

CANCER IN OREGON

Annual Report on Cancer Incidence and Mortality Among Oregonians

2003



Published by the
Oregon State Cancer Registry
www.healthoregon.org/oscar



SUGGESTED CITATION

Riddell C, Pliska JM. Cancer in Oregon, 2003: Annual Report on Cancer Incidence and Mortality Among Oregonians. Department of Human Services, Oregon Public Health Division, Oregon State Cancer Registry, Portland, Oregon, 2006.

Coordination, design, and layout: JM Pliska. Photos of Oregon's Lost Lake and Mt. Hood.

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CANCER IN OREGON, 2003

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SPECIAL THANKS

Special thanks to Recinda Sherman, CTR, Florida Cancer Data System, former OSCaR Research and Surveillance staff member; the Oregon Tobacco Prevention and Education Program; the Oregon Partnership for Cancer Control; and the Oregon Genetics Program for their contributions to this report.

FUNDING SOURCE

This publication was supported by Grant/Cooperative Agreement #U55/CCU021984 from the Centers for Disease Control and Prevention (CDC), National Program of Cancer Registries (NPCR). Its contents are solely the responsibility of the authors and do not necessarily represent the official views of CDC.

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July 1, 2006

Dear Colleague:

The Oregon State Cancer Registry (OSCaR) is pleased to present its eighth annual report, *Cancer in Oregon, 2003*. This report contains complete cancer surveillance data for the years 1999-2003; trends for selected sites also include data from 1996 forward. For complete historical data, see earlier reports of [Cancer in Oregon](#), which are available on our website www.healthoregon.org/oscar. This report uses current methods for cancer data analysis that conform to national standards. You may find it helpful to review the technical documentation for specific details.

The information in this report is available due to the diligent efforts of hospital-based cancer registrars, as well as staff from hospitals, ambulatory surgery centers, pathology laboratories, numerous physician offices, and other states in which Oregon residents are diagnosed with and/or treated for cancer. Their cooperation in reporting timely, accurate, and complete cancer incidence data is deeply appreciated.

OSCaR would also like to acknowledge the following organizations that have been supportive of cancer reporting in Oregon: Oregon Medical Association (OMA), Oregon Cancer Registrars' Association (OCRA), the Oregon Association of Hospitals and Health Systems (OAHHS), and the Oregon State Cancer Registry Advisory Committee. We would also like to acknowledge our primary funding source, the Centers for Disease Control and Prevention (CDC), National Program of Cancer Registries (NPCR).

For additional copies of this report, please feel free to download a copy from our website: www.healthoregon.org/oscar. If you need to receive the report in an alternate format, please contact the office at (971)673-0986.

Sincerely,

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I. EXECUTIVE SUMMARY

On an average day in 2003, 46 Oregonians were diagnosed with a reportable cancer¹, and 20 Oregonians died due to malignant cancer. Altogether, 18,465 reportable cancers were added to the registry. Cancer risk increases with age, and Oregon's population is aging; more than 75% of cancers in Oregon occur in people over the age of 55. Consequently, there is the potential for an upsurge in cancer incidence and mortality.

It is estimated that more than half of all cancers could be prevented through smoking cessation and improved diet. By controlling modifiable risk factors (see *Cancer Risks*) and appropriately screening for cancers that can be detected at an early stage (see *Cancer Screening and Prevention*), Oregonians can help reduce the burden of cancer in their state.

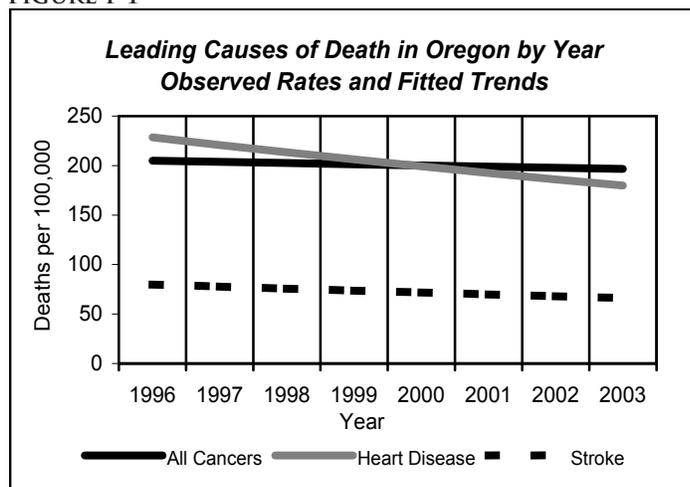
CANCER LEADING CAUSE OF DEATH AMONG OREGONIANS

In 2000, a long-standing trend was broken when cancers surpassed heart disease to become the leading cause of death among Oregonians². (See Figure I-1.)

Mortality rates due to cancers³ have been declining by 1% a year since 1996. In 2003, the mortality rate for all cancers combined was 194.7; the rate was 179.8 for heart disease and 64.7 for stroke.

The average age of death due to cancer is younger than the age of deaths due to heart disease. This results in over 30% more years of potential life lost⁴ (YPLL) due to cancer than to heart disease. Cancer is the 2nd leading cause of YPLL for men, following unintentional injuries and is the leading cause of YPLL for Oregon women. Annually, about 22,700 YPLLs in Oregon are attributable to cancer mortality.

FIGURE I-1



¹ Reportable cancers include all cancers that are *in situ* or invasive with the following exceptions: basal and squamous cell carcinoma of the skin (except of genitalia) and carcinoma *in situ* of the cervix.

² Although there were more heart disease deaths in 2000 and in 2002 than cancer deaths, the age-adjusted rate was higher for cancer deaths, which indicates a greater burden among Oregonians. In 2001, both the counts and age-adjusted rates for cancer deaths exceeded those for heart disease.

³ The all-cancers mortality data exclude *in situ* cases, cases of unknown or uncertain behavior (there is an average of 50 such deaths a year in Oregon), as well as benign neoplasms. Cancers that first became reportable in 2001 are not included in the all-cancers mortality trends. Including these additional cases raises the all-cancers mortality rate and artificially affects the historical trends. Please see the *Technical Section* and/or *Appendix A* for additional information about these newly reportable cases.

⁴ YPLL calculated on combined mortality data from 1999-2003 with age 65 as the threshold for age of death.

LEADING CANCER SITES

Breast Cancer is the most common reportable malignancy, with 2,565 invasive cases diagnosed among women and 14 among men in 2003. It is the 3rd leading cause of cancer death in Oregon. Among 44 states with high quality cancer incidence data, Oregon consistently has one of the highest female breast cancer incidence rates (ranking 2nd in 2002). However, the mortality rate due to female breast cancer in Oregon is below that seen nationally (ranking 31st in 2002). Appropriate screening through breast exams and mammography may decrease the number of women diagnosed at advanced stages of disease and, thereby, decrease mortality.

Lung Cancer is the 2nd most common reportable malignancy, with 2,448 invasive cases diagnosed in 2003. Lung cancer is the leading cause of cancer death in Oregon. At present, there are no effective early detection tools for lung cancer. Therefore, this malignancy is often diagnosed at an advanced stage, resulting in a poor prognosis. Tobacco use is the single, greatest risk factor for lung cancer. In 2003, tobacco use was implicated in 80% of lung cancer deaths. Although lung cancer incidence rates among Oregon men are similar to those seen nationally (ranking 25th in 2002). Oregon ranks as one of the states with the highest lung cancer incidence among women (14th among the states in 2002). Decreasing tobacco use in Oregon could significantly lower lung cancer incidence and mortality.

Prostate Cancer is the 3rd most common reportable malignancy, with 2,384 invasive cases diagnosed in 2003. It is also the 4th

leading cause of cancer death in Oregon. Among 44 states with high quality cancer incidence data, Oregon men ranked 34th for prostate cancer in 2002. Currently, the causes of prostate cancer are poorly understood and there is no consensus on the benefit of prostate cancer screening.

Colorectal Cancer is the 4th most common reportable malignancy, with 1,804 invasive cases diagnosed in 2003. Colorectal cancer is the 2nd most common cause of cancer death among Oregonians. Routine screening can reduce both the incidence and mortality of colorectal cancer through early detection and removal of precancerous polyps.

Bladder Cancer is the 5th most common invasive malignancy with 820 invasive cases diagnosed in 2003. Smoking is the greatest risk factor for bladder cancer. Exposure to chemicals in the workplace can also increase the risk for bladder cancer if safety measures are not taken. Workers at highest risk are rubber, leather, textiles, and paint products workers as well as hairdressers, machinists, printers, and truck drivers. Although there are no recommendations for routine screening tests, blood in the urine is an early sign of bladder cancer. Having the bladder checked by a health care provider at the first sign of blood in the urine can identify bladder cancer in the earliest and most treatable stage.

Melanomas are the 6th most common reportable malignancy with 789 invasive cases diagnosed in 2003¹. Oregon has one of the highest melanoma incidence rates in the nation (ranking 5th in 2002) particularly among women, and a higher melanoma mortality rate than the national average. Sun avoidance, particularly during childhood, is the best protective measure against developing melanomas.

¹ Cancer incidence rates are calculated on invasive cancers (excluding *in situ*) with the exception of bladder cancer. Although there were more total cases of melanomas of the skin, there were fewer invasive cases (1,472 total melanomas, of which 789 were invasive, compared to 820 bladder; all of which were invasive).

OREGON POPULATION OVERVIEW

Although the causes of most cancers are unknown, there are specific community characteristics that can influence a population's burden of cancer. The most significant risk factor for cancer is age. According to the 2000 US Census, 12% of Oregonians are aged 65 and over. However, the distribution of Oregon seniors is not constant across the state. (See Figure I-2.)

Regardless of the age of the underlying population, the burden of cancer among Oregonians can be lessened with appropriate, population-based screening for cancers that can be detected at an early or premalignant stage, such as colorectal and cervical cancers. Access to medical care for appropriate screening, as well as treatment, is imperative to reduce the toll of cancer among Oregonians.

An important factor affecting access to medical care is the physical distance the population lives from medical services. The majority of Oregon counties are classified as Rural or Frontier (< 6 persons per square mile). In many counties, there are urban centers with medical services, however, the distribution of the population living outside of those areas is variable by county. (See Figure I-3.) Most counties with a high percentage of residents residing outside urban areas also have a high percentage of senior residents.

FIGURE I-2

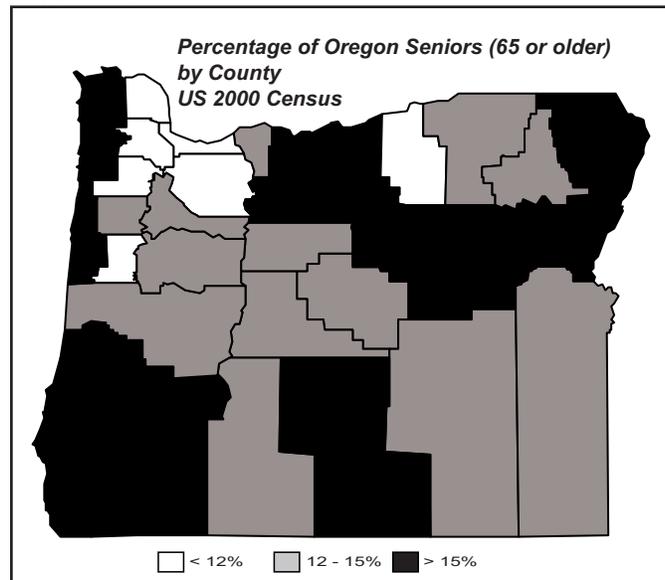
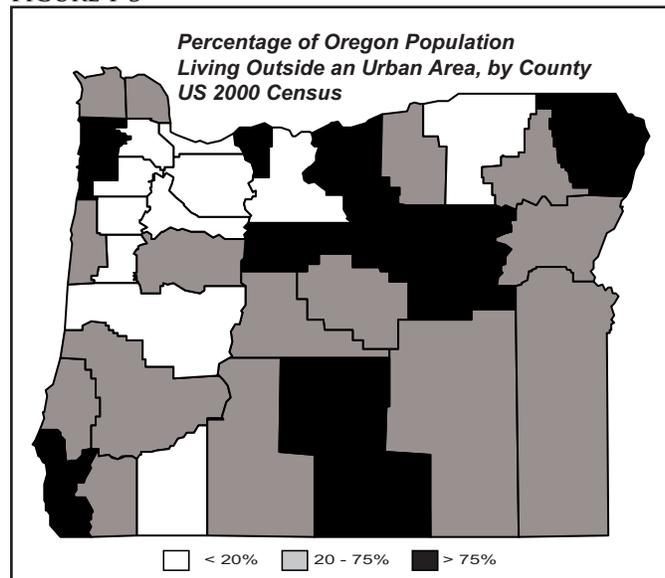


FIGURE I-3



II. INTRODUCTION

The Oregon State Cancer Registry (OSCaR) was established by the 1995 Oregon Legislature to conduct statewide cancer surveillance and to guide cancer control program planning. The registry began collecting information on all reportable cancers diagnosed in Oregon as of January 1, 1996. The enabling statute defines the purpose of OSCaR as follows:

“...to provide information to design, target, monitor, facilitate, and evaluate efforts; determine the causes or sources of cancer among the residents of Oregon; and reduce the burden of cancer and benign tumors in Oregon.”

Data from OSCaR provide an overview of all reportable cancers diagnosed in Oregon, including all malignant cancers—except basal or squamous cell carcinomas of the skin and *in situ* cervical cancers. Non-melanoma skin cancer is reportable when it occurs on the skin of the genitalia. Cancer incidence data, which are collected by registrars trained in cancer reporting, provide a more complete picture of cancer among Oregonians than can be obtained from mortality data alone. This information is useful for cancer prevention programs, clinicians, policymakers, and for the public to understand the impact of cancer among Oregonians.

By combining information from the statewide cancer registry, death certificates, and health behavior surveys, the data provide an opportunity to answer

a variety of epidemiological questions. This information will help cancer control programs identify at-risk populations as well as support epidemiologic studies of risk factors and cancer etiology. Many such questions are covered in this report including the following:

- ✓ *How many Oregonians are diagnosed with cancer each year?*
- ✓ *Which cancers are the most common?*
- ✓ *Which cancers are the deadliest (most deaths per diagnosed case)?*
- ✓ *What are the trends in cancer incidence and mortality?*
- ✓ *How many Oregonians are being screened for cancers?*
- ✓ *Which groups of Oregonians are disproportionately affected by cancer?*
- ✓ *What geographic areas in the state have higher cancer mortality?*

OSCaR also collects information on the stage of disease (the level of a cancer’s progression) at the time of diagnosis. This is an important indicator of the effectiveness of screening efforts, as well as a determinant of treatment options and a predictor of survival for many types of cancers. For example, detecting female breast cancer in the early stages (through screening such as mammography) is thought to reduce mortality and have the strongest influence over whether a woman with breast cancer can be successfully treated.

III. WHAT'S NEW IN 2003?

Diagnosis year 2003 marks the eighth year of complete cancer reporting for Oregon. Five years of complete data are included in this annual report, 1999-2003. Limited data

for prior years are included. For historical data, please review prior reports on our website at www.healthoregon.org/oscar.

CANCER AND RACE AND ETHNICITY IN OREGON

Due to issues with the completeness and accuracy of race and ethnicity reporting, these data must be interpreted with caution. Please refer to the *Technical Section* for additional information and an overview of ongoing efforts to improve the race and ethnic origin data in the Registry.

Since 2002, race and ethnic categories included in this report conform to national reporting standards. There are four race categories—African American (AA),

American Indian/Alaskan Native (AI/AN), Asian/Pacific Islander (A/PI), and White. There are two ethnic categories—Hispanic and Non-Hispanic.

Racial and ethnic categories are not mutually exclusive. The race data are reported regardless of ethnicity, and the ethnicity data are reported regardless of race. This change allows for comparability with national data and facilitates comparisons for tracking progress in achieving Healthy People 2010 objectives.

DENOMINATOR CHANGE

Denominator data used to calculate incidence and mortality rates for prior years were population estimates from the Center for Population Research and Urban Studies, Portland State University (PSU), a resource center for population data designated by the US Bureau of the Census. However, the PSU data does not include race or ethnicity population counts with the level of detail

needed to age-adjust rates. This year's report uses bridged, intercensal estimates directly from the 2000 US Census. Although the differences in rates are negligible at the state level, some county level rates show modest variation due to the change in calculation. However, this allows direct comparability among the race and ethnicity rates and rates for the general population.

CHANGE IN CALCULATING AGE-ADJUSTED RATES

Through 2001, all age-adjusted rates were calculated per 100,000 population using the Year 2000 standard population with 18 age groups. To allow greater comparability with national mortality data, the age-adjusted rates are now calculated using

19 age groups: infants less than one year of age are put in an age group stratum separate from one- to four-year-olds. Because cancer is more common among the elderly, this analysis change results in minimal data variance.

TREND DATA

Two types of trends are presented in this year's report: current trends and historical trends. Current trends include the most recent five years of data, 1999-2003. Historical trends include all available years of data, 1996-2003.

All trend data should be interpreted with caution. Over the years, changes in coding and collection standards have occurred, which affect the interpretability of the data. Specifically, in 1999, a national switch from ICD-9 classification to ICD-10 changed how cause of death is recorded and how cancer mortality data correlate with cancer incidence data. In 2001, major changes affecting coding for staging and cancer reportability came into effect for cases collected by cancer registries nationwide. Please review the *Technical Section* for specific information on data collection and analysis changes.

Current trends for 1999-2003 have been calculated for incidence and mortality for each site. The trend is the average annual percent change (APC) per year based on the past five years. These data are presented in *Fast Facts* for selected sites and in the incidence and mortality tables for all cancer sites.

Historical trends have been calculated and presented only for selected sites

and include all available years of data. These trends track any changes in cancer incidence or mortality since the onset of registry data collection in 1996. In future reports, these historical trends will continue to be presented with additional years of data, which will increase their applicability.

Trends are affected by a number of factors including the following:

- ✓ general reporting improvements from early years,
- ✓ site-specific reporting deficiencies in recent years as more cancers are being treated in outpatient settings (outside of the rigorous hospital reporting system),
- ✓ changes in reporting requirements and/or coding standards,
- ✓ changes in characteristics of underlying populations, natural fluctuations, and
- ✓ true changes in population risk and/or burden.

All trends are based on rates per 100,000 population, that are age-adjusted to the Year 2000 Standard Population. Please see the *Technical Section* for more detailed discussion.

CANCER MAPS

The 2003 report includes maps showing regional differences in cancer incidence and mortality. These maps are not intended to represent individual county rates; county rates are presented in Tables 3 and 4.

These maps depict statistically smoothed county rates to identify regional differences that would not necessarily be apparent when reviewing single county rates. The mapped rates for 2003 show the county rates as above, below, or at the national rates. For additional information about methodology, please see the *Technical Section*.

Regional variations in cancer rates may lead to concern about exposures to carcinogens or unequal risk in some areas of the state. However, translating regional cancer rate differences into differences in cancer risk is problematic. It is important to recognize that multiple factors influence geographic variation in cancer rates. Despite the multitude of factors influencing cancer variations by region, these maps illustrate regional differences in cancer incidence and mortality and may suggest areas to target screening and prevention programs or to expand treatment facilities.

In addition to true differences in burden or random rate fluctuations, the following are also responsible for regional variation of cancer rates:

Variation in Population Demographics - Some cancers have different rates among different racial or ethnic groups. For example, breast cancer rates are generally higher in white women and prostate cancer rates are generally higher in African American men. Therefore, racial makeup of an area should be considered when evaluating regional differences.

Variation in Medical Care/Screening - In areas with higher cancer screening rates, such as PSA testing for prostate cancer, more cancers will be diagnosed. However, for several cancers, notably cervical, breast, and colorectal, a higher percentage of early stage diagnoses associated with higher screening rates can result in more favorable prognosis for these cancers. Comparing both incidence and mortality rates is important to gain a more complete picture of regional cancer differences.

Variation in Reporting - Although OSCaR has a total case completeness rate of over 95%, cancer reporting may differ by region in terms of completeness and type of report source (hospital vs. physician office). Ongoing efforts by registry staff will help alleviate artifactual differences.

IV. CANCER OVERVIEW

The cause of most cases of cancer is unknown. However, exposure to substances in the environment increase the likelihood that a person will develop cancer; certain behaviors can increase and other behaviors can decrease this chance. In addition, changes in some genes (called mutations) inherited (or passed on) from parent to child predispose a person to developing cancer. Exposure to substances in the environment, lifestyle behaviors, and the inherited genes combine to influence each individual's chance of developing cancer.

The Oregon Partnership for Cancer Control (OPCC) was formed in 2004 to develop and implement the first statewide cancer control plan for Oregon. The OPCC uses Oregon specific cancer data to monitor progress towards reducing the burden of cancer in Oregon. For more information about OPCC, its activities, and the Oregon Comprehensive Cancer Plan, visit www.healthoregon.org/cancer or contact the program at 971-673-0984.

Oregon public health programs use cancer registry data in many ways:

- To identify substances in the environment that can cause cancer and decrease people's exposures to these substances.
- Encourage people to eliminate or reduce behaviors that increase the chance of cancer, for example smoking; and promote behaviors that decrease the chance of developing cancer, for example, getting plenty of exercise and eating a diet high in vegetables and fruit.
- Promote health screening to detect cancer early, while it is still treatable.

A. CANCER RISKS

The lifetime chance of developing cancer for males is about 46% and about 38% for females. Risk factors for cancer include biological predisposition, behaviors, and environmental exposures. While some biological risk factors are inherent and immutable (age, genes), many behavioral and environmental risk factors are modifiable. Behavioral factors that affect cancer risk include tobacco use, viral infections, diet, physical inactivity, and

alcohol intake. In addition, occupational or environmental exposures to radiation, asbestos, secondhand smoke, and other carcinogens contribute to cancers that are potentially preventable. In this section, we summarize the leading known risk factors for cancer. For additional information, please review the National Toxicology Program's *Report on Carcinogens* available at the following website <http://ntp.niehs.nih.gov/ntpweb>.

BIOLOGICAL PREDISPOSITION

Alterations in genes, called mutations, cause the change of a normal cell to a cancer cell. Once a cell becomes cancerous, it multiplies, causing the descendants of the original cell to overgrow the surrounding tissue and eventually spread to other parts of the body. Mutations in multiple cells are almost always required for a cell to become cancerous. There is the potential for a mutation to occur each time a cell divides. Because cells continue to divide over a person's lifetime, mutations accumulate as a person ages. Thus, the risk of developing cancer increases with age. Overall, 75% of cancers in Oregon occur in people over the age of 55 years.

Most often, when more cases of cancer occur in a family than expected by chance alone, no single "cancer gene" can be found. This situation is termed "familial cancer" (as opposed to "inherited cancer"). Familial cancers may be a sign of common gene mutations, shared environment or lifestyles, or a combination of these factors.

Mutations can also be inherited from a parent. If a mutation is inherited, it is present in all of the cells of the body. Therefore, fewer

additional mutations are required in order for the person to develop cancer.

Most inherited mutations increase the chance of developing cancer by only a modest amount. A few increase a person's risk substantially. Two examples are BRCA1 and BRCA2 (short for breast cancer 1 and breast cancer 2). A woman with a mutation in the BRCA1 or BRCA2 gene has an approximately 36-85% chance of developing breast cancer over her lifetime compared to the population risk of about 13%. Lifetime risk estimates of ovarian cancer for women in the general population show that 1.7 percent will get ovarian cancer, compared with 16-60% of women with an altered BRCA1 or BRCA2 gene.

A third example is one of the genes predisposing to Hereditary Nonpolyposis Colon Cancer. A person who inherits a mutation in this gene has about an 80% lifetime risk of developing colon cancer compared to the general population lifetime risk of 2%. Also, the average age of colorectal cancer diagnosis in a person with a HNPCC gene mutation is twenty years earlier than for sporadic colorectal cancer (44 years vs. 64 years). Clues that a

gene causing a significantly increased risk of cancer is present in a family include: multiple relatives with the same type of cancer, cancer diagnosed at an earlier than usual age, one individual with more than one primary cancer (of either the same type or different types), or very rare cancers.

Melanoma also appears to be influenced by genetics. About 10% of melanoma cases occur in individuals with a family history of melanoma. Individuals who have a first-degree relative with melanoma are eight

times more likely to develop the condition themselves compared to individuals without a family history.

In addition to age and inherited mutations, a third biological factor affecting cancer risk is sex. Some cancers are clearly sex specific because of the involved organ, for example prostate cancer in men and uterine cancer in women. Other cancers are more common among persons of a particular sex. For example, lung cancer is more common in men, and breast cancer is more prevalent in women.

MODIFIABLE BEHAVIORS

Tobacco Use – Tobacco use is the greatest preventable risk factor for cancer. Historically, tar has been considered the most important carcinogen in tobacco. However, recent evidence suggests that nicotine disrupts apoptosis, or programmed cell death, which can lead to tumor initiation, progression, or metastasis. Apoptosis is needed to destroy abnormal cells that are a threat to the body, such as cells with DNA damage due to age or an exposure, and is a central self-defense mechanism against cancer. This may explain the synergistic effect smoking has when combined with other exposures, such as sun exposure. Because of its overwhelming importance as a carcinogen, we have devoted an entire section of this report to the effects of smoking tobacco. (See *Tobacco and Cancer*.)

Diet – Dietary factors appear to increase the risk of developing many cancers. The varying incidence in different parts of the world suggests that diet plays an important role in the development of oral,

esophageal, and stomach cancers. Population studies suggest that persons who consume a high-fiber, low-fat diet have a lower risk of developing colorectal cancer. Comparative studies have shown that prostate cancer rates are generally higher in countries in which the population consumes more animal fat.

Physical Activity – Epidemiologic studies suggest that increased physical activity decreases risk of breast, colorectal, and pancreatic cancers. The association has been noted for occupational, transportation-related, and leisure time physical activity.

Obesity – People who are overweight are at increased risk of multiple cancers, including breast, colorectal, endometrial, kidney, pancreatic, oral, and esophageal cancers.

Alcohol Use – Heavy alcohol consumption is a risk factor for cancers of the oral cavity, pharynx, and larynx. Smoking and alcohol consumption result in a synergistic effect, producing a greater cancer risk than would be expected if their effects were merely additive.

These two behaviors account for approximately three-fourths of all oral cancers in the United States. In addition, heavy alcohol consumption increases the risk of developing esophageal and liver cancers and has been implicated in development of cancers at other sites.

Reproductive Behavior – Several epidemiological studies suggest that reproductive patterns influence breast cancer risk. Prolonged exposure to natural and therapeutic estrogen is believed to raise the risk of breast cancers slightly. The number of menstruating years for a woman is one risk factor; early menarche and late menopause increase a woman’s risk. An early age at first pregnancy and a high number of full-term pregnancies are protective factors. The effect of lactation is still not clear; however, there is evidence of an increasing protective effect with the greater number of months a woman breastfeeds.

Sexual Behavior – The risk of cervical cancer is linked with the onset of sexual activity. The risk is higher among women who become sexually active at an early age and who have multiple sexual partners. This risk is related to the risk of exposure

to human papilloma viruses (HPV), which have been identified as a cause of cervical cancer. Several different types of HPV infect the genital tract. Some of these cause genital warts. Other types appear to cause cervical dysplasia and cervical cancer. Infection with HPV is the strongest risk factor for developing cervical cancer. HPV is spread primarily through sexual contact, and about 40 HPV variants have been linked to other cancers of the anus, vulva, vagina, penis, oropharynx, mouth, and skin. A vaccine for HPV was approved by the Food and Drug Administration (FDA) in the summer of 2006 and CDC’s Advisory Committee on Immunization Practices recommends routine vaccination of females age 11-12. The HPV vaccine is effective against four strains of HPV that are estimated to cause 70% of cervical cancer.

Sexual activity may also be related to the development of prostate cancer. One study has shown greater sexual activity and frequency of venereal disease in prostate cancer cases compared to controls. This suggests the possibility that some cases of prostate cancer may also result from a sexually transmitted agent; however, no culprit has been identified.

ENVIRONMENTAL EXPOSURES

Environmental Contamination – Exposure to carcinogens in the environment is a risk factor for cancers. However, assessing exposure to environmental contamination is particularly difficult due to the lag time between exposure and diagnosis, as well as the complexity of determining an individual’s or community’s exposure.

Currently, such exposures are thought to contribute to a relatively small proportion of all cancer diagnoses. However, there is sustained concern among the public about environmental hazards, and researchers are continually improving research techniques to address such issues.

Secondhand smoke – Exposure to secondhand smoke increases the risk of lung cancer in a non-smoker. A non-smoking spouse of a heavy smoker will have double the risk of developing lung cancer compared to a non-smoking spouse of a non-smoker.

Ionizing Radiation – Sources of exposure to ionizing radiation include medical imaging and treatment (x-rays, radiotherapy), radioactive elements in the soil and air (uranium, radon gas), nuclear weapons, and occupational exposure (such as that occurring among nuclear shipyard workers). Ionizing radiation has been related to an increased risk of several cancers, including leukemia, thyroid, breast, and lung cancers.

Occupational Exposures – Many occupational exposures have been associated with increased risk of developing certain cancers. For instance, workers exposed to aniline dyes and certain solvents are at increased risk for bladder cancer. Miners exposed to radon gas have an increased risk of developing lung cancer. Asbestos exposure is the primary risk factor for developing mesothelioma, and workers exposed to vinyl chloride are at increased risk for developing angiosarcoma of the liver.

Sun Exposure – Epidemiologic studies have identified a strong relationship between being sunburned as a child or adolescent and developing melanoma as an adult. Exposure to sun also increases the risk of developing basal and squamous cell carcinomas for the skin. While the use of sunscreen is recommended for general skin health, there is limited evidence that sunscreen use can prevent skin cancers. Therefore, using sunscreen is not a substitute for avoidance of sun exposure.

Viral Infections – In addition to HPV and its contributory role in developing cervical, vulvar, and penile cancers (*See Sexual Behavior*), several other viruses have been associated with cancers. These include Epstein-Barr virus, which has been associated with Burkitts lymphoma, nasopharyngeal carcinoma, and Hodgkin lymphoma; hepatitis B and C virus, which increase the risk of hepatocellular carcinoma; HTLV-1 virus, which causes adult T-cell leukemia, and the human immunodeficiency virus (HIV), which has been associated with non-Hodgkin lymphoma and Kaposi sarcomas.

UNKNOWN FACTORS

The causes of many cancers are still unknown. For instance, most breast cancers (80%) occur in women with no identifiable risk factors other than being female and post-menopausal. Colorectal cancers frequently occur in individuals without any known risk factors other than

age. This emphasizes the importance of population-based preventive screening so that these cancers can be identified early at the most treatable stage. (*See Cancer Screening and Prevention* for recommendations on preventive screenings.)

B. TOBACCO AND CANCER

Smoking contributes to about one in every five deaths in the US and is one of the most important modifiable risk factors leading to premature death. Cigarette smoking resulted in over one million years of potential life lost (YPLL) before age 65 in 1990 alone. More than 6,000 Oregonians die annually from tobacco-related disease. Tobacco annually claims more lives than AIDS, drug and alcohol abuse, motor vehicle crashes, murders, and fires combined. In 2003, more than 500,000 Oregon adults smoked

cigarettes, and nearly 100,000 adults chewed tobacco. For most smokers, addiction to tobacco began in their youth. Despite gains in preventing Oregon youth from starting to smoke, 10% of 8th graders and 19% of 11th graders still smoke, and 5% of 11th grade males chew tobacco.

Although lung cancer is perhaps the most well-known and well-publicized disease linked to tobacco use, a variety of other illnesses and cancers are associated with tobacco exposure.

TOBACCO-ASSOCIATED SITES

Lung cancer continues to receive enormous amounts of media attention, and its association with tobacco use is a source of numerous recent and pending lawsuits. It is estimated that 85% of all lung cancers are etiologically related to smoking, and smoking confers 12 to 22 times the risk of dying from lung cancer. Other factors, such as occupational and environmental exposures, play a much lesser role in the development of lung cancer. Non-smokers exposed to second-hand smoke have twice the risk of developing lung cancer compared to non-smokers without passive tobacco smoke exposure.

Most people who develop lung cancer die from the disease, and smoking prevention and cessation remain the best hope for reducing mortality from this cancer. After ten years of smoking cessation, the risk of developing lung cancer falls to about 50% of that of a continuing smoker. At 20 years, the risk approaches that of a non-smoker.

Oral cancers include those of the tongue, gums, inner cheeks, lips, tonsils, and palate, and are highly associated with tobacco and heavy alcohol use. These behaviors have a

synergistic effect on oral cancer risk. Although oral cancers only account for about 3% of all Oregon invasive malignancies, they are highly preventable because the use of tobacco and alcohol accounts for approximately 75% of these cancers. Preventive measures for these cancers include discouraging the initiation of tobacco use, encouraging the cessation of smoking and smokeless tobacco, and decreasing alcohol use. There is good evidence that oral cancer risk declines quickly with cessation of smoking or smokeless tobacco use. In fact, little or no elevation in risk was found among those who had quit smoking for ten or more years.

Bladder cancer is strongly linked to smoking. Carcinogens in the smoke are absorbed into the bloodstream and partially excreted in the urine. Since the bladder collects and holds urine, the lining of the bladder wall is exposed to carcinogenic tobacco by-products for long periods of time. Cigarette smokers develop bladder cancer two to three times more often than non-smokers do, and the risk increases with the quantity smoked. Heavy smokers have bladder cancer risks up to five times those of non-smokers.

Cervical cancer is most strongly associated with the presence of the human papilloma virus (HPV); however, smoking is also associated with elevated risk for cervical cancer. Studies that controlled for other factors, such as age at first intercourse and number of sexual partners, have found this association with smoking to persist. The Pap smear is a useful screening test to detect early stage and precancerous lesions. Safe sexual practices and abstinence from tobacco are the most effective primary prevention strategies.

Pancreatic Cancer is often diagnosed at later stages when it is difficult to treat because symptoms are frequently vague. Smoking is a significant risk factor for pancreatic cancer. Increased smoking increases the risk of developing pancreatic cancers in a dose-dependent fashion up to two times the baseline risk. Eliminating any

modifiable risk factor, specifically smoking, is important to reduce the burden of this disease.

Gastrointestinal cancers have also been linked to smoking. The strength of the relationship between tobacco and these cancers declines with progression from the esophagus downward to the rectum. Heavy smokers have about five times the risk of developing esophageal cancer, and between one and three times the risk of developing stomach cancer. Recently, several studies have suggested that smoking may be related to adenocarcinoma of the bowel after a long latent period, and other studies have suggested a link between smoking and colon polyps. Smokers also have a risk of anal cancer eight times that of non-smokers. Although the anus is at the distal end of the gastrointestinal tract, the anal canal is lined with squamous epithelium, which may be a factor in the stronger association between tobacco smoke and anal cancer.

TOBACCO USE CESSATION

Tobacco use cessation is always advisable because the risk of developing tobacco-related cancers is correlated with the amount of tobacco exposure. Cutting back or, ideally, quitting smoking altogether not only reduces the risk of the aforementioned cancers, but also decreases the morbidity

associated with a variety of other illnesses including chronic bronchitis, emphysema, heart disease, asthma, and stroke. The evidence is clear that quitting use of tobacco early can play a significant role in an individual's health and well-being.

TOBACCO PREVENTION EFFORTS

Prevention efforts in Oregon have resulted in a dramatic drop in youth and adult tobacco use. Much of this decrease can be attributed to Oregon's statewide campaign against tobacco use. In November 1996,

Oregon voters passed Measure 44, an initiative that raised taxes on tobacco and dedicated 10% of the new revenue to tobacco prevention and education. Oregon started a comprehensive tobacco prevention program in 1997. The

program included passage of smokefree workplace ordinances, community education activities, tobacco cessation programs, school-based anti-tobacco programs, anti-tobacco commercials, and billboard advertising. In 2003, there were 2 billion fewer cigarettes sold in Oregon compared to 1996. An additional 2,700 infants were born without fetal exposure to tobacco smoke, because of the decrease in the percentage of mothers who smoked during pregnancy between 1996 and 2003. Besides improved health among Oregonians, reduced tobacco use results in monetary savings in Oregon. In 2002, tobacco use cost Oregonians more than \$1.0 billion in medical care for those made ill by tobacco, and another \$1.0 billion in lost productivity. The reduction in low birth weight babies saved an estimated \$2 million in neonatal medical costs for 2002.

Since 1996, Oregonians' tobacco use has declined more rapidly than the rest of the nation. However, in 2003, the Oregon State Legislature reallocated the Measure 44 funding and dismantled the Tobacco Prevention and Education Program (TPEP) to address existing budget constraints. Funding for TPEP was subsequently reinstated but at less than half the level that voters approved with Ballot Measure 44. Nonetheless, tobacco prevention activities are taking place in several communities around the state. The Oregon Tobacco Quit Line (1-877-270-STOP) is also currently available for Oregonians wanting to quit smoking or chewing tobacco. Since its inception in 1998, the quit line has helped more than 30,000 Oregonians who called seeking help. Follow-up surveys indicate that 20% of those callers were tobacco-free six months after the telephone counseling; this is twice the rate seen among those attempting to quit without quit line support.

C. CANCER SCREENING AND PREVENTION

In addition to engaging in preventive behaviors, people can reduce their cancer burden by receiving appropriate screening tests. Many cancers, if diagnosed at an early stage, are curable.

The US Preventive Services Task Force (USPSTF) is an independent panel of experts in primary care and prevention that systematically reviews the evidence for the effectiveness of clinical preventive services and develops recommendations for their use.

This section lists the USPSTF recommendations for people at average risk for cancer. Individuals with a personal or family history of cancer or other risk factors that increase their personal cancer risk should consult their physician for individualized recommendations.

The complete USPSTF recommendations are available on the web at: <http://www.ahcpr.gov/clinic/uspstfix.htm>.

RECOMMENDATIONS

Mammography – The data are clear that screening women 50-69 years of age every one to two years is of benefit in detecting early stage breast cancer. Estimates of mammography sensitivity in detecting breast cancer range between 75% and 88%. In numerous studies, regular mammography reduced breast cancer mortality in women older than 50 years of age by 20-30%.

The data are less compelling for routine mammography among women 40-49 years of age. Screening in this age group may be less effective due to the greater density of the premenopausal breast. Routine population-based mammography for younger women results in a higher false-positive rate than for post-menopausal women, which can lead to undue patient anxiety and potentially unnecessary diagnostic tests.

Beginning September 2002, the USPSTF began recommending screening mammography, with or without clinical breast examination (CBE), every one to two years for women aged 40 and older. These recommendations correlate with Centers for Disease Control and Prevention (CDC),

National Cancer Institute (NCI), American Cancer Society (ACS), American College of Surgeons (ACoS), and American College of Radiologists (ACR) recommendations.

Pap Smear –The Papanicolaou (Pap) test can detect both precancerous conditions and cervical cancer and has been credited with the decline in cervical cancer diagnoses and deaths seen in the United States over the past few decades. The USPSTF recommends beginning Pap screening within three (3) years of onset of sexual activity or age twenty-one (whichever comes first) and screening at least every three years. The task force recommends against routine screening of women older than 65 if they have had three recent normal Paps and are not otherwise at high risk for cervical cancer. ACS and American College of Obstetricians and Gynecologists (ACOG) recommend annual screenings until a woman is age 30 or older. ACS and ACOG recommend screening every 2-3 years for women over 30 with three (3) negative Pap tests. ACS recommends stopping screening for women over 70 with three recent, consecutive negative tests and no abnormal tests in

three recent, consecutive negative tests and no abnormal tests in 10 years. ACOG does not recommend an upper age-limit for screening cessation.

This test should be considered for all women with a cervix—not just women of childbearing age. Efforts need to be increased to ensure post-menopausal women are receiving this test. It is important that women seek the advice of a physician about when to begin, how often, and when to discontinue cervical screenings—especially if they are at higher-than-average risk of cervical cancer.

Fecal Occult Blood Tests (FOBT), Sigmoidoscopy, Colonoscopy, & Double-Contrast Barium Enema

Routine screening for colorectal cancer is recommended for persons 50 and older. Screening methods include FOBT (a chemical test for blood in stool), sigmoidoscopy (direct visualization of the lower one-third of the bowel using a flexible fiberoptic endoscope), colonoscopy (visualization of the entire colon with a flexible scope), and barium enema (a series of x-rays). The USPSTF does not specify a particular combination of these methods or frequency of screening. However, annual FOBT and sigmoidoscopy every 3-5 years has been advocated by the ACS and other organizations starting at age 50. New data suggest that a full colonoscopy every ten years may be a suitable alternative screening strategy to improve the sensitivity of colorectal cancer detection.

Regular Physical Exams – Clinical exams detect cancer early, particularly breast and oral cancers. A rough, whitish plaque or reddish patch on the mucous membrane

frequently precedes oral cancers and can be identified during a regular physical exam. Periodic examination for and treatment of these precancerous conditions could nearly eliminate oral cancers.

Genetic Testing and Genetic Counseling -

Individuals with multiple relatives with the same type of cancer, cancer diagnosed at an earlier than usual age, one individual with more than one primary cancer (of either the same type or different types) may benefit from genetic testing for a known cancer gene. Individuals considering a genetic test should first receive genetic counseling for an in-depth family history evaluation and discussion of the risks and benefits of genetic testing.

The U.S. Preventive Services Task Force (USPSTF) recommends that women whose family history is associated with an increased risk for mutations in BRCA1 or BRCA2 genes be referred for genetic counseling and evaluation for BRCA testing.

Screening the general population for mutations in genes that increase the risk for cancer is not recommended.

V. CANCER DATA

During 2003, 18,465 new, reportable cancers were diagnosed among Oregonians¹; of these, 16,973 were

invasive². The 2003 Oregon total cancer mortality rate was 22% above the Healthy People 2010 target of 159.9 deaths per 100,000.

CANCER DATA OVERVIEW AND LEADING SITES

A brief overview of Oregon's 2003 cancer data reveals the following: (See Figure V-1.)

- Overall, Oregon's 2003 age-adjusted cancer incidence rate of 455.8 per 100,000 was 1% higher than the 2003 national rate of 452.8. Oregon's age-adjusted cancer mortality rate of 194.7 was 2% higher than the 2003 national rate of 190.1.
- Although more total cancers were reported in women, men had a higher incidence rate of invasive cancers and a higher mortality rate than women.
- Breast cancers have the highest incidence in Oregon; lung cancers have the highest mortality.
- Among Oregon females, breast cancer was the most frequently diagnosed cancer followed by lung, colorectal, and uterine cancers³, and then lymphomas. Lung cancer had the highest mortality for females, followed by breast, colorectal, ovarian, and pancreatic cancers. (See Figure V-2.)
- Among Oregon males, prostate cancers were the most frequently diagnosed cancers followed by lung, colon, urinary bladder, and lymphoma. Lung cancers had the highest mortality for males followed by prostate, colorectal, pancreatic, and then lymphomas. (See Figure V-3.)
- Of the 44 states with central registry data meeting national data quality standards in 2002, Oregon males ranked 36th for all-cancer incidence and Oregon females ranked 9th. Oregon females ranked in the top ten due to high rates of breast and lung cancers.
- Among all 50 states, Oregon males ranked in the lower half, 29th, and females ranked 8th in all-cancer mortality for 2002. The higher ranking for Oregon females is primarily due to the high rates of lung cancer mortality.

¹These numbers represent the cancers that are reportable to OSCaR, which exclude the most frequently diagnosed cancers (*in situ* cervical cancers as well as basal and squamous cell carcinomas of the skin [except if skin of genitalia]).

²Invasive cancers exclude *in situ* diagnoses with the exception of *in situ* bladder cancers.

³Uterine cancers include uterine sarcomas.

ALL CANCERS FAST FACTS

FIGURE V-1

ALL CANCERS FAST FACTS			
YEAR 2003			
Oregon	All Sexes¹	Male	Female
CANCER INCIDENCE			
All Cases Total	18,465	9,085	9,377
<i>In Situ</i>	1,928	792	1136
Localized	7,618	3793	3825
Regional	3,836	1810	2026
Distant	3,596	1878	1717
Unstaged	1,487	812	673
Incidence Rates			
Oregon Crude	476.9	487.0	466.6
Oregon Age-adjusted	455.8	511.1	416.7
Oregon Current Annual Trend (1999-2003)	*-2.4	*-3.0	*-2.0
US SEER Age-adjusted ²	452.8	533.0	397.8
US SEER Annual Trend (1999-2003) ²	-1.2	-1.3	-1.3
CANCER MORTALITY			
Total Deaths	7,324	3,748	3,576
Mortality Rates			
Oregon Crude	205.8	211.9	199.7
Oregon Age-adjusted	194.7	230.4	169.8
Oregon Current Annual Trend (1999-2003)	-0.7	*-1.4	-0.2
US Age-Adjusted ³	190.1	234.1	160.5
US Annual Trend (1999-2003) ³	*-1.3	*1.8	-1.0
PROGNOSIS AND BURDEN⁴			
Prognosis: M/I Ratio	0.41	0.41	0.40
Burden: YPLL before age 65	22,709	11,325	11,384

Incidence and death rates are per 100,000 and age-adjusted to the 2000 US Standard Population (19 age group)

* Indicates a statistically significant trend

¹ All Sexes counts may exceed male/female combined due to additional sex coding

² SEER 13 Registry Data, SEER Stat 6.2.3 (See *Technical Section, National Data*, for a description of SEER 13)

³ National Center for Health Statistics (NCHS) US Mortality Public Use Data

⁴ Calculations based on combined years 1999-2003

M/I = Mortality-to-Incidence Ratio

YPLL = Years of Potential Life Lost

LEADING SITES OF CANCER INCIDENCE AND MORTALITY

FIGURE V-2

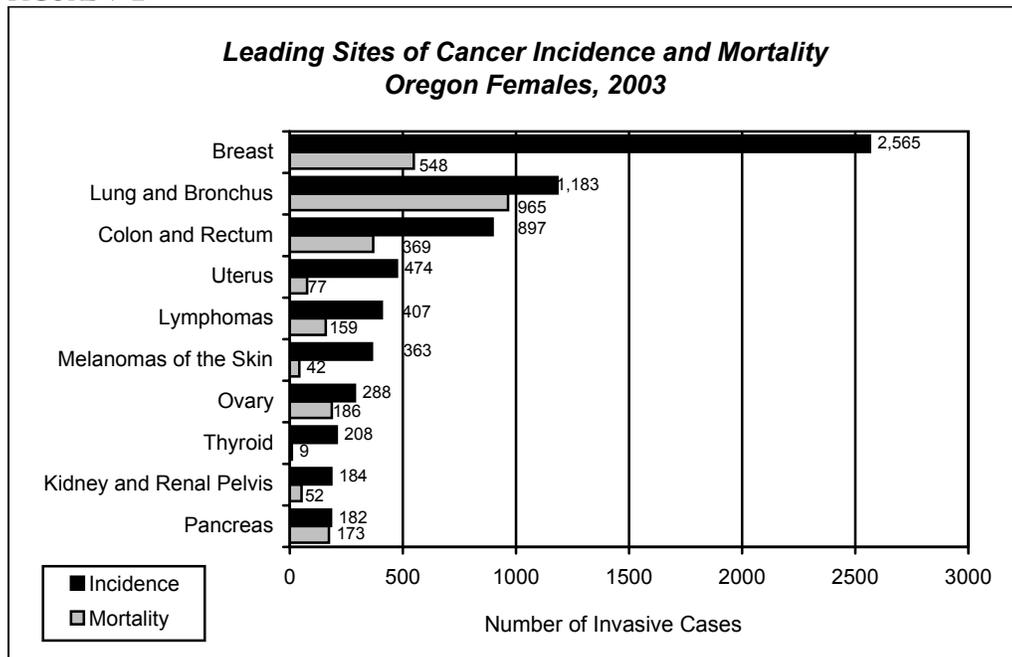
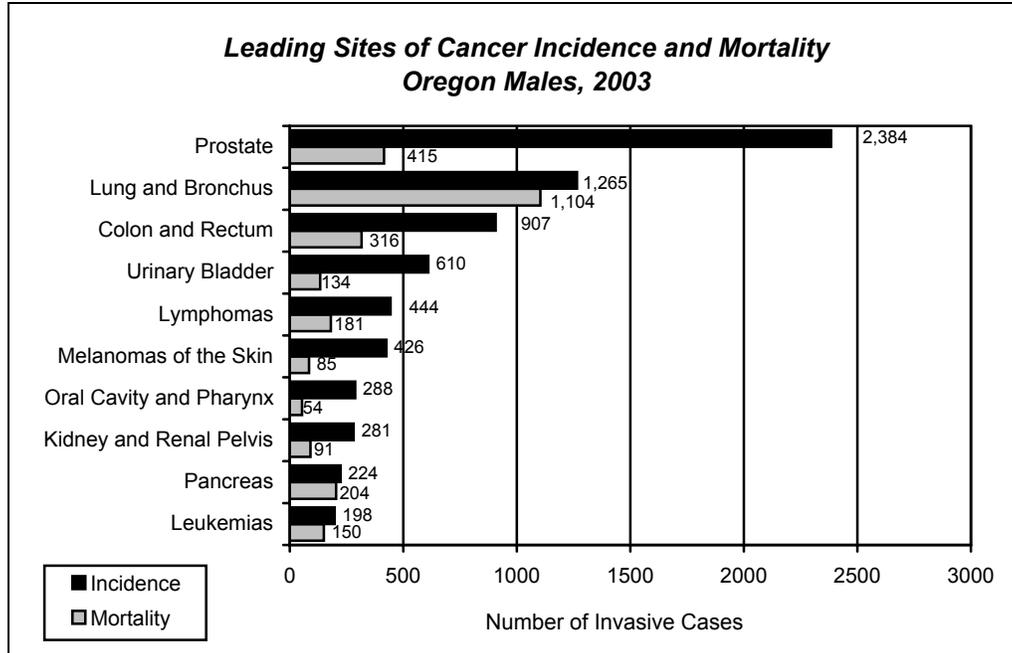


FIGURE V-3



STAGE AT DIAGNOSIS

Of public health importance is the percentage of early stage diagnoses, which is a proxy for success of population-based screening efforts. From 1996 through 2003, the percentage of early stage diagnoses remained the same for female breast cancers and decreased for cervical cancers. The percentage of early stage diagnoses for colorectal cancers increased, and, although there is no national recommendation for prostate cancer screening, the percentage of early stage prostate cancer diagnoses has also increased. (See Figure V-4.)

Although the percentage of female breast cancers diagnosed at an early stage has remained the same, the percentage of *in situ* diagnoses has increased, which will likely improve outcomes. The percentage of colorectal cancers diagnosed both *in situ* (earliest stage) and localized has increased from 1996 to 2003.

Despite variability in the percentage of cases diagnosed at an early stage, all of these screenable cancers demonstrated reductions in mortality. (See Figure V-5.) It is likely that the decrease in mortality is due to a combination of improved screening and enhanced treatment.

FIGURE V-4

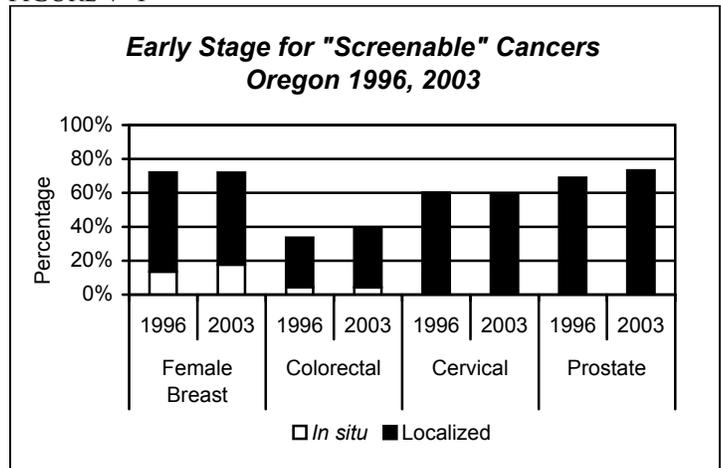
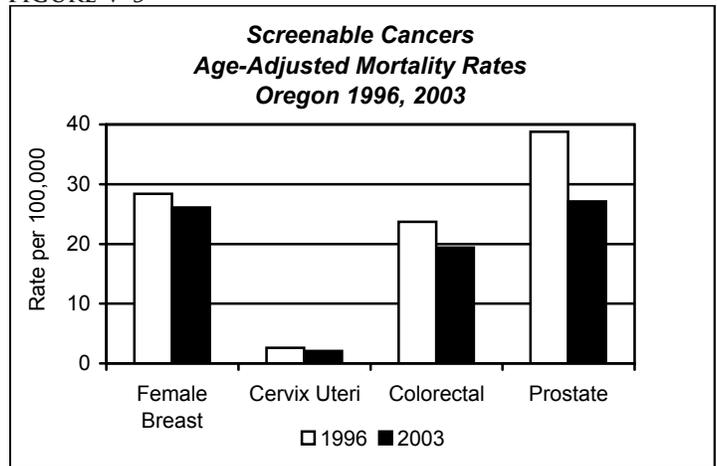


FIGURE V-5



DISEASE SEVERITY

The M/I (mortality-to-incidence) ratio, also known as case-fatality ratio, provides a measure of disease severity. In general, the closer M/I values are to 1.0, the poorer the expected outcome for a patient with cancer of that type. M/I values over 1.0 indicate the poorest prognosis. This means more people died of the particular cancer type than were diagnosed in the same year.

Overall, Oregon's M/I ratio for all cancers was 0.41 for the years 1999-2003. Pancreatic cancer had the worst prognosis with a ratio of 0.99; this was followed by liver and intrahepatic bile duct cancers with a ratio of 0.95. Figure V-6 shows M/I ratios for each cancer site.

FIGURE V-6

M/I (MORTALITY-TO-INCIDENCE) RATIOS
Oregon 1999 - 2003

Selected Cancer Sites	All Sexes	Male	Female
All Sites	0.41	0.41	0.40
Pancreas	0.99	0.98	1.00
Liver and Intrahepatic Bile Duct	0.95	0.89	1.06
Esophagus	0.92	0.95	0.83
Mesothelioma	0.84	0.84	0.83
Myeloma	0.84	0.83	0.85
Lung and Bronchus	0.81	0.82	0.79
Brain and CNS	0.75	0.75	0.75
Ovary	0.67	n/a	0.67
Leukemias	0.67	0.66	0.68
Stomach	0.61	0.58	0.66
Gallbladder	0.58	0.63	0.57
Soft Tissue including Heart	0.48	0.44	0.52
Lymphomas	0.41	0.40	0.42
Bones and Joints	0.39	0.46	0.31
Colon and Rectum	0.37	0.38	0.37
Kidney and Renal Pelvis	0.35	0.37	0.33
Larynx	0.33	0.33	0.34
Cervix Uteri	0.31	n/a	0.31
Oral Cavity and Pharynx	0.25	0.23	0.29
Urinary Bladder	0.21	0.20	0.26
Small Intestine	0.20	0.14	0.26
Breast	0.19	0.19	0.19
Uterus	0.17	n/a	0.17
Prostate	0.16	0.16	n/a
Melanomas of the Skin	0.14	0.17	0.11
Eye and Orbit	0.09	0.10	0.09
Thyroid	0.07	0.10	0.06
Testis	0.06	0.06	n/a

n/a = not applicable

YEARS OF POTENTIAL LIFE LOST

The measure of Years of Potential Life Lost (YPLL) takes into consideration the greater societal costs of a person dying young. For example, using 65 years as a standard age of death, a person dying of cancer at age 25 would have 40 YPLL. The YPLL measure is one way of evaluating the burden of a disease upon a defined population. Lost productivity due to an individual dying prematurely

of cancer should be interpreted as a loss of both economic and non-economic contributions to society.

Figure V-7 shows the leading causes of YPLL for Oregonians. *Accidents and Adverse Effects* were the leading causes of YPLL for male Oregonians, and cancer was the leading cause of YPLL for female Oregonians. However,

due to the high injury rate for men, unintentional injuries were the leading cause of YPLL with both sexes combined. It is interesting to note that, when a standard age at death of 70 or greater (rather than 65) is used in the calculation, cancer becomes the leading cause of YPLL among all Oregonians.

Lung cancers are the leading cancer-related cause of YPLL for all Oregonians, followed by breast, brain/central nervous system, and colorectal cancers. Brain cancer is not a leading cancer site but is a leading cause of YPLL because over half of deaths from this cancer occur in Oregonians younger than 65. Leukemias and lymphomas are additional cancer sites with over 1,000 YPLL each year.

FIGURE V-7

YPLL (YEARS OF POTENTIAL LIFE LOST)
Prior to Age 65, Average Number of Years Lost Annually
Oregon 1999 - 2003

Cause of Death	Total	Male	Female
All Causes of Death	133,536	77,441	56,095
Accidents and Adverse Effects	23,257	16,286	6,971
All Malignant Cancers	22,709	11,325	11,384
Lung and Bronchus	4,342	2,335	2,007
Breast	2,547	13	2,534
Brain and CNS	1,912	1,124	788
Colon and Rectum	1,721	988	733
Leukemias	1,340	775	565
Lymphomas	1,161	734	428
Melanomas of Skin	887	577	310
Pancreas	885	528	357
Ovary	684	n/a	684
Liver and Intrahepatic Bile Duct	684	489	194
Kidney and Renal Pelvis	538	367	171
Esophagus	533	441	92
Soft Tissue Including Heart	507	298	209
Cervix Uteri	458	n/a	458
Oral Cavity and Pharynx	400	317	83
Stomach	360	223	136
Myeloma	267	170	97
Urinary Bladder	265	154	111
Bones and Joints	254	154	100
Prostate	224	224	n/a
Uterus	191	n/a	191
Testis	184	184	n/a
Diseases of the Heart	17,156	9,530	7,626
Suicide and Self-Inflicted Injury	10,296	8,286	2,010
Cerebrovascular Diseases	3,770	1,373	2,398
Homicide and Legal Intervention	3,414	2,446	969
Diabetes Mellitus	2,737	1,503	1,234
Pneumonia and Influenza	2,105	742	1,364
Chronic Obstructive Pulmonary Disease and Allied Conditions	1,951	845	1,107
Human Immunodeficiency Virus (HIV)	1,632	1,458	173

Counts for total may exceed male and female combined

YPLL calculations are rounded to the nearest whole year

n/a = Not applicable

RACE AND ETHNICITY

Age-adjusted cancer rates by race and ethnicity are shown in Figures V-8 to V-11. These differences among racial/ethnic populations are important because they may reflect differences in screening rates, treatment, access to care, or modifiable risk behaviors. However, due to issues with completeness and accuracy of race and ethnicity reporting, data must be interpreted with care. Please refer to the *Technical Section* for additional information.

As seen nationally, African American (AA) men in Oregon have the highest rate of cancer incidence and mortality, followed by Whites. (See Figures V-9 and V-11.) Among women in Oregon and nationally, Whites have the highest cancer incidence rates, but AA women have higher mortality rates. (See Figures V-8 and V-10.) Oregon American Indian/Alaskan Natives (AI/AN) have higher cancer rates than are seen nationally. Nationwide, AI/AN cancer incidence and mortality are the lowest among the four racial groups. Hispanics have lower cancer incidence and mortality rates than Non-Hispanics both in Oregon and nationally.

Historically, Oregon’s AI/AN population has had the lowest incidence and mortality rates of cancer of all racial/ethnic groups. The low incidence rate among AI/AN persons was a phenomenon reported by other population-based cancer registries. OSCaR and other registries have found that AI/AN cases are often misclassified as another race or Hispanic. When AI/AN individuals are properly classified, rates are substantially higher. OSCaR links annually with local and national Indian Health Service and tribal

FIGURE V-8

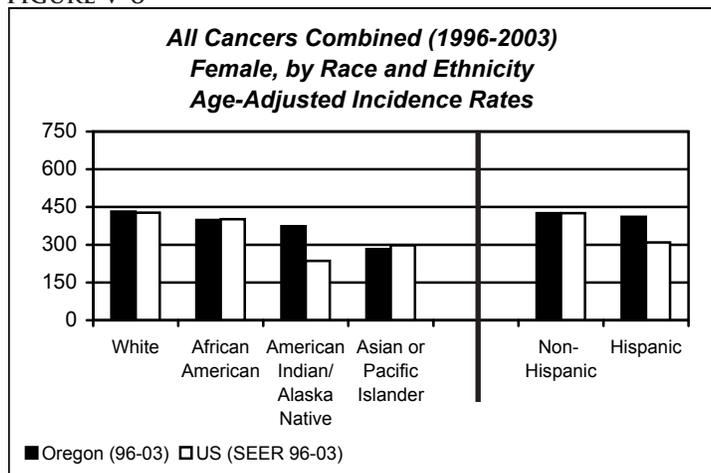
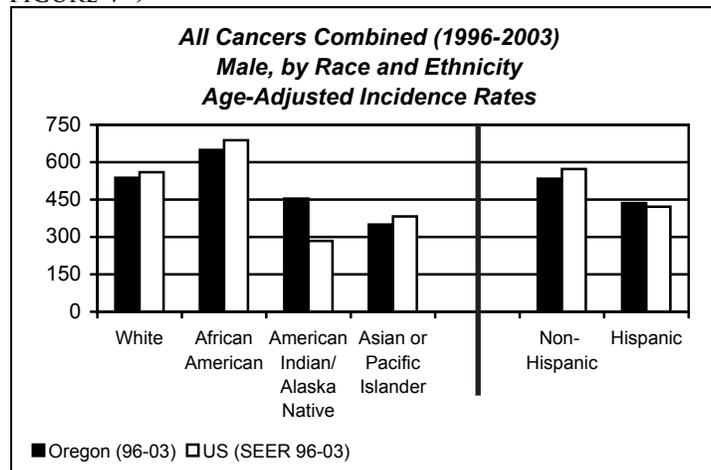


FIGURE V-9



clinic registries to correct racial coding for AI/AN persons. Because of this, Oregon may have higher rates than those seen nationally. As similar linkage projects are conducted in more states, it is hoped racial misclassification will have a progressively smaller effect in artificially suppressing AI/AN cancer rates nationally.

There are also differences in distribution of cancer by anatomic site among the race and ethnic groups. Regardless of race or ethnicity, among men, prostate was the most common cancer site for men in Oregon and nationwide, while breast was the most

FIGURE V-10

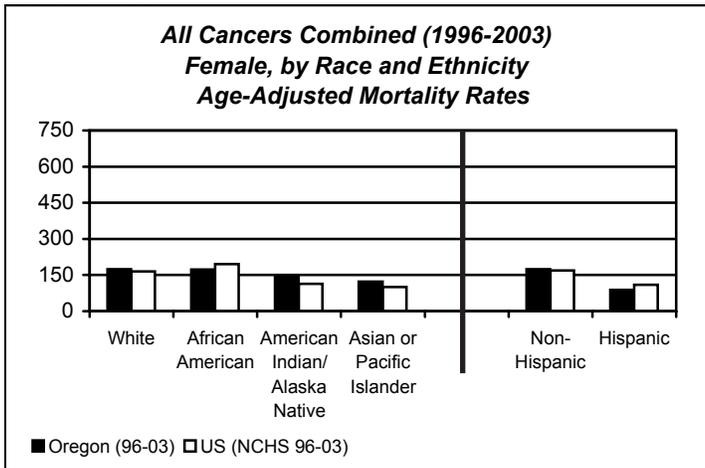
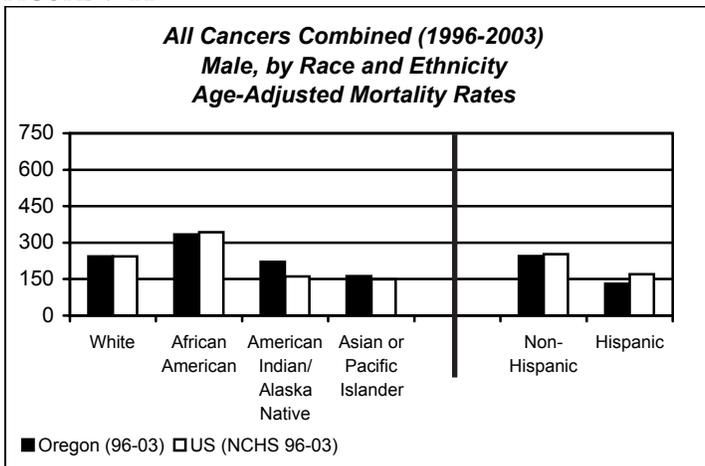


FIGURE V-11



common cancer site for women. (See Figure V-12.) However, lung cancers represent a greater burden among Hispanics and AI/AN women in Oregon than nationally. Cervical cancers could potentially be eliminated with appropriate, population-based screening, but are the 4th most common cancer among Hispanic women for both Oregon and the nation. Melanomas of the skin are the 5th most common cancer among white men in Oregon, but are not among the five leading cancer sites nationally. Lymphomas also represent a greater burden among AI/AN and AA women in Oregon than they do nationally.

For men, lung cancers were the most common cause of cancer death among all racial and ethnic groups in Oregon (See Figure V-13.) For women, lung cancers were also the leading cause of cancer death except among Asian/Pacific Islanders (A/PI), where breast cancers were the leading cause of cancer death. Oregon A/PI have a higher percentage of liver cancer deaths compared to other racial groups. This may be because hepatitis B is more prevalent among this group. Deaths from stomach cancers are also more common in this group as well as in AA men. Generally considered rare cancers, multiple myeloma and brain/central nervous system cancers are among the top 5 cancer causes of death among AA men and AI/AN men, respectively.

RACE AND ETHNICITY—FIVE MOST COMMON CANCER MORTALITY SITES

FIGURE V-13

Five Most Common Cancers
Percentage of Mortality by Sex, Race, and Ethnicity
Oregon 1996 - 2003

		MEN		WOMEN	
African American					
	Lung	31%	21%	Lung	
	Prostate	17%	16%	Breast	
	Colon and Rectum	8%	11%	Colon and Rectum	
	Pancreas	6%	9%	Pancreas	
	Liver/Myeloma (tied)	4%	4%	Uterine	
American Indian or Alaska Native					
	Lung	36%	32%	Lung	
	Colon and Rectum	13%	11%	Breast	
	Esophagus	5%	10%	Colon and Rectum	
	Prostate	5%	5%	Pancreas	
	Liver/Brain/Leukemias (tied)	5%	4%	Lymphomas/Leukemias (tied)	
Asian or Pacific Islander					
	Lung	24%	19%	Breast	
	Liver and Bile Duct	17%	15%	Lung	
	Colon and Rectum	11%	10%	Colon and Rectum	
	Stomach	8%	8%	Stomach	
	Prostate	6%	7%	Liver and Bile Duct	
White					
	Lung	31%	27%	Lung	
	Prostate	12%	15%	Breast	
	Colon and Rectum	9%	10%	Colon and Rectum	
	Pancreas	5%	6%	Ovary	
	Lymphomas	5%	6%	Pancreas	
Hispanic					
	Lung	23%	15%	Lung	
	Prostate	10%	14%	Breast	
	Leukemias	8%	10%	Colon and Rectum	
	Pancreas	8%	6%	Leukemias	
	Colon and Rectum	7%	6%	Pancreas/lymphomas (tied)	
Non Hispanic					
	Lung	31%	27%	Lung	
	Prostate	12%	15%	Breast	
	Colon and Rectum	9%	10%	Colon and Rectum	
	Pancreas	5%	6%	Pancreas	
	Lymphomas	5%	6%	Ovary	

Oregon Data 1996-2003

Due to incompatibility of race/ethnicity coding, national mortality data are not presented for comparison.

Some disparity may be driven by differences in stage at diagnosis. (See Figure V-14.) Whites have the highest percentage of cancers diagnosed at an early stage and AI/AN have the lowest. Hispanics also have a lower percentage of cases diagnosed at an early stage than Non-Hispanics.

FIGURE V-14

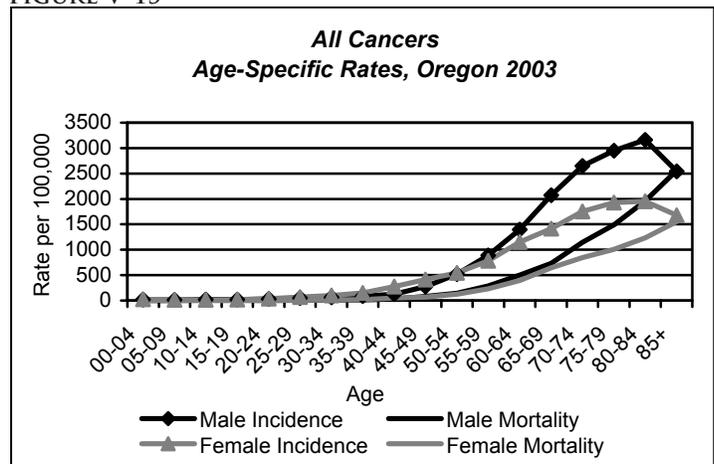
Percentage of Early Stage Diagnoses By Sex, Race and Ethnicity				
Race and Ethnicity	Male		Female	
	Oregon	US	Oregon	US
White	53%	57%	52%	51%
African American	44%	52%	45%	41%
American Indian/ Alaska Native	41%	43%	41%	44%
Asian or Pacific Islander	42%	48%	45%	48%
Non-Hispanics	53%	56%	52%	51%
Hispanics	46%	51%	47%	46%

Oregon Data 1996-2003—National Data 1996-2003

AGE-SPECIFIC CANCER RATES

The greatest risk factor for developing and dying of cancer is age. Figure V-15 shows age-specific cancer incidence and mortality rates for Oregon men and women. During 2003, cancer occurred at a rate of less than 100 per 100,000 Oregonians before age 35. Between the ages of 40 and 54, the increase in rate is nearly 2-fold for each 5-year incremental increase in age. After age 54, incidence rates continue to rise, but the rate of the rise slowly declines. After age 60, cancer incidence was greater than 1,000 per 100,000.

FIGURE V-15



In Oregon, cancer mortality generally increased with age for both males and females. The All Cancers mortality was greater for men than females for most age groups. The age-specific mortality rates were higher for males compared to females except for children under 10 and the 40-59 age group. This mortality pattern was similar to the national data with female mortality rising at an earlier age. The higher mortality for females age 40-59 is predominately due to the rate of female breast cancer.

HISTORICAL TRENDS (1996 - 2003)

All-sites cancer incidence increased 4% annually for men and women from 1996-1999. (See Figure V-16.) This trend was followed by an annual decrease from 1999-2003—3% for men and 2% for women. This variation is likely due to improvements in reporting from the early years of the State Cancer Registry. Since 1996, there has been a 2% annual decrease in mortality among men, while mortality among women has decreased an average of 0.3% a year).

Since 1999, the rate of *in situ* cancers has decreased 3% annually for men and 1% for women. (See Figure V-17.) This increase of *in situ* diagnoses likely reflects a combination of improved reporting for these cases, which are often diagnosed and treated outside of the rigorous hospital cancer reporting system, as well as improvements in cancer screening across the state.

FIGURE V-16

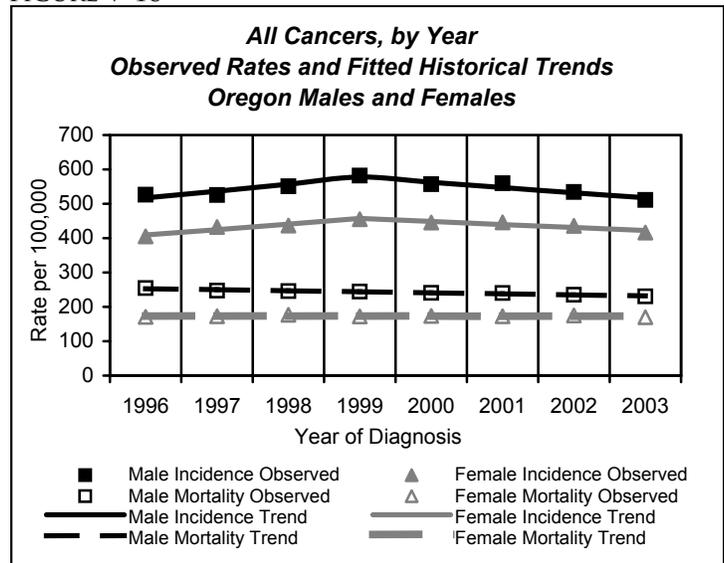
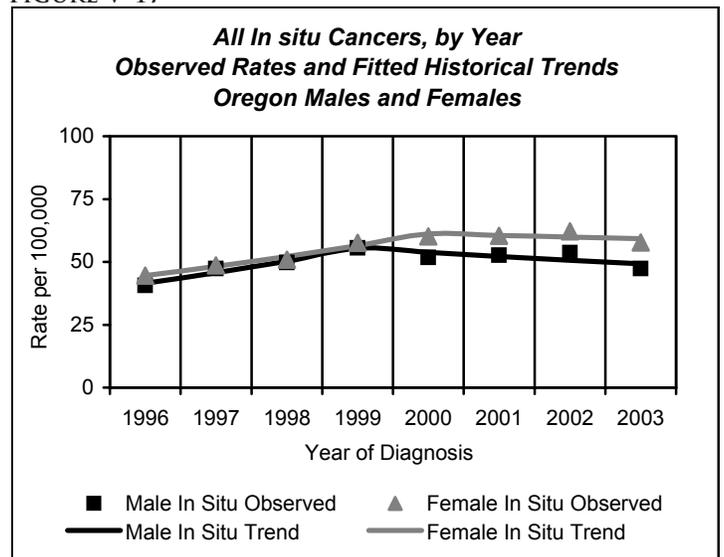


FIGURE V-17



REGIONAL VARIATION (COMBINED FIVE-YEAR RATES: 1999-2003)

Cancer rates vary across the state of Oregon. Differences in screening and reporting rates, access to medical services, and underlying risk factors, such as regional smoking rates, affect these patterns.

All-sites cancer incidence has a clear regional pattern. (See Figure V-18.) In general, the Columbia River Gorge and southern Oregon have incidence rates that are higher than the national rate, while eastern Oregon and the north and south coast have incidence rates that are lower than seen nationally.

All-sites cancer mortality does not completely follow the same pattern as incidence. (See Figure V-19.) The Columbia River Gorge, north coast, and south coast have mortality rates higher than the nation, while central and eastern Oregon have mortality rates that are lower than the nation.

FIGURE V-18

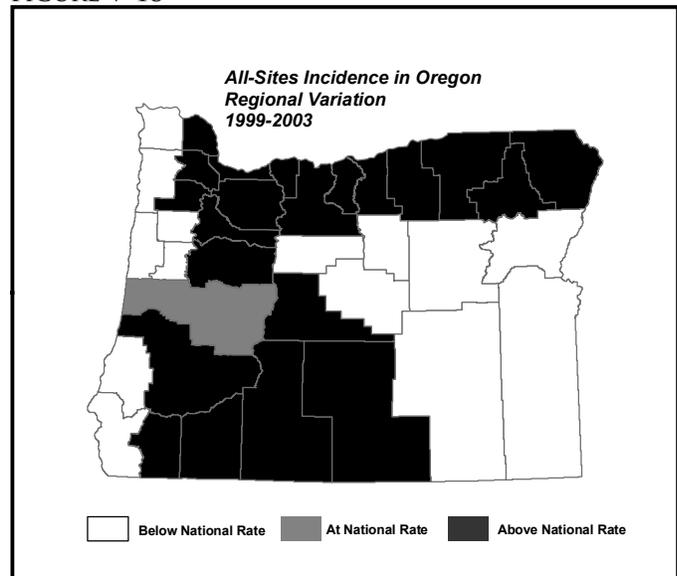
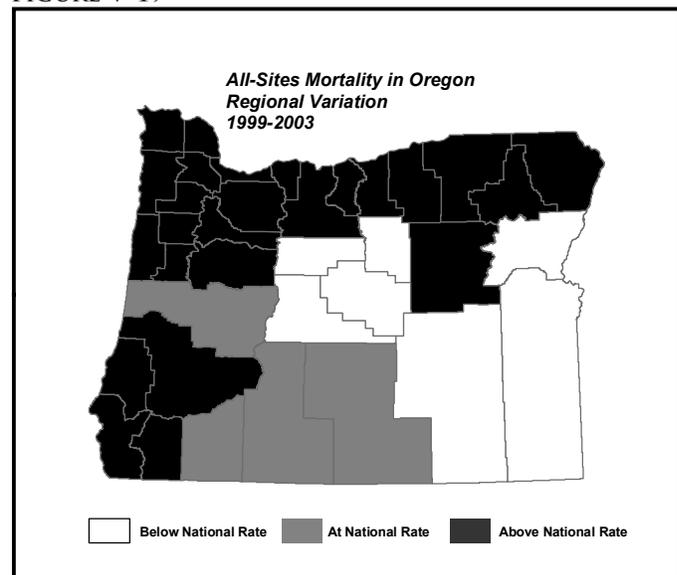
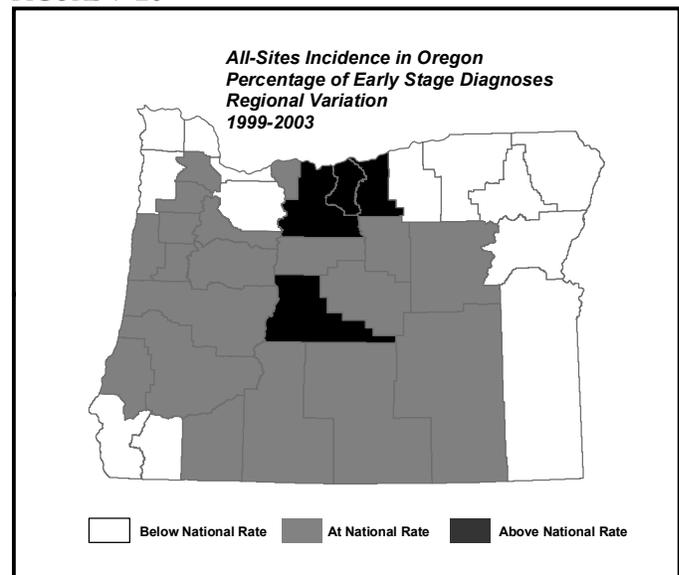


FIGURE V-19



These patterns in incidence and mortality are not entirely explained by differences in effective screening. The percentage of cancers diagnosed at an early stage is lower than the national rate for the north and south coast, northeast Oregon, the Metro area, and the eastern border counties. (See Figure V-20.) In the Columbia River Gorge and Deschutes County, the percentage of early diagnoses is higher than the nation. For the rest of the state, the percentage of cancers diagnosed at an early stage is similar to the nation. These variations are likely a combination of regional reporting differences, regional screening practices, and differences in health behaviors.

FIGURE V-20



VI. CHILDHOOD CANCERS

The incidence of cancers among children in Oregon (0-14 years of age) is low compared to adults. In 2003, there were 110 invasive cancers diagnosed in Oregon children, and 22 children died from cancer. The 1999-2003 incidence rate for cancers in Oregon children was 15.3 per 100,000 compared to the national aggregate rate (1999-2002) of 14.7. This represents a 1% annual increase for the period 1996 through 2003 for Oregon. Oregon's 2003 childhood cancer mortality rate was 3.1.

During 1996-2003, about half of all childhood cancers in children under 14 years of age occurred in children less than 5 years of age. (See Figure VI-1.) Incidence counts were higher at very young ages (<6). These patterns are similar to national data. Mortality among children due to cancer is low. Half of the deaths occurred in children less than 7 years of age.

Nationally, childhood cancer survival rates have shown a dramatic increase over the past few decades. Since the 1960's, the five-year relative survival rate has increased from 30% to approximately 70%. Currently, the Registry does not collect follow-up data, so Oregon-specific survival data are not available.

Figure VI-2 provides brief descriptions of the cancers diagnosed among Oregon children from 1996-2003.

FIGURE VI-1

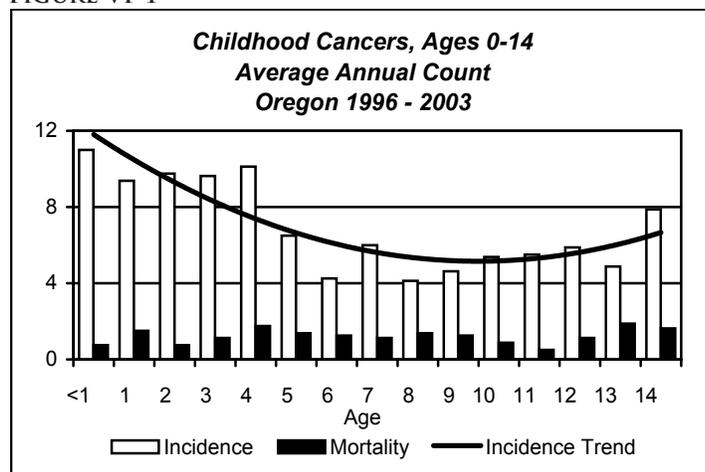


FIGURE VI-2

Childhood Cancers in Oregon, (0-14 Years of Age)				
Incidence, Average Number of Invasive Cases Per Year (1996 - 2003)				
Primary Site	Total*	Male	Female	Synopsis
Leukemia	34	18	16	Nationally, acute leukemias are the most frequent childhood cancers with a higher incidence among boys than girls. Children with certain genetic disorders, particularly Down Syndrome, are at a higher risk for ALL.
<i>Acute Lymphocytic Leukemia (ALL)</i>	27	14	13	
Brain and Central Nervous System (CNS)	23	12	11	Nationally, brain and CNS cancers are the 2 nd most common cancers among children and are more common among boys than girls.
Lymphoma	10	8	3	Nationally, lymphoma is the 3 rd most common cancer among children. NHL rates are generally higher among males than females. HL is fairly rare in early childhood with a peak frequency at age 25-29 and again late in life.
<i>Hodgkin-Lymphoma (HL)</i>	5	3	2	
<i>Non-Hodgkin (NHL)</i>	3	3	1	
Sympathetic Nervous System	7	4	3	Nationally, neuroblastomas account for approximately 8% of all childhood cancers and normally arise during fetal life.
Soft Tissue Sarcomas	7	3	4	Nationally, 7% of childhood cancers are soft tissue sarcomas with rhabdomyosarcomas being the most common.
Renal Tumors (Wilms Tumor)	6	2	3	Nationally, kidney/renal tumors account for 6% of childhood cancers. Wilms tumors are the most common form of renal cancer in children with a peak incidence occurring under five years of age.
Carcinomas/Other Malignant Epithelial Neoplasms	5	2	3	Nationally thyroid cancer and malignant melanomas are the most common carcinomas of children. Generally, carcinomas are more common among girls than boys.
Germ Cell, Trophoblastic/ Other Gonadal tumors (GCTOG)	4	3	2	Nationally, 3% of childhood cancers are GCTOG tumors. GCTOG tumors are more common in the adolescent years (15-19 year age group).
Malignant Bone Cancers	4	3	2	Nationally, bone tumors constitute about 5% of all childhood cancers with osteosarcoma and Ewing sarcoma predominating.
<i>Ewing Sarcomas</i>	2	1	1	
<i>Osteosarcoma</i>	2	2	1	
Retinoblastomas	2	1	1	A relatively uncommon childhood tumor, which usually occurs before the age of two.
Hepatic Tumors	2	1	1	Nationally, only 1% of childhood cancers are liver tumors. Liver cancer is rare in children; Hepatoblastomas is the most common in children younger than four years of age.

*Due to rounding, counts for total may not equal male and female combined; calculations are rounded to the nearest whole case. National Data: 1999-2002, WONDER On-line Database. U.S. Department of Health and Human Services, National Program of Cancer Registries, Centers for Disease Control and Prevention. November 2005

VII. SELECTED SITES

The following section contains detailed information on seven selected sites: breast, cervix uteri, colon and rectum, lung and bronchus, melanoma of the skin, oral, and prostate cancers. These sites are of public health importance because there are existing opportunities for public health intervention to reduce morbidity and/or mortality, such as reducing lung cancers

through smoking cessation, or because the specific cancer impacts large numbers of Oregonians, such as prostate cancer. Each selected site section includes a general data overview, early detection data, age-specific rates, historical trends, and regional maps of incidence and mortality. When possible, data on race, ethnicity, and screening are also included for each site.

A. BREAST CANCERS

Although the cause of breast cancer is unknown, the major risk factors for breast cancer are one's sex (female) and age (older). These risk factors, like heredity, cannot be controlled. Having a first-degree relative (i.e., mother or sister) with breast cancer increases an individual's risk, yet over 80% of individuals with breast cancer have no family history of the disease. Early detection through routine mammograms and breast exams can decrease severity of illness and mortality rates.

As seen nationally, breast cancer is the most common invasive cancer among women and the 2nd leading cause of cancer death among women in Oregon. In Oregon, however, breast cancer is the most common invasive cancer in the state—even among men and women combined. Oregon consistently ranks among the top five states for breast cancer incidence.

The Oregon female breast cancer mortality rate of 26.1 for 2003 was 17% above the Healthy People 2010 target of 22.3 deaths per 100,000 women. Reducing breast cancer incidence and mortality has been identified as a priority by the Oregon Partnership for Cancer Control, which produced Oregon's first cancer plan in 2005 (www.healthoregon.org/cancer).

OREGON
CONSISTENTLY
RANKS AMONG
THE TOP FIVE
STATES FOR
BREAST CANCER
INCIDENCE.

FEMALE BREAST CANCERS FAST FACTS OVERVIEW

A brief overview of breast cancer in Oregon shows the following: (See Figure VII-A-1.)

1. In 2003, 3,117 new cases of breast cancer were diagnosed among Oregon women. Of these, 2,565 were invasive cases. In all, 548 women died of breast cancer. (14 men were diagnosed with invasive breast cancer, and 2 men died of breast cancer.)
2. Current five-year trends show age-adjusted, invasive female breast cancer incidence rates have been decreasing about 4% annually in Oregon—3% nationally. Oregon's mortality rate mirrors the national mortality trend with a 0.4% decline.
3. Oregon's age-adjusted 2003 incidence rate for female breast cancer was 6% higher than the 2003 national rate, while Oregon's 2003 mortality rate was 4% higher than the 2003 national rate.
4. Of the 44 states with central registries meeting national data quality standards in 2003, Oregon was 2nd highest in breast cancer incidence. Among all 50 states, Oregon ranked in the lower half, tied for 29th, for breast cancer mortality.
5. Breast cancer is the leading cancer incidence site for all Oregon women regardless of race or ethnicity. It is the 2nd leading cause of cancer mortality for most Oregon women, but it is the leading cause of cancer mortality for Asian/Pacific Islander women.
6. In Oregon in 2003, 18% of breast cancers were diagnosed at the *in situ* stage, 56% were diagnosed at the localized stage, and 26% were diagnosed at later stages. (See Figure VII-A-2)
7. Current five-year trends show incidence of *in situ* breast cancers has been increasing in Oregon about 4% annually while the nation has shown a nearly 3% decline in *in situ* breast cancers.
8. During 1999-2003, Oregon's M/I ratio for female breast cancer was 0.19, suggesting a relatively good prognosis for this disease. However, breast cancer is the 2nd leading cancer site for YPLL with an average of 2,534 years lost annually.

FEMALE BREAST CANCERS FAST FACTS

FIGURE VII-A-1

FEMALE BREAST CANCERS FAST FACTS

YEAR 2003

<i>Oregon</i>	<i>Female</i>
CANCER INCIDENCE	
All Cases Total	3,117
<i>In Situ</i>	552
Localized	1,702
Regional	700
Distant	101
Unstaged	62
<i>In Situ Rates</i>	
Oregon Crude	30.8
Oregon Age-adjusted	27.8
Oregon Current Annual Trend (1999-2003)	-1.1
US SEER Age-adjusted ²	29.8
US SEER Annual Trend (1999-2003) ²	-0.7
<i>Invasive Rates</i>	
Oregon Crude	143.2
Oregon Age-adjusted	128.6
Oregon Current Annual Trend (1999-2003)	*-3.9
US SEER Age-adjusted ²	121.1
US SEER Annual Trend (1999-2003) ²	*-2.7
CANCER MORTALITY	
Total Deaths	548
<i>Mortality Rates</i>	
Oregon Crude	30.6
Oregon Age-adjusted	26.1
Oregon Current Annual Trend (1999-2003)	-0.4
US Age-adjusted ³	25.2
US Annual Trend (1999-2003) ³	*-1.5
PROGNOSIS AND BURDEN⁴	
Prognosis: M/I Ratio	0.19
Burden: YPLL before age 65	2,534

Incidence and death rates are per 100,000 and age-adjusted to the 2000 US Standard Population (19 age group)

* Indicates a statistically significant trend

¹ All Sexes counts may exceed male/female combined due to additional sex coding

² SEER 13 Registry Data, SEER Stat 6.2.3 (See *Technical Section, National Data*, for a description)

³ National Center for Health Statistics (NCHS) US Mortality Public Use Data

⁴ Calculations based on combined years 1999-2003

M/I = Mortality-to-Incidence Ratio

YPLL = Years of Potential Life Lost

STAGE AT DIAGNOSIS

At present, breast cancer cannot be prevented. However, mortality can be reduced by early detection through mammography and breast examinations. Breast cancers detected at early stages are the most easily treated. Although there is some controversy over the benefits of mammography screening for women 40-49 years of age, there is agreement on the benefits for women ages 50 and older. Routine screening is now recommended for women starting at age 40. (See Section IV-C of *Cancer Overview* for mammography recommendations.)

In 2003, 74% of females were diagnosed at an early stage. (See Figure VII-A-2.) Although the percentage of cases diagnosed *in situ* has been increasing since 1996, the percentage of cases diagnosed at a localized stage has been declining at a similar rate. Therefore, the overall percentage of cases diagnosed at an early stage has remained about the same. (See Figure VII-A-3.) Targeted screening efforts that increase the percentage of cases diagnosed at *in situ* and localized stages could further decrease the burden of female breast cancer in Oregon.

Up to age 80, as age increases, the percentage of early stage diagnoses also increases. (See Figure VII-A-4.) This pattern may be due to increased awareness of risk among older women, screening recommendations and programs targeting older women, the greater effectiveness of mammography for older women, or increased severity and quicker progression of the cancer when diagnosed in younger women. It is likely a combination of all of these factors.

FIGURE VII-A-2

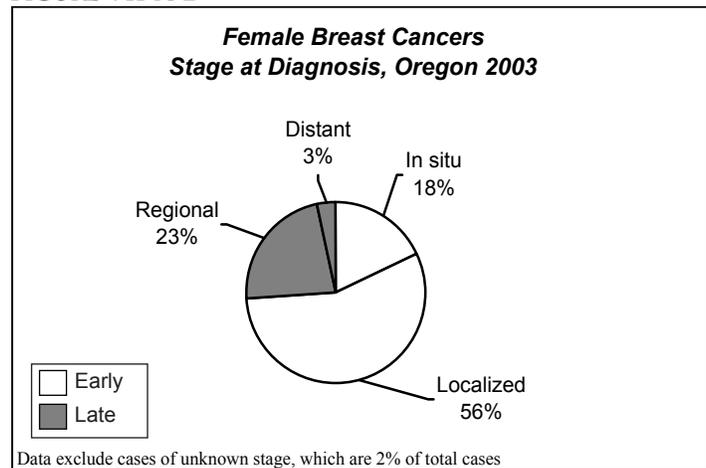


FIGURE VII-A-3

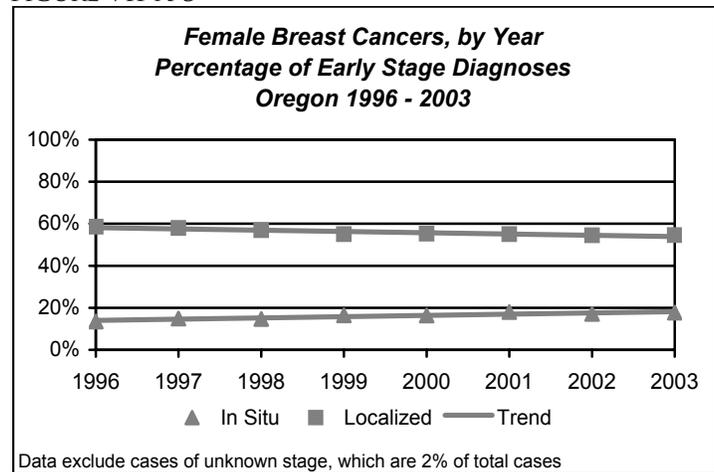
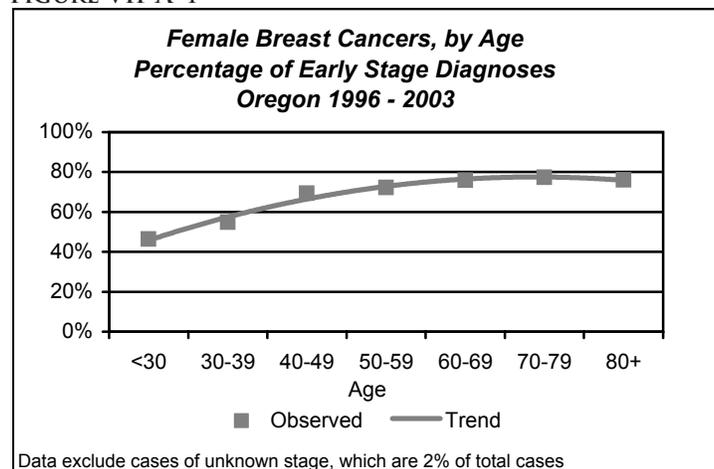


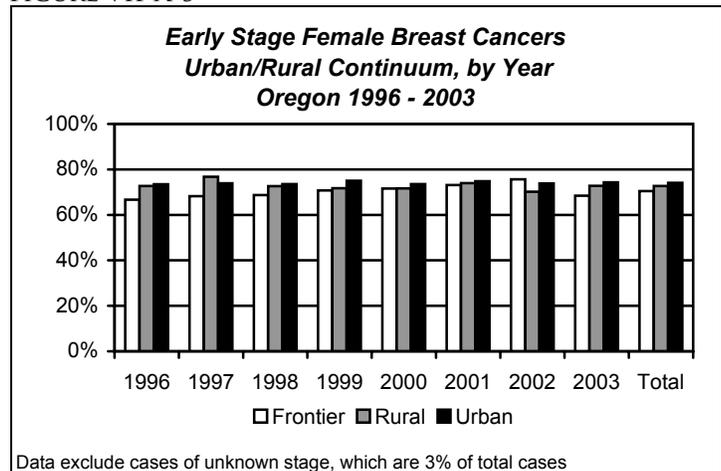
FIGURE VII-A-4



Where a woman resides could influence whether or not her breast cancer is diagnosed at an early, more treatable stage. Historically, there had been a higher percentage of *in situ* diagnoses in the Portland metropolitan area compared to the rest of the state. Differences in access to screening facilities and differences with transportation distance and infrastructure across the state are plausible explanations. Using census categories, which divide counties into Frontier (<6 persons per square mile), Rural, and Urban, we can evaluate the percentage of early stage diagnoses by population density.

Although there is variation from year to year, in general, increasing population density correlates with the increasing percentage of early stage diagnoses. (See Figure VII-A-5.) Please review *Appendix C* for a list of counties and Urban/Rural codes.

FIGURE VII-A-5



ROUTINE SCREENING

During the past decade, rates of routine mammography screening (women aged 52 or older receiving a mammogram within the last two years) have been steadily increasing in Oregon. (See Figure VII-A-6.) According to the 2004 National Healthcare Quality Report, Oregon ranked "Average" for routine mammography screening for both 2000 and 2002.

The trend for mammography by age initially mirrors the early stage by age trend. However, mammography rates increase up to age 70, and then decline slightly for the 70 - 79 age groups. The 80+ group has lower mammography rates similar to the 40 - 49 group. (See Figure VII-A-7.)

The percentage of women reporting routine mammography also increased by population density. (See Figure VII-A-8.)

FIGURE VII-A-6

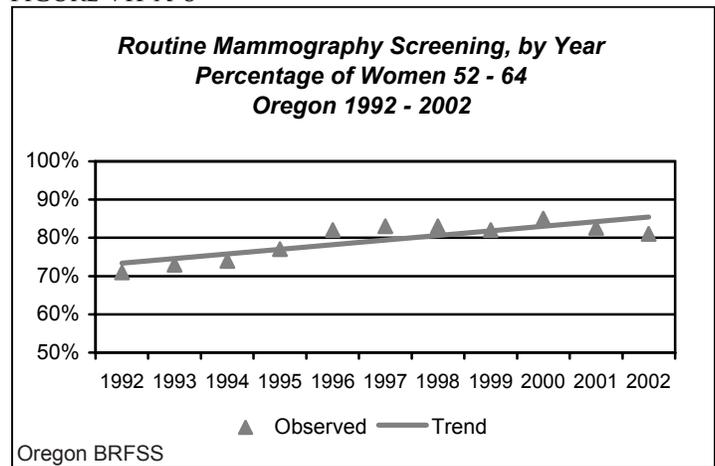


FIGURE VII-A-7

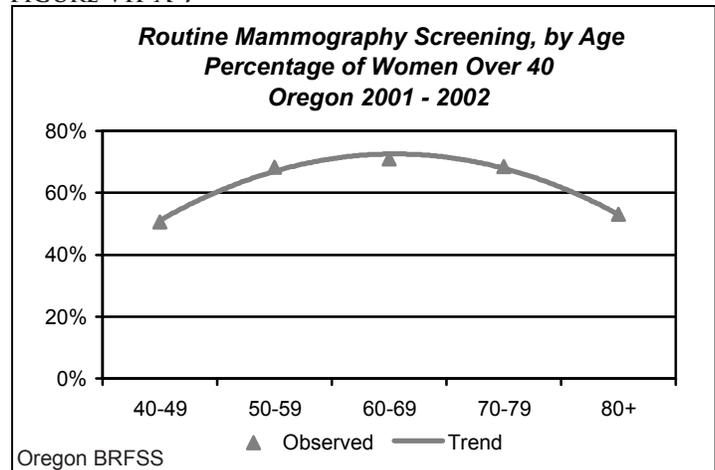
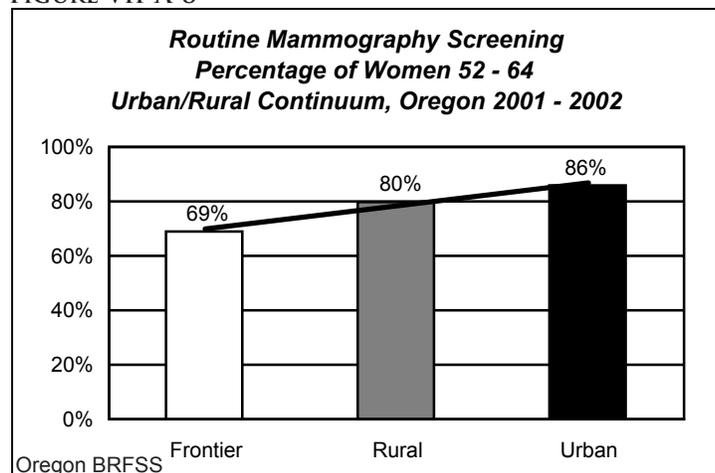


FIGURE VII-A-8



RACE AND ETHNICITY

Although race and ethnicity data need to be interpreted cautiously due to reporting issues (see the *Technical Section* for additional details), breast cancer is the leading cancer site among all women regardless of race or ethnicity. Breast cancer is the 2nd leading cause of cancer mortality for most Oregon women except for Asian/Pacific Islanders (A/PI) for whom it is the leading cause of cancer mortality.

As is seen nationally, Whites have the highest incidence rates, African Americans (AA) have the highest mortality rates, and Non-Hispanics have higher incidence and mortality rates than Hispanics. (See Figure VII-A-9.)

Differences in prognosis may be explained by differences in stage at diagnosis. Among the four race categories, AA women have the lowest percentage of breast cancers diagnosed at an early stage; White women have the highest. (See Figure VII-A-10.)

Overall mortality for Hispanic women is lower than for Non-Hispanics, yet Hispanic women have a low percentage of breast cancers diagnosed at an early stage. (See Figure VII-A-10.) This incongruence between prognosis and stage at diagnosis may reflect differences in how the Registry and Center for Health Statistics report ethnicity. This divergence could also be a result of Hispanic women leaving Oregon after a diagnosis of breast cancer.

There are also racial differences in the percentage of cases unknown at stage at diagnosis. Generally, a breast cancer is not staged at diagnosis because of an extremely poor prognosis or because of comorbidities, like advanced age, contraindicate surgery, and/or treatment. Some unstaged breast cancers may be

FIGURE VII-A-9

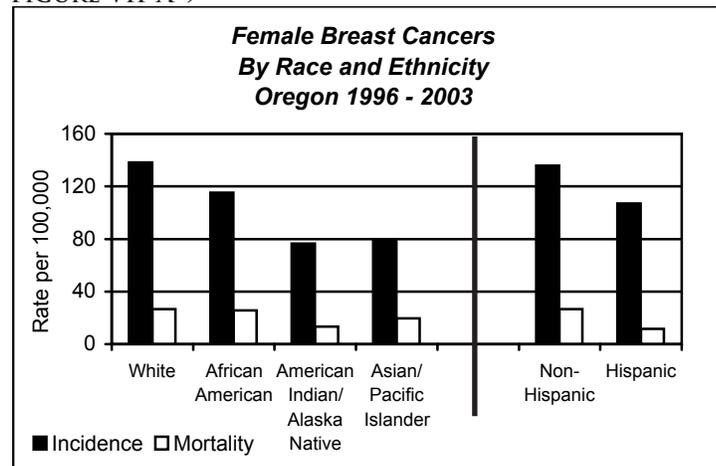
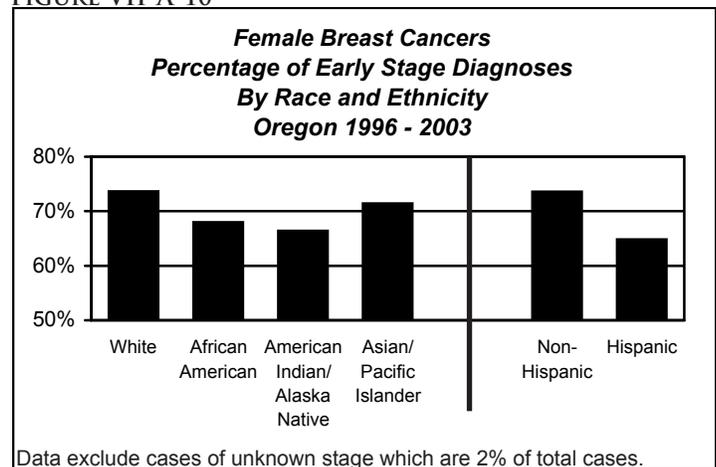


FIGURE VII-A-10



early stage for women who refuse clinical treatment. All cases identified by death certificate are reported as unstaged-at-diagnosis cases. These cases may represent patients who had difficulty getting access to health care or only using health care services near the end of their life.

AA and AI/AN women have more unstaged cases than other women (4% versus 3%) and more breast cancers identified by death certificate only. These stage-at-diagnosis differences may indicate differences in treatment options/choices, disease severity, or access to health care among racial groups. No differences were found between Hispanics and Non-Hispanics.

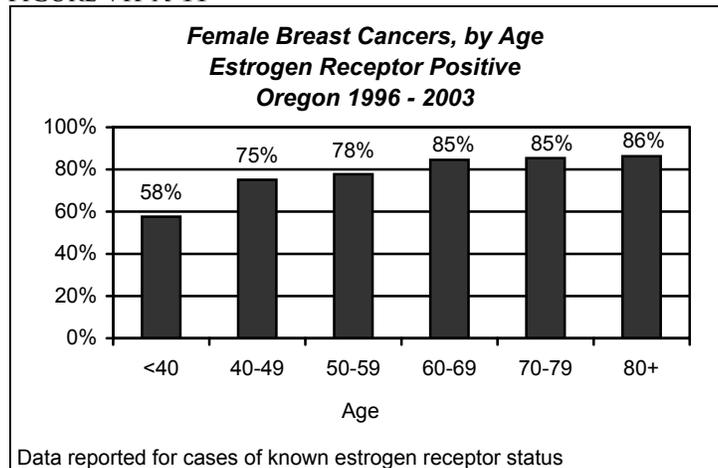
ESTROGEN RECEPTOR STATUS

While the cause of breast cancers remains unknown, exposures to hormones, including estrogen and progesterone, are a significant risk factor. This is why certain life choices (not having children, having a first child after age 30, lack of breast-feeding) and individual factors (early menstruation and late menopause) are associated risk factors for breast cancer. It also suggests why modifiable behaviors (alcohol use, lack of physical exercise, and weight gain after menopause) that increase estrogen levels are associated with higher breast cancer risk.

Some breast cancers respond to hormones and some do not. The cancers that do respond have receptors on the cell that are stimulated by hormones. This stimulation causes growth and division of the cancer cells. An estimated

70% of breast cancers are estrogen receptor positive. As you can see in Figure VII-A-11, this percentage is higher in older women and lower in younger women. Hormone receptor status gives us information about how a given cancer will behave (prognostic factor) and how it will respond to treatment (predictive factor).

FIGURE VII-A-11



MALE BREAST CANCER

Everyone is at risk of breast cancer. Many men do not know they can get breast cancer, and this lack of awareness may contribute to the low percentage of men diagnosed at an early stage compared with women. (See Figure VII-A-12.) Self-exams, clinical exams, and x-rays or ultrasounds of the chest are tools to aid in early detection of breast cancer among men. However, there are no recommended tests for population-based screening for male breast cancer.

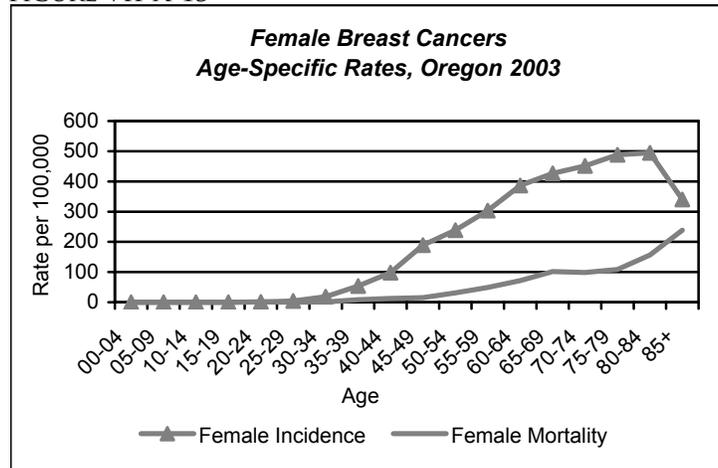
FIGURE VII-A-12

	Male	Female
Percentage of Early Stage	50%	74%

AGE-SPECIFIC INCIDENCE AND MORTALITY

As with other types of cancer, the risk of developing breast cancer increases with age. Figure VII-A-13 shows the age-specific incidence and mortality rates for breast cancer. About 80% of breast cancers occur in women aged 50 years or older. Age-specific breast cancer incidence rates increase sharply around age 40 and drop after age 80, which is similar to the national trend. Breast cancer mortality increases steadily with age.

FIGURE VII-A-13

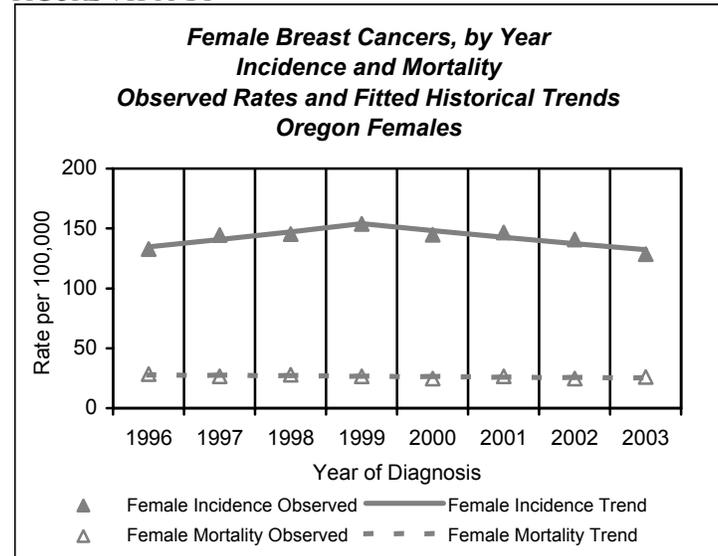


HISTORICAL TRENDS (1996-2003)

Historically, female breast cancer incidence in Oregon increased 4% annually from 1996-1999. From 1999-2003, female breast cancer incidence decreased nearly 4% a year. (See Figure VII-A-14.) This is consistent with national patterns of a 2% annual increase from 1995-1998 followed by a decrease of 2% a year from 1998-2002.

While incidence has been variable, female breast cancer mortality has been steadily decreasing about 1% a year since 1996 in Oregon. This also follows national patterns with a steady decrease of about 2% a year since 1990. With the recent decline in breast cancer incidence, mortality rates may decrease more sharply in the next few years.

FIGURE VII-A-14



REGIONAL VARIATION (COMBINED FIVE-YEAR RATES: 1999-2003)

The western half of Oregon generally has higher female breast cancer incidence rates than the national average. (See Figure VII-A-15.) Northeast Oregon, the eastern border counties, the north coast and Curry County have rates that are lower than the nation.

Female breast cancer mortality rates are higher than the national average for the Willamette Valley, the Columbia River Gorge, the central coast, and much of central, southern, and eastern Oregon. (See Figure VII-A-16.) Southern Oregon, the eastern border counties, and Clatsop, Columbia, and Deschutes Counties have mortality rates that are lower than seen nationally.

The northern and southern coast regions and the southeast portion of Oregon have both low incidence and low mortality, which may be of epidemiologic interest for investigating risk factors for breast cancer.

FIGURE VII-A-15

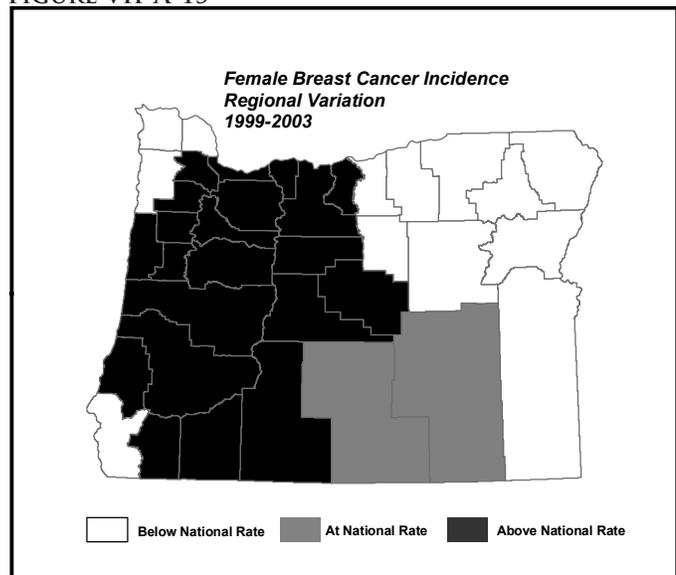
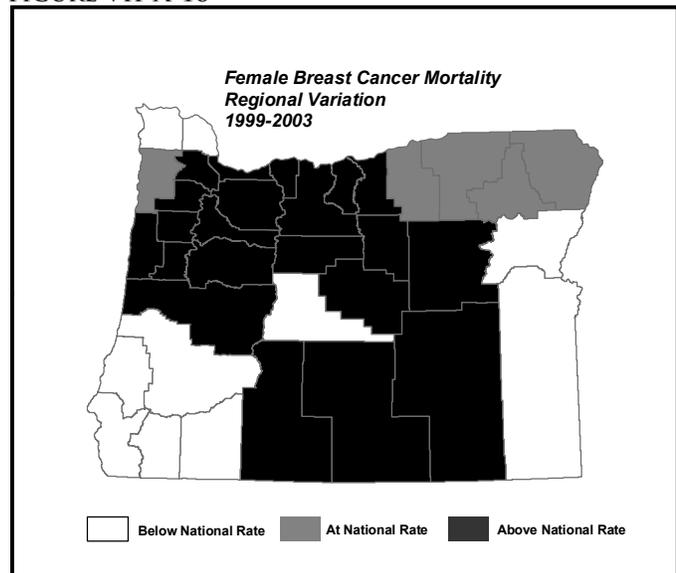


FIGURE VII-A-16



B. CERVICAL CANCERS

Cancer of the cervix is associated with early onset of sexual activity and multiple sexual partners. The most important risk factor is infection by specific types of human papilloma virus (HPV), a group of communicable viruses that also cause genital warts. Vaccines for HPV was recently approved for prevention of infection by high risk types of HPV. It appears to be effective in greatly reducing the risk of cervical cancer. Additionally, even when infection has occurred, the precancerous growths caused by HPV can be detected and treated before the growths develop into cervical cancer.

Cervical cancer used to be a common cause of cancer death for women and remains a leading cause in some areas of the world. In the United States, the number of deaths due to cervical cancer has declined drastically due to the use of the Papanicolaou (Pap) screening test. Not only can mortality be reduced, but cervical cancer could be largely eradicated with routine cervical cancer screening, which can identify precancerous cell growths.

The Oregon cervical cancer mortality rate of 2.1 in 2003 was 5% above the Healthy People 2010 target of 2.0 per 100,000 women. The Oregon Partnership for Cancer Control has made reducing cervical cancer mortality through prevention, education, and screening a priority for Oregon.

INVASIVE CERVICAL
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CANCER SCREENING,
WHICH CAN IDENTIFY
PRECANCEROUS CELL
GROWTHS.

CERVICAL CANCERS FAST FACTS OVERVIEW

Because the numbers are low, some data included in the cervical section are calculated using five or more years of aggregated data to ensure stable descriptions. A brief overview of Oregon's cervical cancer rates shows the following: (See Figure VII-B-1.)

1. In 2003, 116 new cases of invasive cervical cancer were diagnosed in Oregon, and 43 women died due to cervical cancer. *In situ* stage diagnoses are not reportable to OSCaR because they are often indistinguishable from pre-cancerous disease.
2. Current five-year trends show age-adjusted cervical cancer incidence in Oregon has been decreasing 7% annually from 1999-2003. Nationally, cervical cancer incidence has been decreasing 4% annually for 1999-2003. Mortality rates for cervical cancer in Oregon increased 3% a year while national rates decreased 3% a year. Oregon's decrease in incidence is statistically significant, while the increase in mortality is not.
3. Oregon's 2003 incidence rate of 6.3 per 100,000 was 11% below the national rate of 8.0 for 2003. Oregon's 2003 mortality rate was 2.1 per 100,000.
4. Although cervical cancer rates are extremely low, this is the 4th most common cancer site for Hispanic women in Oregon and nationally. This suggests a potential opportunity for outreach to this population by screening programs like Oregon's Breast and Cervical Cancer Program.
5. Among all 50 states, Oregon tied for 26th nationally for cervical cancer mortality in 2002. While the ranking is low, cervical cancer mortality in Oregon could be virtually eliminated through enhanced early detection.
6. In 2003, 59% of cervical cancer cases were diagnosed at a localized stage, which is similar to the 55% diagnosed in 2002.
7. During 1999-2003, Oregon's M/I ratio for cervical cancer was 0.31 and led to 458 YPLL annually. Since cervical cancer that is detected in a localized stage is essentially 100% curable, this indicates an area for public health intervention.

CERVICAL CANCERS FAST FACTS

FIGURE VII-B-1

CERVICAL CANCERS FAST FACTS	
YEAR 2003	
Oregon	Female
CANCER INCIDENCE	
All Cases Total	116
<i>In Situ</i>	Not Reportable
Localized	68
Regional	37
Distant	9
Unstaged	2
Incidence Rates	
Oregon Crude	6.5
Oregon Age-adjusted	6.3
Oregon Current Annual Trend (1999-2003)	*-7.2
US SEER Age-adjusted ²	8.0
US SEER Annual Trend (1999-2003) ²	*-3.7
CANCER MORTALITY	
Total Deaths	43
Mortality Rates	
Oregon Crude	2.4
Oregon Age-adjusted	2.1
Oregon Current Annual Trend (1999-2003)	2.8
US Age-adjusted ³	2.5
US Annual Trend (1999-2003) ³	*-3.4
PROGNOSIS AND BURDEN⁴	
Prognosis: M/I Ratio	0.31
Burden: YPLL before age 65	458

Incidence and death rates are per 100,000 and age-adjusted to the 2000 US Standard Population (19 age group)

* Indicates a statistically significant trend

¹ All Sexes counts may exceed male/female combined due to additional sex coding

² SEER 13 Registry Data, SEER Stat 6.2.3 (See *Technical Section, National Data*, for a description of SEER 13)

³ National Center for Health Statistics (NCHS) US Mortality Public Use Data

⁴ Calculations based on combined years 1999-2003

M/I = Mortality-to-Incidence Ratio

YPLL = Years of Potential Life Lost

STAGE AT DIAGNOSIS

Although OSCaR does not collect information on precancerous conditions or carcinoma *in situ* for cervical cancers, it does collect stage at diagnosis for invasive cervical cancer. The percentage of early stage (localized) diagnoses ranges from 51-63% annually with a current five-year average of 59%. (See Figure VII-B-2.)

The percentage of cervical cancers diagnosed at an early stage decreases with age. (See Figure VII-B-3.)

As with breast cancer, place of residence can influence whether or not a women is diagnosed with cervical cancer at an early stage. In this case, less populated counties historically have had higher percentages of cervical cancers diagnosed at an early stage. (See Figure VII-B-4.)

This disparity has been lessening, and diagnosis year 2001 was the first year to have a greater percentage of early stage diagnoses in urban areas. However, this is not due to an overall improvement in the percentage of early stage diagnoses. While there has been a 7% increase since 1996 in the percentage of early stage cervical cancer diagnoses for women living in urban counties, women in rural areas have had a 12% decrease in the percentage of early stage diagnoses.

FIGURE VII-B-2

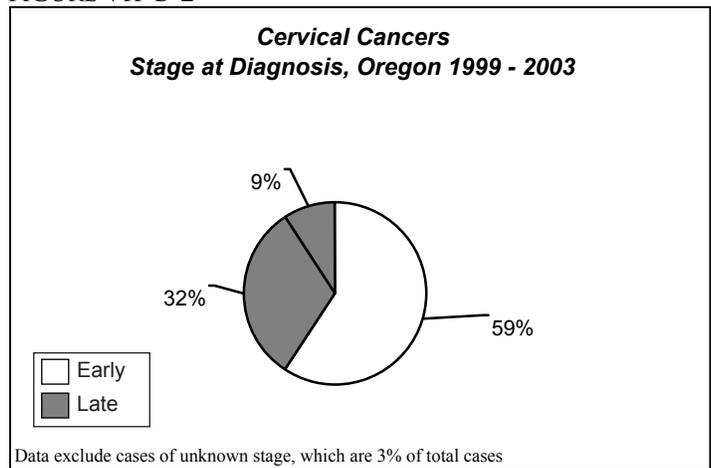


FIGURE VII-B-3

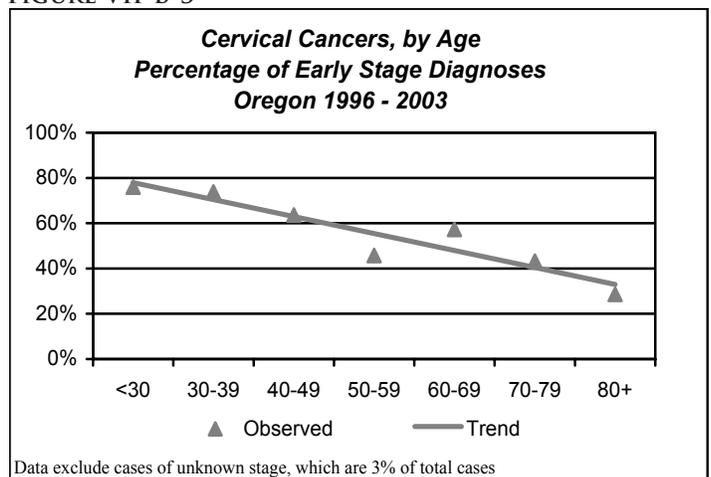
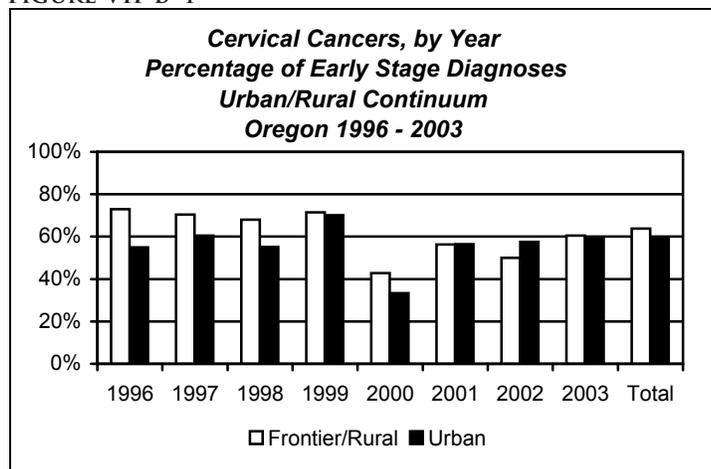


FIGURE VII-B-4



ROUTINE SCREENING

Rates of routine Pap screening among Oregon women remained fairly stable in the last decade. (See Figure VII-B-5.) According to the 2004 National Healthcare Quality Report, Oregon ranked “Below Average” for routine Pap screening for both 2000 and 2002.

Screening rates followed the same pattern seen in percentage of early stage diagnoses by age. The percentage of women receiving routine Pap smears declines as age increases. (See Figure VII-B-6.)

For the combined years 2001-2002, an increase in routine Pap screening correlated with increased population density. (See Figure VII-B-7.) Please review *Appendix B* for a list of counties and their urban/rural code designations.

FIGURE VII-B-5

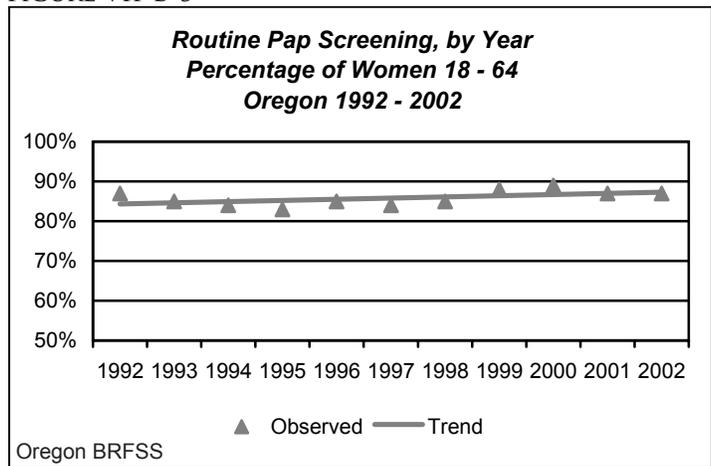


FIGURE VII-B-6

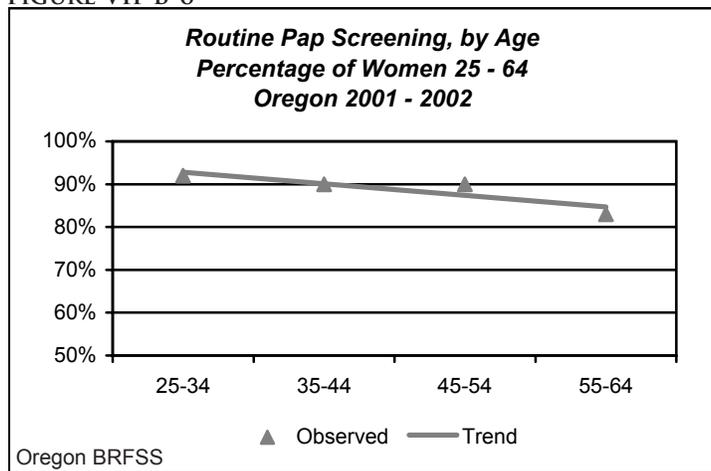
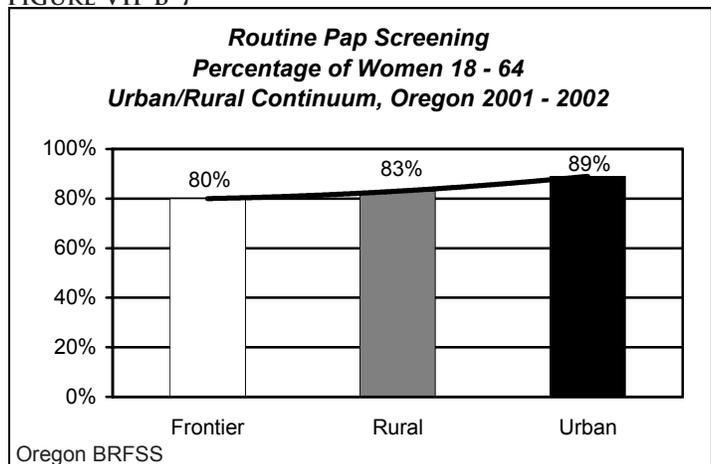


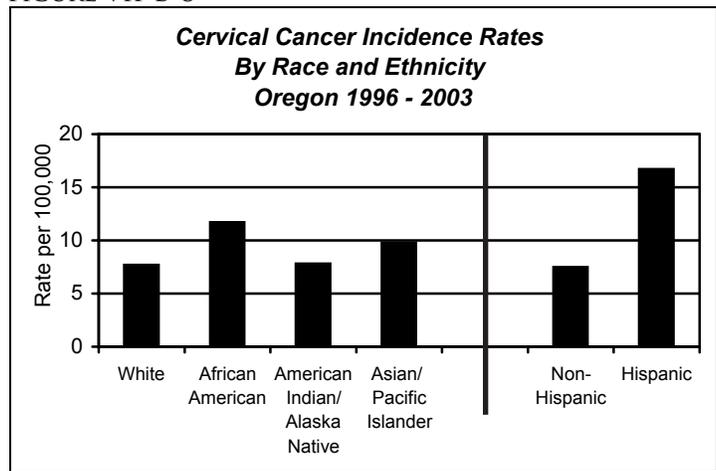
FIGURE VII-B-7



RACE AND ETHNICITY

Although race and ethnicity data need to be interpreted cautiously due to reporting issues (see the *Technical Section* for additional details), cervical cancer is the 4th most common cancer among Hispanic women in Oregon and nationwide. Hispanic women have a higher cervical cancer rate than Non-Hispanic women. Among racial groups, African American women have the highest cervical cancer incidence rates followed by Asian/Pacific Islander women. (See Figure VII-B-8.) There are too few cervical cancer deaths in Oregon to calculate stable mortality rates by race or ethnicity.

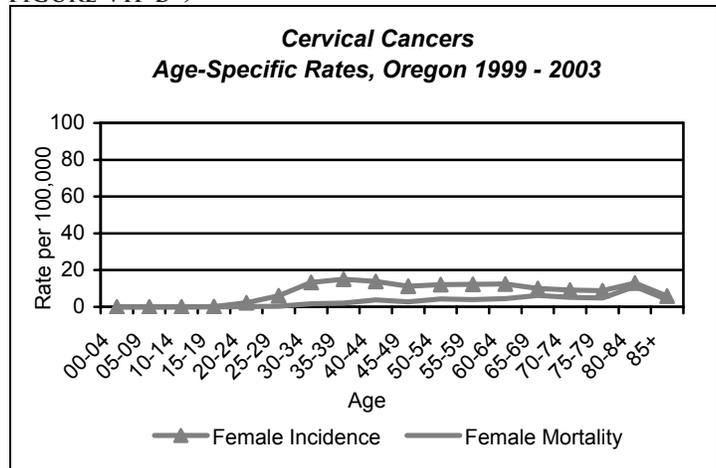
FIGURE VII-B-8



AGE-SPECIFIC INCIDENCE AND MORTALITY

Once sexual activity has begun, the risk of developing cervical cancer does not vary significantly with age. Figure VII-B-9 shows the age-specific incidence and mortality rates for cervical cancer in Oregon. Mortality rates do increase after age 30, consistent with the decline in the percentage of early stage diagnosis as age increases.

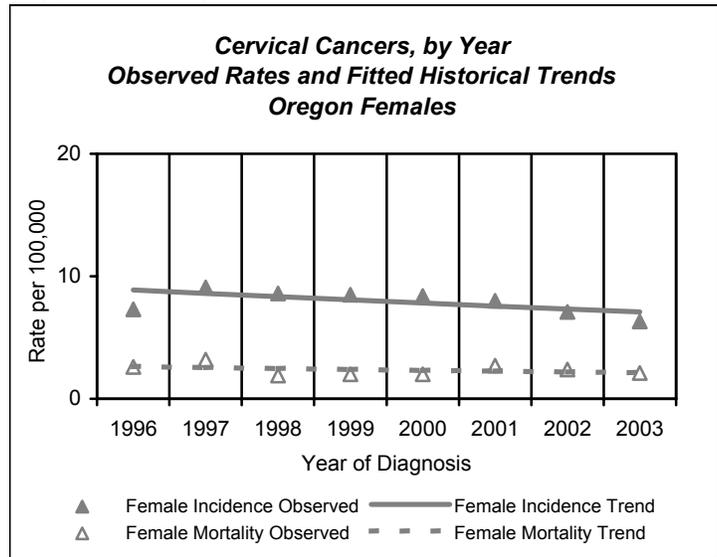
FIGURE VII-B-9



HISTORICAL TRENDS (1996-2003)

Since 1996, both cervical cancer incidence and mortality rates have steadily declined an average of 3% annually. (See Figure VII-B-10.)

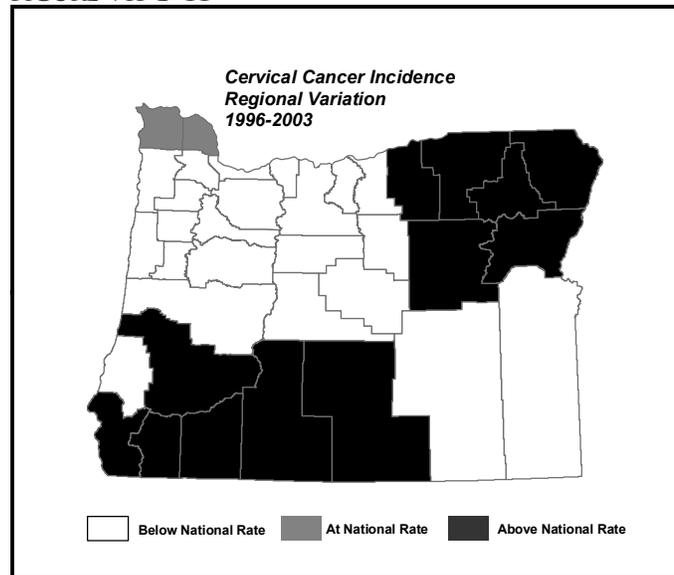
FIGURE VII-B-10



REGIONAL VARIATION (COMBINED EIGHT-YEAR RATES: 1996-2003)

Cervical cancer incidence is higher than the national rate in northeast Oregon and much of southern Oregon. (See Figure VII-B-11.) The northwest portion of the state (except for Clatsop and Columbia Counties), as well as Coos, Harney and Malheur Counties, have cervical cancer incidence rates below the national rate.

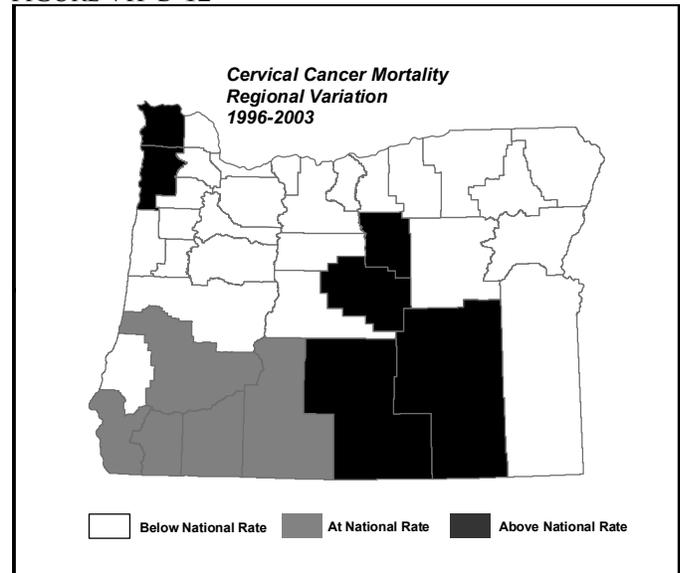
FIGURE VII-B-11



Cervical cancer mortality rates are higher than the national average for the north coast and Crook, Harney, Lake, and Wheeler Counties. (See Figure VII-B-12.) Southern Oregon, with the exception of Coos County, has rates similar to the national rate. The rest of the state (including much of eastern Oregon, and Deschutes, Marion, Linn and Polk Counties) has rates that are lower than the nation.

Since cervical cancer is curable in the early stages, the areas of high mortality should be targeted for screening efforts.

FIGURE VII-B-12



C. COLORECTAL CANCERS

Although a family history of colorectal cancer is a risk factor, three-quarters of colorectal cancers occur in individuals with no known risk factors other than age. Eating a low-fat/high-fiber diet and not smoking may help prevent colorectal cancer. Routine screening can also reduce both morbidity and mortality of colorectal cancer and can even lead to its prevention through early diagnosis and removal of precancerous polyps. Fewer than half of the adults over age 50 receive the recommended screening test for colorectal cancer.

Colorectal cancer is the 3rd most common cancer among Oregonians and the 2nd most common cause of cancer-related death. The 2003 Oregon colorectal cancer mortality rate of 18.0 was 29% above the Healthy People 2010 target of 13.9 per 100,000 persons. Reducing colorectal cancer incidence and mortality through screening has been identified as a priority by the Oregon Partnership for Cancer Control.

INVASIVE COLORECTAL
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AND REMOVAL OF
PRECANCEROUS POLYPS.

 COLORECTAL CANCERS FAST FACTS OVERVIEW

A brief overview of Oregon's colorectal cancer data shows the following: (See Figure VII-C-1.)

1. In 2003, 1,884 new cases of colorectal cancer were diagnosed in Oregon, of which 1,804 were invasive; 685 Oregonians died of colorectal cancer.
2. Current five-year trends show that age-adjusted colorectal cancer incidence rates have decreased 3% a year for both women and men, similar to the decline seen nationally. Age-adjusted colorectal cancer mortality rates among Oregon men declined 3% while the colorectal cancer mortality rate for women remained fairly stable.
3. Oregon's 2003 colorectal cancer incidence rate was nearly the same as the 2003 national rate. Oregon's 2003 mortality rate was 5% lower than the 2003 national mortality rate.
4. Of the 44 states with central registries meeting national data quality standards in 2002, Oregon ranked low in colorectal cancer incidence: 40th for men and 31st for women. Among all 50 states, Oregon also ranked low in colorectal cancer mortality; tied for 35th for men and 44th for women in 2002.
5. Colorectal cancer is the 2nd most common cancer among Asian/Pacific Islander men in Oregon. For all other Oregon men, colorectal cancer is the 3rd most common cancer. Among Oregon women, colorectal cancer is the 2nd most common cancer for African American and Asian/Pacific Islanders. For all other Oregon women, colorectal cancer is the 3rd most common cancer. Among Oregon men, colorectal cancer is the 2nd leading cause of cancer mortality for American Indian/Alaska Natives; 3rd leading cause for African Americans, Asian/Pacific Islanders, Whites, and Non-Hispanics; and 5th leading cause for Hispanics. Among Oregon women, colorectal cancer is the 3rd leading cause of cancer death among all race and ethnic groups.
6. In 2003, 41% of colorectal cancer cases were diagnosed in the early, more treatable stages (*in situ* or localized). Early stage diagnoses have increased 17% since 1996, when 35% were diagnosed in the early stages.
7. During 1999-2003, Oregon's M/I ratio for colorectal cancer was 0.37, suggesting a fair prognosis for this disease. Colorectal cancer was responsible for 1,721 YPLL each year.

COLORECTAL CANCERS FAST FACTS

FIGURE VII-C-1

COLORECTAL CANCERS FAST FACTS

YEAR 2003

Oregon	All Sexes¹	Male	Female
CANCER INCIDENCE			
All Cases Total	1,884	949	935
<i>In Situ</i>	80	42	38
Localized	663	346	317
Regional	715	344	371
Distant	337	177	160
Unstaged	89	40	49
Incidence Rates			
Oregon Crude	50.7	51.3	50.1
Oregon Age-adjusted	48.0	54.5	42.7
Oregon Current Annual Trend (1999-2003)	*-3.1	-3.0	-3.2
US SEER Age-adjusted ²	48.8	56.8	42.4
US SEER Annual Trend (1999-2003) ²	*-2.5	*-2.8	*-2.3
CANCER MORTALITY			
Total Deaths	685	316	369
Mortality Rates			
Oregon Crude	19.2	17.9	20.6
Oregon Age-adjusted	18.0	19.4	16.9
Oregon Current Annual Trend (1999-2003)	-1.6	-3.2	+0.1
US Age-adjusted ³	19.0	23.0	16.1
US Annual Trend (1999-2003) ³	*-2.4	*-2.5	*-2.5
PROGNOSIS AND BURDEN⁴			
Prognosis: M/I Ratio	0.37	0.38	0.37
Burden: YPLL before age 65	1,721	988	733

Incidence and death rates are per 100,000 and age-adjusted to the 2000 US Standard Population (19 age group)

* Indicates a statistically significant trend

¹ All Sexes counts may exceed male/female combined due to additional sex coding

² SEER 13 Registry Data, SEER Stat 6.2.3 (See *Technical Section, National Data*, for a description of SEER 13)

³ National Center for Health Statistics (NCHS) US Mortality Public Use Data

⁴ Calculations based on combined years 1999-2003

M/I = Mortality-to-Incidence Ratio

YPLL = Years of Potential Life Lost

STAGE AT DIAGNOSIS

Because prognosis is strongly influenced by stage at diagnosis, detecting colorectal cancer early can decrease mortality. Screening can also reduce incidence by identifying precancerous polyps, which could then be removed before they develop into cancerous tumors. In 2003, nearly 41% of cancers were detected in the early stages (*in situ* or localized). (See Figure VII-C-2.)

Men generally have a higher percentage of colorectal cancers diagnosed at an early stage than women. (See Figure VII-C-3.)

As seen with other cancers, where an individual resides can influence the stage at diagnosis of colorectal cancer. There is a modest correlation between the percentage of colorectal cancers diagnosed at an early stage (*in situ* or localized) and population density. (See Figure VII-C-4.) Frontier counties generally have a lower percentage of colorectal cancers diagnosed at an early stage, while Urban and Rural counties have a similar, slightly higher percentage.

FIGURE VII-C-2

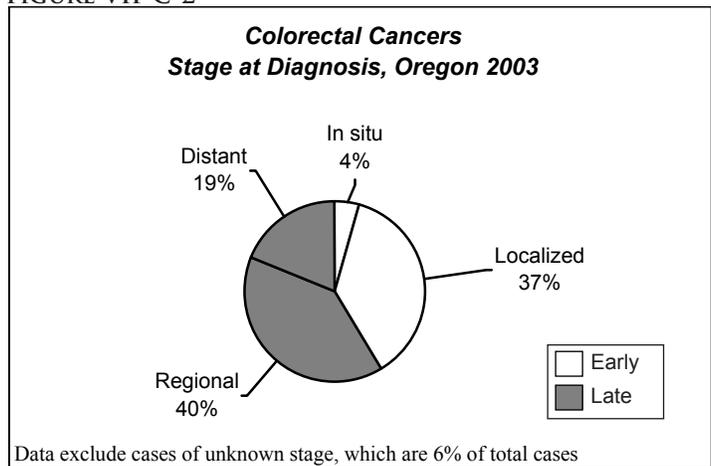


FIGURE VII-C-3

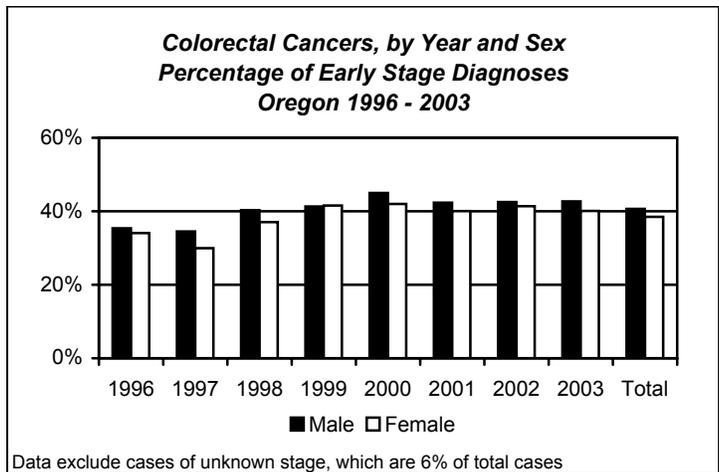
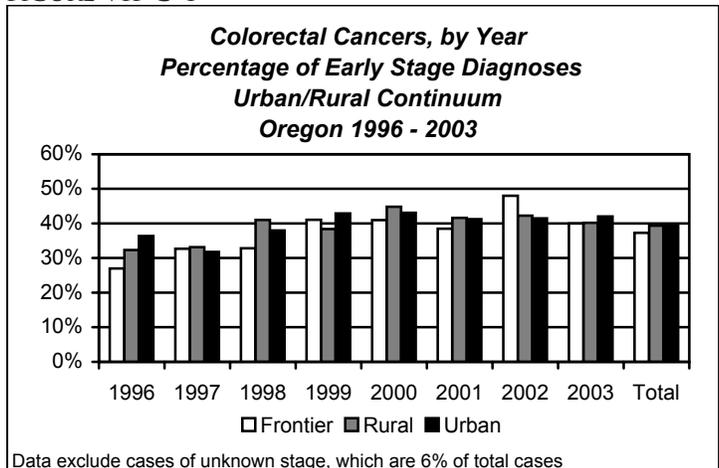


FIGURE VII-C-4



ROUTINE SCREENING

The US Preventive Services Task Force (USPSTF) recommends colorectal cancer screening, for persons age 50 and over, by one of four methods: fecal occult blood test (FOBT), sigmoidoscopy, colonoscopy, or double-contrast barium enema. Although the USPSTF does not recommend a particular screening frequency, many organizations recommend annual FOBT, sigmoidoscopy or barium enema every five years, or colonoscopy every ten years. The American Cancer Society (ACS) preferred method is an annual FOBT and a sigmoidoscopy every five years. In 2002, however, only 48% of Oregonians aged 50 or older reported receiving either FOBT or endoscopy (sigmoidoscopy or colonoscopy) within the recommended time periods and only 11% reported receiving the ACS preferred method.

The percentage of Oregonians who report having ever received FOBT has been consistently higher for women than men since 1997. (See Figure VII-C-5.) Historically, men reported higher rates of ever receiving endoscopy, but, since 2001, women have reported higher rates of endoscopy screening. According to the 2004 National Healthcare Quality Report, Oregon was considered “Above Average” for endoscopy and FOBT screening in 2000, but the rating fell to “Average” in 2001.

While the percentage of Oregonians ever receiving endoscopy has been increasing for both men and women, the greatest increase has been reported by women (23% versus an 8% increase among men). Reported screening rates were

FIGURE VII-C-5

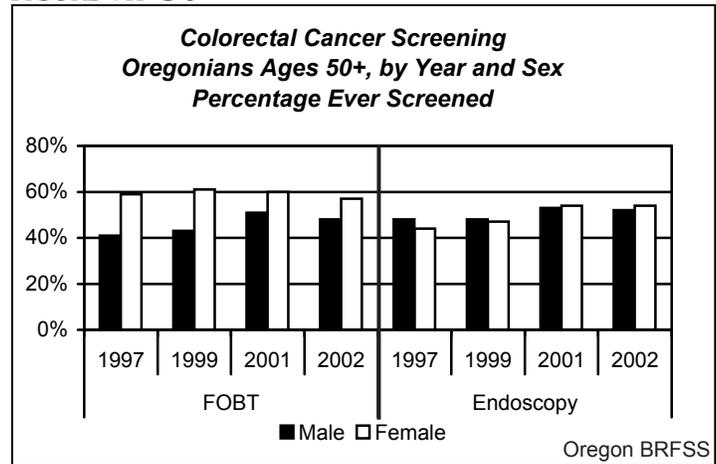
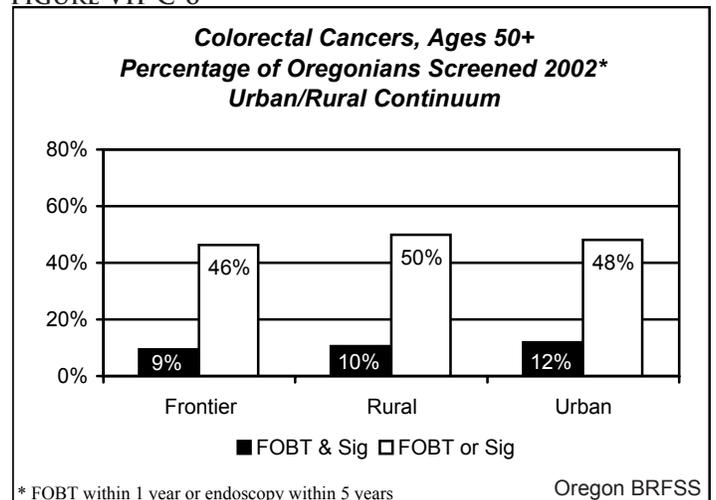


FIGURE VII-C-6



* FOBT within 1 year or endoscopy within 5 years

higher among women in 2002 than men (13% of women and 10% of men received ACS preferred screening; 49% of women and 47% of men received either test within the recommended time periods).

Although county-level data for colorectal cancer screening should be interpreted cautiously due to sampling issues, data suggest that screening rates are lower in Frontier (rural, with less than 6 persons per square mile) counties. (See Figure VII-C-6.)

RACE AND ETHNICITY

Although race and ethnicity data need to be interpreted cautiously due to reporting issues (please see the *Technical Section* for additional details), colorectal cancer is among the top 5 cancers for all Oregonians regardless of race or ethnicity. African Americans (AA) have the highest colorectal cancer incidence followed by American Indians/Alaskan Natives (AI/AN) and Whites. (See Figure VII-C-7.) AI/AN rank higher for colorectal cancer incidence in Oregon than nationally. This may be partially explained by the efforts of the Northwest Portland Area Indian Health Board, OSCaR, and the Indian Health Service to improve reporting for this group. Asian/Pacific Islanders (A/PI) have the lowest colorectal cancer incidence and Hispanics have lower colorectal cancer incidence than Non-Hispanics. Mortality due to colorectal cancer follows the incidence patterns by race and ethnicity. As with incidence, AI/AN rank higher for colorectal cancer mortality in Oregon than nationally.

Among the four race categories, A/PI have the lowest percentage of colorectal cancer diagnosed at an early stage and Whites have the highest percentage. (See Figure VII-C-8.)

There are also differences by race in the percentage of cases that were unstaged at diagnosis. Generally, a colorectal cancer is not staged at diagnosis because of an extremely poor prognosis, or because comorbidities (or advanced age) contraindicate surgery and/or treatment. However, some unstaged colorectal cancer cases may be early stage cases among patients that refuse clinical treatment for ideological or other reasons. All cases

FIGURE VII-C-7

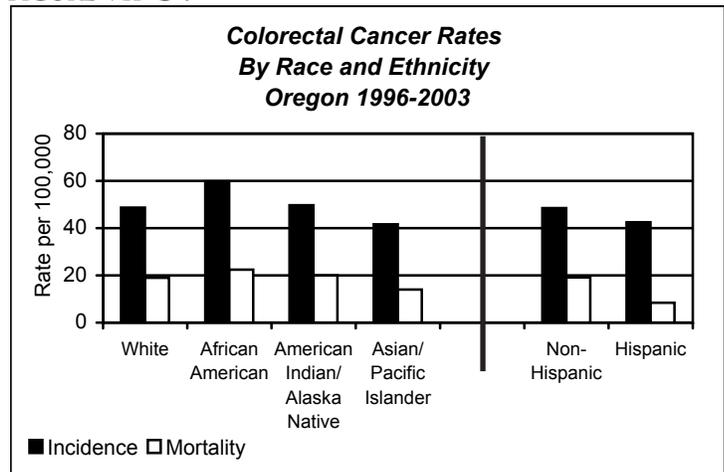
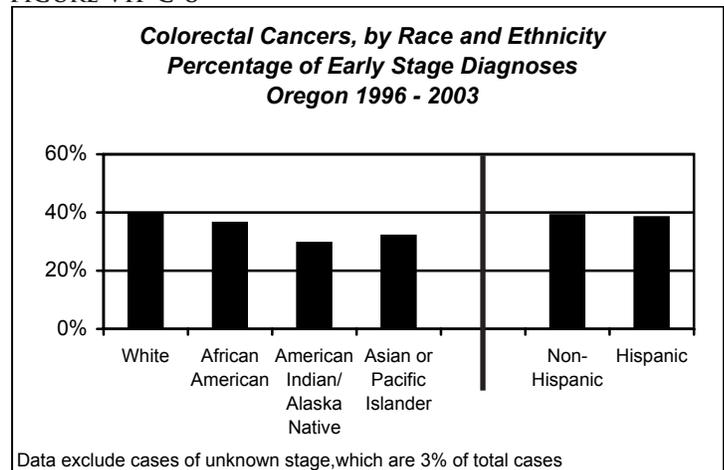


FIGURE VII-C-8



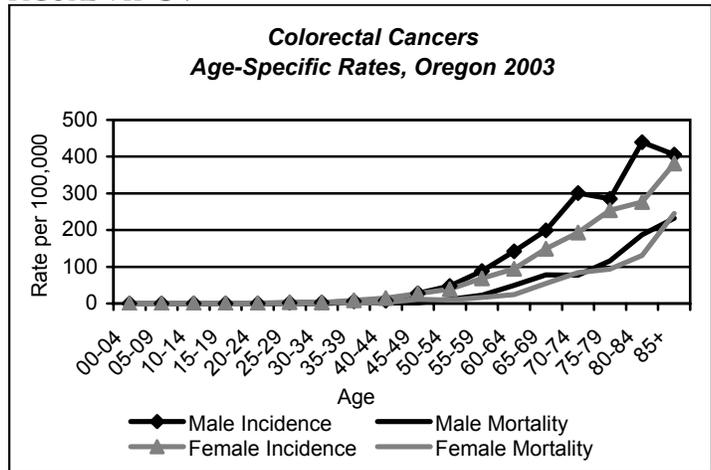
that are identified by a death certificate only are reported as unstaged at diagnosis cases. These cases may represent patients who had difficulty gaining access to health care or were only in the health care system near the end of their life.

A/PI have the lowest percentage of unstaged cases (3%), and AA and AI/AN tied for the highest percentage (8%). These stage-at-diagnosis differences may reflect differences in treatment options, patient treatment choices, disease severity, or may indicate unequal access to health care among these groups.

AGE-SPECIFIC INCIDENCE AND MORTALITY

As with other types of cancer, the risk of developing colorectal cancer increases with age. Figure VII-C-9 shows the age-specific incidence and mortality rates. Colorectal cancer incidence rates begin to increase sharply after age 50 for both men and women. Oregon's age-specific incidence and mortality rates are greater among males than females at nearly every age.

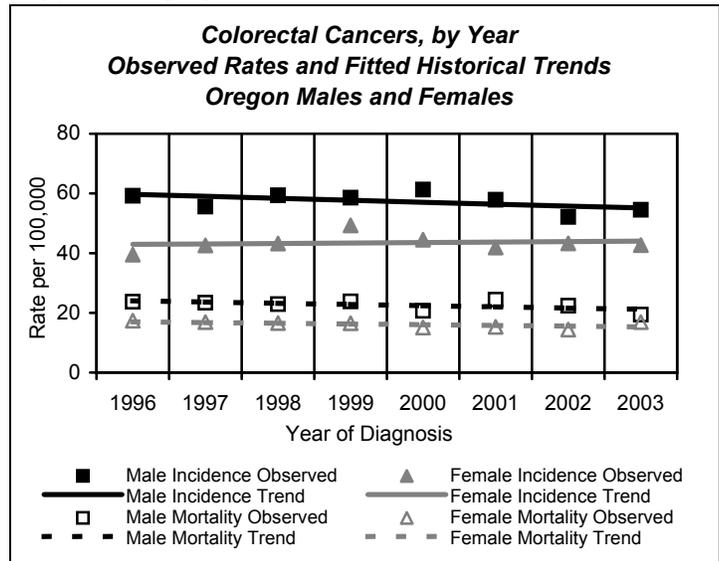
FIGURE VII-C-9



HISTORICAL TRENDS (1996-2003)

Colorectal cancer incidence among Oregon men has decreased an average of 1% a year over the past eight years. Incidence for women has increased about 0.3% annually. Colorectal cancer mortality has been decreasing for both men and women since 1996. Mortality trends for both men and women are decreasing 2% a year. This divergence between incidence and mortality among women may be the result of increased screening in recent years. (See Figure VII-C-10.)

FIGURE VII-C-10



REGIONAL VARIATION (COMBINED FIVE-YEAR RATES: 1999-2003)

With the exception of the northeast portion of the state and Deschutes, Jackson, Klamath, and Lake Counties, the majority of Oregon has lower colorectal cancer incidence rates than the nation. (See Figure VII-C-11.)

Mortality rates for colorectal cancer are higher than national rates in northeast Oregon, Clatsop, and Columbia Counties. The exception are Coos, Crook, and Curry Counties, which are at the national average; the rest of the state has colorectal cancer mortality rates below that seen nationally. (See Figure VII-C-12.)

The high incidence and high mortality seen in northeast Oregon may be of epidemiologic importance in determining the risk factors for colorectal cancer. This area may also benefit from additional colorectal cancer screening.

FIGURE VII-C-11

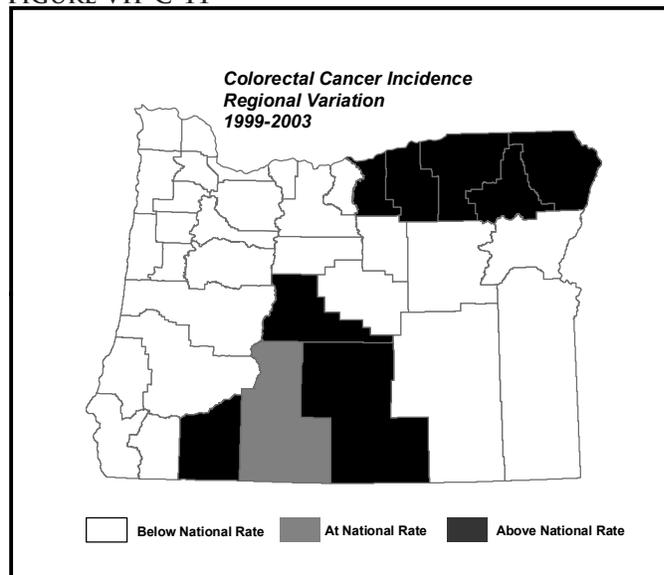
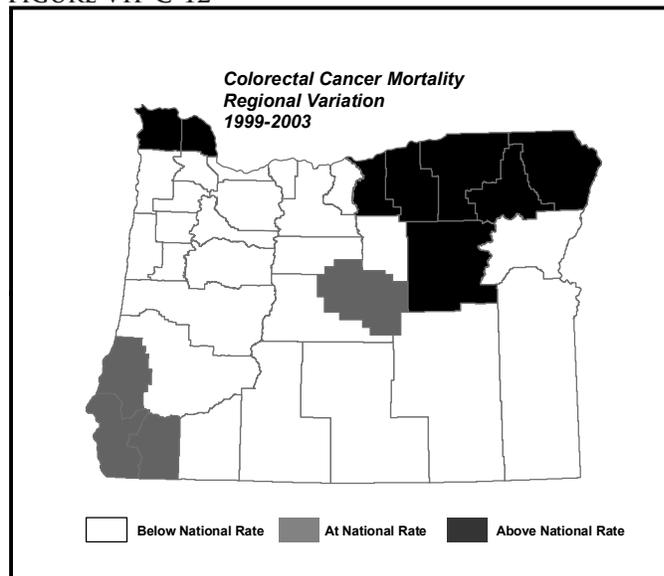


FIGURE VII-C-12



D. LUNG CANCERS

Lung cancer is Oregon's leading cause of cancer-related death and is the state's 3rd most frequently reported cancer. Tobacco use is the primary cause of lung cancer. In 2003, 80% of lung cancer deaths in Oregon were linked to tobacco use. According to data from the Oregon Behavioral Risk Factor Surveillance System (BRFSS), in 2003, an estimated 21% of Oregon adults smoked cigarettes. From Oregon Healthy Teens survey data, an estimated 11% of 8th graders and 19% of 11th graders smoked in 2003.

The 2003 Oregon lung cancer mortality rate of 55.7 was 24% above the Healthy People 2010 target of 44.9 deaths per 100,000 persons. Due to the potential for primary prevention through tobacco control efforts, the reduction of lung cancer incidence and mortality has been identified as a priority for the Oregon Partnership for Cancer Control.

LUNG CANCER MORTALITY RATES HAVE BEEN INCREASING AMONG OREGON WOMEN ABOUT 1% A YEAR. IN 2003, THE MORTALITY RATE FOR WOMEN WAS 14% HIGHER THAN THE NATIONAL RATE.

LUNG CANCERS FAST FACTS OVERVIEW

A brief overview of Oregon's lung cancer data shows the following: (See Figure VII-D-1.)

1. In 2003, 2,448 new cases of invasive lung cancer were diagnosed in Oregonians. There were 2,069 Oregonians who died of lung cancer. Age-adjusted incidence and mortality rates were higher for men than women, as anticipated due to the higher smoking rates among men.
2. Lung cancer incidence in Oregon decreased 2% annually from 1999 to 2003. Mortality rates have been declining for men—2% a year nationally and 1% per year among Oregon men. Mortality rates have been increasing among Oregon women—about 1% a year.
3. Oregon's age-adjusted 2003 lung cancer incidence rate of 66.5 per 100,000 was 9% higher than the national rate of 61.1. The excess is largely due to a 23% higher rate of lung cancer among Oregon women than their national counterparts. Oregon's 2003 mortality rate was 3% higher than the national mortality rate again driven by a higher rate among Oregon women than that seen nationally.
4. Of the 44 states with central registries meeting national data quality standards in 2002, Oregon ranked 28th for men and 14th for women in lung cancer incidence. In 2003, among all 50 states, Oregon's lung cancer mortality rate ranked 32nd for men and 5th for women.
5. Lung cancer is the 2nd most common cancer for Oregon men, except for Asian/Pacific Islanders for whom it is the 3rd most common cancer. Lung cancer is also the 2nd most common cancer for Oregon women, except for African American and Asian/Pacific Islanders for whom it is the 3rd most common cancer. Lung cancer is the most common cause of cancer mortality for all race and ethnic groups, except for Asian/Pacific Islander women for whom it is the 2nd most common cause of cancer mortality.
6. In 2003, only 20% of lung cancers among Oregonians were diagnosed at an early stage. Currently, there are no population-based screening recommendations to detect lung cancer in its early stages.
7. During 1999-2003, Oregon's M/I ratio for lung cancer was 0.81, suggesting a poor prognosis for this disease. The M/I ratio was worse for men than women. Lung cancer is the leading cancer site for YPLL with 4,342 years lost annually.

LUNG CANCERS FAST FACTS

FIGURE VII-D-1

LUNG CANCERS FAST FACTS				
YEAR 2003				
Oregon	All Sexes¹	Male	Female	
CANCER INCIDENCE				
All Cases Total	2,448	1,265	1,183	
<i>In Situ</i>	0	0	0	
Localized	436	212	224	
Regional	594	298	296	
Distant	1,176	641	535	
Unstaged	242	114	128	
Incidence Rates				
Oregon Crude	68.8	71.5	66.0	
Oregon Age-adjusted	66.5	76.9	58.9	
Oregon Current Annual Trend (1999-2003)	*-2.2	*-3.2	-1.5	
US SEER Age-adjusted ²	58.5	73.0	48.0	
US SEER Annual Trend (1999-2003) ²	*-1.6	*-2.2	-0.9	
CANCER MORTALITY				
Total Deaths	2,069	1,104	965	
Mortality Rates				
Oregon Crude	58.1	62.4	53.9	
Oregon Age-adjusted	55.7	67.6	46.9	
Oregon Current Annual Trend (1999-2003)	-0.1	-1.3	+0.9	
US Age-adjusted ³	54.2	71.9	41.2	
US Annual Trend (1999-2003) ³	-0.6	*-1.7	+0.6	
PROGNOSIS AND BURDEN⁴				
Prognosis: M/I Ratio	0.81	0.82	0.79	
Burden: YPLL before age 65	4,342	2,335	2,007	

Incidence and death rates are per 100,000 and age-adjusted to the 2000 US Standard Population (19 age group)

* Indicates a statistically significant trend

¹ All Sexes counts may exceed male/female combined due to additional sex coding

² SEER 13 Registry Data, SEER Stat 6.2.3 (See *Technical Section, National Data*, for a description of SEER 13)

³ National Center for Health Statistics (NCHS) US Mortality Public Use Data

⁴ Calculations based on combined years 1999-2003

M/I = Mortality-to-Incidence Ratio

YPLL = Years of Potential Life Lost

STAGE AT DIAGNOSIS

Lung cancer is typically asymptomatic in the early stages, and currently there are no widely accepted screening methods for this cancer type. Therefore, the majority of lung cancers are diagnosed at a late stage. (See Figure VII-D-2.) Late detection contributes to the fact that lung cancer has one of the poorest prognoses of all cancers.

Regardless of the absence of population-based screening recommendations, there are several consistent patterns in the percentage of early stage diagnoses for lung cancer by sex, age, and population density.

Women have a higher percentage of early stage diagnoses. (See Figure VII-D-3).

Oregonians diagnosed before age 30 have the highest percentage of early stage diagnoses. After age 50, the percentage of early stage diagnoses increases with age. (See Figure VII-D-4.)

FIGURE VII-D-2

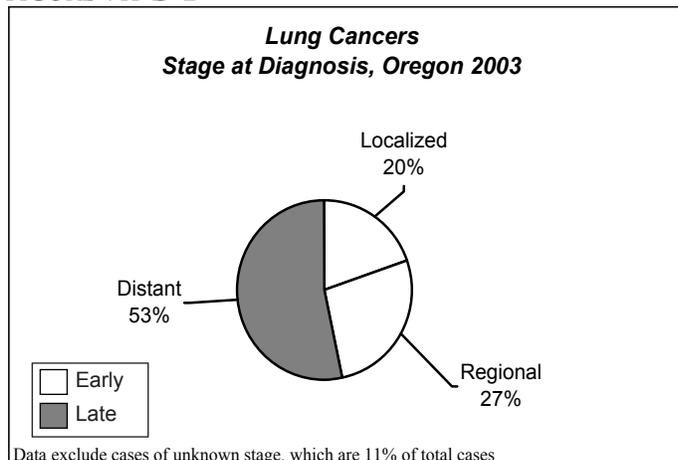


FIGURE VII-D-3

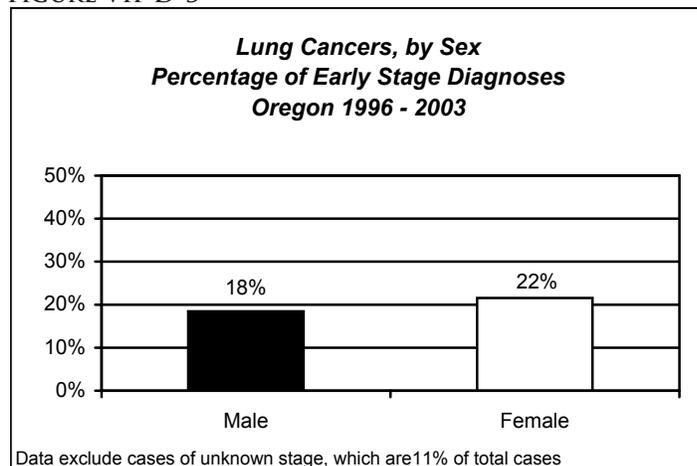
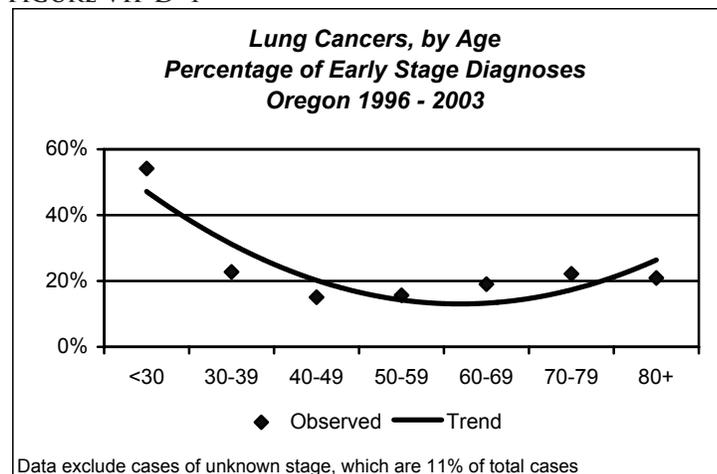
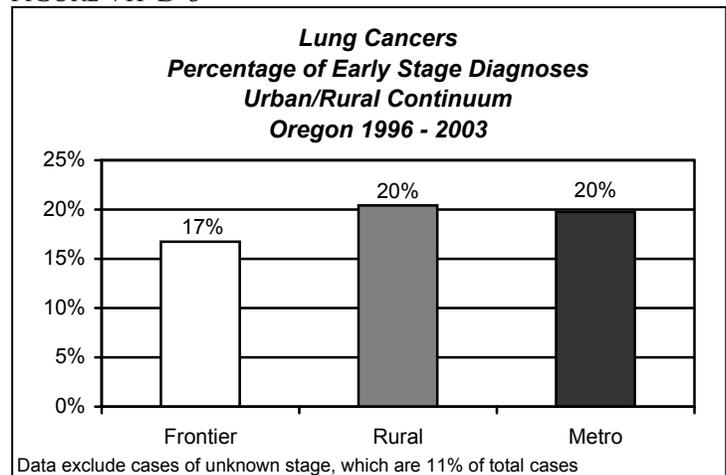


FIGURE VII-D-4



Although the percentage of lung cancer diagnosed at an early stage is similar for Urban and Rural counties, Frontier counties (< 6 persons per square mile) have a lower percentage of early stage cases. (See Figure VII-D-5.)

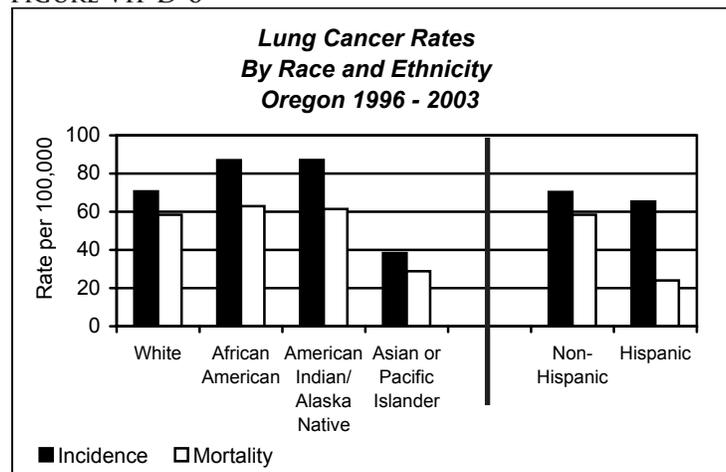
FIGURE VII-D-5



RACE AND ETHNICITY

Although race and ethnicity data need to be interpreted cautiously due to reporting issues (see the *Technical Section* for additional details), lung cancer rates vary by race and ethnicity. (See Figure VII-D-6.) African Americans (AA) and American Indian/Alaskan Natives (AI/AN) have the highest rates of lung cancer incidence, and Asian/Pacific Islanders (A/PI) have the lowest lung cancer incidence and mortality rates in Oregon. AI/AN have higher lung cancer incidence than is seen nationally, which may be partially explained by the improved race reporting for this group in Oregon. As seen nationally, Hispanics in Oregon have lower lung cancer incidence and mortality rates than Non-Hispanics.

FIGURE VII-D-6



Variations by race and ethnicity for lung cancer rates could be related to variations in smoking rates among the different populations. (See Figure VII-D-7.) AI/AN report the highest percentage while A/PI report the lowest percentage of smokers in the adult population. Hispanics report lower smoking rates than Non-Hispanic Whites.

FIGURE VII-D-7

Race and Ethnicity	Percent
American Indian	44%
African American	27%
White (Non-Hispanic)	21%
Hispanic	18%
Asian/Pacific Islander	14%

African Americans (AA) and Asian/Pacific Islanders (A/PI) have the lowest percentage of lung cancers diagnosed at an early stage. (See Figure VII-D-8.) Whites and AI/AN have comparable percentages of lung cancer cases diagnosed at an early stage.

There are also differences in percentage of cases unstaged at diagnosis by race and ethnicity. Generally, lung cancer is not staged at diagnosis because of an extremely poor prognosis, comorbidities, advanced age, contraindicate surgery, and/or treatment. All cases that are identified by death certificate are reported as unstaged-at-diagnosis cases. These cases may represent patients that had difficulty getting access to health care or were only using health care services near the end of their life.

Although the percentage of unstaged lung cancer cases is similar among Hispanics and Non-Hispanics, there is variation in the percentage of unstaged, or unknown stage, lung cancer cases among the four race categories. (See Figure VII-D-8.)

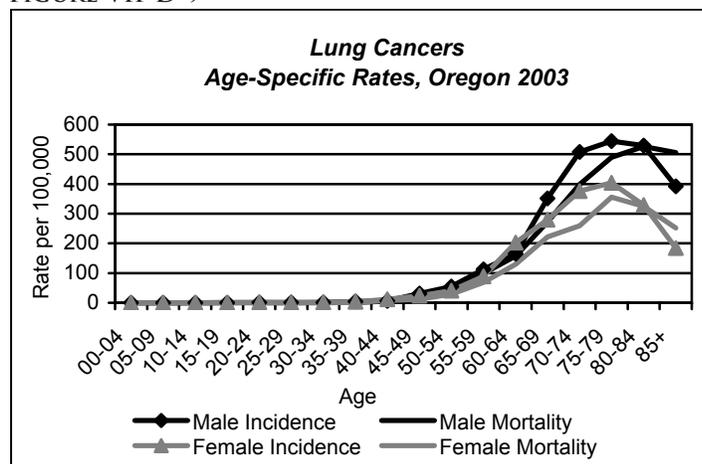
FIGURE VII-D-8

Lung Cancers, Stage at Diagnosis By Race and Ethnicity Oregon 1996-2003		
<i>Race and Ethnicity</i>	<i>Percent of Early Stage</i>	<i>Percent Unstaged</i>
White	20%	12%
American Indian/Alaska Native	22%	8%
African American	17%	10%
Asian or Pacific Islander	17%	9%
Non-Hispanic	20%	12%
Hispanic	22%	13%

AGE-SPECIFIC INCIDENCE AND MORTALITY

Lung cancer incidence increases with age until age 75 when rates begin to taper off. Oregon's age-specific data show incidence rates higher among men than women for all age groups. Mortality rates show similar sex and age patterns. (See Figure VII-D-9.)

FIGURE VII-D-9

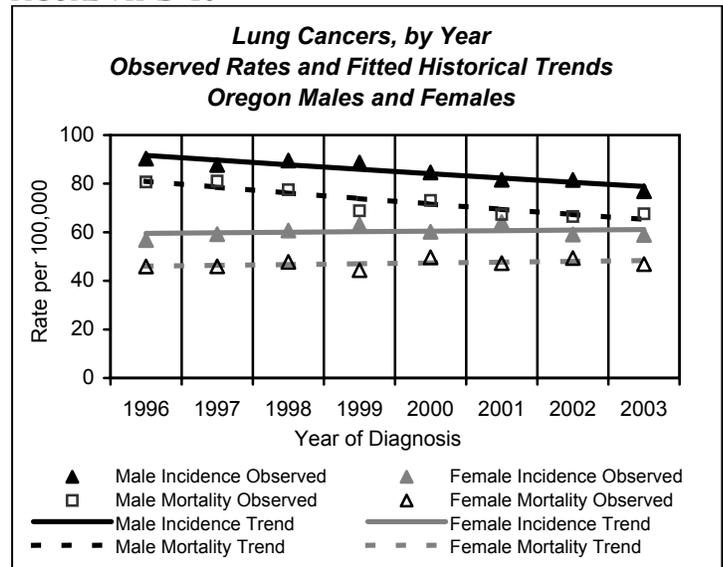


HISTORICAL TRENDS (1996-2003)

Lung cancer incidence for men in Oregon has been decreasing 2% a year while incidence for women in Oregon has been increasing 0.4% a year since 1996. (See Figure VII-D-10.) Nationally, lung cancer incidence has been decreasing 2% a year for men and increasing 0.3% a year for women, over a similar time period.

Following incidence trends, lung cancer mortality has been decreasing for men and increasing for women since 1996. (See Figure VII-D-10.) Mortality has been decreasing 3% a year for men and increasing 1% a year for women. Nationally among men there has been a 2% annual decrease over a similar time period compared to < 0.2% a year increase among women since 1996. However, lung cancer mortality is difficult to compare over this time period due to changes in coding in 1999 that affect the mortality numbers for lung cancer. Please see the *Technical Section* for information about the change to ICD-10 mortality coding.

FIGURE VII-D-10



REGIONAL VARIATION (COMBINED FIVE-YEAR RATES: 1999-2003)

Much of the state has lung cancer incidence rates that are higher than the national rate. (See Figure VII-D-11.) Only Baker and Malheur Counties have lung cancer incidence rates lower than the national average.

As seen with lung cancer incidence, much of the state (including the Columbia River Gorge, the Metro area, the coast and southern Oregon) has mortality rates that are higher than the national average. (See Figure VII-D-12.) Eastern Oregon, Deschutes, Linn, Marion and Polk Counties have mortality rates below the national average.

Areas of high incidence and mortality, such as the northern counties in Oregon, may indicate areas that would benefit from targeted tobacco cessation programs.

FIGURE VII-D-11

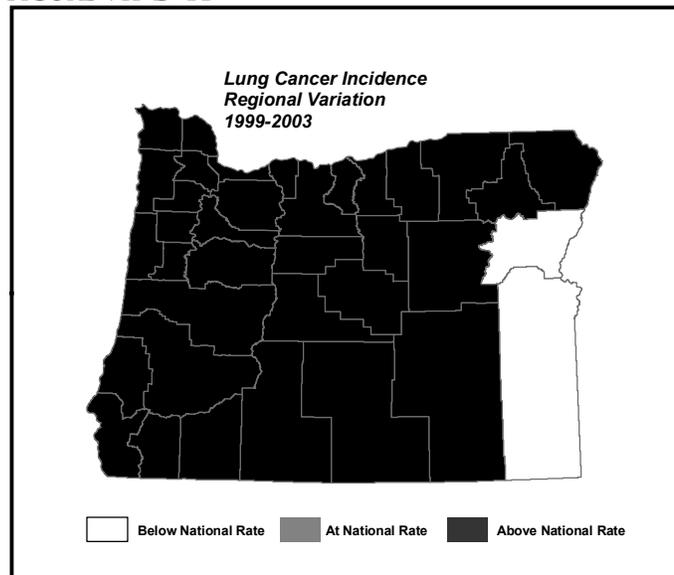
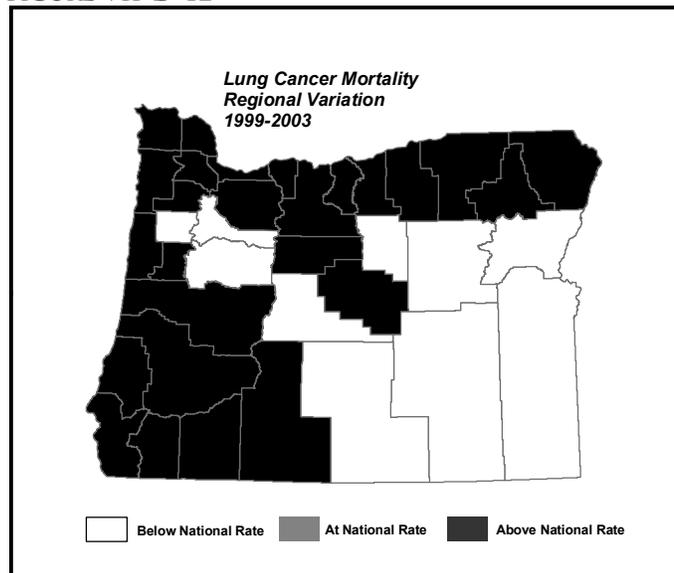


FIGURE VII-D-12



E. MELANOMAS OF THE SKIN

Although basal and squamous cell cancers of the skin, which are not reportable to the Registry, account for the vast majority of skin cancers, melanoma accounts for the majority of skin cancer deaths. Melanoma can be successfully treated at an early stage, but unlike basal or squamous cell skin cancers, melanoma often spreads to other parts of the body and becomes less treatable.

Sun exposure is the primary risk factor for melanoma of the skin. Having certain types of moles is also a risk factor for developing melanoma. Although anyone can develop melanoma, the risk of melanoma is much higher for Whites than African Americans.

Melanoma of the skin is the 6th most common invasive cancer diagnosed in Oregon and the 6th leading cause of cancer-related death among Oregonians. Oregon's melanoma mortality rate of 3.4 for 2003 was 36% above the Healthy People 2010 target of 2.5 deaths per 100,000. Despite a lack of agreement on population-based screening guidelines, the Oregon Partnership for Cancer Control has identified reducing melanoma mortality as a priority because of the high incidence and mortality in the state.

IN 2003, THE OREGON MELANOMA MORTALITY RATE WAS 26% HIGHER THAN THE NATIONAL RATE.

MELANOMAS OF THE SKIN FAST FACTS OVERVIEW

A brief overview of Oregon's melanoma data shows the following: (See Figure VII-E-1.)

1. In 2003, 1,472 Oregonians were diagnosed with melanomas, of which, 789 were invasive. Melanomas were the cause of death for 127 Oregonians.
2. Oregon's melanoma incidence has decreased 0.5% annually while mortality has increased 3% over the past five years. Nationally, melanoma incidence and mortality trends have been unchanged over the last five years.
3. Oregon's age-adjusted 2003 incidence rate of 21.2 was 23% higher than the national rate of 17.3. Similarly, the Oregon 2003 mortality rate was 26% higher than the national rate in 2003.
4. The majority, nearly 94%, of melanomas were diagnosed at an early (*in situ* or localized) stage in 2003.
5. During 1999-2003, Oregon's M/I ratio for melanomas was 0.14, suggesting a good prognosis for this disease. Melanomas are responsible for 887 YPLL each year among Oregonians.

MELANOMAS OF THE SKIN FAST FACTS

FIGURE VII-E-1

MELANOMAS OF THE SKIN FAST FACTS				
YEAR 2003				
Oregon	All Sexes¹	Male	Female	
CANCER INCIDENCE				
All Cases Total	1472	778	694	
<i>In Situ</i>	683	352	331	
Localized	660	343	317	
Regional	52	28	24	
Distant	32	25	7	
Unstaged	45	30	15	
Incidence Rates				
Oregon Crude	22.2	24.1	20.3	
Oregon Age-adjusted	21.2	24.6	19.1	
Oregon Current Annual Trend (1999-2003)	-0.5	-1.1	+0.4	
US SEER Age-adjusted ²	17.3	21.8	14.1	
US SEER Annual Trend (1999-2003) ²	0.0	-0.3	0.3	
CANCER MORTALITY				
Total Deaths	127	85	42	
Mortality Rates				
Oregon Crude	3.6	4.8	2.3	
Oregon Age-adjusted	3.4	4.8	2.0	
Oregon Current Annual Trend (1999-2003)	2.2	3.6	-0.8	
US Age-adjusted ³	2.7	3.9	1.7	
US Annual Trend (1999-2003) ³	0.0	0.2	-0.5	
PROGNOSIS AND BURDEN⁴				
Prognosis: M/I Ratio	0.14	0.17	0.11	
Burden: YPLL before age 65	887	577	310	

Incidence and death rates are per 100,000 and age-adjusted to the 2000 US Standard Population (19 age group)

* Indicates a statistically significant trend

¹ All Sexes counts may exceed male/female combined due to additional sex coding

² SEER 13 Registry Data, SEER Stat 6.2.3 (See *Technical Section, National Data*, for a description of SEER 13)

³ National Center for Health Statistics (NCHS) US Mortality Public Use Data

⁴ Calculations based on combined years 1999-2003

M/I = Mortality-to-Incidence Ratio

YPLL = Years of Potential Life Lost

STAGE AT DIAGNOSIS

Sun avoidance, including wearing protective clothing and avoiding the sun during high intensity hours, may help prevent melanomas. In 2003, the last year for which the Oregon Behavioral Risk Factor Surveillance System (BRFSS) data are available, 37% of Oregonians reported getting a sunburn within the last 12 months.

As with other cancers, mortality due to melanomas can be reduced through early detection. Melanomas can be found early through self-exam and physician exams. However, there are no national screening recommendations for melanoma.

The majority of melanomas diagnosed in 2003 were diagnosed at an early, treatable stage. (See Figure VII-E-2.) This high percentage likely has contributed to the good prognosis of these cancers.

There are several patterns in the percentage of early stage diagnoses for melanomas by sex, age, and population density. Although the percentages are both over 90%, women have a higher percentage of early stage diagnoses, 95% versus 93% for men. (See Figure VII-E-3.)

Although the decline is slight, the percentage of melanomas diagnosed at an early stage decreases with age. (See Figure VII-E-4.)

FIGURE VII-E-2

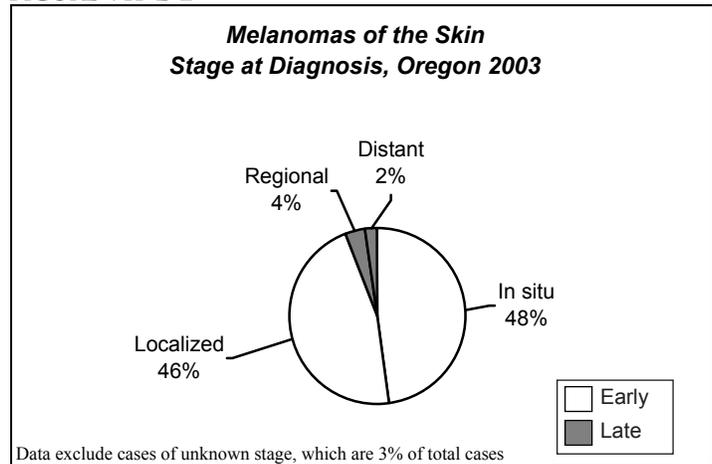


FIGURE VII-E-3

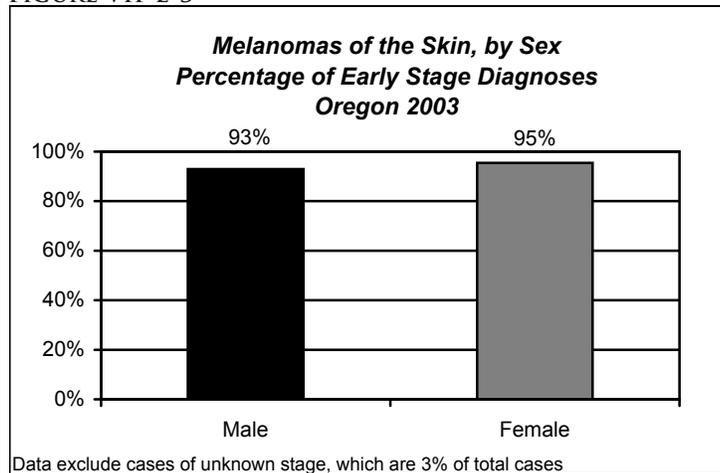
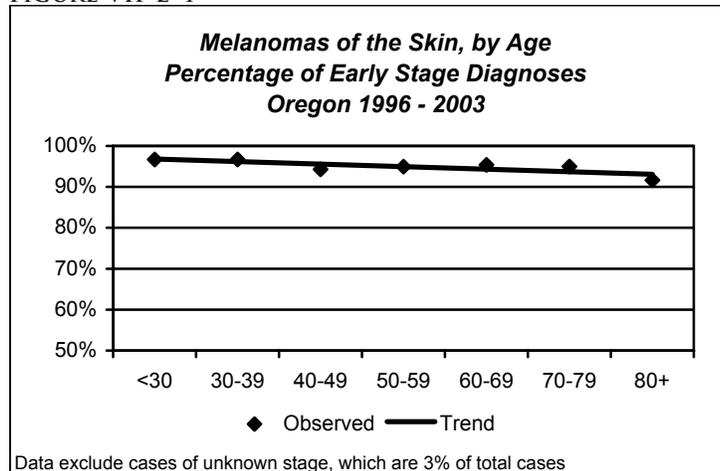
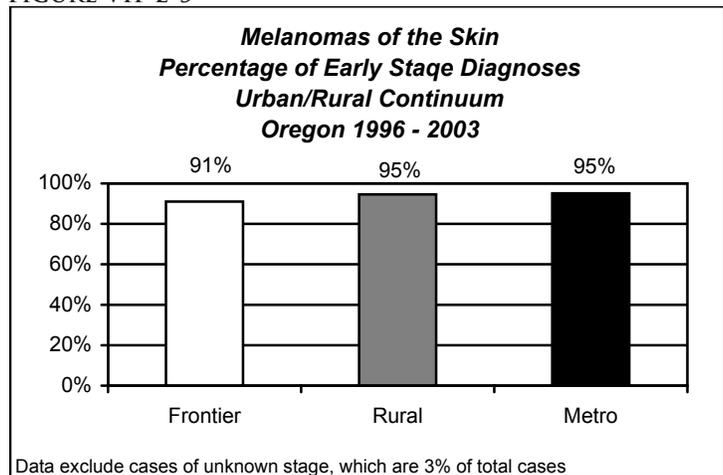


FIGURE VII-E-4



Moreover, although the percentage of melanomas diagnosed at an early stage is similar for Urban and Rural counties, Frontier counties (<6 persons per square mile) have a lower percentage. (See Figure VII-E-5.)

FIGURE VII-E-5

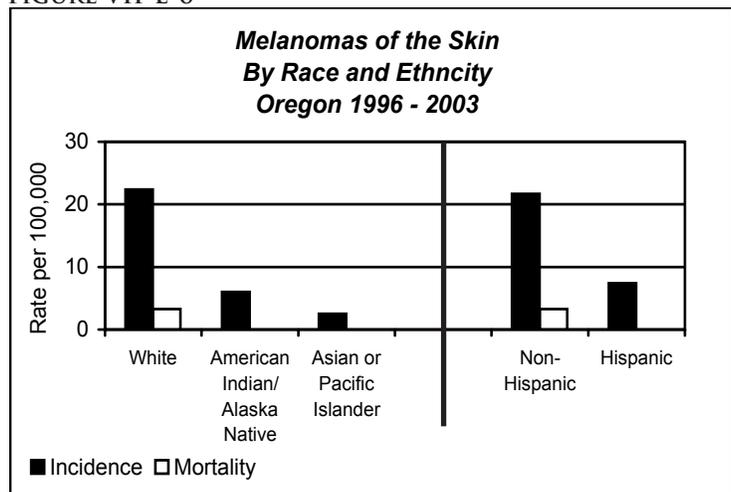


RACE AND ETHNICITY

Although race and ethnicity data need to be interpreted cautiously due to reporting issues (please see the *Technical Section* for additional details), melanoma cancer rates vary by race and ethnicity. (See Figure VII-E-6.) Whites have the highest rate of melanoma incidence, and Asian/Pacific Islanders have the lowest incidence rates in Oregon. Hispanics in Oregon have lower melanoma cancer incidence rates than Non-Hispanics. There are too few cases to calculate stable mortality rates for any race or ethnic group besides Whites and Non-Hispanics.

The difference in rates of melanoma by race and ethnicity is principally genetic. Because skin pigment has a protective effect, the risk of melanoma of the skin is about 20 times higher for Whites than for AA.

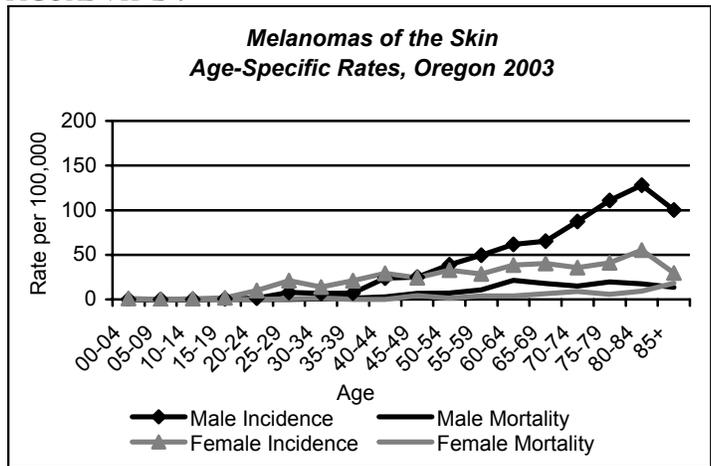
FIGURE VII-E-6



AGE-SPECIFIC INCIDENCE AND MORTALITY

As with other types of cancer, the risk of developing melanoma increases with age. Figure VII-E-7 shows the age-specific incidence and mortality rates for melanoma. Oregon's age-specific incidence steadily increases for men with increasing age. The age-specific melanoma incidence rates fluctuate for women under 50; it then increases with age until the rate begins to drop after age 75. With the exception of the 15- to 50-year-old age groups, men have higher melanoma incidence rates than women. In general, mortality due to melanoma is higher for men than women. As seen with incidence, mortality due to melanoma increases steadily with age for men but is more variable for women.

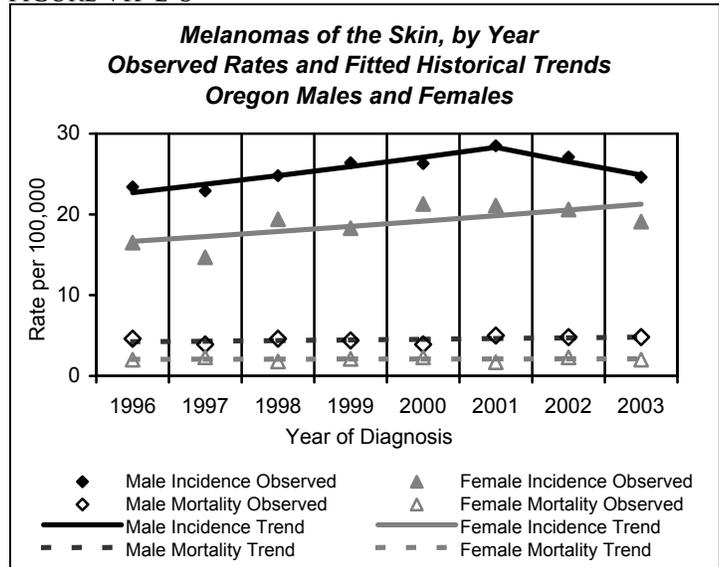
FIGURE VII-E-7



HISTORICAL TRENDS (1996-2003)

Incidence rates for melanoma have been increasing for both men and women since 1996, but the annual rate of increase has been greater for women (3% versus 2% for men). (See Figure VII-E-8). For mortality due to melanomas, rates have been decreasing 0.3% a year for women and increasing 2% a year for men.

FIGURE VII-E-8



REGIONAL VARIATION (COMBINED EIGHT-YEAR RATES: 1996-2003)

Regional variation for melanoma incidence is difficult to interpret because any potential variation could be due to the individual climate of the region as well as individual behaviors, such as sun avoidance or seeking medical care early. With this in mind, incidence of melanoma has an east/west gradient across Oregon (See Figure VII-E-9.) Eastern Oregon and Clatsop, Columbia, and Lincoln Counties have rates of melanoma incidence that are lower than are seen nationally. The remainder of the state has rates higher than the rates seen nationally.

The geographic pattern for mortality is similar to incidence. (See Figure VII-E-10.) In general, melanoma-specific mortality is higher than is seen nationally in southern, western, and central Oregon. Lincoln County has a melanoma mortality rate lower than the nation. The rest of the state has melanoma mortality rates that are similar to the national rate.

FIGURE VII-E-9

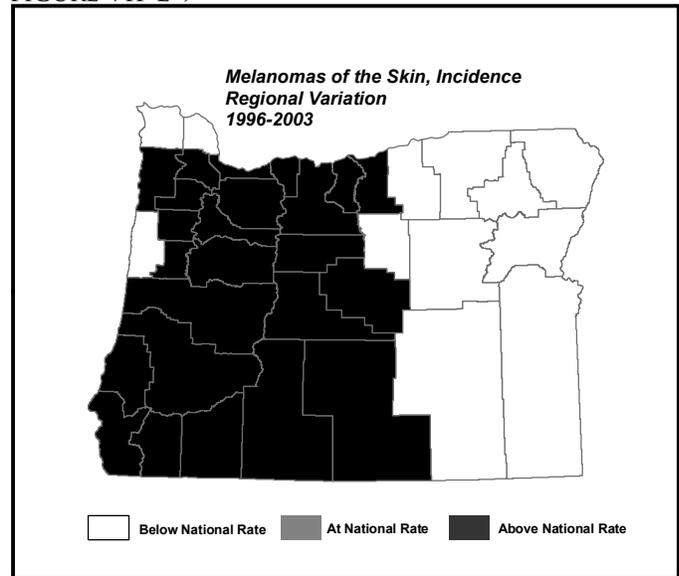
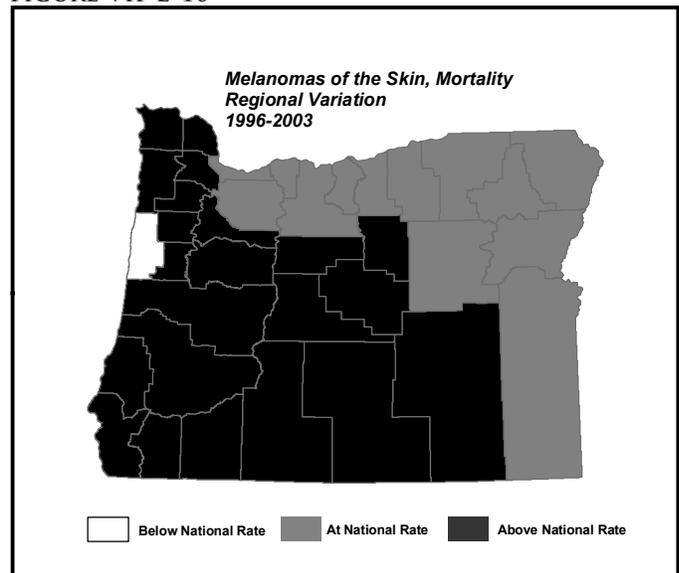


FIGURE VII-E-10



F. ORAL CANCERS

Using tobacco and alcohol increases one's risk of oral cancers dramatically, and the risk rises with the amount and length of use. Over 80% of people with oral cancers are heavy tobacco and/or alcohol users. Data from the 2003 Oregon Behavioral Risk Factor Surveillance System (BRFSS) show that in addition to the 20% of Oregonians who smoked in 2003, an estimated 3% of Oregon adults used smokeless (chewing) tobacco. Data from the 2003 Oregon Healthy Teens survey show that an estimated 3% of 8th graders and 6% of 11th graders used smokeless tobacco. In addition, from the 2003 Oregon BRFSS, 6% of adult males and 7% of adult females were heavy drinkers (men who drank more than two drinks a day or women who drank more than one drink a day). And from the 2003 Oregon Healthy Teens survey, an estimated 25% of 8th graders and 43% of 11th graders drank at least one drink of alcohol in the 30 days preceding the survey.

About 15% of newly diagnosed patients with oral cancers will have another cancer in nearby areas such as the larynx, esophagus, or lung at the time of diagnosis. Another 10% to 40% will develop cancer of one of these organs or a second cancer of the oral cavity later. For this reason, it is very important for patients with oral cancers to have follow-up examinations throughout their lives and to avoid risk factors, like tobacco and alcohol use, which increase the risk for these secondary cancers.

Early detection and prevention are possible through an oral exam to look for precancerous plaques or early disease. Regular dental and medical check-ups for evaluation of symptoms and precancerous lesions may be useful in detecting oral cancers early. Due to the potential for primary prevention through tobacco control efforts, the reduction of oral cancers incidence and mortality has been identified as a priority for the Oregon Partnership for Cancer Control.

OVER 80% OF PEOPLE
WITH ORAL CANCERS
ARE CONSIDERED HEAVY
TOBACCO AND/OR
ALCOHOL USERS.

ORAL CANCERS FAST FACTS OVERVIEW

Oral cancers are the 7th leading cancer site for Oregon men. A brief overview of Oregon's oral cancer data shows the following: (See Figure VII-F-1.)

1. In 2003, 427 new cases of oral cancers were diagnosed in Oregonians; 414 were invasive. In 2003, 93 Oregonians died due to oral cancers.
2. There has been a 1% annual decrease in oral cancer incidence rates over the past five years in Oregon. Mortality has also declined over this period by 3%, but this reduction is artificially amplified by a change in mortality coding in 1999. Please review the *Technical Section* for discussion of ICD-9 versus ICD-10 coding for oral cancers.
3. Oregon's age-adjusted oral cancer incidence and mortality rates are similar to national rates. As seen nationally, age-adjusted incidence and mortality rates were higher for men than women in Oregon.
4. Of all 50 states, Oregon tied for 17th for oral cancer mortality rates in 2002.
5. About 40%, of oral cancers were diagnosed at an early stage (*in situ* or localized).
6. During 1999-2003, Oregon's M/I ratio for oral cancers was 0.25, suggesting a good prognosis for this disease. The M/I ratio was worse for women than men. Oral cancers leads to 400 YPLL each year in Oregon.

ORAL CANCERS FAST FACTS

FIGURE VII-F-1

ORAL CANCERS FAST FACTS				
YEAR 2003				
Oregon	All Sexes¹	Male	Female	
CANCER INCIDENCE				
All Cases Total	427	297	129	
In Situ	13	9	4	
Localized	153	97	56	
Regional	213	159	54	
Distant	32	22	10	
Unstaged	16	10	5	
Incidence Rates				
Oregon Crude	11.7	16.3	7.0	
Oregon Age-adjusted	10.9	16.2	6.2	
Oregon Current Annual Trend (1999-2003)	-1.0	-1.7	-0.2	
US SEER Age-adjusted ²	0.3	0.4	0.2	
US SEER Annual Trend (1999-2003) ²	-3.7	-4.9	-0.5	
CANCER MORTALITY				
Total Deaths	93	54	39	
Mortality Rates				
Oregon Crude	2.6	3.1	2.2	
Oregon Age-adjusted	2.5	3.2	1.8	
Oregon Current Annual Trend (1999-2003)	-3.1	-7.3	+4.5	
US Age-adjusted ³	2.6	4.1	1.5	
US Annual Trend (1999-2003) ³	-0.8	-0.4	*-1.9	
PROGNOSIS AND BURDEN⁴				
Prognosis: M/I Ratio	0.25	0.23	0.29	
Burden: YPLL before age 65	400	317	83	

Incidence and death rates are per 100,000 and age-adjusted to the 2000 US Standard Population (19 age group)

* Indicates a statistically significant trend

¹ All Sexes counts may exceed male/female combined due to additional sex coding

² SEER 13 Registry Data, SEER Stat 6.2.3 (See *Technical Section, National Data*, for a description of SEER 13)

³ National Center for Health Statistics (NCHS) US Mortality Public Use Data

⁴ Calculations based on combined years 1999-2003

M/I = Mortality-to-Incidence Ratio

YPLL = Years of Potential Life Lost

STAGE AT DIAGNOSIS

Identifying and treating precancerous conditions could nearly eliminate this group of cancers. Periodic examination of the mouth, by a health professional or by self-exam, is an important prevention strategy to detect early precancerous lesions. The Healthy People 2010 target is for 85% of dentists to counsel their patients about smoking cessation. In 1997, the only year for which data are available, 59% of dentists nationally were counseling their patients to stop using tobacco.

Despite the lack of a specific population-based screening test, 40% of the oral cancers cases were diagnosed at an early stage. (See Figure VII-F-2.)

As seen with lung cancer, women have a greater percentage of early stage oral cancers at diagnosis than men. (See Figure VII-F-3.)

Oregonians aged 40-59 have lower rates of oral cancer diagnosed at an early stage compared to those who are older and younger. (See Figure VII-F-4.)

FIGURE VII-F-2

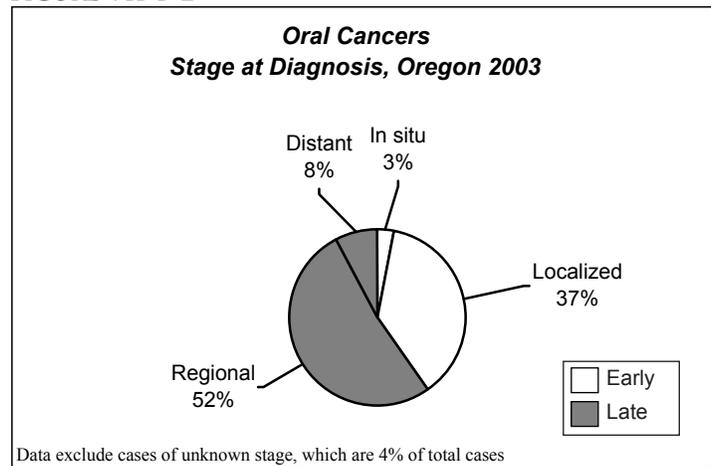


FIGURE VII-F-3

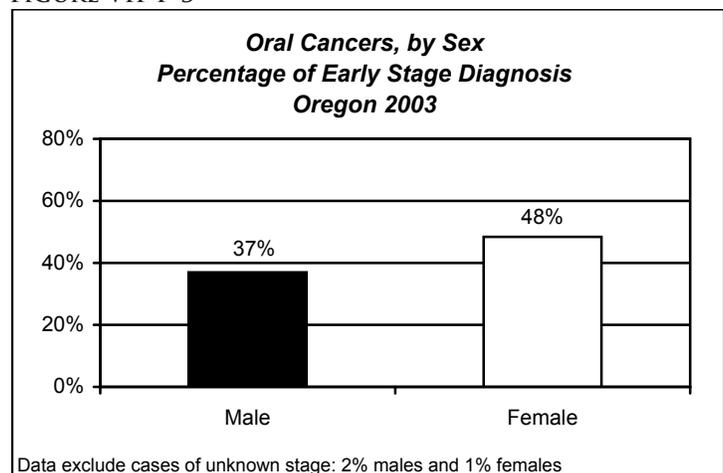
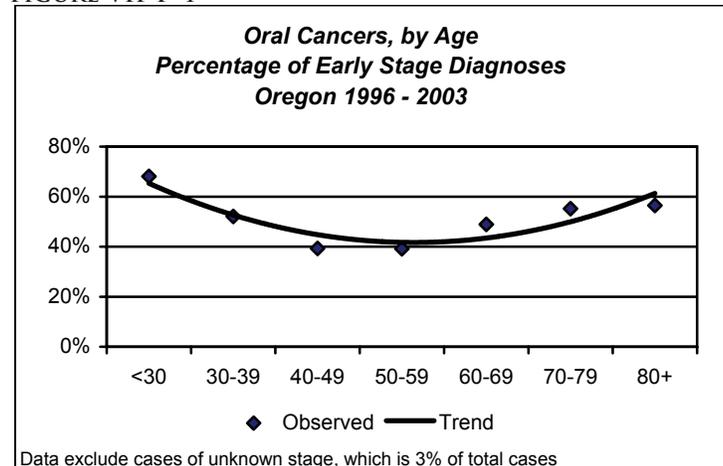
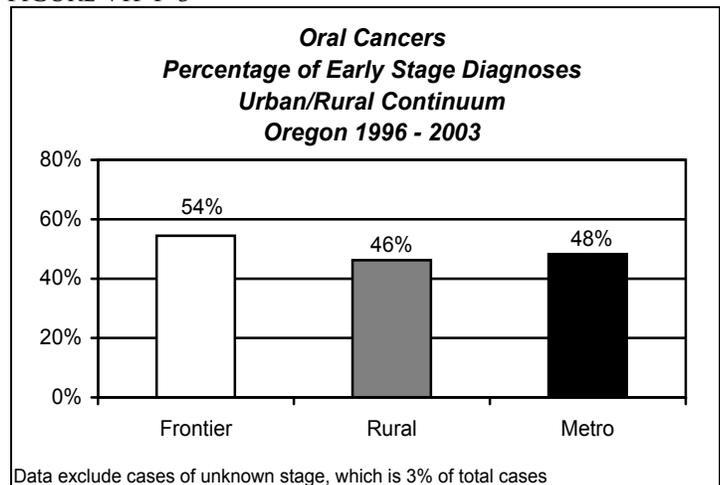


FIGURE VII-F-4



Like lung cancer, the percentage of oral cancers diagnosed at an early stage is similar for Rural and Urban counties. However, Frontier counties (<6 persons per square mile) have a larger percentage of cases diagnosed at an early stage. (See Figure VII-F-5.)

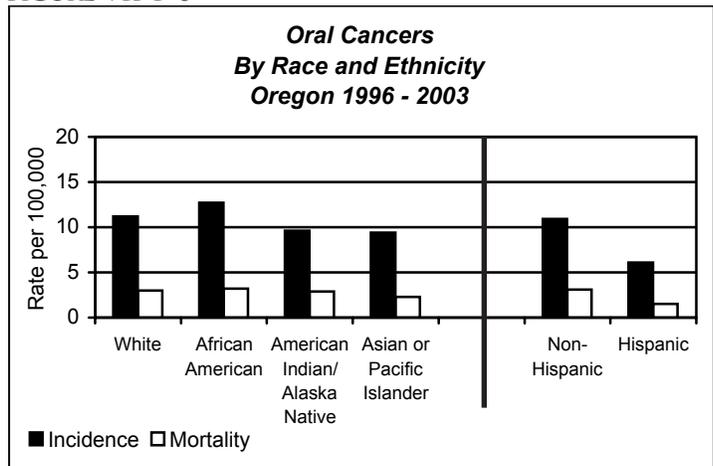
FIGURE VII-F-5



RACE AND ETHNICITY

Although race and ethnicity data need to be interpreted cautiously due to reporting issues (see the *Technical Section* for additional details), oral cancer incidence varies by race and ethnicity. (See Figure VII-F-6.) African Americans (AA) have the highest oral cancer incidence rates and Hispanics have the lowest. There are too few deaths due to oral cancers to evaluate stage at diagnosis by race or ethnicity.

FIGURE VII-F-6



Among racial groups in Oregon, the ranking of oral cancer incidence does not correlate with reported rates of smokeless tobacco use. (See Figure VII-F-7.) As with smoking rates, AI/AN report the highest smokeless tobacco usage while AA have the lowest rate of smokeless tobacco use but the highest oral cancer incidence rate.

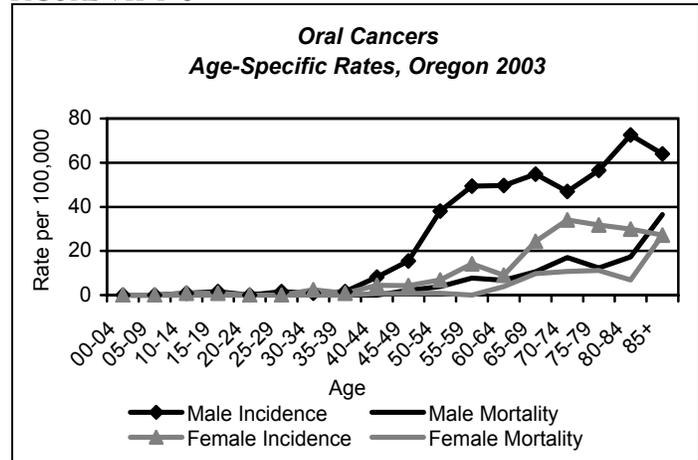
FIGURE VII-F-7

Race and Ethnicity	Percent
American Indian/Alaskan Native	16%
White (Non-Hispanic)	8%
Asian/Pacific Islander	2%
African American	1%
Hispanic	2%

AGE-SPECIFIC RATES

Oral cancer incidence and mortality rates increase with age. Incidence and mortality rates are greater for men than women in all age groups. (See Figure VII-F-8.)

FIGURE VII-F-8

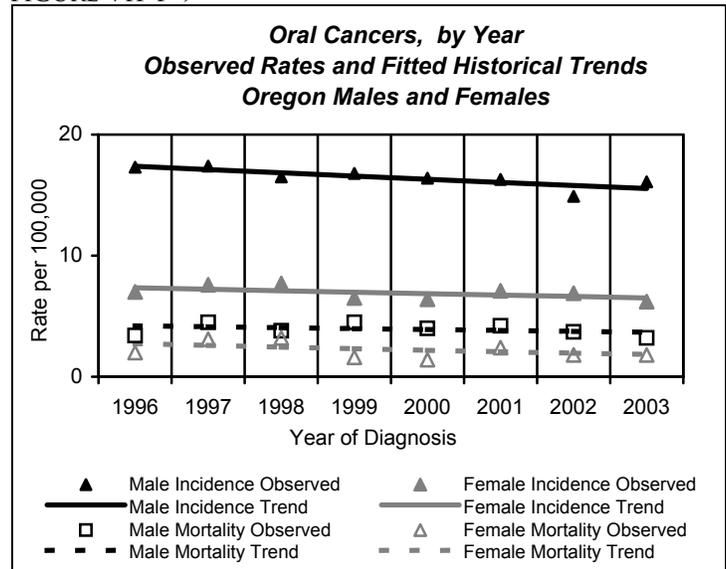


HISTORICAL TRENDS (1996-2003)

Oral cancer incidence rates have been declining, 2% a year for men and 0.2% a year for women. (See Figure VII-F-9.) Oral cancer mortality also decreased, by 1% a year for men and 5% a year for women.

It should be noted that oral cancer mortality is difficult to compare over this time period due to changes in coding in 1999 that significantly affect the mortality numbers for oral cancers. Please see the *Technical Section* for information about the change to ICD-10 mortality coding.

FIGURE VII-F-9



REGIONAL VARIATION (COMBINED EIGHT-YEAR RATES: 1996-2003)

Eastern Oregon, Clatsop County, and much of central Oregon have oral cancer incidence rates that are lower than the national rate. The rest of the state has oral cancer incidence rates that are higher than seen nationally. (See Figure VII-F-10.)

Oral cancer mortality has a less defined geographical pattern than incidence. (See Figure VII-F-11.) This may be due to regional differences in diagnosing and treating oral cancers. Mortality rates are higher than the national rates in the lower Columbia River Gorge, southern coast, and Clackamas, Jefferson, and Wheeler Counties. Eastern Oregon, much of the Willamette Valley, and Crook and Deschutes Counties have oral cancer mortality rates that are lower than national rates.

FIGURE VII-F-10

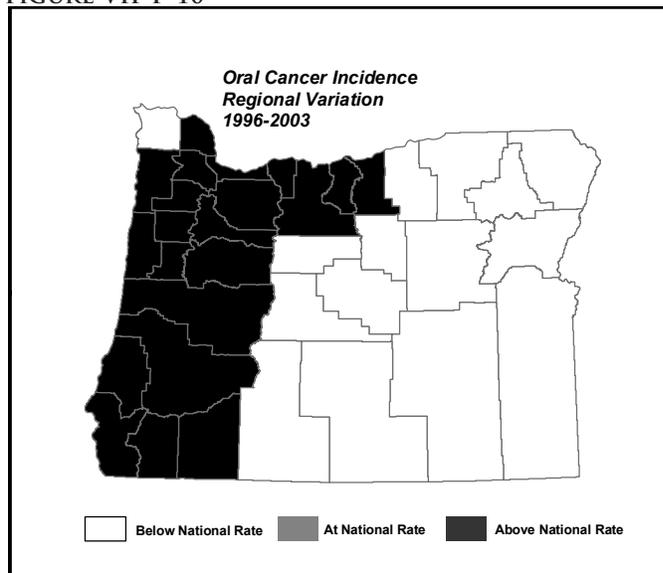
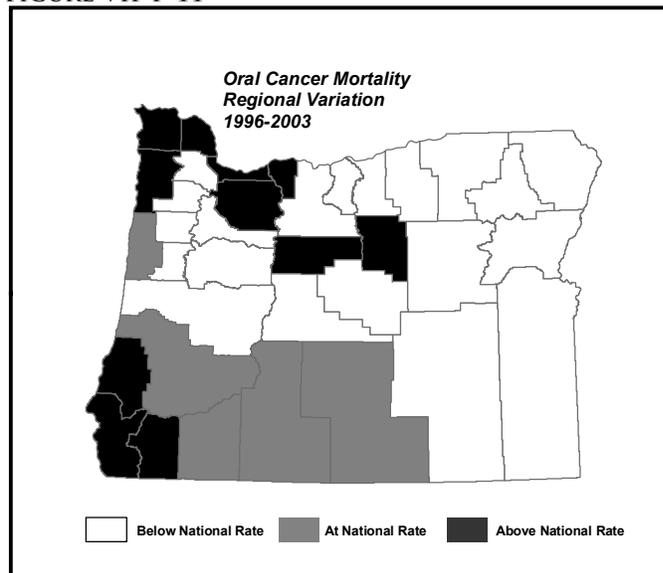


FIGURE VII-F-11



G. PROSTATE CANCERS

Age is the most important risk factor for prostate cancer with 65% of the diagnoses in men age 65 and older. While screening tests are available, routine screening for prostate cancer is controversial. There are some highly aggressive prostate cancers with high mortality, which warrant treatment. However, many prostate cancers occur in older men, grow slowly, and do not generally result in death even when left untreated. Current screening tests cannot reliably differentiate between slow growing and aggressive forms of prostate cancer. Unfortunately, the potential harms of treatment, including unnecessary surgery or surgical complications such as incontinence and impotence, can significantly affect a man's quality of life. Currently, there is no consensus public health recommendation regarding prostate cancer screening except to encourage men to discuss options with their health care providers.

Prostate cancer is the most common cancer diagnosed in Oregon men, and the 2nd leading cause of cancer-related death among Oregon men. Oregon's prostate cancer mortality rate of 27.1 for 2003 was 6% below the Healthy People 2010 target of 28.8 deaths per 100,000 men. Despite a lack of consensus on screening and treatment issues, the Oregon Partnership for Cancer Control has identified increasing informed decisionmaking about prostate cancer screening and treatment as a priority.

AFRICAN AMERICAN
MEN HAVE MORE THAN
TWICE THE MORTALITY
RATE FOR PROSTATE
CANCER THAN ALL
OTHER OREGON MEN.

PROSTATE CANCERS FAST FACTS OVERVIEW

A brief overview of Oregon's prostate cancer data shows the following: (See Figure VII-G-1.)

1. In 2003, 2,384 Oregon men were diagnosed with prostate cancer; all were invasive. Prostate cancer was the cause of death for 415 Oregon men.
2. Prostate cancer incidence in Oregon has decreased 6% annually in the past five years, while nationally there has been a 2% yearly increase. Prostate cancer mortality rates have declined 4% per year during this period both in Oregon and nationally.
3. Oregon's age-adjusted 2003 incidence rate of 141.2 was 11% lower than the national rate of 160.4; the Oregon 2003 mortality rate was 2% higher than the national rate.
4. Of the 44 states with central registries meeting national data quality standards in 2002, Oregon ranked 32nd for prostate cancer incidence. Of the 50 states, Oregon tied for 20th in prostate cancer mortality.
5. The prostate is the leading cancer incidence site for males regardless of race or ethnicity. Prostate cancers are the 2nd leading cancer mortality site for African-Americans and Whites as well as Hispanics. Prostate cancers rank 4th for cancer mortality among American Indian/Alaskan Natives, 5th among Asian/Pacific Islanders, and 2nd among Non-Hispanics.
6. The majority, 80%, of prostate cancers were diagnosed at an early (localized) stage in 2003.
7. During 1999-2003, Oregon's M/I ratio for prostate cancer was 0.16, suggesting a relatively good prognosis for this disease. Prostate cancers are responsible for 191 YPLL each year among Oregon men.

 PROSTATE CANCERS FAST FACTS

FIGURE VII-G-1

PROSTATE CANCERS FAST FACTS

YEAR 2003

Oregon**Male****CANCER INCIDENCE**

All Cases Total	2,384
<i>In Situ</i>	0
Localized	1,746
Regional	357
Distant	92
Unstaged	189
Incidence Rates	
Oregon Crude	134.8
Oregon Age-adjusted	141.2
Oregon Current Annual Trend (1999-2003)	*-6.0
US SEER Age-adjusted ¹	160.4
US SEER Annual Trend (1999-2003) ¹	2.2

CANCER MORTALITY

Total Deaths	415
Mortality Rates	
Oregon Crude	23.5
Oregon Age-adjusted	27.1
Oregon Current Annual Trend (1999-2003)	*-3.9
US Age-adjusted ²	26.6
US Annual Trend (1999-2003) ²	*-4.1

PROGNOSIS AND BURDEN³

Prognosis: M/I Ratio	0.16
Burden: YPLL before age 65	191

Incidence and death rates are per 100,000 and age-adjusted to the 2000 US Standard Population (19 age group)

* Indicates a statistically significant trend

¹ SEER 13 Registry Data, SEER Stat 6.2.3 (See *Technical Section, National Data*, for a description of SEER 13)

² National Center for Health Statistics (NCHS) US Mortality Public Use Data

³ Calculations based on combined years 1999-2003

M/I = Mortality-to-Incidence Ratio

YPLL = Years of Potential Life Lost

STAGE AT DIAGNOSIS

The majority of prostate cancer diagnoses in 2003 were made at an early stage. (See Figure VII-G-2.)

The percentage of prostate cases diagnosed at an early stage increases with age until the 70-79 age group. (See Figure VII-G-3.) This decrease in early stage cases among older Oregonians may be due to decisions by these patients and their health care providers to be less aggressive with surgical intervention. Indeed, the percentage of unstaged cases increases with age. (See Figure VII-G-3.)

There is no distinct pattern of early stage diagnosis along the urban/ rural continuum (See Figure VII-G-4.)

ROUTINE SCREENING

Prostate cancers can be found early by evaluating the amount of PSA (prostate-specific antigen) in blood. Another screening tool is a physician digital rectal exam (DRE). There are no national screening recommendations for prostate cancer. Data from the 2002 Oregon BRFSS shows that 60% of Oregon men age 40 and over reported ever having a PSA test and 79% reported ever having a digital rectal exam.

FIGURE VII-G-2

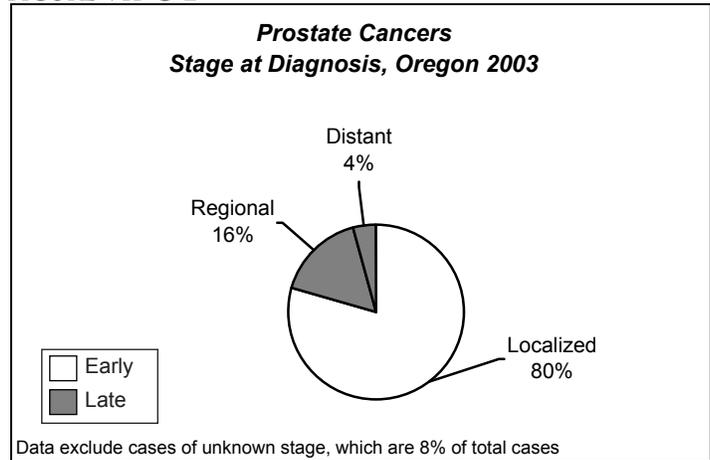


FIGURE VII-G-3

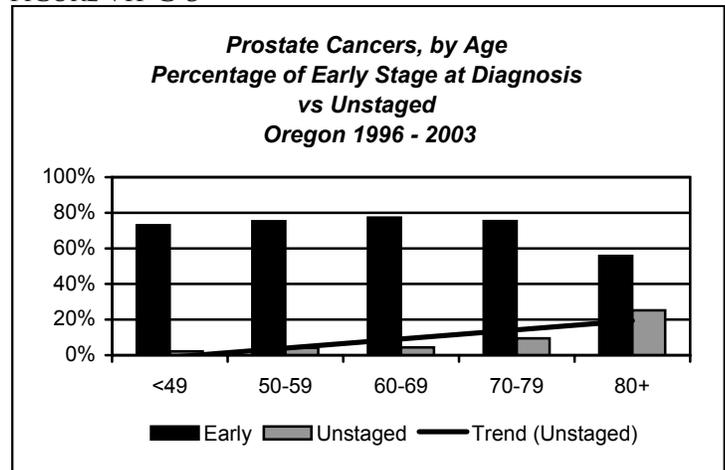
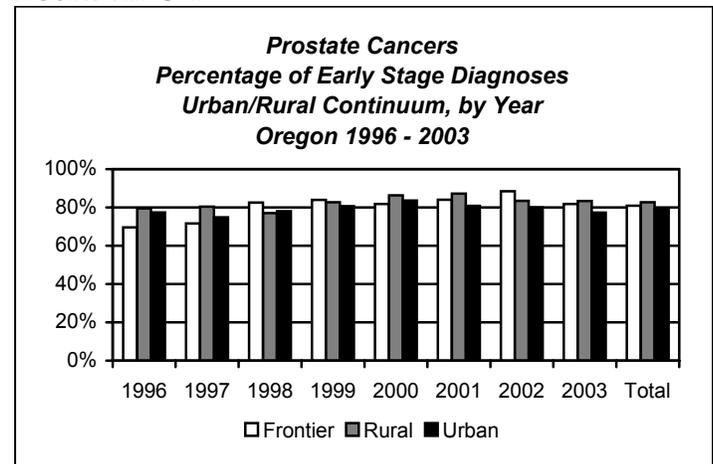


FIGURE VII-G-4



RACE AND ETHNICITY

Although race and ethnicity data need to be interpreted cautiously due to reporting issues (please see the *Technical Section* for additional details), prostate cancer rates vary by race and ethnicity. (See Figure VII-G-5.) Among the four race categories, African Americans (AA) have the highest rate of prostate cancer incidence, and Asian/Pacific Islanders (A/PI) have the lowest incidence rates in Oregon. Nationally, it is American Indian/Alaska Natives (AI/AN) who have the lowest prostate cancer rates. Oregon likely diverges from the national rates for AI/AN due to increased efforts to properly identify these persons in the Oregon Registry. As is seen nationally, Hispanics in Oregon have lower prostate cancer incidence and mortality rates than Non-Hispanics. Mortality due to prostate cancer follows the incidence patterns by race and ethnicity.

Among the four race categories, Whites have the highest percentage of prostate cancer cases diagnosed at an early stage followed closely by A/PI. (See Figure VII-G-6.)

FIGURE VII-G-5

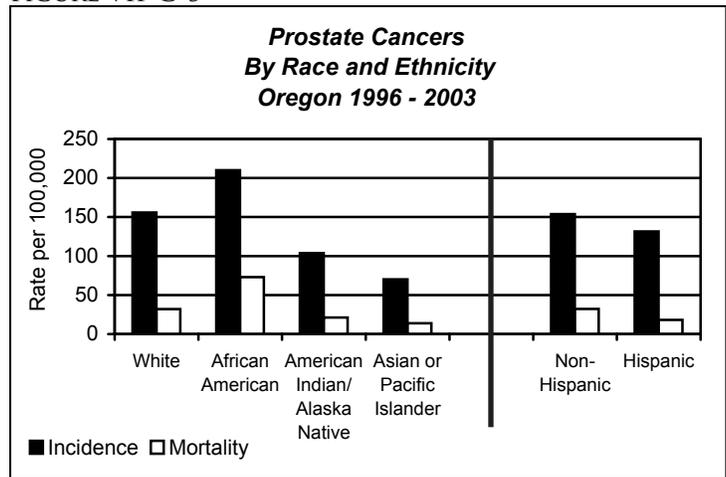


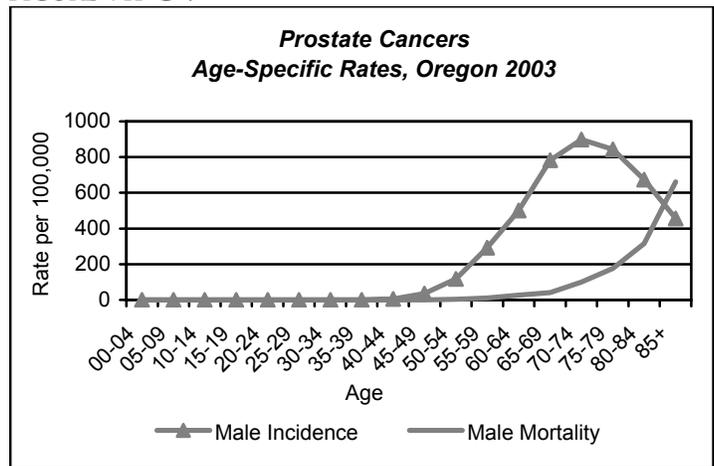
FIGURE VII-G-6

Prostate Cancers, Stage at Diagnosis By Race and Ethnicity Oregon 1996-2003	
Race and Ethnicity	Percent of Early Stage
African American	74%
White	80%
Asian or Pacific Islander	79%
American Indian/Alaska Native	75%
Non-Hispanic	80%
Hispanic	73%

AGE-SPECIFIC INCIDENCE AND MORTALITY

As with other types of cancer, the risk of developing prostate cancer increases with age. Figure VII-G-7 shows the age-specific incidence and mortality rates for prostate cancer. Oregon's age-specific incidence rates sharply increase at age 50 and peak in males aged 70-74. After age 75, the incidence begins to drop. Mortality rates increase sharply at age 70 and surpass incidence rates in the 85 and over age group.

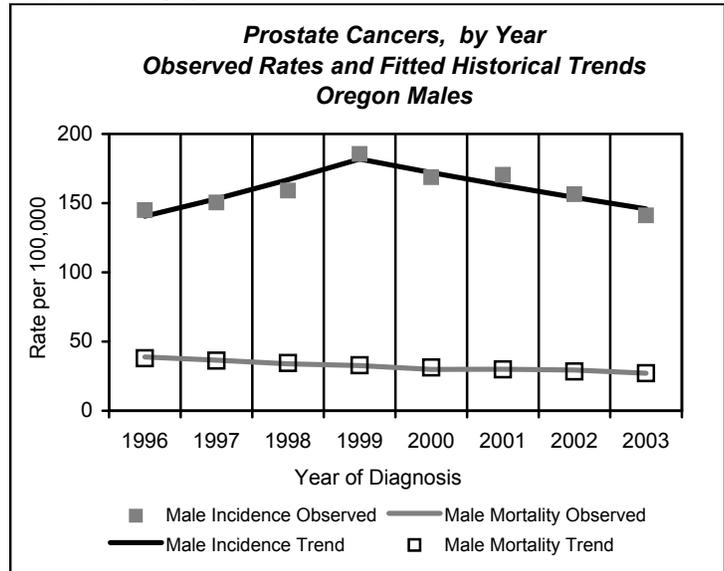
FIGURE VII-G-7



HISTORICAL TRENDS (1996-2003)

Prostate cancer incidence and mortality trends have been variable since 1996. Initially, prostate cancer incidence was increasing 9% a year from 1996-1999. From 1999-2003, the trend reversed and incidence began to decrease 6% a year. Mortality due to prostate cancer has been consistently decreasing over the same time period, but the rate of decrease has slowed in the last couple of years. Initially, mortality decreased 6% a year from 1996-2000 and then slowed to a 3% annual decrease from 2000-2003. (See Figure VII-G-8.)

FIGURE VII-G-8



REGIONAL VARIATION (COMBINED FIVE-YEAR RATES: 1999-2003)

The northeast corner of the state, Deschutes and Lincoln Counties have prostate cancer incidence rates that are higher than seen nationally. (See Figure VII-G-9.) The rest of the state, including the entire southern portion of the state, most of the coast and the Willamette Valley, have rates of prostate cancer incidence that are below the national rate.

Much of Oregon has rates of prostate cancer mortality that are higher than the nation. (See Figure VII-G-10.) Portions of the state with mortality rates which are higher than the nation include the northeast corner of the state, the southwestern area, and counties along the Columbia River from the Metro area to the coast.

FIGURE VII-G-9

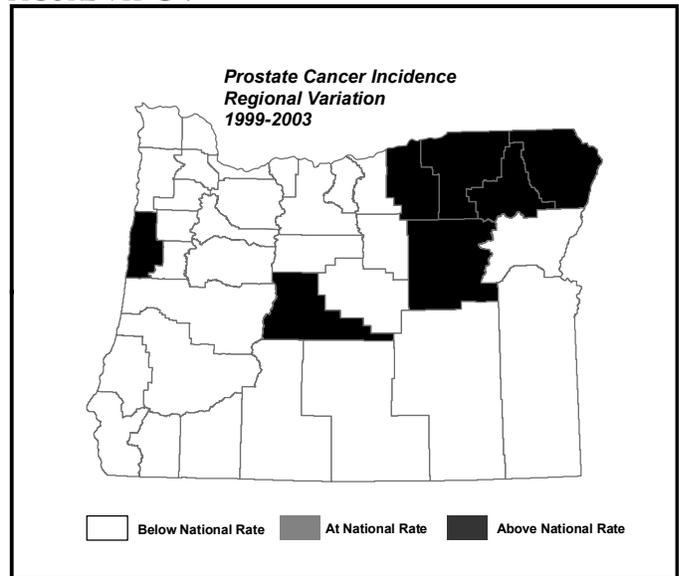
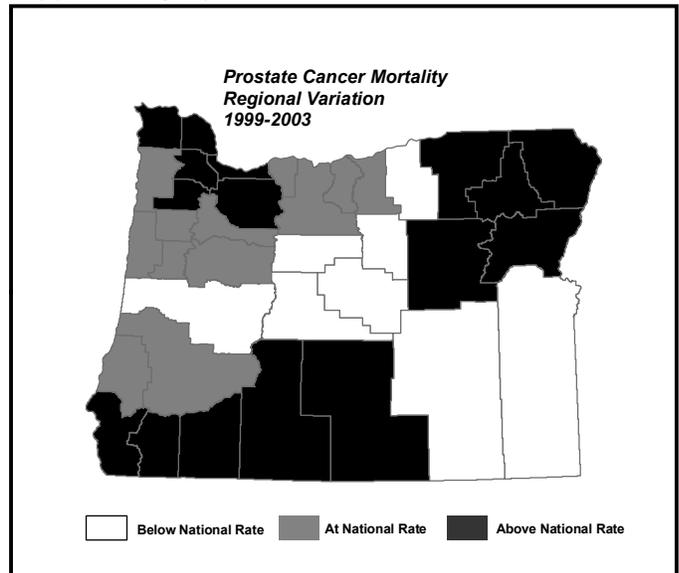


FIGURE VII-G-10



VIII. DATA USES

Providing data for cancer prevention and control is a fundamental purpose of the Oregon State Cancer Registry. Early Registry efforts were focused on planning and implementation. The initial objective was to establish a system through which the Registry could collect complete and accurate data on all reportable cancers diagnosed or treated in Oregon. The Registry is now in a position to support use of the cancer data for cancer prevention and control. The Registry produces annual reports containing general, descriptive epidemiologic data on cancer in Oregon and facilitates research efforts to better understand the natural history

of specific cancers and to improve cancer-related care. Cancer control programs within the Department of Human Services, Oregon Public Health Division, and independent researchers have used OSCaR's database.

In addition to funded research, OSCaR fulfills data requests on a regular basis from the media, legislators, and policy makers, individual physicians, collaborative partners (such as the American Cancer Society and Northwest Portland Area Indian Health Board), and concerned citizens. OSCaR responds to over 200 such public access data requests annually.

RESEARCH PROTOCOL

Research Protocol – The Registry has provided data to outside researchers on a variety of approved cancer projects. Before the release of any confidential data, the following criteria must be reviewed for compliance:

1. The proposed research will be used to determine the sources of cancer among the residents of Oregon or to reduce the burden of cancer in Oregon;
2. the data requested are necessary for the efficient conduct of the study;
3. adequate protections are in place to provide secure conditions to use and store the data;
4. assurances are given that the data will only be used for purposes of the study, and that confidential data will be destroyed at the conclusion of the study (*See Researcher Assurances Form in Appendix D.*);
5. the researcher has adequate resources to carry out the proposed research;
6. the proposal has been reviewed and approved by the Committee for the Protection of Human Subjects or is exempt from such review;
7. any additional safeguards needed to protect the data from inadvertent disclosure due to unique or special characteristics of the proposed research have been required of the researcher;
8. the research methodology has been reviewed for scientific excellence by a nationally recognized peer group, or if such a review has not taken place, that an ad hoc peer review subcommittee of the OSCaR Advisory Committee containing appropriately qualified scientists has performed a peer review of the research.

PATIENT NOTIFICATION

Patient Notification – OSCaR has a unique system of patient notification to inform patients that their information has been reported to OSCaR and to identify patients who are willing to participate in case study research. At the time of notification, patients receive a patient notification letter. (*See Appendix E.*) Oregon is the only state to notify patients of their inclusion in the cancer registry and the only state to give patients the opportunity to inform the Registry of their preference regarding participation in research projects. A form accompanies the letter asking if they are willing to participate in research projects. Those who decide “yes” will be contacted if a research project for which they

are eligible becomes available. Those who decide “no” will never be contacted. If the form is not returned, researchers will consult with the patient’s physician before contacting the patient.

This “pre-consent” identifies potential study participants for researchers. Consent is still required as is stipulated by each project’s Institutional Review Board (IRB) approval, and the patient is not required to participate in a study even if they are eligible. However, patients do not have an option to opt out of the Registry database. The entire database is available for approved academic research that does not require patient contact.

IX. TECHNICAL SECTION

To comprehend and interpret cancer data, it is important to understand the sources of data, collection methods, data quality, and the significance of reported measures.

The following section provides the essential background for understanding and interpreting the data contained in this report.

A. DATA SOURCES

Oregon Incidence Data – All cancer incidence data were obtained directly from the Oregon State Cancer Registry. A number of changes in cancer incidence reporting and collection were implemented in 2001, including transitions to Summary Stage 2000 and ICD-O-3. These changes create problems when comparing data across years. However, the updated reporting requirements and coding guidelines are intended to reflect current medical knowledge of the behavior, pathology, prognosis, and treatment of cancers, and should increase the applicability of registry data for surveillance and research.

Specifically, incidence for ovarian cancers, lymphomas, leukemias, and other hematopoietic diseases will be difficult to compare across years due to changes in ICD-O-3 definitions and reporting requirements implemented in 2001. In addition, comparing stage data for lung, ovarian, and colorectal cancers across years is problematic based on the new Summary Stage 2000 guidelines.

Changes in Stage Coding - Staging is the grouping of cases into broad categories based on extent of disease. Summary Stage is a coded format that has been used by cancer registries since 1977. It allows electronic analysis of cases with similar characteristics. Increasing stage number means more

widespread involvement or severity. New guidelines for staging cancer, called Summary Stage 2000, were put into effect for cancer cases diagnosed on or after January 1, 2001.

Overall, changes in the guidelines should result in increased accuracy and consistency in coding of stage. Instructions are highly detailed, site-specific, and include illustrations to assist coders. However, the new guidelines have differences in determining stage and some sites are coded differently. For instance, a lung cancer with a separate tumor nodule in a different lobe (same lung) was staged as localized using Summary Stage 1977, but is now coded distant/metastatic in Summary Stage 2000.

This means, for some sites, comparing stage data from 1996-2000 with data from 2001 to the present is difficult. In particular, the staging criteria for lung, ovarian, and colorectal cancers have changed with Summary Stage 2000. However, differences in coding stage reflect a new understanding of the natural history of cancer, and the new criteria should improve the usefulness of staging as an accurate predictor of prognosis and survival for cases staged under the new system. The new guidelines are detailed in *SEER Summary Staging Manual – 2000* available on the web at: <http://seer.cancer.gov/tools/ssm/>.

Changes in Reportable Cancers –The International Classification of Diseases for Oncology (ICD-O) has been the standard coding system for neoplasms for over 25 years. ICD-O includes a four-character code for primary site, four-digit numeric code for cell type, one-digit code for tumor behavior, and a one-digit code for tumor aggressiveness. An updated version of the ICD-O system, ICD-O-3, is used for cases diagnosed on or after January 1, 2001.

The changes in ICD-O-3 do not affect primary site codes but there are significant changes regarding cell type (histology). This affects leukemias and lymphomas particularly. A small number of cancers that were coded as borderline behavior are now coded as malignant, including refractory anemia, polycythemia vera, papillary meningioma, and a number of other hematopoietic diseases. (See *Appendix A*.) There are a number of previously reported borderline tumors of the ovary that are now considered benign. This means that counts of ovarian cancers, lymphomas, leukemias, and some hematopoietic diseases will change due to changes in reportability or definition. As with coding of stage, it is difficult to compare cases for those cancer sites diagnosed on or after January 1, 2001, with data from prior years. Nevertheless, like Summary Stage 2000, these amendments reflect advances in the understanding of pathology and behavior of cancers.

Other changes in ICD-O-3 include new codes, terms, synonyms, and guidelines intended to improve accuracy and consistency of coding. The ICD-O-3 manual is available from the World Health Organization's North American distributor, WHO Publications Center USA, 49 Sheridan Avenue, Albany, NY 12210.

Oregon Mortality Data – Cancer mortality data include all deaths among Oregon residents with malignant tumors as the primary

cause of death. These data exclude cases in which benign or *in situ* neoplasms or those of unknown behavior are listed as the cause of death, with the exception of newly reportable cases based on the 2001 adoption of ICD-O-3.

All of the cancer mortality data were obtained from the Center for Health Statistics (CHS) death certificate database. CHS is the state's depository for all vital records and is a major information source for vital statistics and health survey data about Oregonians. Mortality data from this report are age-adjusted and are, therefore, not comparable to the crude rates published by CHS. Moreover, invalid age or cause of death codes are excluded, so mortality counts presented in this report may differ from data presented in CHS publications.

Changes in Cause-of-Death Coding

There has been a methodological change that alters how mortality data are presented but does not represent a true variation in the underlying burden of cancer in Oregon. In 1999, vital record departments across the nation were required to switch from the ninth revision of the International Classification of Diseases (ICD) to the tenth revision for recording cause of death. The ICD is the classification system used to code and classify mortality data from death certificates. The ICD has been revised approximately every ten years since the first international conference in 1900. The intent of the revisions is to reflect changes in disease nomenclature and understanding of etiology. ICD-10 is far more detailed than ICD-9 with approximately 3,000 additional codes. ICD-10 also uses an alphanumeric system, whereas ICD-9 is numeric only. The ICD-10 system is closely compatible with the ICD-Oncology (ICD-O) system used for reporting cancer cases, based on site of origin, whereas the ICD-9 system was not entirely compatible.

Although the ICD-10 and ICD-O systems correspond more directly with each other, switching to the ICD-10 system creates issues affecting the interpretation of mortality data over time. For cancer deaths, the number of overall cancer deaths using the ICD-9 and the ICD-10 systems is essentially the same; however, causes of cancer death are moved among different sub-categories.

One notable change in cancer mortality coding involves lung cancer deaths. Lung cancer is classified as secondary to some other cancers in ICD-10. Therefore, some of the deaths classified as lung cancer in ICD-9 were moved to one of 15 other primary sites in ICD-10. The result is a lower number of cancer deaths defined as lung cancer. *This is an artifact due to a change in classification and not a true change in mortality.*

Another important change for cancer death coding involves cancers with multiple primary sites. Using the ICD-9 system, individuals who died with two primary cancer sites were classified based on the site first listed on the death certificate. Under the new ICD-10 system, the same individuals are coded into the miscellaneous site group. The result is a higher rate of cancer deaths determined as miscellaneous cancer site and lower rates of cancer in sites with common secondary cancers such as oral cancer. *This is an artifact due to a change in classification and not a true change in mortality rates.*

An additional change in cancer coding in ICD-10 concerns mesothelioma. Mesothelioma is a rare form of cancer with cancerous cells found in the lining of the chest (pleura) or abdomen (peritoneum). This cancer was indistinguishable from respiratory and digestive system cancers in the ICD-9 system. The new ICD-10 coding creates a separate site code for these cases. The result

is a decrease in the number of respiratory system cases, which comprise the majority of malignant mesotheliomas.

Oregon Screening Data – Cancer screening data were obtained from the Behavioral Risk Factor Surveillance System (BRFSS) maintained by Oregon’s Center for Health Statistics. BRFSS is an ongoing random-digit-dialed telephone survey of adults concerning health-related behaviors. Information is used to guide health promotion and disease prevention programs. BRFSS includes questions on health behavior risk factors such as seat belt use, diet, weight control, tobacco and alcohol use, physical exercise, preventive health screening, and use of preventive and other health care services.

Oregon Population Data – Denominators used to calculate Oregon incidence and mortality rates are population estimates from the Population Estimates Branch of the US Census Bureau. Denominator data for 1996-1999 were based on the State and County Characteristics Population Estimates from the 1990 and 2000 US Census. Denominator data for 2000-2003 were based on the National Center for Health Statistics (NCHS) estimates of the July 1, 2000-July 1, 2003, United States resident population from the Bridged-race Vintage 2003 postcensal population estimate by year, county, single-year of age, bridged-race, Hispanic origin, and sex prepared under a collaborative arrangement with the US Census Bureau 2003. Available on the Internet at: <http://www.cdc.gov/nchs/about/major/dvs/popbridge/popbridge.htm>.

Prior to the US 2000 Census, race was reported as only one category, whereas in 2000 respondents were allowed to report one or more races. Registry data, or numerator data, are also single race categories. It is essential to have comparable numerator

data (cancer counts) and denominator data (population counts) to calculate rates. Therefore, population data for years 2000 forward are 2000 US Census data bridged from a multiple-race count with 31 race categories to a single-race count with four race categories. Allocation probabilities developed by the NCHS were applied to the Census Bureau's April 1, 2000, Modified Race Data Summary File population counts to assign multiple-race responses to single-race categories. See the NCHS website <http://www.cdc.gov/nchs/about/major/dvs/popbridge/popbridge.htm> for specific information about the bridging methodology.

National Data – National incidence data were calculated from the Surveillance, Epidemiology, and End Results (SEER) Program (www.seer.cancer.gov) SEER*Stat Database: Incidence-SEER 13 Registries (Atlanta, Connecticut, Detroit, Hawaii, Iowa, Los Angeles, New Mexico, San Francisco-Oakland, San Jose-Monterey, Seattle-Puget Sound, Utah, rural Georgia, plus the Alaska Native Tumor Registry) Public-Use Data (1992-2003), National Cancer Institute (NCI), DCCPS, Surveillance Research Program

(SRP), Cancer Statistics Branch (CSB), released April 2006, based on the Nov 2005 submission. SEER data were used to calculate a five-year aggregate rate for 1999-2003.

National mortality data were calculated using the National Center for Health Statistics (NCHS) (www.cdc.gov/nchs), US Mortality Public Use Data set included in the SEER (www.seer.cancer.gov) SEER*Stat Database: Mortality - All COD, Public-Use With State, Total U.S. (1990-2003), NCI, DCCPS, SRP, CSB, released April 2006.

National incidence rankings were obtained from the US Cancer Statistics Working Group. *United States Cancer Statistics: 1999-2002 Incidence and Mortality Web-based Report Version*. Atlanta (GA): Department of Health and Human Services, CDC, and NCI; 2005, available at: www.cdc.gov/cancer/npcr/uscs.

National rates used in the Public-Use Database and CDC Wonder were calculated using national Census 2000 population data for denominators.

B. DATA QUALITY

Data Review – When OSCaR receives reports, they are closely reviewed and edited for quality control. The anatomical site of origin of the cancer was known and reported for 98% of cancers reported in 2003. Stage of progression of the cancer at the time of diagnosis was determined for 92% of cancers reported in 2003.

The accuracy and usability of OSCaR data has increased through efforts on several

different levels. Data review protocols to review Hispanic ethnicity for American Indians and Filipinos have been instituted to increase accuracy of ethnicity data. Increased use of Registry data in linkage projects through academic research as well as general registry operations like death clearance (see page 98) helps ensure that Registry data are reviewed and corrected on many levels in addition to the standard internal data review protocols.

One notable effort is in race coding for American Indians/Alaskan Natives (AI/AN). Due to a cooperative effort among state registries, the Northwest Portland Area Indian Health Board (NPAIHB), the Indian Health Service (IHS), and the Centers for Disease Control and Prevention (CDC), OSCaR links annually with local tribal clinic registry data and national IHS patient data to determine if AI/AN are miscoded as white or some other race. One-third of the AI/AN cases currently in the OSCaR database were identified through data linkages and have been corrected due to this effort.

In addition to internal Registry operations, OSCaR conducts audits of reporting hospitals and facilities across the state to assess quality and completeness of data maintained in the central registry. Initially, hospitals to be audited were selected based on the identification of reporting problems (i.e., a high number

of missed cases). However, because overall reporting has improved from early years, the Registry now performs random facility audits every quarter. Hospitals are divided into groups based on the total number of hospital patients. The sampling method used ensures that all sizes of facilities are selected each time for auditing. OSCaR is beginning to audit other reporting facilities such as freestanding clinics and cancer centers.

External Data Review – Federal funding requires that OSCaR is audited by an outside agency every five years to assess the quality and completeness of registry data. In July 2003, Macro International Inc. conducted an audit of OSCaR data. The results of the audit estimated OSCaR's overall case completeness rate as 98.9%, and the overall data accuracy rate for 13 essential data elements was 96.0%. OSCaR was commended for exceeding national standards for both outcomes.

C. CANCER REPORTING

The North American Association of Central Cancer Registries (NAACCR) annually reviews cancer registries for their ability to produce complete, accurate, and timely data. The NAACCR certification program recognizes registries that meet the highest standards with a Gold or Silver Certification. OSCaR data for diagnosis year 2003 received Gold Certification. OSCaR has received certification for every year of complete data. Additional information about NAACCR certification is available on the web: http://www.naacr.org/index.asp?Col_SectionKey=12&Col_ContentID=54.

Reportable Cancers – Not all cancers diagnosed in Oregon are reportable to the Oregon

State Cancer Registry (OSCaR). Reportable cancers include all malignant neoplasms that are *in situ* or invasive (ICD-O behavior codes 2 and 3) with the following exceptions:

- Basal and squamous cell carcinoma of the skin (except of genitalia)
- Carcinoma *in situ* of the cervix

Although incidence is high for these cancers, they have an extremely high treatment success rate. In addition, *in situ* cervical cancer is a diagnosis that is inconsistently used. Carcinoma *in situ* of the cervix overlaps with some diagnoses that indicate precancerous conditions.

Reporting Source – By law, outside of the above exceptions, all cancers diagnosed or treated in Oregon must be reported to OSCaR by the patient’s physician. However, most hospitals retain cancer registrars that are trained to collect and report cancer cases in accordance with national standards. Most of the cases included in this report were reported from hospitals by cancer registrars. Some case reports originated from doctors’ offices and a few from death certificates. Since cancer reporting started in 1996, 88% of new cancer diagnoses have come from hospitals, 11% from physician offices, and 1% were identified from review of death certificates. The remaining cases were identified by review of pathology reports from laboratories or by autopsy. Many of the physician office cases were initially identified through active follow-up from laboratory reports or death certificates, and the physician was queried for additional information.

Death Clearance – Death clearance is a process used to identify cases diagnosed by a physician but not reported to the Registry, as well as cases diagnosed through autopsy. Death certificates are compared, or cleared, with Registry files. Deaths due to cancer that are not found in the Registry are investigated further by contacting the certifying physician listed on the certificate. Cases with no physician response and subsequent report are classified as death certificate only (DCO) cases. Cases for which a response and full report are received are classified as a physician office report. Deaths due to cancer diagnosed prior to the Registry’s first reporting year, 1996, are not included in the Registry.

Full death clearance procedures were not necessary during the first few years of Registry operation since most of the cancer deaths were due to cancers diagnosed

prior to 1996. Initially, death clearance was performed only for selected cancer sites that have known short-term survival.

Initial death clearance efforts focused on deaths due to cancers of the esophagus, liver, lung, pancreas, stomach, multiple myeloma, and cancers with unknown primaries for years 1996-1998. For the year 1998, lung cancer deaths were aggressively reviewed in this process. For the year 1999, death certificate review procedures were expanded to include all cancer sites. Consequently, there is a higher percentage of cases reported from death certificates since 1999. Typically, cancer cases identified by death certificate are those with a poor prognosis, often with stage distant or not determinable due to the patient’s health.

Due to increased review, more DCO cases were identified from 1999 to present. These cases differ from other cases due to increased severity of disease and lack of information about the cases. DCO cases are staged unknown due to lack of information. This requires caution when comparing stage of diagnosis from year to year.

Changes in the death clearance process resulted in increased data quality and completeness for diagnosis year 2000 onward. Prior to 2000, Registry cases and the death certificate data were linked on Social Security Number in an external system. Any cancer deaths not reported in the Registry were followed back to the physician or hospital to see if they were missed cases. The death clearance process is now performed using an automated program within the main Registry system. The deterministic match criteria are extremely stringent and have resulted in the identification of thousands of discrepancies in demographic information

between death certificate data and the Cancer Registry. The discrepancies are reviewed and corrected.

This process improves completeness of race data reporting by supplying race information from the death certificate on cases in the Registry that were reported as *unknown* race. Gender data was also improved. Discrepancies between the death certificate and registry data for sex of male breast cases prompted further review of these cases. In 1999, 24 male breast cancer cases were reported. After review of each case, only 17 were actually male. Seven of the cases had been miscoded and were in fact female.

Primary Site Definitions – Cancer data presented in the current incidence and mortality sections of this report follow nationally accepted standards for groupings of site categories for analysis. Cancer groupings for analysis are classified using the National Cancer Institute’s SEER Program Recodes. (Please see Appendices F and G.) The majority of neoplasms are grouped by the organ in which they originate. Neoplasms of the lymphatic, hematopoietic, and reticuloendothelial systems, however, are grouped by their histologies (leukemias, lymphomas, etc.), and not by the anatomic site where they occurred. Melanoma of the skin is a combination of both anatomic site and histologic type.

For mortality years 1996-1998, the ICD-9 codes did not directly match ICD-O codes. Therefore, minor discrepancies exist for those years between Oregon’s Center for Health Statistics (CHS) counts and the mortality counts reported in this publication. Beginning in 1999, with the change to ICD-10 coding, mortality coding and counts match exactly for most sites. However, since 2001, the all-site mortality and miscellaneous cancer mortality

differ due to the inclusion of newly reportable cancers which are excluded from the CHS counts. Additionally, cases of unknown age or invalid ICD-10 code are excluded from the data in this report, which also results in occasional differences in counts from CHS.

Multiple Primaries – The majority of cancer diagnoses reported to OSCaR were the first primary cancer diagnosed for the patient. However, nearly 20% of the cancer diagnoses occur in individuals with a previous cancer, so the number of cancer cases and number of people with cancer are not the same. Rates are calculated using the number of cancer cases as the numerator and population as the denominator.

Case Ascertainment/Completeness – The Registry conducts random case-finding audits to monitor case-reporting completeness from hospitals, and contacts physician offices that have a reduction in case reporting. Identifying missed cases through review of pathology reports and death certificates is part of normal Registry procedure. Data sharing agreements among neighboring states help identify Oregon residents diagnosed elsewhere.

The 2003 data have a greater than expected number of cases based on national models.

The estimated percentage of case completeness is calculated in accordance with procedures outlined by the North American Association of Central Cancer Registries (NAACCR). However, using mathematical models based on national numbers to estimate reporting completeness for individual states has inherent limitations and is the subject of national debate.

D. EPIDEMIOLOGIC MEASURES

Cancer Rates – In analyzing Oregon’s cancer data, we looked at various measures commonly used in epidemiologic studies of cancer. One measure is a rate. Rates help compare the burden of disease across populations of various sizes.

Incidence rates provide information on the frequency with which cancers occur in the population. Cases of invasive cancer only are included in rate calculations except for cancer of the bladder, which includes *in situ* cases. The mortality rate describes the frequency of deaths due to cancer.

All rates in this report are per 100,000 population. Rates based on counts <11 are unstable and are not presented.

Crude Rates – Crude rates are used when a summary measurement is needed and there is no need to adjust for confounding factors, such as age. Since cancer risk is very dependent upon age, age-adjusted rates are more useful for comparison among regions, time periods, etc. Crude rates are not included in the tables in the annual report but are still reported for individual sites in the *Selected Sites* sections.

The denominators in Figure IX-1 can be used to calculate additional crude rates.

Figure IX-1

Oregon’s Population by Year			
Year	Total	Male	Female
1996	3,247,111	1,604,527	1,642,584
1997	3,304,469	1,634,309	1,670,160
1998	3,352,449	1,659,190	1,693,259
1999	3,393,941	1,681,715	1,712,226
2000	3,430,707	1,701,604	1,729,103
2001	3,472,629	1,723,589	1,749,040
2002	3,520,355	1,748,055	1,772,300
2003	3,559,596	1,768,478	1,791,118

Age-Adjusted Rates – Age-adjusted rates are calculated to allow comparisons between two different populations (i.e., Oregon and US) whose age distributions differ. Age-adjusted rates are calculated by direct method, using the age distribution of Year 2000 United States Standard Population. All age-adjusted rates are expressed as events per 100,000 individuals per year.

In the past, a number of different standard populations have been used. Most vital statistics data were age-adjusted using a standard population based on the 1940 United States population. Most cancer data were age-adjusted using a standard population based on the 1970 United States population. Age-adjusted rates calculated using different standard populations are not comparable. All age-adjusted rates presented in this report are calculated using the Year 2000 Standard to ensure comparability.

Year 2000 Standard has a higher percentage of individuals in middle and older age groups. Hence, more weight is applied to cancer cases or deaths of individuals in these age groups using the direct standardization method. These are the same age groups that have higher numbers of cancer. Using the Year 2000 Standard for age-adjusting results in cancer rates that are higher than rates using older population standards.

Childhood Cancer Classification – The classification system used in this report to record the occurrence of childhood cancer is the International Classification of Childhood Cancer (ICCC), which was developed by the World Health Organization’s International Agency for Research on Cancer (IARC). This system places greater emphasis on tumor morphology than does the International Classification of Diseases (ICD) classification system, which emphasizes tumor location.

Childhood cancers are defined as cancers diagnosed in individuals less than 15 years of age. The five-year age group stratification for childhood cancers is 0-4, 5-9, and 10-14. The following are included in the IARC classification system for lymphomas: Hodgkin lymphoma, non-Hodgkin lymphoma, Burkitts lymphoma, Histiocytosis X, unspecified lymphomas, and other reticuloendothelial neoplasms. Histologic confirmation is obtained on nearly every diagnoses of childhood cancer reported to OSCaR.

Geographic Comparisons

County Comparisons – This report compares incidence and mortality rates by county. These analyses may help target screening and/or educational efforts. Because some counties with small populations only have a few cases reported, rates for those counties are unstable and must be interpreted with caution.

Regional Comparisons – Regional maps depict “smoothed” or fitted county rates and should not be used to evaluate individual county rates. Data smoothing is a statistical technique intended to limit the influence of randomness in data. Through this process, information (cancer rates) are interpolated or “borrowed” from neighboring areas to stabilize results for less populated areas.

The statistical algorithm used for the regional maps is a weighted, median-based method intended for non-point, spatial data called “head-banging”. The observed rate for each county is compared to the median rates of neighboring counties. The county rates are weighted by population size to ensure that statistically stable rates are not modified based on rates from sparsely populated counties. Please see <http://srab.cancer.gov/headbang/> for additional information.

This process stabilizes the county cancer rates for counties with low population density to allow potential geographic patterns to emerge. However, the smoothed rates for individual counties are not appropriate for single county comparisons. To compare single county rates, please use the county rates presented in Tables 3 and 4.

Incidence Counts – All primary reportable malignancies diagnosed among Oregon residents are reported to OSCaR. Cases are categorized based on the International Classification of Diseases for Oncology (ICD-O) and are presented using the Surveillance, Epidemiology, and End Results (SEER) Program recodes. (See *Appendix F*.)

Cancer counts represent the number of primary cancers reported to OSCaR, not the number of persons with cancers. People may be diagnosed with more than one primary tumor (e.g. lung cancer and Hodgkin lymphoma), and, therefore, counted as more than one case. About 20% of the cases reported to OSCaR occur in a person who has already been diagnosed with another cancer.

The number of cancers is reported in two ways – *total* cancers and *invasive* cancers. The invasive cancer category excludes *in situ* cancers with the exception of urinary bladder cancer. The *Total* cancer category includes all cancers, regardless of stage at diagnosis, with the exception of cervical cancer since *in situ* cervical cancer is not reported to the Registry.

The *All Sexes* and *Total* categories used in this report for cancer incidence include cases defined as male, female, and other (i.e., hermaphrodite, transsexual) and may exceed the total of male and female alone.

Prognosis and Burden – Several methods are used to measure the prognosis and burden of cancer within a defined population. In this report we use two such measures: mortality-to-incidence ratio (M/I ratio) and years of potential life lost (YPLL).

The M/I ratio provides a measure of disease severity. The M/I ratio is the number of deaths among a population divided by the number of invasive cases (of that particular cancer) within the same population. In general, the higher the value, the poorer the prognosis for that cancer site. Occasionally, a M/I ratio will exceed 1.0 when there are more deaths than diagnoses within a particular time period.

The years of potential life lost (YPLL) index quantifies premature mortality from cancer occurring in younger age groups. YPLL can be interpreted as lost productive years (both economic and non-economic) that a person dying prematurely of cancer would have contributed to society had he or she survived. A person dying of cancer at age 35 would have 30 more YPLL than a person dying of cancer at age 65.

Race and Ethnicity – The data used in the *Race and Ethnicity* section of the overview do not include cases with race or ethnicity listed as “unknown”. The 2003 “unknown” race category was 2% of cases, and the 2003 “unknown” Hispanic origin category was also 2%. There are ongoing Registry efforts to improve the quality of race and ethnicity reporting from hospitals.

Software – All incidence and mortality counts were generated using SEER*Stat [Surveillance Research Program, National Cancer Institute SEER*Stat software (www.seer.cancer.gov/seerstat) Version 6.2.3, May 5, 2006]. Data were formatted for SEER*Stat using SEER Prep [Surveillance Research Program, National Cancer Institute SEER*Prep software Version 2.3.2.,

February 2005]. Historical trends were calculated using Joinpoint Regression Software [(www.srab.cancer.gov/joinpoint) Version 3.0, April 2005, National Cancer Institute]. Smoothed rates for regional maps were calculated using Headbang [Hansen Simonson and Surveillance Research Program, NCI Headbang software (<http://srab.cancer.gov/headbang>) Version 3.0].

Trends – All trends are calculated using age-adjusted rates and reported as an annual percent change (APC). The APC is calculated by fitting a weighted, least-squares regression line to the natural logarithm of the rates using year as a regressor variable.

Current Five-Year Trends – These trends are calculated using two-year averages of the age-adjusted rates as endpoints. The trends are used to compare general Oregon trends with national trends based on direction (increase or decrease) and slope (rapid or slow change). This trend analysis is intended to describe broad, temporal changes of cancer rates in Oregon.

Historical Trends – Historical trends are calculated using age-adjusted rates for all years of data (1996-2003, eight years, for this report). Because of limitations due to a small number of years of data, analysis was done assuming no joinpoints (constant annual percent change for all years) and then compared to results using one joinpoint to determine if any change in trends is statistically significant. The number of joinpoints considered statistically significant is determined using the permutation test. In subsequent years, the number of joinpoints analyzed will increase with increasing years of data available for analysis. The purpose of these trends is to describe temporal changes in Oregon cancer rates.

X. STATISTICAL TABLES

The following tables show cancer incidence and mortality data for Oregonians. The cancer incidence rates represent invasive cancers only; *in situ* cases are excluded with the exception of bladder cancers. The counts

will differ from the cancer incidence counts reported as *All Cases* totals in the *Selected Sites* section. All rates are age-adjusted to the year 2000 US (19 age group) standard and per 100,000 population.

A. STATE DATA TABLES OVERVIEW

The incidence and mortality tables are broken down by site, year, and sex. The *All Sexes* category includes cancer cases of males, females, transsexuals, and hermaphrodites; therefore, *All Sexes* may exceed the total of male and female alone.

“APC” is the trend—the average, current, five-year annual percent change. The current APC for trends may differ from the historical (eight-year) trends reported in the *Executive Summary* and *Selected Sites* sections. Any current trend with an asterisk (*) is statistically significant.

Rates based on small numbers of events for a given period of time or for a rare cancer must be viewed with caution. A small number of events results in considerable random variation in the rate estimates, thus limiting their usefulness. If the number of cancer events (new cases or deaths) is 10 or fewer, the calculated rate is considered unstable. In the tables, such a rate is not shown and is replaced by a caret (^). If the number of average cases per year is 10 or fewer, the trend is not shown and is replaced by a caret (^).

TABLE 1: CANCER INCIDENCE by Site, Sex, and Year (1999-2003)		All Sexes		Male		Female	
		Invasive Cancer Counts	Rate/ Current Trend	Invasive Cancer Counts	Rate/ Current Trend	Invasive Cancer Counts	Rate/ Current Trend
Primary Sites	Year						
ALL SITES	Annual Average	17,339	484.0	8,809	548.2	8,528	439.7
	5-Year APC (Trend)		*-2.4		*-3.0		*-2.0
	1999	17,518	506.7	8,953	582.0	8,563	455.1
	2000	17,251	491.1	8,734	557.1	8,516	445.6
	2001	17,591	492.9	8,968	560.2	8,621	446.8
	2002	17,364	475.8	8,777	534.3	8,585	435.7
	2003	16,973	455.8	8,613	511.1	8,357	416.7
BONES/JOINTS	Annual Average	34	1.0	19	1.1	15	0.8
	5-Year APC (Trend)		+4.5		+4.7		+4.9
	1999	32	0.9	17	1.0	15	0.8
	2000	29	0.8	18	1.0	11	0.6
	2001	33	0.9	15	0.9	18	1.0
	2002	40	1.1	25	1.5	15	0.8
	2003	36	1.0	18	1.1	18	0.9
BRAIN/CNS	Annual Average	254	7.2	145	8.6	109	5.9
	5-Year APC (Trend)		+1.8		-1.4		+6.2
	1999	225	6.6	137	8.4	88	4.9
	2000	266	7.6	154	9.3	112	6.0
	2001	249	7.1	141	8.5	108	5.8
	2002	258	7.1	150	8.7	108	5.6
	2003	273	7.5	143	8.1	130	6.9
Brain	Annual Average	242	6.8	138	8.2	103	5.5
	5-Year APC (Trend)		+1.8		-1.3		+6.1
	1999	218	6.4	133	8.1	85	4.8
	2000	246	7.0	142	8.6	104	5.6
	2001	240	6.8	136	8.2	104	5.6
	2002	243	6.7	145	8.4	98	5.0
	2003	261	7.1	136	7.7	125	6.7
BREAST	Annual Average	2,757	76.5	17	1.1	2,739	142.7
	5-Year APC (Trend)		*-4.0		-9.4		*-3.8
	1999	2,870	82.8	21	1.4	2,849	153.9
	2000	2,748	77.8	16	1.1	2,732	144.7
	2001	2,816	78.4	16	1.0	2,800	146.5
	2002	2,770	75.4	19	1.1	2,751	140.8
	2003	2,580	68.6	14	0.8	2,565	128.6
DIGESTIVE SYSTEM	Annual Average	2,996	83.0	1,578	99.0	1,419	70.2
	5-Year APC (Trend)		-1.7		-1.3		-2.1
	1999	2,993	86.0	1,512	99.4	1,481	75.0
	2000	3,045	86.1	1,630	104.8	1,415	70.9
	2001	2,912	81.0	1,573	99.3	1,339	66.5
	2002	2,967	80.5	1,509	92.2	1,458	71.2
	2003	3,065	81.8	1,664	99.2	1,400	67.5

Rates are per 100,000 and age-adjusted to the 2000 U.S. (19 age group) standard.

APC=Average Annual Percent Change

Counts for All Sexes may exceed male/female combined due to additional sex coding.

* Indicates a statistically significant trend.

^ Rate is not calculated due to instability of small numbers.

n/a = not applicable

TABLE 1: CANCER INCIDENCE by Site, Sex, and Year (1999-2003)		All Sexes		Male		Female	
Primary Sites	Year	Invasive Cancer Counts	Rate/ Current Trend	Invasive Cancer Counts	Rate/ Current Trend	Invasive Cancer Counts	Rate/ Current Trend
Colon/Rectum	Annual Average	1,799	49.8	899	56.8	900	44.3
	5-Year APC (Trend)		*-3.1		-3.0		-3.2
	1999	1,859	53.3	885	58.6	974	49.3
	2000	1,837	52.0	947	61.3	890	44.5
	2001	1,756	48.8	910	57.9	846	41.9
	2002	1,739	47.0	847	52.1	892	43.3
	2003	1,804	48.0	907	54.5	897	42.7
Esophagus	Annual Average	196	5.4	148	9.2	48	2.4
	5-Year APC (Trend)		+0.9		+2.6		-6.9
	1999	169	4.9	123	8.1	46	2.4
	2000	207	5.9	149	9.5	58	3.0
	2001	206	5.8	153	9.5	53	2.6
	2002	191	5.2	155	9.3	36	1.7
	2003	206	5.5	161	9.5	45	2.2
Gallbladder	Annual Average	36	1.0	8	0.5	28	1.3
	5-Year APC (Trend)		-0.4		^		-0.3
	1999	32	0.9	5	^	27	1.3
	2000	35	1.0	9	^	26	1.3
	2001	38	1.0	10	^	28	1.3
	2002	44	1.2	10	^	34	1.7
	2003	29	0.8	6	^	23	1.1
Liver/Intrahepatic Bile Duct	Annual Average	148	4.1	98	5.8	50	2.6
	5-Year APC (Trend)		+0.4		+0.2		+0.5
	1999	147	4.2	92	5.8	55	2.8
	2000	153	4.3	108	6.6	45	2.3
	2001	130	3.6	81	4.9	49	2.5
	2002	144	3.9	93	5.3	51	2.6
	2003	167	4.5	114	6.5	52	2.7
Liver	Annual Average	128	3.5	87	5.2	40	2.1
	5-Year APC (Trend)		+3.2		+3.2		+2.3
	1999	127	3.6	79	4.9	48	2.5
	2000	121	3.4	93	5.6	28	1.4
	2001	107	2.9	71	4.3	36	1.8
	2002	130	3.5	85	4.8	45	2.3
	2003	154	4.1	108	6.1	45	2.4
Pancreas	Annual Average	386	10.7	194	12.2	192	9.5
	5-Year APC (Trend)		-0.7		+0.5		-1.4
	1999	404	11.6	195	12.7	209	10.5
	2000	347	9.8	178	11.6	169	8.5
	2001	386	10.7	199	12.7	187	9.2
	2002	389	10.6	174	10.8	215	10.4
	2003	406	10.9	224	13.3	182	8.8

Rates are per 100,000 and age-adjusted to the 2000 U.S. (19 age group) standard.

APC=Average Annual Percent Change

Counts for All Sexes may exceed male/female combined due to additional sex coding.

* Indicates a statistically significant trend.

^ Rate is not calculated due to instability of small numbers.

n/a = not applicable

TABLE 1: CANCER INCIDENCE by Site, Sex, and Year (1999-2003)		All Sexes		Male		Female	
		Invasive Cancer Counts	Rate/ Current Trend	Invasive Cancer Counts	Rate/ Current Trend	Invasive Cancer Counts	Rate/ Current Trend
Primary Sites	Year						
Small intestine	Annual Average	56	1.6	31	1.9	25	1.3
	5-Year APC (Trend)		+1.7		+1.4		+3.1
	1999	50	1.4	28	1.8	22	1.1
	2000	55	1.6	28	1.8	27	1.4
	2001	54	1.5	33	2.0	21	1.1
	2002	61	1.7	32	1.9	29	1.5
	2003	58	1.5	32	1.9	26	1.3
Stomach	Annual Average	202	5.6	129	8.1	73	3.6
	5-Year APC (Trend)		-2.9		-4.5		+0.2
	1999	195	5.6	133	8.9	62	3.1
	2000	233	6.5	143	9.1	90	4.4
	2001	178	5.0	115	7.3	63	3.2
	2002	211	5.7	129	8.0	82	4.1
	2003	192	5.2	125	7.5	67	3.4
ENDOCRINE SYSTEM	Annual Average	265	7.5	74	4.3	191	10.7
	5-Year APC (Trend)		*+5.0		+4.1		*+5.5
	1999	235	6.8	73	4.4	162	9.2
	2000	250	7.2	67	4.0	183	10.4
	2001	260	7.4	66	3.9	194	10.9
	2002	270	7.5	72	4.1	198	11.0
	2003	310	8.5	91	5.2	219	11.8
Thyroid	Annual Average	247	7.0	64	3.7	183	10.2
	5-Year APC (Trend)		*+5.4		+3.9		*+6.1
	1999	213	6.2	64	3.8	149	8.5
	2000	232	6.7	56	3.3	176	10.0
	2001	250	7.1	62	3.6	188	10.6
	2002	253	7.0	60	3.4	193	10.7
	2003	287	7.8	79	4.5	208	11.2
EYE/ORBIT	Annual Average	36	1.0	18	1.1	18	0.9
	5-Year APC (Trend)		-0.9		-11.5		+10.9
	1999	34	1.0	24	1.5	10	0.5
	2000	37	1.1	16	1.0	21	1.1
	2001	34	1.0	20	1.2	14	0.7
	2002	46	1.3	23	1.3	23	1.2
	2003	29	0.8	9	^	20	1.0
GENITAL SYSTEM FEMALE	Annual Average	971	50.8	n/a	n/a	971	50.8
	5-Year APC (Trend)		-3.7		n/a		-3.7
	1999	985	53.2	n/a	n/a	985	53.2
	2000	1,036	55.2	n/a	n/a	1,036	55.2
	2001	953	50.2	n/a	n/a	953	50.2
	2002	927	47.4	n/a	n/a	927	47.4
	2003	952	47.7	n/a	n/a	952	47.7

Rates are per 100,000 and age-adjusted to the 2000 U.S. (19 age group) standard.

APC=Average Annual Percent Change

Counts for All Sexes may exceed male/female combined due to additional sex coding.

* Indicates a statistically significant trend.

^ Rate is not calculated due to instability of small numbers.

n/a = not applicable

TABLE 1: CANCER INCIDENCE by Site, Sex, and Year (1999-2003)		All Sexes		Male		Female	
Primary Sites	Year	Invasive Cancer Counts	Rate/ Current Trend	Invasive Cancer Counts	Rate/ Current Trend	Invasive Cancer Counts	Rate/ Current Trend
Cervix Uteri	Annual Average	138	7.7	n/a	n/a	138	7.7
	5-Year APC (Trend)		*-7.2		n/a		*-7.2
	1999	149	8.5	n/a	n/a	149	8.5
	2000	150	8.4	n/a	n/a	150	8.4
	2001	144	8.0	n/a	n/a	144	8.0
	2002	129	7.1	n/a	n/a	129	7.1
	2003	116	6.3	n/a	n/a	116	6.3
Ovary	Annual Average	294	15.2	n/a	n/a	294	15.2
<i>Interpret trend with caution for this site due to changes in ICD-O-3 coding affecting data from 2001 forward.</i>	-Year APC (Trend)		-5.4		n/a		-5.4
	1999	305	16.5	n/a	n/a	305	16.5
	2000	321	17.0	n/a	n/a	321	17.0
	2001	295	15.2	n/a	n/a	295	15.2
	2002	262	13.1	n/a	n/a	262	13.1
	2003	288	14.2	n/a	n/a	288	14.2
Uterus	Annual Average	462	24.0	n/a	n/a	462	24.0
	5-Year APC (Trend)		-1.6		n/a		-1.6
	1999	459	24.5	n/a	n/a	459	24.5
	2000	473	25.1	n/a	n/a	473	25.1
	2001	448	23.6	n/a	n/a	448	23.6
	2002	457	23.2	n/a	n/a	457	23.2
	2003	474	23.5	n/a	n/a	474	23.5
GENITAL SYSTEM MALE	Annual Average	2,772	172.0	2,772	172.0	n/a	n/a
	5-Year APC (Trend)		*-5.7		*-5.7		n/a
	1999	2,968	193.0	2,968	193.0	n/a	n/a
	2000	2,781	176.9	2,781	176.9	n/a	n/a
	2001	2,878	179.3	2,878	179.3	n/a	n/a
	2002	2,710	164.2	2,710	164.2	n/a	n/a
	2003	2,524	149.1	2,524	149.1	n/a	n/a
Prostate	Annual Average	2,633	164.0	2,633	164.0	n/a	n/a
	5-Year APC (Trend)		*-6.0		*-6.0		n/a
	1999	2,840	185.5	2,840	185.5	n/a	n/a
	2000	2,642	168.7	2,642	168.7	n/a	n/a
	2001	2,725	170.5	2,725	170.5	n/a	n/a
	2002	2,572	156.4	2,572	156.4	n/a	n/a
	2003	2,384	141.2	2,384	141.2	n/a	n/a
Testis	Annual Average	124	7.0	124	7.0	n/a	n/a
	5-Year APC (Trend)		-0.7		-0.7		n/a
	1999	119	6.9	119	6.9	n/a	n/a
	2000	120	6.9	120	6.9	n/a	n/a
	2001	135	7.6	135	7.6	n/a	n/a
	2002	127	7.2	127	7.2	n/a	n/a
	2003	117	6.5	117	6.5	n/a	n/a

Rates are per 100,000 and age-adjusted to the 2000 U.S. (19 age group) standard.

APC=Average Annual Percent Change

Counts for All Sexes may exceed male/female combined due to additional sex coding.

* Indicates a statistically significant trend.

^ Rate is not calculated due to instability of small numbers.

n/a = not applicable

TABLE 1: CANCER INCIDENCE by Site, Sex, and Year (1999-2003)		All Sexes		Male		Female	
		Invasive Cancer Counts	Rate/ Current Trend	Invasive Cancer Counts	Rate/ Current Trend	Invasive Cancer Counts	Rate/ Current Trend
Primary Sites	Year						
KAPOSI SARCOMA	Annual Average	9	0.3	8	0.5	1	^
	5-Year APC (Trend)		^		^		^
	1999	8	^	8	^	0	^
	2000	13	0.4	12	0.7	1	^
	2001	7	^	7	^	0	^
	2002	6	^	6	^	0	^
	2003	12	0.3	9	^	3	^
LEUKEMIAS	Annual Average	403	11.3	227	14.1	176	9.1
<i>Interpret trend with caution for this site due to changes in ICD-O-3 coding affecting data from 2001 forward.</i>	-Year APC (Trend)		-6.7		-6.4		-7.2
	1999	437	12.7	250	16.1	187	9.8
	2000	405	11.6	211	13.6	193	10.0
	2001	456	12.9	258	16.4	198	10.4
	2002	375	10.4	217	13.3	158	8.1
	2003	341	9.3	198	11.6	143	7.3
LYMPHOMAS	Annual Average	814	22.7	431	26.4	383	19.7
<i>Interpret trend with caution for this site due to changes in ICD-O-3 coding affecting data from 2001 forward.</i>	-Year APC (Trend)		+0.3		-0.8		+1.2
	1999	787	22.7	419	26.7	368	19.6
	2000	803	22.9	435	27.4	368	19.2
	2001	782	21.9	414	25.2	368	19.1
	2002	845	23.2	443	26.6	402	20.3
	2003	851	22.9	444	26.1	407	20.3
Hodgkin Lymphomas	Annual Average	93	2.7	51	3.0	42	2.4
<i>Interpret trend with caution for this site due to changes in ICD-O-3 coding affecting data from 2001 forward.</i>	-Year APC (Trend)		+1.7		+0.6		+2.7
	1999	96	2.8	51	3.0	45	2.6
	2000	89	2.6	54	3.2	35	1.9
	2001	74	2.1	40	2.3	34	2.0
	2002	108	3.1	56	3.2	52	2.9
	2003	99	2.8	54	3.1	45	2.5
Non-Hodgkin Lymphomas	Annual Average	720	20.0	380	23.4	340	17.3
<i>Interpret trend with caution for this site due to changes in ICD-O-3 coding affecting data from 2001 forward.</i>	-Year APC (Trend)		+0.1		-1.0		+1.0
	1999	691	19.9	368	23.7	323	17.0
	2000	714	20.4	381	24.2	333	17.3
	2001	708	19.7	374	22.9	334	17.1
	2002	737	20.1	387	23.4	350	17.4
	2003	752	20.2	390	23.0	362	17.9
MESOTHELIOMA	Annual Average	49	1.4	41	2.6	8	0.4
	5-Year APC (Trend)		-1.1		-1.1		^
	1999	54	1.6	46	3.0	8	^
	2000	47	1.3	38	2.5	9	^
	2001	37	1.1	29	1.9	8	^
	2002	56	1.5	51	3.2	5	^
	2003	52	1.4	40	2.5	12	0.5

Rates are per 100,000 and age-adjusted to the 2000 U.S. (19 age group) standard.

APC=Average Annual Percent Change

Counts for All Sexes may exceed male/female combined due to additional sex coding.

* Indicates a statistically significant trend.

^ Rate is not calculated due to instability of small numbers.

n/a = not applicable

TABLE 1: CANCER INCIDENCE by Site, Sex, and Year (1999-2003)		<i>All Sexes</i>		<i>Male</i>		<i>Female</i>	
		Invasive Cancer Counts	Rate/ Current Trend	Invasive Cancer Counts	Rate/ Current Trend	Invasive Cancer Counts	Rate/ Current Trend
Primary Sites	Year						
MYELOMA	Annual Average	177	4.9	102	6.4	75	3.8
	5-Year APC (Trend)		-4.4		-3.7		-6.5
	1999	178	5.1	98	6.5	80	4.2
	2000	171	4.9	98	6.4	73	3.8
	2001	204	5.6	120	7.4	84	4.2
	2002	192	5.3	109	6.7	83	4.1
	2003	140	3.8	85	5.1	55	2.7
ORAL CAVITY/PHARYNX	Annual Average	399	11.1	269	16.1	130	6.6
	5-Year APC (Trend)		-1.1		-1.8		-0.2
	1999	393	11.3	268	16.8	125	6.5
	2000	388	11.0	264	16.4	124	6.4
	2001	410	11.4	271	16.3	139	7.1
	2002	391	10.6	255	14.9	136	6.9
	2003	414	10.9	288	16.1	125	6.2
RESPIRATORY SYSTEM	Annual Average	2,635	74.0	1,411	89.0	1,224	62.8
	5-Year APC (Trend)		*-2.3		*-3.1		-1.6
	1999	2,689	78.0	1,459	95.9	1,230	65.2
	2000	2,601	74.3	1,409	91.1	1,192	62.1
	2001	2,674	75.4	1,392	87.7	1,282	66.1
	2002	2,611	72.2	1,417	87.7	1,194	60.5
	2003	2,598	70.5	1,377	83.3	1,221	60.8
Larynx	Annual Average	113	3.1	90	5.5	23	1.2
	5-Year APC (Trend)		-3.9		-3.1		-6.6
	1999	123	3.6	95	6.1	28	1.5
	2000	113	3.2	89	5.5	24	1.3
	2001	107	3.0	86	5.2	21	1.1
	2002	101	2.8	85	5.1	16	0.8
	2003	120	3.2	94	5.3	26	1.3
Lung/Bronchus	Annual Average	2,492	70.0	1,304	82.5	1,189	61.0
	5-Year APC (Trend)		*-2.2		*-3.2		-1.5
	1999	2,538	73.6	1,346	88.7	1,192	63.1
	2000	2,461	70.3	1,304	84.6	1,157	60.2
	2001	2,537	71.6	1,291	81.6	1,246	64.2
	2002	2,478	68.6	1,312	81.5	1,166	59.1
	2003	2,448	66.5	1,265	76.9	1,183	58.9
SKIN	Annual Average	858	24.0	468	28.3	389	21.1
<i>Excludes Basal and Squamous Carcinoma.</i>	-Year APC (Trend)		-0.3		-0.9		+0.6
	1999	796	23.0	450	28.1	346	19.2
	2000	856	24.5	450	28.0	406	22.5
	2001	901	25.3	500	30.2	401	21.9
	2002	890	24.4	481	28.5	409	21.9
	2003	846	22.8	461	26.7	385	20.2

Rates are per 100,000 and age-adjusted to the 2000 U.S. (19 age group) standard.

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n/a = not applicable

TABLE 1: CANCER INCIDENCE by Site, Sex, and Year (1999-2003)		All Sexes		Male		Female	
		Invasive Cancer Counts	Rate/ Current Trend	Invasive Cancer Counts	Rate/ Current Trend	Invasive Cancer Counts	Rate/ Current Trend
Primary Sites	Year						
Melanomas of Skin	Annual Average	809	22.6	441	26.5	368	20.1
	5-Year APC (Trend)		-0.5		-1.1		+0.4
	1999	753	21.8	425	26.4	328	18.3
	2000	807	23.1	424	26.3	383	21.3
	2001	856	24.1	471	28.5	385	21.1
	2002	842	23.1	459	27.1	383	20.6
	2003	789	21.2	426	24.6	363	19.1
SOFT TISSUE	Annual Average	108	3.0	59	3.6	49	2.6
<i>Includes Heart</i>	-Year APC (Trend)		-0.7		+2.5		-3.5
	1999	105	3.0	57	3.6	48	2.6
	2000	114	3.3	62	3.9	52	2.8
	2001	101	2.8	43	2.6	58	3.2
	2002	104	2.8	62	3.6	42	2.3
	2003	118	3.2	72	4.2	46	2.4
URINARY SYSTEM	Annual Average	1,294	36.0	916	57.8	377	19.0
	5-Year APC (Trend)		-0.9		-1.8		+1.4
	1999	1,303	37.7	942	61.9	360	18.8
	2000	1,210	34.3	853	54.6	357	18.2
	2001	1,311	36.5	935	59.3	375	19.0
	2002	1,329	36.4	937	58.1	392	19.5
	2003	1,315	35.1	913	54.9	402	19.5
Kidney/Renal Pelvis	Annual Average	416	11.6	255	15.5	160	8.3
	5-Year APC (Trend)		+2.7		+2.5		+3.0
	1999	396	11.5	247	15.6	149	8.0
	2000	374	10.6	220	13.6	154	8.1
	2001	404	11.2	256	15.4	148	7.7
	2002	440	12.0	273	16.3	167	8.5
	2003	465	12.3	281	16.3	184	9.0
Urinary Bladder	Annual Average	847	23.6	642	41.1	205	10.2
	5-Year APC (Trend)		-2.4		-3.4		+0.9
	1999	874	25.2	676	44.9	197	10.1
	2000	803	22.8	614	39.7	189	9.5
	2001	880	24.5	661	42.7	218	10.9
	2002	860	23.6	649	40.9	211	10.3
	2003	820	22.0	610	37.3	210	10.1
MISCELLANEOUS SITES	Annual Average	508	14.0	254	16.2	254	12.4
<i>A trend cannot be calculated for this category, due to changes in coding affecting cases diagnosed from 2001 forward.</i>	-Year APC (Trend)		n/a		n/a		n/a
	1999	425	12.2	204	13.8	221	11.0
	2000	451	12.6	220	14.5	231	11.2
	2001	573	15.8	290	18.7	282	13.7
	2002	576	15.7	291	18.1	284	13.8
	2003	517	13.9	263	16.1	254	12.2

Rates are per 100,000 and age-adjusted to the 2000 U.S. (19 age group) standard.

APC=Average Annual Percent Change

Counts for All Sexes may exceed male/female combined due to additional sex coding.

* Indicates a statistically significant trend.

^ Rate is not calculated due to instability of small numbers.

n/a = not applicable

TABLE 2: CANCER MORTALITY by Site, Sex, and Year (1999-2003)		TOTAL		MALE		FEMALE	
Primary Sites	Year	Cancer Deaths	Rate/ Current Trend	Cancer Deaths	Rate/ Current Trend	Cancer Deaths	Rate/ Current Trend
ALL DEATH CAUSES	Annual Average	30,182	822.0	14,812	970.0	15,371	704.5
	5-Year APC Trend		-0.7		-1.1		-0.5
	1999	29,356	834.5	14,430	992.5	14,926	709.6
	2000	29,541	824.0	14,491	976.9	15,050	704.0
	2001	30,125	821.7	14,688	964.5	15,437	710.0
	2002	31,081	828.3	15,286	977.4	15,795	710.9
	2003	30,809	802.8	15,163	940.7	15,646	689.0
ALL MALIGNANT CANCERS	Annual Average	7,086	196.1	3,636	234.5	3,450	170.4
	5-Year APC Trend		-0.7		*-1.4		-0.2
	1999	6,904	198.2	3,572	241.4	3,332	170.0
	2000	6,989	197.5	3,584	237.2	3,405	171.2
	2001	7,199	199.7	3,712	240.4	3,487	172.7
	2002	7,334	199.2	3,732	235.1	3,602	174.8
	2003	7,324	194.7	3,748	230.4	3,576	169.8
BONES/JOINTS	Annual Average	13	0.4	9	0.5	5	0.3
	5-Year APC Trend		-5.6		^		^
	1999	14	0.4	9	^	5	^
	2000	18	0.5	12	0.7	6	^
	2001	9	^	7	^	2	^
	2002	12	0.3	8	^	4	^
	2003	14	0.4	7	^	7	^
BRAIN/CNS	Annual Average	191	5.3	109	6.5	82	4.3
	5-Year APC Trend		+3.7		+2.6		+4.4
	1999	155	4.5	96	6.0	59	3.2
	2000	195	5.5	106	6.5	89	4.7
	2001	194	5.4	109	6.6	85	4.4
	2002	218	5.9	122	7.0	96	4.9
	2003	195	5.3	114	6.6	81	4.1
BREAST	Annual Average	516	14.2	3	0.2	513	25.8
	5-Year APC Trend		-0.4		^		-0.4
	1999	513	14.7	3	^	510	26.6
	2000	484	13.7	2	^	482	24.7
	2001	530	14.7	7	^	523	26.5
	2002	503	13.6	2	^	501	24.7
	2003	550	14.5	2	^	548	26.1
DIGESTIVE SYSTEM	Annual Average	1,595	44.0	873	55.6	723	34.6
	5-Year APC Trend		-0.2		-0.7		+0.4
	1999	1,551	44.4	833	55.6	718	35.5
	2000	1,533	43.1	842	55.0	691	33.5
	2001	1,628	45.0	904	58.2	724	34.6
	2002	1,609	43.3	899	55.8	710	33.4
	2003	1,656	44.0	885	53.4	771	36.2

Rates are per 100,000 and age-adjusted to the 2000 U.S. (19 age group) standard.

Counts may not match Center for Health Statistics publications because invalid ages and site codes are excluded from the data.

APC = Average Annual Percent Change

* Indicates a statistically significant trend.

^ Rate is not calculated due to instability of small numbers.

n/a = Not Applicable

TABLE 2: CANCER MORTALITY by Site, Sex, and Year (1999-2003)		TOTAL		MALE		FEMALE	
Primary Sites	Year	Cancer Deaths	Rate/ Current Trend	Cancer Deaths	Rate/ Current Trend	Cancer Deaths	Rate/ Current Trend
Colon/Rectum	Annual Average	674	18.5	342	22.1	332	15.6
	5-Year APC Trend		-1.6		-3.2		+0.1
	1999	687	19.6	349	23.8	338	16.5
	2000	629	17.6	314	20.7	315	15.1
	2001	702	19.3	375	24.4	327	15.3
	2002	665	17.8	354	22.4	311	14.4
	2003	685	18.0	316	19.4	369	16.9
Esophagus	Annual Average	180	5.0	140	8.8	40	1.9
	5-Year APC Trend		+0.1		+0.0		-1.6
	1999	166	4.8	127	8.3	39	2.0
	2000	168	4.8	134	8.7	34	1.7
	2001	203	5.6	161	10.1	42	2.0
	2002	186	5.0	137	8.3	49	2.3
	2003	177	4.7	143	8.6	34	1.5
Gallbladder	Annual Average	21	0.6	5	0.3	16	0.8
	5-Year APC Trend		+3.0		^		+5.6
	1999	17	0.5	4	^	13	0.6
	2000	18	0.5	3	^	15	0.7
	2001	28	0.8	10	^	18	0.9
	2002	17	0.5	4	^	13	0.6
	2003	23	0.6	4	^	19	0.9
Liver/Intrahepatic Bile Duct	Annual Average	141	3.9	87	5.3	54	2.7
	5-Year APC Trend		+7.0		+7.7		+6.8
	1999	105	3.0	64	4.0	41	2.1
	2000	152	4.3	93	5.8	59	2.9
	2001	128	3.5	77	4.7	51	2.5
	2002	147	3.9	91	5.3	56	2.7
	2003	172	4.6	111	6.3	61	3.1
Liver	Annual Average	104	2.9	68	4.1	36	1.8
	5-Year APC Trend		+5.4		+3.2		+10.9
	1999	81	2.3	54	3.4	27	1.4
	2000	118	3.3	78	4.8	40	2.0
	2001	88	2.4	60	3.7	28	1.4
	2002	107	2.9	67	3.8	40	1.9
	2003	127	3.4	81	4.6	46	2.4
Pancreas	Annual Average	382	10.6	191	12.2	192	9.3
	5-Year APC Trend		-0.5		+3.0		-3.6
	1999	378	10.9	165	10.8	213	10.6
	2000	357	10.1	186	12.2	171	8.4
	2001	397	11.0	195	12.6	202	9.9
	2002	402	10.9	203	12.6	199	9.5
	2003	377	10.1	204	12.4	173	8.3

Rates are per 100,000 and age-adjusted to the 2000 U.S. (19 age group) standard.

Counts may not match Center for Health Statistics publications because invalid ages and site codes are excluded from the data.

APC = Average Annual Percent Change

* Indicates a statistically significant trend.

^ Rate is not calculated due to instability of small numbers.

n/a = Not Applicable

TABLE 2: CANCER MORTALITY by Site, Sex, and Year (1999-2003)		TOTAL		MALE		FEMALE	
Primary Sites	Year	Cancer Deaths	Rate/ Current Trend	Cancer Deaths	Rate/ Current Trend	Cancer Deaths	Rate/ Current Trend
Small Intestine	Annual Average	11	0.3	4	0.3	7	0.3
	5-Year APC Trend		+23.0		^		^
	1999	8	^	5	^	3	^
	2000	9	^	2	^	7	^
	2001	7	^	3	^	4	^
	2002	13	0.4	5	^	8	^
	2003	18	0.5	7	^	11	0.5
Stomach	Annual Average	123	3.4	75	4.8	48	2.3
	5-Year APC Trend		-4.0		-9.0		+2.9
	1999	137	3.9	93	6.3	44	2.2
	2000	130	3.6	77	5.1	53	2.5
	2001	100	2.8	59	3.9	41	2.0
	2002	128	3.5	79	4.9	49	2.4
	2003	122	3.3	68	4.1	54	2.6
ENDOCRINE SYSTEM	Annual Average	32	0.9	14	0.9	18	0.9
	5-Year APC Trend		-8.5		-1.3		-13.3
	1999	35	1.0	13	0.8	22	1.1
	2000	34	1.0	15	1.0	19	1.0
	2001	30	0.8	13	0.8	17	0.8
	2002	36	1.0	18	1.1	18	0.9
	2003	23	0.6	11	0.7	12	0.5
Thyroid	Annual Average	18	0.5	7	0.4	11	0.5
	5-Year APC Trend		-2.4		^		-1.8
	1999	20	0.6	8	^	12	0.6
	2000	15	0.4	6	^	9	^
	2001	17	0.5	3	^	14	0.7
	2002	21	0.6	8	^	13	0.7
	2003	17	0.4	8	^	9	^
EYE/ORBIT	Annual Average	3	0.1	2	^	2	^
	5-Year APC Trend		^		^		^
	1999	3	^	0	^	3	^
	2000	3	^	1	^	2	^
	2001	0	^	0	^	0	^
	2002	9	^	6	^	3	^
	2003	2	^	2	^	0	^
GENITAL SYSTEM FEMALE	Annual Average	339	17.0	n/a	n/a	339	17.0
	5-Year APC Trend		-0.7		n/a		-0.7
	1999	313	16.2	n/a	n/a	313	16.2
	2000	340	17.4	n/a	n/a	340	17.4
	2001	358	18.0	n/a	n/a	358	18.0
	2002	358	17.7	n/a	n/a	358	17.7
	2003	328	15.5	n/a	n/a	328	15.5

Rates are per 100,000 and age-adjusted to the 2000 U.S. (19 age group) standard.

Counts may not match Center for Health Statistics publications because invalid ages and site codes are excluded from the data.

APC = Average Annual Percent Change

* Indicates a statistically significant trend.

^ Rate is not calculated due to instability of small numbers.

n/a = Not Applicable

TABLE 2: CANCER MORTALITY by Site, Sex, and Year (1999-2003)		TOTAL		MALE		FEMALE	
Primary Sites	Year	Cancer Deaths	Rate/ Current Trend	Cancer Deaths	Rate/ Current Trend	Cancer Deaths	Rate/ Current Trend
Cervix Uteri	Annual Average	42	2.3	n/a	0.0	42	2.3
	5-Year APC Trend		+2.8				+2.8
	1999	36	2.0	n/a	n/a	36	2.0
	2000	36	2.0	n/a	n/a	36	2.0
	2001	51	2.7	n/a	n/a	51	2.7
	2002	45	2.4	n/a	n/a	45	2.4
	2003	43	2.1	n/a	n/a	43	2.1
Corpus/Uterus	Annual Average	79	3.9	n/a	n/a	79	3.9
	5-Year APC Trend		-0.5		n/a		-0.5
	1999	70	3.5	n/a	n/a	70	3.5
	2000	86	4.3	n/a	n/a	86	4.3
	2001	83	4.1	n/a	n/a	83	4.1
	2002	79	3.8	n/a	n/a	79	3.8
	2003	77	3.6	n/a	n/a	77	3.6
Ovary	Annual Average	198	9.9	n/a	n/a	198	9.9
	5-Year APC Trend		-2.4		n/a		-2.4
	1999	192	10.0	n/a	n/a	192	10.0
	2000	202	10.3	n/a	n/a	202	10.3
	2001	199	10.0	n/a	n/a	199	10.0
	2002	212	10.4	n/a	n/a	212	10.4
	2003	186	8.8	n/a	n/a	186	8.8
GENITAL SYSTEM MALE	Annual Average	438	30.2	438	30.2	n/a	n/a
	5-Year APC Trend		-3.7		-3.7		n/a
	1999	451	33.1	451	33.1	n/a	n/a
	2000	428	30.4	428	30.4	n/a	n/a
	2001	442	30.4	442	30.4	n/a	n/a
	2002	448	30.1	448	30.1	n/a	n/a
	2003	422	27.5	422	27.5	n/a	n/a
Prostate	Annual Average	430	29.8	430	29.8	n/a	n/a
	5-Year APC Trend		-3.9		-3.9		n/a
	1999	445	32.7	445	32.7	n/a	n/a
	2000	420	29.9	420	29.9	n/a	n/a
	2001	434	30.0	434	30.0	n/a	n/a
	2002	435	29.4	435	29.4	n/a	n/a
	2003	415	27.1	415	27.1	n/a	n/a
Testis	Annual Average	7	0.2	7	0.4	n/a	n/a
	5-Year APC Trend		^		^		n/a
	1999	4	^	4	^	n/a	n/a
	2000	7	^	7	^	n/a	n/a
	2001	6	^	6	^	n/a	n/a
	2002	12	0.7	12	0.7	n/a	n/a
	2003	6	^	6	^	n/a	n/a

Rates are per 100,000 and age-adjusted to the 2000 U.S. (19 age group) standard.

Counts may not match Center for Health Statistics publications because invalid ages and site codes are excluded from the data.

APC = Average Annual Percent Change

* Indicates a statistically significant trend.

^ Rate is not calculated due to instability of small numbers.

n/a = Not Applicable

TABLE 2: CANCER MORTALITY by Site, Sex, and Year (1999-2003)		TOTAL		MALE		FEMALE	
Primary Sites	Year	Cancer Deaths	Rate/ Current Trend	Cancer Deaths	Rate/ Current Trend	Cancer Deaths	Rate/ Current Trend
LEUKEMIAS	Annual Average	268	7.4	149	9.7	119	5.8
	5-Year APC Trend		-0.3		+2.1		-2.1
	1999	250	7.2	127	8.6	123	6.1
	2000	268	7.6	150	9.9	118	5.7
	2001	280	7.8	154	9.9	126	6.2
	2002	274	7.5	163	10.5	111	5.4
	2003	268	7.1	150	9.4	118	5.6
LYMPHOMAS	Annual Average	330	9.1	170	11.0	159	7.6
	5-Year APC Trend		-1.1		-1.3		-0.9
	1999	327	9.3	172	11.4	155	7.6
	2000	316	8.9	163	11.0	153	7.6
	2001	346	9.5	172	11.2	174	8.4
	2002	320	8.6	164	10.3	156	7.3
	2003	340	9.0	181	11.0	159	7.4
Hodgkin Lymphomas	Annual Average	16	0.4	8	0.5	8	0.4
	5-Year APC Trend		+0.9		^		^
	1999	15	0.4	11	0.7	4	^
	2000	17	0.5	7	^	10	^
	2001	12	0.3	7	^	5	^
	2002	18	0.5	10	^	8	^
	2003	17	0.4	6	^	11	0.5
Non-Hodgkin Lymphomas	Annual Average	314	8.6	162	10.5	152	7.3
	5-Year APC Trend		-1.2		-0.9		-1.6
	1999	312	8.9	161	10.7	151	7.4
	2000	299	8.4	156	10.5	143	7.0
	2001	334	9.2	165	10.8	169	8.2
	2002	302	8.1	154	9.7	148	6.8
	2003	323	8.6	175	10.6	148	6.9
MESOTHELIOMA	Annual Average	41	1.1	34	2.2	7	0.4
ICD-10 only	5-Year APC Trend		+3.3		+3.7		^
	1999	30	0.9	26	1.9	4	^
	2000	46	1.3	36	2.4	10	^
	2001	52	1.5	44	2.8	8	^
	2002	28	0.8	22	1.4	6	^
	2003	50	1.3	43	2.7	7	^
MYELOMA	Annual Average	148	4.1	84	5.4	64	3.1
	5-Year APC Trend		+3.0		+0.8		+5.0
	1999	148	4.2	88	6.1	60	3.0
	2000	124	3.5	70	4.6	54	2.7
	2001	136	3.7	81	5.2	55	2.6
	2002	173	4.7	87	5.5	86	4.2
	2003	159	4.3	95	5.9	64	3.0

Rates are per 100,000 and age-adjusted to the 2000 U.S. (19 age group) standard.

Counts may not match Center for Health Statistics publications because invalid ages and site codes are excluded from the data.

APC = Average Annual Percent Change

* Indicates a statistically significant trend.

^ Rate is not calculated due to instability of small numbers.

n/a = Not Applicable

TABLE 2: CANCER MORTALITY by Site, Sex, and Year (1999-2003)		TOTAL		MALE		FEMALE	
Primary Sites	Year	Cancer Deaths	Rate/ Current Trend	Cancer Deaths	Rate/ Current Trend	Cancer Deaths	Rate/ Current Trend
ORAL CAVITY/PHARYNX	Annual Average	100	2.8	63	3.9	37	1.8
	5-Year APC Trend		-3.1		-7.3		+4.5
	1999	103	2.9	70	4.5	33	1.6
	2000	91	2.6	62	4.0	29	1.4
	2001	115	3.2	68	4.2	47	2.4
	2002	98	2.7	60	3.7	38	1.8
	2003	93	2.5	54	3.2	39	1.8
RESPIRATORY SYSTEM	Annual Average	2,062	57.7	1,108	70.9	954	48.2
	5-Year APC Trend		+0.0		-1.1		+0.9
	1999	1,927	55.7	1,066	70.9	861	44.9
	2000	2,122	60.5	1,141	75.0	981	50.5
	2001	2,032	57.2	1,089	69.7	943	48.1
	2002	2,109	58.1	1,101	69.0	1,008	50.0
	2003	2,122	57.1	1,144	70.0	978	47.5
Larynx	Annual Average	37	1.0	30	1.9	8	0.4
	5-Year APC Trend		+3.7		+1.6		^
	1999	30	0.9	27	1.8	3	^
	2000	36	1.0	26	1.7	10	^
	2001	40	1.1	31	2.0	9	^
	2002	46	1.3	35	2.1	11	0.6
	2003	35	0.9	29	1.7	6	^
Lung/Bronchus	Annual Average	2,014	56.4	1,073	68.6	942	47.5
	5-Year APC Trend		-0.1		-1.3		+0.9
	1999	1,886	54.5	1,034	68.8	852	44.4
	2000	2,078	59.3	1,112	73.1	966	49.7
	2001	1,981	55.7	1,052	67.3	929	47.3
	2002	2,057	56.7	1,061	66.5	996	49.4
	2003	2,069	55.7	1,104	67.6	965	46.9
SKIN	Annual Average	146	4.0	96	5.9	50	2.5
	5-Year APC Trend		+2.8		+3.4		+1.3
<i>Excludes basal and squamous cell</i>	1999	128	3.7	85	5.4	43	2.3
	2000	146	4.1	93	5.9	53	2.7
	2001	142	3.9	97	6.0	45	2.1
	2002	155	4.2	98	6.0	57	2.8
	2003	159	4.2	108	6.3	51	2.4
Melanomas of Skin	Annual Average	117	3.2	76	4.6	41	2.1
	5-Year APC Trend		+2.2		+3.6		-0.8
	1999	110	3.2	71	4.4	39	2.1
	2000	107	3.0	63	3.9	44	2.3
	2001	118	3.2	83	5.0	35	1.7
	2002	123	3.3	77	4.8	46	2.3
	2003	127	3.4	85	4.8	42	2.0

Rates are per 100,000 and age-adjusted to the 2000 U.S. (19 age group) standard.

Counts may not match Center for Health Statistics publications because invalid ages and site codes are excluded from the data.

APC = Average Annual Percent Change

* Indicates a statistically significant trend.

^ Rate is not calculated due to instability of small numbers.

n/a = Not Applicable

TABLE 2: CANCER MORTALITY by Site, Sex, and Year (1999-2003)		TOTAL		MALE		FEMALE	
Primary Sites	Year	Cancer Deaths	Rate/ Current Trend	Cancer Deaths	Rate/ Current Trend	Cancer Deaths	Rate/ Current Trend
SOFT TISSUE	Annual Average	52	1.4	26	1.6	26	1.3
<i>Includes Heart</i>	5-Year APC Trend		-4.8		-2.0		-8.2
	1999	61	1.8	30	1.9	31	1.7
	2000	47	1.3	23	1.5	24	1.2
	2001	47	1.3	23	1.4	24	1.2
	2002	52	1.4	23	1.4	29	1.5
	2003	51	1.4	30	1.8	21	1.0
URINARY SYSTEM	Annual Average	339	9.3	229	14.9	110	5.2
	5-Year APC Trend		+1.3		-0.4		+4.2
	1999	316	9.0	221	15.1	95	4.7
	2000	328	9.2	219	14.6	109	5.4
	2001	328	9.0	233	15.5	95	4.5
	2002	379	10.2	242	15.3	137	6.4
	2003	346	9.1	231	14.4	115	5.3
Kidney/Renal Pelvis	Annual Average	147	4.1	94	5.9	53	2.6
	5-Year APC Trend		-0.1		-1.1		+1.6
	1999	133	3.8	91	5.9	42	2.2
	2000	156	4.4	95	6.0	61	3.1
	2001	137	3.8	92	5.9	45	2.2
	2002	165	4.4	101	6.0	64	3.0
	2003	143	3.8	91	5.6	52	2.4
Urinary Bladder	Annual Average	181	4.9	128	8.6	53	2.5
	5-Year APC Trend		+2.5		+0.7		+4.7
	1999	169	4.8	119	8.4	50	2.4
	2000	164	4.6	118	8.2	46	2.2
	2001	183	4.9	136	9.2	47	2.1
	2002	200	5.4	133	8.7	67	3.1
	2003	190	5.0	134	8.4	56	2.5
MISCELLANEOUS SITES	Annual Average	471	12.9	228	14.9	243	11.6
<i>Trends cannot be calculated for this category, due to changes in coding affecting cases diagnosed from 2001 forward.</i>	5-Year APC Trend		n/a		n/a		n/a
	1999	579	16.6	282	19.4	297	14.8
	2000	466	13.0	221	14.7	245	11.7
	2001	530	14.6	269	17.6	261	12.3
	2002	553	14.8	269	17.2	284	13.1
	2003	546	14.4	269	17.0	277	12.6

Rates are per 100,000 and age-adjusted to the 2000 U.S. (19 age group) standard.

Counts may not match Center for Health Statistics publications because invalid ages and site codes are excluded from the data.

APC = Average Annual Percent Change

* Indicates a statistically significant trend.

^ Rate is not calculated due to instability of small numbers.

n/a = Not Applicable

B. COUNTY TABLES OVERVIEW

Tables 3A-3E provide data on selected cancer sites at the county level for the years 1999-2003. Tables 4A-4H provide data on several additional cancer sites at the county level for the years 1996-2003. The data in the tables include average annual invasive incidence and mortality counts, age-adjusted rates for incidence and mortality, and average APC for incidence and mortality in each of Oregon's 36 counties. Any statistically significant trend is indicated with an asterisk (*).

Interpretation of inter-county differences in the rates for a particular type of cancer must be made with caution due to the following:

- The rarity of some cancers can cause the number of cases occurring in some regions to be so small that the calculated rate might be statistically unstable.
- Correlations between incidence of a disease and prevalence of risk factors for that disease in a geographical area can be misleading. To examine the relationships between a risk factor and a disease, detailed analytical epidemiological studies are necessary.
- For many cancers, there is a long time interval between exposure to a risk factor and diagnosis of disease. Migration between geographical areas can result in individuals being exposed to a risk factor in one geographical area and then diagnosed in a different geographical area.

- There may be differences between geographical areas with respect to availability of screening and/or early detection programs.
- It is possible that the completeness of case reporting differs by area of the state.

A small number of events can result in considerable random variation in the rate estimates; thus limiting their usefulness. Therefore, if the number of cancer events (new cases or deaths) is ten or fewer, the calculated rate is considered unstable. Such a rate is not shown and is replaced with a caret (^), and the rate is not shown. However, the number of events is shown.

Oregon Counties

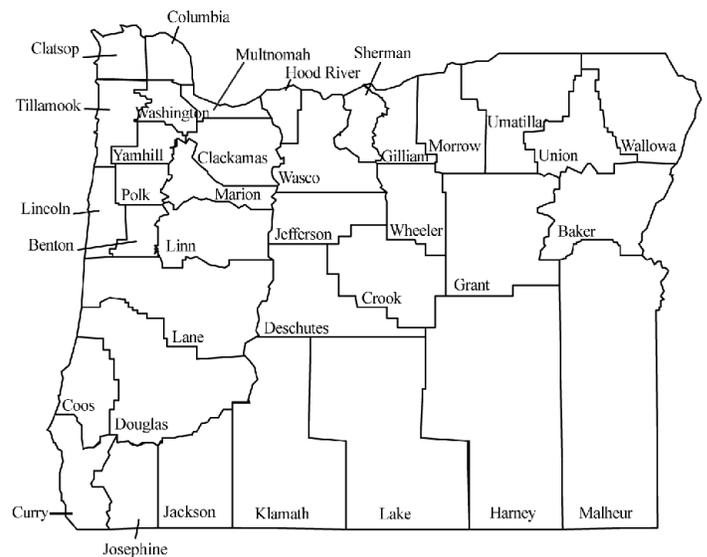


TABLE 3: HIGH INCIDENCE CANCER SITES - CURRENT FIVE-YEAR AVERAGE

TABLE 3A All Cancers Years 1999-2003 Oregon Counties	INCIDENCE			MORTALITY		
	Average Invasive Cases Per Year	Age- Adjusted Rate	Current 5-Year Trend APC	Average Malignant Deaths Per Year	Age- Adjusted Rate	Current 5-Year Trend APC
State	17,339	484.0	*-2.4	7,190	198.9	-0.7
Baker	104	443.0	-4.1	44	178.0	-4.5
Benton	299	433.3	*-5.0	111	162.1	-5.3
Clackamas	1,626	476.8	*-5.6	660	198.8	-2.7
Clatsop	196	457.6	*-5.0	95	215.6	-1.3
Columbia	236	529.4	-0.2	105	241.5	-4.4
Coos	476	542.1	*-5.5	210	228.7	0.2
Crook	100	434.6	-0.9	43	184.1	-5.8
Curry	180	463.5	*-7.7	85	208.0	2.2
Deschutes	707	545.5	-0.2	232	182.2	-1.9
Douglas	660	499.1	-3.7	287	208.6	1.2
Gilliam	16	588.0	5.1	6	230.1	^
Grant	43	422.8	2.1	23	217.2	0.2
Harney	42	467.9	5.4	17	192.2	-5.0
Hood River	92	452.8	4.3	37	176.9	1.1
Jackson	1,122	506.7	0.6	453	196.5	0.0
Jefferson	78	405.8	-7.4	37	196.7	5.1
Josephine	527	477.8	1.9	248	214.5	1.9
Klamath	359	484.5	-2.1	154	205.2	*-3.0
Lake	52	526.3	-2.9	21	208.0	-1.4
Lane	1,629	469.3	0.1	686	194.2	-0.3
Lincoln	317	502.1	*-4.2	140	217.1	-1.5
Linn	535	456.7	-0.8	250	207.6	1.9
Malheur	128	390.9	-1.9	56	162.7	-3.5
Marion	1,416	505.4	*-2.5	596	208.6	-1.1
Morrow	47	469.4	5.4	19	199.8	7.4
Multnomah	3,155	508.3	-1.5	1,302	211.1	0.6
Polk	315	442.2	-4.1	125	165.9	5.0
Sherman	9	387.5	^	3	124.0	^
Tillamook	152	436.4	-0.6	69	195.9	*-4.2
Umatilla	331	472.5	*-5.8	143	201.5	*-7.1
Union	137	492.3	*-6.4	52	180.6	-2.8
Wallowa	45	444.7	*-11.9	18	166.1	-7.9
Wasco	148	503.2	-2.7	63	207.0	-1.1
Washington	1,658	447.8	*-4.1	629	177.5	-1.0
Wheeler	9	366.8	^	5	171.2	^
Yamhill	392	477.6	-2.1	167	201.9	1.2

Rates are per 100,000 and age-adjusted to the 2000 US Standard Population (19 age group) standard.

APC = Average Annual Percent Change

Counts may not match Center for Health Statistics data tables due to cases in unknown counties.

* Indicates a statistically significant trend.

^ Rate/Trend is not calculated due to instability of small numbers.

TABLE 3: HIGH INCIDENCE CANCER SITES - CURRENT FIVE-YEAR AVERAGE

TABLE 3B Female Breast Cancer Years 1999-2003 Oregon Counties	INCIDENCE			MORTALITY		
	Average Invasive Cases Per Year	Age- Adjusted Rate	Current 5-Year Trend APC	Average Malignant Deaths Per Year	Age- Adjusted Rate	Current 5-Year Trend APC
State	2,739	142.7	*-3.8	513	25.8	-0.4
Baker	16	136.7	-2.3	3	21.7	^
Benton	50	132.9	-1.3	10	25.1	^
Clackamas	288	152.7	-4.7	42	22.3	11.1
Clatsop	28	122.2	4.3	6	23.5	^
Columbia	30	125.9	0.7	5	22.2	^
Coos	65	142.9	*-9.1	11	23.2	-14.9
Crook	15	133.6	0.2	4	31.0	^
Curry	21	114.2	-16.2	3	15.1	^
Deschutes	98	143.9	-0.7	17	24.4	-0.3
Douglas	87	129.9	-6.5	18	25.2	*14.9
Gilliam	1	^	^	1	^	^
Grant	6	116.8	^	2	^	^
Harney	5	102.0	^	1	^	^
Hood River	15	136.7	-1.5	5	38.9	^
Jackson	167	144.4	0.4	31	25.2	-6.5
Jefferson	9	97.4	^	3	27.4	^
Josephine	77	137.3	-3.1	16	25.5	-0.9
Klamath	53	141.2	-5.9	11	30.4	3.3
Lake	7	127.8	^	2	^	^
Lane	263	141.4	-2.5	53	27.5	-4.4
Lincoln	51	152.1	-8.7	12	34.8	*22.2
Linn	79	129.9	-7.4	15	23.7	-3.1
Malheur	17	105.8	-3.4	3	17.8	^
Marion	236	156.6	-4.0*	43	27.1	-0.6
Morrow	5	101.8	^	1	^	^
Multnomah	519	151.0	-2.6	95	26.9	0.2
Polk	54	142.3	-8.5	9	22.0	^
Sherman	2	^	^	0	^	^
Tillamook	23	126.5	5.1	5	26.0	^
Umatilla	43	118.5	-2.2	10	26.5	^
Union	20	138.3	-7.3	3	23.9	^
Wallowa	5	90.7	^	2	^	^
Wasco	22	144.8	-9.2	4	26.7	^
Washington	297	142.1	-5.1	53	25.5	3.9
Wheeler	1	^	^	0	^	^
Yamhill	66	153.8	-5.1	15	32.9	-1.4

Rates are per 100,000 and age-adjusted to the 2000 US Standard Population (19 age group) standard.

APC = Average Annual Percent Change

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^ Rate/Trend is not calculated due to instability of small numbers.

TABLE 3: HIGH INCIDENCE CANCER SITES - CURRENT FIVE-YEAR AVERAGE

TABLE 3C Colon/Rectum Cancer Years 1999-2003 Oregon Counties	INCIDENCE			MORTALITY		
	Average Invasive Cases Per Year	Age- Adjusted Rate	Current 5-Year Trend APC	Average Malignant Deaths Per Year	Age- Adjusted Rate	Current 5-Year Trend APC
State	1,799	49.8	*-3.1	674	18.5	-1.6
Baker	11	46.7	-0.7	3	13.9	^
Benton	34	48.6	-10.5	10	14.5	-19.8
Clackamas	162	48.3	-4.1	62	18.7	-4.7
Clatsop	22	50.2	-9.0	11	23.9	-2.6
Columbia	25	56.8	-9.3	9	21.4	^
Coos	43	46.4	-14.7	17	17.8	-4.1
Crook	11	46.1	6.0	5	20.8	^
Curry	19	47.9	-7.6	9	20.8	^
Deschutes	67	52.4	-3.3	21	16.9	-0.6
Douglas	70	51.5	-3.6	25	17.9	5.7
Gilliam	2	^	^	1	^	^
Grant	4	39.4	^	3	29.0	^
Harney	3	36.6	^	2	^	^
Hood River	10	49.8	^	3	14.6	^
Jackson	126	55.1	0.9	44	19.2	-1.0
Jefferson	9	48.0	^	4	19.0	^
Josephine	59	51.2	4.0	23	19.7	-4.4
Klamath	38	50.6	0.9	14	19.1	7.3
Lake	6	61.0	^	1	^	^
Lane	158	44.9	2.4	54	15.1	4.2
Lincoln	38	58.0	8.8	13	20.3	-8.6
Linn	60	49.6	5.4	25	20.5	-0.1
Malheur	15	43.1	-8.2	7	19.6	^
Marion	157	55.2	-4.0	63	21.7	3.5
Morrow	7	66.3	^	3	25.9	^
Multnomah	310	50.1	-4.7	118	18.8	-0.2
Polk	36	48.0	-6.5	14	18.5	4.5
Sherman	0	^	^	0	^	^
Tillamook	14	37.2	-10.1	6	16.6	^
Umatilla	40	56.6	-12.6	16	22.2	-5.6
Union	17	60.0	-14.7	9	31.3	^
Wallowa	4	34.8	^	1	^	^
Wasco	16	50.7	11.1	5	16.9	^
Washington	167	46.8	-3.9	60	16.7	-8.9
Wheeler	1	^	^	0	^	^
Yamhill	38	45.8	-1.8	13	15.2	-3.9

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APC = Average Annual Percent Change

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TABLE 3: HIGH INCIDENCE CANCER SITES - CURRENT FIVE-YEAR AVERAGE

TABLE 3D Lung/Bronchus Cancer Years 1999-2003 Oregon Counties	INCIDENCE			MORTALITY		
	Average Invasive Cases Per Year	Age- Adjusted Rate	Current 5-Year Trend APC	Average Malignant Deaths Per Year	Age- Adjusted Rate	Current 5-Year Trend APC
State	2,492	70.0	*-2.2	2,014	56.4	-0.1
Baker	14	59.0	-2.7	12	48.2	3.2
Benton	34	51.1	-9.7	29	43.5	-2.2
Clackamas	214	64.6	-5.2	174	52.6	-4.2
Clatsop	30	69.4	-12.3	26	58.7	-10.6
Columbia	39	88.7	-5.4	33	76.2	-6.7
Coos	86	93.8	*-9.9	73	78.8	3.9
Crook	19	78.8	-0.9	14	58.8	2.9
Curry	30	72.8	1.9	24	58.8	0.5
Deschutes	80	61.2	1.2	64	49.9	-4.1
Douglas	112	80.5	-6.8	88	62.5	-2.7
Gilliam	2	^	^	1	^	^
Grant	5	51.2	^	5	43.2	^
Harney	6	63.0	^	5	50.3	^
Hood River	12	59.3	-0.9	10	49.2	14.3
Jackson	169	74.7	-0.1	131	57.4	3.8
Jefferson	11	55.1	2.1	9	45.7	^
Josephine	92	79.9	2.8	80	68.2	8.8
Klamath	57	74.4	*-12.5	42	55.5	-4.0
Lake	7	67.5	^	5	49.4	^
Lane	242	69.5	1.0	199	56.8	0.4
Lincoln	54	82.0	-3.4	43	65.7	5.1
Linn	83	69.7	-0.1	69	57.3	2.6
Malheur	18	53.6	3.3	17	49.2	-7.0
Marion	194	69.8	-1.2	162	57.7	-0.2
Morrow	8	80.3	^	6	67.1	^
Multnomah	469	78.8	1.5	359	60.2	1.2
Polk	40	55.6	-2.7	31	43.3	0.8
Sherman	1	^	^	1	^	^
Tillamook	23	64.3	-10.1	21	59.3	-8.1
Umatilla	46	66.2	-11.0	41	58.2	-3.9
Union	17	59.9	-4.1	12	43.3	0.2
Wallowa	7	63.6	^	4	39.3	^
Wasco	22	74.4	-3.1	19	61.8	1.1
Washington	194	56.4	*-4.7	157	45.8	-2.3
Wheeler	2	^	^	2	^	^
Yamhill	54	66.3	4.3	46	56.0	2.8

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APC = Average Annual Percent Change

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TABLE 3: HIGH INCIDENCE CANCER SITES - CURRENT FIVE-YEAR AVERAGE

TABLE 3E Prostate Cancer Years 1999-2003 Oregon Counties	INCIDENCE			MORTALITY		
	Average Invasive Cases Per Year	Age- Adjusted Rate	Current 5-Year Trend APC	Average Malignant Deaths Per Year	Age- Adjusted Rate	Current 5-Year Trend APC
State	2,633	164.0	*-6.0	430	29.8	*-3.9
Baker	18	158.9	-6.9	4	38.0	^
Benton	56	186.5	-4.0	7	27.5	^
Clackamas	235	155.5	*-10.6	38	31.2	-3.5
Clatsop	30	151.7	*-13.4	6	32.2	^
Columbia	33	159.2	0.9	5	27.6	^
Coos	73	169.7	*-6.2	11	27.2	-2.9
Crook	18	155.4	15.3	2	^	^
Curry	34	170.7	-11.6	7	34.5	^
Deschutes	159	253.5	-6.0	11	20.7	3.0
Douglas	104	157.4	-8.1	19	31.4	-19.2
Gilliam	3	220.5	^	0	^	^
Grant	9	178.2	^	2	^	^
Harney	10	213.5	^	1	^	^
Hood River	18	203.8	4.5	2	^	^
Jackson	175	170.1	-1.4	32	31.8	-7.2
Jefferson	14	136.1	9.4	3	37.0	^
Josephine	79	144.8	4.1	18	34.1	6.2
Klamath	52	141.7	-1.3	10	31.4	^
Lake	10	207.6	^	2	^	^
Lane	258	165.5	-9.3	38	26.3	-10.4
Lincoln	51	170.0	-9.4	9	33.8	^
Linn	79	145.9	-5.0	16	31.5	-0.3
Malheur	19	123.9	2.7	3	19.0	^
Marion	216	177.2	-3.5	34	29.1	2.8
Morrow	7	134.7	^	1	^	^
Multnomah	394	154.3	-5.9	73	31.8	5.0
Polk	54	171.6	0.7	9	28.3	^
Sherman	2	^	^	0	^	^
Tillamook	26	147.8	-3.0	4	30.0	^
Umatilla	62	193.4	-10.2	10	34.8	^
Union	25	195.3	*-18.8	4	32.0	^
Wallowa	10	189.0	^	3	52.7	^
Wasco	28	199.7	-8.0	3	27.2	^
Washington	216	142.6	*-9.2	32	25.6	0.8
Wheeler	2	^	^	0	^	^
Yamhill	53	147.8	-7.9	12	36.1	-12.4

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APC = Average Annual Percent Change

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^ Rate/Trend is not calculated due to instability of small numbers.

TABLE 4: LOW INCIDENCE CANCER SITES - CURRENT EIGHT-YEAR AVERAGE

TABLE 4-A Brain/CNS Cancer Years 1996-2003 Oregon Counties	INCIDENCE			MORTALITY		
	Average Invasive Cases Per Year	Age- Adjusted Rate	Current 8-Year Trend APC	Average Malignant Deaths Per Year	Age- Adjusted Rate	Current 8-Year Trend APC
State	253	7.3	-0.7	195	5.6	-1.0
Baker	2	7.4	^	2	8.2	^
Benton	5	7.0	^	4	5.6	^
Clackamas	25	7.5	-2.6	21	6.3	5.1
Clatsop	4	10.5	^	2	5.2	^
Columbia	4	9.4	^	3	6.5	^
Coos	5	6.3	^	4	4.3	^
Crook	1	^	^	1	^	^
Curry	2	7.7	^	2	4.7	^
Deschutes	11	8.9	-1.7	8	6.1	^
Douglas	10	8.1	^	9	7.1	^
Gilliam	0	^	^	0	^	^
Grant	0	^	^	0	^	^
Harney	0	^	^	0	^	^
Hood River	1	^	^	1	^	^
Jackson	13	6.6	-3.2	12	5.5	-2.3
Jefferson	1	^	^	1	^	^
Josephine	7	7.1	^	6	6.4	^
Klamath	4	5.9	^	3	4.7	^
Lake	0	^	^	0	^	^
Lane	23	7.0	-3.3	19	5.7	-1.9
Lincoln	6	10.7	^	4	7.2	^
Linn	7	6.9	^	6	5.1	^
Malheur	1	^	^	1	^	^
Marion	23	8.3	-5.8	15	5.6	0.0
Morrow	1	^	^	1	^	^
Multnomah	46	7.3	2.6	34	5.5	-3.1
Polk	6	8.7	^	4	6.2	^
Sherman	0	^	^	0	^	^
Tillamook	2	6.0	^	2	5.8	^
Umatilla	5	7.5	^	3	4.2	^
Union	1	^	^	1	^	^
Wallowa	1	^	^	0	^	^
Wasco	1	^	^	2	5.7	^
Washington	30	7.7	3.1	21	5.5	-0.5
Wheeler	1	^	^	1	^	^
Yamhill	5	5.5	^	4	4.7	^

Rates are per 100,000 and age-adjusted to the 2000 US Standard Population (19 age group) standard.

APC = Average Annual Percent Change

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* Indicates a statistically significant trend.

^ Rate/Trend is not calculated due to instability of small numbers.

TABLE 4: LOW INCIDENCE CANCER SITES - CURRENT EIGHT-YEAR AVERAGE

TABLE 4-B Cervical Cancer Years 1996-2003 Oregon Counties	INCIDENCE			MORTALITY		
	Average Invasive Cases Per Year	Age- Adjusted Rate	Current 8-Year Trend APC	Average Malignant Deaths Per Year	Age- Adjusted Rate	Current 8-Year Trend APC
State	140	7.9	-2.8	44	2.4	-2.6
Baker	1	^	^	0	^	^
Benton	2	6.7	^	1	^	^
Clackamas	9	5.3	^	4	2.3	^
Clatsop	2	9.1	^	1	^	^
Columbia	2	9.2	^	1	^	^
Coos	4	11.7	^	1	^	^
Crook	1	^	^	0	^	^
Curry	2	10.8	^	1	^	^
Deschutes	4	6.2	^	1	^	^
Douglas	5	10.0	^	2	3.0	^
Gilliam	0	^	^	0	^	^
Grant	0	^	^	0	^	^
Harney	1	^	^	0	^	^
Hood River	1	^	^	0	^	^
Jackson	10	10.7	^	3	2.8	^
Jefferson	1	^	^	0	^	^
Josephine	3	7.1	^	1	^	^
Klamath	4	12.1	^	1	^	^
Lake	0	^	^	0	^	^
Lane	11	6.9	7.2*	3	1.8	^
Lincoln	3	11.1	^	1	^	^
Linn	5	8.3	^	1	^	^
Malheur	1	^	^	0	^	^
Marion	11	7.8	-5.4	4	2.9	^
Morrow	1	^	^	0	^	^
Multnomah	28	8.3	-6.9	8	2.2	^
Polk	2	5.0	^	1	^	^
Sherman	0	^	^	0	^	^
Tillamook	1	^	^	1	^	^
Umatilla	4	11.5	^	1	^	^
Union	2	13.1	^	1	^	^
Wallowa	0	^	^	0	^	^
Wasco	1	^	^	1	^	^
Washington	16	7.0	-3.8	4	2.0	^
Wheeler	0	^	^	0	^	^
Yamhill	4	11.0	^	1	^	^

Rates are per 100,000 and age-adjusted to the 2000 US Standard Population (19 age group) standard.

APC = Average Annual Percent Change

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TABLE 4: LOW INCIDENCE CANCER SITES - CURRENT EIGHT-YEAR AVERAGE

TABLE 4-C Corpus/Uterus Cancer Years 1996-2003 Oregon Counties	INCIDENCE			MORTALITY		
	Average Invasive Cases Per Year	Age- Adjusted Rate	Current 8-Year Trend APC	Average Malignant Deaths Per Year	Age- Adjusted Rate	Current 8-Year Trend APC
State	457	24.3	-1.2	81	4.0	-1.7
Baker	3	26.1	^	1	^	^
Benton	12	32.3	*8.6	2	5.0	^
Clackamas	41	22.8	-2.3	7	4.0	^
Clatsop	6	25.0	^	1	^	^
Columbia	7	28.2	^	1	^	^
Coos	13	28.9	6.1	3	5.7	^
Crook	3	22.9	^	1	^	^
Curry	4	19.2	^	1	^	^
Deschutes	14	21.2	-5.2	3	4.5	^
Douglas	17	25.1	-2.2	3	4.3	^
Gilliam	0	^	^	0	^	^
Grant	1	^	^	0	^	^
Harney	1	^	^	0	^	^
Hood River	2	18.5	^	0	^	^
Jackson	30	25.9	-3.3	5	3.9	^
Jefferson	2	19.0	^	1	^	^
Josephine	12	22.5	1.6	2	3.8	^
Klamath	10	25.6	-4.3	2	3.8	^
Lake	1	^	^	0	^	^
Lane	40	21.7	-2.8	7	3.5	^
Lincoln	7	20.9	^	1	^	^
Linn	13	20.6	-3.9	4	5.3	^
Malheur	3	19.2	^	1	^	^
Marion	38	25.7	3.6	7	4.0	^
Morrow	1	^	^	0	^	^
Multnomah	90	26.5	-0.5	17	4.6	3.5
Polk	9	23.6	^	2	3.9	^
Sherman	0	^	^	0	^	^
Tillamook	4	23.8	^	0	^	^
Umatilla	7	20.5	^	1	^	^
Union	4	22.9	^	1	^	^
Wallowa	2	46.3	^	0	^	^
Wasco	4	24.4	^	0	^	^
Washington	47	23.8	-1.5	7	3.3	^
Wheeler	0	^	^	0	^	^
Yamhill	12	27.1	*7.8	1	^	^

Rates are per 100,000 and age-adjusted to the 2000 US Standard Population (19 age group) standard.

APC = Average Annual Percent Change

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TABLE 4: LOW INCIDENCE CANCER SITES - CURRENT EIGHT-YEAR AVERAGE

TABLE 4-D Leukemias	INCIDENCE			MORTALITY		
	Average Invasive Cases Per Year	Age-Adjusted Rate	Current 8-Year Trend APC	Average Malignant Deaths Per Year	Age-Adjusted Rate	Current 8-Year Trend APC
Years 1996-2003 Oregon Counties						
State	384	11.0	-0.1	270	7.7	-1.9
Baker	2	7.7	^	2	8.1	^
Benton	7	9.9	^	5	8.0	^
Clackamas	38	11.7	2.3	27	8.5	-1.2
Clatsop	4	10.0	^	3	6.2	^
Columbia	6	15.3	^	3	7.9	^
Coos	10	11.3	^	8	9.0	^
Crook	1	^	^	1	^	^
Curry	4	10.2	^	3	8.2	^
Deschutes	11	9.6	-1.6	8	6.8	^
Douglas	13	10.6	-1.3	10	7.6	^
Gilliam	1	^	^	0	^	^
Grant	1	^	^	1	^	^
Harney	2	17.1	^	1	^	^
Hood River	2	8.0	^	1	^	^
Jackson	24	11.4	-2.6	18	7.8	-7.7*
Jefferson	2	12.4	^	1	^	^
Josephine	8	8.0	^	6	5.7	^
Klamath	9	13.2	^	5	6.3	^
Lake	1	^	^	1	^	^
Lane	32	9.6	3.5	30	8.7	-5.9
Lincoln	5	7.8	^	3	4.5	^
Linn	10	8.7	^	9	7.7	^
Malheur	4	11.4	^	3	7.7	^
Marion	35	12.4	-3.0	22	7.6	1.6
Morrow	1	^	^	1	^	^
Multnomah	80	12.9	2.1	49	7.9	1.0
Polk	6	9.5	^	6	7.7	^
Sherman	0	^	^	0	^	^
Tillamook	3	9.4	^	4	10.4	^
Umatilla	7	9.7	^	5	7.0	^
Union	3	11.8	^	2	7.2	^
Wallowa	2	17.4	^	1	^	^
Wasco	3	9.9	^	2	4.8	^
Washington	42	11.4	-2.8	27	7.6	-3.5
Wheeler	0	^	^	0	^	^
Yamhill	7	9.2	^	5	6.4	^

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APC = Average Annual Percent Change

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TABLE 4: LOW INCIDENCE CANCER SITES - CURRENT EIGHT-YEAR AVERAGE

TABLE 4-E Lymphomas Years 1996-2003 Oregon Counties	INCIDENCE			MORTALITY		
	Average Invasive Cases Per Year	Age- Adjusted Rate	Current 8-Year Trend APC	Average Malignant Deaths Per Year	Age- Adjusted Rate	Current 8-Year Trend APC
State	775	22.2	*1.4	326	9.2	-0.7
Baker	5	20.6	^	3	10.0	^
Benton	13	18.6	-2.7	5	6.8	^
Clackamas	75	22.6	-0.3	32	9.9	-0.2
Clatsop	8	18.5	^	4	8.1	^
Columbia	13	30.6	1.4	5	12.9	^
Coos	20	23.6	1.7	8	9.2	^
Crook	4	19.4	^	2	7.2	^
Curry	6	20.0	^	2	6.2	^
Deschutes	26	21.8	4.6	10	8.2	^
Douglas	29	23.0	-4.8	12	9.0	-7.1
Gilliam	1	^	^	0	^	^
Grant	2	24.7	^	1	^	^
Harney	2	18.8	^	1	^	^
Hood River	5	23.8	^	2	7.8	^
Jackson	53	25.4	*8.1	16	7.4	1.8
Jefferson	4	22.2	^	2	11.2	^
Josephine	23	22.0	4.6	11	9.5	-0.1
Klamath	14	20.2	9.5	7	9.2	^
Lake	3	28.6	^	1	^	^
Lane	72	21.2	*5.6	30	8.8	0.4
Lincoln	12	19.6	2.4	7	11.0	^
Linn	20	17.9	2.7	11	9.5	0.4
Malheur	6	19.6	^	2	6.9	^
Marion	61	21.9	1.1	26	9.1	1.5
Morrow	2	16.8	^	1	^	^
Multnomah	147	23.2	-0.9	61	9.8	-2.6
Polk	14	20.8	1.2	7	10.0	^
Sherman	0	^	^	1	^	^
Tillamook	6	17.2	^	3	7.6	^
Umatilla	13	19.4	-1.4	7	10.5	^
Union	6	21.3	^	3	10.3	^
Wallowa	2	23.0	^	1	^	^
Wasco	8	28.4	^	4	11.6	^
Washington	85	22.7	0.0	33	9.6	-0.9
Wheeler	0	^	^	0	^	^
Yamhill	17	20.8	0.6	7	8.6	^

Rates are per 100,000 and age-adjusted to the 2000 US Standard Population (19 age group) standard.

APC = Average Annual Percent Change

Counts may not match Center for Health Statistics data tables due to cases in unknown counties.

* Indicates a statistically significant trend.

^ Rate/Trend is not calculated due to instability of small numbers.

TABLE 4: LOW INCIDENCE CANCER SITES - CURRENT EIGHT-YEAR AVERAGE

TABLE 4-F Melanomas Years 1996-2003 Oregon Counties	INCIDENCE			MORTALITY		
	Average Invasive Cases Per Year	Age- Adjusted Rate	Current 8-Year Trend APC	Average Malignant Deaths Per Year	Age- Adjusted Rate	Current 8-Year Trend APC
State	754	21.6	2.5	112	3.2	1.3*
Baker	3	13.9	^	0	^	^
Benton	12	17.6	1.5	1	^	^
Clackamas	82	23.9	0.1	11	3.3	2.9
Clatsop	6	13.6	^	2	4.5	^
Columbia	8	16.6	^	2	4.0	^
Coos	23	29.5	-0.6	3	4.1	^
Crook	4	20.1	^	1	^	^
Curry	6	18.5	^	1	^	^
Deschutes	38	31.6	6.0	6	4.8	^
Douglas	37	31.1	2.8	3	2.5	^
Gilliam	1	^	^	0	^	^
Grant	1	^	^	1	^	^
Harney	1	^	^	0	^	^
Hood River	4	19.6	^	1	^	^
Jackson	50	25.4	-1.4	8	3.9	^
Jefferson	2	13.1	^	1	^	^
Josephine	17	18.3	3.9	4	4.0	^
Klamath	8	12.1	^	2	3.4	^
Lake	2	23.5	^	1	^	^
Lane	80	24.0	-1.5	10	3.0	^
Lincoln	8	15.0	^	3	4.8	^
Linn	20	18.0	1.3	3	2.9	^
Malheur	4	11.2	^	1	^	^
Marion	52	18.9	8.6*	9	3.3	^
Morrow	2	23.4	^	1	^	^
Multnomah	135	20.6	5.2*	17	2.7	-0.9
Polk	12	17.8	7.2*	1	^	^
Sherman	0	^	^	0	^	^
Tillamook	7	23.1	^	2	6.1	^
Umatilla	11	16.1	-2.7	2	2.7	^
Union	5	20.5	^	1	^	^
Wallowa	2	20.4	^	0	^	^
Wasco	5	19.9	^	1	^	^
Washington	93	23.3	2.0	11	3.1	5.1
Wheeler	1	^	^	0	^	^
Yamhill	15	18.1	4.1	3	3.5	^

Rates are per 100,000 and age-adjusted to the 2000 US Standard Population (19 age group) standard.

APC = Average Annual Percent Change

Counts may not match Center for Health Statistics data tables due to cases in unknown counties.

* Indicates a statistically significant trend.

^ Rate/Trend is not calculated due to instability of small numbers.

TABLE 4: LOW INCIDENCE CANCER SITES - CURRENT EIGHT-YEAR AVERAGE

TABLE 4-G Oral/Pharynx Cancer Years 1996-2003 Oregon Counties	INCIDENCE			MORTALITY		
	Average Invasive Cases Per Year	Age- Adjusted Rate	Current 8-Year Trend APC	Average Malignant Deaths Per Year	Age- Adjusted Rate	Current 8-Year Trend APC
State	397	11.3	-1.5*	104	2.9	-3.3
Baker	2	9.2	^	1	^	^
Benton	5	7.0	^	1	^	^
Clackamas	38	11.3	1.8	10	3.1	^
Clatsop	4	9.9	^	2	4.1	^
Columbia	6	13.6	^	1	^	^
Coos	12	14.6	1.0	3	3.6	^
Crook	1	^	^	0	^	^
Curry	4	11.6	^	1	^	^
Deschutes	12	9.3	-3.8	3	2.6	^
Douglas	15	11.1	-12.9*	4	3.1	^
Gilliam	1	^	^	0	^	^
Grant	1	^	^	0	^	^
Harney	1	^	^	0	^	^
Hood River	2	7.6	^	1	^	^
Jackson	25	12.0	-0.8	6	2.8	^
Jefferson	2	10.8	^	1	^	^
Josephine	12	11.0	-2.0	4	3.6	^
Klamath	6	8.5	^	3	3.5	^
Lake	1	^	^	0	^	^
Lane	37	10.9	-0.6	8	2.4	^
Lincoln	10	16.2	^	3	4.5	^
Linn	13	11.5	0.3	5	3.9	^
Malheur	3	8.3	^	1	^	^
Marion	30	10.9	-4.9	6	2.3	^
Morrow	2	16.3	^	0	^	^
Multnomah	87	14.1	-1.6	24	3.8	-3.5
Polk	6	8.7	^	2	2.6	^
Sherman	0	14.9	^	0	^	^
Tillamook	4	11.9	^	1	^	^
Umatilla	7	9.8	^	2	2.5	^
Union	2	7.1	^	1	^	^
Wallowa	0	^	^	0	^	^
Wasco	4	11.9	^	1	^	^
Washington	38	10.4	-2.5	8	2.2	^
Wheeler	1	^	^	0	^	^
Yamhill	8	10.2	^	2	2.0	^

Rates are per 100,000 and age-adjusted to the 2000 US Standard Population (19 age group) standard.

APC = Average Annual Percent Change

Counts may not match Center for Health Statistics data tables due to cases in unknown counties.

* Indicates a statistically significant trend.

^ Rate/Trend is not calculated due to instability of small numbers.

TABLE 4: LOW INCIDENCE CANCER SITES - CURRENT EIGHT-YEAR AVERAGE

TABLE 4-H Urinary Bladder Cancer Years 1996-2003 Oregon Counties	INCIDENCE			MORTALITY		
	Average Invasive Cases Per Year	Age- Adjusted Rate	Current 8-Year Trend APC	Average Malignant Deaths Per Year	Age- Adjusted Rate	Current 8-Year Trend APC
State	829	23.6	-0.5	172	4.8	*2.0
Baker	4	17.8	^	2	6.9	^
Benton	13	19.8	-2.7	2	3.0	^
Clackamas	81	25.1	-1.7	17	5.2	7.0
Clatsop	9	21.0	^	3	5.9	^
Columbia	13	31.3	1.8	3	6.4	^
Coos	27	30.5	-2.9	6	6.4	^
Crook	5	24.4	^	1	^	^
Curry	11	27.3	-3.8	3	6.4	^
Deschutes	32	26.5	8.4	5	4.0	^
Douglas	32	23.3	-1.1	7	4.8	^
Gilliam	1	^	^	0	^	^
Grant	2	20.6	^	1	^	^
Harney	2	24.6	^	1	^	^
Hood River	4	17.5	^	1	^	^
Jackson	56	25.0	-0.3	12	5.1	-6.2
Jefferson	3	15.2	^	1	^	^
Josephine	30	25.7	-2.1	7	6.3	^
Klamath	18	24.6	-0.7	3	4.5	^
Lake	2	22.7	^	0	^	^
Lane	78	22.7	2.6	19	5.5	5.6
Lincoln	15	23.0	-9.1	3	4.3	^
Linn	27	23.2	-4.0	7	5.7	^
Malheur	7	19.5	^	1	^	^
Marion	64	22.9	0.2	12	4.1	2.7
Morrow	2	20.0	^	0	^	^
Multnomah	143	23.5	-2.5	30	4.8	-0.2
Polk	14	19.6	-0.1	2	2.9	^
Sherman	1	^	^	0	^	^
Tillamook	10	26.4	-4.5	2	4.3	^
Umatilla	14	20.7	1.3	3	4.7	^
Union	7	25.0	^	1	^	^
Wallowa	2	18.8	^	1	^	^
Wasco	8	24.7	^	1	^	^
Washington	72	21.3	0.5	13	3.9	2.1
Wheeler	0	^	^	0	^	^
Yamhill	21	26.7	-0.6	3	3.7	^

Rates are per 100,000 and age-adjusted to the 2000 US Standard Population (19 age group) standard.

APC = Average Annual Percent Change

Counts may not match Center for Health Statistics data tables due to cases in unknown counties.

* Indicates a statistically significant trend.

^ Rate/Trend is not calculated due to instability of small numbers.

XI. APPENDICES

REPORTABLE INCIDENCE CASES

ICD-9-CM DIAGNOSIS CODE (W/ PREFERRED ICDO-3 TERMINOLOGY)

Reportable cases (with diagnosis date 2004 or later) include all invasive and *in situ* malignant neoplasms and benign specified neoplasms of the brain and CNS as listed below:

ICD-9-CM	Terminology
140.0 – 208.9	Malignant neoplasms (primary and secondary)
225.0	Benign neoplasm of brain, NOS
225.1	Benign neoplasm of cranial nerves
225.2	Benign neoplasm of cerebral meninges; cerebral meningioma
225.3	Benign neoplasm of spinal cord, cauda equina
225.4	Benign neoplasm of spinal meninges; spinal meningioma
225.8	Benign neoplasm of other specified sites of nervous system
225.9	Benign neoplasm of nervous system, part unspecified
227.3	Benign neoplasm of pituitary, craniopharyngeal duct, craniobuccal pouch, hypophysis, Rathke's pouch, sella turcica
227.4	Benign neoplasm of pineal gland, pineal body
230.0 – 234.9	Carcinoma <i>in situ</i> (excludes 232-skin* and 233.1-cervix uteri*)
237.0	Neoplasm of uncertain behavior of pituitary gland and craniopharyngeal duct
237.1	Neoplasm of uncertain behavior of pineal gland
237.5	Neoplasm of uncertain behavior of brain and spinal cord
237.6	Neoplasm of uncertain behavior of meninges; NOS, cerebral, spinal
237.70	Neurofibromatosis, Unspecified von Recklinghausen Disease
237.71**	Neurofibromatosis, Type One von Recklinghausen Disease
237.72	Neurofibromatosis, Type Two von Recklinghausen Disease
237.9	Neoplasm of uncertain behavior of other/unspecified parts of nervous system; cranial nerves
238.4	Polycythemia vera
238.6	Solitary plasmacytoma, extramedullary plasmacytoma
238.7	Other lymphatic and hematopoietic tissue diseases: Chronic myeloproliferative disease Myelosclerosis with myeloid metaplasia Essential thrombocythemia Refractory cytopenia with multilineage dysplasia Myelodysplastic syndrome with 5q syndrome Therapy-related myelodysplastic syndrome
239.0 – 239.9**	Neoplasms of unspecified nature
273.2	Gamma heavy chain disease; Franklin disease
273.3	Waldenstrom macroglobulinemia
284.9	Refractory anemia without sideroblasts; Refractory anemia, unspecified
285.0	Refractory anemia with ringed sideroblasts; excess blasts; with excess blasts in transformation
288.3	Hypereosinophilic Syndrome
289.8	Acute myelofibrosis

Note: Reportable diagnoses include VIN III, VAIN III, AIN III, juvenile astrocytoma, pilocytic astrocytoma and piloid astrocytoma.

* Exclusions: Basal/squamous cell carcinoma of skin, except of the genitalia, and *in situ* carcinoma of the cervix uteri, and PIN III are not reportable.

** Code 237.71 and Codes 239.0 – 239.9 may not be reportable, however, these diagnoses may indicate a reportable condition and should be reviewed.

Note: Prior to 2004, tumors of the brain and central nervous system were not reportable.

REPORTABLE MORTALITY ICD-10 CODES

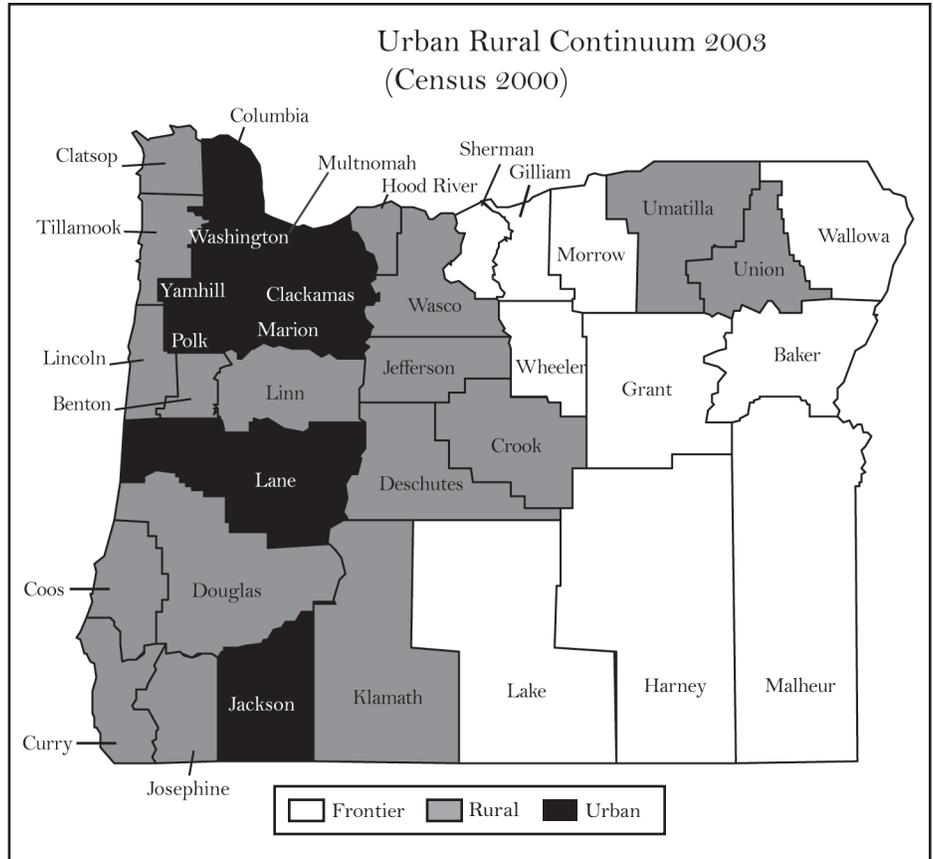
**Mortality Recodes for Cancers
Newly Reportable in 2001**

ICD-9	ICD-O Histology (Site C42.1)	ICD-10	Added to Miscellaneous Mortality Category
238.4 207.1	9950/3	D45	Polycythemia Vera
284.9 238.7 285.0	9980/3 9982/3 9983/3 9984/3 9985/3 9986/3 9987/3 9989/3	D46	Myelodysplastic Syndrome
238.7	9960/3 9961/3	D47.1	Chronic myeloproliferative disease (myelofibrosis with myeloid metaplasia, myeloproliferative disease, NOS, myelosclerosis (megakaryocytic) with myeloid metaplasia)
238.7	9962/3	D47.3	Essential (hemorrhagic) thrombocytopenia (idiopathic hemorrhagic thrombocytopenia)

URBAN/RURAL CONTINUUM, CODES FOR OREGON 2003

Urban/Rural Continuum
Codes for Oregon, 2003

County	Density Designation
Baker	Frontier
Benton	Rural
Clackamas	Urban
Clatsop	Rural
Columbia	Urban
Coos	Rural
Crook*	Rural
Curry	Rural
Deschutes	Rural
Douglas	Rural
Gilliam	Frontier
Grant	Frontier
Harney	Frontier
Hood River	Rural
Jackson	Urban
Jefferson	Rural
Josephine	Rural
Klamath	Rural
Lake	Frontier
Lane	Urban
Lincoln	Rural
Linn	Rural
Malheur	Frontier
Marion	Urban
Morrow	Frontier
Multnomah	Urban
Polk	Urban
Sherman	Frontier
Tillamook	Rural
Umatilla	Rural
Union	Rural
Wallowa	Frontier
Wasco	Rural
Washington	Urban
Wheeler	Frontier
Yamhill	Urban



* Classified as Frontier in previous reports based on 1990 census

RESEARCHER ASSURANCES FORM

Assurances Form

The undersigned agrees to (initial each statement, sign and date):

- ___ accept responsibility for the ethical conduct of the study and the protection of the rights, privacy and welfare of the individuals whose private health information is retained in the OSCaR registry;
- ___ conduct this study in compliance with the protocol as reviewed and approved by OSCaR and/or the Advisory Committee;
- ___ submit all proposed study changes, including those accepted by an IRB, to OSCaR to seek approval prior to implementing changes. This includes but is not limited to change in venue, change in PI or other investigators, change in study focus, and any change requiring IRB approval;
- ___ report upon discovery all unanticipated problems, protocol violations, and breaches of confidentiality to OSCaR;
- ___ submit copies of literature and formal presentations generated using OSCaR data;
- ___ pay all relevant fees prior to receiving OSCaR data (see Schedule of Research Fees); and
- ___ complete dataset received from OSCaR will be destroyed upon conclusion of the study and OSCaR will be informed.

I agree to comply with the above requirements. I attest that information in this Research Proposal Review Form and attachments are true and complete. I also attest that I have no conflicts of interests to disclose regarding this study.

Non-compliance to this agreement may result in termination of the study approval. This means approval for OSCaR study data may be revoked. If this occurs, proof is required that all data obtained from OSCaR for the purposes of this study are destroyed. If this occurs, no investigator on this study may benefit from the use of OSCaR data either monetarily, including grant funding, nor through publications, presentations, or any other means.

_____ Date

_____ (P.I. signature)

PATIENT NOTIFICATION LETTER



Oregon
Ted Kulongoski, Governor

Department of Human Services
Health Services
Oregon State Cancer Registry
800 NE Oregon Street, Suite 730
Portland, OR 97232-2162
(503) 731-4858 Telephone
(503) 731-4848 Fax
(971) 673-0372 TTY-Nonvoice

September 15, 2006

Dear _____:

In 1995, the Oregon State Legislature established the Oregon State Cancer Registry (OSCaR). At the time, Oregon was one of only a few states without a statewide cancer registry. Today, every state has one. The purpose of the registry is to understand how cancer affects Oregonians and what can be done to fight it. Information from the registry is used to target early detection of cancer and prevention efforts, develop screening and treatment programs, and evaluate cancer clusters. Registry information is also used in academic research studying the causes and/or treatment of specific cancer types.

Sometime in the last couple of years, you had a medical evaluation that showed cancer or a closely related condition. This letter is to inform you that your case has been reported to OSCaR, in compliance with Oregon law (statute ORS 432.520). Information such as your name, address, age, sex, characteristics and type of cancer, and details of diagnosis and treatment are included in this HIGHLY CONFIDENTIAL record. The information in the registry is granted legal protection under Oregon law and cannot be accessed even by court subpoena (statute ORS 432.530).

So that this information can help in future cancer research, we are enclosing a form on which you can indicate your willingness to participate in research studies. Before the release of any confidential data, all research studies must be reviewed for compliance with strict criteria as provided by law (statute 432.540). If you do not return the research participation form, researchers will consult with your physician if you qualify for a study. Regardless of how you are contacted, your participation in any research project is strictly voluntary and you may decline at any time.

If you have any questions, please contact OSCaR's Program Manager at (503) 731-4858 or via email OSCaR.OHD@state.or.us. Visit our website for general information about OSCaR, to view our latest annual report, *Cancer in Oregon*, and to see a list of current research activities: www.healthoregon.org/oscar

Sincerely yours,

Richard Leman, MD
Medical Epidemiologist, Oregon State Cancer Registry

SEER SITE RECODE ICD-O-3 DEFINITION

Site Group	Primary Site	Histologic Type
Oral cavity and Pharynx		
Lip	C000-C009	
Tongue	C019-C029	
Salivary gland	C079-C089	
Floor of mouth	C040-C049	
Gum & other mouth	C030-C039,C050-C059,C060-C069	
Nasopharynx	C110-C119	
Tonsil	C090-C099	
Oropharynx	C100-C109	
Hypopharynx	C129,C130-C139	excluding 9590-9989, and sometimes 9050-9055, 9140*
Other Oral Cavity and Pharynx	C140,C142-C148	
Digestive system		
Esophagus	C150-C159	
Stomach	C160-C169	excluding 9590-9989, and sometimes 9050-9055, 9140*
Small intestine	C170-C179	
Colon and Rectum		
Colon excluding rectum		
Cecum	C180	
Appendix	C181	
Ascending Colon	C182	
Hepatic Flexure	C183	
Transverse Colon	C184	
Splenic Flexure	C185	
Descending Colon	C186	
Sigmoid Colon	C187	
Large Intestine, NOS	C188-C189,C260	excluding 9590-9989, and sometimes 9050-9055, 9140*
Rectum & Rectosigmoid Junction		
Rectosigmoid Junction	C199	
Rectum	C209	excluding 9590-9989, and sometimes 9050-9055, 9140*
Anus, Anal Canal & Anorectum	C210-C212,C218	
Liver & Intrahepatic Bile Duct		
Liver	C220	
Intrahepatic Bile Duct	C221	
Gallbladder	C239	
Other Biliary	C240-C249	
Pancreas	C250-C259	
Retroperitoneum	C480	
Peritoneum, Omentum & Mesentery	C481-C482	excluding 9590-9989, and sometimes 9050-9055, 9140*
Other Digestive Organs	C268-C269,C488	
Respiratory System		
Nose, Nasal Cavity and Middle Ear	C300-C301,C310-C319	
Larynx	C320-C329	
Lung and Bronchus	C340-C349	
Pleura	C384	
Trachea, Mediastinum/Other Respiratory	C339,C381-C383,C388,C390,C398,C399	excluding 9590-9989, and sometimes 9050-9055, 9140*

SEER SITE RECODE ICD-O-3 DEFINITION (CONTINUED)

Bones and joints	C400-C419	excluding 9590-9989, and sometimes 9050-9055, 9140*
Soft tissue including Heart	C380,C470-C479,C490-C499	
Skin excluding Basal and Squamous		
Melanomas of the Skin	C440-C449	8720-8790
Other Non-Epithelial Skin	C440-C449	excluding 8000-8005, 8010- 8045, 8050-8084, 8090-8110, 8720-8790, 9590-9989, and sometimes 9050-9055, 9140*
Breast	C500-C509	excluding 9590-9989, and sometimes 9050-9055, 9140*
Female Genital System		
Cervix	C530-C539	excluding 9590-9989, and sometimes 9050-9055, 9140*
Corpus and Uterus, NOS		
Corpus	C540-C549	
Uterus, NOS	C559	
Ovary	C569	
Vagina	C529	
Vulva	C510-C519	
Other Female Genital Organs	C570-C589	
Male Genital System		
Prostate	C619	excluding 9590-9989, and sometimes 9050-9055, 9140*
Testis	C620-C629	
Penis	C600-C609	
Other Male Genital Organs	C630-C639	
Urinary System		
Urinary Bladder	C670-C679	excluding 9590-9989, and sometimes 9050-9055, 9140*
Kidney and Renal Pelvis	C649,C659	
Ureter	C669	
Other Urinary Organs	C680-C689	
Eye & Orbit	C690-C699	excluding 9590-9989, and sometimes 9050-9055, 9140*
Brain and Other Nervous System		
Brain	C710-C719	excluding 9530-9539, 9590- 9989, and sometimes 9050- 9055, 9140*
Cranial Nerves Other Nervous System	C710-C719	9530-9539
	C700-C709,C720-C729	excluding 9590-9989, and sometimes 9050-9055, 9140*
Endocrine system		
Thyroid	C739	excluding 9590-9989, and sometimes 9050-9055, 9140*
Other Endocrine (including Thymus)	C379,C740-C749,C750-C759	
Lymphomas		
Hodgkin Lymphoma		9650-9667
Hodgkin—Nodal	C024,C098-C099,C111, C142,C379,C422,C770-C779	
Hodgkin—Extranodal	All other sites	

SEER SITE RECODE ICD-O-3 DEFINITION (CONTINUED)

Non-Hodgkin lymphoma		
NHL—Nodal	C024,C098,C099,C111,C142, C379,C422,C770-C779	9590-9596, 9670- 9671, 9673, 9675, 9678-9680, 9684, 9687, 9689-9691, 9695, 9698-9702, 9705, 9708-9709, 9714-9719, 9727- 9729, 9823, 9827
NHL— Extranodal	All sites except C024, C098-C099, C111, C142, C379, C422, C770-C779	9590-9596, 9670- 9671, 9673, 9675, 9678-9680, 9684, 9687, 9689-9691, 9695, 9698-9702, 9705, 9708-9709, 9714-9719, 9727-9729
	All sites except C024, C098-C099, C111, C142, C379, C420-C422, C424, C770- C779	9823, 9827
Myeloma		9731-9732, 9734
Leukemia		
Lymphocytic Leukemia		
Acute Lymphocytic Leukemia		9826, 9835-9837
Chronic Lymphocytic Leukemia	C420-C421,C424	9823
Other Lymphocytic Leukemia		9820, 9832-9834, 9940
Myeloid and Monocytic Leukemia		
Acute Myeloid Leukemia		9840, 9861, 9866, 9867, 9871- 9874, 9895-9897, 9910, 9920
Acute Monocytic Leukemia		9891
Chronic Myeloid Leukemia		9863, 9875, 9876, 9945, 9946
Other Myeloid/Monocytic Leukemia		9860, 9930
Other Leukemia		
Other Acute Leukemia		
Other Chronic Leukemia		9801, 9805, 9931
Aleukemic, Subleukemic and NOS		9733, 9742, 9800, 9831, 9870, 9948, 9963, 9964
	C420-C421, C424	9827
Mesothelioma+		9050-9055
Kaposi's Sarcoma+		9140
Miscellaneous		9740-9741, 9750- 9758, 9760- 9769, 9950, 9960-9962, 9970, 9975, 9980, 9982-9987, 9989
	C760-C768, C809	excluding 9590-9989, and sometimes 9050-9055, 9140*
	C42-0-C424	
	C770-C779	
Invalid	Site or histology code not within valid range or site code not found in this table.	

+ The Site Recode variable can be created with or without Mesothelioma (9050-9055) and Kaposi Sarcoma (9140) as separate groupings. The table above documents both possibilities.

SEER CAUSE OF DEATH RECODES

Cancer Causes of Death	ICD-9 (1979-1998) #	ICD-10 (1999+) #
All Malignant Cancers	140-208, 238.6	C00-C97
Oral Cavity and Pharynx		
Lip	140	C00
Tongue	141	C01-C02
Salivary Gland	142	C07-C08
Floor of Mouth	144	C04
Gum and Other Mouth	143, 145	C03, C05-C06
Nasopharynx	147	C11
Tonsil	146.0-146.2	C09
Oropharynx	146.3-146.9	C10
Hypopharynx	148	C12-C13
Other Oral Cavity and Pharynx	149	C14
Digestive System		
Esophagus	150	C15
Stomach	151	C16
Small Intestine	152	C17
Colon and Rectum		
Colon excluding Rectum	153, 159.0	C18, C26.0
Rectum and Rectosigmoid Junction	154.0-154.1	C19-C20
Anus, Anal Canal and Anorectum	154.2-154.3, 154.8	C21
Liver and Intrahepatic Bile Duct		
Liver	155.0, 155.2	C22.0, C22.2-C22.4, C22.7, C22.9
Intrahepatic Bile Duct	155.1	C22.1
Gallbladder	156	C23
Other Biliary	156.1-156.2, 156.8-156.9	C24
Pancreas	157	C25
Retroperitoneum	158	C48.0
Peritoneum, Omentum and Mesentery	158.8-158.9	C45.1+, C48.1-C48.2
Other Digestive Organs	159.8-159.9	C26.8-C26.9, C48.8
Respiratory System		
Nose, Nasal Cavity and Middle Ear	160	C30-C31
Larynx	161	C32
Lung and Bronchus	162.2-162.5, 162.8-162.9	C34
Pleura	163	C38.4, C45.0+
Trachea, Mediastinum/Other Respiratory Organs	162.0, 164.2-164.3, 164.8-164.9, 165	C33, C38.1-C38.3, C38.8, C39
Bones and Joints		
	170	C40-C41
Soft Tissue including Heart		
	164.1, 171	C47, C49, C38.0, C45.2+
Skin excluding Basal and Squamous		
Melanoma of the Skin	172	C43
Other Non-Epithelial Skin	173	C44, C46+
Breast		
	174-175	C50

SEER CAUSE OF DEATH RECODES (CONTINUED)

Female Genital System		
Cervix Uteri	180	C53
Corpus and Uterus, NOS		
Corpus Uteri	182	C54
Uterus, NOS	179	C55
Ovary	183	C56
Vagina	184	C52
Vulva	184.1-184.4	C51
Other Female Genital Organs	181, 183.2-183.5, 183.8-183.9, 184.8-184.9	C57-C58
Male Genital System		
Prostate	185	C61
Testis	186	C62
Penis	187.1-187.4	C60
Other Male Genital Organs	187.5-187.9	C63
Urinary System		
Urinary Bladder	188	C67
Kidney and Renal Pelvis	189.0-189.1	C64-C65
Ureter	189.2	C66
Other Urinary Organs	189.3-189.4, 189.8-189.9	C68
Eye and Orbit		
	190	C69
Brain and Other Nervous System		
	191, 192	C70, C71, C72
Endocrine System		
Thyroid	193	C73
Other Endocrine including Thymus	164.0, 194	C37, C74-C75
Lymphoma		
Hodgkin Lymphoma	201	C81
Non-Hodgkin Lymphoma	200, 202.0-202.2, 202.8-202.9	C82-C85, C96.3
Myeloma		
	203.0, 238.6	C90.0, C90.2
Leukemia		
Lymphocytic Leukemia		
Acute Lymphocytic Leukemia	204	C91.0
Chronic Lymphocytic Leukemia	204.1	C91.1
Other Lymphocytic Leukemia	202.4, 204.2, 204.8-204.9	C91.2-C91.4, C91.7, C91.9
Myeloid and Monocytic Leukemia		
Acute myeloid	205.0, 207.0, 207.2	C92.0, C92.4-C92.5, C94.0, C94.2
Acute Monocytic Leukemia	206	C93.0
Chronic Myeloid Leukemia	205.1	C92.1
Other Myeloid/Monocytic Leukemia	205.2-205.3, 205.8-205.9, 206.1- 206.2, 206.8-206.9	C92.2-C92.3, C92.7, C92.9, C93.1- C93.2, C93.7, C93.9
Other Leukemia		
Other Acute Leukemia	208	C94.4, C94.5, C95.0
Aleukemic, subleukemic and NOS	203.1, 207.1, 207.8, 208.1- 208.2, 208.8-208.9	C90.1, C91.5, C94.1, C94.3, C94.7, C95.1, C95.2, C95.7, C95.9
Mesothelioma (ICD-10 only) +		
	N/A	C45+
Kaposi Sarcoma (ICD-10 only) +		
	N/A	C46+
Miscellaneous Malignant Cancer		
	159.1, 195-199, 202.3, 202.5- 202.6, 203.8	C26.1, C45.7+, C45.9+, C76-C80, C88, C96.0-C96.2, C96.7, C96.9, C97

All ICD codes are tested for validity prior to generating this variable. Those deemed invalid are classified as Unknown/missing/invalid COD. Those deemed valid but not meeting the definition of any above grouping are classified as Other Cause of Death.

+ This variable can be created with or without Mesothelioma (C45) and Kaposi Sarcoma (C46) as separate groupings. The table above documents both possibilities. Note: this is only possible with ICD-10.

GLOSSARY

African American – The race rates for African Americans include all cases classified as African American regardless of ethnicity (Hispanic origin).

Age – The age of the patient is in completed years (rounded) at the time of diagnosis or death.

Age-Adjusted Rate – Since cancer rates tend to vary with age, and since populations vary with respect to their age distribution, incidence and mortality rates are age-adjusted to allow comparison of rates between different populations with different age distributions. In this report, age-adjusted rates are calculated by the direct method, using the age distribution of the 2000 United States standard population with 19 age groups. All age-adjusted rates are expressed per 100,000 individuals per year and include rates of invasive cancer only.

Age-Specific Incidence Rate – The number of new cases diagnosed per 100,000 individuals over a specified time period for a specified age group. Age-specific rates show the variation in cancer incidence by age group and are presented for males, females, and for the total population. Age groups are divided into five-year age groupings.

American Indian/Alaskan Native – The race rates for American Indian/Alaskan Natives include all cases classified as American Indian/Alaskan Native regardless of ethnicity (Hispanic origin).

APC (Trend) – Average Annual Percent Change, or trend, is the average percent change in the annual rate among years for time period analyzed. This is calculated using SEER methodology.

Asian/Pacific Islander – The race rates for Asian/Pacific Islander include all cases classified as Asian or Pacific Islander regardless of ethnicity (Hispanic origin).

Benign – A benign tumor has abnormal growth without cancerous behavior.

Cancer Site – The human organ or system in which the malignancy originates; the anatomical site.

Carcinogen – A substance scientifically proven to cause cancer.

CDC – Centers for Disease Control and Prevention is a federal agency that develops and applies disease prevention and control, environmental health, health promotion and education activities to improve the health of the people of the United States.

Childhood Cancer – Cancer occurring in an individual between the ages of 0 and 14 is classified as a childhood cancer.

Colonoscopy – An examination of the entire colon with a flexible scope that allows a doctor to see and closely inspect the inside of the entire colon for signs of cancer or polyps.

Crude Rate – The number of new cases of cancer, or cancer deaths, during the year expressed as a rate per 100,000 persons in the population, without regard to the age distribution of the population.

Current Trend – Trend based on the latest five years of available data.

Ethnicity – Rates based on ethnicity are for persons of Hispanic origin only.

Fecal Occult Blood Test (FOBT) – A chemical test to detect blood in stool, used as a screening test for colorectal cancer.

Frontier County – Frontier counties are counties with a population of < 6 people per square mile.

Healthy People 2010 – Healthy People 2010 is the prevention agenda for the United States. It is a statement of national health objectives designed to identify the most significant preventable threats to health and to establish national goals to reduce these threats.

Hispanic – An ethnic category that is not mutually exclusive from whites or other racial groups.

Histology – Also known as morphology, this describes the cell type of the tumor, its structure, and biologic activity.

Historical Trend – Trend based on all available years of data.

ICCC – The International Classification of Childhood Cancer (ICCC) is used for tumors occurring in children, ages 0-14, and is based on tumor morphology rather than the site of the tumor, as for adults.

ICD-9 – The Ninth Revision of the International Classification of Diseases. Mortality data for years 1996-1998 are recorded using ICD-9. This classification system is not directly compatible with the ICD-O classification system used for cancer reporting.

ICD-10 – The 10th Revision of the International Classification of Diseases. Mortality data recording converted to ICD-10 beginning with death year 1999. This classification system mirrors the ICD-O system used for cancer reporting.

ICD-O-3 – The Third Edition of the International Classification of Diseases for Oncology. A further classification of the ICD system designed for use specifically for cancer. Cancer incidence is reported to the Registry using the ICD-O system. The ICD-10 cancer site classifications are based on this system.

Incidence – The rate of new cases of a given type of cancer diagnosed in a population during a specified time period. Cancer incidence is not the same as the number of Oregonians diagnosed with cancer since one person could be diagnosed with more than one cancer.

In Situ Cancer – An *in situ* cancer is a tumor that fulfills all microscopic criteria for malignancy but does not invade or penetrate surrounding tissue. *In situ* cancers are not included in the calculation of incidence rates and thus are not presented in incidence tables, with the exception of *in situ* bladder cancer. However, *in situ* cancers are classified as early stage and are included in the sections presenting stage at diagnosis.

Invasive Cancer – A malignant tumor that has penetrated surrounding tissue. These are cancers diagnosed in the local, regional, or metastatic stages – no *in situ* diagnoses with the exception of urinary bladder cancers.

Localized – A cancer of localized stage is a tumor that is invasive but remains restricted to the site of origin. Localized cancers are classified as early stage cancers.

Leukemias – Cancers that develop in blood-forming tissue.

Lymphomas – Cancers that develop from cells in the lymphatic system

Malignant – A tumor made up of cancer cells of a type that can spread to other parts of the body is considered malignant.

Mammography – The use of x-rays to create a picture of the breast (mammogram) that can show signs of breast cancer before it can be felt.

Metastatic/Distant – The most advanced stage of a cancer in which cells from the original tumor break away, travel to other parts of the body, and continue to grow. Although the cancer has spread to an additional site or sites, it is still named after the original site of the tumor. These cancers are classified as late-stage cancers.

Morbidity – The incidence or prevalence (i.e., the number of people living with cancer) of a disease in a population.

Mortality – The rate of deaths with cancer as the underlying cause of death in a population during a specified time period.

M/I Ratio – The M/I (mortality-to-incidence) ratio provides a measure of disease severity. The M/I ratio is the number of deaths divided by the number of invasive cases (for a particular cancer). The higher the value, the poorer the prognosis for that cancer. It is possible to have an M/I Ratio exceed 1.0 if the number of deaths for a population is greater than the number of new diagnoses during the specific time period.

NAACCR (North American Association of Central Cancer Registries) – NAACCR is a professional organization that develops and promotes uniform data standards for cancer registration; provides education and training; certifies population-based registries; aggregates and publishes data from central cancer registries; and promotes the use of cancer surveillance data and systems for cancer control and epidemiologic research, public health programs, and patient care to reduce the burden of cancer in North America.

Non-Hispanic – An ethnic category that is not mutually exclusive from whites or other racial groups.

NPCR (National Program of Cancer Registries) – NPCR was established by the Centers for Disease Control and Prevention (with the passage of Public Law 102-515). NPCR collects information on cancer cases from registries covering 96% of the nation's population.

Papanicolaou (Pap) Smear – The collection of cells from the cervix (the lower, narrow end of the uterus that forms a canal between the uterus and vagina) and their examination under a microscope.

Race – There are four, mutually exclusive race categories used in this report: African American, American Indian/Alaskan Native, Asian/Pacific Islander, and White.

Regional – An invasive malignant tumor that has spread by direct extension to adjacent organs or tissues and/or has spread to regional lymph nodes, but appears to have spread no further. Regional cancers are classified as late-stage cancers.

Routine Cancer Screening – For purposes of analysis, routine cancer screening is defined as follows:

Breast Cancer Screening – Routine mammography has been defined as receipt of a mammogram by women, ages 52-64, within the past two years. A minimum age of 52 is used to allow women two years to receive their first routine mammogram. This is the definition used for analysis purposes for this report. Now routine mammography is recommended for women starting at age 40. Subsequent reports will include screening data for both age-groups.

Cervical Cancer Screening - Routine cervical cancer screening is defined as receipt of a Pap test (within the past three years) among women 18-64 who have a cervix.

Colorectal Cancer Screening - Routine colorectal screening is defined as receipt of 1) FOBT within the last year and endoscopy within the last five years (the preferred screening method of the American Cancer Society), or 2) who have received FOBT within the last year, and/or endoscopy within the last five years, among persons age 50 or older.

Rural County – A county without a major city (50,000 people or more), not in an urbanized area, with a population of at least 100,000, and with a population density > 6 persons per square mile.

SEER (Surveillance, Epidemiology, and End Results) – A program of the National Cancer Institute, SEER is an authoritative source of information on cancer incidence and survival in the United States.

Sigmoidoscopy – An exam of the rectum and the lower part of the colon with a thin, flexible, lighted scope to find polyps, abnormal areas, and tumors.

Stage at Diagnosis – The degree to which a tumor has spread from its site of origin at the time of diagnosis. Cancer stage is often related to survival and is used to select appropriate treatment. Patients with early stage disease have better long-term survival. Detecting cancers at an early stage may lead to a reduction in mortality. The cancer stages, in order of increasing spread, are *in situ*, localized, regional, and distant. *In situ* and localized tumors are referred to as early stage tumors; regional and distant tumors are referred to as late-stage tumors. A number of cancers are also reported as unstaged (unknown stage at diagnosis).

Unstaged/Unknown – Insufficient information is available to determine the stage of disease at the time of diagnosis, or the case was reported with missing stage data. Cancer cases are often unstaged because the patient's current medical situation contraindicates clinical workup required to stage the case (often due to comorbid conditions) or because the patient decides to forego standard treatment or procedures. Unstaged/unknown cases can sometimes be classified as late-stage diagnoses, but they are removed from the stage at diagnoses analysis for this report.

Urban County – A county with at least one major city (50,000 people or more) or an urbanized area with a population of at least 100,000. Counties that experience a high degree of social and economic "attachment" to a metropolitan area are also considered part of that metropolitan area.

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