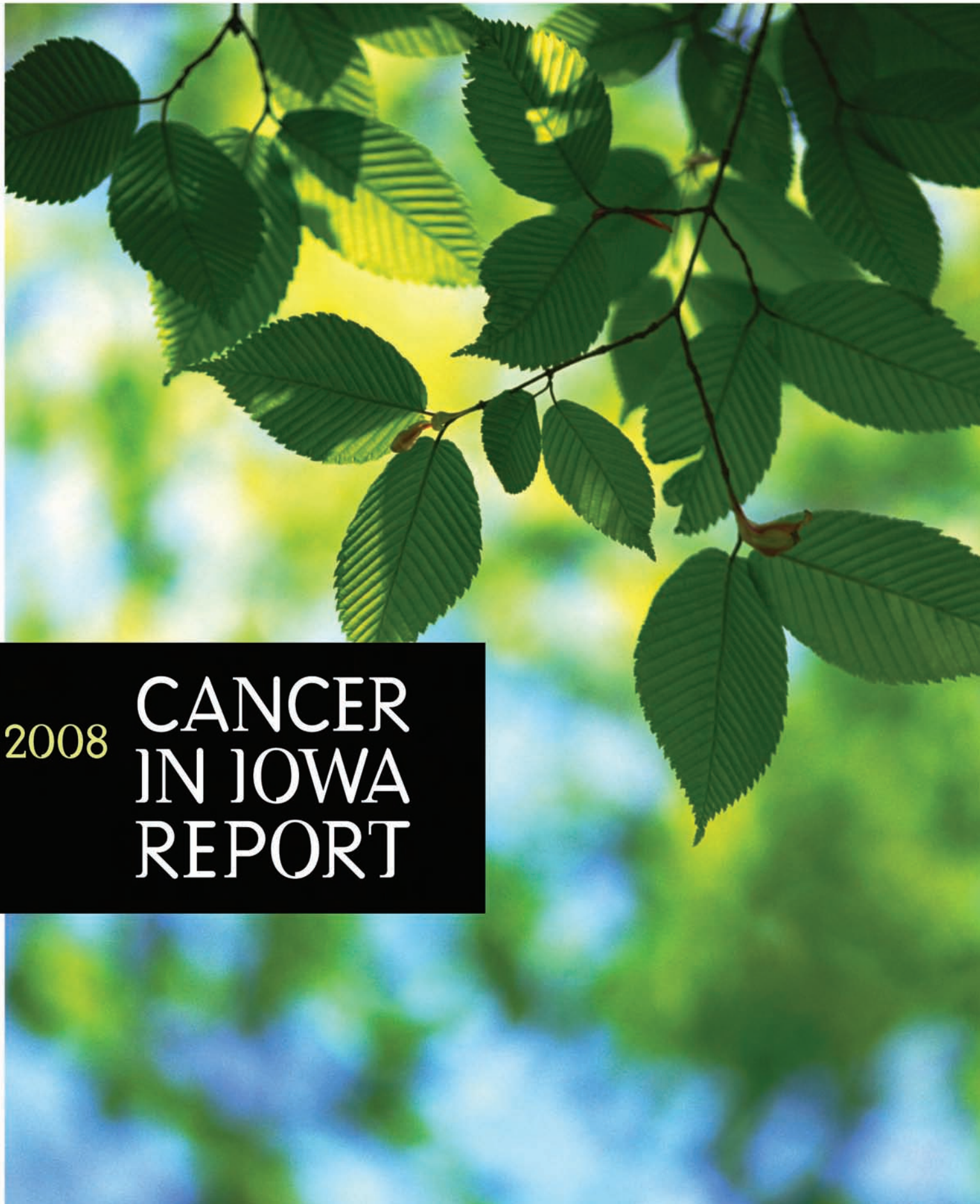
State Health Registry of Iowa

The University of Iowa



2008 CANCER IN IOWA REPORT

In 2008, an estimated 6,300 Iowans will die from cancer, 14 times the number caused by auto fatalities. Cancer is second only to heart disease as a cause of death.

These projections are based upon mortality data the State Health Registry of Iowa receives from the Iowa Department of Public Health. The Registry has been recording the occurrence of cancer in Iowa since 1973, and is one of 15 population-based registries and three supplementary registries nationwide providing data to the National Cancer Institute.

With *2008 Cancer in Iowa* the Registry makes a general report to the public on the status of cancer. This report will focus on:

- **a description of the Registry and its goals;**
- **cancer estimates for 2008;**
- **a special section on non-Hodgkin lymphoma;**
- **brief summaries of recent/ongoing research projects;**
- **a selected list of publications from 2007.**

The Goals of the Registry are to:

- **assemble and report measurements of cancer incidence, survival and mortality among Iowans;**
- **provide information on changes over time in the extent of disease at diagnosis, therapy, and patient survival;**
- **promote and conduct studies designed to identify factors relating to cancer etiology, prevention and control;**
- **respond to requests from individuals and organizations in the state of Iowa for cancer data and analyses;**
- **provide data and expertise for cancer research activities and educational opportunities.**

THE STATE HEALTH REGISTRY OF IOWA

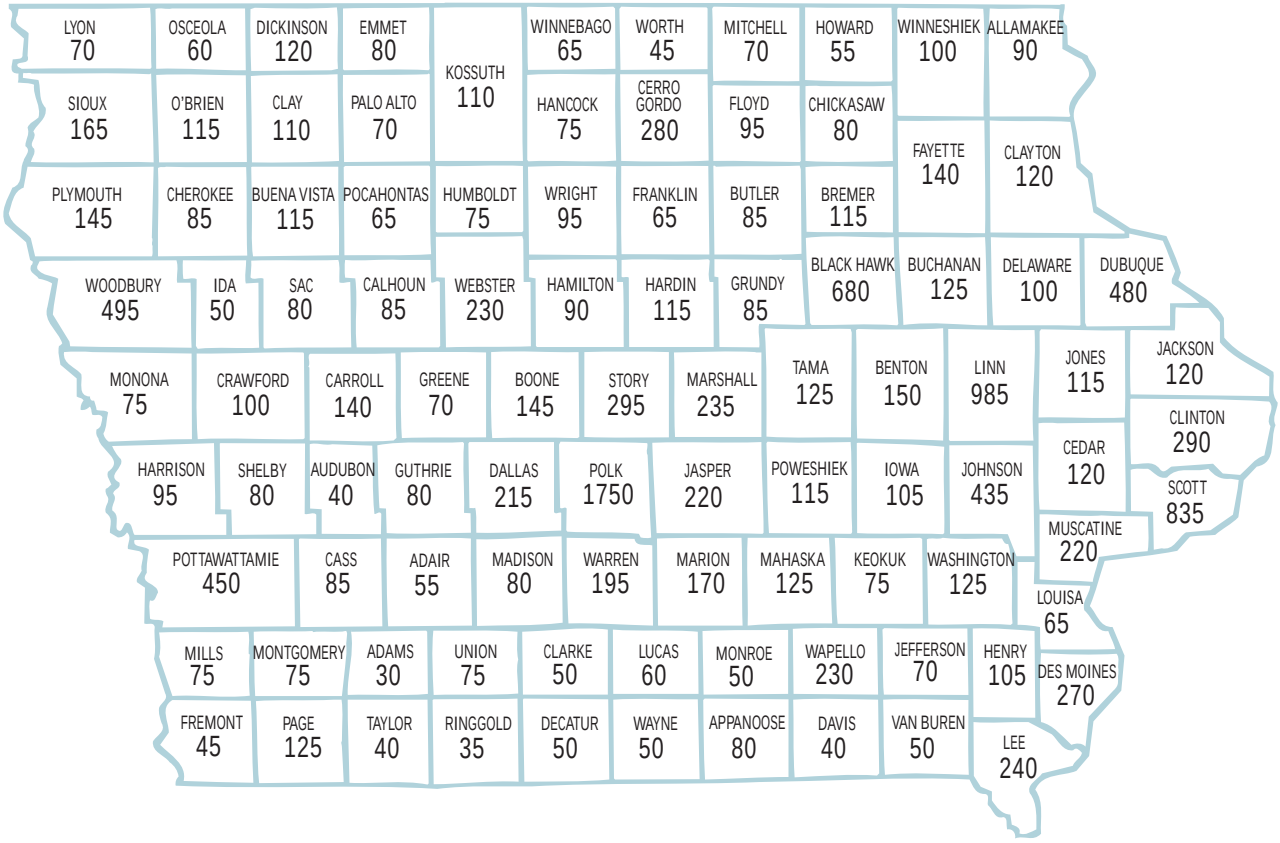
Cancer is a reportable disease as stated in the Iowa Administrative Code. Cancer data are collected by the State Health Registry of Iowa, located at The University of Iowa in the College of Public Health's Department of Epidemiology. The staff includes more than 50 people. Half of them, situated throughout the state, regularly visit hospitals, clinics, and medical laboratories in Iowa and neighboring states to collect cancer data. A follow-up program tracks more than 99 percent of the cancer survivors diagnosed since 1973. This program provides regular updates for follow-up and survival. The Registry maintains the confidentiality of the patients, physicians, and hospitals providing data.

In 2008 data will be collected on an estimated 16,000 new cancers among Iowa residents. Noninvasive cases of bladder cancer are included in the estimates for bladder cancer, to be in agreement with the definition of reportable cases of the Surveillance, Epidemiology, and End Results (SEER) Program of the National Cancer Institute.

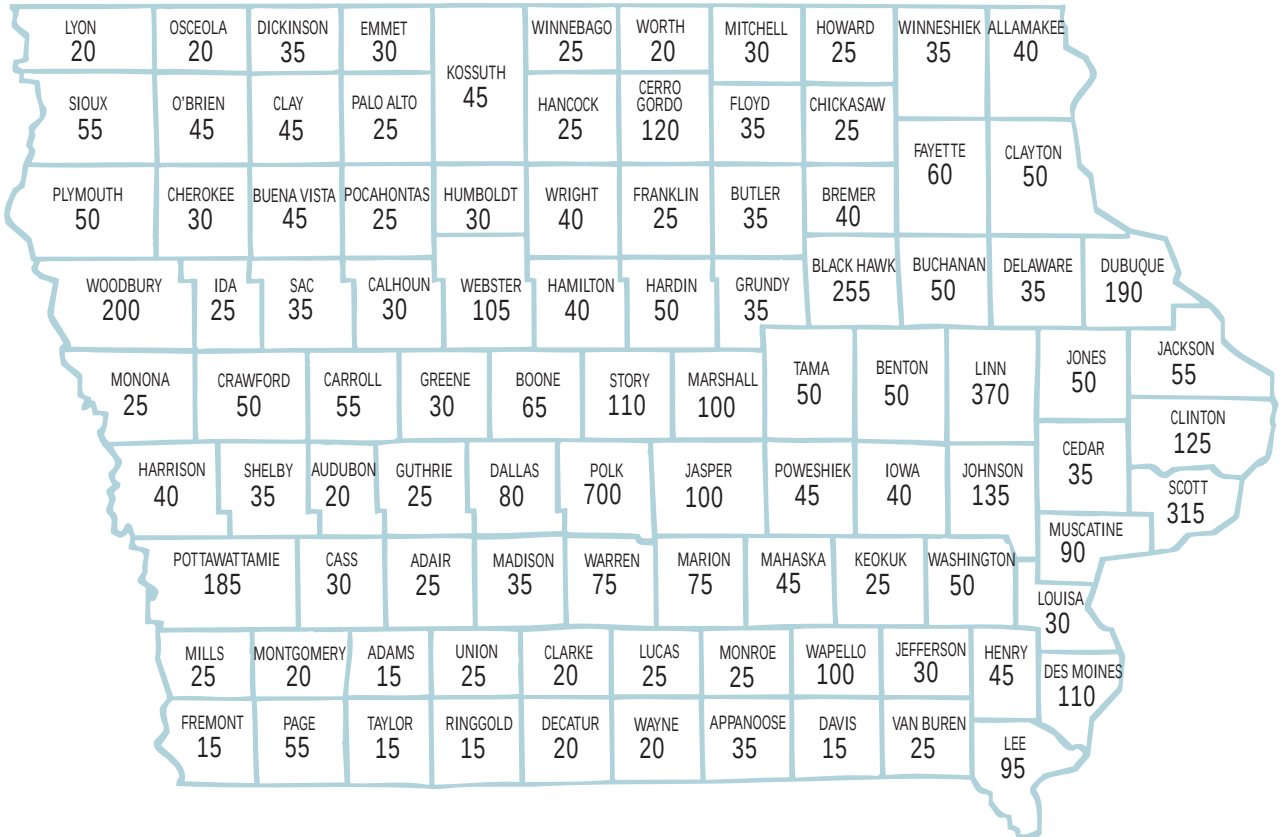
Since 1973 the Iowa Registry has been funded primarily by the SEER Program of the National Cancer Institute. Iowa represents rural and Midwestern populations and provides data included in many National Cancer Institute publications. Beginning in 1990 a small percent of the Registry's annual operating budget has been provided by the state of Iowa. Beginning in 2003, the University of Iowa has also been providing cost-sharing funds. The Registry also receives funding through grants and contracts with university, state, and national researchers investigating cancer-related topics.

CANCER PROJECTIONS FOR 2008

Estimated Number of New Cancers in Iowa for 2008



Estimated Number of Cancer Deaths in Iowa for 2008



TOP 10 TYPES OF CANCER IN IOWA ESTIMATED FOR 2008

New Cancers in Females

Type	# of Cancers	% of Total
Breast	2120	27.5
Lung	980	12.7
Colon & Rectum	940	12.2
Uterus	470	6.1
Non-Hodgkin Lymphoma	340	4.4
Skin Melanoma	280	3.7
Ovary	240	3.1
Thyroid	220	2.9
Leukemia	210	2.7
Kidney & Renal Pelvis	200	2.6
All Others	1700	22.1
Total	**7700**	

Cancer Deaths in Females

Type	# of Cancers	% of Total
Lung	730	24.4
Breast	430	14.3
Colon & Rectum	330	11.0
Pancreas	180	6.0
Ovary	180	6.0
Non-Hodgkin Lymphoma	130	4.3
Leukemia	120	4.0
Uterus	100	3.3
Brain	80	2.7
Kidney & Renal Pelvis	70	2.3
All Others	650	21.7
Total	**3000**	

New Cancers in Males

Type	# of Cancers	% of Total
Prostate	2100	25.3
Lung	1250	15.0
Colon & Rectum	930	11.2
Bladder (invasive and noninvasive)	620	7.5
Non-Hodgkin Lymphoma	400	4.8
Skin Melanoma	340	4.1
Kidney & Renal Pelvis	330	4.0
Leukemia	290	3.5
Oral Cavity	220	2.7
Pancreas	180	2.2
All Others	1640	19.7
Total	**8300**	

Cancer Deaths in Males

Type	# of Cancers	% of Total
Lung	1000	30.3
Prostate	350	10.6
Colon & Rectum	310	9.4
Pancreas	180	5.5
Leukemia	160	4.8
Non-Hodgkin Lymphoma	140	4.3
Esophagus	140	4.3
Bladder	100	3.0
Kidney & Renal Pelvis	100	3.0
Brain	100	3.0
All Others	720	21.8
Total	**3300**	

Fortunately for Iowans, the chances of being diagnosed with many types of cancer can be reduced through positive health practices such as smoking cessation, physical exercise, healthful dietary habits, and alcohol consumption in moderation. Early detection through obtaining recommended screening tests and regular health checkups can improve cancer survival.

NON-HODGKIN LYMPHOMA

Non-Hodgkin lymphoma (NHL) is the 6th most common cancer that the State Health Registry of Iowa will track this year. This cancer typically arises in lymphoid tissue in the lymphatic system, which is part of the body's immune system. In the lymphatic system, a network of lymph vessels carries clear fuid called lymph. Lymph vessels lead to small, round organs called lymph nodes. Lymph nodes are filled with lymphocytes, a type of white blood cell. The lymph nodes identify and react to bacteria or other harmful substances that may be in the lymph. Groups of lymph nodes are found in the neck, underarms, chest, abdomen, and groin. Other parts of the lymphatic system include the tonsils, spleen, and thymus. These parts of the lymphatic system give rise to nodal NHL. There is also lymphoid tissue in the oral cavity, pharynx, stomach, small intestine, lung, skin, and brain in which lymphomas can arise; these are called extranodal NHL.

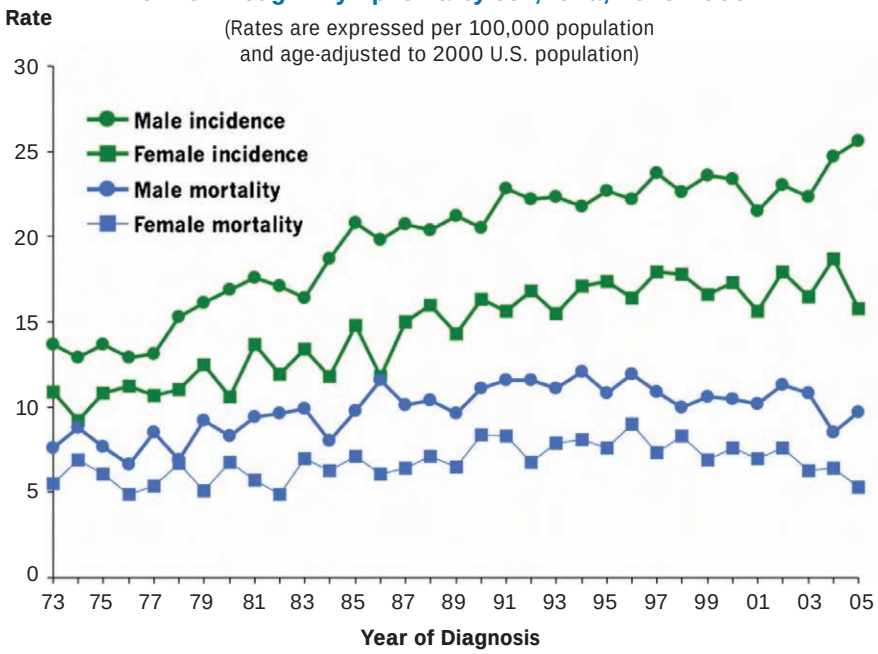
NHL has been one of the most rapidly increasing types of cancer in the United States, having more than doubled in incidence (new NHL diagnoses) since the 1970s. While a small fraction of this increase is due to AIDS-related NHL, for the most part the reason is unknown. Figure 1 shows incidence rates of NHL by gender for the state of Iowa for 1973-2005. Male incidence has always been greater than female incidence. In both genders, the increase in incidence was most rapid during the 1980s. When compared to the 8 other SEER geographic areas, Iowa's rates have generally been in the middle over this 33-year period. Mortality rates (shown in figure 1) have also increased over this timeframe, and are also higher in males than females. In the 1990s in Iowa, the annual rate of increase in NHL incidence lessened, and an increase in the survival rates was observed, which has led to more recent declines in the mortality rate (number of deaths due to NHL).

NHLs are characterized by the abnormal growth of lymphocytes. Lymphocytes exist either as B-cells or T-cells. B-cells develop into plasma cells that produce antibodies to fight infections. T-cells directly attack foreign invaders, such as bacteria or viruses. NHLs are often divided into subtypes based on how the cancer cells look under a microscope, their pattern of growth, and other specialized tests done on the cancer cells. It is important to accurately determine the subtype of NHL because subtypes can behave differently and often require different treatments.

Subtype classification schemes for NHL have been modified several times over the past few decades based on increasing knowledge of this disease. Between 1992 and 2005, there were 8,800 NHLs diagnosed among Iowans, and

Figure 1. **Age-adjusted incidence and mortality rates for non-Hodgkin lymphoma by sex, Iowa, 1973-2005**

(Rates are expressed per 100,000 population and age-adjusted to 2000 U.S. population)



these were about evenly split between men and women. 71% were nodal NHLs and 29% were extranodal. Of the 8,800 NHLs, 87% were B-cell lymphomas, 7% T-cell lymphomas, and the remainder were of other or unknown subtype. Among the B-cell lymphomas, the two major subtypes were diffuse large B-cell lymphoma (46%) and follicular lymphoma (24%). Follicular lymphoma is typically low grade and slow growing, while diffuse large B-cell lymphoma is more aggressive. Recent advances in our understanding of the molecules and genes that cause lymphoma cells to behave abnormally are allowing us to classify lymphomas based not only on their appearance under the microscope, but also on the gene expression patterns of the lymphoma cells. Such genetic approaches will likely continue to lead to different classification schemes in the years ahead. Most importantly, it is hoped this will allow for more individualized approaches to therapy.

The exact causes of NHL are not known. Research shows that certain risk factors increase a person's chance of developing this disease. Having a weak immune system (from an inherited condition, human immunodeficiency virus (HIV) infection, or certain drugs), increases the risk for NHL. Certain types of infections, including HIV, Epstein-Barr virus (EBV), *Helicobacter pylori* (bacteria that can cause stomach ulcers), Human T-cell leukemia/lymphoma virus (HTLV-1), and Hepatitis C, increase the risk of some subtypes of lymphoma. Various environmental risk factors, such as polychlorinated biphenyls (PCBs), pesticides, solvents, and hair dyes have also been associated with increased risk of NHL. As a result, occupations such as farming are associated with increased risk.

The risk of developing this disease increases with age. Most people with NHL are older than 60.

Researchers have also noted differences in the incidence patterns of NHL subtypes. As an example, in Figure 2a age-adjusted incidence rates for 1992-2005 are shown for diffuse large B-cell lymphoma (DLBCL) and for follicular lymphoma by sex and in Figure 2b age-specific incidence rates are shown. DLBCL male incidence rates are consistently

Figure 2a. **Age-adjusted incidence for common subtypes of non-Hodgkin B-cell lymphoma by sex, Iowa, 1992-2005**

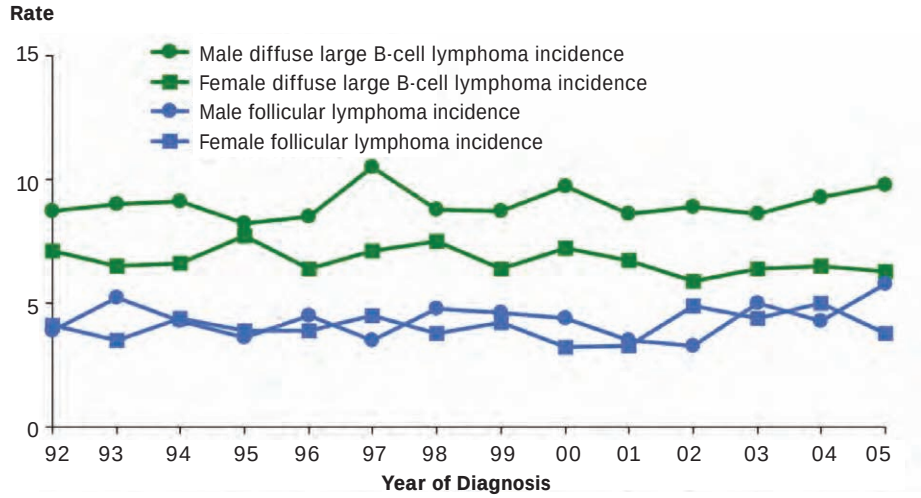
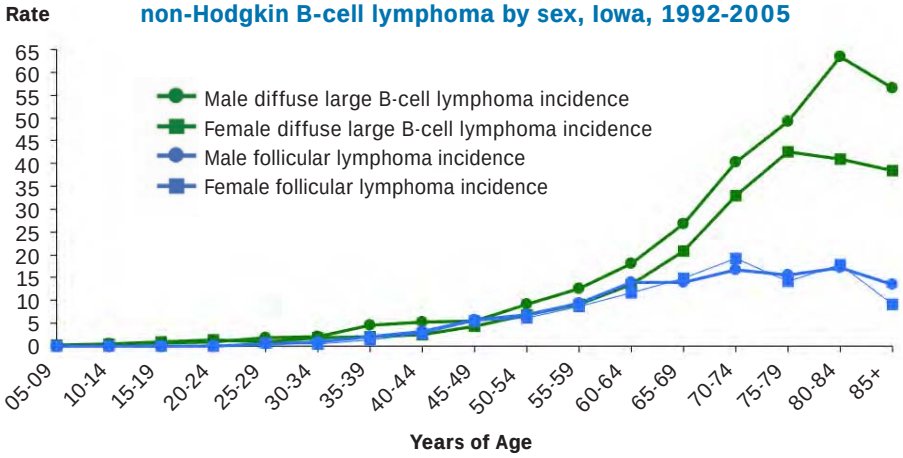
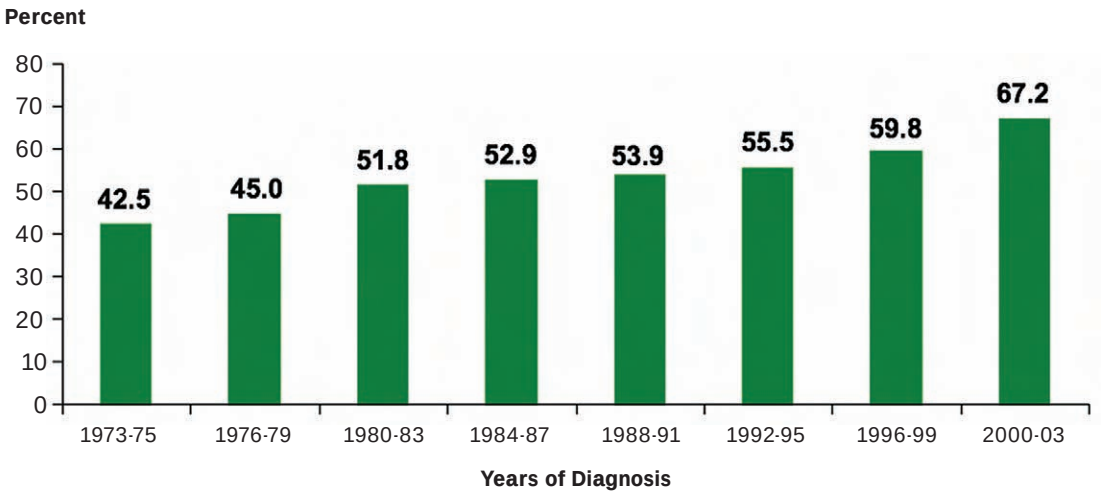


Figure 2b. **Age-specific incidence rates for common subtypes of non-Hodgkin B-cell lymphoma by sex, Iowa, 1992-2005**



(Rates are expressed per 100,000 population and age-adjusted to 2000 U.S. population)

Figure 3. **5-year relative survival percents by time period, Iowa, 1973-2003**



higher than female incidence rates by year of diagnosis and by age at diagnosis. Both sexes show a dramatic increase in age-specific rates after age 50 that peaks at age 75-79 for females but at 80-84 for males. However, follicular lymphoma shows much greater similarity between males and females, and the increase with age is not as pronounced. To researchers, these findings suggest that while these subtypes both arise from the same cell of origin (B-cell), they may evolve as unique diseases that have unique risk factors.

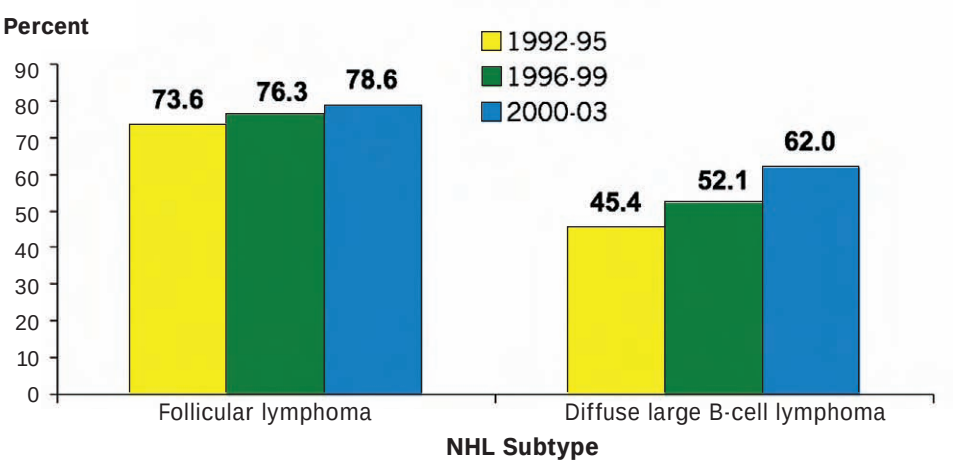
A population-based case-control study, in which four SEER registries (including Iowa) participated, has been contributing important findings in this regard. A listing of some of the findings, published in 2007, is provided in the publications section of this monograph. Briefy, for DLBCL, late birth order and high body mass index appear to increase risk as well as genetic factors that lead to immune dysfunction. On the other hand, several other risk factors appear to increase the risk of follicular lymphoma such as greater height, use of permanent hair dyes before 1980 (when certain carcinogenic dyes were used), and genetic factors related to DNA repair and to direct DNA damage from environmental carcinogens.

There are no recommended screening tests for the early detection of NHL. This leaves reducing incidence and/or improving therapy as the two major options to reduce NHL mortality. Traditionally, treatment for NHL has consisted of chemotherapy and radiation therapy. More recently, immuno-therapy has been added to treatment regimens. As shown in Figure 3, five-year relative survival percents have increased over the past 30 years in Iowa from 42.5% for NHL diagnosed during 1973 to 1975 to 67.2% for NHL diagnosed during 2000 to 2003. The biggest increases in these survival percents occurred initially between 1976-79 and 1980-83 and more recently between 1996-99 and 2000-03. Reasons for the former likely relate to the discovery and wider use of new chemotherapy regimens and diagnostic tests, while the reason for the latter relates to the development and use of

immunotherapy, most notably Rituximab. Rituximab was approved in 1997 by the Food and Drug Administration. It is a monoclonal antibody that attaches to a specific protein on the surface of most B-cells. This drug has had an enormous impact on the treatment of NHL involving B-cell subtypes, which account for the majority of lymphomas. This impact is likely reflected in Figure 4, where five-year survival percents are increasing for the two common subtypes of B-cell NHL as this drug becomes more widely used as common therapy. Researchers are still developing new approaches that take optimal advantage of Rituximab. In addition, ongoing studies are exploring whether the next generation of monoclonal antibody treatments are superior to Rituximab, or whether other novel approaches to lymphoma therapy might result in additional improvements. These novel approaches include individualized lymphoma vaccines or drugs that interfere with abnormal activities in lymphoma cells.

A point and click cancer data retrieval system is now available for Iowa at www.public-health.uiowa.edu/shri. Click on Iowa Cancer Data. Try it out!

Figure 4. **5-year relative survival percents for common subtypes of non-Hodgkin lymphoma, Iowa, 1992-2003**



RESEARCH PROJECTS DURING 2008

The State Health Registry of Iowa is participating in around two dozen funded studies during 2008. Brief descriptions of a few of these studies are provided.

The Agricultural Health Study

The Agricultural Health Study is a long-term study of agricultural exposures (including pesticides) and chronic disease (especially cancer) among commercial or private pesticide applicators (and their spouses, if married) in Iowa and North Carolina. The study is funded primarily by the National Cancer Institute. We are in the 16th year of the study.

In the first five years, 89,658 subjects (58,564 in Iowa and 31,094 in North Carolina) were enrolled in the study. This total for Iowa included 31,877 private applicators (farmers), 21,771 spouses of private applicators, and 4,916 commercial applicators. Enrollment consisted of completing questionnaires about past exposures and health. The second phase of the study for private applicators and their spouses was completed at the end of 2003. It involved a telephone interview, a mailed dietary questionnaire, and collection of a cheek cell sample from all consenting cohort members. The telephone interview asked about pesticide use since enrollment, current farming and work practices, and health changes. The dietary health questionnaire asked about cooking practices and types of foods eaten. The cheek cells will be used to understand possible links between genetics, exposures, and disease. For commercial applicators, the second phase of the study was completed at the end of 2005. The study's third phase began in 2005, involves updating information about exposures and health, and is ongoing.

Since 1997, cohort members have been linked annually to mortality and cancer registry incidence databases in both states. In addition, mortality data on the cohort are being obtained from the National Death Index. More information about recent results from this study, the study background, frequently asked questions, other resources (internet & telephone) for agricultural health information, references for publications to date, and information for scientific collaborators can be found at the website, www.aghealth.org. The abstract and/or full text are available for the publications at the website. The cancer-related references for recent publications are provided in the last section of this report.

Studies involving Non-Hodgkin Lymphoma (NHL)

The State Health Registry of Iowa (SHRI), along with researchers at the Mayo Clinic participated in a collaborative, population-based case-control study of NHL involving researchers at the National Cancer Institute and three other Surveillance, Epidemiology, and End Results (SEER) registries. The main objective of the study was to better characterize risk factors for NHL. In Iowa, 364 live patients newly diagnosed with NHL between July 1, 1998 and June 30, 2000 were enrolled. A similar number of population controls participated. Blood samples were sought from study participants. The SHRI also coordinated the acquisition of pathology reports, slides and tissue blocks from all SEER centers. The slides were reviewed to determine the reliability of NHL pathologic classification. More recently, we are collaborating with researchers at the Mayo Clinic to investigate whether genes with functional, common variant polymorphisms involved in immune function and regulation are associated with overall survival from NHL among these patients. To achieve this aim, medical record reviews were performed to obtain more detailed information on the treatment received for NHL. In addition, NHL patients not diagnosed and/or treated at the University of Iowa Hospitals and Clinics or at the Mayo Clinic are being contacted by Registry staff to see if they have a family history of hematopoietic cancer. If yes, they are being invited to participate by providing a family

history and by providing blood samples from themselves and their relatives. These research activities resulted in several publications during 2007. The references for these are provided in the last section of this report.

Geographical Information Systems

The State Health Registry of Iowa is involved with research utilizing a geographical information system to develop and test a methodology for identifying regions of excess cancer burden for breast and colorectal cancer in Iowa. It will refine measures of geographic access to cancer prevention, treatment and screening services in Iowa by computing values using fine-scaled geographic data on individuals, the spatial choices of individuals and the locations of service providers. A regional simulation workbench will generate the expected range and variations in the cancer burden measures for small geographic areas of Iowa based on local demographic characteristics of the area and statewide cancer burden rates. Results can be used to plan more appropriate cancer prevention and control programs.

A Centers for Disease Control and Prevention supported project using Registry data has led to a book "Geocoding Health Data: The Use of Geographic Codes in Cancer Prevention and Control, Research and Practice" recently published by CRC Press. Edited by seven faculty at the University of Iowa (Rushton, Armstrong, Gittler, Greene, Pavlik, West and Zimmerman), this book presents a state-of-the-art discussion on the current technical and administrative developments in geographic information science. In particular, it discusses how geocoded residential addresses can be used to examine the spatial patterns of cancer incidence, staging, survival, and mortality. Many of its examples and illustrations use State Health Registry of Iowa data.

The Registry has also provided data for maps created for use by the Iowa Consortium for Comprehensive Cancer Control. The maps were created by Dr. Gerard Rushton, Professor of Geography at the University of Iowa, and graduate students Kristen Beyer, Zunqiu Chen, and Veronica Escamilla. These maps can be used for planning purposes for cancer prevention and control activities. These maps can be viewed at www.uiowa.edu/~gishlth/ICCCCMaps/index.htm. The Registry has received support from the National Cancer Institute to develop a web-based mapping program that will permit cancer maps to be prepared by Cancer Registries. This project is being pursued with the Utah and the New Jersey Cancer Registries.

Pooled Analyses

Today, researchers are increasingly looking to combine their study data with that of other studies evaluating similar outcomes. The State Health Registry of Iowa has been involved with such pooling activities for studies involving residential radon and lung cancer, diet and cancer, second cancers, and non-Hodgkin lymphoma. During 2007 these activities have resulted in several publications, which are listed in the last section of this report.

SEER Patterns of Care Studies

SEER Patterns of Care Studies are conducted to satisfy a U.S. Congressional directive to the National Cancer Institute to "assess the incorporation of state-of-the-art cancer treatment into clinical practice and the extent to which cancer patients receive such treatments and include the results in such assessment in the biennial reports." This year's Patterns of Care Study will involve thyroid, glioblastoma, and adolescent/young adult cancers (acute lymphoblastic leukemia, germ cell, lymphoma, sarcoma) diagnosed between January 1, 2006 and December 31, 2006. The objectives of the SEER Patterns of Care Study are to: 1) describe the use of adjuvant therapy, which has been verified with the treating physician, in a community setting, 2) characterize the practice patterns in different communities, 3) describe more completely the use of surgery in the treatment of specific cancers, 4) compare the patterns of treatment for cancer over time, 5) compare patterns of care by age and race, 6) describe effect of co-morbid conditions on treatment, and 7) describe treatment by hospital characteristics: i.e. for profit vs. not for profit,

teaching vs. non-teaching, disproportionate share status, etc. The SHRI has been involved with these types of studies over the past 20 years.

Adolescent and Young Adult Component

Compared to younger and older aged cancer populations, SEER data suggest that the adolescent and young adult (AYA) population between the ages of 15 and 39 years has seen little or no improvement in cancer survival rates for decades. In 2005 the National Cancer Institute partnered with the Lance Armstrong Foundation and developed a Progress Review Group (PRG) to address the special research and cancer care needs of the AYA cancer population. The PRG suggested a special emphasis should be placed on collection of current and complete treatment data for a sample of the AYA cancer population. This feasibility study is SEER's first attempt to address the needs of the AYA cancer population through a modification to its Patterns of Care Study design, focusing on contacting AYAs for permission to obtain all outpatient and inpatient medical records relating to the cancers of interest and for them to complete a brief survey. The State Health Registry of Iowa will be enrolling 50 patients in the AYA portion of the study, diagnosed between July 2007 and August 2008.

The Iowa Women's Health Study

This is a population-based cohort of 41,837 Iowa women, aged 55-69 in 1986, who were recruited to determine whether diet, body fat distribution and other risk factors were related to cancer incidence. Exposure and lifestyle information was collected in a baseline mailed survey and subsequently in several follow-up mailed surveys. Mortality and cancer incidence have been ascertained annually since 1986 through linkage to the State Health Registry of Iowa databases and the National Death Index. The project has been extremely productive with over 200 publications, some of which occurred in 2007 and are listed in the references provided in the last section of this report. This past year SHRI personnel obtained pathologic materials for several hundred women in this study who have been diagnosed with colorectal cancer as part of a collaborative study with researchers at the Mayo Clinic. The primary aims of the study are to examine associations between environmental factors and colorectal cancer subtypes exhibiting DNA patterns defined by a microsatellite instability phenotype, Ki-ras mutation status, p53 mutation status, and gene-specific methylation patterns. The study will be ongoing for the next few years.

Elderly Cancer Survivors: Cognitive Outcomes and Markers of Neurodegeneration

The goal of this study is to examine the long-term outcomes following treatment for breast cancer. Funded by a University of Iowa Institutional Grant from the UI Cancer and Aging Program, this study is interested in learning whether breast cancer treatments may affect how the brain ages in later years. The project seeks to invite women over the age of 65 who have undergone successful treatment of breast cancer at least ten years earlier with no evidence of recurrence or other cancer diagnosis since then. The results from this research study may help us understand whether there is a contribution of different cancer treatments to brain changes and eventually learn how these changes may be prevented.

Cooperative Agreements and Other Registries

The SHRI maintains cooperative agreements with several hospital cancer registries and other agencies/entities. Some of the latter include:

* Iowa Department of Public Health
* Iowa Consortium for Comprehensive Cancer Control
* The University of Iowa
  - Center for Health Effects of Environmental Contamination
  - Center for Public Health Statistics
  - Environmental Health Sciences Research Center
  - Health Effectiveness Research Center
  - Holden Comprehensive Cancer Center
  - Iowa Center for Agricultural Safety and Health
  - Injury Prevention Research Center
  - Preventive Intervention Center
  - Reproductive Molecular Epidemiology Research & Education Program

SELECTED 2007 PUBLICATIONS

Agricultural Health Study

1. Bonner, M. R., Coble, J., Blair, A., Beane Freeman, L. E., Hoppin, J. A., Sandler, D. P., and Alavanja, M. C. Malathion Exposure and the incidence of cancer in the Agricultural Health Study. Am J Epidemiol, 166: 1023-34, 2007.
2. Lee, W. J., Alavanja, M. C., Hoppin, J. A., Rusiecki, J. A., Kamel, F., Blair, A., and Sandler, D. P. Mortality among pesticide applicators exposed to chlorpyrifos in the Agricultural Health Study. Environ Health Perspect, 115: 528-34, 2007.
3. Lee, W. J., Sandler, D. P., Blair, A., Samanic, C., Cross, A. J., and Alavanja, M. C. Pesticide use and colorectal cancer risk in the agricultural health study. Int J Cancer, 121: 339-346, 2007.
4. Mahajan, R., Blair, A., Coble, J., Lynch, C. F., Hoppin, J. A., Sandler, D. P., and Alavanja, M. C. Carbaryl exposure and incident cancer in the Agricultural Health Study. Int J Cancer, 121: 1799-1805, 2007.
5. Purdue, M. P., Hoppin, J. A., Blair, A., Dosemeci, M., and Alavanja, M. C. Occupational exposure to organochlorine insecticides and cancer incidence in the Agricultural Health Study. Int J Cancer, 120: 642-9, 2007.

Cancer Prevention II Nutrition Cohort

1. Jacobs, E. J., Thun, M. J., Bain, E. B., Rodriguez, C., Henley, S. J., and Calle, E. E. A large cohort study of long-term daily use of adult-strength aspirin and cancer incidence. J Natl Cancer Inst, 99: 608-15, 2007.
2. Jacobs, E. J., Rodriguez, C., Bain, E. B., Wang, Y., Thun, M. J., and Calle, E. E. Cholesterol-Lowering Drugs and Advanced Prostate Cancer Incidence in a Large U.S. Cohort. Cancer Epidemiol Biomarkers Prev, 16: 2213-7, 2007.
3. McCullough, M. L., Bandera, E. V., Patel, R., Patel, A. V., Gansler, T., Kushi, L. H., Thun, M. J., and Calle, E. E. A prospective study of fruits, vegetables, and risk of endometrial cancer. Am J Epidemiol, 166: 902-11, 2007.
4. Rodriguez, C., Freedland, S. J., Deka, A., Jacobs, E. J., McCullough, M. L., Patel, A. V., Thun, M. J., and Calle, E. E. Body mass index, weight change, and risk of prostate cancer in the Cancer Prevention Study II Nutrition Cohort. Cancer Epidemiol Biomarkers Prev, 16: 63-9, 2007.

Iowa Women's Health Study

1. Bardia, A., Ebbert, J. O., Vierkant, R. A., Limburg, P. J., Anderson, K., Wang, A. H., Olson, J. E., Vachon, C. M., and Cerhan, J. R. Association of aspirin and nonaspirin nonsteroidal anti-inflammatory drugs with cancer incidence and mortality. J Natl Cancer Inst, 99: 881-9, 2007.
2. Molokwu, J. C., Prizment, A. E., and Folsom, A. R. Reproductive characteristics and risk of kidney cancer: Iowa Women's Health Study. Maturitas, 58: 156-63, 2007.
3. Prizment, A. E., Anderson, K. E., Harlow, B. L., and Folsom, A. R. Reproductive risk factors for incident bladder cancer: Iowa Women's Health Study. Int J Cancer, 120: 1093-8, 2007.
4. Prizment, A. E., Folsom, A. R., Cerhan, J. R., Flood, A., Ross, J. A., and Anderson, K. E. History of allergy and reduced incidence of colorectal cancer, Iowa Women's Health Study. Cancer Epidemiol Biomarkers Prev, 16: 2357-62, 2007.

NHL Case-Control Study

1. Cerhan, J. R., Wang, S., Maurer, M. J., Ansell, S. M., Geyer, S. M., Cozen, W., Morton, L. M., Davis, S., Severson, R. K., Rothman, N., Lynch, C. F., Wacholder, S., Chanock, S. J., Habermann, T. M., and Hartge, P. Prognostic significance of host immune gene polymorphisms in follicular lymphoma survival. Blood, 109: 5439-46, 2007.
2. Colt, J. S., Hartge, P., Davis, S., Cerhan, J. R., Cozen, W., and Severson, R. K. Hobbies with solvent exposure and risk of non-Hodgkin lymphoma. Cancer Causes Control, 18: 385-90, 2007.
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