 2005) and the Minnesota Center for Health Statistics. Cases were microscopically confirmed (1988-2002) or Death Certificate Only (1995-2002). *In situ* cancers were excluded. All analyses were conducted by MCSS.

[§] Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

[†] Non-Hispanic persons reported with unknown or other race are included in all races combined, but are excluded from race-specific data. Hispanic includes persons of any race, including unknown. See Chapter I for comments on the accuracy of race- and ethnic-specific cancer rates.

~ Race-specific rates based on fewer than 10 cases or deaths are not presented.

Soft Tissues

Table III-24.4: Other Minnesota cancer statistics[†], 2000-2002, Cancer of the Soft Tissues, including Heart

	Males	Females
Median Age at Diagnosis	52.0	57.0
Median Age at Death	57.0	71.0
Lifetime Risk of Diagnosis	0.3%	0.3%
Lifetime Risk of Death	0.1%	0.2%
Annual Percent Change [‡]		
Incidence (1988-2002)	-0.8%	1.1%
Mortality (1988-2002)	0.4%	-0.4%

[†] See Appendix D or E for definition of terms.

[‡]The average *annual percent change* in the age-adjusted rate during the segment ending in 2002 from Joinpoint regression. Statistically significant ($P < 0.05$) trends are in **bold**.

Table III-24.5: Average annual incidence and mortality rates[§] in the United States, 1998-2002, Cancer of the Soft Tissues, including Heart

	Males	Females
Incidence		
All Races	3.5	2.4
White [†]	3.6	2.4
Mortality		
All Races	1.5	1.2
White [†]	1.5	1.2

Source: *SEER Cancer Statistics Review, 1975-2002*. Incidence data represent 14% 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 whites, including persons of Hispanic ethnicity

Table III-24.6: Extent of disease at diagnosis and five-year relative survival, Cancer of the Soft Tissues, including Heart

Stage at Diagnosis	Percent of Cases [†] (%)	5-Year Relative Survival [‡] (%)
<i>In Situ</i>	0.0	-
Localized	60.9	~
Regional	18.3	~
Distant	10.4	~
Unknown	10.4	~

[†] Among Minnesota cases diagnosed 2001-2002.

[‡] Among SEER cases diagnosed 1995-2001 followed through 2002, from *SEER Cancer Statistics Review, 1975-2002*.

~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 predominantly sarcomas.

About 50 percent of these tumors develop in the extremities. Soft tissue cancers are relatively uncommon. Approximately 145 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 (60.9%).

Trends: Rates of soft issue sarcomas have been fairly stable since cancer reporting was implemented in Minnesota in 1988. This is similar to what is seen nationally.

Age: Incidence rates for soft tissue sarcomas increase with age, but unlike many cancers, the majority of soft tissue sarcomas are diagnosed among persons less than 65 years of age. Approximately nine percent are diagnosed among persons less than 20 years of age, and 52 percent between ages 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 age 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 both incidence and mortality rates appear to be similar between whites and blacks.

Risk Factors

Ionizing radiation accounts for 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 sarcoma that often occurs in AIDS patients, and found that immunosuppression increases disease risk.

Early Detection / Prevention

There are no methods 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, 1988-2002, 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	121	12.0	5.0	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	4.0	103	89	6.0	3.5
1992	226	125	12.9	5.0	141	82	7.9	3.1
1993	195	95	10.8	3.8	120	87	6.8	3.3
1994	206	116	11.4	4.4	130	82	7.4	3.0
1995	173	99	9.3	3.7	123	88	6.7	3.2
1996	195	98	10.2	3.6	115	77	6.3	2.8
1997	186	105	9.8	4.0	114	57	6.2	2.1
1998	189	104	9.6	3.9	91	76	4.8	2.7
1999	204	113	10.2	3.9	106	74	5.3	2.6
2000	155	118	7.7	4.3	97	73	4.9	2.5
2001	190	110	9.1	3.8	107	79	5.3	2.7
2002	183	108	8.6	3.8	95	75	4.6	2.5

Table III-25.2: Number of new cases and deaths and average annual incidence and mortality rates[§] by age, Minnesota, 1998-2002, Stomach Cancer

Age at Diagnosis or Death (years)	Incidence 1998-2002				Mortality 1998-2002			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
0 – 19	0	2	0.0	0.1	0	2	0.0	0.1
20 – 34	8	13	0.3	0.5	4	6	0.2	0.2
35 – 49	74	42	2.5	1.4	32	20	1.1	0.7
50 – 64	239	90	13.5	5.0	112	46	6.3	2.5
65 – 74	232	113	33.9	14.3	112	70	16.4	8.8
74 – 85	267	175	62.5	27.3	157	130	36.8	20.3
85 and older	101	118	80.6	37.8	79	103	63.0	33.0

Table III-25.3: Number of new cases and deaths and average annual incidence and mortality rates[§] by race and ethnicity, Minnesota, 1998-2002, Stomach Cancer

Race and Ethnicity [†]	Incidence 1998-2002				Mortality 1998-2002			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
All Races	921	553	9.0	3.9	496	377	5.0	2.6
American Indian	4	6	~	~	3	5	~	~
Asian/Pacific Isl.	33	26	22.6	15.6	18	24	14.3	16.5
Black	21	11	13.6	7.6	9	8	~	~
Non-Hispanic White	844	498	8.6	3.6	459	336	4.8	2.4
Hispanic (All Races)	16	8	19.2	~	7	4	~	~

Source: MCSS (April 2005) and the Minnesota Center for Health Statistics. Cases were microscopically confirmed (1988-2002) or Death Certificate Only (1995-2002). *In situ* cancers were excluded. All analyses were conducted by MCSS.

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Non-Hispanic persons reported with unknown or other race are included in all races combined, but are excluded from race-specific data. Hispanic includes persons of any race, including unknown. See Chapter I for comments on the accuracy of race- and ethnic-specific cancer rates.

~ Race-specific rates based on fewer than 10 cases or deaths are not presented.

Stomach

Table III-25.4: Other Minnesota cancer statistics[†], 2000-2002, Stomach Cancer

	Males	Females
Median Age at Diagnosis	72.0	75.5
Median Age at Death	74.0	79.0
Lifetime Risk of Diagnosis	0.9%	0.5%
Lifetime Risk of Death	0.5%	0.4%
Annual Percent Change [‡]		
Incidence (1988-2002)	-2.5%	-1.6%
Mortality (1988-2002)	-3.7%	-3.4%

[†] See Appendix D or E for definition of terms.

[‡]The average *annual percent change* in the age-adjusted rate during the segment ending in 2002 from Joinpoint regression. Statistically significant ($P < 0.05$) trends are in **bold**.

Table III-25.5: Average annual incidence and mortality rates[§] in the United States, 1998-2002, Stomach Cancer

	Males	Females
Incidence		
All Races	12.3	6.1
Non-Hispanic White	9.5	4.2
Mortality		
All Races	6.3	3.2
Non-Hispanic White	5.2	2.5

Source: SEER Cancer Statistics Review, 1975-2002. Incidence data represent 14% 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.

Table III-25.6: Extent of disease at diagnosis and five-year relative survival, Stomach Cancer

Stage at Diagnosis	Percent of Cases [†] (%)	5-Year Relative Survival [‡] (%)
<i>In Situ</i>	1.3	-
Localized	17.2	58.0
Regional	35.6	21.9
Distant	33.9	3.1
Unknown	12.0	12.4

[†] Among Minnesota cases diagnosed 2001-2002.

[‡] Among SEER cases diagnosed 1995-2001 followed through 2002, from SEER Cancer Statistics Review, 1975-2002.

Descriptive Epidemiology

Incidence and Mortality: Stomach cancer accounts for 1.3 percent of all cancers diagnosed in Minnesota, and 1.9 percent of cancer deaths. Rates in Minnesota are 20 to 35 percent lower than those reported by SEER and for the U.S. Based on SEER data, the five-year relative survival rate for stomach cancer is 58.0 percent for localized tumors, 21.9 percent for regional tumors, and 3.1 percent for distant tumors. Most cases

in Minnesota are at the regional (35.6%) or distant (33.9%) stage.

Trends: Rates of stomach cancer in Minnesota decreased significantly by 1.6 percent to 3.7 percent each year from 1988 to 2002. 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 72 years for men and 75.5 years for women.

Gender: Stomach cancer rates are two to three times higher among males than females.

Race: Incidence rates of stomach cancer appear to be higher among people of color in Minnesota than among non-Hispanic whites, but there are too few cases and deaths to calculate rates for all race and ethnic groups. Incidence among Asian/Pacific Islanders is three times that of non-Hispanic whites, and rates among blacks are about two times that of whites. Asian/Pacific Islanders have the highest mortality rates of stomach cancer. Nationally, blacks have the highest mortality rates from stomach cancer, followed by Asian/Pacific Islanders.

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.

Specific Cancers

Testis

Table III-26.1: Number of new cases and deaths and incidence and mortality rates[§] by year, Minnesota, 1988-2002, 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	-	5.7	-	7	-	0.3	-
1992	141	-	6.0	-	5	-	0.2	-
1993	128	-	5.3	-	4	-	0.2	-
1994	151	-	6.2	-	3	-	0.1	-
1995	138	-	5.6	-	3	-	0.1	-
1996	150	-	6.1	-	6	-	0.3	-
1997	151	-	6.0	-	9	-	0.4	-
1998	156	-	6.3	-	6	-	0.3	-
1999	173	-	6.9	-	6	-	0.2	-
2000	218	-	8.7	-	7	-	0.3	-
2001	181	-	7.1	-	5	-	0.2	-
2002	182	-	7.1	-	7	-	0.3	-

Table III-26.2: Number of new cases and deaths and average annual incidence and mortality rates[§] by age, Minnesota, 1998-2002, Testis Cancer

Age at Diagnosis or Death (years)	Incidence 1998-2002				Mortality 1998-2002			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
0 – 19	52	-	1.4	-	0	-	0.0	-
20 – 34	418	-	16.4	-	10	-	0.4	-
35 – 49	362	-	12.1	-	11	-	0.4	-
50 – 64	58	-	3.3	-	5	-	0.3	-
65 – 74	16	-	2.3	-	3	-	0.4	-
74 – 85	4	-	0.9	-	2	-	0.5	-
85 and older	0	-	0.0	-	0	-	0.0	-

Table III-26.3: Number of new cases and deaths and average annual incidence and mortality rates[§] by race and ethnicity, Minnesota, 1998-2002, Testis Cancer

Race and Ethnicity [†]	Incidence 1998-2002				Mortality 1998-2002			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
All Races	910	-	7.2	-	31	-	0.3	-
American Indian	8	-	~	-	1	-	~	-
Asian/Pacific Isl.	7	-	~	-	1	-	~	-
Black	13	-	2.2	-	0	-	~	-
Non-Hispanic White	835	-	7.6	-	29	-	0.3	-
Hispanic (All Races)	15	-	2.5	-	1	-	~	-

Source: MCSS (April 2005) and the Minnesota Center for Health Statistics. Cases were microscopically confirmed (1988-2002) or Death Certificate Only (1995-2002). *In situ* cancers were excluded. All analyses were conducted by MCSS.

[§] Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

[†] Non-Hispanic persons reported with unknown or other race are included in all races combined, but are excluded from race-specific data. Hispanic includes persons of any race, including unknown. See Chapter I for comments on the accuracy of race- and ethnic-specific cancer rates.

~ Race-specific rates based on fewer than 10 cases or deaths are not presented.

Testis

Table III-26.4: Other Minnesota cancer statistics[†], 2000-2002, Testis Cancer

	Males	Females
Median Age at Diagnosis	34.0	-
Median Age at Death	42.0	-
Lifetime Risk of Diagnosis	0.5%	-
Lifetime Risk of Death	0.0%	-
Annual Percent Change [‡]		
Incidence (1988-2002)	2.5%	-
Mortality (1993-2002)	4.7%	-

[†] See Appendix D or E for definition of terms.

[‡]The average *annual percent change* in the age-adjusted rate during the segment ending in 2002 from Joinpoint regression. Statistically significant ($P < 0.05$) trends are in **bold**.

Table III-26.5: Average annual incidence and mortality rates[§] in the United States, 1998-2002, Testis Cancer

	Males	Females
Incidence		
All Races	5.3	-
Non-Hispanic White	7.2	-
Mortality		
All Races	0.3	-
Non-Hispanic White	0.3	-

Source: *SEER Cancer Statistics Review, 1975-2002*. Incidence data represent 14% 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.

Table III-26.6: Extent of disease at diagnosis and five-year relative survival, Testis Cancer

Stage at Diagnosis	Percent of Cases [†] (%)	5-Year Relative Survival [‡] (%)
<i>In Situ</i>	0.3	-
Localized	70.9	99.4
Regional	19.0	96.3
Distant	7.4	71.7
Unknown	2.5	87.9

[†] Among Minnesota cases diagnosed 2001-2002.

[‡] Among SEER cases diagnosed 1995-2001 followed through 2002, from *SEER Cancer Statistics Review, 1975-2002*.

Descriptive Epidemiology

Incidence and Mortality: Testicular cancer accounts for 1.6 percent of cancer diagnoses among Minnesota men. About 180 cases are diagnosed each year, while six deaths occur as a result of testicular cancer. Incidence rates for testicular cancer are in Minnesota are about 35 percent higher than those reported by SEER for the years 1998-2002, for all races combined, but only six percent higher for non-Hispanic whites, a

difference that was not significantly different from the SEER rate. The five-year relative survival rates reported by SEER among cases diagnosed 1995-2001 are 99.4 percent for localized tumors and 96.3 percent for regional tumors. Most cases in Minnesota are diagnosed while the tumor is localized (70.9%).

Trends: A statistically significant increase of 2.5 percent per year of testicular cancer was observed among Minnesota men since 1988, accompanied by an increase of 4.7 percent in mortality since 1993, which was not statistically significant. Nationally, among all races, incidence increased significantly by 1.5 percent per year since the mid 1970s, while mortality decreased through the mid-1990s, and then began to level off.

Age: Testicular cancer is most commonly diagnosed between the ages of 20 and 49 years, with the median age at diagnosis being 34 years. About 46 percent of cancers are diagnosed among those 20 to 34 years of age.

Race: In Minnesota, non-Hispanic white men are nearly 3.5 times more likely to develop testicular cancer than blacks. In the U.S., non-Hispanic white men have over four times the risk of developing testicular cancer compared to blacks, and more than three times the risk of Asian/Pacific Islanders and American Indian men.

Risk Factors

Cryptorchidism, 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 an 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, 1988-2002, 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	137	3.2	6.0	4	10	0.3	0.4
1990	66	156	3.3	6.8	9	12	0.6	0.5
1991	62	145	3.0	6.2	9	13	0.5	0.5
1992	69	180	3.5	7.7	8	11	0.5	0.4
1993	69	173	3.2	7.4	8	15	0.4	0.5
1994	65	179	3.1	7.7	9	14	0.5	0.6
1995	58	179	2.7	7.7	7	11	0.4	0.4
1996	66	201	3.0	8.2	6	17	0.3	0.6
1997	87	227	3.9	9.3	13	21	0.6	0.7
1998	84	232	3.6	9.5	4	9	0.2	0.3
1999	89	233	3.9	9.5	7	19	0.4	0.7
2000	93	241	3.9	9.7	12	10	0.6	0.4
2001	85	277	3.6	10.9	12	14	0.6	0.5
2002	110	273	4.5	10.7	2	8	0.1	0.3

Table III-27.2: Number of new cases and deaths and average annual incidence and mortality rates[§] by age, Minnesota, 1998-2002, Thyroid Cancer

Age at Diagnosis or Death (years)	Incidence 1998-2002				Mortality 1998-2002			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
0 – 19	9	34	0.2	1.0	0	0	0.0	0.0
20 – 34	88	314	3.5	12.7	1	1	0.0	0.0
35 – 49	157	488	5.2	16.6	1	4	0.0	0.1
50 – 64	103	246	5.8	13.6	7	9	0.4	0.5
65 – 74	55	97	8.0	12.2	5	10	0.7	1.3
74 – 85	47	54	11.0	8.4	19	20	4.4	3.1
85 and older	2	23	1.6	7.4	4	16	3.2	5.1

Table III-27.3: Number of new cases and deaths and average annual incidence and mortality rates[§] by race and ethnicity, Minnesota, 1998-2002, Thyroid Cancer

Race and Ethnicity [†]	Incidence 1998-2002				Mortality 1998-2002			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
All Races	461	1,256	3.9	10.1	37	60	0.4	0.4
American Indian	1	6	~	~	0	0	~	~
Asian/Pacific Isl.	7	33	~	11.1	2	1	~	~
Black	6	21	~	5.1	0	2	~	~
Non-Hispanic White	428	1,143	4.0	10.0	35	56	0.4	0.4
Hispanic (All Races)	7	15	~	8.2	0	1	~	~

Source: MCSS (April 2005) and the Minnesota Center for Health Statistics. Cases were microscopically confirmed (1988-2002) or Death Certificate Only (1995-2002). *In situ* cancers were excluded. All analyses were conducted by MCSS.

[§] Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

[†] Non-Hispanic persons reported with unknown or other race are included in all races combined, but are excluded from race-specific data. Hispanic includes persons of any race, including unknown. See Chapter I for comments on the accuracy of race- and ethnic-specific cancer rates.

~ Race-specific rates based on fewer than 10 cases or deaths are not presented.

Thyroid

Table III-27.4: Other Minnesota cancer statistics[†], 2000-2002, Thyroid Cancer

	Males	Females
Median Age at Diagnosis	47.0	43.0
Median Age at Death	76.5	76.0
Lifetime Risk of Diagnosis	0.3%	0.9%
Lifetime Risk of Death	0.0%	0.1%
Annual Percent Change [‡]		
Incidence (1988-2002)	2.4%	4.1%
Mortality (1988-2002)	1.3%	0.3%

[†] See Appendix D or E for definition of terms.

[‡]The average *annual percent change* in the age-adjusted rate during the segment ending in 2002 from Joinpoint regression. Statistically significant ($P < 0.05$) trends are in **bold**.

Table III-27.5: Average annual incidence and mortality rates[§] in the United States, 1998-2002, Thyroid Cancer

	Males	Females
Incidence		
All Races	4.0	11.1
Non-Hispanic White	4.5	12.1
Mortality		
All Races	0.4	0.5
Non-Hispanic White	0.5	0.4

Source: *SEER Cancer Statistics Review, 1975-2002*. Incidence data represent 14% 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.

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 [‡] (%)
<i>In Situ</i>	0.1	-
Localized	65.0	99.5
Regional	28.7	96.4
Distant	3.2	60.0
Unknown	2.9	85.4

[†] Among Minnesota cases diagnosed 2001-2002.

[‡] Among SEER cases diagnosed 1995-2001 followed through 2002, from *SEER Cancer Statistics Review, 1975-2002*.

Descriptive Epidemiology

Incidence and Mortality: Thyroid cancer accounts for 1.5 percent of cancers in Minnesota, and 0.2 percent of cancer-related deaths. About 340 cases are diagnosed each year, and about 20 deaths occur as a result of thyroid cancer. Based on SEER data, the five-year relative survival rate for thyroid cancer is 99.5 percent for localized tumors and 96.4 percent for regional tumors. Most cases in Minnesota are diagnosed while

the tumor is localized (65.0%). Rates in Minnesota are significantly lower than those reported nationally. In general, incidence rates reflect young women with papillary or follicular carcinomas, while mortality reflects elderly persons with undifferentiated carcinomas.

Trends: The incidence of thyroid cancer is significantly increasing among both men and women in Minnesota; for women, it is the cancer with the largest average increase per year. Similar, or even higher, increases are seen nationally. The reasons for these increases are not clear, but may represent a combination of increased detection, exposure to radiation early in life, and other factors.

Age: Thyroid cancer occurs at a relatively young age compared to other cancers. In Minnesota, 81.3 percent of cases were diagnosed among persons 20 to 64 years of age.

Gender: Thyroid cancer is one of the few cancers that occur 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, followed by non-Hispanic white women. Black women have about half the rate of non-Hispanic 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 that 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 of thyroid cancer with 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 individuals 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, 1988-2002, 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	604	220	35.4	9.4	130	68	8.4	2.7
1989	638	224	37.4	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	6.8	2.7
1992	683	268	38.3	10.9	132	60	7.9	2.1
1993	678	235	37.3	9.2	116	40	7.1	1.4
1994	674	241	36.7	9.5	132	62	7.8	2.2
1995	680	226	36.5	8.5	113	63	6.7	2.1
1996	661	275	34.8	10.6	159	60	9.0	2.1
1997	734	231	38.2	8.7	136	84	7.7	2.8
1998	749	268	38.3	10.0	133	63	7.3	2.0
1999	756	263	38.2	9.8	129	70	6.9	2.2
2000	751	258	37.2	9.6	146	63	7.8	1.9
2001	810	270	39.1	9.9	146	51	7.3	1.6
2002	825	294	38.9	10.3	164	77	8.4	2.6

Table III-28.2: Number of new cases and deaths and average annual incidence and mortality rates[§] by age, Minnesota, 1998-2002, Urinary Bladder Cancer

Age at Diagnosis or Death (years)	Incidence 1998-2002				Mortality 1998-2002			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
0 – 19	6	2	0.2	0.1	0	0	0.0	0.0
20 – 34	24	11	0.9	0.4	0	0	0.0	0.0
35 – 49	199	70	6.6	2.4	20	7	0.7	0.2
50 – 64	870	279	49.1	15.4	83	28	4.7	1.5
65 – 74	1,224	353	178.9	44.6	174	55	25.4	6.9
74 – 85	1,174	406	274.8	63.4	254	96	59.5	15.0
85 and older	394	232	314.3	74.4	187	138	149.2	44.2

Table III-28.3: Number of new cases and deaths and average annual incidence and mortality rates[§] by race and ethnicity, Minnesota, 1998-2002, Urinary Bladder Cancer

Race and Ethnicity [†]	Incidence 1998-2002				Mortality 1998-2002			
	Total Cases		Average Rate		Total Deaths		Average Rate	
	Males	Females	Males	Females	Males	Females	Males	Females
All Races	3,891	1,353	38.3	9.9	718	324	7.5	2.1
American Indian	15	6	32.8	~	2	1	~	~
Asian/Pacific Isl.	8	7	~	~	4	2	~	~
Black	34	14	24.5	10.4	6	6	~	~
Non-Hispanic White	3,772	1,304	38.5	9.9	704	314	7.6	2.1
Hispanic (All Races)	6	5	~	~	2	1	~	~

Source: MCSS (April 2005) and the Minnesota Center for Health Statistics. Cases were microscopically confirmed (1988-2002) or Death Certificate Only (1995-2002). *In situ* cancers of the bladder were included in the analyses. All analyses were conducted by MCSS.

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Non-Hispanic persons reported with unknown or other race are included in all races combined, but are excluded from race-specific data. Hispanic includes persons of any race, including unknown. See Chapter I for comments on the accuracy of race- and ethnic-specific cancer rates.

~ Race-specific rates based on fewer than 10 cases or deaths are not presented.

Urinary Bladder

Table III-28.4: Other Minnesota cancer statistics[†], 2000-2002, Urinary Bladder Cancer

	Males	Females
Median Age at Diagnosis	72.0	74.0
Median Age at Death	78.0	81.0
Lifetime Risk of Diagnosis	4.2%	1.3%
Lifetime Risk of Death	0.9%	0.3%
Annual Percent Change [‡]		
Incidence (1988-2002)	0.2%	0.3%
Mortality (1988-2002)	0.3%	-0.6%

[†] See Appendix D or E for definition of terms.

[‡]The average *annual percent change* in the age-adjusted rate during the segment ending in 2002 from Joinpoint regression. Statistically significant ($P < 0.05$) trends are in **bold**.

Table III-28.5: Average annual incidence and mortality rates[§] in the United States, 1998-2002, Urinary Bladder Cancer

	Males	Females
Incidence		
All Races	36.0	9.1
Non-Hispanic White	41.1	10.3
Mortality		
All Races	7.6	2.3
Non-Hispanic White	8.0	2.3

Source: *SEER Cancer Statistics Review, 1975-2002*. Incidence data represent 14% 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.

Table III-28.6: Extent of disease at diagnosis and five-year relative survival, Urinary Bladder Cancer

Stage at Diagnosis	Percent of Cases [†] (%)	5-Year Relative Survival [‡] (%)
<i>In Situ</i> /Localized	85.7	94.2
Regional	8.2	48.4
Distant	3.5	6.2
Unknown	2.5	61.1

[†] Among Minnesota cases diagnosed 2001-2002.

[‡] Among SEER cases diagnosed 1995-2001 followed through 2002, from *SEER Cancer Statistics Review, 1975-2002*.

Descriptive Epidemiology

Incidence and Mortality: Cancer of the urinary bladder accounts for 4.7 percent of cancers in Minnesota and 2.3 percent of cancer deaths. Approximately 1,050 cases of urinary bladder cancer are diagnosed annually, and 210 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 five-year relative survival rate is 94.2 percent for urinary bladder

cancers diagnosed in the *in situ* or localized stage. In Minnesota, about 85.7 percent of cases are diagnosed at these stages.

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: The incidence rate of urinary bladder cancer is nearly four times higher in men than women in Minnesota and nationally. The mortality rate among men is more than three times that of women.

Race: Urinary bladder cancer rates appear to be highest among non-Hispanic white males in Minnesota, followed by American Indian men. There are too few cases among people of color in the state to assess disparities in urinary bladder cancer mortality. 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; and American Indians have the lowest rates. Among women, non-Hispanic whites have the highest rates, followed by blacks and Hispanics. Mortality rates are about 45 percent higher among non-Hispanic white men than black men, while black women have higher mortality than non-Hispanic white women.

Risk Factors

Cigarette smoking is a well 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 to avoid tobacco smoke.

[This page left intentionally blank]

**Chapter IV:
Occurrence of Cancer in
Minnesota Counties and Regions,
1998-2002**

Chapter IV: Cancer in Minnesota Counties and Regions, 1998 – 2002

This chapter contains a profile of cancer incidence for 1998-2002 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” numbers of cancers are those that were first diagnosed in residents of the county during the 5-year period, 1998-2002. The “expected” number of cancers is calculated by applying the 1998-2002 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.

When there were at least ten cancers of a given type, the average annual age-adjusted incidence rate is also provided. Because of the year-to-year variability in the occurrence of cancer, which is especially noticeable in smaller populations, average annual rates that appear to be different between counties may actually be statistically indistinguishable.

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: Aitkin County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	344	342.1	250	250.9	539.7	426.1
Brain & Other Nervous System	7	4.3	0	2.8	~	~
Breast	1	0.7	88	81.6	~	147.5
Cervix Uteri	-	-	3	2.9	-	~
Colon & Rectum	27	36.8	30	30.7	40.2	42.4
Corpus & Uterus, NOS	-	-	9	16.4	-	~
Esophagus	7	5.1	0	1.3	~	~
Hodgkin Lymphoma	0	1.4	1	1.0	~	~
Kaposi Sarcoma (all sites)	0	0.2	0	0.0	~	~
Kidney & Renal Pelvis	10	10.4	4	5.6	16.5	~
Larynx	8	3.8	3	0.8	~	~
Leukemia	6	10.3	6	6.3	~	~
Liver & Intrahepatic Bile Duct	3	3.0	1	1.1	~	~
Lung & Bronchus	53	46.4	39	30.5	84.6	59.6
Melanoma of the Skin	11	10.7	6	7.3	19.6	~
Mesothelioma (all sites)	2	1.6	0	0.3	~	~
Myeloma	1	3.8	1	2.6	~	~
Non-Hodgkin Lymphoma	24	14.5	7	11.2	36.6	~
Oral Cavity & Pharynx	7	9.1	8	4.0	~	~
Ovary	-	-	13	7.8	-	18.3
Pancreas	9	6.2	4	5.2	~	~
Prostate	116	122.5	-	-	174.7	-
Soft Tissues incl. Heart	2	1.7	4	1.4	~	~
Stomach	7	5.3	1	2.6	~	~
Testis	4	2.2	-	-	~	-
Thyroid	3	1.8	4	4.0	~	~
Urinary Bladder	26	23.5	1	6.7	39.4	~

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-2: Anoka County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	2719	2704.8	2413	2556.7	563.0	395.9
Brain & Other Nervous System	51	53.9	38	38.3	8.3	5.4
Breast	3	5.8	803	886.9	~	125.8
Cervix Uteri	-	-	37	49.9	-	5.0
Colon & Rectum	245	276.1	233	252.9	53.7	42.2
Corpus & Uterus, NOS	-	-	161	166.7	-	25.9
Esophagus	54	38.4	10	10.3	10.6	1.8
Hodgkin Lymphoma	30	25.2	13	19.3	3.8	1.7
Kaposi Sarcoma (all sites)	0	3.4	0	0.2	~	~
Kidney & Renal Pelvis	74	92.9	56	53.2	13.9	9.4
Larynx	30	30.6	13	7.6	5.7	2.0
Leukemia	91	90.4	56	62.2	17.7	9.5
Liver & Intrahepatic Bile Duct	19	26.9	8	10.8	4.2	~
Lung & Bronchus	346	334.1	331	266.4	75.6	58.8
Melanoma of the Skin	99	113.0	98	109.8	16.9	13.7
Mesothelioma (all sites)	7	11.1	2	2.3	~	~
Myeloma	28	28.8	25	22.7	6.1	4.8
Non-Hodgkin Lymphoma	129	128.0	97	105.7	26.3	16.8
Oral Cavity & Pharynx	87	86.0	32	40.2	16.4	5.1
Ovary	-	-	69	85.6	-	11.1
Pancreas	40	48.2	38	42.6	9.0	7.3
Prostate	952	863.7	-	-	202.7	-
Soft Tissues incl. Heart	20	20.3	16	17.8	3.0	2.7
Stomach	31	39.7	29	22.0	7.5	5.2
Testis	71	58.7	-	-	8.8	-
Thyroid	18	26.8	65	75.6	2.4	8.5
Urinary Bladder	176	163.4	50	54.9	41.9	8.7

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-3: Becker County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	495	471.9	344	396.7	588.1	370.5
Brain & Other Nervous System	7	6.8	2	4.8	~	~
Breast	1	1.0	101	129.4	~	110.6
Cervix Uteri	-	-	6	5.2	-	~
Colon & Rectum	50	50.6	47	47.9	59.4	44.8
Corpus & Uterus, NOS	-	-	34	25.2	-	36.7
Esophagus	9	6.9	0	2.0	~	~
Hodgkin Lymphoma	5	2.6	7	2.0	~	~
Kaposi Sarcoma (all sites)	0	0.4	0	0.0	~	~
Kidney & Renal Pelvis	11	14.7	8	8.6	12.3	~
Larynx	5	5.2	0	1.2	~	~
Leukemia	14	14.9	12	10.3	17.7	11.3
Liver & Intrahepatic Bile Duct	3	4.3	1	1.8	~	~
Lung & Bronchus	68	62.2	37	45.7	79.8	39.1
Melanoma of the Skin	14	16.0	13	12.8	16.3	16.1
Mesothelioma (all sites)	3	2.2	0	0.4	~	~
Myeloma	4	5.3	7	4.0	~	~
Non-Hodgkin Lymphoma	28	20.8	15	17.7	35.5	15.0
Oral Cavity & Pharynx	18	13.2	4	6.4	20.3	~
Ovary	-	-	6	12.5	-	~
Pancreas	7	8.5	6	7.9	~	~
Prostate	166	162.7	-	-	193.3	-
Soft Tissues incl. Heart	2	2.7	4	2.4	~	~
Stomach	5	7.4	1	4.1	~	~
Testis	7	4.9	-	-	~	-
Thyroid	2	3.0	5	7.5	~	~
Urinary Bladder	38	31.8	7	10.3	43.9	~

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-4: Beltrami County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	482	467.5	382	412.7	581.7	384.2
Brain & Other Nervous System	8	7.6	1	5.5	~	~
Breast	1	1.0	118	134.9	~	120.0
Cervix Uteri	-	-	9	6.2	-	~
Colon & Rectum	48	49.8	56	47.8	57.8	54.1
Corpus & Uterus, NOS	-	-	15	25.9	-	15.2
Esophagus	9	6.7	2	2.0	~	~
Hodgkin Lymphoma	1	3.3	0	2.8	~	~
Kaposi Sarcoma (all sites)	0	0.4	1	0.0	~	~
Kidney & Renal Pelvis	19	14.7	9	8.8	23.1	~
Larynx	6	5.1	0	1.2	~	~
Leukemia	17	15.5	16	10.8	19.8	14.3
Liver & Intrahepatic Bile Duct	3	4.3	3	1.9	~	~
Lung & Bronchus	59	60.0	42	45.7	72.9	43.6
Melanoma of the Skin	13	16.8	11	15.0	15.8	11.4
Mesothelioma (all sites)	2	2.1	1	0.4	~	~
Myeloma	8	5.1	5	4.1	~	~
Non-Hodgkin Lymphoma	15	21.2	22	18.3	18.0	22.6
Oral Cavity & Pharynx	16	13.4	4	6.6	19.1	~
Ovary	-	-	10	13.2	-	10.3
Pancreas	6	8.3	7	7.8	~	~
Prostate	172	156.5	-	-	208.4	-
Soft Tissues incl. Heart	4	3.0	2	2.8	~	~
Stomach	8	7.3	3	4.2	~	~
Testis	9	6.8	-	-	~	-
Thyroid	1	3.4	7	9.6	~	~
Urinary Bladder	30	30.9	9	10.2	36.4	~

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-5: Benton County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	363	360.8	248	341.4	565.5	311.6
Brain & Other Nervous System	7	6.3	8	4.6	~	~
Breast	0	0.8	78	110.2	~	98.8
Cervix Uteri	-	-	2	5.5	-	~
Colon & Rectum	35	38.6	23	40.5	55.3	26.6
Corpus & Uterus, NOS	-	-	10	20.7	-	14.0
Esophagus	2	5.1	0	1.6	~	~
Hodgkin Lymphoma	2	3.0	0	2.4	~	~
Kaposi Sarcoma (all sites)	1	0.4	0	0.0	~	~
Kidney & Renal Pelvis	6	11.5	12	7.2	~	15.8
Larynx	8	3.8	1	0.9	~	~
Leukemia	10	12.4	11	9.1	16.2	14.3
Liver & Intrahepatic Bile Duct	4	3.4	5	1.5	~	~
Lung & Bronchus	40	45.1	21	36.3	62.4	28.2
Melanoma of the Skin	7	13.8	10	13.1	~	13.4
Mesothelioma (all sites)	3	1.6	0	0.3	~	~
Myeloma	4	4.0	4	3.3	~	~
Non-Hodgkin Lymphoma	19	16.9	16	15.2	27.8	19.7
Oral Cavity & Pharynx	8	10.6	4	5.5	~	~
Ovary	-	-	9	10.8	-	~
Pancreas	5	6.4	6	6.5	~	~
Prostate	153	116.3	-	-	245.9	-
Soft Tissues incl. Heart	0	2.5	2	2.3	~	~
Stomach	10	5.7	1	3.6	15.9	~
Testis	5	6.8	-	-	~	-
Thyroid	3	3.1	5	8.5	~	~
Urinary Bladder	16	23.8	5	8.6	26.5	~

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-6: Big Stone County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	138	116.7	106	100.0	658.0	428.3
Brain & Other Nervous System	1	1.4	1	1.1	~	~
Breast	1	0.3	22	31.4	~	93.9
Cervix Uteri	-	-	1	1.1	-	~
Colon & Rectum	23	12.9	16	13.3	106.4	48.5
Corpus & Uterus, NOS	-	-	12	6.1	-	54.0
Esophagus	2	1.7	1	0.5	~	~
Hodgkin Lymphoma	1	0.5	1	0.4	~	~
Kaposi Sarcoma (all sites)	0	0.1	0	0.0	~	~
Kidney & Renal Pelvis	4	3.5	3	2.2	~	~
Larynx	1	1.2	0	0.3	~	~
Leukemia	6	3.7	7	2.7	~	~
Liver & Intrahepatic Bile Duct	0	1.0	1	0.5	~	~
Lung & Bronchus	20	15.6	12	11.8	90.7	54.9
Melanoma of the Skin	5	3.7	4	2.8	~	~
Mesothelioma (all sites)	0	0.6	1	0.1	~	~
Myeloma	0	1.3	0	1.1	~	~
Non-Hodgkin Lymphoma	3	5.1	7	4.7	~	~
Oral Cavity & Pharynx	7	3.1	1	1.6	~	~
Ovary	-	-	2	3.0	-	~
Pancreas	2	2.1	2	2.1	~	~
Prostate	40	40.7	-	-	184.8	-
Soft Tissues incl. Heart	0	0.6	0	0.6	~	~
Stomach	3	1.9	1	1.2	~	~
Testis	0	0.8	-	-	~	-
Thyroid	0	0.6	3	1.5	~	~
Urinary Bladder	16	8.3	2	2.8	75.7	~

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-7: Blue Earth County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	570	623.5	594	594.1	512.9	413.0
Brain & Other Nervous System	11	10.2	11	7.6	9.7	8.5
Breast	1	1.4	194	189.3	~	140.9
Cervix Uteri	-	-	5	8.6	-	~
Colon & Rectum	63	66.8	93	72.5	57.3	57.2
Corpus & Uterus, NOS	-	-	35	36.1	-	24.4
Esophagus	7	8.8	3	2.9	~	~
Hodgkin Lymphoma	4	5.0	4	4.2	~	~
Kaposi Sarcoma (all sites)	0	0.6	0	0.1	~	~
Kidney & Renal Pelvis	21	19.4	15	12.6	18.9	10.6
Larynx	11	6.6	0	1.6	9.9	~
Leukemia	11	21.0	17	15.8	9.4	9.9
Liver & Intrahepatic Bile Duct	5	5.7	5	2.7	~	~
Lung & Bronchus	60	79.0	52	65.2	54.9	36.9
Melanoma of the Skin	27	22.9	22	21.4	23.3	17.2
Mesothelioma (all sites)	3	2.8	0	0.6	~	~
Myeloma	3	6.9	5	6.0	~	~
Non-Hodgkin Lymphoma	33	28.8	24	27.0	29.2	17.4
Oral Cavity & Pharynx	13	17.8	4	9.6	11.8	~
Ovary	-	-	18	18.7	-	13.3
Pancreas	13	11.0	10	11.6	12.0	7.6
Prostate	182	204.0	-	-	167.6	-
Soft Tissues incl. Heart	5	4.1	2	4.1	~	~
Stomach	11	9.8	7	6.4	10.3	~
Testis	11	11.0	-	-	7.7	-
Thyroid	4	4.9	15	13.5	~	10.9
Urinary Bladder	38	41.7	15	15.4	34.7	8.7

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-8: Brown County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	408	419.5	370	367.0	546.5	417.2
Brain & Other Nervous System	5	5.9	4	4.3	~	~
Breast	0	1.0	116	117.0	~	130.5
Cervix Uteri	-	-	4	4.7	-	~
Colon & Rectum	41	45.8	53	46.6	53.3	49.8
Corpus & Uterus, NOS	-	-	37	22.5	-	46.4
Esophagus	7	6.0	4	1.9	~	~
Hodgkin Lymphoma	2	2.4	1	1.9	~	~
Kaposi Sarcoma (all sites)	0	0.3	0	0.0	~	~
Kidney & Renal Pelvis	13	12.8	5	8.0	17.0	~
Larynx	2	4.4	0	1.0	~	~
Leukemia	20	13.6	11	9.8	27.1	10.6
Liver & Intrahepatic Bile Duct	3	3.7	0	1.7	~	~
Lung & Bronchus	29	55.0	27	42.0	38.3	31.4
Melanoma of the Skin	12	14.2	12	11.6	17.0	15.2
Mesothelioma (all sites)	1	2.0	0	0.4	~	~
Myeloma	9	4.7	2	3.8	~	~
Non-Hodgkin Lymphoma	21	18.8	17	16.8	29.5	19.0
Oral Cavity & Pharynx	8	11.5	3	5.9	~	~
Ovary	-	-	8	11.3	-	~
Pancreas	10	7.5	13	7.5	13.4	12.7
Prostate	154	142.5	-	-	201.2	-
Soft Tissues incl. Heart	6	2.4	2	2.2	~	~
Stomach	5	6.8	5	4.1	~	~
Testis	5	4.5	-	-	~	-
Thyroid	1	2.7	12	6.7	~	17.4
Urinary Bladder	32	29.2	7	9.9	43.6	~

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-9: Carlton County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	461	454.0	409	399.7	571.4	430.6
Brain & Other Nervous System	9	6.9	2	4.9	~	~
Breast	1	1.0	122	129.9	~	129.5
Cervix Uteri	-	-	3	5.5	-	~
Colon & Rectum	53	48.7	47	48.3	66.5	45.6
Corpus & Uterus, NOS	-	-	26	25.0	-	28.7
Esophagus	12	6.6	3	2.0	14.4	~
Hodgkin Lymphoma	7	2.8	1	2.1	~	~
Kaposi Sarcoma (all sites)	0	0.4	0	0.0	~	~
Kidney & Renal Pelvis	17	14.3	5	8.7	20.4	~
Larynx	2	4.9	1	1.2	~	~
Leukemia	6	14.6	7	10.3	~	~
Liver & Intrahepatic Bile Duct	3	4.2	0	1.8	~	~
Lung & Bronchus	58	58.9	49	45.6	70.6	53.6
Melanoma of the Skin	17	16.2	21	13.3	20.1	23.0
Mesothelioma (all sites)	7	2.1	0	0.4	~	~
Myeloma	10	5.1	6	4.1	11.8	~
Non-Hodgkin Lymphoma	21	20.5	22	18.0	26.0	22.5
Oral Cavity & Pharynx	12	13.0	9	6.4	15.6	~
Ovary	-	-	15	12.6	-	17.3
Pancreas	7	8.2	6	7.9	~	~
Prostate	146	152.9	-	-	181.9	-
Soft Tissues incl. Heart	4	2.7	5	2.4	~	~
Stomach	7	7.1	4	4.2	~	~
Testis	5	5.8	-	-	~	-
Thyroid	4	3.2	8	8.0	~	~
Urinary Bladder	31	30.5	13	10.3	40.2	10.9

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-10: Carver County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	537	620.4	555	588.6	486.2	394.3
Brain & Other Nervous System	11	12.4	10	8.8	8.7	7.5
Breast	2	1.4	183	201.0	~	123.8
Cervix Uteri	-	-	12	11.7	-	7.3
Colon & Rectum	61	64.3	65	61.1	60.0	49.3
Corpus & Uterus, NOS	-	-	29	36.7	-	22.4
Esophagus	7	8.7	1	2.4	~	~
Hodgkin Lymphoma	6	5.8	5	4.5	~	~
Kaposi Sarcoma (all sites)	0	0.8	0	0.0	~	~
Kidney & Renal Pelvis	23	21.2	11	12.2	19.9	8.6
Larynx	5	6.8	2	1.7	~	~
Leukemia	10	21.5	11	15.1	9.3	7.3
Liver & Intrahepatic Bile Duct	3	6.2	0	2.5	~	~
Lung & Bronchus	61	76.1	43	59.3	59.2	34.1
Melanoma of the Skin	29	26.2	28	25.6	19.2	16.7
Mesothelioma (all sites)	2	2.6	0	0.5	~	~
Myeloma	5	6.7	4	5.3	~	~
Non-Hodgkin Lymphoma	34	29.8	32	24.8	28.7	23.5
Oral Cavity & Pharynx	11	19.6	5	9.3	9.6	~
Ovary	-	-	14	19.3	-	11.1
Pancreas	6	11.0	8	10.0	~	~
Prostate	177	194.2	-	-	168.3	-
Soft Tissues incl. Heart	2	4.7	6	4.2	~	~
Stomach	7	9.4	3	5.4	~	~
Testis	15	13.5	-	-	8.9	-
Thyroid	7	6.2	24	17.6	~	13.1
Urinary Bladder	34	38.5	14	13.1	33.5	10.9

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-11: Cass County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	494	514.7	341	373.2	536.9	380.4
Brain & Other Nervous System	6	6.9	2	4.5	~	~
Breast	2	1.1	114	123.4	~	125.4
Cervix Uteri	-	-	8	4.8	-	~
Colon & Rectum	50	55.0	42	43.5	55.2	44.5
Corpus & Uterus, NOS	-	-	21	24.6	-	23.1
Esophagus	6	7.6	4	1.8	~	~
Hodgkin Lymphoma	4	2.4	1	1.8	~	~
Kaposi Sarcoma (all sites)	0	0.3	0	0.0	~	~
Kidney & Renal Pelvis	13	15.9	10	8.2	13.5	11.0
Larynx	5	5.7	1	1.2	~	~
Leukemia	16	15.6	6	9.3	19.9	~
Liver & Intrahepatic Bile Duct	2	4.6	1	1.7	~	~
Lung & Bronchus	84	69.0	36	44.5	86.7	38.3
Melanoma of the Skin	17	16.7	13	11.8	20.0	17.5
Mesothelioma (all sites)	1	2.4	0	0.4	~	~
Myeloma	8	5.7	2	3.8	~	~
Non-Hodgkin Lymphoma	16	22.1	15	16.4	17.5	15.7
Oral Cavity & Pharynx	25	14.0	7	5.9	27.5	~
Ovary	-	-	10	11.9	-	11.7
Pancreas	10	9.3	6	7.4	11.5	~
Prostate	170	182.6	-	-	179.4	-
Soft Tissues incl. Heart	4	2.7	3	2.2	~	~
Stomach	8	8.0	6	3.7	~	~
Testis	6	4.1	-	-	~	-
Thyroid	1	3.0	3	6.9	~	~
Urinary Bladder	22	34.7	6	9.5	25.5	~

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-12: Chippewa County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	202	219.6	169	202.0	517.8	343.0
Brain & Other Nervous System	2	3.0	0	2.3	~	~
Breast	0	0.5	47	63.5	~	93.1
Cervix Uteri	-	-	3	2.4	-	~
Colon & Rectum	26	24.4	28	26.7	65.2	42.5
Corpus & Uterus, NOS	-	-	12	12.2	-	24.5
Esophagus	3	3.2	2	1.1	~	~
Hodgkin Lymphoma	1	1.1	1	0.9	~	~
Kaposi Sarcoma (all sites)	0	0.2	0	0.0	~	~
Kidney & Renal Pelvis	1	6.6	9	4.4	~	~
Larynx	2	2.3	1	0.6	~	~
Leukemia	8	7.2	1	5.5	~	~
Liver & Intrahepatic Bile Duct	3	2.0	0	1.0	~	~
Lung & Bronchus	29	28.7	12	23.2	72.5	25.6
Melanoma of the Skin	8	7.3	6	6.1	~	~
Mesothelioma (all sites)	0	1.0	0	0.2	~	~
Myeloma	4	2.5	3	2.2	~	~
Non-Hodgkin Lymphoma	10	9.9	11	9.4	27.4	25.0
Oral Cavity & Pharynx	3	6.0	3	3.3	~	~
Ovary	-	-	7	6.1	-	~
Pancreas	3	4.0	1	4.3	~	~
Prostate	71	74.3	-	-	178.7	-
Soft Tissues incl. Heart	0	1.2	1	1.2	~	~
Stomach	2	3.7	0	2.4	~	~
Testis	3	2.0	-	-	~	-
Thyroid	0	1.3	8	3.3	~	~
Urinary Bladder	12	15.7	3	5.7	28.5	~

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-13: Chisago County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	516	459.6	467	388.4	618.6	496.5
Brain & Other Nervous System	16	8.1	11	5.5	19.0	11.5
Breast	0	1.0	153	130.0	~	163.2
Cervix Uteri	-	-	7	6.8	-	~
Colon & Rectum	52	48.6	49	42.6	65.0	51.1
Corpus & Uterus, NOS	-	-	27	24.4	-	29.0
Esophagus	6	6.5	6	1.7	~	~
Hodgkin Lymphoma	2	3.6	7	2.7	~	~
Kaposi Sarcoma (all sites)	0	0.5	0	0.0	~	~
Kidney & Renal Pelvis	16	15.0	9	8.2	19.1	~
Larynx	3	5.0	3	1.1	~	~
Leukemia	13	15.4	9	10.0	15.6	~
Liver & Intrahepatic Bile Duct	4	4.4	3	1.7	~	~
Lung & Bronchus	63	58.0	52	41.3	77.4	58.2
Melanoma of the Skin	23	17.7	17	15.4	25.4	16.8
Mesothelioma (all sites)	0	2.0	1	0.4	~	~
Myeloma	11	5.0	1	3.7	13.2	~
Non-Hodgkin Lymphoma	25	21.4	15	16.7	28.6	15.9
Oral Cavity & Pharynx	12	13.7	4	6.2	13.9	~
Ovary	-	-	25	12.6	-	26.2
Pancreas	6	8.2	9	7.0	~	~
Prostate	188	149.8	-	-	230.0	-
Soft Tissues incl. Heart	4	3.1	3	2.6	~	~
Stomach	5	7.1	5	3.7	~	~
Testis	7	7.9	-	-	~	-
Thyroid	5	3.9	11	10.2	~	11.1
Urinary Bladder	25	29.8	9	9.2	29.0	~

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-14: Clay County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	709	608.6	553	564.1	656.8	419.1
Brain & Other Nervous System	9	9.7	12	7.3	~	9.2
Breast	2	1.4	170	181.0	~	134.1
Cervix Uteri	-	-	16	8.2	-	13.0
Colon & Rectum	75	65.4	75	68.3	69.7	52.9
Corpus & Uterus, NOS	-	-	30	34.5	-	23.1
Esophagus	7	8.7	4	2.8	~	~
Hodgkin Lymphoma	3	4.3	4	3.8	~	~
Kaposi Sarcoma (all sites)	1	0.5	0	0.1	~	~
Kidney & Renal Pelvis	15	19.0	18	12.0	14.1	13.4
Larynx	3	6.5	1	1.6	~	~
Leukemia	28	20.3	15	15.0	26.0	10.9
Liver & Intrahepatic Bile Duct	4	5.6	4	2.6	~	~
Lung & Bronchus	93	78.1	51	62.2	86.4	40.8
Melanoma of the Skin	17	21.8	18	20.1	15.6	13.7
Mesothelioma (all sites)	3	2.8	0	0.6	~	~
Myeloma	12	6.8	5	5.7	11.2	~
Non-Hodgkin Lymphoma	28	27.8	21	25.4	25.7	17.2
Oral Cavity & Pharynx	26	17.3	11	9.1	23.6	8.4
Ovary	-	-	17	17.8	-	12.7
Pancreas	9	10.9	8	11.0	~	~
Prostate	279	202.0	-	-	258.9	-
Soft Tissues incl. Heart	2	3.8	6	3.8	~	~
Stomach	8	9.6	9	6.0	~	~
Testis	8	8.8	-	-	~	-
Thyroid	1	4.5	13	12.6	~	10.5
Urinary Bladder	40	41.0	14	14.6	37.8	9.8

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-15: Clearwater County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	137	144.5	108	112.5	524.3	387.3
Brain & Other Nervous System	1	2.0	1	1.3	~	~
Breast	0	0.3	36	36.4	~	133.3
Cervix Uteri	-	-	1	1.4	-	~
Colon & Rectum	17	15.9	14	14.0	62.5	39.1
Corpus & Uterus, NOS	-	-	11	7.1	-	37.6
Esophagus	4	2.1	0	0.6	~	~
Hodgkin Lymphoma	1	0.8	0	0.6	~	~
Kaposi Sarcoma (all sites)	0	0.1	0	0.0	~	~
Kidney & Renal Pelvis	4	4.4	2	2.4	~	~
Larynx	0	1.5	0	0.3	~	~
Leukemia	6	4.6	1	3.0	~	~
Liver & Intrahepatic Bile Duct	0	1.3	1	0.5	~	~
Lung & Bronchus	24	18.9	14	12.8	93.0	51.3
Melanoma of the Skin	3	4.8	0	3.6	~	~
Mesothelioma (all sites)	1	0.7	0	0.1	~	~
Myeloma	3	1.6	1	1.2	~	~
Non-Hodgkin Lymphoma	2	6.4	3	5.1	~	~
Oral Cavity & Pharynx	2	4.0	1	1.8	~	~
Ovary	-	-	6	3.5	-	~
Pancreas	2	2.6	2	2.3	~	~
Prostate	47	49.5	-	-	178.7	-
Soft Tissues incl. Heart	1	0.8	0	0.7	~	~
Stomach	4	2.3	1	1.2	~	~
Testis	1	1.4	-	-	~	-
Thyroid	0	0.9	3	2.1	~	~
Urinary Bladder	9	10.1	0	3.0	~	~

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-16: Cook County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	80	92.2	75	73.1	496.3	406.5
Brain & Other Nervous System	3	1.3	1	0.9	~	~
Breast	0	0.2	22	24.5	~	120.0
Cervix Uteri	-	-	1	1.0	-	~
Colon & Rectum	9	9.9	9	8.5	~	~
Corpus & Uterus, NOS	-	-	4	4.8	-	~
Esophagus	2	1.4	0	0.4	~	~
Hodgkin Lymphoma	0	0.5	0	0.3	~	~
Kaposi Sarcoma (all sites)	0	0.1	0	0.0	~	~
Kidney & Renal Pelvis	4	2.9	1	1.6	~	~
Larynx	0	1.0	0	0.2	~	~
Leukemia	3	2.8	3	1.8	~	~
Liver & Intrahepatic Bile Duct	1	0.8	0	0.3	~	~
Lung & Bronchus	12	12.2	13	8.3	78.9	78.1
Melanoma of the Skin	1	3.1	1	2.4	~	~
Mesothelioma (all sites)	1	0.4	1	0.1	~	~
Myeloma	0	1.0	0	0.7	~	~
Non-Hodgkin Lymphoma	4	4.0	5	3.2	~	~
Oral Cavity & Pharynx	2	2.6	0	1.2	~	~
Ovary	-	-	3	2.3	-	~
Pancreas	0	1.7	1	1.4	~	~
Prostate	22	32.0	-	-	131.6	-
Soft Tissues incl. Heart	0	0.5	0	0.4	~	~
Stomach	0	1.4	0	0.7	~	~
Testis	1	0.8	-	-	~	-
Thyroid	0	0.6	1	1.4	~	~
Urinary Bladder	9	6.2	1	1.8	~	~

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-17: Cottonwood County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	202	222.0	204	198.6	518.2	450.5
Brain & Other Nervous System	1	2.9	1	2.2	~	~
Breast	2	0.5	68	62.1	~	160.3
Cervix Uteri	-	-	5	2.2	-	~
Colon & Rectum	28	24.8	36	26.7	70.2	66.3
Corpus & Uterus, NOS	-	-	20	12.0	-	46.4
Esophagus	2	3.2	0	1.1	~	~
Hodgkin Lymphoma	1	1.0	1	0.9	~	~
Kaposi Sarcoma (all sites)	0	0.1	0	0.0	~	~
Kidney & Renal Pelvis	8	6.6	1	4.3	~	~
Larynx	2	2.3	0	0.5	~	~
Leukemia	3	7.3	6	5.5	~	~
Liver & Intrahepatic Bile Duct	1	1.9	0	0.9	~	~
Lung & Bronchus	24	29.2	14	22.9	61.7	33.3
Melanoma of the Skin	11	7.2	6	5.8	29.7	~
Mesothelioma (all sites)	0	1.1	0	0.2	~	~
Myeloma	3	2.5	2	2.1	~	~
Non-Hodgkin Lymphoma	11	9.9	5	9.3	29.4	~
Oral Cavity & Pharynx	3	6.0	1	3.2	~	~
Ovary	-	-	5	6.0	-	~
Pancreas	4	4.0	2	4.2	~	~
Prostate	72	75.8	-	-	173.8	-
Soft Tissues incl. Heart	0	1.2	0	1.2	~	~
Stomach	2	3.7	1	2.4	~	~
Testis	3	1.8	-	-	~	-
Thyroid	2	1.2	7	3.1	~	~
Urinary Bladder	9	16.0	7	5.7	~	~

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-18: Crow Wing County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	940	899.0	779	748.2	583.3	435.4
Brain & Other Nervous System	12	12.6	7	9.0	8.2	~
Breast	2	2.0	244	243.2	~	135.8
Cervix Uteri	-	-	11	9.9	-	8.4
Colon & Rectum	86	96.4	101	90.0	53.1	49.7
Corpus & Uterus, NOS	-	-	37	47.7	-	21.1
Esophagus	12	13.1	3	3.7	7.4	~
Hodgkin Lymphoma	4	4.8	5	3.8	~	~
Kaposi Sarcoma (all sites)	0	0.6	0	0.1	~	~
Kidney & Renal Pelvis	22	27.8	19	16.4	14.0	9.8
Larynx	12	9.8	3	2.2	7.0	~
Leukemia	23	28.3	19	19.2	15.5	9.9
Liver & Intrahepatic Bile Duct	5	8.1	3	3.4	~	~
Lung & Bronchus	116	119.2	96	87.4	71.6	52.3
Melanoma of the Skin	27	29.9	21	24.2	17.8	13.7
Mesothelioma (all sites)	4	4.2	0	0.8	~	~
Myeloma	6	10.0	8	7.7	~	~
Non-Hodgkin Lymphoma	39	39.3	31	33.5	25.2	16.8
Oral Cavity & Pharynx	26	24.6	20	12.0	16.8	10.9
Ovary	-	-	30	23.5	-	17.4
Pancreas	26	16.2	19	15.0	16.0	9.9
Prostate	380	312.0	-	-	229.3	-
Soft Tissues incl. Heart	7	5.0	8	4.5	~	~
Stomach	8	14.1	11	7.7	~	6.5
Testis	8	9.0	-	-	~	-
Thyroid	2	5.6	19	14.2	~	14.0
Urinary Bladder	72	61.0	20	19.4	45.1	10.2

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-19: Dakota County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	3084	3195.5	3137	3091.5	536.9	422.6
Brain & Other Nervous System	55	63.1	57	45.9	7.7	7.2
Breast	6	7.0	1079	1067.7	~	139.4
Cervix Uteri	-	-	51	60.6	-	5.8
Colon & Rectum	297	329.2	282	311.2	55.5	41.6
Corpus & Uterus, NOS	-	-	197	198.6	-	25.7
Esophagus	44	45.3	12	12.6	8.1	1.8
Hodgkin Lymphoma	40	29.3	27	23.5	5.1	3.1
Kaposi Sarcoma (all sites)	1	4.0	0	0.2	~	~
Kidney & Renal Pelvis	104	109.0	71	64.0	16.4	9.7
Larynx	32	35.6	11	9.1	5.9	1.4
Leukemia	117	108.1	66	76.2	19.2	9.6
Liver & Intrahepatic Bile Duct	23	31.7	15	13.1	4.4	2.4
Lung & Bronchus	366	394.3	314	317.6	67.1	46.5
Melanoma of the Skin	147	132.9	124	133.6	22.0	15.0
Mesothelioma (all sites)	18	13.3	3	2.8	3.7	~
Myeloma	41	34.4	37	27.5	7.0	5.5
Non-Hodgkin Lymphoma	158	151.9	152	128.6	25.9	21.4
Oral Cavity & Pharynx	106	101.1	44	48.8	16.3	5.8
Ovary	-	-	123	103.0	-	16.3
Pancreas	49	57.0	60	51.8	8.0	8.7
Prostate	958	1014.2	-	-	174.9	-
Soft Tissues incl. Heart	23	23.9	21	21.6	2.9	2.4
Stomach	46	47.6	32	27.3	9.1	4.6
Testis	86	68.4	-	-	8.9	-
Thyroid	35	31.3	104	91.9	4.5	11.4
Urinary Bladder	177	196.2	64	67.2	35.3	9.4

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-20: Dodge County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	199	212.9	173	187.8	527.8	382.1
Brain & Other Nervous System	4	3.5	4	2.5	~	~
Breast	0	0.5	54	61.4	~	120.9
Cervix Uteri	-	-	1	2.9	-	~
Colon & Rectum	17	22.8	29	22.0	43.9	59.2
Corpus & Uterus, NOS	-	-	6	11.6	-	~
Esophagus	3	3.0	0	0.9	~	~
Hodgkin Lymphoma	1	1.5	0	1.2	~	~
Kaposi Sarcoma (all sites)	0	0.2	0	0.0	~	~
Kidney & Renal Pelvis	12	6.8	4	4.0	29.8	~
Larynx	5	2.3	0	0.5	~	~
Leukemia	9	7.1	5	5.0	~	~
Liver & Intrahepatic Bile Duct	0	2.0	1	0.8	~	~
Lung & Bronchus	29	27.2	20	20.5	78.7	46.3
Melanoma of the Skin	9	7.8	7	6.9	~	~
Mesothelioma (all sites)	0	1.0	0	0.2	~	~
Myeloma	2	2.4	1	1.8	~	~
Non-Hodgkin Lymphoma	7	9.8	12	8.3	~	26.2
Oral Cavity & Pharynx	9	6.2	5	3.0	~	~
Ovary	-	-	3	5.9	-	~
Pancreas	3	3.8	3	3.6	~	~
Prostate	69	70.1	-	-	185.0	-
Soft Tissues incl. Heart	0	1.4	1	1.2	~	~
Stomach	3	3.4	0	1.9	~	~
Testis	0	3.2	-	-	~	-
Thyroid	1	1.6	5	4.3	~	~
Urinary Bladder	7	14.2	0	4.7	~	~

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-21: Douglas County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	605	542.1	479	461.5	626.1	444.5
Brain & Other Nervous System	6	7.5	2	5.4	~	~
Breast	0	1.3	179	148.0	~	176.7
Cervix Uteri	-	-	7	5.8	-	~
Colon & Rectum	61	59.2	67	57.7	62.0	54.7
Corpus & Uterus, NOS	-	-	25	28.8	-	23.7
Esophagus	12	7.8	2	2.4	12.5	~
Hodgkin Lymphoma	3	2.9	3	2.3	~	~
Kaposi Sarcoma (all sites)	0	0.4	1	0.0	~	~
Kidney & Renal Pelvis	9	16.5	9	10.0	~	~
Larynx	8	5.8	0	1.3	~	~
Leukemia	19	17.4	17	12.1	19.9	14.4
Liver & Intrahepatic Bile Duct	1	4.8	3	2.1	~	~
Lung & Bronchus	78	71.1	36	53.4	79.6	30.1
Melanoma of the Skin	20	18.1	11	14.5	22.1	12.8
Mesothelioma (all sites)	2	2.5	0	0.5	~	~
Myeloma	6	6.1	11	4.8	~	8.8
Non-Hodgkin Lymphoma	17	24.0	24	21.0	18.6	20.9
Oral Cavity & Pharynx	12	14.9	7	7.4	13.2	~
Ovary	-	-	9	14.3	-	~
Pancreas	13	9.7	5	9.4	13.8	~
Prostate	230	185.8	-	-	233.1	-
Soft Tissues incl. Heart	2	3.0	6	2.8	~	~
Stomach	11	8.7	7	5.0	11.3	~
Testis	7	5.5	-	-	~	-
Thyroid	2	3.3	6	8.3	~	~
Urinary Bladder	53	37.6	15	12.4	54.1	12.2

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-22: Faribault County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	276	295.3	218	265.9	531.9	347.4
Brain & Other Nervous System	4	3.9	2	2.9	~	~
Breast	0	0.7	65	83.4	~	100.0
Cervix Uteri	-	-	3	3.0	-	~
Colon & Rectum	38	32.7	31	35.4	70.6	36.2
Corpus & Uterus, NOS	-	-	11	16.2	-	18.0
Esophagus	3	4.3	2	1.4	~	~
Hodgkin Lymphoma	2	1.4	2	1.1	~	~
Kaposi Sarcoma (all sites)	0	0.2	0	0.0	~	~
Kidney & Renal Pelvis	8	8.9	5	5.8	~	~
Larynx	1	3.1	1	0.7	~	~
Leukemia	9	9.5	5	7.2	~	~
Liver & Intrahepatic Bile Duct	2	2.6	0	1.3	~	~
Lung & Bronchus	34	39.0	21	31.0	65.0	37.5
Melanoma of the Skin	13	9.6	10	7.7	28.1	21.3
Mesothelioma (all sites)	0	1.4	1	0.3	~	~
Myeloma	3	3.4	3	2.9	~	~
Non-Hodgkin Lymphoma	10	13.0	16	12.4	19.5	20.4
Oral Cavity & Pharynx	5	8.0	5	4.3	~	~
Ovary	-	-	6	8.0	-	~
Pancreas	5	5.3	0	5.7	~	~
Prostate	99	101.5	-	-	181.3	-
Soft Tissues incl. Heart	1	1.6	1	1.5	~	~
Stomach	4	4.8	3	3.1	~	~
Testis	3	2.5	-	-	~	-
Thyroid	3	1.7	8	4.1	~	~
Urinary Bladder	13	21.0	4	7.5	23.2	~

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-23: Fillmore County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	342	359.3	297	306.6	536.5	398.0
Brain & Other Nervous System	7	4.9	1	3.5	~	~
Breast	0	0.8	90	97.0	~	122.6
Cervix Uteri	-	-	2	3.7	-	~
Colon & Rectum	37	39.6	44	39.8	56.7	48.8
Corpus & Uterus, NOS	-	-	19	18.7	-	27.7
Esophagus	4	5.2	2	1.6	~	~
Hodgkin Lymphoma	6	1.9	2	1.5	~	~
Kaposi Sarcoma (all sites)	0	0.3	0	0.0	~	~
Kidney & Renal Pelvis	11	10.9	7	6.6	18.6	~
Larynx	2	3.8	0	0.9	~	~
Leukemia	20	11.7	7	8.3	31.7	~
Liver & Intrahepatic Bile Duct	4	3.2	2	1.4	~	~
Lung & Bronchus	44	47.2	27	35.1	66.7	34.2
Melanoma of the Skin	9	11.9	6	9.4	~	~
Mesothelioma (all sites)	0	1.7	1	0.3	~	~
Myeloma	4	4.1	2	3.2	~	~
Non-Hodgkin Lymphoma	13	16.0	20	14.2	21.2	27.9
Oral Cavity & Pharynx	13	9.7	8	5.0	21.4	~
Ovary	-	-	9	9.3	-	~
Pancreas	7	6.5	6	6.4	~	~
Prostate	110	122.6	-	-	168.5	-
Soft Tissues incl. Heart	0	2.0	1	1.8	~	~
Stomach	5	5.9	5	3.5	~	~
Testis	4	3.4	-	-	~	-
Thyroid	0	2.1	7	5.3	~	~
Urinary Bladder	18	25.3	9	8.5	25.8	~

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-24: Freeborn County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	509	551.5	440	478.7	519.8	381.4
Brain & Other Nervous System	4	7.6	5	5.5	~	~
Breast	2	1.3	126	152.9	~	112.1
Cervix Uteri	-	-	9	5.9	-	~
Colon & Rectum	64	60.1	76	60.7	65.8	57.4
Corpus & Uterus, NOS	-	-	28	29.8	-	24.7
Esophagus	7	8.0	2	2.5	~	~
Hodgkin Lymphoma	2	2.8	1	2.3	~	~
Kaposi Sarcoma (all sites)	0	0.4	0	0.0	~	~
Kidney & Renal Pelvis	14	16.9	11	10.4	14.8	9.9
Larynx	9	5.9	2	1.4	~	~
Leukemia	14	17.6	19	12.7	15.0	18.6
Liver & Intrahepatic Bile Duct	3	4.9	3	2.2	~	~
Lung & Bronchus	53	72.8	38	55.5	52.1	32.2
Melanoma of the Skin	18	18.4	13	14.8	19.8	12.5
Mesothelioma (all sites)	0	2.6	0	0.5	~	~
Myeloma	4	6.2	6	5.0	~	~
Non-Hodgkin Lymphoma	27	24.5	21	21.9	28.9	18.2
Oral Cavity & Pharynx	11	15.1	6	7.7	11.8	~
Ovary	-	-	16	14.7	-	14.9
Pancreas	5	9.9	10	9.9	~	9.0
Prostate	187	189.1	-	-	184.7	-
Soft Tissues incl. Heart	6	3.0	5	2.8	~	~
Stomach	10	8.9	3	5.3	10.3	~
Testis	7	5.3	-	-	~	-
Thyroid	2	3.4	8	8.4	~	~
Urinary Bladder	35	38.2	5	13.0	35.8	~

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-25: Goodhue County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	603	617.9	584	560.2	551.2	433.4
Brain & Other Nervous System	9	9.4	6	6.8	~	~
Breast	0	1.4	185	181.7	~	140.2
Cervix Uteri	-	-	11	7.8	-	8.1
Colon & Rectum	64	66.9	76	68.8	58.6	48.8
Corpus & Uterus, NOS	-	-	43	34.7	-	33.5
Esophagus	4	8.9	3	2.8	~	~
Hodgkin Lymphoma	5	3.8	7	3.0	~	~
Kaposi Sarcoma (all sites)	1	0.5	0	0.1	~	~
Kidney & Renal Pelvis	22	19.4	10	12.0	20.0	7.4
Larynx	11	6.6	1	1.6	9.7	~
Leukemia	22	20.1	21	14.8	20.2	16.1
Liver & Intrahepatic Bile Duct	4	5.7	5	2.6	~	~
Lung & Bronchus	71	79.9	44	62.4	64.7	33.2
Melanoma of the Skin	19	21.9	28	18.8	17.5	22.8
Mesothelioma (all sites)	1	2.8	2	0.6	~	~
Myeloma	4	6.9	5	5.7	~	~
Non-Hodgkin Lymphoma	33	28.0	18	25.2	29.9	12.3
Oral Cavity & Pharynx	13	17.6	14	9.0	11.5	10.0
Ovary	-	-	10	17.5	-	8.7
Pancreas	7	11.1	12	11.1	~	7.2
Prostate	229	207.3	-	-	209.7	-
Soft Tissues incl. Heart	6	3.7	6	3.5	~	~
Stomach	7	9.8	8	6.1	~	~
Testis	9	7.6	-	-	~	-
Thyroid	6	4.3	15	11.3	~	13.9
Urinary Bladder	31	41.9	11	14.7	28.2	7.6

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-26: Grant County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	138	122.6	108	102.7	622.9	413.9
Brain & Other Nervous System	1	1.5	2	1.1	~	~
Breast	0	0.3	27	32.1	~	108.5
Cervix Uteri	-	-	1	1.1	-	~
Colon & Rectum	18	13.7	19	13.7	81.3	56.4
Corpus & Uterus, NOS	-	-	3	6.2	-	~
Esophagus	1	1.8	0	0.6	~	~
Hodgkin Lymphoma	0	0.6	0	0.4	~	~
Kaposi Sarcoma (all sites)	0	0.1	0	0.0	~	~
Kidney & Renal Pelvis	4	3.6	3	2.2	~	~
Larynx	3	1.3	0	0.3	~	~
Leukemia	4	3.9	5	2.8	~	~
Liver & Intrahepatic Bile Duct	1	1.1	0	0.5	~	~
Lung & Bronchus	17	16.2	13	12.0	72.8	61.1
Melanoma of the Skin	3	3.9	3	3.0	~	~
Mesothelioma (all sites)	1	0.6	1	0.1	~	~
Myeloma	0	1.4	2	1.1	~	~
Non-Hodgkin Lymphoma	5	5.4	5	4.8	~	~
Oral Cavity & Pharynx	6	3.2	1	1.7	~	~
Ovary	-	-	5	3.1	-	~
Pancreas	1	2.2	2	2.2	~	~
Prostate	51	42.3	-	-	227.4	-
Soft Tissues incl. Heart	0	0.6	2	0.6	~	~
Stomach	5	2.0	0	1.2	~	~
Testis	0	0.9	-	-	~	-
Thyroid	1	0.7	1	1.6	~	~
Urinary Bladder	10	8.8	4	2.9	44.9	~

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-27: Hennepin County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	11988	12144.4	12443	11952.3	554.3	432.5
Brain & Other Nervous System	194	210.1	147	157.6	7.8	5.2
Breast	42	27.6	4281	3961.5	2.0	150.5
Cervix Uteri	-	-	188	196.7	-	6.4
Colon & Rectum	1199	1285.3	1251	1360.7	56.7	41.8
Corpus & Uterus, NOS	-	-	720	749.0	-	25.8
Esophagus	166	172.3	53	54.9	8.0	1.8
Hodgkin Lymphoma	94	97.4	87	78.2	3.3	3.0
Kaposi Sarcoma (all sites)	39	13.0	1	1.1	1.4	~
Kidney & Renal Pelvis	408	394.9	231	252.0	18.2	8.1
Larynx	146	131.3	39	34.1	6.6	1.4
Leukemia	394	404.0	312	305.1	17.9	10.7
Liver & Intrahepatic Bile Duct	145	115.2	63	53.2	6.4	2.2
Lung & Bronchus	1551	1531.0	1461	1287.1	74.0	51.9
Melanoma of the Skin	536	468.8	503	457.4	23.0	17.1
Mesothelioma (all sites)	48	53.0	10	11.8	2.3	0.3
Myeloma	130	133.2	110	115.2	6.2	3.8
Non-Hodgkin Lymphoma	592	566.5	508	522.9	26.9	17.5
Oral Cavity & Pharynx	384	362.5	218	190.7	16.8	7.5
Ovary	-	-	382	383.0	-	13.6
Pancreas	244	217.1	230	221.8	11.4	7.9
Prostate	3605	3936.8	-	-	172.0	-
Soft Tissues incl. Heart	76	82.2	64	78.4	3.1	2.1
Stomach	208	188.5	128	119.7	9.8	4.3
Testis	210	222.9	-	-	6.9	-
Thyroid	105	104.6	279	295.3	4.0	9.5
Urinary Bladder	820	789.1	315	291.1	39.8	10.6

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-28: Houston County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	242	293.6	231	254.1	464.0	383.1
Brain & Other Nervous System	4	4.3	4	3.1	~	~
Breast	0	0.7	79	82.1	~	136.3
Cervix Uteri	-	-	3	3.5	-	~
Colon & Rectum	37	32.1	27	31.4	69.6	44.6
Corpus & Uterus, NOS	-	-	13	15.7	-	20.6
Esophagus	5	4.2	1	1.3	~	~
Hodgkin Lymphoma	2	1.7	1	1.3	~	~
Kaposi Sarcoma (all sites)	0	0.2	0	0.0	~	~
Kidney & Renal Pelvis	3	9.1	5	5.5	~	~
Larynx	3	3.1	1	0.7	~	~
Leukemia	9	9.6	2	6.7	~	~
Liver & Intrahepatic Bile Duct	0	2.7	0	1.2	~	~
Lung & Bronchus	25	38.1	18	28.6	48.2	30.6
Melanoma of the Skin	10	10.2	8	8.4	18.9	~
Mesothelioma (all sites)	2	1.4	0	0.3	~	~
Myeloma	2	3.3	4	2.6	~	~
Non-Hodgkin Lymphoma	14	13.3	12	11.5	27.9	20.3
Oral Cavity & Pharynx	13	8.3	5	4.1	25.1	~
Ovary	-	-	17	7.9	-	30.1
Pancreas	1	5.3	5	5.1	~	~
Prostate	71	98.9	-	-	135.9	-
Soft Tissues incl. Heart	1	1.7	2	1.6	~	~
Stomach	3	4.7	1	2.7	~	~
Testis	1	3.2	-	-	~	-
Thyroid	4	1.9	5	5.0	~	~
Urinary Bladder	15	20.3	4	6.7	28.1	~

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-29: Hubbard County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	313	333.3	241	253.5	536.2	388.8
Brain & Other Nervous System	2	4.5	3	3.0	~	~
Breast	1	0.7	69	83.5	~	116.4
Cervix Uteri	-	-	4	3.3	-	~
Colon & Rectum	54	35.7	39	29.9	95.7	58.6
Corpus & Uterus, NOS	-	-	9	16.6	-	~
Esophagus	6	4.9	0	1.3	~	~
Hodgkin Lymphoma	2	1.6	1	1.2	~	~
Kaposi Sarcoma (all sites)	0	0.2	0	0.0	~	~
Kidney & Renal Pelvis	6	10.3	7	5.5	~	~
Larynx	3	3.7	2	0.8	~	~
Leukemia	13	10.2	2	6.4	25.2	~
Liver & Intrahepatic Bile Duct	1	3.0	0	1.1	~	~
Lung & Bronchus	44	44.5	34	29.9	69.1	52.3
Melanoma of the Skin	7	10.9	13	8.1	~	26.4
Mesothelioma (all sites)	0	1.5	0	0.3	~	~
Myeloma	5	3.7	0	2.6	~	~
Non-Hodgkin Lymphoma	13	14.4	18	11.2	23.1	26.2
Oral Cavity & Pharynx	11	9.1	4	4.0	19.0	~
Ovary	-	-	5	8.0	-	~
Pancreas	7	6.0	5	5.0	~	~
Prostate	97	117.4	-	-	157.5	-
Soft Tissues incl. Heart	5	1.8	2	1.5	~	~
Stomach	6	5.2	0	2.5	~	~
Testis	2	2.8	-	-	~	-
Thyroid	2	2.0	2	4.7	~	~
Urinary Bladder	20	22.5	9	6.5	34.4	~

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-30: Isanti County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	313	363.8	271	326.7	482.8	345.2
Brain & Other Nervous System	6	6.2	8	4.4	~	~
Breast	1	0.8	87	108.9	~	111.1
Cervix Uteri	-	-	9	5.3	-	~
Colon & Rectum	31	38.9	23	37.1	50.3	28.9
Corpus & Uterus, NOS	-	-	23	20.7	-	30.5
Esophagus	4	5.2	0	1.5	~	~
Hodgkin Lymphoma	2	2.7	1	2.1	~	~
Kaposi Sarcoma (all sites)	0	0.4	0	0.0	~	~
Kidney & Renal Pelvis	10	11.7	5	6.8	14.4	~
Larynx	2	4.0	0	0.9	~	~
Leukemia	9	12.1	4	8.4	~	~
Liver & Intrahepatic Bile Duct	6	3.4	3	1.4	~	~
Lung & Bronchus	40	45.9	25	35.0	62.9	33.4
Melanoma of the Skin	15	13.9	8	12.3	22.5	~
Mesothelioma (all sites)	3	1.6	1	0.3	~	~
Myeloma	1	4.0	0	3.1	~	~
Non-Hodgkin Lymphoma	15	16.9	14	14.2	21.7	18.3
Oral Cavity & Pharynx	5	10.9	4	5.2	~	~
Ovary	-	-	10	10.5	-	12.5
Pancreas	4	6.5	6	6.0	~	~
Prostate	105	119.0	-	-	164.7	-
Soft Tissues incl. Heart	3	2.4	3	2.1	~	~
Stomach	4	5.7	3	3.3	~	~
Testis	3	5.8	-	-	~	-
Thyroid	5	2.9	7	7.9	~	~
Urinary Bladder	21	23.9	9	8.0	33.2	~

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-31: Itasca County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	658	736.5	580	591.2	505.9	410.8
Brain & Other Nervous System	14	10.3	7	7.1	11.3	~
Breast	1	1.6	177	194.4	~	129.2
Cervix Uteri	-	-	13	7.9	-	10.6
Colon & Rectum	75	79.4	82	70.3	58.3	50.9
Corpus & Uterus, NOS	-	-	43	37.9	-	31.2
Esophagus	6	10.8	3	2.9	~	~
Hodgkin Lymphoma	3	3.9	3	3.0	~	~
Kaposi Sarcoma (all sites)	0	0.5	0	0.0	~	~
Kidney & Renal Pelvis	20	23.0	11	12.9	16.8	8.1
Larynx	7	8.1	3	1.8	~	~
Leukemia	18	23.0	13	15.0	15.3	9.6
Liver & Intrahepatic Bile Duct	7	6.7	0	2.7	~	~
Lung & Bronchus	109	97.3	78	68.5	80.1	52.9
Melanoma of the Skin	24	24.8	11	19.2	19.6	7.9
Mesothelioma (all sites)	5	3.4	0	0.6	~	~
Myeloma	6	8.2	5	6.0	~	~
Non-Hodgkin Lymphoma	26	32.4	25	26.4	21.5	17.6
Oral Cavity & Pharynx	25	20.6	8	9.4	19.7	~
Ovary	-	-	17	18.8	-	13.7
Pancreas	10	13.3	12	11.7	7.9	7.9
Prostate	205	254.5	-	-	151.9	-
Soft Tissues incl. Heart	3	4.1	0	3.5	~	~
Stomach	17	11.6	5	6.0	13.9	~
Testis	6	7.0	-	-	~	-
Thyroid	2	4.6	5	11.3	~	~
Urinary Bladder	48	50.0	18	15.1	36.1	12.1

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-32: Jackson County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	171	200.8	129	168.4	469.4	312.7
Brain & Other Nervous System	3	2.7	2	1.9	~	~
Breast	0	0.5	36	53.2	~	88.4
Cervix Uteri	-	-	5	2.0	-	~
Colon & Rectum	22	22.4	15	22.0	59.0	33.8
Corpus & Uterus, NOS	-	-	15	10.3	-	39.1
Esophagus	5	2.9	0	0.9	~	~
Hodgkin Lymphoma	0	1.0	2	0.8	~	~
Kaposi Sarcoma (all sites)	0	0.1	0	0.0	~	~
Kidney & Renal Pelvis	3	6.0	1	3.7	~	~
Larynx	0	2.1	0	0.5	~	~
Leukemia	4	6.6	2	4.5	~	~
Liver & Intrahepatic Bile Duct	2	1.8	0	0.8	~	~
Lung & Bronchus	18	26.3	10	19.5	47.7	24.5
Melanoma of the Skin	6	6.6	9	5.1	~	~
Mesothelioma (all sites)	2	1.0	0	0.2	~	~
Myeloma	3	2.3	1	1.8	~	~
Non-Hodgkin Lymphoma	5	9.0	6	7.8	~	~
Oral Cavity & Pharynx	2	5.4	2	2.7	~	~
Ovary	-	-	4	5.1	-	~
Pancreas	4	3.6	3	3.5	~	~
Prostate	64	68.0	-	-	174.6	-
Soft Tissues incl. Heart	0	1.1	1	1.0	~	~
Stomach	2	3.3	1	1.9	~	~
Testis	0	1.9	-	-	~	-
Thyroid	2	1.2	2	2.8	~	~
Urinary Bladder	17	14.4	4	4.7	41.5	~

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-33: Kanabec County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	200	221.6	170	174.6	509.2	402.6
Brain & Other Nervous System	4	3.3	2	2.2	~	~
Breast	0	0.5	54	57.8	~	130.2
Cervix Uteri	-	-	2	2.5	-	~
Colon & Rectum	25	23.6	19	20.0	63.9	42.0
Corpus & Uterus, NOS	-	-	19	11.3	-	46.4
Esophagus	2	3.2	1	0.8	~	~
Hodgkin Lymphoma	1	1.3	2	1.0	~	~
Kaposi Sarcoma (all sites)	0	0.2	0	0.0	~	~
Kidney & Renal Pelvis	12	7.0	4	3.8	28.5	~
Larynx	3	2.4	0	0.5	~	~
Leukemia	5	7.0	6	4.4	~	~
Liver & Intrahepatic Bile Duct	1	2.0	1	0.8	~	~
Lung & Bronchus	29	29.1	17	20.1	72.2	38.8
Melanoma of the Skin	4	7.7	5	6.0	~	~
Mesothelioma (all sites)	1	1.0	0	0.2	~	~
Myeloma	1	2.5	1	1.7	~	~
Non-Hodgkin Lymphoma	6	9.9	5	7.7	~	~
Oral Cavity & Pharynx	4	6.3	2	2.8	~	~
Ovary	-	-	4	5.6	-	~
Pancreas	5	4.0	3	3.3	~	~
Prostate	70	75.9	-	-	178.3	-
Soft Tissues incl. Heart	3	1.3	2	1.1	~	~
Stomach	1	3.4	2	1.7	~	~
Testis	2	2.5	-	-	~	-
Thyroid	0	1.5	4	3.7	~	~
Urinary Bladder	9	14.8	1	4.3	~	~

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-34: Kandiyohi County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	559	580.5	524	510.6	541.3	429.0
Brain & Other Nervous System	8	8.6	3	6.3	~	~
Breast	0	1.3	172	165.6	~	142.1
Cervix Uteri	-	-	7	7.0	-	~
Colon & Rectum	48	63.1	74	62.3	46.9	54.6
Corpus & Uterus, NOS	-	-	29	31.8	-	25.1
Esophagus	9	8.3	3	2.5	~	~
Hodgkin Lymphoma	1	3.5	2	2.8	~	~
Kaposi Sarcoma (all sites)	0	0.5	0	0.1	~	~
Kidney & Renal Pelvis	20	18.0	12	11.0	19.1	9.8
Larynx	3	6.2	0	1.5	~	~
Leukemia	21	19.0	12	13.4	20.4	8.1
Liver & Intrahepatic Bile Duct	3	5.3	2	2.3	~	~
Lung & Bronchus	71	75.3	53	57.4	68.4	44.0
Melanoma of the Skin	13	20.2	23	17.1	13.1	22.2
Mesothelioma (all sites)	2	2.7	2	0.5	~	~
Myeloma	10	6.5	6	5.2	9.9	~
Non-Hodgkin Lymphoma	23	26.2	20	23.0	22.1	14.9
Oral Cavity & Pharynx	15	16.3	6	8.2	14.6	~
Ovary	-	-	12	16.0	-	9.9
Pancreas	7	10.4	12	10.1	~	9.2
Prostate	211	195.2	-	-	203.3	-
Soft Tissues incl. Heart	5	3.4	7	3.2	~	~
Stomach	5	9.3	7	5.4	~	~
Testis	3	6.9	-	-	~	-
Thyroid	5	3.9	17	10.3	~	17.1
Urinary Bladder	43	39.8	8	13.3	41.4	~

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-35: Kittson County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	93	100.1	74	82.4	547.5	391.7
Brain & Other Nervous System	1	1.3	1	0.9	~	~
Breast	0	0.2	26	26.0	~	138.9
Cervix Uteri	-	-	0	0.9	-	~
Colon & Rectum	14	11.3	10	10.9	76.4	39.5
Corpus & Uterus, NOS	-	-	2	5.0	-	~
Esophagus	0	1.4	0	0.4	~	~
Hodgkin Lymphoma	1	0.5	1	0.4	~	~
Kaposi Sarcoma (all sites)	0	0.1	0	0.0	~	~
Kidney & Renal Pelvis	3	3.0	0	1.8	~	~
Larynx	0	1.0	0	0.2	~	~
Leukemia	4	3.3	3	2.3	~	~
Liver & Intrahepatic Bile Duct	1	0.9	0	0.4	~	~
Lung & Bronchus	14	13.1	9	9.6	83.9	~
Melanoma of the Skin	3	3.3	2	2.4	~	~
Mesothelioma (all sites)	0	0.5	0	0.1	~	~
Myeloma	2	1.2	0	0.9	~	~
Non-Hodgkin Lymphoma	6	4.5	3	3.8	~	~
Oral Cavity & Pharynx	3	2.7	2	1.3	~	~
Ovary	-	-	3	2.5	-	~
Pancreas	2	1.8	2	1.7	~	~
Prostate	29	34.1	-	-	171.8	-
Soft Tissues incl. Heart	0	0.5	0	0.5	~	~
Stomach	1	1.7	2	1.0	~	~
Testis	0	0.8	-	-	~	-
Thyroid	0	0.6	2	1.3	~	~
Urinary Bladder	2	7.2	2	2.3	~	~

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-36: Koochiching County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	249	240.9	196	205.5	586.6	398.4
Brain & Other Nervous System	3	3.4	2	2.4	~	~
Breast	2	0.5	61	66.8	~	127.0
Cervix Uteri	-	-	6	2.6	-	~
Colon & Rectum	29	26.0	16	25.0	66.2	31.0
Corpus & Uterus, NOS	-	-	13	13.0	-	29.1
Esophagus	3	3.5	2	1.0	~	~
Hodgkin Lymphoma	1	1.3	0	1.0	~	~
Kaposi Sarcoma (all sites)	0	0.2	0	0.0	~	~
Kidney & Renal Pelvis	8	7.5	3	4.5	~	~
Larynx	0	2.6	0	0.6	~	~
Leukemia	10	7.6	5	5.3	23.9	~
Liver & Intrahepatic Bile Duct	1	2.2	0	0.9	~	~
Lung & Bronchus	34	31.9	27	24.0	77.0	54.3
Melanoma of the Skin	7	8.1	4	6.5	~	~
Mesothelioma (all sites)	3	1.1	0	0.2	~	~
Myeloma	4	2.7	4	2.1	~	~
Non-Hodgkin Lymphoma	8	10.6	13	9.2	~	21.2
Oral Cavity & Pharynx	11	6.7	5	3.3	28.4	~
Ovary	-	-	3	6.4	-	~
Pancreas	2	4.4	2	4.1	~	~
Prostate	83	83.1	-	-	188.7	-
Soft Tissues incl. Heart	1	1.3	1	1.2	~	~
Stomach	3	3.8	4	2.2	~	~
Testis	4	2.3	-	-	~	-
Thyroid	0	1.5	1	3.7	~	~
Urinary Bladder	15	16.4	7	5.4	37.4	~

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-37: Lac Qui Parle County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	133	159.8	114	133.1	470.8	380.3
Brain & Other Nervous System	1	2.0	1	1.4	~	~
Breast	0	0.4	30	41.7	~	108.1
Cervix Uteri	-	-	0	1.5	-	~
Colon & Rectum	13	17.9	18	18.0	47.8	44.4
Corpus & Uterus, NOS	-	-	13	8.0	-	52.9
Esophagus	3	2.3	0	0.7	~	~
Hodgkin Lymphoma	0	0.7	1	0.6	~	~
Kaposi Sarcoma (all sites)	0	0.1	0	0.0	~	~
Kidney & Renal Pelvis	2	4.7	2	2.9	~	~
Larynx	2	1.7	0	0.4	~	~
Leukemia	9	5.2	3	3.7	~	~
Liver & Intrahepatic Bile Duct	0	1.4	0	0.6	~	~
Lung & Bronchus	17	21.1	10	15.4	59.2	33.1
Melanoma of the Skin	5	5.1	1	3.8	~	~
Mesothelioma (all sites)	2	0.8	0	0.1	~	~
Myeloma	2	1.8	2	1.4	~	~
Non-Hodgkin Lymphoma	5	7.1	5	6.2	~	~
Oral Cavity & Pharynx	7	4.3	4	2.2	~	~
Ovary	-	-	6	4.0	-	~
Pancreas	3	2.9	0	2.9	~	~
Prostate	50	54.7	-	-	169.9	-
Soft Tissues incl. Heart	0	0.8	0	0.8	~	~
Stomach	1	2.7	3	1.6	~	~
Testis	2	1.2	-	-	~	-
Thyroid	0	0.9	5	2.0	~	~
Urinary Bladder	5	11.6	3	3.8	~	~

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-38: Lake County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	229	215.1	167	163.3	596.7	418.1
Brain & Other Nervous System	3	2.8	3	1.9	~	~
Breast	0	0.5	56	53.0	~	140.7
Cervix Uteri	-	-	2	2.0	-	~
Colon & Rectum	29	23.1	24	19.9	75.9	51.6
Corpus & Uterus, NOS	-	-	13	10.4	-	31.2
Esophagus	2	3.2	1	0.8	~	~
Hodgkin Lymphoma	0	1.0	1	0.8	~	~
Kaposi Sarcoma (all sites)	0	0.1	0	0.0	~	~
Kidney & Renal Pelvis	3	6.6	3	3.6	~	~
Larynx	4	2.4	1	0.5	~	~
Leukemia	5	6.6	2	4.2	~	~
Liver & Intrahepatic Bile Duct	2	1.9	0	0.7	~	~
Lung & Bronchus	42	28.9	22	19.3	105.4	51.7
Melanoma of the Skin	13	7.0	5	5.1	35.7	~
Mesothelioma (all sites)	1	1.0	0	0.2	~	~
Myeloma	1	2.4	1	1.7	~	~
Non-Hodgkin Lymphoma	9	9.3	3	7.3	~	~
Oral Cavity & Pharynx	10	5.8	5	2.6	26.6	~
Ovary	-	-	3	5.1	-	~
Pancreas	0	3.9	3	3.3	~	~
Prostate	69	75.5	-	-	172.3	-
Soft Tissues incl. Heart	1	1.1	1	1.0	~	~
Stomach	4	3.4	1	1.7	~	~
Testis	1	1.8	-	-	~	-
Thyroid	1	1.2	3	2.9	~	~
Urinary Bladder	17	14.7	3	4.3	47.1	~

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-39: Lake of the Woods County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	66	79.0	57	61.6	464.8	392.0
Brain & Other Nervous System	1	1.1	1	0.7	~	~
Breast	0	0.2	21	20.2	~	147.0
Cervix Uteri	-	-	0	0.8	-	~
Colon & Rectum	8	8.7	4	7.4	~	~
Corpus & Uterus, NOS	-	-	5	3.9	-	~
Esophagus	1	1.1	0	0.3	~	~
Hodgkin Lymphoma	0	0.4	1	0.3	~	~
Kaposi Sarcoma (all sites)	0	0.1	0	0.0	~	~
Kidney & Renal Pelvis	1	2.4	2	1.3	~	~
Larynx	1	0.9	0	0.2	~	~
Leukemia	1	2.5	1	1.6	~	~
Liver & Intrahepatic Bile Duct	0	0.7	0	0.3	~	~
Lung & Bronchus	12	10.3	6	7.2	81.4	~
Melanoma of the Skin	0	2.7	1	2.0	~	~
Mesothelioma (all sites)	1	0.4	0	0.1	~	~
Myeloma	2	0.9	1	0.6	~	~
Non-Hodgkin Lymphoma	0	3.5	3	2.8	~	~
Oral Cavity & Pharynx	1	2.2	2	1.0	~	~
Ovary	-	-	2	1.9	-	~
Pancreas	0	1.4	2	1.2	~	~
Prostate	27	27.0	-	-	195.4	-
Soft Tissues incl. Heart	0	0.4	1	0.4	~	~
Stomach	0	1.3	0	0.6	~	~
Testis	0	0.7	-	-	~	-
Thyroid	0	0.5	0	1.1	~	~
Urinary Bladder	5	5.5	3	1.6	~	~

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-40: Le Sueur County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	360	356.2	265	306.2	568.0	363.4
Brain & Other Nervous System	5	5.4	5	3.8	~	~
Breast	0	0.8	90	100.0	~	128.2
Cervix Uteri	-	-	2	4.3	-	~
Colon & Rectum	36	38.4	35	36.7	56.9	43.1
Corpus & Uterus, NOS	-	-	22	19.3	-	28.9
Esophagus	4	5.1	0	1.5	~	~
Hodgkin Lymphoma	3	2.2	2	1.7	~	~
Kaposi Sarcoma (all sites)	0	0.3	0	0.0	~	~
Kidney & Renal Pelvis	5	11.2	9	6.6	~	~
Larynx	5	3.9	1	0.9	~	~
Leukemia	14	11.5	5	8.0	22.0	~
Liver & Intrahepatic Bile Duct	5	3.3	1	1.4	~	~
Lung & Bronchus	56	46.1	31	34.3	87.9	43.5
Melanoma of the Skin	12	12.7	4	10.4	19.4	~
Mesothelioma (all sites)	1	1.6	0	0.3	~	~
Myeloma	3	4.0	3	3.1	~	~
Non-Hodgkin Lymphoma	25	16.1	8	13.7	38.3	~
Oral Cavity & Pharynx	12	10.2	3	4.9	18.1	~
Ovary	-	-	6	9.6	-	~
Pancreas	3	6.4	3	6.0	~	~
Prostate	107	119.8	-	-	168.6	-
Soft Tissues incl. Heart	1	2.1	1	1.9	~	~
Stomach	7	5.6	4	3.2	~	~
Testis	8	4.4	-	-	~	-
Thyroid	4	2.5	5	6.3	~	~
Urinary Bladder	20	24.0	5	7.8	32.5	~

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-41: Lincoln County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	115	133.1	94	110.4	492.9	374.7
Brain & Other Nervous System	0	1.6	1	1.2	~	~
Breast	0	0.3	36	34.1	~	137.4
Cervix Uteri	-	-	1	1.2	-	~
Colon & Rectum	14	14.9	13	15.1	62.7	42.2
Corpus & Uterus, NOS	-	-	5	6.7	-	~
Esophagus	2	1.9	0	0.6	~	~
Hodgkin Lymphoma	0	0.6	2	0.5	~	~
Kaposi Sarcoma (all sites)	0	0.1	0	0.0	~	~
Kidney & Renal Pelvis	6	3.9	2	2.4	~	~
Larynx	1	1.4	0	0.3	~	~
Leukemia	3	4.3	4	3.1	~	~
Liver & Intrahepatic Bile Duct	1	1.1	1	0.5	~	~
Lung & Bronchus	15	17.7	8	12.9	66.0	~
Melanoma of the Skin	0	4.2	0	3.1	~	~
Mesothelioma (all sites)	0	0.6	0	0.1	~	~
Myeloma	2	1.5	1	1.2	~	~
Non-Hodgkin Lymphoma	4	5.9	4	5.2	~	~
Oral Cavity & Pharynx	4	3.5	1	1.8	~	~
Ovary	-	-	1	3.3	-	~
Pancreas	2	2.4	3	2.4	~	~
Prostate	44	45.9	-	-	173.2	-
Soft Tissues incl. Heart	3	0.7	1	0.6	~	~
Stomach	3	2.2	2	1.3	~	~
Testis	1	1.0	-	-	~	-
Thyroid	0	0.7	2	1.6	~	~
Urinary Bladder	5	9.7	0	3.2	~	~

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-42: Lyon County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	330	330.4	282	304.8	562.6	387.3
Brain & Other Nervous System	5	5.0	5	3.7	~	~
Breast	0	0.8	81	96.7	~	109.8
Cervix Uteri	-	-	11	4.1	-	18.0
Colon & Rectum	45	36.2	45	38.6	76.5	57.6
Corpus & Uterus, NOS	-	-	19	18.4	-	29.6
Esophagus	6	4.7	0	1.5	~	~
Hodgkin Lymphoma	0	2.1	1	1.8	~	~
Kaposi Sarcoma (all sites)	0	0.3	0	0.0	~	~
Kidney & Renal Pelvis	15	10.2	4	6.5	26.3	~
Larynx	2	3.5	1	0.8	~	~
Leukemia	16	11.1	6	8.3	25.4	~
Liver & Intrahepatic Bile Duct	0	3.0	0	1.4	~	~
Lung & Bronchus	43	42.4	25	33.8	74.3	38.2
Melanoma of the Skin	13	11.6	7	10.3	22.0	~
Mesothelioma (all sites)	0	1.5	0	0.3	~	~
Myeloma	6	3.7	2	3.1	~	~
Non-Hodgkin Lymphoma	14	15.1	19	14.0	23.5	22.9
Oral Cavity & Pharynx	6	9.2	5	4.9	~	~
Ovary	-	-	10	9.4	-	15.2
Pancreas	6	5.9	5	6.1	~	~
Prostate	95	109.6	-	-	163.7	-
Soft Tissues incl. Heart	4	2.0	0	2.0	~	~
Stomach	1	5.4	6	3.4	~	~
Testis	5	4.4	-	-	~	-
Thyroid	5	2.3	7	6.2	~	~
Urinary Bladder	24	22.9	5	8.2	41.5	~

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-43: McLeod County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	433	452.2	387	419.0	537.9	378.0
Brain & Other Nervous System	9	7.1	6	5.3	~	~
Breast	2	1.0	108	135.3	~	109.2
Cervix Uteri	-	-	10	6.0	-	10.9
Colon & Rectum	59	48.8	66	51.0	73.2	58.7
Corpus & Uterus, NOS	-	-	23	26.0	-	24.3
Esophagus	2	6.5	2	2.1	~	~
Hodgkin Lymphoma	3	3.0	2	2.4	~	~
Kaposi Sarcoma (all sites)	0	0.4	0	0.0	~	~
Kidney & Renal Pelvis	12	14.2	9	9.0	14.8	~
Larynx	6	4.8	0	1.2	~	~
Leukemia	14	15.0	8	11.1	17.7	~
Liver & Intrahepatic Bile Duct	2	4.1	1	1.9	~	~
Lung & Bronchus	43	58.0	33	47.0	53.8	33.3
Melanoma of the Skin	21	16.2	14	14.3	25.3	15.6
Mesothelioma (all sites)	1	2.1	0	0.4	~	~
Myeloma	4	5.0	3	4.3	~	~
Non-Hodgkin Lymphoma	24	20.7	21	18.9	29.5	19.6
Oral Cavity & Pharynx	12	12.9	5	6.7	15.0	~
Ovary	-	-	19	13.1	-	18.8
Pancreas	5	8.1	9	8.3	~	~
Prostate	140	150.4	-	-	175.4	-
Soft Tissues incl. Heart	6	2.8	1	2.6	~	~
Stomach	9	7.2	4	4.5	~	~
Testis	5	6.3	-	-	~	-
Thyroid	1	3.3	10	8.7	~	11.5
Urinary Bladder	33	30.6	10	10.9	41.0	8.8

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-44: Mahnommen County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	109	83.2	81	67.6	746.2	525.1
Brain & Other Nervous System	1	1.2	2	0.8	~	~
Breast	0	0.2	25	21.8	~	165.0
Cervix Uteri	-	-	3	0.9	-	~
Colon & Rectum	7	9.1	11	8.4	~	59.8
Corpus & Uterus, NOS	-	-	3	4.3	-	~
Esophagus	1	1.2	1	0.3	~	~
Hodgkin Lymphoma	0	0.4	0	0.3	~	~
Kaposi Sarcoma (all sites)	0	0.1	0	0.0	~	~
Kidney & Renal Pelvis	3	2.5	0	1.5	~	~
Larynx	2	0.9	0	0.2	~	~
Leukemia	4	2.7	5	1.8	~	~
Liver & Intrahepatic Bile Duct	4	0.7	0	0.3	~	~
Lung & Bronchus	12	10.9	11	7.7	80.2	70.8
Melanoma of the Skin	1	2.8	1	2.1	~	~
Mesothelioma (all sites)	2	0.4	0	0.1	~	~
Myeloma	1	0.9	0	0.7	~	~
Non-Hodgkin Lymphoma	4	3.7	8	3.1	~	~
Oral Cavity & Pharynx	9	2.3	0	1.1	~	~
Ovary	-	-	3	2.1	-	~
Pancreas	2	1.5	1	1.4	~	~
Prostate	39	28.6	-	-	254.4	-
Soft Tissues incl. Heart	0	0.5	0	0.4	~	~
Stomach	3	1.3	0	0.7	~	~
Testis	2	0.8	-	-	~	-
Thyroid	2	0.5	0	1.2	~	~
Urinary Bladder	8	5.7	4	1.8	~	~

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-45: Marshall County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	173	178.9	122	142.8	543.8	355.4
Brain & Other Nervous System	2	2.4	4	1.7	~	~
Breast	0	0.4	45	46.0	~	134.4
Cervix Uteri	-	-	3	1.8	-	~
Colon & Rectum	20	19.5	13	17.7	63.6	31.5
Corpus & Uterus, NOS	-	-	4	9.0	-	~
Esophagus	6	2.6	0	0.7	~	~
Hodgkin Lymphoma	1	0.9	0	0.7	~	~
Kaposi Sarcoma (all sites)	0	0.1	0	0.0	~	~
Kidney & Renal Pelvis	1	5.5	0	3.1	~	~
Larynx	3	1.9	0	0.4	~	~
Leukemia	10	5.7	3	3.7	30.8	~
Liver & Intrahepatic Bile Duct	1	1.6	0	0.7	~	~
Lung & Bronchus	19	23.7	14	16.8	58.2	39.6
Melanoma of the Skin	2	5.9	2	4.4	~	~
Mesothelioma (all sites)	0	0.8	0	0.2	~	~
Myeloma	2	2.0	1	1.5	~	~
Non-Hodgkin Lymphoma	6	8.0	4	6.5	~	~
Oral Cavity & Pharynx	5	4.9	0	2.3	~	~
Ovary	-	-	6	4.4	-	~
Pancreas	4	3.2	2	2.9	~	~
Prostate	60	61.3	-	-	183.9	-
Soft Tissues incl. Heart	0	1.0	1	0.8	~	~
Stomach	8	2.9	4	1.5	~	~
Testis	3	1.7	-	-	~	-
Thyroid	0	1.1	4	2.5	~	~
Urinary Bladder	10	12.5	2	3.8	30.6	~

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-46: Martin County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	379	364.9	323	338.8	583.0	388.7
Brain & Other Nervous System	3	5.0	5	3.8	~	~
Breast	1	0.9	95	107.1	~	121.5
Cervix Uteri	-	-	3	4.0	-	~
Colon & Rectum	35	40.1	51	44.4	53.0	54.3
Corpus & Uterus, NOS	-	-	20	20.6	-	26.4
Esophagus	5	5.3	0	1.8	~	~
Hodgkin Lymphoma	2	1.9	2	1.5	~	~
Kaposi Sarcoma (all sites)	0	0.3	0	0.0	~	~
Kidney & Renal Pelvis	12	11.2	6	7.4	18.8	~
Larynx	3	3.9	0	0.9	~	~
Leukemia	14	11.8	12	9.1	22.8	13.9
Liver & Intrahepatic Bile Duct	3	3.3	2	1.6	~	~
Lung & Bronchus	54	47.9	29	39.0	81.5	33.0
Melanoma of the Skin	20	12.2	15	10.2	31.5	19.5
Mesothelioma (all sites)	2	1.7	0	0.4	~	~
Myeloma	1	4.1	0	3.6	~	~
Non-Hodgkin Lymphoma	7	16.3	10	15.7	~	11.3
Oral Cavity & Pharynx	12	10.0	5	5.5	18.7	~
Ovary	-	-	15	10.3	-	19.0
Pancreas	7	6.6	3	7.1	~	~
Prostate	132	124.4	-	-	200.5	-
Soft Tissues incl. Heart	3	2.0	2	2.0	~	~
Stomach	4	5.9	6	3.9	~	~
Testis	4	3.4	-	-	~	-
Thyroid	1	2.2	6	5.6	~	~
Urinary Bladder	30	25.6	10	9.4	45.1	9.6

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-47: Meeker County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	311	341.8	231	293.5	511.0	328.4
Brain & Other Nervous System	5	5.0	4	3.5	~	~
Breast	0	0.8	66	94.4	~	95.8
Cervix Uteri	-	-	2	3.9	-	~
Colon & Rectum	35	37.1	32	36.8	58.0	37.8
Corpus & Uterus, NOS	-	-	10	18.2	-	14.7
Esophagus	3	4.9	1	1.5	~	~
Hodgkin Lymphoma	0	2.0	1	1.5	~	~
Kaposi Sarcoma (all sites)	0	0.3	0	0.0	~	~
Kidney & Renal Pelvis	10	10.6	5	6.3	16.2	~
Larynx	2	3.7	0	0.8	~	~
Leukemia	13	11.1	7	7.8	22.6	~
Liver & Intrahepatic Bile Duct	1	3.1	2	1.3	~	~
Lung & Bronchus	49	44.5	27	33.0	78.8	37.2
Melanoma of the Skin	6	11.8	11	9.5	~	18.0
Mesothelioma (all sites)	0	1.6	1	0.3	~	~
Myeloma	2	3.8	6	3.0	~	~
Non-Hodgkin Lymphoma	10	15.3	10	13.3	16.3	12.9
Oral Cavity & Pharynx	7	9.6	1	4.7	~	~
Ovary	-	-	9	9.1	-	~
Pancreas	5	6.1	10	5.9	~	13.5
Prostate	104	115.8	-	-	168.7	-
Soft Tissues incl. Heart	5	2.0	0	1.8	~	~
Stomach	8	5.5	3	3.2	~	~
Testis	4	3.8	-	-	~	-
Thyroid	3	2.2	9	5.6	~	~
Urinary Bladder	24	23.4	3	7.8	39.1	~

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-48: Mille Lacs County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	451	337.8	307	291.7	749.9	437.1
Brain & Other Nervous System	4	4.9	4	3.5	~	~
Breast	1	0.8	102	94.1	~	152.8
Cervix Uteri	-	-	3	3.9	-	~
Colon & Rectum	48	36.5	36	35.9	78.8	48.2
Corpus & Uterus, NOS	-	-	29	18.2	-	42.1
Esophagus	8	4.9	3	1.5	~	~
Hodgkin Lymphoma	3	2.0	1	1.5	~	~
Kaposi Sarcoma (all sites)	1	0.3	0	0.0	~	~
Kidney & Renal Pelvis	13	10.4	6	6.3	21.5	~
Larynx	4	3.6	1	0.9	~	~
Leukemia	9	10.9	6	7.7	~	~
Liver & Intrahepatic Bile Duct	1	3.0	0	1.3	~	~
Lung & Bronchus	50	44.2	35	33.3	82.0	49.7
Melanoma of the Skin	11	11.5	12	9.5	19.2	18.5
Mesothelioma (all sites)	2	1.6	3	0.3	~	~
Myeloma	2	3.8	2	3.0	~	~
Non-Hodgkin Lymphoma	16	15.1	10	13.1	27.4	15.2
Oral Cavity & Pharynx	13	9.3	4	4.7	22.9	~
Ovary	-	-	7	9.1	-	~
Pancreas	9	6.1	5	5.8	~	~
Prostate	182	115.2	-	-	297.3	-
Soft Tissues incl. Heart	2	1.9	1	1.8	~	~
Stomach	8	5.4	2	3.1	~	~
Testis	5	3.8	-	-	~	-
Thyroid	0	2.2	6	5.6	~	~
Urinary Bladder	42	23.1	10	7.7	68.5	10.8

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-49: Morrison County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	530	462.1	377	393.8	642.0	398.5
Brain & Other Nervous System	12	6.8	4	4.8	15.2	~
Breast	1	1.0	104	126.8	~	109.8
Cervix Uteri	-	-	7	5.3	-	~
Colon & Rectum	63	49.8	48	48.4	77.6	42.1
Corpus & Uterus, NOS	-	-	27	24.5	-	31.8
Esophagus	6	6.7	3	2.0	~	~
Hodgkin Lymphoma	2	2.8	1	2.1	~	~
Kaposi Sarcoma (all sites)	0	0.4	0	0.0	~	~
Kidney & Renal Pelvis	20	14.3	8	8.6	24.9	~
Larynx	4	5.0	2	1.1	~	~
Leukemia	16	15.0	13	10.4	20.0	12.9
Liver & Intrahepatic Bile Duct	0	4.2	2	1.8	~	~
Lung & Bronchus	62	60.4	38	45.0	73.0	38.3
Melanoma of the Skin	12	15.9	16	13.0	14.9	19.8
Mesothelioma (all sites)	3	2.1	0	0.4	~	~
Myeloma	7	5.2	2	4.0	~	~
Non-Hodgkin Lymphoma	21	20.7	19	17.8	25.4	20.5
Oral Cavity & Pharynx	16	12.8	3	6.3	19.5	~
Ovary	-	-	18	12.3	-	19.8
Pancreas	6	8.3	9	7.9	~	~
Prostate	201	156.7	-	-	238.5	-
Soft Tissues incl. Heart	4	2.7	3	2.4	~	~
Stomach	9	7.3	9	4.2	~	~
Testis	5	5.4	-	-	~	-
Thyroid	3	3.1	11	7.7	~	15.3
Urinary Bladder	34	31.5	4	10.3	41.5	~

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-50: Mower County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	681	631.6	588	571.2	606.3	438.3
Brain & Other Nervous System	9	8.6	2	6.5	~	~
Breast	1	1.5	171	179.2	~	133.0
Cervix Uteri	-	-	10	6.8	-	9.9
Colon & Rectum	69	69.3	80	74.5	62.4	52.5
Corpus & Uterus, NOS	-	-	37	34.8	-	28.3
Esophagus	6	9.1	3	3.0	~	~
Hodgkin Lymphoma	2	3.4	4	2.7	~	~
Kaposi Sarcoma (all sites)	1	0.5	0	0.1	~	~
Kidney & Renal Pelvis	21	19.2	17	12.5	19.1	12.2
Larynx	5	6.6	1	1.6	~	~
Leukemia	17	20.6	16	15.4	15.7	10.1
Liver & Intrahepatic Bile Duct	4	5.6	0	2.7	~	~
Lung & Bronchus	108	83.1	79	66.5	95.3	56.8
Melanoma of the Skin	19	20.9	29	17.4	17.6	26.0
Mesothelioma (all sites)	2	3.0	1	0.6	~	~
Myeloma	8	7.1	3	6.1	~	~
Non-Hodgkin Lymphoma	28	28.2	32	26.5	25.4	23.8
Oral Cavity & Pharynx	19	17.1	7	9.3	17.9	~
Ovary	-	-	10	17.4	-	8.3
Pancreas	13	11.4	10	12.0	11.6	6.2
Prostate	248	215.0	-	-	215.9	-
Soft Tissues incl. Heart	0	3.5	2	3.4	~	~
Stomach	12	10.3	2	6.5	11.4	~
Testis	5	6.3	-	-	~	-
Thyroid	1	3.9	13	9.7	~	13.4
Urinary Bladder	54	44.4	13	15.8	46.6	7.5

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-51: Murray County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	154	172.8	121	142.9	503.0	339.3
Brain & Other Nervous System	3	2.3	4	1.6	~	~
Breast	0	0.4	39	45.4	~	121.7
Cervix Uteri	-	-	1	1.7	-	~
Colon & Rectum	30	19.0	18	18.4	108.3	40.4
Corpus & Uterus, NOS	-	-	10	8.9	-	31.9
Esophagus	3	2.5	0	0.8	~	~
Hodgkin Lymphoma	1	0.8	0	0.6	~	~
Kaposi Sarcoma (all sites)	0	0.1	0	0.0	~	~
Kidney & Renal Pelvis	3	5.2	6	3.1	~	~
Larynx	2	1.8	0	0.4	~	~
Leukemia	7	5.5	4	3.8	~	~
Liver & Intrahepatic Bile Duct	0	1.5	0	0.7	~	~
Lung & Bronchus	25	22.9	6	16.8	78.6	~
Melanoma of the Skin	4	5.6	5	4.2	~	~
Mesothelioma (all sites)	0	0.8	1	0.2	~	~
Myeloma	1	2.0	0	1.5	~	~
Non-Hodgkin Lymphoma	1	7.6	5	6.6	~	~
Oral Cavity & Pharynx	5	4.7	1	2.3	~	~
Ovary	-	-	3	4.4	-	~
Pancreas	2	3.1	3	3.0	~	~
Prostate	48	59.7	-	-	147.6	-
Soft Tissues incl. Heart	1	0.9	0	0.8	~	~
Stomach	1	2.8	1	1.6	~	~
Testis	0	1.4	-	-	~	-
Thyroid	0	1.0	3	2.3	~	~
Urinary Bladder	12	12.2	4	3.9	38.1	~

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-52: Nicollet County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	324	331.4	298	299.7	548.9	415.0
Brain & Other Nervous System	5	5.6	5	4.0	~	~
Breast	0	0.7	98	98.9	~	137.4
Cervix Uteri	-	-	6	4.7	-	~
Colon & Rectum	31	35.2	37	33.9	56.6	49.8
Corpus & Uterus, NOS	-	-	22	18.8	-	31.5
Esophagus	4	4.7	2	1.4	~	~
Hodgkin Lymphoma	2	2.6	4	2.1	~	~
Kaposi Sarcoma (all sites)	0	0.3	0	0.0	~	~
Kidney & Renal Pelvis	15	10.7	8	6.3	20.9	~
Larynx	4	3.6	0	0.9	~	~
Leukemia	11	11.0	9	7.7	18.9	~
Liver & Intrahepatic Bile Duct	3	3.1	2	1.3	~	~
Lung & Bronchus	45	42.0	27	32.6	75.5	38.0
Melanoma of the Skin	15	12.5	13	11.3	23.0	18.5
Mesothelioma (all sites)	1	1.5	0	0.3	~	~
Myeloma	1	3.7	3	2.9	~	~
Non-Hodgkin Lymphoma	19	15.3	9	13.2	31.5	~
Oral Cavity & Pharynx	13	9.8	7	4.8	20.9	~
Ovary	-	-	8	9.7	-	~
Pancreas	2	5.9	2	5.6	~	~
Prostate	88	108.8	-	-	153.3	-
Soft Tissues incl. Heart	1	2.2	1	2.0	~	~
Stomach	5	5.1	4	3.0	~	~
Testis	9	5.5	-	-	~	-
Thyroid	4	2.7	5	7.3	~	~
Urinary Bladder	32	21.6	7	7.3	59.2	~

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-53: Nobles County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	309	315.6	262	283.7	548.7	377.8
Brain & Other Nervous System	4	4.5	3	3.3	~	~
Breast	0	0.7	85	90.0	~	121.8
Cervix Uteri	-	-	1	3.5	-	~
Colon & Rectum	44	34.4	44	36.4	77.8	56.5
Corpus & Uterus, NOS	-	-	25	17.4	-	39.6
Esophagus	1	4.5	1	1.5	~	~
Hodgkin Lymphoma	0	1.8	2	1.4	~	~
Kaposi Sarcoma (all sites)	0	0.2	0	0.0	~	~
Kidney & Renal Pelvis	12	9.7	9	6.1	22.0	~
Larynx	6	3.3	0	0.8	~	~
Leukemia	13	10.3	3	7.7	22.6	~
Liver & Intrahepatic Bile Duct	2	2.8	1	1.3	~	~
Lung & Bronchus	34	41.2	16	32.3	59.9	24.6
Melanoma of the Skin	10	10.7	16	8.9	17.8	28.0
Mesothelioma (all sites)	0	1.5	0	0.3	~	~
Myeloma	2	3.5	3	3.0	~	~
Non-Hodgkin Lymphoma	15	14.2	10	13.0	27.3	11.8
Oral Cavity & Pharynx	8	8.7	5	4.6	~	~
Ovary	-	-	8	8.7	-	~
Pancreas	5	5.7	2	5.9	~	~
Prostate	105	106.9	-	-	184.4	-
Soft Tissues incl. Heart	2	1.8	2	1.7	~	~
Stomach	6	5.1	0	3.2	~	~
Testis	3	3.5	-	-	~	-
Thyroid	4	2.0	5	5.1	~	~
Urinary Bladder	14	21.9	7	7.8	24.7	~

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-54: Norman County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	143	137.1	124	113.3	582.4	445.3
Brain & Other Nervous System	1	1.8	3	1.3	~	~
Breast	0	0.3	34	35.8	~	140.0
Cervix Uteri	-	-	3	1.3	-	~
Colon & Rectum	16	15.1	18	14.8	67.1	49.1
Corpus & Uterus, NOS	-	-	9	7.0	-	~
Esophagus	3	2.0	1	0.6	~	~
Hodgkin Lymphoma	0	0.7	1	0.5	~	~
Kaposi Sarcoma (all sites)	0	0.1	0	0.0	~	~
Kidney & Renal Pelvis	3	4.1	3	2.5	~	~
Larynx	1	1.4	0	0.3	~	~
Leukemia	7	4.4	7	3.0	~	~
Liver & Intrahepatic Bile Duct	1	1.2	2	0.5	~	~
Lung & Bronchus	19	18.2	11	13.2	75.8	38.6
Melanoma of the Skin	2	4.4	1	3.4	~	~
Mesothelioma (all sites)	0	0.7	0	0.1	~	~
Myeloma	1	1.6	3	1.2	~	~
Non-Hodgkin Lymphoma	5	6.0	5	5.2	~	~
Oral Cavity & Pharynx	3	3.7	1	1.8	~	~
Ovary	-	-	2	3.4	-	~
Pancreas	5	2.5	3	2.4	~	~
Prostate	59	47.3	-	-	231.9	-
Soft Tissues incl. Heart	0	0.7	1	0.7	~	~
Stomach	1	2.2	0	1.3	~	~
Testis	1	1.1	-	-	~	-
Thyroid	2	0.8	1	1.9	~	~
Urinary Bladder	7	9.7	4	3.1	~	~

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-55: Olmsted County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	1509	1385.9	1320	1318.5	600.5	415.8
Brain & Other Nervous System	35	23.7	14	17.5	12.2	4.3
Breast	1	3.1	440	438.8	~	141.4
Cervix Uteri	-	-	16	21.7	-	4.8
Colon & Rectum	117	146.4	137	149.4	48.5	40.7
Corpus & Uterus, NOS	-	-	71	83.0	-	23.0
Esophagus	28	19.8	8	6.1	10.8	~
Hodgkin Lymphoma	13	10.5	6	8.6	4.1	~
Kaposi Sarcoma (all sites)	2	1.4	0	0.1	~	~
Kidney & Renal Pelvis	66	45.0	32	27.7	25.7	10.6
Larynx	15	15.1	4	3.8	5.6	~
Leukemia	54	45.9	40	33.8	21.8	12.3
Liver & Intrahepatic Bile Duct	32	13.0	3	5.8	11.5	~
Lung & Bronchus	185	175.7	131	141.6	77.7	43.2
Melanoma of the Skin	65	52.6	62	50.2	24.0	19.2
Mesothelioma (all sites)	5	6.1	1	1.3	~	~
Myeloma	20	15.2	11	12.7	8.0	3.3
Non-Hodgkin Lymphoma	86	64.0	62	57.4	33.9	19.0
Oral Cavity & Pharynx	40	41.0	25	21.0	15.0	8.0
Ovary	-	-	42	42.2	-	13.2
Pancreas	34	24.7	29	24.4	14.7	9.3
Prostate	479	455.2	-	-	193.0	-
Soft Tissues incl. Heart	10	9.2	12	8.7	3.1	3.7
Stomach	14	21.4	9	13.2	6.0	~
Testis	23	23.3	-	-	7.0	-
Thyroid	23	11.5	55	32.3	7.6	16.6
Urinary Bladder	96	89.9	34	32.1	41.2	10.5

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-56: Otter Tail County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	1059	1005.8	696	826.2	586.2	350.3
Brain & Other Nervous System	17	13.5	10	9.5	10.1	5.8
Breast	2	2.3	209	266.1	~	109.1
Cervix Uteri	-	-	11	10.2	-	7.1
Colon & Rectum	119	110.1	98	103.4	65.2	43.7
Corpus & Uterus, NOS	-	-	54	52.0	-	28.6
Esophagus	12	14.6	4	4.3	6.6	~
Hodgkin Lymphoma	6	5.1	4	3.9	~	~
Kaposi Sarcoma (all sites)	0	0.7	0	0.1	~	~
Kidney & Renal Pelvis	30	30.5	12	17.9	16.8	6.8
Larynx	5	10.8	6	2.4	~	~
Leukemia	32	32.0	13	21.7	18.8	6.7
Liver & Intrahepatic Bile Duct	10	8.9	6	3.8	5.5	~
Lung & Bronchus	117	132.6	64	95.9	64.7	31.1
Melanoma of the Skin	26	33.2	27	25.5	15.1	17.0
Mesothelioma (all sites)	5	4.7	0	0.9	~	~
Myeloma	8	11.3	9	8.6	~	~
Non-Hodgkin Lymphoma	38	44.3	28	37.4	22.3	13.5
Oral Cavity & Pharynx	25	27.5	11	13.3	13.7	4.7
Ovary	-	-	23	25.6	-	11.5
Pancreas	15	18.1	20	16.9	8.1	10.0
Prostate	443	347.1	-	-	239.9	-
Soft Tissues incl. Heart	4	5.5	1	4.9	~	~
Stomach	17	16.2	3	9.0	9.3	~
Testis	6	9.0	-	-	~	-
Thyroid	6	6.0	6	14.4	~	~
Urinary Bladder	70	70.0	27	22.2	38.1	12.3

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-57: Pennington County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	164	193.1	186	179.4	474.0	442.3
Brain & Other Nervous System	6	2.8	4	2.1	~	~
Breast	0	0.5	59	57.6	~	143.5
Cervix Uteri	-	-	2	2.4	-	~
Colon & Rectum	22	21.1	29	22.5	61.2	61.7
Corpus & Uterus, NOS	-	-	18	11.1	-	42.6
Esophagus	2	2.8	0	0.9	~	~
Hodgkin Lymphoma	0	1.2	2	1.0	~	~
Kaposi Sarcoma (all sites)	0	0.2	0	0.0	~	~
Kidney & Renal Pelvis	4	6.0	7	3.8	~	~
Larynx	2	2.0	0	0.5	~	~
Leukemia	7	6.4	7	4.8	~	~
Liver & Intrahepatic Bile Duct	1	1.7	1	0.8	~	~
Lung & Bronchus	18	24.9	13	20.2	53.4	31.7
Melanoma of the Skin	6	6.7	4	5.8	~	~
Mesothelioma (all sites)	0	0.9	0	0.2	~	~
Myeloma	5	2.2	0	1.9	~	~
Non-Hodgkin Lymphoma	7	8.8	4	8.2	~	~
Oral Cavity & Pharynx	6	5.4	4	2.9	~	~
Ovary	-	-	6	5.6	-	~
Pancreas	5	3.5	6	3.6	~	~
Prostate	44	64.6	-	-	127.9	-
Soft Tissues incl. Heart	0	1.1	1	1.1	~	~
Stomach	1	3.1	1	2.0	~	~
Testis	1	2.4	-	-	~	-
Thyroid	1	1.3	5	3.4	~	~
Urinary Bladder	14	13.3	3	4.8	40.0	~

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-58: Pine County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	425	408.0	298	321.2	588.2	381.1
Brain & Other Nervous System	8	6.1	3	4.0	~	~
Breast	2	0.9	78	105.5	~	99.9
Cervix Uteri	-	-	0	4.4	-	~
Colon & Rectum	39	43.3	43	37.8	56.4	54.4
Corpus & Uterus, NOS	-	-	21	20.7	-	26.8
Esophagus	6	5.9	1	1.6	~	~
Hodgkin Lymphoma	4	2.5	0	1.7	~	~
Kaposi Sarcoma (all sites)	0	0.3	0	0.0	~	~
Kidney & Renal Pelvis	13	12.8	9	7.0	18.1	~
Larynx	6	4.5	1	1.0	~	~
Leukemia	15	12.8	9	8.2	21.0	~
Liver & Intrahepatic Bile Duct	3	3.7	4	1.4	~	~
Lung & Bronchus	75	53.6	50	37.1	98.5	62.7
Melanoma of the Skin	13	14.2	9	10.7	17.6	~
Mesothelioma (all sites)	4	1.9	0	0.3	~	~
Myeloma	6	4.5	2	3.2	~	~
Non-Hodgkin Lymphoma	19	18.0	9	14.2	27.1	~
Oral Cavity & Pharynx	6	11.4	4	5.1	~	~
Ovary	-	-	10	10.2	-	13.3
Pancreas	5	7.3	7	6.3	~	~
Prostate	136	140.3	-	-	190.7	-
Soft Tissues incl. Heart	0	2.4	2	2.0	~	~
Stomach	9	6.3	1	3.2	~	~
Testis	5	4.9	-	-	~	-
Thyroid	1	2.8	3	6.4	~	~
Urinary Bladder	28	27.1	11	8.2	40.6	13.5

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-59: Pipestone County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	162	169.8	149	156.9	528.4	396.8
Brain & Other Nervous System	4	2.2	4	1.7	~	~
Breast	0	0.4	47	49.0	~	131.0
Cervix Uteri	-	-	2	1.8	-	~
Colon & Rectum	17	18.9	30	20.9	53.7	67.9
Corpus & Uterus, NOS	-	-	8	9.5	-	~
Esophagus	1	2.4	0	0.9	~	~
Hodgkin Lymphoma	0	0.8	2	0.7	~	~
Kaposi Sarcoma (all sites)	0	0.1	0	0.0	~	~
Kidney & Renal Pelvis	9	5.1	3	3.4	~	~
Larynx	2	1.8	0	0.4	~	~
Leukemia	7	5.6	3	4.3	~	~
Liver & Intrahepatic Bile Duct	1	1.5	1	0.7	~	~
Lung & Bronchus	16	22.3	8	18.1	50.6	~
Melanoma of the Skin	1	5.5	3	4.6	~	~
Mesothelioma (all sites)	3	0.8	0	0.2	~	~
Myeloma	1	1.9	1	1.7	~	~
Non-Hodgkin Lymphoma	6	7.6	9	7.3	~	~
Oral Cavity & Pharynx	3	4.5	1	2.5	~	~
Ovary	-	-	3	4.7	-	~
Pancreas	4	3.1	5	3.4	~	~
Prostate	65	57.9	-	-	205.1	-
Soft Tissues incl. Heart	0	0.9	0	0.9	~	~
Stomach	2	2.8	3	1.8	~	~
Testis	2	1.5	-	-	~	-
Thyroid	0	1.0	4	2.5	~	~
Urinary Bladder	10	12.2	4	4.4	29.6	~

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-60: Polk County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	505	479.5	415	427.2	592.3	417.1
Brain & Other Nervous System	5	6.8	5	5.0	~	~
Breast	1	1.1	130	135.8	~	128.9
Cervix Uteri	-	-	10	5.4	-	13.8
Colon & Rectum	92	52.7	55	54.9	106.9	48.4
Corpus & Uterus, NOS	-	-	35	26.1	-	37.6
Esophagus	17	6.9	2	2.2	20.4	~
Hodgkin Lymphoma	3	2.7	2	2.2	~	~
Kaposi Sarcoma (all sites)	1	0.4	0	0.0	~	~
Kidney & Renal Pelvis	14	14.6	15	9.2	16.8	16.2
Larynx	2	5.1	1	1.2	~	~
Leukemia	14	15.7	13	11.5	16.5	12.5
Liver & Intrahepatic Bile Duct	5	4.3	2	2.0	~	~
Lung & Bronchus	61	62.5	38	48.3	72.4	36.8
Melanoma of the Skin	10	16.3	11	13.5	12.1	14.8
Mesothelioma (all sites)	5	2.2	0	0.5	~	~
Myeloma	1	5.4	3	4.5	~	~
Non-Hodgkin Lymphoma	12	21.6	16	19.6	13.7	14.8
Oral Cavity & Pharynx	16	13.2	7	6.9	18.7	~
Ovary	-	-	14	13.1	-	14.3
Pancreas	9	8.6	9	8.8	~	~
Prostate	157	162.0	-	-	182.6	-
Soft Tissues incl. Heart	2	2.7	6	2.6	~	~
Stomach	7	7.8	6	4.8	~	~
Testis	5	5.1	-	-	~	-
Thyroid	6	3.0	7	7.7	~	~
Urinary Bladder	32	33.5	7	11.7	36.7	~

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-61: Pope County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	199	205.8	177	177.4	533.8	419.2
Brain & Other Nervous System	3	2.7	1	2.0	~	~
Breast	0	0.5	52	55.9	~	129.6
Cervix Uteri	-	-	3	2.0	-	~
Colon & Rectum	29	22.7	30	23.4	74.5	61.3
Corpus & Uterus, NOS	-	-	15	10.9	-	31.9
Esophagus	2	3.0	0	1.0	~	~
Hodgkin Lymphoma	0	1.0	0	0.8	~	~
Kaposi Sarcoma (all sites)	0	0.1	0	0.0	~	~
Kidney & Renal Pelvis	4	6.2	2	3.8	~	~
Larynx	2	2.2	1	0.5	~	~
Leukemia	7	6.6	8	4.8	~	~
Liver & Intrahepatic Bile Duct	2	1.8	0	0.8	~	~
Lung & Bronchus	27	27.3	12	20.5	69.6	31.4
Melanoma of the Skin	6	6.7	12	5.3	~	34.2
Mesothelioma (all sites)	2	1.0	1	0.2	~	~
Myeloma	4	2.3	2	1.9	~	~
Non-Hodgkin Lymphoma	6	9.1	13	8.2	~	26.2
Oral Cavity & Pharynx	3	5.5	1	2.9	~	~
Ovary	-	-	7	5.4	-	~
Pancreas	3	3.7	1	3.7	~	~
Prostate	63	70.8	-	-	167.7	-
Soft Tissues incl. Heart	1	1.1	3	1.0	~	~
Stomach	4	3.4	1	2.1	~	~
Testis	1	1.7	-	-	~	-
Thyroid	1	1.2	0	2.9	~	~
Urinary Bladder	15	14.6	3	5.0	40.9	~

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-62: Ramsey County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	5452	5540.3	5903	5682.1	551.4	433.3
Brain & Other Nervous System	84	93.9	71	74.0	7.5	5.4
Breast	13	12.5	1973	1856.4	1.3	149.0
Cervix Uteri	-	-	90	88.0	-	6.9
Colon & Rectum	514	588.0	631	666.1	52.8	43.6
Corpus & Uterus, NOS	-	-	360	352.9	-	27.3
Esophagus	76	78.8	32	26.9	7.5	2.4
Hodgkin Lymphoma	35	42.6	31	36.7	2.8	2.3
Kaposi Sarcoma (all sites)	7	5.6	0	0.5	~	~
Kidney & Renal Pelvis	186	178.0	113	120.7	18.4	8.1
Larynx	64	59.7	13	16.1	6.4	1.0
Leukemia	184	185.4	147	148.0	18.2	10.2
Liver & Intrahepatic Bile Duct	74	52.0	27	25.6	7.0	2.0
Lung & Bronchus	760	703.1	730	620.4	78.4	54.8
Melanoma of the Skin	191	207.8	177	209.3	18.6	13.2
Mesothelioma (all sites)	27	24.5	6	5.7	2.8	~
Myeloma	75	60.9	63	55.9	7.6	4.3
Non-Hodgkin Lymphoma	283	256.1	265	252.4	28.6	18.5
Oral Cavity & Pharynx	149	162.3	115	90.9	14.3	8.5
Ovary	-	-	190	180.3	-	14.3
Pancreas	104	98.9	116	108.3	10.5	8.4
Prostate	1677	1813.8	-	-	172.8	-
Soft Tissues incl. Heart	43	36.7	36	37.3	4.0	2.6
Stomach	81	86.2	58	58.5	8.2	3.9
Testis	81	94.5	-	-	6.2	-
Thyroid	53	45.2	115	132.9	4.5	8.7
Urinary Bladder	362	363.5	155	142.4	38.4	10.6

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-63: Red Lake County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	56	74.8	53	60.2	423.6	351.4
Brain & Other Nervous System	2	1.0	0	0.7	~	~
Breast	0	0.2	19	19.2	~	117.0
Cervix Uteri	-	-	2	0.7	-	~
Colon & Rectum	9	8.2	6	7.6	~	~
Corpus & Uterus, NOS	-	-	1	3.7	-	~
Esophagus	0	1.1	1	0.3	~	~
Hodgkin Lymphoma	1	0.4	0	0.3	~	~
Kaposi Sarcoma (all sites)	0	0.1	0	0.0	~	~
Kidney & Renal Pelvis	2	2.3	1	1.3	~	~
Larynx	0	0.8	0	0.2	~	~
Leukemia	2	2.4	2	1.6	~	~
Liver & Intrahepatic Bile Duct	0	0.7	0	0.3	~	~
Lung & Bronchus	7	9.8	7	7.0	~	~
Melanoma of the Skin	0	2.5	1	1.9	~	~
Mesothelioma (all sites)	1	0.4	0	0.1	~	~
Myeloma	0	0.8	1	0.6	~	~
Non-Hodgkin Lymphoma	1	3.3	5	2.8	~	~
Oral Cavity & Pharynx	1	2.0	1	1.0	~	~
Ovary	-	-	0	1.9	-	~
Pancreas	0	1.3	2	1.2	~	~
Prostate	23	25.5	-	-	169.9	-
Soft Tissues incl. Heart	1	0.4	1	0.4	~	~
Stomach	0	1.2	0	0.7	~	~
Testis	0	0.7	-	-	~	-
Thyroid	0	0.4	1	1.1	~	~
Urinary Bladder	3	5.2	1	1.6	~	~

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-64: Redwood County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	276	287.2	241	246.0	539.5	411.4
Brain & Other Nervous System	5	3.8	2	2.8	~	~
Breast	1	0.7	85	77.6	~	150.8
Cervix Uteri	-	-	0	2.9	-	~
Colon & Rectum	42	32.0	30	32.2	79.4	42.3
Corpus & Uterus, NOS	-	-	16	15.0	-	31.6
Esophagus	3	4.1	1	1.3	~	~
Hodgkin Lymphoma	1	1.5	0	1.1	~	~
Kaposi Sarcoma (all sites)	0	0.2	0	0.0	~	~
Kidney & Renal Pelvis	9	8.6	4	5.3	~	~
Larynx	3	3.0	0	0.7	~	~
Leukemia	7	9.4	7	6.7	~	~
Liver & Intrahepatic Bile Duct	1	2.5	1	1.2	~	~
Lung & Bronchus	31	37.5	23	28.2	58.9	40.3
Melanoma of the Skin	11	9.5	7	7.4	23.4	~
Mesothelioma (all sites)	0	1.4	1	0.3	~	~
Myeloma	3	3.3	4	2.6	~	~
Non-Hodgkin Lymphoma	10	12.9	12	11.4	19.7	20.0
Oral Cavity & Pharynx	4	7.8	2	4.0	~	~
Ovary	-	-	5	7.5	-	~
Pancreas	4	5.1	5	5.1	~	~
Prostate	99	97.5	-	-	190.9	-
Soft Tissues incl. Heart	1	1.6	0	1.5	~	~
Stomach	4	4.8	5	2.8	~	~
Testis	4	2.7	-	-	~	-
Thyroid	0	1.7	6	4.1	~	~
Urinary Bladder	9	20.5	8	6.8	~	~

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-65: Renville County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	250	289.2	262	248.2	488.0	442.5
Brain & Other Nervous System	1	3.9	2	2.8	~	~
Breast	0	0.7	85	78.2	~	151.8
Cervix Uteri	-	-	4	3.0	-	~
Colon & Rectum	37	31.9	35	32.4	70.3	51.0
Corpus & Uterus, NOS	-	-	18	15.1	-	29.8
Esophagus	4	4.2	0	1.3	~	~
Hodgkin Lymphoma	4	1.5	5	1.2	~	~
Kaposi Sarcoma (all sites)	0	0.2	0	0.0	~	~
Kidney & Renal Pelvis	12	8.7	3	5.4	22.6	~
Larynx	3	3.0	0	0.7	~	~
Leukemia	12	9.4	3	6.7	22.8	~
Liver & Intrahepatic Bile Duct	3	2.6	2	1.2	~	~
Lung & Bronchus	26	38.0	17	28.7	50.1	26.8
Melanoma of the Skin	7	9.6	12	7.5	~	20.8
Mesothelioma (all sites)	1	1.4	0	0.3	~	~
Myeloma	0	3.3	2	2.6	~	~
Non-Hodgkin Lymphoma	13	12.9	10	11.5	24.5	16.2
Oral Cavity & Pharynx	6	7.9	5	4.0	~	~
Ovary	-	-	6	7.6	-	~
Pancreas	4	5.2	6	5.2	~	~
Prostate	80	98.4	-	-	153.4	-
Soft Tissues incl. Heart	2	1.6	0	1.5	~	~
Stomach	4	4.7	2	2.8	~	~
Testis	1	2.8	-	-	~	-
Thyroid	1	1.7	12	4.2	~	30.4
Urinary Bladder	14	20.4	7	6.9	26.1	~

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-66: Rice County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	635	646.2	588	585.8	551.5	419.0
Brain & Other Nervous System	9	10.8	7	7.7	~	~
Breast	4	1.5	171	191.3	~	124.4
Cervix Uteri	-	-	11	8.9	-	8.6
Colon & Rectum	101	68.7	103	68.7	89.0	69.5
Corpus & Uterus, NOS	-	-	38	36.5	-	27.1
Esophagus	11	9.2	5	2.8	9.3	~
Hodgkin Lymphoma	1	5.0	3	4.0	~	~
Kaposi Sarcoma (all sites)	0	0.6	0	0.1	~	~
Kidney & Renal Pelvis	15	20.6	12	12.4	12.4	8.8
Larynx	9	7.0	0	1.7	~	~
Leukemia	28	21.5	24	15.3	24.5	15.9
Liver & Intrahepatic Bile Duct	7	6.0	3	2.6	~	~
Lung & Bronchus	87	82.0	64	64.0	77.5	47.9
Melanoma of the Skin	13	24.1	10	21.3	10.1	7.4
Mesothelioma (all sites)	3	2.9	0	0.6	~	~
Myeloma	11	7.1	6	5.7	9.5	~
Non-Hodgkin Lymphoma	19	29.7	18	26.0	16.1	12.3
Oral Cavity & Pharynx	14	18.9	10	9.4	11.4	7.3
Ovary	-	-	14	18.7	-	9.6
Pancreas	8	11.5	10	11.1	~	6.8
Prostate	189	212.8	-	-	165.2	-
Soft Tissues incl. Heart	3	4.3	6	3.9	~	~
Stomach	14	10.0	4	6.0	12.3	~
Testis	11	10.7	-	-	7.1	-
Thyroid	7	5.2	12	13.6	~	9.5
Urinary Bladder	34	42.5	17	14.7	31.7	12.4

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-67: Rock County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	162	168.4	130	145.5	539.1	374.8
Brain & Other Nervous System	1	2.3	1	1.7	~	~
Breast	0	0.4	47	45.7	~	142.1
Cervix Uteri	-	-	1	1.7	-	~
Colon & Rectum	20	18.6	17	19.0	70.1	46.9
Corpus & Uterus, NOS	-	-	12	8.8	-	39.1
Esophagus	1	2.4	0	0.8	~	~
Hodgkin Lymphoma	2	0.8	0	0.7	~	~
Kaposi Sarcoma (all sites)	0	0.1	0	0.0	~	~
Kidney & Renal Pelvis	4	5.1	2	3.2	~	~
Larynx	2	1.7	0	0.4	~	~
Leukemia	3	5.5	4	3.9	~	~
Liver & Intrahepatic Bile Duct	2	1.5	0	0.7	~	~
Lung & Bronchus	19	22.2	5	16.9	62.5	~
Melanoma of the Skin	7	5.5	3	4.4	~	~
Mesothelioma (all sites)	0	0.8	0	0.2	~	~
Myeloma	6	1.9	2	1.6	~	~
Non-Hodgkin Lymphoma	9	7.5	10	6.8	~	24.1
Oral Cavity & Pharynx	1	4.5	1	2.4	~	~
Ovary	-	-	1	4.4	-	~
Pancreas	2	3.0	6	3.1	~	~
Prostate	59	57.2	-	-	189.9	-
Soft Tissues incl. Heart	1	0.9	0	0.9	~	~
Stomach	0	2.8	2	1.7	~	~
Testis	0	1.5	-	-	~	-
Thyroid	1	1.0	4	2.4	~	~
Urinary Bladder	12	12.0	3	4.0	37.1	~

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-68: Roseau County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	174	213.9	163	172.5	457.4	393.3
Brain & Other Nervous System	2	3.4	1	2.2	~	~
Breast	0	0.5	61	56.4	~	152.3
Cervix Uteri	-	-	5	2.6	-	~
Colon & Rectum	30	23.2	20	20.6	78.8	44.4
Corpus & Uterus, NOS	-	-	10	10.7	-	24.6
Esophagus	4	3.0	0	0.8	~	~
Hodgkin Lymphoma	0	1.4	1	1.0	~	~
Kaposi Sarcoma (all sites)	0	0.2	0	0.0	~	~
Kidney & Renal Pelvis	4	6.7	3	3.6	~	~
Larynx	2	2.3	2	0.5	~	~
Leukemia	3	7.2	7	4.6	~	~
Liver & Intrahepatic Bile Duct	2	2.0	0	0.8	~	~
Lung & Bronchus	21	27.4	6	18.7	55.6	~
Melanoma of the Skin	6	7.7	6	6.2	~	~
Mesothelioma (all sites)	0	1.0	0	0.2	~	~
Myeloma	2	2.4	2	1.7	~	~
Non-Hodgkin Lymphoma	3	9.8	5	7.7	~	~
Oral Cavity & Pharynx	10	6.1	4	2.8	26.3	~
Ovary	-	-	5	5.4	-	~
Pancreas	4	3.8	1	3.3	~	~
Prostate	57	70.7	-	-	153.2	-
Soft Tissues incl. Heart	1	1.3	3	1.1	~	~
Stomach	0	3.4	0	1.8	~	~
Testis	2	3.0	-	-	~	-
Thyroid	0	1.6	3	3.9	~	~
Urinary Bladder	11	14.5	7	4.4	28.6	~

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-69: St Louis County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	2998	2913.8	2766	2681.7	578.1	427.1
Brain & Other Nervous System	36	42.9	23	31.8	7.2	3.9
Breast	6	6.7	933	865.4	~	147.9
Cervix Uteri	-	-	41	35.6	-	7.8
Colon & Rectum	354	315.9	330	331.9	68.2	46.8
Corpus & Uterus, NOS	-	-	185	166.5	-	28.4
Esophagus	38	42.1	17	13.5	7.1	2.0
Hodgkin Lymphoma	16	17.4	13	14.3	3.3	2.2
Kaposi Sarcoma (all sites)	0	2.4	1	0.3	~	~
Kidney & Renal Pelvis	81	91.1	58	57.7	15.3	9.0
Larynx	32	31.3	11	7.6	6.1	1.8
Leukemia	88	94.0	64	70.0	17.4	9.3
Liver & Intrahepatic Bile Duct	25	26.6	12	12.4	4.8	1.8
Lung & Bronchus	420	378.9	330	303.9	80.4	50.1
Melanoma of the Skin	98	101.9	80	88.1	18.8	14.2
Mesothelioma (all sites)	24	13.4	3	2.8	4.7	~
Myeloma	26	32.7	28	27.6	5.0	4.3
Non-Hodgkin Lymphoma	133	131.5	112	121.7	25.7	16.5
Oral Cavity & Pharynx	91	82.7	44	43.1	17.6	7.0
Ovary	-	-	99	83.8	-	15.7
Pancreas	72	52.5	56	53.8	13.8	8.1
Prostate	926	982.2	-	-	177.9	-
Soft Tissues incl. Heart	16	17.1	12	16.5	3.0	1.9
Stomach	67	46.5	31	28.9	13.0	3.9
Testis	29	34.3	-	-	6.3	-
Thyroid	23	19.7	49	52.0	4.6	9.7
Urinary Bladder	213	198.6	78	70.7	41.3	11.7

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-70: Scott County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	729	741.8	719	685.7	558.9	424.8
Brain & Other Nervous System	22	15.7	13	10.9	11.2	6.8
Breast	0	1.6	254	235.8	~	146.1
Cervix Uteri	-	-	11	14.9	-	4.3
Colon & Rectum	68	75.7	56	67.2	57.9	37.4
Corpus & Uterus, NOS	-	-	40	43.2	-	25.1
Esophagus	13	10.3	4	2.7	11.6	~
Hodgkin Lymphoma	8	7.7	8	5.9	~	~
Kaposi Sarcoma (all sites)	0	1.0	0	0.1	~	~
Kidney & Renal Pelvis	18	25.6	17	14.1	12.7	10.2
Larynx	7	8.2	0	2.0	~	~
Leukemia	21	26.0	20	17.3	17.6	10.4
Liver & Intrahepatic Bile Duct	9	7.4	3	2.9	~	~
Lung & Bronchus	92	89.7	75	67.7	76.5	49.1
Melanoma of the Skin	37	32.2	37	31.9	21.6	18.0
Mesothelioma (all sites)	3	3.0	1	0.6	~	~
Myeloma	7	7.9	10	5.9	~	6.5
Non-Hodgkin Lymphoma	36	36.0	33	28.3	25.6	22.1
Oral Cavity & Pharynx	22	23.7	6	10.8	14.5	~
Ovary	-	-	22	22.7	-	13.2
Pancreas	10	13.1	11	11.1	6.8	6.7
Prostate	233	229.2	-	-	190.8	-
Soft Tissues incl. Heart	4	5.9	4	5.1	~	~
Stomach	18	11.0	9	6.0	13.7	~
Testis	15	18.5	-	-	5.9	-
Thyroid	9	8.0	28	22.8	~	12.3
Urinary Bladder	37	44.8	18	14.4	32.5	12.3

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-71: Sherburne County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	662	551.7	508	510.4	662.6	407.5
Brain & Other Nervous System	16	11.3	8	7.8	11.0	~
Breast	0	1.2	172	172.3	~	138.3
Cervix Uteri	-	-	10	10.1	-	5.7
Colon & Rectum	65	56.6	53	53.6	64.5	43.2
Corpus & Uterus, NOS	-	-	19	31.7	-	15.8
Esophagus	5	7.7	3	2.1	~	~
Hodgkin Lymphoma	4	5.6	5	4.2	~	~
Kaposi Sarcoma (all sites)	0	0.7	0	0.0	~	~
Kidney & Renal Pelvis	29	18.7	11	10.5	24.7	9.4
Larynx	5	6.0	3	1.4	~	~
Leukemia	21	19.2	11	13.3	23.0	9.3
Liver & Intrahepatic Bile Duct	7	5.4	0	2.2	~	~
Lung & Bronchus	73	67.4	62	51.0	77.6	56.7
Melanoma of the Skin	26	23.2	27	22.4	21.9	17.3
Mesothelioma (all sites)	1	2.3	0	0.5	~	~
Myeloma	6	5.9	3	4.6	~	~
Non-Hodgkin Lymphoma	27	26.5	19	21.6	27.3	15.7
Oral Cavity & Pharynx	22	17.2	6	8.1	21.4	~
Ovary	-	-	20	16.7	-	16.5
Pancreas	11	9.7	4	8.7	11.4	~
Prostate	226	172.7	-	-	238.2	-
Soft Tissues incl. Heart	5	4.3	5	3.7	~	~
Stomach	13	8.2	3	4.8	13.4	~
Testis	16	13.1	-	-	9.5	-
Thyroid	8	5.6	14	15.6	~	8.4
Urinary Bladder	46	33.8	16	11.5	52.3	14.1

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-72: Sibley County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	206	232.2	173	195.5	498.7	376.0
Brain & Other Nervous System	4	3.4	3	2.3	~	~
Breast	1	0.5	51	62.6	~	111.3
Cervix Uteri	-	-	4	2.6	-	~
Colon & Rectum	25	25.3	19	24.3	59.3	37.6
Corpus & Uterus, NOS	-	-	17	12.1	-	38.3
Esophagus	2	3.3	0	1.0	~	~
Hodgkin Lymphoma	3	1.3	2	1.0	~	~
Kaposi Sarcoma (all sites)	0	0.2	0	0.0	~	~
Kidney & Renal Pelvis	6	7.1	5	4.2	~	~
Larynx	1	2.5	1	0.6	~	~
Leukemia	11	7.6	7	5.2	26.4	~
Liver & Intrahepatic Bile Duct	2	2.1	0	0.9	~	~
Lung & Bronchus	20	30.3	15	22.4	47.6	31.8
Melanoma of the Skin	2	7.9	7	6.3	~	~
Mesothelioma (all sites)	0	1.1	0	0.2	~	~
Myeloma	0	2.6	0	2.0	~	~
Non-Hodgkin Lymphoma	11	10.4	7	8.8	27.4	~
Oral Cavity & Pharynx	3	6.4	1	3.2	~	~
Ovary	-	-	8	6.0	-	~
Pancreas	2	4.2	4	4.0	~	~
Prostate	77	78.7	-	-	184.2	-
Soft Tissues incl. Heart	4	1.3	0	1.2	~	~
Stomach	5	3.7	2	2.1	~	~
Testis	4	2.6	-	-	~	-
Thyroid	1	1.5	5	3.7	~	~
Urinary Bladder	10	16.0	3	5.2	23.8	~

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-73: Stearns County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	1647	1501.7	1372	1295.6	616.5	441.5
Brain & Other Nervous System	25	25.1	20	17.7	8.2	6.6
Breast	7	3.3	419	424.1	~	138.5
Cervix Uteri	-	-	15	20.6	-	4.9
Colon & Rectum	155	158.5	164	146.7	58.8	50.6
Corpus & Uterus, NOS	-	-	89	81.0	-	29.6
Esophagus	25	21.4	11	6.0	9.8	3.5
Hodgkin Lymphoma	16	11.7	11	9.3	5.1	3.3
Kaposi Sarcoma (all sites)	0	1.5	0	0.1	~	~
Kidney & Renal Pelvis	57	47.6	31	27.7	21.0	9.8
Larynx	12	16.1	5	3.8	4.5	~
Leukemia	37	50.0	39	33.4	13.3	12.4
Liver & Intrahepatic Bile Duct	16	13.9	12	5.8	5.8	3.9
Lung & Bronchus	172	191.9	128	143.1	66.3	41.2
Melanoma of the Skin	55	55.3	49	49.0	19.0	15.7
Mesothelioma (all sites)	8	6.7	2	1.3	~	~
Myeloma	12	16.4	14	12.6	4.7	4.3
Non-Hodgkin Lymphoma	73	68.7	74	57.2	27.2	23.5
Oral Cavity & Pharynx	23	43.0	18	20.6	8.5	5.7
Ovary	-	-	36	41.7	-	12.0
Pancreas	34	26.7	36	24.3	12.7	11.2
Prostate	674	496.6	-	-	254.3	-
Soft Tissues incl. Heart	9	9.9	8	8.9	~	~
Stomach	20	23.2	15	12.8	7.7	4.4
Testis	21	25.4	-	-	6.1	-
Thyroid	7	12.0	34	32.0	~	10.6
Urinary Bladder	107	98.6	45	31.6	41.0	14.4

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-74: Steele County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	433	424.4	348	392.9	573.8	360.4
Brain & Other Nervous System	6	6.7	2	5.0	~	~
Breast	3	1.0	97	127.9	~	103.6
Cervix Uteri	-	-	1	5.7	-	~
Colon & Rectum	56	45.7	59	46.8	75.6	55.3
Corpus & Uterus, NOS	-	-	18	24.5	-	20.5
Esophagus	3	6.1	1	1.9	~	~
Hodgkin Lymphoma	4	2.9	2	2.3	~	~
Kaposi Sarcoma (all sites)	0	0.4	0	0.0	~	~
Kidney & Renal Pelvis	15	13.4	9	8.5	20.0	~
Larynx	7	4.5	0	1.1	~	~
Leukemia	18	14.0	6	10.3	23.9	~
Liver & Intrahepatic Bile Duct	3	3.9	4	1.8	~	~
Lung & Bronchus	45	54.5	47	44.0	59.4	48.8
Melanoma of the Skin	12	15.4	16	13.7	15.3	18.8
Mesothelioma (all sites)	2	1.9	0	0.4	~	~
Myeloma	2	4.7	5	3.9	~	~
Non-Hodgkin Lymphoma	19	19.4	21	17.5	25.2	21.9
Oral Cavity & Pharynx	10	12.2	5	6.3	12.5	~
Ovary	-	-	9	12.4	-	~
Pancreas	5	7.6	5	7.7	~	~
Prostate	146	140.9	-	-	195.0	-
Soft Tissues incl. Heart	2	2.6	0	2.5	~	~
Stomach	9	6.7	4	4.1	~	~
Testis	6	6.0	-	-	~	-
Thyroid	2	3.1	2	8.4	~	~
Urinary Bladder	33	28.5	10	10.0	44.1	9.1

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-75: Stevens County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	147	143.8	133	129.1	583.2	432.8
Brain & Other Nervous System	1	2.0	2	1.5	~	~
Breast	0	0.3	35	40.2	~	127.2
Cervix Uteri	-	-	2	1.6	-	~
Colon & Rectum	29	15.8	25	16.8	115.6	74.4
Corpus & Uterus, NOS	-	-	13	7.7	-	52.2
Esophagus	3	2.1	1	0.7	~	~
Hodgkin Lymphoma	1	0.9	0	0.8	~	~
Kaposi Sarcoma (all sites)	0	0.1	0	0.0	~	~
Kidney & Renal Pelvis	7	4.3	6	2.8	~	~
Larynx	1	1.5	0	0.4	~	~
Leukemia	8	4.8	2	3.5	~	~
Liver & Intrahepatic Bile Duct	0	1.3	1	0.6	~	~
Lung & Bronchus	12	18.7	11	14.7	47.0	34.9
Melanoma of the Skin	3	4.8	4	4.1	~	~
Mesothelioma (all sites)	0	0.7	1	0.1	~	~
Myeloma	2	1.6	0	1.4	~	~
Non-Hodgkin Lymphoma	3	6.5	4	6.0	~	~
Oral Cavity & Pharynx	5	3.9	1	2.1	~	~
Ovary	-	-	3	4.0	-	~
Pancreas	2	2.6	4	2.7	~	~
Prostate	56	48.3	-	-	219.7	-
Soft Tissues incl. Heart	0	0.8	1	0.8	~	~
Stomach	3	2.3	1	1.5	~	~
Testis	1	1.7	-	-	~	-
Thyroid	2	0.9	1	2.4	~	~
Urinary Bladder	4	10.1	5	3.6	~	~

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-76: Swift County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	199	191.9	180	166.0	590.0	447.5
Brain & Other Nervous System	3	2.8	7	1.8	~	~
Breast	1	0.5	56	51.8	~	149.2
Cervix Uteri	-	-	4	1.9	-	~
Colon & Rectum	19	21.2	23	22.2	56.5	51.5
Corpus & Uterus, NOS	-	-	5	10.0	-	~
Esophagus	1	2.7	2	0.9	~	~
Hodgkin Lymphoma	1	1.2	0	0.7	~	~
Kaposi Sarcoma (all sites)	0	0.2	0	0.0	~	~
Kidney & Renal Pelvis	6	5.9	7	3.6	~	~
Larynx	0	2.0	0	0.5	~	~
Leukemia	5	6.3	5	4.5	~	~
Liver & Intrahepatic Bile Duct	3	1.7	0	0.8	~	~
Lung & Bronchus	33	24.6	15	19.3	100.6	35.8
Melanoma of the Skin	11	6.8	9	4.9	31.6	~
Mesothelioma (all sites)	1	0.9	0	0.2	~	~
Myeloma	1	2.2	2	1.8	~	~
Non-Hodgkin Lymphoma	8	8.8	10	7.8	~	20.3
Oral Cavity & Pharynx	6	5.4	6	2.7	~	~
Ovary	-	-	4	5.0	-	~
Pancreas	2	3.4	3	3.5	~	~
Prostate	62	63.3	-	-	182.8	-
Soft Tissues incl. Heart	1	1.1	2	1.0	~	~
Stomach	2	3.2	2	1.9	~	~
Testis	1	2.6	-	-	~	-
Thyroid	3	1.4	3	2.6	~	~
Urinary Bladder	18	13.4	6	4.7	51.5	~

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-77: Todd County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	393	381.1	265	311.9	581.3	346.0
Brain & Other Nervous System	5	5.5	2	3.8	~	~
Breast	0	0.9	78	101.2	~	108.2
Cervix Uteri	-	-	4	4.1	-	~
Colon & Rectum	44	41.0	33	38.0	64.9	40.9
Corpus & Uterus, NOS	-	-	25	19.7	-	32.2
Esophagus	5	5.5	1	1.6	~	~
Hodgkin Lymphoma	3	2.1	2	1.6	~	~
Kaposi Sarcoma (all sites)	0	0.3	0	0.0	~	~
Kidney & Renal Pelvis	13	11.8	7	6.8	18.8	~
Larynx	8	4.2	0	0.9	~	~
Leukemia	10	12.1	10	8.1	15.2	11.6
Liver & Intrahepatic Bile Duct	2	3.4	2	1.4	~	~
Lung & Bronchus	50	50.1	31	36.0	72.4	37.6
Melanoma of the Skin	9	12.9	6	10.0	~	~
Mesothelioma (all sites)	2	1.8	1	0.3	~	~
Myeloma	5	4.2	3	3.2	~	~
Non-Hodgkin Lymphoma	18	16.9	8	14.0	27.8	~
Oral Cavity & Pharynx	15	10.6	4	5.0	22.5	~
Ovary	-	-	13	9.8	-	17.7
Pancreas	7	6.9	4	6.3	~	~
Prostate	143	130.9	-	-	205.1	-
Soft Tissues incl. Heart	0	2.2	1	1.9	~	~
Stomach	4	6.0	3	3.3	~	~
Testis	6	4.0	-	-	~	-
Thyroid	3	2.4	2	5.9	~	~
Urinary Bladder	20	25.8	6	8.2	28.6	~

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-78: Traverse County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	83	89.0	73	71.9	540.6	443.7
Brain & Other Nervous System	0	1.1	0	0.8	~	~
Breast	0	0.2	26	22.2	~	163.3
Cervix Uteri	-	-	1	0.7	-	~
Colon & Rectum	9	10.0	19	9.9	~	95.1
Corpus & Uterus, NOS	-	-	2	4.3	-	~
Esophagus	0	1.3	0	0.4	~	~
Hodgkin Lymphoma	1	0.4	1	0.3	~	~
Kaposi Sarcoma (all sites)	0	0.1	0	0.0	~	~
Kidney & Renal Pelvis	1	2.6	1	1.6	~	~
Larynx	0	0.9	0	0.2	~	~
Leukemia	1	2.9	1	2.0	~	~
Liver & Intrahepatic Bile Duct	0	0.8	1	0.3	~	~
Lung & Bronchus	9	11.9	6	8.4	~	~
Melanoma of the Skin	3	2.7	1	2.0	~	~
Mesothelioma (all sites)	0	0.4	0	0.1	~	~
Myeloma	1	1.0	1	0.8	~	~
Non-Hodgkin Lymphoma	0	3.9	3	3.4	~	~
Oral Cavity & Pharynx	4	2.3	1	1.2	~	~
Ovary	-	-	2	2.1	-	~
Pancreas	0	1.6	0	1.6	~	~
Prostate	36	30.9	-	-	213.2	-
Soft Tissues incl. Heart	1	0.4	3	0.4	~	~
Stomach	4	1.5	0	0.9	~	~
Testis	0	0.6	-	-	~	-
Thyroid	0	0.4	0	1.0	~	~
Urinary Bladder	8	6.5	1	2.1	~	~

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-79: Wabasha County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	321	325.8	289	267.6	555.4	453.0
Brain & Other Nervous System	4	4.7	8	3.3	~	~
Breast	0	0.7	97	87.4	~	155.1
Cervix Uteri	-	-	2	3.7	-	~
Colon & Rectum	46	35.4	41	32.2	78.3	58.3
Corpus & Uterus, NOS	-	-	17	16.9	-	25.5
Esophagus	5	4.7	0	1.3	~	~
Hodgkin Lymphoma	1	1.9	0	1.4	~	~
Kaposi Sarcoma (all sites)	0	0.3	0	0.0	~	~
Kidney & Renal Pelvis	12	10.1	3	5.7	20.9	~
Larynx	5	3.5	1	0.8	~	~
Leukemia	18	10.5	10	7.0	30.7	15.4
Liver & Intrahepatic Bile Duct	3	2.9	1	1.2	~	~
Lung & Bronchus	35	42.5	40	30.2	59.3	63.9
Melanoma of the Skin	15	11.3	11	9.0	27.1	21.0
Mesothelioma (all sites)	2	1.5	0	0.3	~	~
Myeloma	4	3.7	1	2.7	~	~
Non-Hodgkin Lymphoma	8	14.7	16	11.9	~	23.3
Oral Cavity & Pharynx	7	9.1	0	4.3	~	~
Ovary	-	-	5	8.4	-	~
Pancreas	4	5.8	4	5.3	~	~
Prostate	87	110.3	-	-	148.5	-
Soft Tissues incl. Heart	1	1.9	1	1.6	~	~
Stomach	3	5.2	2	2.8	~	~
Testis	7	3.6	-	-	~	-
Thyroid	7	2.1	7	5.4	~	~
Urinary Bladder	27	22.3	2	6.9	46.0	~

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-80: Wadena County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	273	236.2	200	204.6	655.1	414.1
Brain & Other Nervous System	3	3.2	4	2.3	~	~
Breast	0	0.5	58	64.5	~	129.4
Cervix Uteri	-	-	3	2.4	-	~
Colon & Rectum	26	25.9	29	26.5	64.3	55.1
Corpus & Uterus, NOS	-	-	12	12.6	-	25.3
Esophagus	6	3.4	0	1.1	~	~
Hodgkin Lymphoma	2	1.2	0	0.9	~	~
Kaposi Sarcoma (all sites)	0	0.2	0	0.0	~	~
Kidney & Renal Pelvis	8	7.1	6	4.5	~	~
Larynx	5	2.5	0	0.6	~	~
Leukemia	6	7.6	5	5.5	~	~
Liver & Intrahepatic Bile Duct	2	2.1	0	1.0	~	~
Lung & Bronchus	30	31.2	25	24.0	70.8	52.9
Melanoma of the Skin	1	7.7	3	6.1	~	~
Mesothelioma (all sites)	2	1.1	0	0.2	~	~
Myeloma	4	2.7	0	2.2	~	~
Non-Hodgkin Lymphoma	18	10.4	8	9.5	45.2	~
Oral Cavity & Pharynx	6	6.4	2	3.3	~	~
Ovary	-	-	6	6.2	-	~
Pancreas	5	4.2	7	4.3	~	~
Prostate	106	81.5	-	-	248.5	-
Soft Tissues incl. Heart	2	1.3	0	1.2	~	~
Stomach	1	3.8	4	2.3	~	~
Testis	2	2.1	-	-	~	-
Thyroid	3	1.4	7	3.4	~	~
Urinary Bladder	19	16.6	9	5.6	43.8	~

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-81: Waseca County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	273	259.7	187	227.9	592.6	340.6
Brain & Other Nervous System	7	4.1	0	2.8	~	~
Breast	0	0.6	50	73.4	~	95.1
Cervix Uteri	-	-	1	3.1	-	~
Colon & Rectum	36	28.1	24	28.0	78.3	39.5
Corpus & Uterus, NOS	-	-	12	14.0	-	20.9
Esophagus	5	3.7	0	1.1	~	~
Hodgkin Lymphoma	2	1.8	1	1.3	~	~
Kaposi Sarcoma (all sites)	0	0.2	0	0.0	~	~
Kidney & Renal Pelvis	13	8.2	4	4.9	27.6	~
Larynx	2	2.7	1	0.7	~	~
Leukemia	9	8.7	5	6.1	~	~
Liver & Intrahepatic Bile Duct	2	2.4	1	1.1	~	~
Lung & Bronchus	34	33.2	21	25.6	75.0	38.1
Melanoma of the Skin	11	9.5	10	7.6	23.0	22.8
Mesothelioma (all sites)	0	1.2	0	0.2	~	~
Myeloma	4	2.9	2	2.3	~	~
Non-Hodgkin Lymphoma	13	12.0	7	10.3	28.2	~
Oral Cavity & Pharynx	8	7.4	2	3.7	~	~
Ovary	-	-	8	7.1	-	~
Pancreas	6	4.6	7	4.5	~	~
Prostate	79	85.2	-	-	174.7	-
Soft Tissues incl. Heart	3	1.6	2	1.4	~	~
Stomach	5	4.2	2	2.5	~	~
Testis	2	3.9	-	-	~	-
Thyroid	0	2.0	3	4.6	~	~
Urinary Bladder	12	17.7	8	6.0	25.6	~

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-82: Washington County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	1890	1932.9	1882	1808.1	549.8	438.2
Brain & Other Nervous System	42	37.3	30	26.5	9.1	6.4
Breast	6	4.2	705	630.5	~	155.6
Cervix Uteri	-	-	40	34.6	-	8.2
Colon & Rectum	189	199.5	165	180.8	57.3	42.1
Corpus & Uterus, NOS	-	-	118	117.9	-	27.7
Esophagus	28	27.7	6	7.3	8.5	~
Hodgkin Lymphoma	16	16.6	6	12.9	3.2	~
Kaposi Sarcoma (all sites)	0	2.3	0	0.1	~	~
Kidney & Renal Pelvis	69	66.3	32	37.5	18.8	7.8
Larynx	19	21.9	2	5.4	5.8	~
Leukemia	61	63.9	42	44.0	16.8	9.8
Liver & Intrahepatic Bile Duct	20	19.2	6	7.6	5.4	~
Lung & Bronchus	210	240.2	186	187.3	65.0	48.7
Melanoma of the Skin	88	79.6	76	76.3	23.1	16.4
Mesothelioma (all sites)	7	8.0	2	1.6	~	~
Myeloma	17	20.8	25	16.1	5.3	6.2
Non-Hodgkin Lymphoma	87	91.2	90	74.7	23.8	21.2
Oral Cavity & Pharynx	56	61.7	27	28.5	14.1	6.0
Ovary	-	-	67	60.5	-	15.0
Pancreas	41	34.7	19	30.2	11.8	5.0
Prostate	607	621.4	-	-	184.5	-
Soft Tissues incl. Heart	19	14.0	17	12.3	4.8	3.8
Stomach	22	28.8	15	15.8	6.0	3.7
Testis	50	37.4	-	-	9.8	-
Thyroid	17	18.2	48	51.9	3.6	9.6
Urinary Bladder	118	118.3	44	39.2	37.9	10.8

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-83: Watonwan County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	176	192.1	183	169.5	511.1	448.9
Brain & Other Nervous System	1	2.6	3	2.0	~	~
Breast	0	0.4	56	53.4	~	137.5
Cervix Uteri	-	-	1	2.0	-	~
Colon & Rectum	17	21.0	21	22.0	47.7	44.4
Corpus & Uterus, NOS	-	-	11	10.3	-	25.6
Esophagus	1	2.8	2	0.9	~	~
Hodgkin Lymphoma	1	1.0	2	0.8	~	~
Kaposi Sarcoma (all sites)	0	0.1	0	0.0	~	~
Kidney & Renal Pelvis	4	5.8	3	3.7	~	~
Larynx	0	2.0	4	0.5	~	~
Leukemia	2	6.2	4	4.6	~	~
Liver & Intrahepatic Bile Duct	2	1.7	1	0.8	~	~
Lung & Bronchus	31	25.3	12	19.6	87.8	35.8
Melanoma of the Skin	7	6.4	7	5.2	~	~
Mesothelioma (all sites)	0	0.9	0	0.2	~	~
Myeloma	1	2.2	3	1.8	~	~
Non-Hodgkin Lymphoma	6	8.5	9	7.8	~	~
Oral Cavity & Pharynx	1	5.2	4	2.7	~	~
Ovary	-	-	6	5.2	-	~
Pancreas	1	3.4	3	3.5	~	~
Prostate	75	65.9	-	-	213.8	-
Soft Tissues incl. Heart	2	1.1	3	1.0	~	~
Stomach	5	3.1	3	1.9	~	~
Testis	2	1.9	-	-	~	-
Thyroid	0	1.2	3	2.9	~	~
Urinary Bladder	12	13.4	6	4.7	34.3	~

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-84: Wilkin County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	104	102.8	98	93.1	565.3	418.0
Brain & Other Nervous System	0	1.5	2	1.1	~	~
Breast	0	0.2	34	29.9	~	159.8
Cervix Uteri	-	-	0	1.2	-	~
Colon & Rectum	19	11.1	12	11.8	101.6	40.7
Corpus & Uterus, NOS	-	-	7	5.7	-	~
Esophagus	1	1.5	0	0.5	~	~
Hodgkin Lymphoma	0	0.6	0	0.5	~	~
Kaposi Sarcoma (all sites)	1	0.1	0	0.0	~	~
Kidney & Renal Pelvis	4	3.2	0	2.0	~	~
Larynx	1	1.1	0	0.3	~	~
Leukemia	5	3.3	1	2.5	~	~
Liver & Intrahepatic Bile Duct	0	0.9	0	0.4	~	~
Lung & Bronchus	15	13.4	12	10.4	81.6	52.7
Melanoma of the Skin	1	3.6	2	3.0	~	~
Mesothelioma (all sites)	2	0.5	0	0.1	~	~
Myeloma	1	1.1	1	1.0	~	~
Non-Hodgkin Lymphoma	3	4.6	3	4.2	~	~
Oral Cavity & Pharynx	7	2.9	2	1.5	~	~
Ovary	-	-	4	2.9	-	~
Pancreas	3	1.8	3	1.9	~	~
Prostate	32	34.9	-	-	172.5	-
Soft Tissues incl. Heart	1	0.6	0	0.6	~	~
Stomach	1	1.6	3	1.0	~	~
Testis	0	1.2	-	-	~	-
Thyroid	1	0.7	1	1.8	~	~
Urinary Bladder	6	7.0	3	2.5	~	~

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-85: Winona County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	626	609.4	551	561.1	576.6	412.0
Brain & Other Nervous System	18	9.6	5	7.1	16.2	~
Breast	1	1.4	181	179.9	~	139.7
Cervix Uteri	-	-	10	7.9	-	8.5
Colon & Rectum	83	65.5	80	68.4	77.7	55.5
Corpus & Uterus, NOS	-	-	42	34.4	-	31.6
Esophagus	10	8.7	4	2.8	9.4	~
Hodgkin Lymphoma	6	4.3	6	3.7	~	~
Kaposi Sarcoma (all sites)	0	0.5	0	0.1	~	~
Kidney & Renal Pelvis	13	19.1	12	11.9	11.8	9.7
Larynx	5	6.5	2	1.6	~	~
Leukemia	22	20.1	13	14.9	20.8	9.5
Liver & Intrahepatic Bile Duct	4	5.6	2	2.6	~	~
Lung & Bronchus	93	78.3	56	62.0	86.1	42.1
Melanoma of the Skin	19	21.8	11	19.7	17.4	8.5
Mesothelioma (all sites)	3	2.8	1	0.6	~	~
Myeloma	8	6.8	3	5.7	~	~
Non-Hodgkin Lymphoma	24	27.8	22	25.4	21.9	14.9
Oral Cavity & Pharynx	16	17.4	6	9.0	14.2	~
Ovary	-	-	25	17.6	-	20.3
Pancreas	13	10.9	12	11.0	12.0	8.6
Prostate	201	202.8	-	-	185.5	-
Soft Tissues incl. Heart	2	3.8	4	3.7	~	~
Stomach	9	9.6	1	6.0	~	~
Testis	7	8.8	-	-	~	-
Thyroid	6	4.5	11	12.3	~	9.9
Urinary Bladder	41	40.9	11	14.6	38.7	7.8

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-86: Wright County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	912	911.0	774	811.2	565.4	397.3
Brain & Other Nervous System	19	16.8	14	11.8	9.4	6.7
Breast	2	2.0	260	272.0	~	132.6
Cervix Uteri	-	-	8	14.6	-	~
Colon & Rectum	104	95.2	85	87.7	66.8	44.3
Corpus & Uterus, NOS	-	-	42	51.1	-	21.6
Esophagus	15	12.9	3	3.5	9.5	~
Hodgkin Lymphoma	6	7.6	2	5.9	~	~
Kaposi Sarcoma (all sites)	0	1.0	1	0.1	~	~
Kidney & Renal Pelvis	32	30.1	21	17.0	17.7	11.3
Larynx	11	10.0	3	2.3	6.8	~
Leukemia	33	30.8	21	20.9	20.8	10.4
Liver & Intrahepatic Bile Duct	6	8.7	1	3.5	~	~
Lung & Bronchus	97	114.0	91	85.4	61.0	49.3
Melanoma of the Skin	43	35.9	29	32.9	22.9	13.3
Mesothelioma (all sites)	2	3.9	1	0.8	~	~
Myeloma	12	9.9	6	7.5	8.6	~
Non-Hodgkin Lymphoma	37	42.6	34	34.8	20.7	17.4
Oral Cavity & Pharynx	25	27.5	11	12.9	15.5	5.8
Ovary	-	-	22	26.3	-	11.3
Pancreas	11	16.2	20	14.4	7.5	10.8
Prostate	313	294.6	-	-	199.6	-
Soft Tissues incl. Heart	6	6.4	7	5.6	~	~
Stomach	8	13.9	5	7.7	~	~
Testis	17	17.2	-	-	7.2	-
Thyroid	8	8.1	14	22.1	~	6.1
Urinary Bladder	65	57.9	20	18.8	44.4	10.8

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-87: Yellow Medicine County 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	176	191.2	169	169.7	514.0	456.8
Brain & Other Nervous System	1	2.6	2	1.9	~	~
Breast	1	0.5	59	53.1	~	170.0
Cervix Uteri	-	-	2	2.0	-	~
Colon & Rectum	23	21.2	21	22.7	63.0	52.0
Corpus & Uterus, NOS	-	-	13	10.3	-	35.6
Esophagus	3	2.7	0	0.9	~	~
Hodgkin Lymphoma	0	1.0	0	0.8	~	~
Kaposi Sarcoma (all sites)	0	0.1	0	0.0	~	~
Kidney & Renal Pelvis	8	5.8	7	3.7	~	~
Larynx	0	2.0	0	0.5	~	~
Leukemia	4	6.2	4	4.7	~	~
Liver & Intrahepatic Bile Duct	0	1.7	0	0.8	~	~
Lung & Bronchus	23	25.1	18	19.5	69.5	47.7
Melanoma of the Skin	4	6.3	5	5.0	~	~
Mesothelioma (all sites)	1	0.9	1	0.2	~	~
Myeloma	0	2.2	3	1.8	~	~
Non-Hodgkin Lymphoma	8	8.5	6	7.9	~	~
Oral Cavity & Pharynx	6	5.2	2	2.8	~	~
Ovary	-	-	5	5.1	-	~
Pancreas	4	3.4	4	3.6	~	~
Prostate	63	65.2	-	-	182.1	-
Soft Tissues incl. Heart	1	1.0	1	1.0	~	~
Stomach	3	3.2	2	2.0	~	~
Testis	1	1.7	-	-	~	-
Thyroid	0	1.1	4	2.8	~	~
Urinary Bladder	15	13.6	4	4.8	42.3	~

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-88: Northwestern Region 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	2415	2484.9	2006	2085.5	544.9	400.1
Brain & Other Nervous System	32	35.9	26	25.3	7.6	5.4
Breast	3	5.7	643	673.4	~	131.0
Cervix Uteri	-	-	42	27.7	-	10.1
Colon & Rectum	337	270.1	275	256.5	76.1	48.9
Corpus & Uterus, NOS	-	-	122	130.3	-	25.1
Esophagus	53	35.8	7	10.5	11.9	~
Hodgkin Lymphoma	10	14.2	9	11.2	2.5	~
Kaposi Sarcoma (all sites)	1	1.9	1	0.2	~	~
Kidney & Renal Pelvis	64	76.7	49	45.0	14.4	10.2
Larynx	22	26.6	5	6.0	4.9	~
Leukemia	88	80.6	67	54.9	20.2	12.8
Liver & Intrahepatic Bile Duct	19	22.3	9	9.6	4.4	~
Lung & Bronchus	310	324.3	205	236.9	69.2	40.9
Melanoma of the Skin	53	84.9	53	68.3	12.1	12.2
Mesothelioma (all sites)	12	11.5	1	2.2	2.7	~
Myeloma	32	27.9	17	21.4	7.2	3.5
Non-Hodgkin Lymphoma	74	111.2	96	94.1	16.6	18.8
Oral Cavity & Pharynx	83	69.1	30	33.5	18.9	5.4
Ovary	-	-	62	65.1	-	12.9
Pancreas	46	44.6	42	41.7	10.4	7.7
Prostate	811	844.5	-	-	180.4	-
Soft Tissues incl. Heart	14	14.3	18	12.9	3.2	3.8
Stomach	39	39.8	17	22.4	8.8	3.0
Testis	26	27.2	-	-	7.0	-
Thyroid	14	16.0	35	40.4	3.4	8.6
Urinary Bladder	151	170.7	51	54.8	34.0	9.6

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-89: Northeastern Region 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	5019	4994.7	4443	4365.4	564.9	422.6
Brain & Other Nervous System	75	71.9	38	51.8	8.8	4.1
Breast	11	11.3	1459	1415.7	1.3	141.9
Cervix Uteri	-	-	69	57.5	-	8.1
Colon & Rectum	576	539.7	538	534.8	65.1	46.2
Corpus & Uterus, NOS	-	-	293	274.0	-	28.1
Esophagus	70	72.5	26	21.9	7.7	2.1
Hodgkin Lymphoma	27	28.3	19	22.5	3.3	2.1
Kaposi Sarcoma (all sites)	0	3.9	1	0.4	~	~
Kidney & Renal Pelvis	143	155.9	85	94.5	16.1	8.1
Larynx	53	54.1	19	12.7	5.8	1.9
Leukemia	136	158.9	100	112.9	15.8	9.4
Liver & Intrahepatic Bile Duct	42	45.4	13	20.1	4.8	1.2
Lung & Bronchus	728	654.4	558	500.0	80.5	52.2
Melanoma of the Skin	171	171.8	128	142.0	19.5	13.7
Mesothelioma (all sites)	43	23.0	4	4.6	4.9	~
Myeloma	48	56.0	45	44.9	5.4	4.1
Non-Hodgkin Lymphoma	225	222.9	187	196.9	25.7	17.0
Oral Cavity & Pharynx	158	140.5	79	70.0	18.0	7.7
Ovary	-	-	153	136.9	-	15.2
Pancreas	100	90.2	84	87.4	11.2	7.5
Prostate	1567	1702.7	-	-	173.8	-
Soft Tissues incl. Heart	27	28.6	23	26.5	3.0	2.4
Stomach	105	79.1	46	46.4	12.0	3.7
Testis	50	54.2	-	-	6.7	-
Thyroid	33	32.7	71	83.3	3.9	8.8
Urinary Bladder	359	339.7	121	114.4	40.6	10.8

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-90: West Central Region 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	3539	3292.4	2661	2822.6	601.8	396.4
Brain & Other Nervous System	44	46.3	33	33.4	7.8	5.5
Breast	5	7.6	833	904.7	~	130.6
Cervix Uteri	-	-	47	36.1	-	8.8
Colon & Rectum	409	358.5	392	353.0	69.5	51.8
Corpus & Uterus, NOS	-	-	183	175.4	-	28.1
Esophagus	47	47.6	11	14.5	7.9	1.4
Hodgkin Lymphoma	19	18.2	19	14.8	3.6	3.7
Kaposi Sarcoma (all sites)	2	2.5	1	0.3	~	~
Kidney & Renal Pelvis	85	100.8	59	61.1	14.7	8.6
Larynx	28	35.2	8	8.1	4.8	~
Leukemia	118	106.0	74	74.7	20.5	9.9
Liver & Intrahepatic Bile Duct	21	29.4	16	13.0	3.5	2.1
Lung & Bronchus	436	431.6	242	323.2	73.5	35.8
Melanoma of the Skin	93	110.9	91	90.3	16.9	15.3
Mesothelioma (all sites)	18	15.4	3	3.0	3.0	~
Myeloma	38	37.0	38	29.2	6.4	5.1
Non-Hodgkin Lymphoma	128	146.4	116	128.2	22.3	16.5
Oral Cavity & Pharynx	106	90.6	39	45.5	18.5	5.4
Ovary	-	-	76	87.6	-	11.4
Pancreas	53	59.2	49	57.3	9.0	7.1
Prostate	1356	1124.8	-	-	226.4	-
Soft Tissues incl. Heart	13	18.6	26	17.3	2.4	4.1
Stomach	58	52.8	25	30.8	9.8	3.1
Testis	30	34.2	-	-	6.4	-
Thyroid	16	20.7	33	52.6	3.0	6.4
Urinary Bladder	244	227.5	79	75.5	41.1	10.6

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-91: Central Region 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	8119	7609.2	6377	6492.9	598.2	408.4
Brain & Other Nervous System	143	122.8	97	85.8	9.8	6.5
Breast	18	16.9	2001	2134.1	1.5	130.3
Cervix Uteri	-	-	89	100.3	-	6.0
Colon & Rectum	823	807.9	748	748.1	61.4	45.3
Corpus & Uterus, NOS	-	-	401	408.9	-	26.3
Esophagus	108	109.1	39	30.7	8.1	2.4
Hodgkin Lymphoma	55	53.2	38	41.2	3.6	2.5
Kaposi Sarcoma (all sites)	2	7.0	1	0.6	~	~
Kidney & Renal Pelvis	264	241.7	158	138.8	19.0	10.3
Larynx	88	82.6	23	19.0	6.4	1.5
Leukemia	223	249.2	169	167.9	16.6	10.5
Liver & Intrahepatic Bile Duct	59	70.3	37	29.0	4.3	2.3
Lung & Bronchus	981	979.0	707	719.3	72.5	45.7
Melanoma of the Skin	263	276.2	225	236.3	18.7	14.9
Mesothelioma (all sites)	36	34.1	9	6.6	2.6	~
Myeloma	85	83.7	48	63.6	6.4	3.0
Non-Hodgkin Lymphoma	349	345.2	277	285.9	25.6	17.5
Oral Cavity & Pharynx	206	218.5	93	103.6	15.0	5.9
Ovary	-	-	220	207.1	-	14.4
Pancreas	144	135.9	141	123.2	10.7	8.6
Prostate	3047	2544.1	-	-	225.2	-
Soft Tissues incl. Heart	49	47.9	48	42.4	3.5	3.2
Stomach	108	118.1	70	65.2	8.3	4.2
Testis	108	112.2	-	-	7.0	-
Thyroid	49	57.6	140	150.2	3.3	9.4
Urinary Bladder	526	502.2	171	160.8	39.9	10.6

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-92: Southwestern Region 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	4282	4543.1	3754	3999.3	529.3	391.9
Brain & Other Nervous System	57	63.6	49	46.4	7.7	5.7
Breast	8	10.7	1169	1268.6	~	126.1
Cervix Uteri	-	-	60	49.7	-	8.1
Colon & Rectum	545	499.8	561	514.5	66.8	50.4
Corpus & Uterus, NOS	-	-	265	244.7	-	29.6
Esophagus	54	65.2	13	20.9	6.6	1.1
Hodgkin Lymphoma	16	25.1	23	19.8	2.3	3.1
Kaposi Sarcoma (all sites)	0	3.5	0	0.4	~	~
Kidney & Renal Pelvis	144	138.3	89	86.6	18.0	9.4
Larynx	39	47.8	2	11.2	4.9	~
Leukemia	155	148.8	89	107.8	19.2	8.2
Liver & Intrahepatic Bile Duct	25	40.5	12	18.7	3.1	1.2
Lung & Bronchus	536	592.7	312	456.6	65.8	33.3
Melanoma of the Skin	143	153.5	141	125.0	18.6	17.7
Mesothelioma (all sites)	13	21.3	7	4.4	1.7	~
Myeloma	50	51.5	43	42.0	6.2	4.2
Non-Hodgkin Lymphoma	179	204.2	180	184.1	22.3	17.3
Oral Cavity & Pharynx	105	124.7	52	64.6	13.3	4.7
Ovary	-	-	110	122.4	-	12.0
Pancreas	68	81.5	81	82.7	8.4	6.7
Prostate	1472	1536.4	-	-	179.7	-
Soft Tissues incl. Heart	32	25.7	16	24.1	4.3	1.8
Stomach	58	74.2	45	45.1	7.1	4.0
Testis	38	47.8	-	-	5.7	-
Thyroid	27	28.5	111	71.2	3.7	15.3
Urinary Bladder	292	318.4	88	109.3	35.0	7.9

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-93: South Central Region 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	2972	3074.8	2611	2764.5	542.7	393.0
Brain & Other Nervous System	45	46.1	38	33.6	8.3	6.6
Breast	3	7.1	815	885.0	~	126.6
Cervix Uteri	-	-	29	37.0	-	5.6
Colon & Rectum	322	333.4	364	343.9	58.8	47.6
Corpus & Uterus, NOS	-	-	187	170.1	-	29.2
Esophagus	38	44.1	13	14.0	7.0	1.8
Hodgkin Lymphoma	21	19.6	20	15.7	3.8	3.5
Kaposi Sarcoma (all sites)	0	2.6	0	0.3	~	~
Kidney & Renal Pelvis	97	95.3	60	59.5	17.8	8.9
Larynx	29	32.7	8	7.8	5.2	~
Leukemia	101	100.9	75	73.5	18.3	10.7
Liver & Intrahepatic Bile Duct	27	27.9	12	12.8	5.0	1.8
Lung & Bronchus	363	397.8	235	311.7	66.3	35.9
Melanoma of the Skin	119	107.7	100	91.8	22.0	17.0
Mesothelioma (all sites)	8	14.1	1	2.9	~	~
Myeloma	25	34.4	21	28.4	4.5	3.1
Non-Hodgkin Lymphoma	145	139.3	107	125.8	26.5	15.3
Oral Cavity & Pharynx	75	86.4	34	44.5	13.7	5.2
Ovary	-	-	83	86.0	-	13.1
Pancreas	49	55.0	45	55.6	9.0	6.1
Prostate	993	1030.6	-	-	181.1	-
Soft Tissues incl. Heart	26	18.4	14	17.4	4.7	2.2
Stomach	51	49.2	36	30.1	9.3	4.8
Testis	48	39.6	-	-	8.9	-
Thyroid	18	21.3	62	54.8	3.3	11.5
Urinary Bladder	199	210.1	65	73.3	36.4	8.4

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-94: Southeastern Region 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	6100	6058.5	5409	5484.4	564.6	410.9
Brain & Other Nervous System	109	93.7	58	68.5	9.8	4.8
Breast	12	13.9	1691	1779.5	1.1	132.0
Cervix Uteri	-	-	76	78.5	-	6.3
Colon & Rectum	691	652.3	752	662.9	64.4	52.0
Corpus & Uterus, NOS	-	-	332	340.6	-	25.9
Esophagus	86	86.9	29	26.9	7.9	2.0
Hodgkin Lymphoma	43	39.5	32	32.0	3.8	2.5
Kaposi Sarcoma (all sites)	4	5.3	0	0.5	~	~
Kidney & Renal Pelvis	204	190.5	122	117.2	18.6	9.5
Larynx	76	65.0	12	15.6	6.9	1.0
Leukemia	231	198.8	163	144.1	21.4	11.8
Liver & Intrahepatic Bile Duct	64	55.5	24	25.0	5.8	1.7
Lung & Bronchus	775	781.4	564	610.3	71.9	43.5
Melanoma of the Skin	208	216.3	201	189.6	18.9	16.7
Mesothelioma (all sites)	20	27.5	6	5.7	1.9	~
Myeloma	69	67.5	47	55.2	6.4	3.3
Non-Hodgkin Lymphoma	278	275.3	254	245.9	25.7	18.8
Oral Cavity & Pharynx	165	172.5	91	88.0	15.0	6.9
Ovary	-	-	160	172.1	-	12.8
Pancreas	100	108.5	106	107.5	9.3	7.7
Prostate	2016	2025.1	-	-	187.0	-
Soft Tissues incl. Heart	31	37.0	40	34.8	2.8	3.1
Stomach	89	96.0	39	58.1	8.3	2.6
Testis	80	81.4	-	-	7.1	-
Thyroid	59	43.6	140	116.0	5.3	12.1
Urinary Bladder	391	408.6	116	141.6	36.8	8.2

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

Table IV-95: Metropolitan Region 1998 - 2002 observed and expected numbers of cancers and average annual incidence rates for selected sites, all races combined

Cancer Site	Males		Females		Avg. Annual Rate§	
	Observed	Expected†	Observed	Expected†	Males	Females
All Sites	26399	26880.1	27052	26365.1	550.8	427.3
Brain & Other Nervous System	459	486.4	366	362.1	8.0	5.7
Breast	72	60.1	9278	8839.9	1.6	146.1
Cervix Uteri	-	-	429	456.4	-	6.3
Colon & Rectum	2573	2818.0	2683	2900.1	55.5	42.2
Corpus & Uterus, NOS	-	-	1625	1665.1	-	26.2
Esophagus	388	381.5	118	117.2	8.3	1.9
Hodgkin Lymphoma	229	224.4	177	181.1	3.5	2.6
Kaposi Sarcoma (all sites)	47	30.1	1	2.2	0.7	~
Kidney & Renal Pelvis	882	887.9	531	553.6	17.6	8.5
Larynx	303	294.0	80	75.9	6.2	1.3
Leukemia	878	899.3	654	667.9	17.9	10.3
Liver & Intrahepatic Bile Duct	293	258.6	122	115.6	5.8	2.0
Lung & Bronchus	3386	3368.4	3140	2805.9	73.5	51.8
Melanoma of the Skin	1127	1060.6	1043	1043.9	21.3	15.6
Mesothelioma (all sites)	112	115.6	24	25.5	2.5	0.4
Myeloma	303	292.7	274	248.6	6.5	4.4
Non-Hodgkin Lymphoma	1319	1259.6	1177	1137.4	27.0	18.6
Oral Cavity & Pharynx	815	816.9	447	419.2	15.7	7.0
Ovary	-	-	867	854.5	-	13.7
Pancreas	494	480.1	482	475.8	10.4	7.8
Prostate	8209	8673.3	-	-	176.8	-
Soft Tissues incl. Heart	187	187.7	164	176.7	3.3	2.5
Stomach	413	411.3	274	254.8	8.9	4.3
Testis	528	514.0	-	-	7.5	-
Thyroid	244	240.3	663	688.0	4.0	9.7
Urinary Bladder	1724	1713.9	660	622.3	38.7	10.4

§ Rates are per 100,000 persons and are age-adjusted to the 2000 U.S. population.

† Expected number of cancers based on State 1998 - 2002 incidence

~ Rates based on fewer than 10 cases are not presented.

- Not applicable; site is sex-specific.

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 1988-1991 were coded to the first edition of ICD-O, cases diagnosed in 1992-2000 according to the second edition (ICD-O-2), and those cases diagnosed in 2001-2002 according to the third edition (ICD-O-3). These codes were then grouped according to conventions developed by the Surveillance, Epidemiology, and End Results (SEER) program of the National Cancer Registry.

Cancer	Anatomic site (ICD-O-3)	Histologic Type (ICD-O-3)
Oral Cavity and Pharynx		Excluding 9590-9989, 9050-9055, 9140
Lip	C000-C009	
Tongue	C019-C029	
Salivary Gland	C079-C089	
Floor of Mouth	C040-C049	
Gum and Other Mouth	C030-C039, C050-C059, C060-C069	
Nasopharynx	C110-C119	
Tonsil	C090-C099	
Oropharynx	C100-C109	
Hypopharynx	C129, C130-C139	
Other Oral Cavity and Pharynx	C140, C142-C148	
Digestive System		Excluding 9590-9989, 9050-9055, 9140
Esophagus	C150-C159	
Stomach	C160-C169	
Small Intestine	C170-C179	
Colon excluding Rectum	C180-C189, C260	
Rectum and Rectosigmoid Junction	C199, C209	
Anus, Anal Canal, and Anorectum	C210-C212, C218	
Liver and Intrahepatic Bile Duct	C220, C221	
Gallbladder	C239	
Other Biliary	C240-C249	

Appendix A: Definitions for Cancer Incidence Data, continued

Cancer	Anatomic site (ICD-O-3)	Histologic Type (ICD-O-3)
Pancreas	C250-C259	
Retroperitoneum	C480	
Peritoneum, Omentum, and Mesentery	C481-C482	
Other Digestive Organs	C268-C269, C488	
Respiratory System		Excluding 9590-9989, 9050-9055, 9140
Nose, Nasal Cavity and Middle Ear	C300-C301, C310-C319	
Larynx	C320-C329	
Lung and Bronchus	C340-C349	
Pleura	C384	
Trachea, Mediastinum and Other Respiratory Organs	C339, C381-C383, C388, C390, C398, C399	
Mesothelioma	All sites	9050-9055
Bones and Joints	C400-C419	Excluding 9590-9989, 9050-9055, 9140
Soft Tissue including Heart	C380, C470-C479, C490-C499	Excluding 9590-9989, 9050-9055, 9140
Skin excluding Basal and Squamous		
Melanoma of the Skin	C440-C449	8720 – 8790
Other Non-Epithelial Skin	C440-C449	Excluding 8000-8005, 8010-8045, 8050-8084, 8090-8110, 8720-8790, 9590-9989, 9050-9055, 9140
Kaposi Sarcoma	All sites	9140
Breast	C500-C509	Excluding 9590-9989, 9050-9055, 9140
Female Genital System		Excluding 9590-9989, 9050-9055, 9140
Cervix Uteri	C530-C539	
Corpus and Uterus, NOS	C540-C549, C559	
Ovary	C569	
Vagina	C529	
Vulva	C510-C519	
Other Female Genital Organs	C570-C589	
Male Genital System		Excluding 9590-9989, 9050-9055, 9140
Prostate	C619	
Testis	C620-C629	
Penis	C600-C609	

Appendix A: Definitions for Cancer Incidence Data, continued

Cancer	Anatomic site (ICD-O-3)	Histologic Type (ICD-O-3)
Other Male Genital Organs	C630-C639	
Urinary System		Excluding 9590-9989, 9050-9055, 9140
Urinary Bladder	C670-C679	
Kidney and Renal Pelvis	C649, C659	
Ureter	C669	
Other Urinary Organs	C680-C689	
Eye and Orbit	C690-C699	Excluding 9590-9989, 9050-9055, 9140
Brain and Other Nervous System		
Brain	C710-C719	Excluding 9530-9539, 9590-9989, 9050-9055, 9140
Other Nervous System	C710-C719	9530-9539
	C700-C709, C720-C729	Excluding 9590-9989, 9050-9055, 9140
Endocrine System		Excluding 9590-9989, 9050-9055, 9140
Thyroid	C739	
Other Endocrine including Thymus	C379, C740-C749, C750-C759	
Lymphoma		
Hodgkin Lymphoma	All sites	9650-9667
Non-Hodgkin Lymphoma	C024, C098-C099, C111, C142, C379, C422, C770-C779	9590-9596, 9670-9671, 9673, 9675, 9678-9680, 9684, 9687, 9689-9691, 9695, 9698-9702, 9705, 9708-9709, 9714-9719, 9727-9729, 9823, 9827
	All sites except C024, C098-C099, C111, C142, C379, C422, C770-C779	9590-9596, 9670-9671, 9673, 9675, 9678-9680, 9684, 9687, 9689-9691, 9695, 9698-9702, 9705, 9708-9709, 9714-9719, 9727-9729
	All sites, except C024, C098-C099, C111, C142, C379, C420-C422, C424, C770-C779	9823, 9827
Multiple Myeloma	All sites	9731-9732, 9734
Leukemia		
Lymphocytic Leukemia		
Acute Lymphocytic Leukemia	All sites	9826, 9835-9837
Chronic Lymphocytic Leukemia	C420-C421, C424	9823
Other Lymphocytic Leukemia	All sites	9820, 9832-9834, 9940

Appendix A: Definitions for Cancer Incidence Data, continued

Cancer	Anatomic site (ICD-O-3)	Histologic Type (ICD-O-3)
Myeloid and Monocytic Leukemia		
Acute Myeloid Leukemia	All sites	9840, 9861, 9866, 9867, 9871-9874, 9895-9897, 9910, 9920
Acute Monocytic Leukemia	All sites	9891
Chronic Myeloid Leukemia	All sites	9863, 9875, 9876, 9945, 9946
Other Myeloid/Monocytic Leukemia	All sites	9860, 9930
Other Leukemia		
Other Acute Leukemia	All sites	9801, 9805, 9931
Aleukemic, Subleukemic and NOS	All sites	9733, 9742, 9800, 9831, 9870, 9948, 9963, 9964
	C420-C421,C424	9827
Miscellaneous	All sites	9740-9741, 9750-9758, 9760-9769, 9950, 9960-9962, 9970, 9975, 9980, 9982-9987, 9989
	C420-C424, C760-C768, C770-C779, C809	Excluding 9590-9989, 9050-9055, 9140

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. 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-9)	Anatomic site (ICD-10)
Oral Cavity and Pharynx		
Lip	140	C00
Tongue	141	C01-C02
Salivary Gland	142	C07-C08
Floor of Mouth	144	C04
Gum and Other Mouth	143, 145	C03, C05-C06
Nasopharynx	147	C11
Tonsil	146.0-146.2	C09
Oropharynx	146.3-146.9	C10
Hypopharynx	148	C12-C13
Other Oral Cavity and Pharynx	149	C14
Digestive System		
Esophagus	150	C15
Stomach	151	C16
Small Intestine	152	C17
Colon excluding Rectum	153,159.0	C18, C26.0
Rectum and Rectosigmoid Junction	154.0-154.1	C19-C20
Anus, Anal Canal, and Anorectum	154.2-154.3, 154.8	C21
Liver	155.0, 155.2	C22.0, C22.2-C22.4, C22.7, C22.9
Intrahepatic Bile Duct	155.1	C22.1
Gallbladder	156.0	C23
Other Biliary	156.1-156.2, 156.8-156.9	C24
Pancreas	157	C25
Retroperitoneum	158.0	C48.0
Peritoneum, Omentum, and Mesentery	158.8-158.9	C48.1-C48.2
Other Digestive Organs	159.8-159.9	C26.8-C26.9, C48.8

Appendix B: Definitions for Cancer Mortality Data

Cancer	Anatomic site (ICD-9)	Anatomic site (ICD-10)
Respiratory System		
Nose, Nasal Cavity, and Middle Ear	160	C30-C31
Larynx	161	C32
Lung and Bronchus	162.2-162.5, 162.8-162.9	C34
Pleura	163	C38.4
Trachea, Mediastinum, and Other Respiratory Organs	162.0, 164.2-164.3, 164.8-164.9, 165	C33, C38.1-C38.3, C38.8, C39
Mesothelioma	N/A	C45
Bones and Joints	170	C40-C41
Soft Tissue including Heart	164.1, 171	C47, C49, C38.0
Skin excluding Basal and Squamous		
Melanoma of the Skin	172	C43
Other Non-Epithelial Skin	173	C44
Kaposi Sarcoma	N/A	C46
Breast	174-175	C50
Female Genital System		
Cervix Uteri	180	C53
Corpus and Uterus, NOS	179, 182	C54-C55
Ovary	183.0	C56
Vagina	184.0	C52
Vulva	184.1-184.4	C51
Other Female Genital Organs	181, 183.2-183.5, 183.8-183.9, 184.8-184.9	C57-C58
Male Genital System		
Prostate	185	C61
Testis	186	C62
Penis	187.1-187.4	C60
Other Male Genital Organs	187.5-187.9	C63
Urinary System		
Bladder	188	C67
Kidney and Renal Pelvis	189.0-189.1	C64-C65
Ureter	189.2	C66

Appendix B: Definitions for Cancer Mortality Data

Cancer	Anatomic site (ICD-9)	Anatomic site (ICD-10)
Other Urinary Organs	189.3-189.4, 189.8-189.9	C68
Eye and Orbit	190	C69
Brain and Other Nervous System	191, 192	C70, C71, C72
Endocrine System		
Thyroid	193	C73
Other Endocrine, including Thymus	164.0, 194	C37, C74-C75
Lymphoma		
Hodgkin Lymphoma	201	C81
Non-Hodgkin Lymphoma	200, 202.0-202.2, 202.8-202.9	C82-C85, C96.3
Multiple Myeloma	203.0, 238.6	C90.0, C90.2
Leukemia		
Lymphocytic Leukemia		
Acute Lymphocytic Leukemia	204.0	C91.0
Chronic Lymphocytic Leukemia	204.1	C91.1
Other Lymphocytic Leukemia	202.4, 204.2, 204.8-204.9	C91.2-C91.4, C91.7, C91.9
Myeloid and Monocytic Leukemia		
Acute Myeloid Leukemia	205.0, 207.0, 207.2	C92.0, C92.4-C92.5, C94.0, C94.2
Acute Monocytic Leukemia	206.0	C93.0
Chronic Myeloid Leukemia	205.1	C92.1
Other Myeloid/Monocytic Leukemia	205.2-205.3, 205.8-205.9, 206.1-206.2, 206.8-206.9	C92.2-C92.3, C92.7, C92.9, C93.1-C93.2, C93.7, C93.9
Other Leukemia		
Other Acute Leukemia	208.0	C94.4, C94.5, C95.0
Aleukemic, Subleukemic and NOS	203.1, 207.1, 207.8, 208.1-208.2, 208.8-208.9	C90.1, C91.5, C94.1, C94.3, C94.7, C95.1, C95.2, C95.7, C95.9
Miscellaneous	159.1, 195-199, 202.3, 202.5-202.6, 203.8	C26.1, C76-C80, C88, C96.0-C96.2, C96.7, C96.9, C97

[This page left intentionally blank]

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 for the text and graphs are shown in parentheses.

Region	Counties			
Metropolitan Minnesota (Metro)	Anoka Carver	Dakota Hennepin	Ramsey Scott	Washington
Southeastern Minnesota (SE)	Dodge Fillmore Freeborn	Goodhue Houston Mower	Olmsted Rice Steele	Wabasha Winona
South Central Minnesota (SC)	Blue Earth Brown Faribault	Le Sueur Martin	Nicollet Sibley	Waseca Watsonwan
Southwestern Minnesota (SW)	Big Stone Chippewa Cottonwood Jackson Kandiyohi	Lac Qui Parle Lincoln Lyon McLeod Meeker	Murray Nobles Pipestone Redwood Renville	Rock Swift Yellow Medicine
Central Minnesota (Central)	Benton Cass Chisago Crow Wing	Isanti Kanabec Mille Lacs Morrison	Pine Sherburne Stearns Todd	Wadena Wright
West Central Minnesota (WC)	Becker Clay Douglas	Grant Otter Tail	Pope Stevens	Traverse Wilkin
Northwestern Minnesota (NW)	Beltrami Clearwater Hubbard	Kittson Lake of the Woods Mahnommen	Marshall Norman Pennington	Polk Red Lake Roseau
Northeastern Minnesota (NE)	Aitkin Carlton	Cook Itasca	Koochiching Lake	St. Louis

[This page left intentionally blank]

Appendix D: Glossary

Age-Adjusted Rate: 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. All age-adjusted rates in this report are age-adjusted to the 2000 U.S. population and are expressed per 100,000 persons.

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).

Annual Percent Change (APC): The average percent change in the age-adjusted rate each year over a specified period of time. See also Appendix E.

Artifact: Any artificial product. In epidemiology, any observation that has been introduced by the methods used for data collection or data analysis.

Benign: A tumor or abnormal cell growth that is not malignant and unlikely to metastasize.

Cancer: A group of diseases characterized by rapid, uncontrolled cell growth, with a tendency to spread throughout the body.

Cancer Incidence: The number of new cases of cancer diagnosed during a specified period of time.

Cancer Incidence Rate: The rate at which newly diagnosed cancers occur in a population (the number of cancers occurring in a defined period of time divided by the total number of people in the population during that period of time).

Cancer Mortality: The number of deaths due to cancer during a specified period of time, regardless of when the disease was diagnosed.

Cancer Mortality Rate: The rate at which cancer-related 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).

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. The MCSS is a population-based cancer registry.

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.

Glossary

CDC: Centers for Disease Control and Prevention.

Clinical Diagnosis: Cancers that are not histologically confirmed, but are instead diagnosed through other means—for example, through imaging procedures such as CT scans. The MCSS does not collect information on cancers that are only clinically diagnosed and have no microscopic confirmation.

Cumulative Lifetime Risk of Cancer: As calculated in this report, this is the estimated percentage of newborns in Minnesota in 2000-2002 who would be diagnosed with cancer over their entire lifetime, if cancer incidence and mortality and all-cause mortality rates do not change from those in 2000-2002. See also Appendix E.

Death Clearance: A quality control activity that links the 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 on each of these cases to see if the cancer should have been included in the database.

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.

Five-year Relative Survival: The estimated proportion of persons who will be alive five years following diagnosis, after adjusting for expected mortality from other causes.

Histology: The type of tissue in which a tumor originated, e.g., glandular tissue, connective tissue, etc.

ICD-9 and ICD-10: The ninth and tenth revisions of the International Classification of Diseases used to code and classify underlying cause of death.

ICD-O-FT, ICD-O-2 and ICD-O-3: The 1987 Field Trial, second and third revisions of the International Classifications of Diseases for Oncology used to code and classify anatomic site and histologic type of cancer cases.

Invasive: The tendency of a tumor to spread to adjacent healthy tissues. Technically, “invasive” means the carcinoma has penetrated the basement membranes and is close to blood vessels.

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.

Median Age: As calculated in this report, the midpoint of the age distribution of group of persons diagnosed with or dying of cancer during the 3-year period 2000-2002; that is, the age at which 50 percent of cases or deaths are younger and 50 percent are older.

Microscopic Confirmation: A tumor of which at least a piece has been examined microscopically and diagnosed by a pathologist or other specialist.

NAACCR: North American Association of Central Cancer Registries.

NPCR: National Program of Cancer Registries.

Observed Number of Cases: The actual (also called crude) number of cases of a cancer recorded for a given population for a given period of time.

Pathology: The branch of medicine that studies the essential nature of disease, especially the structural changes in tissues or organs associated with disease.

Prevalence: The number of people alive on a certain date who have been diagnosed with cancer at any time in their lives. Prevalence considers both newly diagnosed and previously diagnosed cancers.

Primary Site (cancer 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.

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 thirteen U.S. regions comprising approximately 10 or 14 percent of the U.S. population depending on which years of data are examined. Since a cancer registry covering the entire U.S. does not exist, cancer incidence data from SEER are widely cited as national data.

Stage at diagnosis: The extent to which the cancer has spread at the time of diagnosis. Two well-known staging systems include the General Summary Stage system, developed for the SEER Program, and the TNM staging system, developed by the American Joint Committee on Cancer. For this report, the following terms describing cancer stage are used:

- ***In situ*:** earliest stage of cancer development in which the tumor has not infiltrated the tissue of the organ in which they are growing;
- **Localized:** tumor has invaded the tissue of the organ, but has not spread beyond the organ in which the tumor originated;
- **Regional:** tumor has spread beyond the organ in which the tumor originated to adjacent lymph nodes or tissues;
- **Distant:** most advanced stage of cancer development in which the tumor has spread, or metastasized, beyond the organ in which the tumor originated to organs in other parts of the body;
- **Unknown:** unstaged tumors due to insufficient information recorded in the medical record to determine the extent of the tumor at the time of diagnosis.

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

Age-Adjusted Rates

Age-adjusted rates were calculated using the Surveillance Research Program, National Cancer Institute SEER*Stat software (www.seer.cancer.gov/seerstat) version 6.1.4. Cases diagnosed in 2001-2002 with histology defined as a “borderline malignancy” under ICD-O-2 coding rules and “invasive” under ICD-O-3 were not included under data for All Cancer Sites Combined or Miscellaneous cancers. These histologies (9950, 9960-9962, and 9980-9989) are miscellaneous myeloproliferative and lymphoproliferative disorders and myelodysplastic syndromes; they accounted for a total of 736 diagnoses over the two-year period 2001-2002.

$$age\text{-}adjusted\text{-}rate = \sum_{i=1}^k \left[\left(\frac{count_i}{pop_i} \right) \times 100,000 \times \left(\frac{std_{mi_i}}{\sum_{j=1}^k std_{mi_j}} \right) \right]$$

Standard Population

2000 U.S. Standard Million Population

Age group (years)	Population
0	13,818
1-4	55,317
5-9	72,533
10-14	73,032
15-19	72,169
20-24	66,478
25-29	64,529
30-34	71,044
35-39	80,762
40-44	81,851
45-49	72,118
50-54	62,716
55-59	48,454
60-64	38,793
65-69	34,264
70-74	31,773
75-79	26,999
80-84	17,842
85+	15,508

Trends/Annual Percent Change

All Minnesota trends were calculated using the Surveillance Research Program, National Cancer Institute Joinpoint Regression Program (<http://www.seer.cancer.gov/joinpoint>) version 3.0, with a maximum of three joinpoints (i.e. four line segments). Joinpoint takes annual age-adjusted cancer rates and their standard errors and identifies points in time where trends change direction and calculates the Annual Percent Change (APC) during the intervals between these points, called a segment. Only the APC for the segment ending in 2002 is presented.

Statistical Methods

Cumulative Lifetime Risk

Cumulative lifetime risk was calculated using DevCan (<http://www.seer.cancer.gov/devcan>) version 6.0, using site-, sex-, and age-specific incidence, cancer mortality and all cause mortality in Minnesota for 2000-2002. It represents the estimated percentage of newborns in Minnesota in 2000-2002 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 2000-2002.

Statistical Significance

Statistical significance was based on 95% confidence intervals for all age-adjusted rates and trends.

Prevalence

MCSS cannot directly calculate prevalence for Minnesota because MCSS has only registered cancers in Minnesota since 1988 and does not have complete follow-up information on the vital status of the individual. However, prevalence percents based on cancer registration in the SEER Program are available in the National Cancer Institute Cancer Prevalence Database at <http://srab.cancer.gov/prevalence/canques.html>, and are the basis for estimating complete and five-year prevalence for Minnesota.

The age-, sex- and site-specific cancer prevalence percents (5-year and 25-year) for the white population in the nine regions participating in the SEER Program since 1975 were obtained from the Cancer Prevalence Database for all sites combined and the most common cancers. Prevalence percents were multiplied by the corresponding age- and sex-specific population estimates for Minnesota on January 1, 2002, obtained by averaging estimates for the mid-year of 2001 and 2002 obtained from SEER.

To adjust for generally lower cancer rates in Minnesota, the resulting numbers were multiplied by age-, sex- and site-specific rate ratios for cancer incidence in Minnesota and in the SEER 9 Region white population during 1988-2002. Age-specific estimates were summed for site and sex totals and rounded to the nearest ten persons. The prevalence estimates for males and females were summed to estimate prevalence for both sexes combined. Complete prevalence was estimated by applying the site-specific ratio of complete to 25-year prevalence in the U.S. from the Cancer Prevalence Database to the 25-year estimates for Minnesota.

The prevalence data presented here are estimates, not actual counts of Minnesotans living with cancer. Adjusting the prevalence percents for the white population in the nine SEER regions by known differences in cancer incidence between Minnesota and SEER decreased cancer prevalence estimates for Minnesota. This is appropriate given that overall cancer incidence has historically been lower in Minnesota than in the geographic areas participating in the SEER program.

However, other factors affecting cancer prevalence could not be adjusted for. If Minnesotans have higher cancer survival rates than the SEER 9 Region white population, our prevalence estimates will be too low. MCSS is not yet able to calculate cancer survival rates for Minnesotans because of incomplete follow-up information. However, given the recognized high quality of health care in Minnesota, higher survival rates in Minnesota may occur. Similarly, Minnesotans have a higher life expectancy than many other states, due in part to having the lowest heart disease mortality rate in the nation. Since Minnesotans live longer and therefore have more “opportunity” to develop cancer, these prevalence estimates may be too low. It is therefore likely that the prevalence estimates presented here represent the lower limits of actual prevalence.