2004 CANCER IN IOWA REPORT

STATE HEALTH REGISTRY OF IOWA

Implementing the State's Comprehensive Cancer Control Plan

The University of Iowa

In 2004, an estimated 6,500 Iowans will die from cancer, 13 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 fourteen registries nationwide providing data to the National Cancer Institute. With the *2004 Cancer in Iowa Report* 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 2004;
- a special section on comprehensive cancer control in the state of Iowa;
- brief summaries of research projects during 2004;
- a selected list of publications from 2003.

During 2004, the Registry will respond to 300 requests for data, analyses, and cancer cluster investigations.

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. In 2004 data will be collected on an estimated 15,200 new cancers among Iowa residents. A follow-up program tracks more than 97 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.

Since 1973 the Iowa Registry has been funded by the Surveillance, Epidemiology, and End Results (SEER) Program of the National Cancer Institute (NCI). Iowa represents rural and midwestern populations and provides data included in many NCI publications. Beginning in 1990 about 5-10 percent of the Registry's annual operating budget has been provided by the state of Iowa. Beginning in 2003, the University of Iowa is also providing cost-sharing funds. The Registry also receives funding through grants and contracts with university, state, and national researchers investigating cancer-related topics.

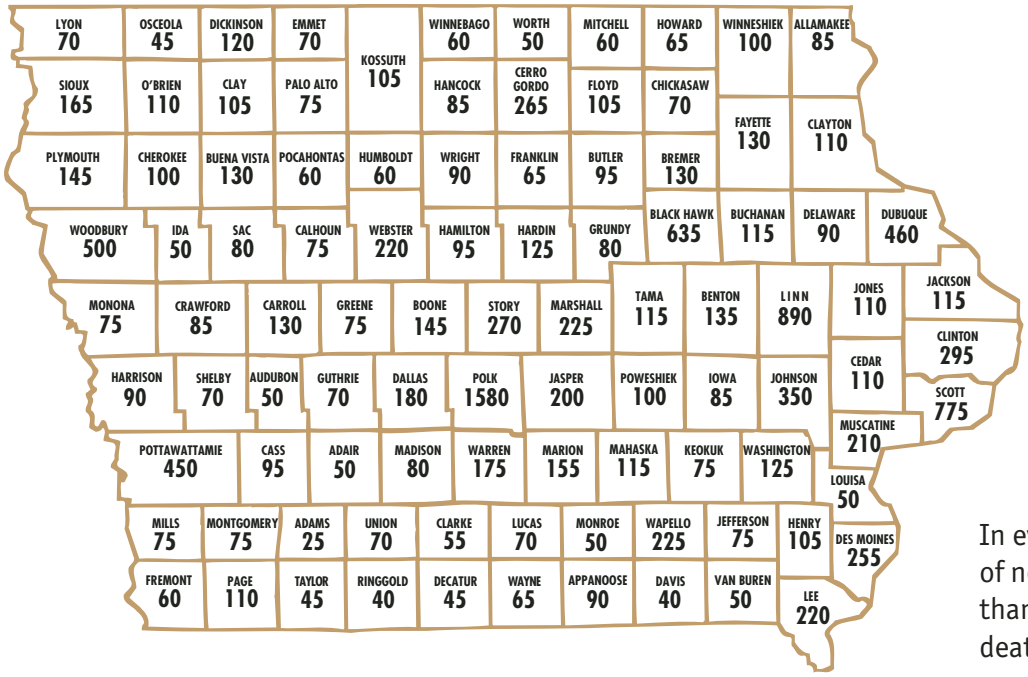
The goals of the Registry are to:

- 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.

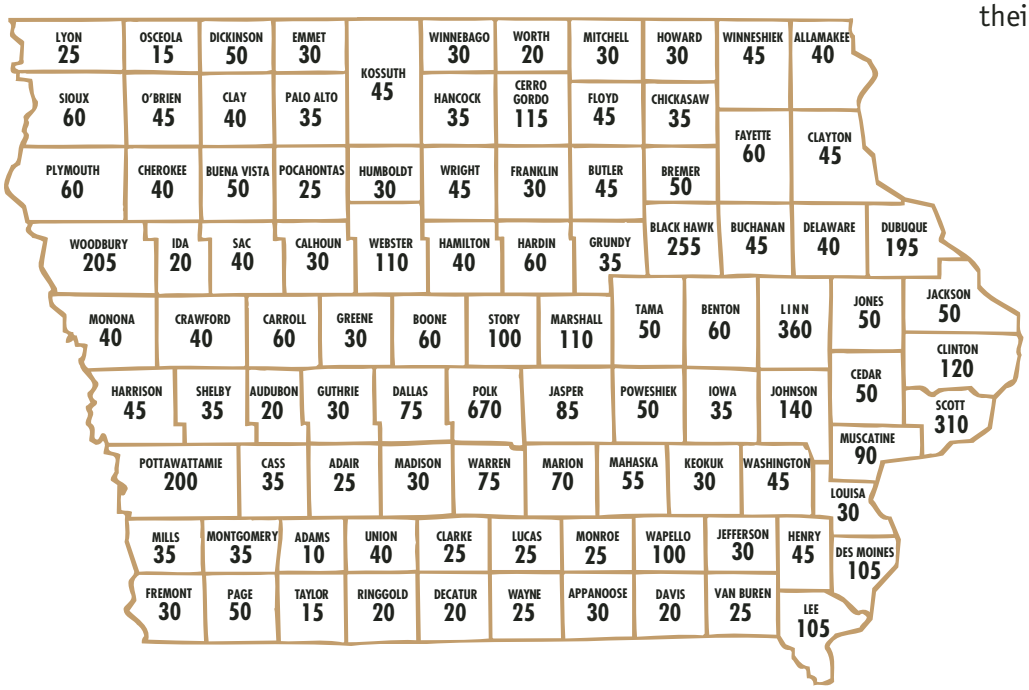
In 2004, cancer will strike five out of every 1,000 Iowans. Cancer is the second leading cause of death in Iowa, responsible for 230 of every 1,000 deaths.

CANCER PROJECTIONS FOR 2004

Estimated Number of New Cancers in Iowa for 2004



Estimated Number of Cancer Deaths in Iowa for 2004



In every county, the number of new cancers is much greater than the number of cancer deaths. This coincides with more and more Iowans surviving their cancer.

TOP 10 TYPES OF CANCER IN IOWA ESTIMATED FOR 2004

New Cancers in Females

Type	# of Cancers	% of Total
Breast	2250	30.0
Colon & Rectum	1100	14.7
Lung	870	11.6
Uterus	490	6.5
Non-Hodgkin's Lymphoma	290	3.9
Skin Melanoma	280	3.7
Ovary	260	3.5
Leukemia	190	2.5
Pancreas	180	2.4
Thyroid	170	2.3
All Others	1420	18.9
Total	7500	

Cancer Deaths in Females

Type	# of Cancers	% of Total
Lung	690	21.9
Breast	460	14.6
Colon & Rectum	390	12.4
Ovary	190	6.0
Pancreas	190	6.0
Non-Hodgkin's Lymphoma	150	4.8
Leukemia	130	4.1
Uterus	90	2.9
Brain	70	2.2
Multiple Myeloma	70	2.2
All Others	720	22.9
Total	3150	

New Cancers in Males

Type	# of Cancers	% of Total
Prostate	2200	28.6
Lung	1150	14.9
Colon & Rectum	1000	13.0
Non-Hodgkin's Lymphoma	300	3.9
Skin Melanoma	290	3.8
Leukemia	270	3.5
Kidney & Renal Pelvis	250	3.2
Bladder	240	3.1
Pancreas	190	2.5
Oral Cavity	180	2.3
All Others	1630	21.2
Total	7700	

Cancer Deaths in Males

Type	# of Cancers	% of Total
Lung	1040	31.0
Prostate	400	11.9
Colon & Rectum	350	10.4
Pancreas	170	5.1
Leukemia	160	4.8
Non-Hodgkin's Lymphoma	150	4.5
Kidney & Renal Pelvis	120	3.6
Esophagus	120	3.6
Brain	90	2.7
Bladder	90	2.7
All Others	660	19.7
Total	3350	

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 self-examination and regular health checkups can improve cancer survival.

COMPREHENSIVE CANCER CONTROL

Comprehensive Cancer Control (CCC), as defined by the Centers for Disease Control and Prevention, is an integrated and coordinated approach to reducing cancer incidence, morbidity, and mortality through prevention, early detection, treatment, rehabilitation, and palliation. It improves cancer prevention and control efforts by bringing together stakeholders who focus on improving cancer services by:

- Enhancing infrastructure;
- Mobilizing support to maximize resources;
- Using data and research to develop sound strategies;
- Building partnerships that facilitate coordination and collaboration of efforts;
- Addressing the cancer burden by targeting specific needs and prioritizing activities to meet the needs; and
- Evaluating efforts.

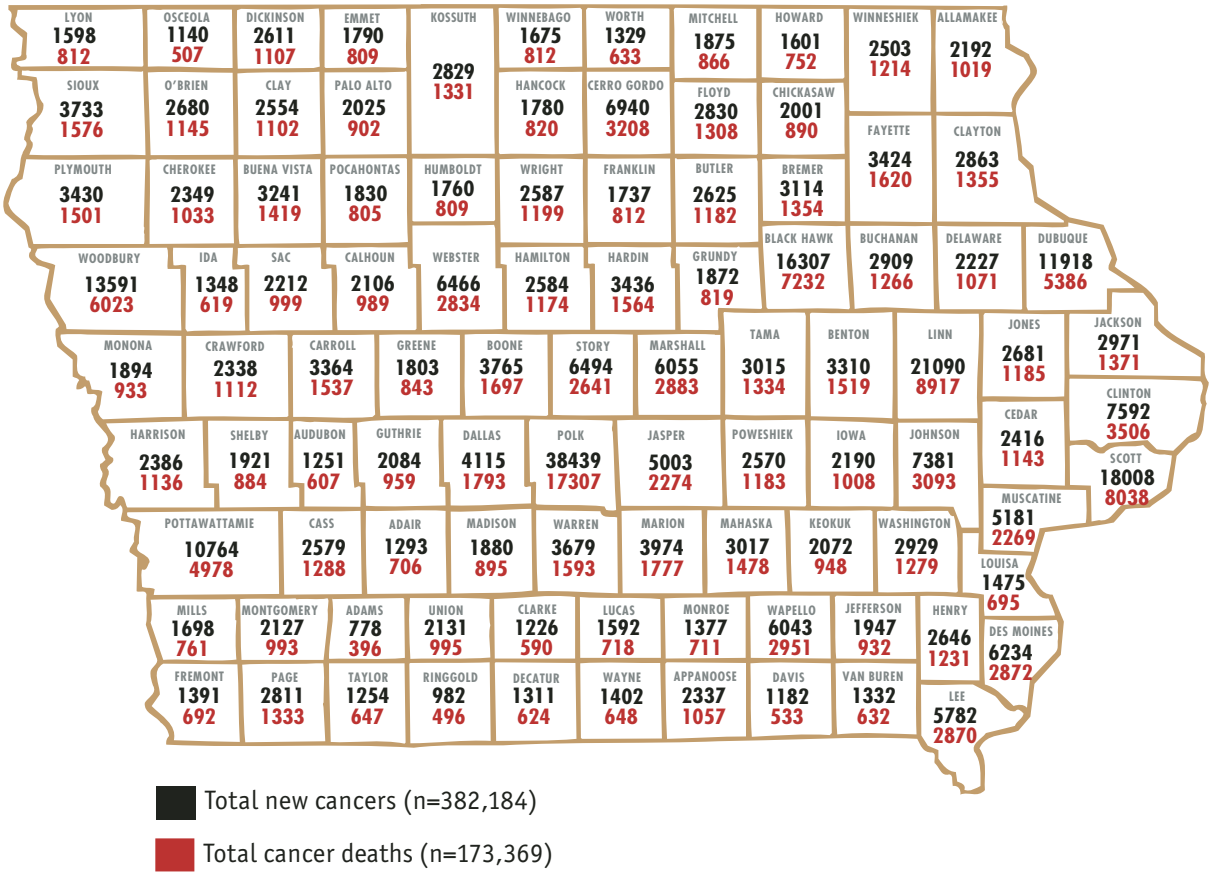
The Burden of Cancer in Iowa

For the years 1973-2001 over 380,000 cancers have been newly diagnosed among Iowans. More than 170,000 Iowans have died from cancer. The following map (Figure 1) demonstrates an appreciable burden of cancer exists in every county in Iowa.

Healthy Iowans 2010

In an effort to advance the boundaries of healthy living and a high quality of life as well as to eliminate health disparities in the new decade, 200 organizations developed the document, *Healthy Iowans 2010*. *Healthy Iowans 2010* is a statewide effort for health promotion and disease prevention and is the state's contribution to *Healthy People 2010*, the federal government's national public health plan coordinated by the United States Department of Health and Human Services. The foundation for a national prevention agenda was laid with the 1979 Surgeon General's Report, *Healthy People*. Since then, these agendas

Figure 1. **New Cancers and Cancer Deaths, 1973-2001**



Lung, colorectum, female breast, and prostate are cancer sites specifically targeted in *Healthy Iowans 2010*. These four cancer sites account for over 50% of all newly diagnosed cancers and cancer deaths in Iowa. Improvement in all sites incidence and mortality requires that progress be made with these major cancer sites.

have called for each state to contribute ideas and initiatives for improving the health of their citizenry.

The *Healthy Iowans 2010* report came on the heels of a "report card" issued by the Iowa Department of Public Health on the *Healthy Iowans 2000* goals. That analysis showed that nearly 70% (93 of 134) goals set out in 1993 were achieved.

The cancer chapter in *Healthy Iowans 2010* focuses on all cancers combined as well as cancers where modifiable risk factors have been identified and/or screening guidelines have been widely accepted. A similar percent improvement was used for Iowa as was specified for the United States in *Healthy People 2010*. Iowa's baseline cancer rates differ, however, from those of the United States and therefore year 2010 goals differ. The cancer site goals for *Healthy Iowans 2010* are shown in Figure 2.

Figure 2. **Cancer Site Goals of *Healthy Iowans 2010***

Goal	Cancer Site#	Gender	Improvement (Iowa Baseline Rate+)	Year 2010 Goal* Iowa	U.S.
2-1	All sites mortality	M & F	21% (198.2)	157.0	159.9
2-2	All sites incidence	M & F	10% (463.2)	417.0	NE
2-4	Lung	M & F	22% (54.6)	42.6	44.9
2-5	Breast	F	20% (29.2)	23.4	22.3
2-6	Cervix	F	60% (2.6)	1.0	2.0
2-7	Colorectum	M & F	34% (23.5)	15.5	13.9
2-8	Oropharynx	M & F	15% (2.6)	2.2	2.7
2-9	Prostate	M	10% (36.2)	32.6	28.8
2-10	Skin melanoma	M & F	10% (2.6)	2.3	2.5

Each goal is for mortality except Goal 2-2 which is for incidence.
* Goal expressed as a rate.
+ All rates expressed per 100,000 population and age-adjusted to Year 2000 U.S. standard; Iowa baseline rates from 1994-96.
NE=not established

The Iowa Cancer Registry has data available to evaluate progress toward the goals of *Healthy Iowans 2010*. Utilizing data from 2000-2002 for the mortality goals (all but goal 2-2), the rate can be compared to the goal from the years 1994-1996. The goal for all sites incidence was compared using 1994-1996 and 1999-2001, since data are not complete yet for new cancer cases for the year 2002. Figure 3 shows that as a state, the rates for all the goals listed are moving in the right direction except for all sites incidence. Mortality rates for female breast cancer and prostate cancer for 1993-2002 are shown in Figure 4. The 2002 mortality rate for female breast cancer is 25.2 which is approaching the 2010 goal of 23.4. The 2002 mortality rate for prostate cancer is 30.1 which already is lower than the 2010 goal of 32.6. Furthermore, these trends are occurring in the most common cancers (excluding non-melanotic skin cancers) among women and men in Iowa. A formal midcourse review of *Healthy Iowans 2010* is planned for later this year.

For more information on *Healthy Iowans 2010*, visit **www.idph.state.ia.us/admin/healthy_iowans_2010.asp**

Figure 3. **Progress Towards Goals of *Healthy Iowans 2010***

Cancer Site	Gender	Trend in Iowa Mortality Rates* 1994-96	2000-2002	Trend Moving in Right Direction?
All sites mortality	M & F	198.2	188.5	Yes
All sites incidence	M & F	463.2	475.9	No
Lung	M & F	54.6	51.6	Yes
Breast	F	29.2	24.1	Yes
Cervix	F	2.6	2.3	Yes
Colorectum	M & F	23.5	21.0	Yes
Oropharynx	M & F	2.6	2.2	Yes
Prostate	M	36.2	29.3	Yes
Skin melanoma	M & F	2.6	2.2	Yes

* Expressed per 100,000 and age-adjusted to Year 2000 U.S. standard; for all sites, both mortality and incidence rates are provided.

Figure 4a. **Mortality Rates for Female Breast Cancer, 1993-2002**

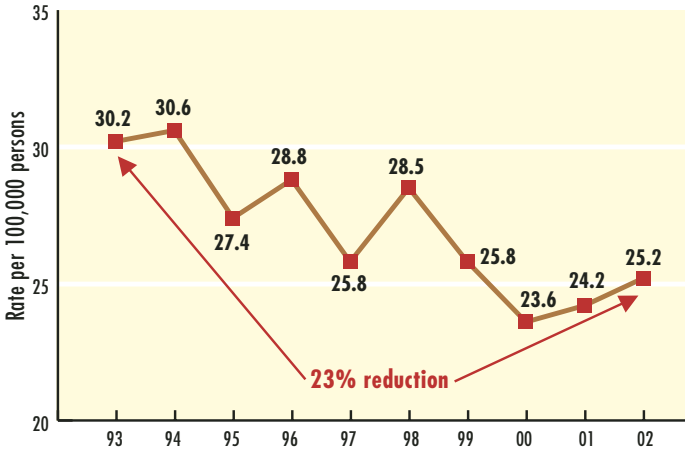
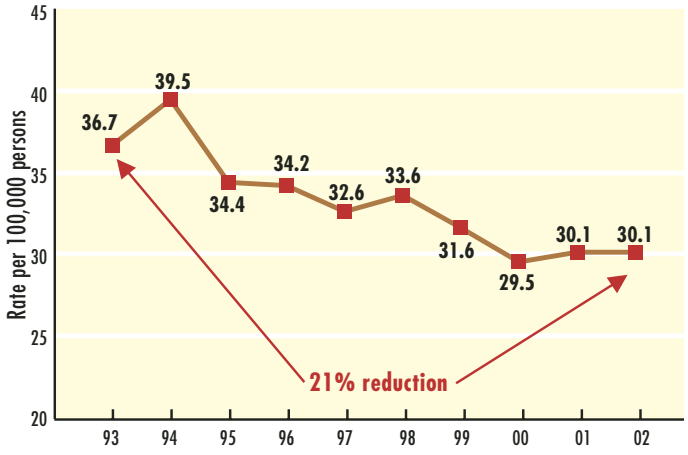


Figure 4b. **Mortality Rates for Prostate Cancer, 1993-2002**



CANCER CONTROL PLANET
Plan, Link, Act, Network with Evidence-based Tools

Links to resources for comprehensive cancer control

http://cancercontrolplanet.cancer.gov

THE FACE OF CANCER IN IOWA

In 2001, the Iowa Legislature commissioned a detailed study of the impact of cancer on the state of Iowa. The Iowa Cancer Registry provided data to measure the cancer burden. The report, *The Face of Cancer in Iowa,* was published in January of 2002 (http://www.idph.state.ia.us/hppab/pdf/Cancer_full_report.pdf). It contains recommendations for developing a statewide, comprehensive cancer prevention and control plan to reduce the burden of cancer on Iowans by:

- Preventing cancer from ever occurring whenever possible,
- Detecting cancer in its earliest stages when it occurs,
- Treating any cancer found with the most appropriate treatment known,
- Assuring that the quality of life of cancer patients is the best it can be, and,
- Move research findings more quickly into prevention and control practices.

The Face of Cancer in Iowa report, in part, led to the formation of the Iowa Consortium for Comprehensive Cancer Control. The Consortium is comprised of over 100 people representing approximately 50 agencies from across the state. It developed a state comprehensive cancer control plan in April of 2003. This state plan was funded in October of 2003 by the Centers for Disease Control through an implementation grant that is providing initial funding to address activities targeting cancer prevention, early detection, treatment, quality of life, and research. In addition, it includes cross-cutting issues related to advocacy, patient education, financial issues, surveillance, data and evaluation, population disparities, and web-based information resources. For the current year the Consortium, through its implementation groups and standing committees, will focus on issues related to tobacco, obesity, youth exposure to sun, screening barriers, patient and family resources, genetics, data and evaluation, and a cancer information website. For more information about the Comprehensive Cancer Control plan, contact Lorrie Graaf, Public Health Advisor, at 515-281-7739.

RESEARCH PROJECTS DURING 2004

The State Health Registry of Iowa is participating in over two dozen funded studies during 2004. 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 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 12th year of the study, which was funded at the end of 2003 for continuation through 2008.

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, 21,771 spouses of private applicators, and 4,916 commercial applicators. 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. The telephone interview asked about pesticide use since enrollment, current farming and work practices, and health changes. The dietary health questionnaire asks about cooking practices and types of foods eaten. Cooking practices and diet may play a role in cancer and other health conditions. The cheek cells will be used to understand possible links between genetics, exposures, and disease. The second phase of the study is ongoing with commercial applicators.

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 is being obtained every other year 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**.

Breast Cancer, Radiation Exposure, and Genetic Susceptibility

The objective of this study is to investigate gene-environment interactions in the etiology of breast cancer. We are establishing a repository of epidemiologic risk factor information and biologic specimens for a targeted goal of 700 women with asynchronous bilateral breast cancer (cases) and 1400 women with unilateral breast cancer (controls), who are being ascertained through 5 population-based tumor registries in the U.S. and Denmark, including the Iowa Cancer Registry. All subjects are being interviewed using a structured questionnaire and blood samples are being collected for genetic analyses. Initially, we will examine the interaction of radiation exposure, the ataxia-telangiectasia mutated (ATM) gene, and breast cancer. Ionizing radiation is known to be a breast carcinogen and recent studies suggest that the ATM gene may increase susceptibility to radiation-induced breast cancer. Our hypothesis is that women who are ATM gene carriers and who have received radiation therapy as part of breast cancer treatment are at an increased risk of developing a second primary breast cancer. We will also provide descriptive statistics on the prevalence of ATM in this large population-based sample of women. Thereafter, we will determine the prevalence of BRCA1 and BRCA2 mutations in this population and evaluate interactions between breast cancer, BRCA1/2 and ATM genetic mutations, and radiation exposure. Iowa contributed 111 cases and 235 controls to the study population.

Lung Cancer Care Outcomes Research and Surveillance Consortium

This study involves a coordinating center, the Iowa Cancer Registry, and five other primary data collection and research sites across the United States. Across these sites, we are investigating patterns of care for lung cancer, the reasons for particular care decisions by patients and their physicians, variation in dissemination of modern care

protocols and practices in different geographic areas, and the effects of these decisions and practices on patient outcomes, including quality of life. In Iowa, we plan to rapidly identify and enroll 1,000 lung cancer patients newly diagnosed over an 18-month period beginning Spring 2003.

Epidemiological and Medical Monitoring Proposal of Former Department of Defense Workers at The Iowa Army Ammunitions Plant in Middletown, Iowa

This study aims to conduct an epidemiologic survey of occupational health outcomes and needs for individuals employed by the Department of Defense (DOD) contractor, the Iowa Army Ammunition Plant in Middletown, Iowa. The targeted employees worked in conventional weapons manufacture on what was known as Division A, which has been in operation from 1945 to the present. Historical exposure assessment and medical surveillance data are being collected for these employees. The data are also being linked to Iowa death tapes, Iowa drivers' licenses, Medicare files, and the Iowa Cancer Registry incidence database.

Immunogenetic Determinants of Non-Hodgkin's Lymphoma (NHL) Survival

In this study 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. The specific aims are to evaluate:
1) the association of polymorphisms in selected immune-related genes from four key pathways on NHL survival that include genes encoding inflammatory and regulatory cytokines, Th1/Th2 cytokines, innate immunity, and chemokines; 2) whether any effects are independent of other established NHL prognostic factors (such as age and stage) and treatment modalities; and 3) whether any effects are specific to diffuse large B-cell lymphoma or the combination of follicular and small lymphocytic lymphoma. To achieve these aims, we are developing a prognostic cohort from 364 HIV-negative NHL patients who participated in the last few years in a population-based case-control study in Iowa.

Second Cancer Studies of the Gastrointestinal System

The Second Cancer Studies of the GI System include seven case-control investigations with a common primary purpose of evaluating the relation between cancer treatment (radiation and/or chemotherapy) and cancer risk for three gastrointestinal organs (stomach, pancreas, esophagus). Radiation and chemotherapy are commonly used as treatment for the cancers in this series (Hodgkin's disease and cancer of the testis, breast and cervix). Radiation and chemotherapy may be given with the intention of curing cancer or for cancer control and prolonged life.
The cumulative effect may include a risk of developing treatment-induced cancers. The results of this series of studies will help determine if current treatment protocols should be modified to control the risk of second cancers involving the stomach, pancreas, or esophagus.

A GIS Based Workbench to Interpret Cancer Maps

This research is developing and testing 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. It uses State Health Registry of Iowa data for a ten-year period and links patient files to Medicare and selected medical insurance records. Statistical models are being computed to associate specific cancer burden measures to predictor variables that capture local characteristics of the area and characteristics of the individuals. A regional simulation workbench is being developed to 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.

Integrating Aging and Cancer Research

This is a 5-year planning and formulating grant that will add a Cancer and Aging Program (CAP) to the research activities of the Holden Comprehensive Cancer Center (HCCC) at the University of Iowa. The CAP will be a joint effort of the University of Iowa's Center on Aging and the HCCC. It will have three scientific aims: 1) biology of aging and cancer, 2) effects of co-morbidity on clinical cancer outcomes, and 3) chemotherapy pharmacology in older cancer patients. The Iowa Cancer Registry incidence and follow-up databases will contribute to aims 2 and 3. This grant will also provide for a pilot grant program that will promote research in areas selected by investigators involved with the development of the CAP.

The Iowa and Missouri Combined Residential Radon Epidemiologic Studies

The National Cancer Institute has funded a study that combines Iowa and Missouri Residential Radon Lung Cancer Studies. This combined study is building on findings from previous research projects, including the Iowa Radon Lung Cancer Study. The Iowa Radon Lung Cancer Study demonstrated that prolonged exposure to radon gas in the home is associated with increased lung cancer risk and presents a significant environmental health hazard. The combined study, which takes place from 2001 to 2005, seeks to determine the association between residential radon progeny (decay products) exposure and lung cancer. Since the radon progeny deliver the actual radiation doses to lung tissues rather than the radon gas itself, more accurate dose estimates can be obtained by retrospectively determining exposure to the progeny. The study uses a state-of-the-art retrospective radon progeny detector that can estimate past radon progeny concentrations by measuring decay products that have been embedded in glass surfaces. The study also explores the shape of the dose-response curve that best describes the relationship between residential radon progeny exposure and lung cancer and evaluates whether exposure to residential radon progeny is associated with specific morphologic types of lung cancer, such as adenocarcinoma.

Cooperative Agreements and Other Registries

The SHRI maintains cooperative agreements with several hospital cancer registries and other agencies. Some of these include:

- Iowa Department of Public Health
- The University of Iowa
  - -Birth Defects Registry of Iowa
  - -Center for Health Effects of Environmental Contamination
  - -Injury Prevention Research Center
  - -Environmental Health Sciences Research Center
  - -Iowa Center for Agricultural Safety and Health
  - -Prevention Intervention Center
- Holden Comprehensive Cancer Center
- Center for Public Health Statistics

SELECTED 2003 PUBLICATIONS INVOLVING THE IOWA CANCER REGISTRY

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FOR MORE INFORMATION ON CANCER IN IOWA, AND FOR CURRENT REGISTRY PUBLICATIONS, CONTACT:

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