2017

CANCER in IOWA

The University of Iowa | College of Public Health

In 2017 an estimated 6,200 Iowans will die from cancer, 18 times the number caused by auto fatalities. Cancer and heart disease are the leading causes of death in Iowa. These estimates 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 population-based registries and three supplementary registries nationwide providing data to the National Cancer Institute. With *2017 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 2017
- a special section on liver cancer
- brief summaries of recent/ongoing research projects
- a selected list of publications from 2016

The State Health Registry of Iowa

The State Health Registry of Iowa is the best statewide resource for determining the burden of cancer on the Iowa population and assessing trends in the occurrence of cancer over time.

Cancer is a reportable disease as stated in the Iowa Administrative Code. Cancer data are collected by the State Health Registry of Iowa, also known as the Iowa Cancer Registry, located at The University of Iowa in the College of Public Health's Department of Epidemiology. The staff includes 50 people of whom 20 are situated throughout the state, regularly working with hospitals, clinics, and medical laboratories in Iowa and neighboring states to collect cancer data. Approved hospital cancer programs also report 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 2017 data will be collected on an estimated 17,400 new cancers among Iowa residents. In situ 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 (NCI).

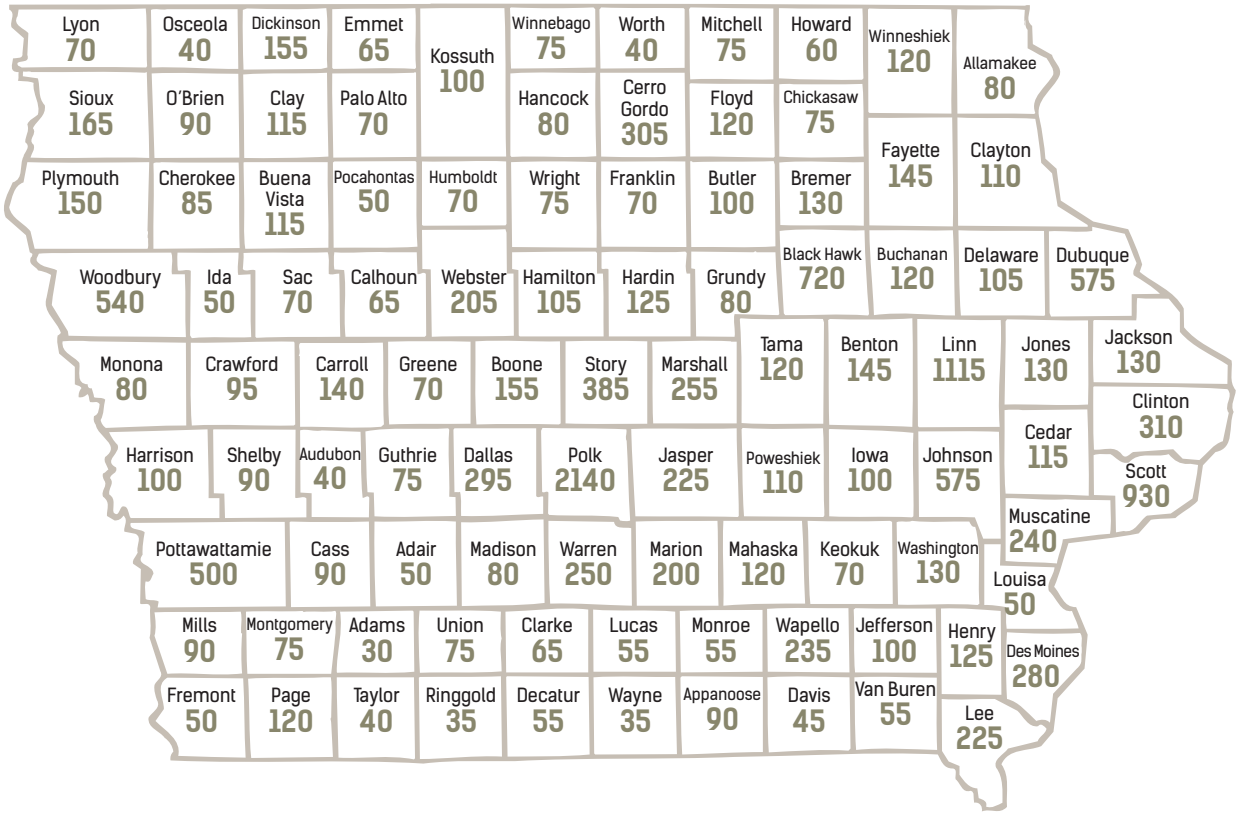
Since 1973 the Iowa Registry has been funded by the NCI SEER Program. Iowa represents rural and Midwestern populations and provides data included in many NCI and other publications. Beginning in 1990 about 5-10 percent of the Registry's annual operating budget has been provided by the state of Iowa. Since 2003 the University of Iowa has also been providing cost-sharing funds. Additionally the Registry receives funding through grants and contracts with university, state and national researchers investigating cancer-related topics.

The goals of the Registry are to:

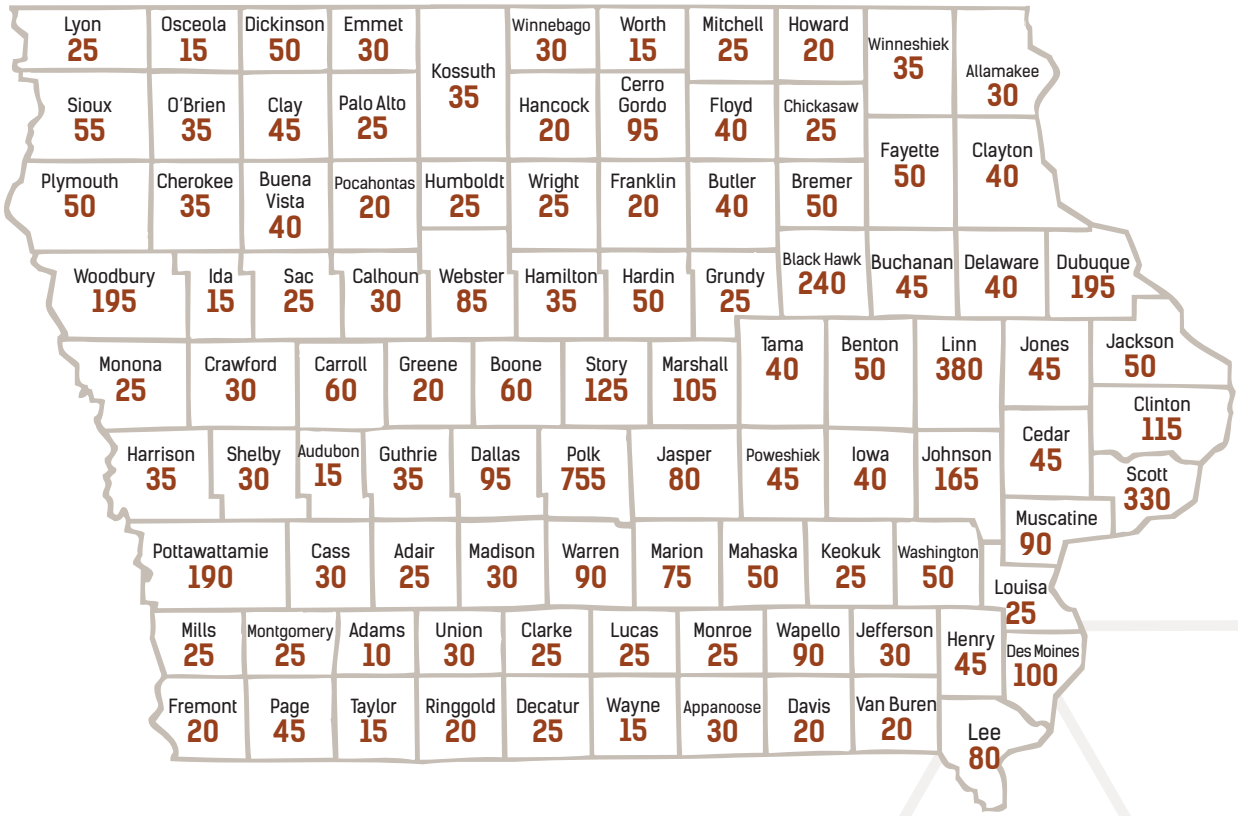
- assemble and report measurements of cancer incidence, survival and mortality among Iowans
- provide information on changes over time in the extent of disease at diagnosis, therapy and patient survival
- promote and conduct studies designed to identify factors relating to cancer etiology, prevention 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

Cancer Estimates for 2017

Estimated Number of New Cancers in Iowa by County for 2017



Estimated Number of Cancer Deaths in Iowa by County for 2017



Top 10 Types of Cancer in Iowa Estimated for 2017

New Cancers in Females

Type	# of Cancers	% of Total
Breast	2300	26.7
Lung	1100	12.8
Colon & Rectum	800	9.3
Uterus	600	7.0
Skin Melanoma	390	4.5
Thyroid	350	4.1
Non-Hodgkin Lymphoma	340	4.0
Leukemia	250	2.9
Pancreas	240	2.8
Kidney & Renal Pelvis	240	2.8
All Others	1990	23.1
Total	**8600**	

Cancer Deaths in Females

Type	# of Cancers	% of Total
Lung	740	25.5
Breast	370	12.8
Colon & Rectum	290	10.0
Pancreas	200	6.9
Ovary	150	5.2
Uterus	120	4.1
Non-Hodgkin Lymphoma	110	3.8
Leukemia	100	3.4
Brain	80	2.8
Kidney & Renal Pelvis	60	2.1
All Others	680	23.4
Total	**2900**	

New Cancers in Males

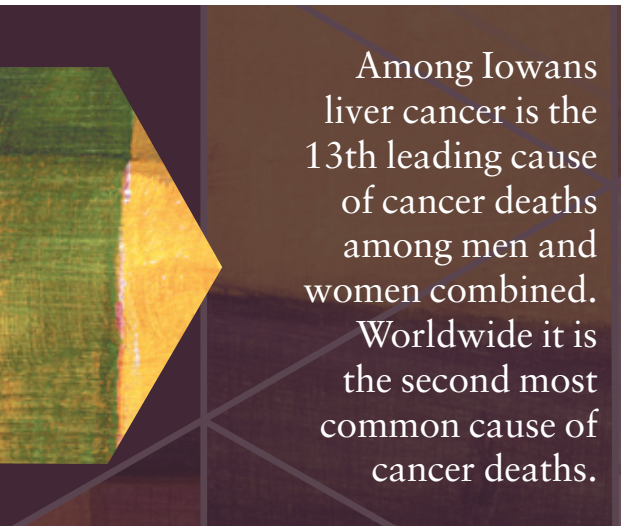
Type	# of Cancers	% of Total
Prostate	1500	17.0
Lung	1260	14.3
Colon & Rectum	860	9.8
Bladder (invasive and noninvasive)	630	7.1
Skin Melanoma	540	6.1
Kidney & Renal Pelvis	420	5.0
Non-Hodgkin Lymphoma	410	4.7
Leukemia	380	4.3
Oral Cavity	300	3.4
Pancreas	250	2.8
All Others	2250	25.5
Total	**8800**	

Cancer Deaths in Males

Type	# of Cancers	% of Total
Lung	930	28.3
Prostate	300	9.1
Colon & Rectum	260	7.9
Pancreas	220	6.7
Esophagus	140	4.2
Leukemia	140	4.2
Non-Hodgkin Lymphoma	140	4.2
Bladder	120	3.6
Kidney & Renal Pelvis	120	3.6
Liver	110	3.3
All Others	820	24.9
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 self-examination and regular health checkups can improve cancer survival.

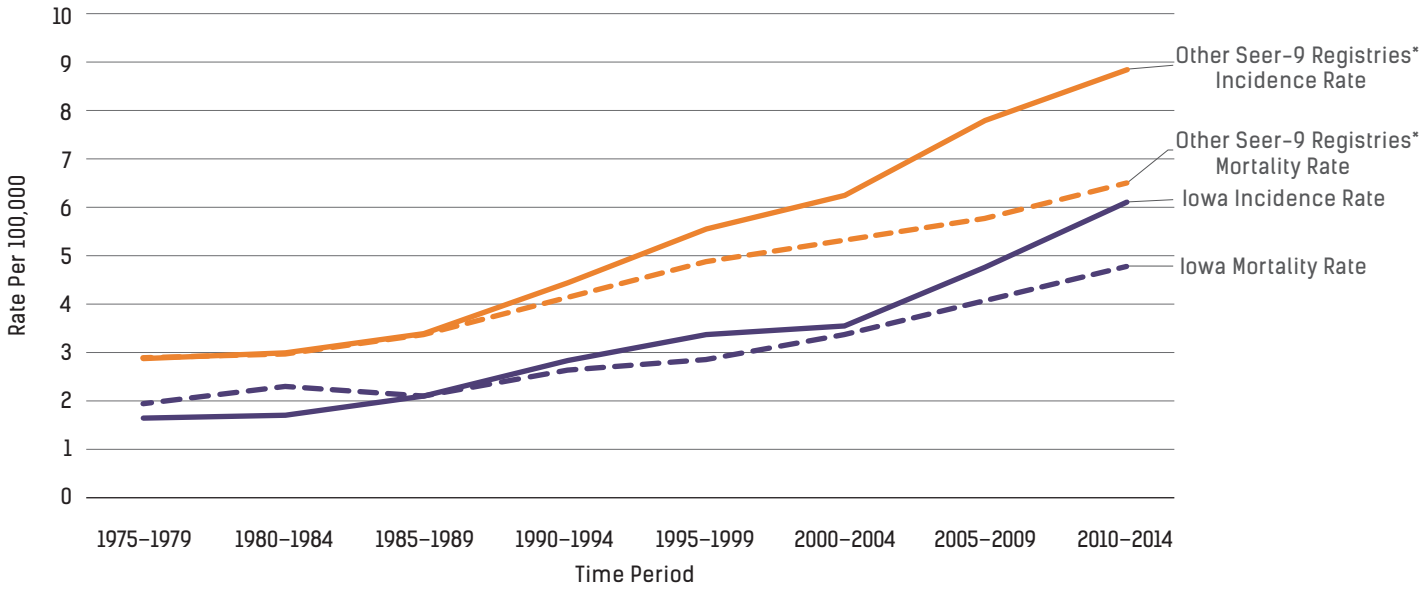
Liver Cancer in Iowa



Among Iowans liver cancer is the 13th leading cause of cancer deaths among men and women combined. Worldwide it is the second most common cause of cancer deaths. Unlike most other common cancers, both new cases of and deaths from liver and intrahepatic bile duct (liver) cancer are on the rise in Iowa and throughout the U.S. as shown in **Figure 1**. The rate of new cases in Iowa has roughly tripled from 2 cases per 100,000 people in 1975-1979 to 6 cases per 100,000 population in 2010-2014. A similar trend is seen in other registries across the U.S., except with higher rates. Chronic infections with hepatitis B or hepatitis C are the major risk factors for liver cancer, and these infections are correlated with the increase in liver cancer.

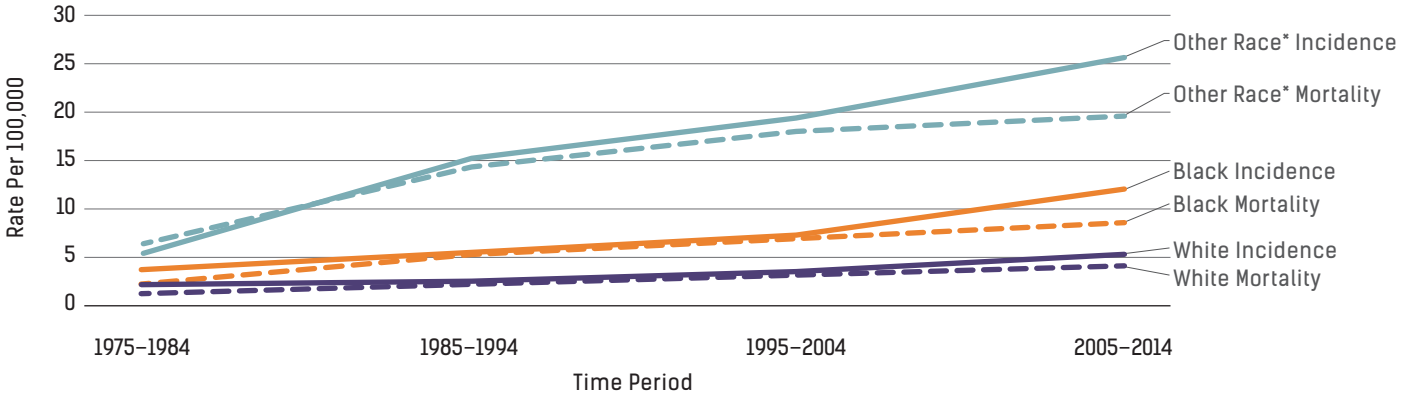
Most people who get primary liver cancer (cancer starting in the liver) will eventually die from it. As demonstrated by **Figure 1**, the rate of deaths due to liver cancer tracks closely with the rate of new cases of liver cancer, although in recent years deaths have been increasing slower than new cases. Iowa has a similar trend in deaths due to liver cancer compared to other SEER Registries, but has lower rates overall, possibly due to earlier detection and improvements in treatment of chronic hepatitis.

Figure 1. Incidence and Mortality Rates for Liver and Intrahepatic Bile Duct Cancer, Iowa vs Other SEER-9 Registries, 1975-2014



*Other SEER-9 Registries include: Atlanta, Connecticut, Detroit, Hawaii, New Mexico, San Francisco-Oakland, Seattle-Puget Sound, and Utah

Figure 2. Incidence and Mortality Rates for Liver and Intrahepatic Bile Duct Cancer by Race, Iowa, 1975–2014



*Other Race predominantly included Asian and Pacific Islanders, with a very small number of American Indians or Alaska Natives

Rates of liver cancer cases and deaths vary by race. **Figure 2** displays rates of liver cancer by White, Black and Other races. There were not enough Hispanic Iowans to allow for an accurate display of rates of liver cancer in Hispanics. The 'Other' category consists mostly of Asian and Pacific Islander races and has the greatest liver cancer incidence and mortality. Regions of Asia and Africa have the highest rates of Hepatitis B, so people so people who have immigrated from there may have greater exposure to the hepatitis B virus and are therefore at greater risk for liver cancer. The Black population in Iowa has the second highest rates of liver cancer incidence and mortality, followed by Whites.

Liver cancer also varies by age and gender. Men have nearly a 3-fold higher rate of getting liver cancer compared to women. Liver cancer rates generally increase with age. However, the frequency of liver cancer is particularly increasing among people born between 1945 and 1965 (also known as 'Baby Boomers'), as illustrated by **Figure 3**. This is because hepatitis C infection was most common from the 1960s to the 1980s, before this virus was discovered and preventive measures, including screening of the blood supply, became possible. Liver cancer cases among those born after 1965 are rising at a much slower rate because hepatitis C is no longer transmitted through blood transfusions, and

Figure 3. Frequency of Liver and Intrahepatic Bile Duct Cancer by Sex and Year of Birth, Iowa, 1975–2014

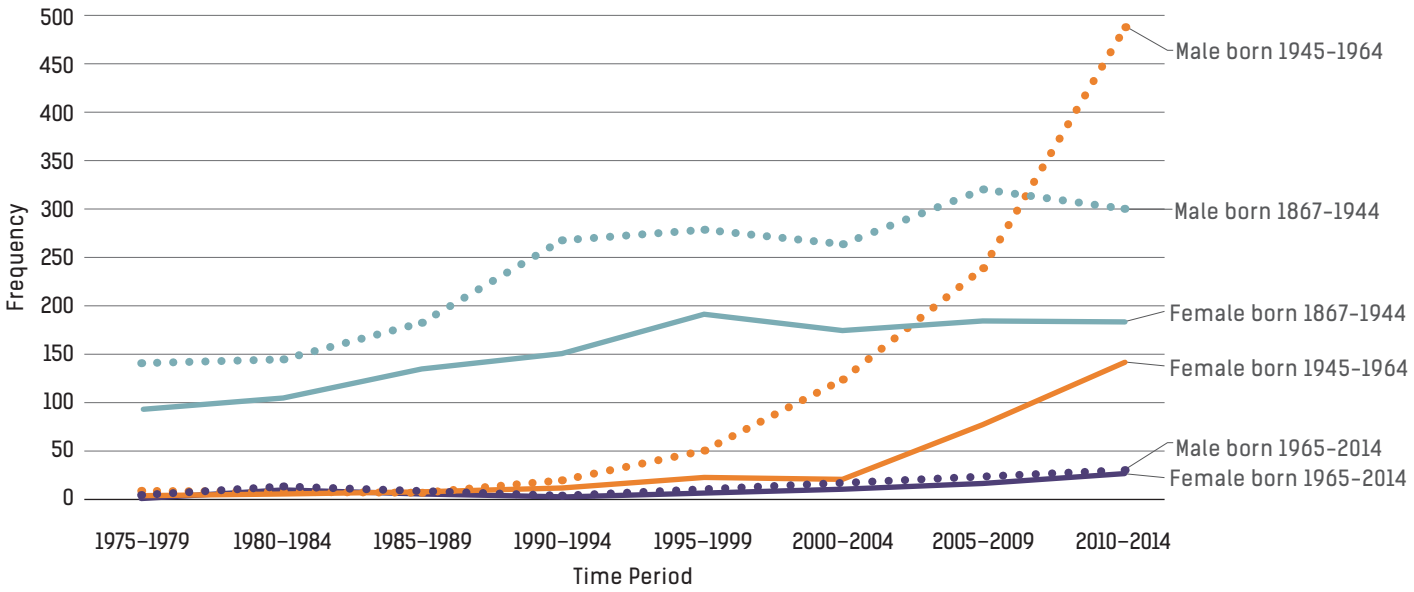
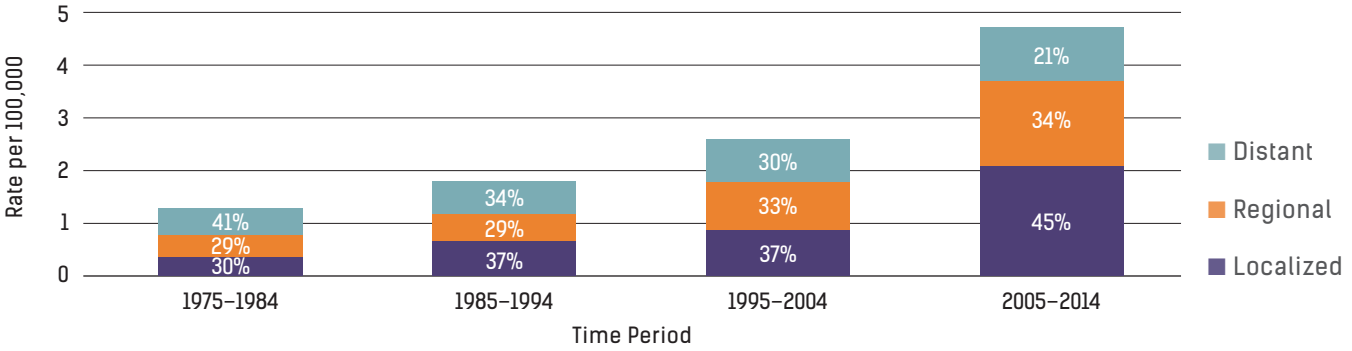


Figure 4. Incidence Rates for Liver and Intrahepatic Bile Duct Cancer by Stage, Iowa, 1975–2014



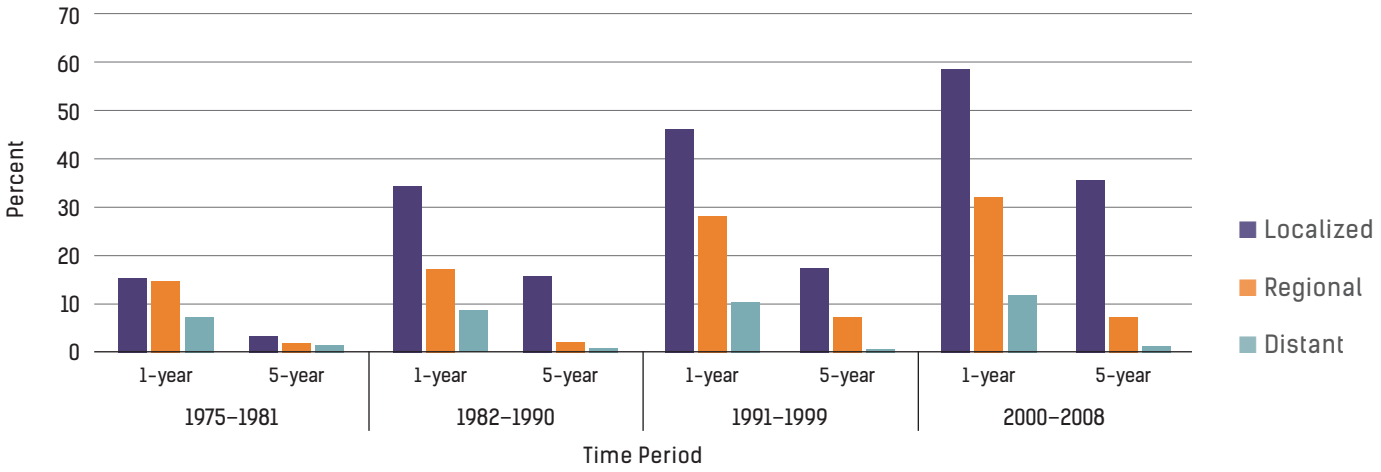
improvements in infection control practices in health care settings, access to safe injection equipment for persons who inject drugs and testing and counseling for those at risk for hepatitis infection have been implemented.

It is estimated that the Baby Boomers (born between 1945 and 1965) are five times more likely to have hepatitis C compared to other groups. Among all people in the U.S. living with hepatitis C, about 75% were born between 1945 and 1965. People can live with hepatitis C for decades without knowing they have it and before it causes any noticeable symptoms. As a result, the Centers for Disease Control and Prevention (CDC) recommends that all people born between 1945 and 1965 receive a one-time screening for hepatitis C. Hepatitis C can be cured with 12 weeks of anti-viral medications taken by mouth. It is projected that for every 10,000 people who have hepatitis C and receive treatment, 310 cases of liver cancer could be prevented.

Figure 4 illustrates the changing trends in how far liver cancer has spread (called stage of disease) at the time of diagnosis. Back in the 1975-1984 time period, over one-third of people with liver cancer were diagnosed after it had already spread to distant sites in the body (distant stage). Over time, the proportion of people diagnosed with distant stage liver cancer has declined to 21%, while the proportion of those diagnosed while the cancer is still confined to the liver (localized stage), has increased from 30% to 45%. Patients with localized liver cancers can sometimes be cured by having part of their liver removed, or by having a liver transplant. Once the cancer has spread to the lymph nodes (regional stage) or other organs (distant stage), surgery is no longer an option. Some patients receive radiation therapy, chemotherapy and/or targeted therapy to slow the growth of the cancer and relieve pain or other symptoms, but these treatments do not usually result in a cure. Liver cancer typically occurs after the liver has already become cirrhotic and most liver cancer patients may also develop liver failure. Thus, liver cancer patients should have access to liver transplantation in planning their treatment.

The proportion of people with localized liver cancer who survived at least one year from diagnosis has improved from 15% in 1975-1981, to almost 60% in 2000-2008, and the proportion of people with localized liver cancer who survived at least five years has improved from 3% in 1975-1981 to 35% in 2000-2008 (**Figure 5**). Survival rates for those with regional stage liver cancer has also improved over time, but to a much lesser degree. The survival rates for distant stage liver cancer have changed very little over time. Liver cancer has a very poor prognosis with only one-third of localized liver cancer patients surviving five years. Prevention is key.

Figure 5. 1-year and 5-year Relative Survival of Liver and Intrahepatic Bile Duct Cancer by Stage, Iowa, 1975–2008



Prevention

The greatest risk factor for liver cancer is infection with hepatitis B or C. These viruses can spread through sharing contaminated needles and through unprotected sex. Therefore, not sharing needles and using safe sex practices, including condoms, can prevent infection with these viruses.

There is no cure for chronic hepatitis B, but there are medications that can completely suppress the virus, improve the liver disease and reduce the risk of cancer. There is also a vaccine available to prevent hepatitis B infection, and the CDC recommends that all children receive this vaccination. Adults who may be at risk should also receive the vaccine. You are at risk of having hepatitis B if you:

- Are exposed to blood on the job, such as a health care worker
- Have sex with someone who is infected
- Have multiple sex partners
- Have a sexually transmitted disease
- Are a man who has sex with other men
- Inject drugs
- Live with a person who has chronic hepatitis B
- Travel to countries where many people have hepatitis B (highest rates found in sub-Saharan Africa, East Asia, the Amazon & southern parts of Eastern/Central Europe)
- Get long-term hemodialysis

Hepatitis C can be cured but has no vaccine. It can be detected through a simple blood test. The CDC recommends you get tested for hepatitis C if any of the following are true:

- You were born between 1945 and 1965
- You ever injected drugs (even just once or a long time ago)
- You needed medicine for a blood clotting problem before 1987
- You received a blood transfusion or organ transplant before July 1992 (when blood and organs started being screened for hepatitis C)
- You are on long-term hemodialysis
- You are infected with HIV

Despite CDC recommendations for one-time hepatitis C screening for people born between 1945 and 1965, only 12% of this age group has received testing according to the 2013 National Health Interview Survey. The high cost of hepatitis C medications may prevent some people with hepatitis C from getting curative treatment.

Cirrhosis or scarring of the liver precedes most liver cancer. Aside from hepatitis B and C, heavy alcohol use can also lead to cirrhosis. Not drinking alcohol or drinking in moderation could help prevent liver cancer. Smoking also increases the risk of liver cancer, so quitting smoking will reduce the chances of getting liver cancer. Obesity is another risk factor for liver cancer, so maintaining a healthy weight through diet and exercise will help protect against liver cancer.

Research Projects During 2017

The Iowa Cancer Registry (ICR) is participating in over 75 open studies during 2017 that have been approved by the University of Iowa Human Subjects Office. Brief descriptions of a few of these studies are provided.

Agricultural Health Study

The Agricultural Health Study (AHS) 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 through the National Cancer Institute (NCI) and involves several federal agencies. We are in the 25th 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. The total for Iowa included 31,877 private applicators, 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, since cooking practices and diet may play a role in cancer and other health conditions. The cheek cells are being 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 and ended in 2010. It involved updating information about exposures and health. The fourth phase of the study began in the fall of 2011 and for the University of Iowa research team primarily involved the collection of cheek cells from AHS participants diagnosed with cancer and the collection of blood, urine, cheek cells and dust samples from a select subgroup of AHS male participants. During this fourth phase health histories have also been updated.

Since 1997 cohort members have been linked annually or biennially 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 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, http://aghealth.nci.nih.gov/. This study's data have also been pooled with data from other cohort studies and analyzed as collaborative activities. The titles for over 250 publications from this study linked to PubMed are available at the website. The cancer-related references for 2016 publications are provided in the last section of this report.

Cancer Care Outcomes Research & Surveillance Consortium

This study involves a statistical coordinating center, the ICR and five other primary data collection and research sites around the U.S. Across these sites we conducted population-based research in the areas of access to care and patterns of care for lung and colorectal cancer. We are evaluating the reasons for particular care decisions by patients and their physicians, including variation in disseminations of modern care protocols and practices in different geographic areas. We are also evaluating the effects of these decisions and practices on patient outcomes, including quality of life. In Iowa this study was limited to lung cancer patients. Over 1,000 newly diagnosed lung cancer patients were enrolled between June 2003 and March 2005. Thereafter these patients provided consent for medical record abstraction and participated in follow-up interviews. Several publications have resulted from the findings and those that occurred in 2016 are provided in the last section of this report.

Patterns of Care Studies

SEER Patterns of Care Studies are conducted to satisfy a U.S. Congressional directive to the NCI to "assess the incorporation of state-of-the-art cancer treatment into clinical practice and the extent to which cancer patients receive such treatments." This year's Patterns of Care Study will investigate state-of-the-art therapies for patients with the following cancers diagnosed during 2015: female breast, colorectum and lung. The objectives of the SEER Patterns of Care Study are to: 1) describe the use of adjuvant therapy, which, when applicable, will be verified with the treating physician or with a unified record; 2) characterize the practice patterns in different communities; 3) describe more completely the use of surgery as treatment; 4) compare the patterns of treatment (surgery, radiation therapy, chemotherapy, immunotherapy, hormonal therapy) over time and by age, sex, race/ethnicity and insurance status; 5) describe the co-morbidities and their effect on treatment, 6) describe treatment by hospital characteristics (i.e., profit vs. not for profit, teaching vs. non-teaching, bed size, etc.), 7) describe the use of diagnostic tests and compare their use by demographic variables and geographic region, 8) describe the use of biomarkers, 9) match the Patterns of Care data with the SEER-Medicare linked files as appropriate by age, and 10) compare the outcomes in community practice to the outcomes obtained in clinical trials. The ICR has been involved with these types of studies over the past 25 years.

SEER–Medicare

In the early 1990s, the cancer incidence and survival data from the ICR was combined with other SEER Registry data and linked to Medicare data. This linked data set has been updated on several occasions since and has become an important data resource for cancer research involving epidemiologic and health services research related to the diagnosis and treatment procedures, costs and survival of cancer patients. Over 1,500 publications have resulted from this linked data set including over 200 during 2016, which are listed at http://healthservices.cancer.gov/seermedicare/overview/publications.html.

SEER–Medicare Health Outcomes Survey

In 2003 the ICR obtained human subjects research approval for a new project to link SEER data with the Centers for Medicare and Medicaid (CMS) Medicare Health Outcomes Survey (MHOS). The SEER-MHOS linked data provided a wide range of potential research applications focused on health-related quality of life of cancer patients and cancer survivors. The first paper describing this data resource was published in 2008. Since then several more papers have followed. A listing of publications during 2016 is provided in the last section of this report.

CDC HPV Tissue Typing Project

This year the ICR and the Kentucky and Louisiana cancer registries will be collaborating with the Centers for Disease Prevention and Control (CDC) to obtain tissue for a project entitled, "Reassessment of Monitoring the Impact of a Prophylactic Human Papillomavirus (HPV) vaccine on HPV Types in Cancers: Using Tissues from Central Cancer Registries." Infection with selected types of human papillomavirus (HPV) is in the causal pathway of almost all cases of cervical cancer as well as a large proportion of cancers at non-cervical sites including the oropharynx and anal regions. The objective of this project is to use the central cancer registries to identify HPV-related cases to determine the HPV vaccine impact (after implementation of the vaccine) in monitoring of HPV types, especially in areas with higher burden of disease and racial/ethnic diversity in the same registries that were part of a previous study that obtained tissue from cancers diagnosed prior to 2006. Specifically, we will: 1) obtain tumor tissue for HPV typing on all or a sample of cervical, anal and rectal squamous cell carcinomas and oropharyngeal cancer cases; 2) re-establish an infrastructure for the systematic monitoring of HPV in incident cancers in representative samples of the United States; and 3) determine distribution of HPV types associated with the target cancers in the United States diagnosed in 2014 and 2015 in the post-HPV vaccine licensure era. The ICR will be seeking representative tumor tissue from over 400 cancers diagnosed among Iowans.

Studies Involving Tissue

Today researchers are increasingly looking to obtain tissue to study molecular characteristics of cancers. Several studies that involve the ICR have included tissue. For example last year we began a three-year study to determine the capability of the ICR to obtain formalin-fixed, paraffin-embedded tissue to accompany data that already exists in the registry's surveillance database for breast and pancreatic cancers meeting eligibility criteria for this study. The objectives of this SEER-linked virtual tissue repository project are to: 1) assess the ability of the ICR to serve as a resource for biospecimen research, 2) locate cases with biospecimens in pathology labs and determine the requirements to retrieve those biospecimens for research purposes, 3) provide custom annotation of specified data items for located cases, and 4) capture costs for objectives 2 and 3. This project involves other NCI SEER cancer registries and when completed will provide for an assessment of NCI SEER's capabilities to perform this type of study. During 2016 a few articles involving tissue from Iowans were published, the references for which are provided in the last section of this report.

Transplant Cancer Match Study

Solid organ transplantation provides life-saving treatment for end-stage organ disease but is associated with substantially elevated cancer risk, largely due to the need to maintain long-term immunosuppression. Important questions remain concerning the role of immunosuppression and other factors in causing cancer in this setting. Staff at two federal agencies, the NCI and the Health Resources and Services Administration (HRSA), are creating a database through linkage of information during 1987-2009 or beyond on over 200,000 U.S. transplant recipients, wait list candidates (over 120,000 in addition to those who were subsequently transplanted), and donors (over 60,000 deceased donors, over 50,000 living donors) with information on cancer from 15 U.S. cancer registries, including the ICR. These data are being used to conduct research concerning the spectrum of cancer risk in transplant recipients. The data will also be used by HRSA in its public health role overseeing the U.S. solid organ transplant network to maintain and improve safety of organ transplantation, and will allow NCI to better characterize the burden of cancer in this population and discover additional factors associated with cancer among this population. Several publications have resulted from the findings and those that occurred in 2016 are provided in the last section of this report.

Second Cancer Studies Including the WECARE Study

Over the past three decades, the ICR has participated in several second cancer studies. These have consisted of cohorts with a first cancer of the cervix, ovary, testis, uterus, female breast, non-Hodgkin lymphoma or Hodgkin lymphoma. They have been conducted primarily in collaboration with the Radiation Epidemiology Branch at the NCI and other registries in North America and Europe. Generally these studies evaluate the treatment received for the first cancer and the risk it places on the patient for development of a second cancer. They typically involve medical record review and pathology material retrieval. We are evaluating esophagus, pancreas and stomach as second cancer sites in several of these cohorts, mentioned above, with a first cancer.

The WECARE (Women's Environmental Cancer and Radiation Epidemiology) Study is an example of a second cancer study. This study is designed to examine gene carrier status, demographic and lifestyle factors, as well as environmental and treatment factors reported to be associated with an initial breast cancer as they relate to the development of a second breast cancer in the opposite breast. Eligible cases were diagnosed with a first breast cancer between 1985 and 2009 that did not spread beyond the regional lymph nodes at diagnosis and a second primary contralateral breast cancer diagnosed at least one year after the first breast cancer diagnosis. Eligible controls were women with unilateral breast cancer who were individually matched to cases on year of birth, year of diagnosis, registry region and race. The controls must have survived without any subsequent diagnosis of cancer and with an intact contralateral breast during the interval that elapsed between their matched case's first and second breast cancer diagnoses. Data collection not only involved medical record review, but also participant interviews and biosample collection, either cheek cells, saliva or blood. More recently the WECARE staff collected mammographic film data for its research subjects to evaluate breast density as another risk factor for a subsequent diagnosis of invasive breast cancer in the contralateral breast. A listing of publications during 2016 from second cancer studies, including the WECARE Study, is provided in the last section of this report.

Cooperative Agreements and Other Registries

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

- Iowa Department of Public Health
- Iowa Cancer Consortium
- The University of Iowa
    - Center for Health Effects of Environmental Contamination
    - Center for Health Policy and Research
    - 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
    - Iowa Center for Education and Research on Therapeutics (Iowa CERT)
    - Injury Prevention Research Center
    - Nutrition Center
    - Prevention Research Center for Rural Health
    - Preventive Intervention Center
    - Reproductive Molecular Epidemiology Research & Education Program

Selected 2016 Publications

Agricultural Health Study

Brouwer M, Schinasi L, Beane Freeman LE, Baldi I, Lebailly P, Ferro G, et al. Assessment of occupational exposure to pesticides in a pooled analysis of agricultural cohorts within the AGRICOH consortium. Occup Environ Med. 2016;73(6):359-67.

Christensen CH, Barry KH, Andreotti G, Alavanja MC, Cook MB, Kelly SP, et al. Sex Steroid Hormone Single-Nucleotide Polymorphisms, Pesticide Use, and the Risk of Prostate Cancer: A Nested Case-Control Study within the Agricultural Health Study. Front Oncol. 2016;6:237.

Koutros S, Silverman DT, Alavanja MC, Andreotti G, Lerro CC, Heltshe S, et al. Occupational exposure to pesticides and bladder cancer risk. Int J Epidemiol. 2016;45(3):792-805.

Tual S, Silverman DT, Koutros S, Blair A, Sandler DP, Lebailly P, et al. Use of Dieselized Farm Equipment and Incident Lung Cancer: Findings from the Agricultural Health Study Cohort. Environ Health Perspect. 2016;124(5):611-8.

Cancer Care Outcomes Research & Surveillance Consortium

Brooks GA, Cronin AM, Uno H, Schrag D, Keating NL, Mack JW. Intensity of Medical Interventions between Diagnosis and Death in Patients with Advanced Lung and Colorectal Cancer: A CanCORS Analysis. J Palliat Med. 2016;19(1):42-50.

Litzelman K, Kent EE, Rowland JH. Social factors in informal cancer caregivers: The interrelationships among social stressors, relationship quality, and family functioning in the CanCORS data set. Cancer. 2016;122(2):278-86.

Sullivan DR, Forsberg CW, Ganzini L, Au DH, Gould MK, Provenzale D, et al. Depression symptom trends and health domains among lung cancer patients in the CanCORS study. Lung Cancer. 2016;100:102-9.

Tisnado D, Malin J, Kahn K, Landrum MB, Fletcher R, Klabunde C, et al. Variations in Oncologist Recommendations for Chemotherapy for Stage IV Lung Cancer: What Is the Role of Performance Status? Journal of oncology practice. 2016;12(7):653-62.

SEER–Medicare Health Outcomes Survey

Kent EE, Malinoff R, Rozjabek HM, Ambs A, Clauser SB, Topor MA, et al. Revisiting the Surveillance Epidemiology and End Results Cancer Registry and Medicare Health Outcomes Survey (SEER-MHOS) Linked Data Resource for Patient-Reported Outcomes Research in Older Adults with Cancer. J Am Geriatr Soc. 2016;64(1):186-92.

Kenzik KM, Kent EE, Martin MY, Bhatia S, Pisu M. Chronic condition clusters and functional impairment in older cancer survivors: a population-based study. J Cancer Surviv. 2016;10(6):1096-103.

Leach CR, Bellizzi KM, Hurria A, Reeve BB. Is it my cancer or am I just getting older?: Impact of cancer on age-related health conditions of older cancer survivors. Cancer. 2016;122(12):1946-53.

Studies Involving Tissue

Prizment AE, Vierkant RA, Smyrk TC, Tillmans LS, Lee JJ, Sriramarao P, et al. Tumor eosinophil infiltration and improved survival of colorectal cancer patients: Iowa Women's Health Study. Modern pathology. 2016;29(5):516-27.

Yang B, Shebl FM, Sternberg LR, Warner AC, Kleiner DE, Edelman DC, et al. Telomere Length and Survival of Patients with Hepatocellular Carcinoma in the United States. PLoS One. 2016;11(11):e0166828.

Transplant Cancer Match Study

Arron ST, Raymond AK, Yanik EL, Castenson D, McCulloch CE, Clarke CA, et al. Melanoma Outcomes in Transplant Recipients With Pretransplant Melanoma. Dermatologic surgery. 2016;42(2):157-66.

Hussain SK, Makgoeng SB, Everly MJ, Goodman MT, Martinez-Maza O, Morton LM, et al. HLA and Risk of Diffuse Large B cell Lymphoma After Solid Organ Transplantation. Transplantation. 2016;100(11):2453-60.

Safaeian M, Robbins HA, Berndt SI, Lynch CF, Fraumeni JF, Jr., Engels EA. Risk of Colorectal Cancer After Solid Organ Transplantation in the United States. Am J Transplant. 2016;16(3):960-7.

Yanik EL, Chinnakotla S, Gustafson SK, Snyder JJ, Israni AK, Segev DL, et al. Effects of maintenance immunosuppression with sirolimus after liver transplant for hepatocellular carcinoma. Liver transplantation. 2016;22(5):627-34.

Yanik EL, Clarke CA, Snyder JJ, Pfeiffer RM, Engels EA. Variation in Cancer Incidence among Patients with ESRD during Kidney Function and Nonfunction Intervals. J Am Soc Nephrol. 2016;27(5):1495-504.

Second Cancer Studies Including the WECARE Study

Brooks JD, John EM, Mellemkjaer L, Lynch CF, Knight JA, Malone KE, et al. Body mass index, weight change, and risk of second primary breast cancer in the WECARE study: influence of estrogen receptor status of the first breast cancer. Cancer Med. 2016;5(11):3282-91.

Hauptmann M, Borge Johannesen T, Gilbert ES, Stovall M, van Leeuwen FE, Rajaraman P, et al. Increased pancreatic cancer risk following radiotherapy for testicular cancer. Br J Cancer. 2016;115(7):901-8.

Langballe R, Mellemkjaer L, Malone KE, Lynch CF, John EM, Knight JA, et al. Systemic therapy for breast cancer and risk of subsequent contralateral breast cancer in the WECARE Study. Breast Cancer Res. 2016;18(1):65.

Other

Banegas MP, Harlan LC, Mann B, Yabroff KR. Toward greater adoption of minimally invasive and nephron-sparing surgical techniques for renal cell cancer in the United States. Urol Oncol. 2016;34(10):433.e9-.e17.

Bardia A, Keenan TE, Ebbert JO, Lazovich D, Wang AH, Vierkant RA, et al. Personalizing Aspirin Use for Targeted Breast Cancer Chemoprevention in Postmenopausal Women. Mayo Clin Proc. 2016;91(1):71-80.

Barnes KT, McDowell BD, Button A, Smith BJ, Lynch CF, Gupta A. Obesity is associated with increased risk of invasive penile cancer. BMC urology. 2016;16(1):42.

Charlton ME, Matthews KA, Gaglioti A, Bay C, McDowell BD, Ward MM, et al. Is Travel Time to Colonoscopy Associated With Late-Stage Colorectal Cancer Among Medicare Beneficiaries in Iowa? J Rural Health. 2016;32(4):363-73.

DellaValle CT, Deziel NC, Jones RR, Colt JS, De Roos AJ, Cerhan JR, et al. Polycyclic aromatic hydrocarbons: determinants of residential carpet dust levels and risk of non-Hodgkin lymphoma. Cancer Causes Control. 2016;27(1):1-13.

Inoue-Choi M, Weyer PJ, Jones RR, Booth BJ, Cantor KP, Robien K, et al. Atrazine in public water supplies and risk of ovarian cancer among postmenopausal women in the Iowa Women's Health Study. Occup Environ Med. 2016;73(9):582-7.

Machiela MJ, Lan Q, Slager SL, Vermeulen RC, Teras LR, Camp NJ, et al. Genetically predicted longer telomere length is associated with increased risk of B-cell lymphoma subtypes. Hum Mol Genet. 2016;25(8):1663-76.

Midkiff KD, Andrews EB, Gilsenan AW, Deapen DM, Harris DH, Schymura MJ, et al. The experience of accommodating privacy restrictions during implementation of a large-scale surveillance study of an osteoporosis medication. Pharmacoepidemiol Drug Saf. 2016;25(8):960-8.

The University of Iowa | College of Public Health

Prepared By

Michele M. West, Ph.D.
Coordinator for Special Projects

Mary E. Charlton, Ph.D.
Investigator

Amanda R. Kahl, B.A., MPH Candidate
Research Assistant

Kathleen M. McKeen
Director

Daniel B. Olson, M.S.
Application Developer

Charles E. Platz, M.D.
Investigator

Michael D. Voigt, M.D.
Clinical Professor of Internal Medicine
Medical Director Liver Failure and Transplantation

George Weiner, M.D.
Director, Holden Comprehensive Cancer Center
Professor, Department of Internal Medicine

Charles F. Lynch, M.D., Ph.D.
Principal Investigator

Special thanks to the staff of the State Health Registry of Iowa and hospital cancer programs. We appreciate the generous assistance of physicians and other health care personnel serving Iowans.

This project has been funded in whole or in part with Federal funds from the National Cancer Institute, National Institutes of Health, Department of Health and Human Services, under Contract No. HHSN2612013000201.

Published March 2017