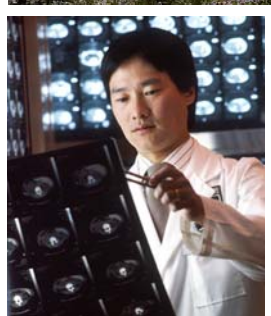
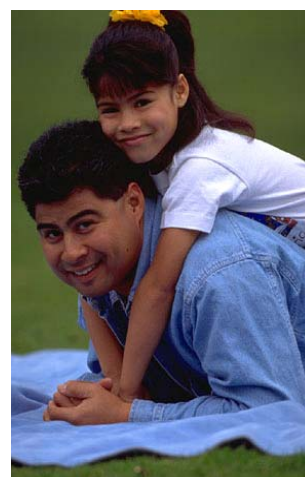

Washington State

Comprehensive Cancer Control Plan



2004-2008

Comprehensive Cancer Control



PARTNERSHIP
Working together to reduce cancer incidence, morbidity, and mortality in Washington State.



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Contents

Acknowledgements.....	3
Executive Summary.....	9
Introduction.....	15
Washington Demographics	25
The Burden of Cancer in Washington	29
Primary Prevention.....	37
Tobacco Use and Exposure.....	37
Alcohol.....	45
Nutrition, Physical Activity, and Obesity.....	48
Sun Exposure.....	62
Infectious Agents.....	65
Environmental Carcinogens.....	70
Family History of Cancer	79
Secondary Prevention.....	83
Screening for Breast Cancer.....	83
Screening for Cervical Cancer.....	90
Screening for Colorectal Cancer.....	94
Screening for Prostate Cancer	99
Medical Care	105
Access to Cancer Care	106
Quality of Cancer Care	111
Psychosocial Services, Palliative Care, and End-of-Life Care	116
Integrating Complementary Therapy into Cancer Care	120
Informed Consent.....	124
Appendices	129
Endnote References	159

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Comprehensive Cancer Control Partnership

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The Coordination Team provided management, oversight, and leadership for the plan development process. They also provided the final review of the plan. Their contribution of time and expertise is greatly appreciated.

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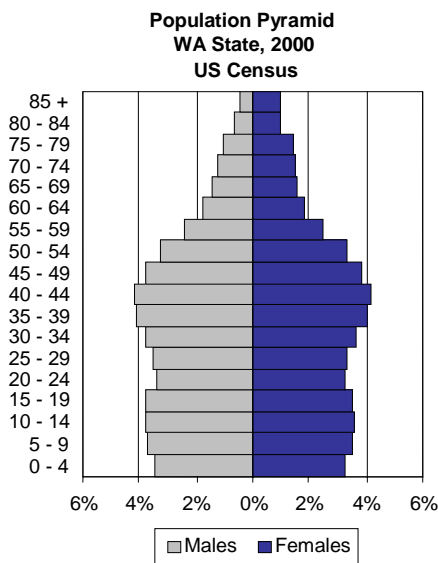
reviewed and edited the topic of screening for breast cancer. Debra Doyle and Angela Brothers reviewed and edited the topic of family history of cancer. Jana Gasow compiled reference materials, assisted with plan organization and formatting, and did a significant amount of writing on various topics throughout the plan. Rebecca Ross designed the cover and layout of the plan. Kelley Hix formatted and coordinated the printing of the plan. Finally, Kay Koth proofread the final draft plan.

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Executive Summary

Although progress has been made in Washington to reduce the burden of cancer, much still remains to be done. Declining birth and death rates mean that Washington’s population, like that of the rest of the US, is aging. Overall cancer incidence and mortality increase with age. The population pyramid on the right shows the age distribution in Washington in 2000. The median age is now about 35 years compared to about 31 years in 1990. As the population of Washington ages, the burden of cancer will increase.



Cancer, however, is not an inevitable result of aging. Although some of the risk factors for cancer, such as aging and heredity, cannot be controlled, others can. According to the Harvard Center for Cancer Prevention, over half of all cancer deaths may be attributed to behavior-related factors such as tobacco use, diet, obesity, and sedentary lifestyle.

Public health efforts to change risk behaviors have had a measure of success. For example, smoking rates have been declining in the US since the 1960s when over 40% of the adult population smoked. Today, in Washington, about 22% of adults are current smokers. Despite reductions in smoking, lung cancer remains the leading cause of cancer death in Washington. Smoking causes about 85% of these deaths. Between 1980 and 1992, lung cancer mortality rates in Washington increased approximately 1.3% per year. However, from 1992 to 2001 this trend reversed, with mortality rates declining 0.9% per year. Continued progress in overall cancer prevention and control will depend not only on gaining new knowledge through research, but more extensively applying current knowledge to reduce known risk factors and promote effective preventive, therapeutic, and palliative care services.

The Burden of Cancer in Washington

The various forms of cancer were responsible for 10,656 deaths among Washington residents in 2000 – approximately 25% of all deaths statewide. Cancer has consistently been the leading cause of death among adults ages 45 to 74, and the second leading cause of death overall.

The number of newly diagnosed cases of cancer is on the rise. In 2000, 29,578 new cases of cancer were diagnosed in Washington residents, a 14% increase over the cases diagnosed in 1995. Based on national data, the Washington State Department of Health estimates that some form of cancer will strike one in three Washingtonians in their lifetime.

In 2000, female breast cancer was the most common cancer with 5,344 new cases diagnosed. Prostate was second with 4,235 new cases, followed by lung and bronchus (3,668), colorectal (2,911) and melanoma of the skin (2,211). These cancers comprise 62% of all new cases.

The five leading causes of cancer mortality in 2000 were lung and bronchus with 3,100 deaths, followed by colorectal (991), female breast (747), pancreatic (591), and prostate (574). Taken together, these five cancers comprise 56% of all cancer deaths.

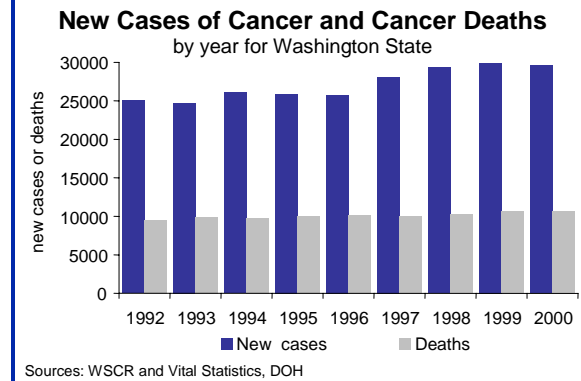
While the number of new cancer cases and cancer deaths are increasing, the age-adjusted incidence rates for all cancers combined have remained essentially constant. Moreover, with the exception of lung cancer in women, the trends in the age-adjusted mortality rates for the five leading cancers have declined between 1980 and 2001.

Comprehensive Cancer Control

Many efforts are currently underway in Washington to address the challenges cancer presents. These challenges include discovering new approaches to prevent, detect, and treat cancer; implementing effective preventive interventions and screening programs; and providing high-quality cancer care to a diverse population in a changing environment. Despite current efforts statewide, gaps in services still exist and disparities in the cancer burden remain. No single organization or agency in Washington can meet these challenges alone. A collaborative approach among key stakeholders may provide an opportunity to further reduce the burden of cancer.

The Washington Comprehensive Cancer Control Partnership (Partnership) is a statewide group of cancer care providers, researchers, public health professionals, advocates, survivors, and others interested in cancer prevention and control. The Partnership is funded by the Washington State Department of Health through a cooperative agreement with the federal Centers for Disease Control and Prevention's National Comprehensive Cancer Control Program. The purpose of the grant funding is to support a new approach to reducing the statewide burden of cancer: *comprehensive cancer control*.

Comprehensive cancer control is defined as an integrated and coordinated approach to reducing cancer incidence, morbidity, and mortality through



prevention, early detection, treatment, rehabilitation, and palliation. The important components of this definition are a focus on working together to achieve important health outcomes and the recognition of a continuum of cancer care (i.e., primary prevention through survivorship or end-of-life).

Comprehensive cancer control is an effort to improve outcomes by:

- ▶ Bringing many partners together.
- ▶ Using available data and research results.
- ▶ Implementing evidence-based solutions.
- ▶ Using limited resources more efficiently and effectively.

Reducing the Cancer Burden in Washington

The burden of cancer can be reduced by implementing effective interventions to decrease preventable cancers, detecting cancer early, and ensuring access to quality cancer care services from diagnosis through survivorship or end-of-life. Taking a collaborative approach toward comprehensive cancer control begins with the development of a plan.

The purpose of the *Washington State Comprehensive Cancer Control Plan* is to:

- ▶ Provide a framework and guide for coordinated and integrated statewide efforts to reduce the burden of cancer.
- ▶ Highlight important cancer issues for future prioritization.
- ▶ Set goals and objectives for improvement.
- ▶ Propose evidence-based or theory-based strategies to achieve goals and objectives.
- ▶ Draw interested organizations and individuals together to work collaboratively toward shared goals.

Plan Goals for Cancer Prevention and Control in Washington

The goals in the plan focus on important cancer issues in Washington across the cancer continuum. The goals are based on an assessment of state surveillance data and statistics, review of results from cancer research, and recommendations from local cancer experts and cancer care providers. The plan is organized into three major content areas: primary prevention, secondary prevention, and medical care.

The goals of the *Washington State Comprehensive Cancer Control Plan* are to:

Primary Prevention

1. Reduce the impact of **tobacco use and exposure** on cancer incidence and mortality in Washington.
2. Reduce the impact of **alcohol consumption** on cancer incidence and mortality in Washington.
3. Reduce the impact of **poor diet** on cancer incidence and mortality in Washington.
4. Reduce the impact of **physical inactivity** on cancer incidence and mortality in Washington.
5. Reduce the impact of **obesity** on cancer incidence and mortality in Washington.
6. Slow the increase in the incidence of malignant **melanoma** in Washington.
7. Reduce the impact of **infectious agents** on cancer incidence and mortality in Washington.
8. Reduce the impact of **environmental carcinogens** on cancer incidence and mortality in Washington State.
9. Increase the early identification of individuals at risk for developing cancer due to **genetic susceptibility or inherited predisposition**.

Secondary Prevention

10. Reduce mortality from **breast cancer** in Washington women.
11. Reduce mortality from invasive **cervical cancer** among Washington women.
12. Reduce mortality from **colorectal cancer** in Washington.
13. Improve informed decision-making between men and their providers regarding **prostate cancer** screening.

Medical Care

14. Improve **access to cancer care** in Washington.
15. Improve the **quality of cancer care** provided in Washington.
16. Ensure the provision of adequate **psychosocial services** starting from diagnosis throughout the continuum of care.
17. Ensure the provision of adequate **palliative care**.

18. Ensure the provision of adequate **end-of-life care** that enables patient autonomy.
19. Ensure the opportunity for safe and effective use of **complementary medicine** in cancer care.
20. Improve the **informed consent** process for cancer patients in Washington.

Plan Implementation and Evaluation

The cancer issues reflected by the goals of the plan are priorities that should be addressed in Washington; however, the plan does not rank goals in terms of overall importance. Since the scope of the plan is broad and resources are limited, the goals within the plan must be further prioritized before strategies are implemented.

Priority goals will be selected from the plan by the Partnership through a systematic process using specific criteria (e.g. the size of the burden, the strength of evidence suggesting an effective solution exists, the likelihood that interventions will lead to significant improvements, the presence of major gaps in current efforts, the existence of important disparities, and the feasibility of intervention). The resulting priorities will set the direction for the initial implementation efforts of the Partnership. In addition, partners and other stakeholders can use the plan to select priorities consistent with their missions.

The goals, objectives, and strategies within the plan represent outputs from an intensive planning process. In order for the goals of the plan to be achieved, the strategies must be implemented. Effective implementation of these diverse strategies will require an ongoing, coordinated, and collaborative effort by the Partnership. Coordinating existing resources and generating new resources to implement strategies will be a key function for the Partnership.

The purpose of developing and implementing the plan is ultimately to reduce cancer incidence, morbidity, and mortality and to improve quality of life. In order to determine if the purpose is being achieved, effectiveness of the plan must be evaluated. Evaluation of the Partnership and plan will be important for determining the value of comprehensive cancer control in Washington.

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Introduction

Although progress has been made to reduce the burden of cancer, much still remains to be done. Cancer accounts for one of every four deaths in Washington each year and is the leading cause of death among adults aged 45 to 74. As the population of Washington ages along with the rest of the nation, the impact of cancer will increase. Continued progress in overall cancer prevention and control will depend not only on gaining new knowledge through research, but also on how extensively current knowledge is applied to reduce known risk factors and promote effective preventive, therapeutic, and palliative care services.

The Division of Cancer Prevention and Control at the federal Centers for Disease Control and Prevention (CDC) works with partners in the government, private, and nonprofit sectors to develop, implement, and promote effective cancer prevention and control practices nationwide. The National Comprehensive Cancer Control Program promotes the development of state plans that include evidence-based strategies to address priority cancer issues. The Washington State Department of Health first received funding through a cooperative agreement with CDC in September 2001 to develop a five-year state comprehensive cancer control plan.

Comprehensive Cancer Control

Comprehensive cancer control (CCC) has been defined as an integrated and coordinated approach to reducing cancer incidence, morbidity, and mortality through prevention, early detection, treatment, rehabilitation, and palliation. A key concept in this approach is a focus on the continuum of cancer issues ranging from prevention through survivorship and end-of-life. Many organizations and individuals are already actively working on these issues in Washington.

However, no single organization or agency can adequately address all of the cancer priorities in the state. Comprehensive cancer control involves systematic assessment of state cancer issues to ensure that important priorities are identified. Ensuring adequate coverage of priorities requires integrated and coordinated efforts among diverse stakeholders throughout the state. Ideally, this approach will lead to more efficient use of the limited resources available by ensuring that priorities are adequately addressed, gaps in current activities are filled, duplication of efforts is avoided, and important disparities are addressed.

Rationale for Comprehensive Cancer Control Planning

Comprehensive cancer control represents a new approach to statewide cancer efforts. The need for a new approach is based on challenges in cancer prevention and control identified by CDC through its partners including state, territorial, and tribal health departments. These challenges include inadequate infrastructure, limited resources, limited use of data and research in decision-making, limited coordination among existing efforts, a heavy and unequal cancer burden, and insufficient information about effective programs and services. To be a worthwhile approach, comprehensive cancer control must address some of these challenges and lead to improvements over current efforts. The potential benefit of comprehensive cancer control planning includes developing solutions for overcoming the identified challenges to cancer prevention and control and improved health and cancer care outcomes.

Comprehensive cancer control is an effort to improve outcomes by:

- ▶ **Bringing many partners together** including medical and public health professionals, voluntary organizations, community-based organizations, insurers, businesses, survivors, government agencies, academia, and advocates to develop a planned approach for solving cancer problems.
- ▶ **Using available data and research results** to identify priorities among the wide range of cancer issues (from prevention through survivorship and end-of-life).
- ▶ **Implementing evidence-based solutions** to ensure that current knowledge is applied in a cost-effective manner to achieve the best possible outcomes.
- ▶ **Using limited resources more efficiently** by integrating and coordinating efforts to reduce duplication and improve overall capacity.
- ▶ **Using limited resources more effectively** by targeting resources to the highest priorities (e.g., areas of heaviest burden, major gaps, important disparities, large potential impact of intervention, and feasibility of intervention).

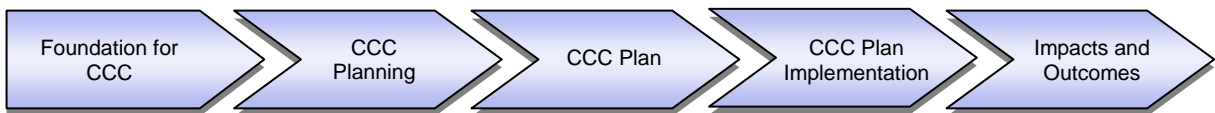
A Logic Model for Comprehensive Cancer Control

The comprehensive cancer control process is described in the logic model shown below. The model shows how the process unfolds in various phases and the key components of each phase. Mobilizing support and bringing key partners together are major steps in preparing to initiate comprehensive cancer control. The planning phase is a systematic process of collecting relevant data and research; assessing the cancer burden; and developing plan goals, objectives, and strategies. The plan itself is a guide and framework for

statewide cancer prevention and control efforts. Once developed, it becomes a foundation that drives implementation efforts. During the implementation phase, the Partnership focuses its efforts on mutually identified priorities from within the plan.

Evaluation is a critical component throughout the process and is used to determine if what is expected to occur during each phase actually occurs (e.g., appropriate partnership is established, priority issues are identified, and intervention strategies produce impacts and outcomes). The ultimate intended outcomes of comprehensive cancer control are reduced cancer incidence, morbidity, and mortality.

Logic Model – Comprehensive Cancer Control



IF we take these initial steps...	AND use a systematic planning process...	TO develop an evidence-based plan...	AND integrate and coordinate efforts to implement the plan...	THEN we may produce these impacts and achieve these outcomes...
<ul style="list-style-type: none"> Assess and enhance current infrastructure Mobilize support and existing resources Build partnerships Strengthen data foundations 	<ul style="list-style-type: none"> Collect and use data and research results Assess the burden Assess current activities Assess current gaps Identify cancer issues (e.g., high-incidence/mortality cancers, gaps in services, populations affected, etc.) Set goals Set specific, measurable, achievable, relevant, and time-phased objectives Develop evidence or theory-based strategies 	<ul style="list-style-type: none"> Provides a framework and guide for coordinated and integrated action Highlights important cancer issues across the continuum Sets goals and objectives for improvement Proposes evidence or theory-based strategies Catalyzes existing partnership AND potential partners to take action 	<ul style="list-style-type: none"> Mobilize current partnership and resources Recruit new partners and resources Implement strategies targeting mutually identified priorities 	<p>IMPACTS</p> <p>Changes in knowledge, attitudes, behaviors, practices, or policies within environments, systems, and individuals</p> <p style="text-align: center;">↓</p> <p>SHORT-TERM OUTCOMES</p> <ul style="list-style-type: none"> ▶ Cancers detected early ▶ State-of-the-art treatment provided ▶ Appropriate rehabilitation and support provided ▶ Effective palliation provided <p style="text-align: center;">↓</p> <p>LONG-TERM OUTCOMES</p> <ul style="list-style-type: none"> ▶ Decreased incidence ▶ Decreased morbidity ▶ Decreased mortality ▶ Reduced disparities



Comprehensive Cancer Control is a National Effort

The National Comprehensive Cancer Control Program at CDC provides funding and technical assistance to states for developing and implementing comprehensive cancer control plans. State health departments facilitate the development of partnerships representing key stakeholders and work collaboratively with partners to develop state plans. The national program at CDC also partners with other national organizations. These partners work to increase coordination and communication among the federal, state, and community levels:

- ▶ American Cancer Society
- ▶ American College of Surgeons
- ▶ Association of State and Territorial Health Officials – Chronic Disease Directors
- ▶ Intercultural Cancer Council
- ▶ National Cancer Institute
- ▶ National Conference of State Legislatures
- ▶ National Dialogue on Cancer
- ▶ National Governors Association
- ▶ North American Association of Central Cancer Registries

Comprehensive Cancer Control in Washington

In early 2001, a group of interested stakeholders met several times to discuss statewide cancer issues in Washington. During these initial meetings, the group discussed draft legislation to establish a cancer planning committee, shared information about the ways in which their respective organizations currently address cancer, and began to discuss specific cancer prevention and control issues. The group also developed and adopted vision, mission, values, and role statements to guide them in their comprehensive cancer control planning efforts (see Appendix A). The Washington State Department of Health, upon the recommendation of the group, applied for funding from CDC for comprehensive cancer control planning. In October 2001, the program was initiated and steps were taken to organize the initial stakeholder group for planning. The group became the Washington Comprehensive Cancer Control Partnership (Partnership) and began developing the plan in February 2002.

The Washington Comprehensive Cancer Control Partnership

The Partnership is the statewide group that developed the plan. Cancer care providers, researchers, public health professionals, advocates, survivors, and others interested in cancer prevention and control were involved in the planning process. In addition to being a partner in the planning process, the Washington State Department of Health provided funding and staff support to the Partnership through the grant from CDC.

During the planning phase, the Partnership consisted of the general membership, four work groups, and a Coordination Team. Partnership meetings were held about quarterly to provide updates on the planning process and to facilitate receiving feedback on development of the plan. The work groups included Primary and Secondary Prevention, Medical Care, Public Policy and Legislation, and Public Awareness and Education. The work groups were the core plan development groups and generally met monthly throughout the planning phase. The Coordination Team served as the leadership group and was responsible for coordinating the planning process, reporting progress to the general membership, and ensuring that the plan reflects the intentions of the Partnership. The Coordination Team included co-chairs for each work group, the project manager, and three additional Partnership members. Coordination Team members and participants in work group and Partnership meetings are listed in the Acknowledgements section. More information about the Partnership and comprehensive cancer control in Washington can be found online at: <http://www.doh.wa.gov/ccp/>.

Purpose of the Plan

Efforts to prevent and control cancer already are taking place in Washington. The purpose of a comprehensive cancer control plan is to lead toward a more systematic approach to planning and implementation of effective strategies among key stakeholders in the state. Although the Department of Health has a primary role in funding and staffing the Partnership, its role is similar to other partners in the development and eventual implementation of the plan.

The plan itself is an end product of the planning process; however, it is just an intermediary outcome within a longer, sustained, comprehensive cancer control process. The cancer burden changes over time and ongoing research provides new evidence on effective prevention, early detection and medical care approaches. The plan will need to be updated periodically in response to changing circumstances.

The purpose of the *Washington State Comprehensive Cancer Control Plan* is to:

- ▶ **Provide a framework and guide for coordinated and integrated statewide efforts to reduce the burden of cancer**—The plan covers a wide range of cancer issues in Washington. The plan addresses these issues

through goals, objectives, and strategies for improvement. The primary audience for the plan includes people who are in a position to effect the changes needed for improvements to occur (e.g., policy makers in public, private, and non-profit organizations; health professionals; and community leaders). Policy makers influence the allocation of resources necessary to conduct cancer prevention and control activities. Health professionals provide care and public health interventions for people who have cancer or are at risk for developing cancer. Public education about reducing individual risk for cancer, improving public awareness about available cancer services, and outreach efforts to underserved populations are also important. The Partnership includes many stakeholders who are members of the intended audience for the plan. However, the Partnership only represents a subset of the relevant stakeholders in Washington. Additional partners will be sought through ongoing recruitment efforts.

- ▶ **Highlight important cancer issues for future prioritization**—The scope of issues that cancer presents is daunting. The plan covers a wide range of important issues, but does not prioritize among them. Ideally, all plan strategies would be implemented to achieve all plan goals and objectives. In reality, resources are limited and additional prioritization will be necessary to guide the implementation efforts of the Partnership. In addition, partners and other stakeholders can use the plan to select priorities consistent with their missions.
- ▶ **Set goals and objectives for improvement**—Plan goals and objectives provide direction to ongoing and new efforts in cancer prevention and control. Goals in the plan were set for important cancer issues in Washington as assessed by the Partnership.
- ▶ **Propose evidence-based or theory-based strategies to achieve goals and objectives**—Effective strategies for preventing, detecting, and treating cancer have been identified through cancer research. Some of these approaches are not being adequately implemented. There is an opportunity to reduce the burden of cancer by doing more of what is already known to be effective.
- ▶ **Draw interested organizations and individuals together to work collaboratively toward shared goals**—Increasing the application of current knowledge may be best realized through integrated and coordinated efforts of key stakeholders statewide. Collaboration, both in planning and implementation, may lead to more efficient use of limited resources while ensuring that mutually identified priorities are addressed. The plan should serve as a catalyst for Partnership members and others to

integrate and coordinate their efforts and direct resources to the major cancer issues in Washington. Partners maintain their current efforts to achieve their own missions and goals.

Development of the Plan

Comprehensive cancer control planning is a systematic process for identifying priority cancer issues in the state. Identifying priorities occurred at different stages in the planning process. The planning process began with decisions regarding the topics to review and consider for inclusion in the plan. Work group participants made recommendations on the topics that would be important to review. This process of selecting topics to review was the first stage of priority setting.

The work groups met to review each topic by assessing relevant data, research results, and other available planning information. After review, some topics were deemed not to be appropriate for inclusion in the plan because the likelihood for reducing the burden of cancer in a substantive manner was low. For example, the Primary and Secondary Prevention work group reviewed the topic of screening for oral cancer. After review, the group decided that based on available data and research results about the efficacy of screening, screening for oral cancer would not substantively reduce the burden of cancer in Washington. This process of selecting topics to include in the plan was the second stage of priority setting. Co-chairs of the work groups presented draft work at Partnership meetings to provide an opportunity for broader input.

After the draft plan was completed, a review process took place. The work groups conducted the initial review and revised the draft. Additional participants in the Partnership and external reviewers provided additional feedback on the revised draft. The Coordination Team considered reviewer comments and suggestions and completed the final document.

Format of the Plan

The plan addresses major topics in cancer prevention and control organized into three sections: Primary Prevention, Secondary Prevention, and Medical Care (tertiary prevention). Within each section, the background information provided varies somewhat from topic to topic. Information included on current activities and gaps is not based on a comprehensive assessment. An attempt was only made to identify major, comprehensive, statewide activities and known gaps in the activities or knowledge base. Following the background information for each topic are the goals, objectives and strategies developed by the work groups.

The goals, objectives, and strategies for each topic within each section are the core components of the plan. The goals generally represent the long-term *results* expected from the implementation of plan strategies. There are one or

more objectives for each goal. Objectives specify the *changes* needed in order to achieve the associated goal and represent the short-term impacts expected from the implementation of plan strategies. Where possible, plan objectives are specific, measurable, achievable, relevant, and time-phased. Objectives in this plan are set for a five-year timeframe. Baseline data are provided for objectives where available. Where baseline data are available, targets for improvement are also set. Where information was available, these targets reflect what is considered to be an achievable level of change given current trends, resources, and potential intervention effectiveness. In the absence of this information, the best judgment of participants was used. National objectives, such as Healthy People 2010, were also considered (See Appendix B).

Strategies represent the *approaches or activities* that, if effectively implemented, should lead to the desired changes indicated within the objectives. Where possible, plan strategies are based on scientific evidence of intervention effectiveness. Such information is limited for many areas of cancer prevention and control. For issues where information on effectiveness is unavailable, the recommendations of experts, professional organizations, or the best judgment of Partnership members was used to select appropriate strategies. Strategies that are not supported by research evidence should be evaluated to determine their effectiveness in achieving objectives.

Data from multiple sources are used throughout the plan. An attempt was made to use the most current readily available data available; however, there is variability.

Setting Plan Priorities for Implementation

The cancer issues addressed in the goals of the plan represent priorities that should be addressed by the Partnership. Since the scope of the plan is broad and resources are limited, it will be necessary to set priorities among plan goals and objectives.

Priority goals and objectives will be selected from the plan by the Partnership through a systematic process using specific criteria (e.g., the size of the burden, the strength of evidence suggesting an effective solution exists, the likelihood that interventions will lead to significant improvements, the presence of major gaps in current efforts, the existence of important disparities, and the feasibility of intervention). The resulting priorities will set the direction for the initial implementation efforts of the Partnership.

Implementation of the Plan

The goals, objectives, and strategies within the plan represent outputs from an intensive planning process. In order for the goals of the plan to be achieved, the strategies must be implemented. Since the goals of the plan range from one end of the cancer continuum (primary prevention) to the other

(survivorship and end-of-life issues), the strategies necessary to achieve them are varied. Effective implementation of these diverse strategies will require an ongoing, coordinated, and collaborative effort by the Partnership. Coordinating existing resources and generating new resources to implement strategies will be a key function for the Partnership. Since capacity for implementation is determined by the size and strength of the Partnership, recruitment of new partners will be an important and ongoing activity.

Evaluation of the Plan

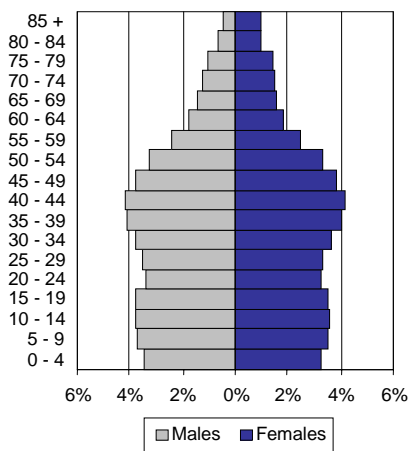
The purpose of developing and implementing the plan is ultimately to reduce cancer incidence, morbidity, and mortality and to improve quality of life. In order to determine if the purpose is being achieved, effectiveness of the plan must be evaluated. Plan effectiveness means that strategies are being appropriately implemented, objectives are being achieved, and goals are being reached. Where possible, measurable objectives (i.e., quantifiable) have been developed. For quantifiable objectives, baseline data will be used to measure progress and determine the effectiveness of plan strategies. To assess performance on process-oriented objectives, activities that lead toward the objectives will be monitored and documented. Evaluation of the Partnership and plan will be important for determining the value of comprehensive cancer control in Washington.

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Washington Demographics

In 2000, Washington’s population was 5,894,121 according to the US Census. Washington’s growth rate in the 1990s was 21%, considerably higher than the national growth rate of 13%. More than three-quarters of Washington’s population live west of the Cascade Mountains. With over 540,000 people in 2000, Seattle is Washington’s largest city. Spokane and Tacoma, each with almost 190,000 residents, are the second and third largest cities, respectively. There are 29 federally recognized Indian tribes in Washington. Each recognized tribe is a sovereign nation.

Population Pyramid
Washington State, 2000
US Census

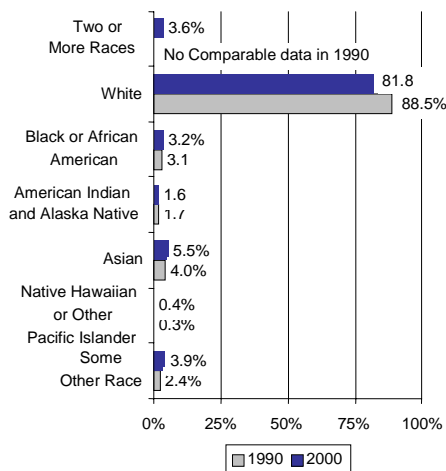


Age and gender

Declining birth and death rates mean that Washington’s population, like that of the rest of the US, is aging. The median age is now about 35 years compared to about 31 years in 1990. In 2000, the composition of Washington’s population by age was nearly the same as that of the nation: about 25% were younger than 18 and slightly over 10% were age 65 and older.

The age structure of Washington’s population is shown in the population pyramid on the right. Males slightly outnumbered females until age 34. In the 60–64 year age group, the number of women was larger than the number of men. The relative number of women increased in each subsequent age group, such that in the oldest age group, there were more than twice as many women as men.

Population Distribution by Race
Washington State, 1990, 2000
US Census



Race

In 2000, Washington’s population consisted of proportionately more whites than did the US population (81.8% versus 75.1%), more Asians (5.5% versus 3.6%), and more American Indians and Alaska Natives (1.6% versus 0.9%), but fewer African Americans (3.2% versus 12.3%). Compared with the US, fewer people in Washington (4% in Washington versus 5.5% in the US) reported “other” race and more people (3.6% versus 2.4%) reported that they were more than one race. About 22% of those choosing multiple races chose white and American Indian/Alaska Native, about 22% reported white and Asian, and about 12% reported white and African American.

Because the 2000 census allowed the reporting of more than one race and the 1990 census required people to select only one race, it is difficult to develop an understanding of how Washington's racial composition has changed over the past decade. For people who reported more than one race in 2000, we do not know which single race that person might have reported if required to choose. However, the proportion of white people in Washington has declined over the decade. In 1990, 88.5% reported that they were white compared to 81.8% who reported *white only* in 2000. Thus, even if all of the 2.8% of people who reported they were both white and another race in the 2000 census would have reported white if asked to choose a single race, the proportion of whites in 2000 would still be lower than in 1990. The proportion of people reporting Asian race has also increased irrespective of how the 1.1% of people reporting Asian and another race would have reported if asked for a single race.

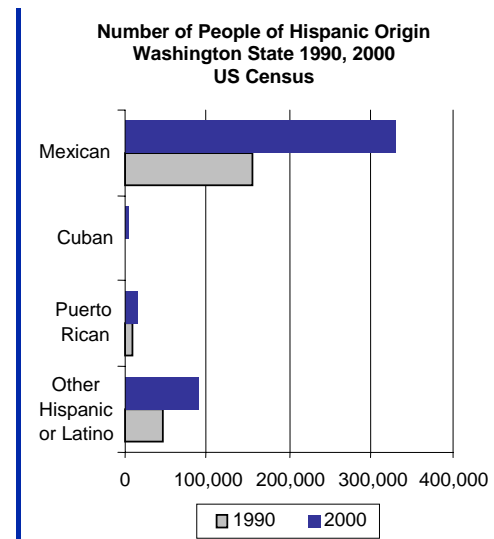
Hispanic Ethnicity

In addition to identifying people by race, the census also reports information about Hispanic or Latino ethnicity. Washington's Hispanic/Latino population has increased substantially, from 4.4% of the state's population in 1990 to 7.5% in 2000, which is still much lower than the national average of 12.5%. Seventy-five percent of the Hispanic people in Washington are of Mexican descent.

Income

The 2000 census asked about income in calendar year 1999. Median household income in Washington for 1999 was \$45,776, compared with \$41,433 in the US. There is considerable variability in median household income among counties. King County has the highest median household income (\$53,157) followed by Snohomish County (\$53,060). The lowest incomes were in Whitman (\$28,584) and Okanogan Counties (\$29,726).

The pattern of higher income in Washington than in the US has been fairly consistent since 1980. In 1980, Washington's per capita income was over 7% higher than that in the US, but by 1987, it had slipped below that of the US. Real average wages started rising in Washington again in 1989, and by 1990 per capita income in Washington again exceeded that in the US. However, 1996 was the first year that Washington wages were significantly higher than the 1980 levels. Whether Washington's per capita income will remain above that of the US remains to be seen. The sharp economic downturn that began in 2001 had a particularly heavy impact on Washington, and the state developed one of the highest unemployment rates in the nation.



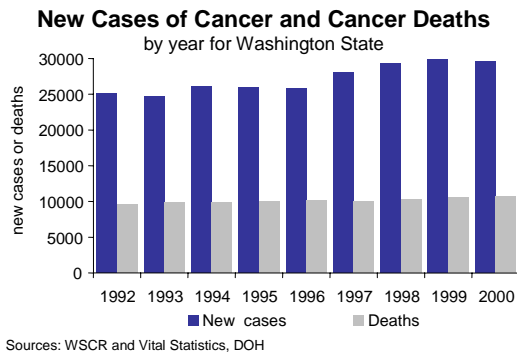
Education

Historically, adults in Washington have had higher levels of education than the US average. In 2000, almost 90% of Washington's population aged 25 years and older had at least a high school education compared to approximately 82% in the country as a whole. In addition, almost 30% of Washington residents in this age group had completed college compared to approximately 25% of those in the US.

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The Burden of Cancer in Washington

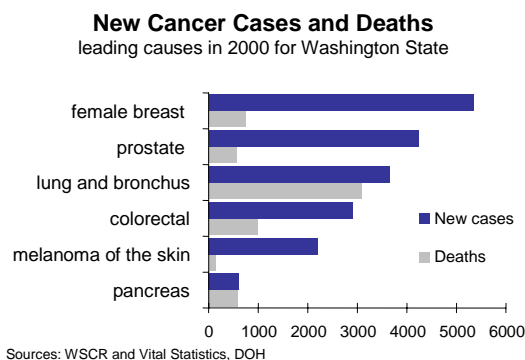
Cancer is a heterogeneous group of diseases characterized by uncontrolled growth and spread of abnormal cells. The various forms of cancer were responsible for 10,656 deaths among Washington residents in 2000 – approximately 25% of all deaths statewide. Cancer has consistently been the leading cause of death among adults ages 45 to 74, and the second leading cause of death overall. Some form of cancer will likely strike one in three Washingtonians in their lifetime.



The number of newly diagnosed cases of cancer is on the rise. In 2000, there were 29,578 new cases of cancer diagnosed in Washington residents, a 14% increase over the cases diagnosed in 1995. This is concerning, but not alarming, since the increase corresponds to the growth and aging of the state’s population.

Twenty-four major cancer types constitute approximately 95% of all new cancer cases diagnosed among Washington residents.

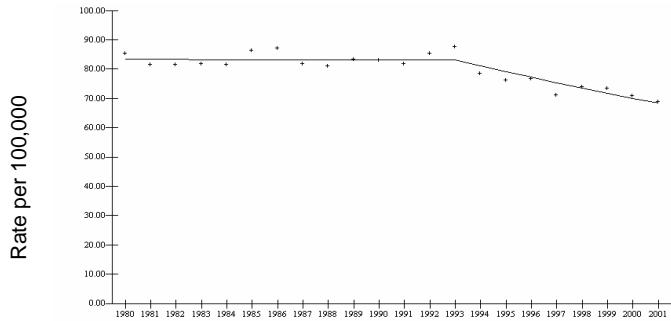
Of those, the five most common types of cancer comprise 62% of all new cases. Since statewide surveillance of cancer incidence began with the inception of the Washington State Cancer Registry (WSCR) in 1992, the five leading types of cancer have not changed (see Appendix C for technical notes on WSCR). In 2000, female breast cancer was the most common cancer with 5,344 new cases diagnosed. Prostate was second with 4,235 new cases, followed by lung and bronchus (3,668), colorectal (2,911) and melanoma of the skin (2,211). Similarly, the leading causes of cancer mortality have remained consistent: lung and bronchus are first in this list with 3,100 deaths in 2000, followed by colorectal (991), female breast (747), pancreatic (591), and prostate (574). Taken together, these five cancers comprise 56% of all cancer deaths.



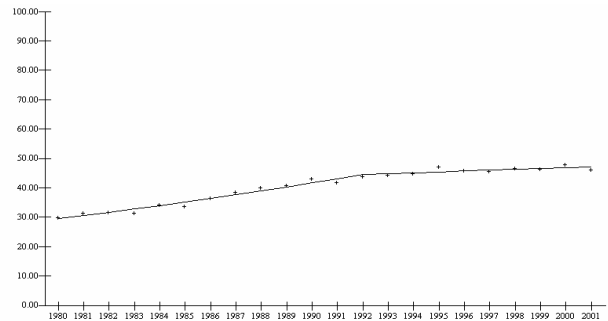
While the number of new cancer cases and cancer deaths are increasing, the age-adjusted incidence rates for all cancers combined have remained essentially constant (see Appendix D for technical notes on age-adjustment and confidence intervals). Moreover, with the exception of lung cancer in women, the trends in the age-adjusted mortality rates for the five leading cancers declined between 1980 and 2001 (see Appendix E for technical notes on mortality data).

Lung and Bronchus Cancer Mortality Rates (1980-2001)

Males

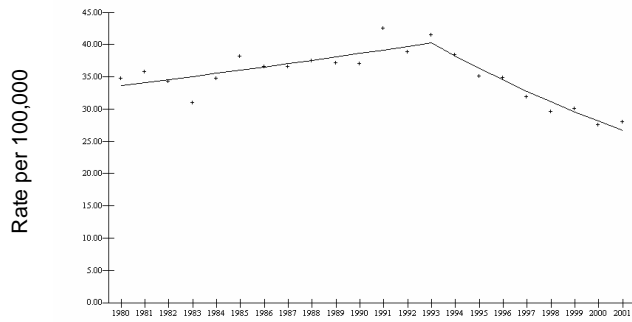


Females



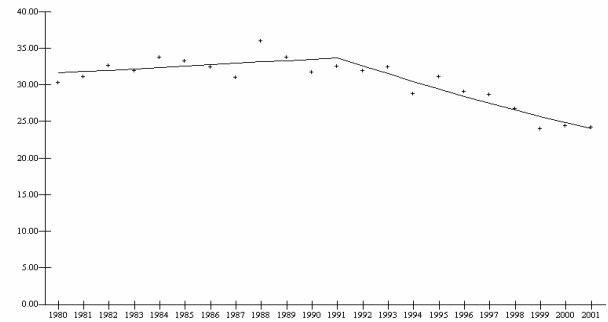
Prostate Cancer Mortality Rates (1980-2001)

Males



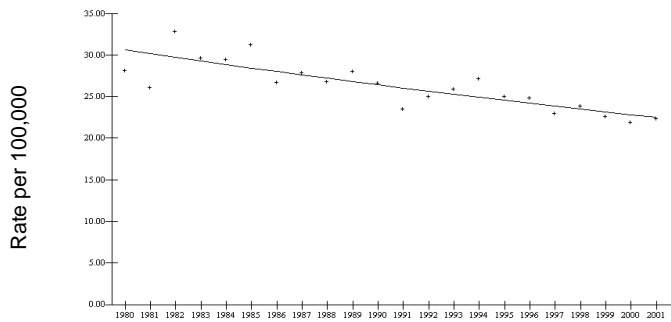
Breast Cancer Mortality Rates (1980-2001)

Females

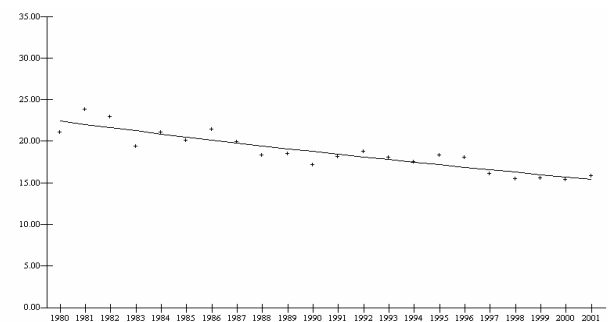


Colorectal Cancer Mortality Rates (1980-2001)

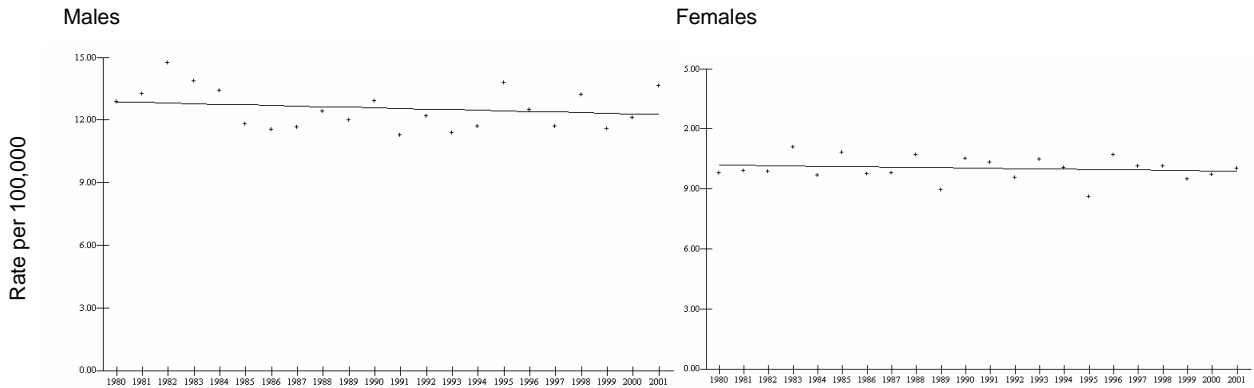
Males



Females

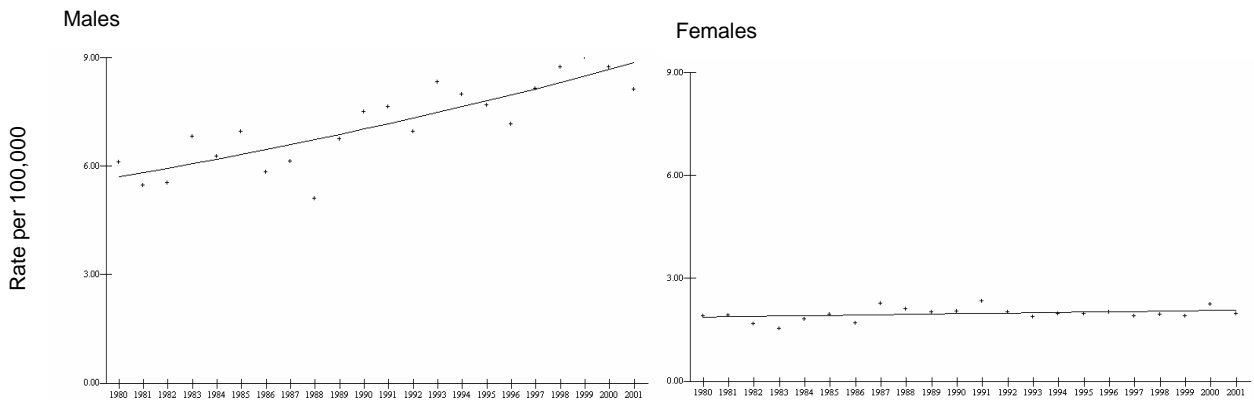


Pancreatic Cancer Mortality Rates (1980-2001)

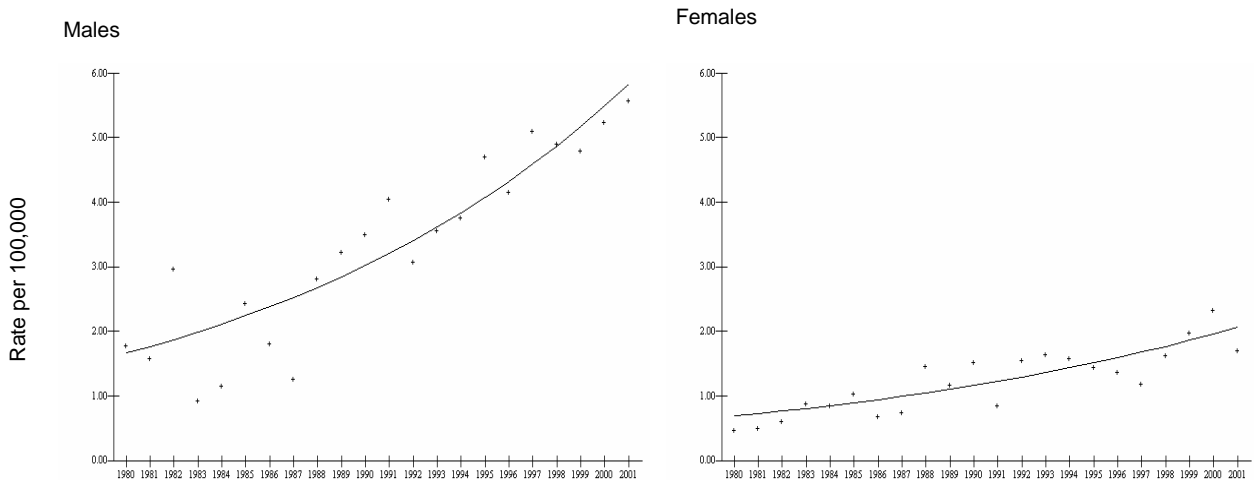


However, there are some less common cancers whose age-adjusted mortality rates appear to be on the rise—esophageal, liver, myeloma, and melanoma of the skin—particularly among men.

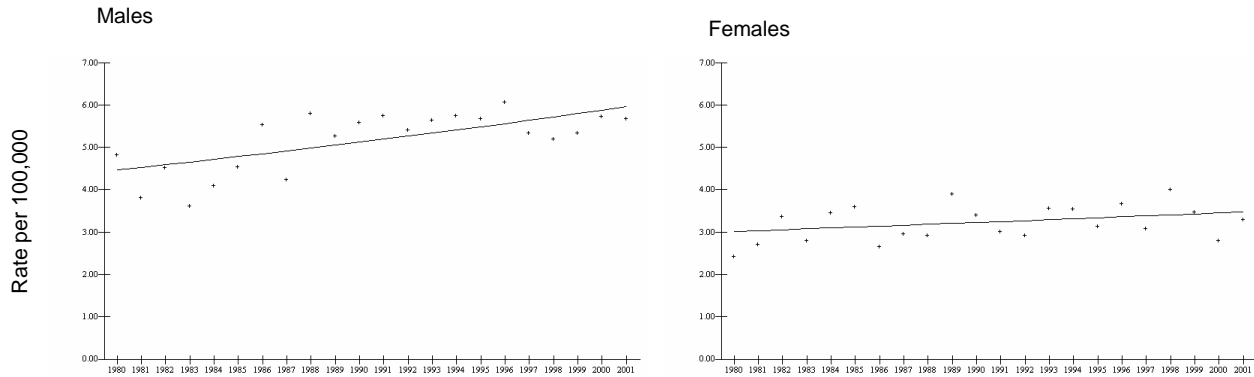
Esophageal Cancer Mortality Rates (1980-2001)



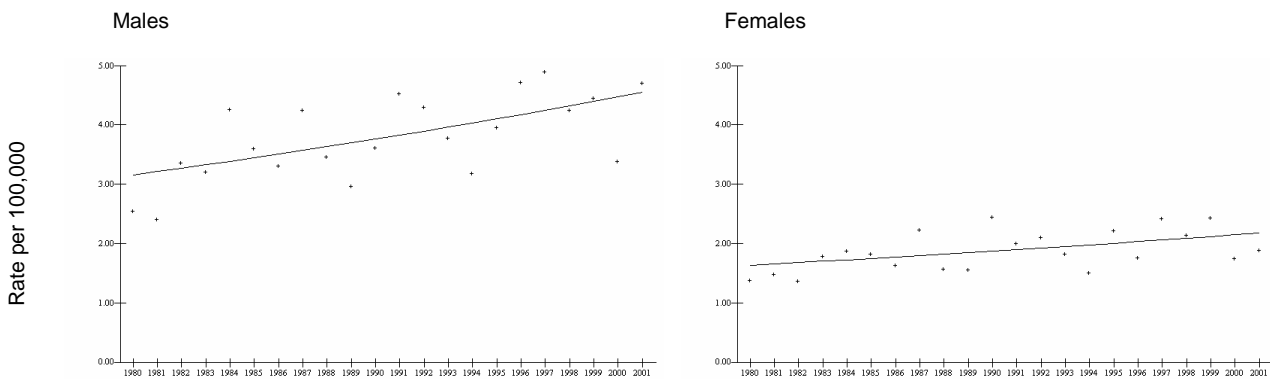
Liver Cancer Mortality Rates (1980-2001)



Multiple Myeloma Mortality Rates (1980-2001)



Melanoma of the Skin Mortality Rates (1980-2001)



The age-adjusted mortality rate trends for these cancers are generally consistent with the national experience and are likely harbingers of emerging issues such as increases in ultraviolet radiation exposure (melanoma of the skin) and hepatitis C (liver cancer).

Age-adjusted rates are commonly used in reporting cancer statistics because cancers are, for the most part, diseases of the elderly, and the age-adjustment process accounts for the age differences in the populations being examined. In fact, only five of the 24 major cancers are as common among those under age 65 as among those ages 65 and older. The age-specific rates of the twenty-four major cancers show this clearly (see page 36). With the continued growth of the population ages 65 and older, the burden of cancer will increase.

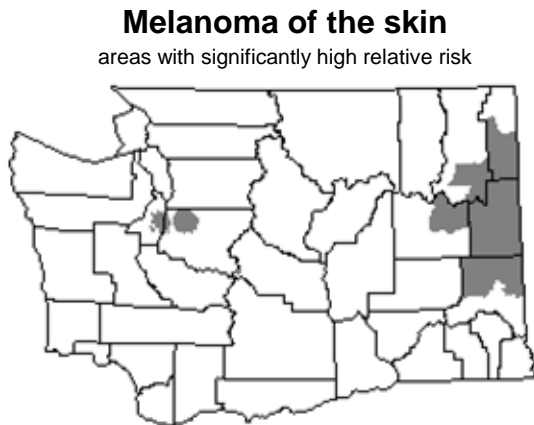
Lung and bronchus cancer
areas with significantly high relative risk



Source: 1997-1999 Cancer incidence and 2000 US Census population
Method: Spatial scan statistic

Unlike age, tobacco use, diet, physical activity, heavy alcohol use, and sun exposure are risk factors that can be modified. The Washington Behavioral

Risk Factor Survey System (BRFSS) has consistently found that Grays Harbor and Cowlitz Counties are among the counties with the highest smoking prevalence statewide. Not surprisingly, those counties, together with most of the south Puget Sound region, have been found to have a significantly high relative risk for lung cancer.

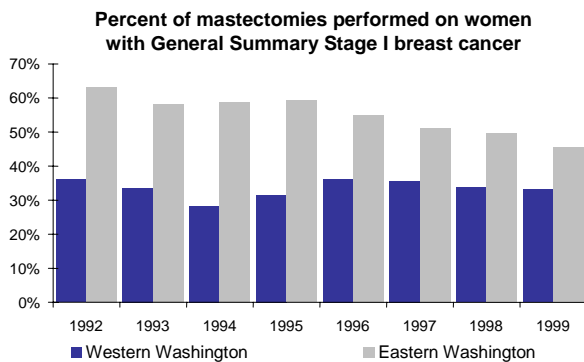


Source: 1997-1999 Cancer incidence and 2000 US Census population
Method: Spatial scan statistic

Similarly, intermittent but intense exposure to the sun is a known risk factor for melanoma of the skin – particularly for people with fair skin. Thus, it is not surprising that certain areas of the state appear to be at greater risk than others. In short, the burden for many cancers is not equally distributed among the regions of the state.

These geographic variations in cancer incidence, as well as differences in disease stage and mortality, likely represent differences in the cultural, racial, social, environmental, and economic characteristics of the communities. For instance, the incidence of female breast cancer is often found to be higher in high-income communities.

This is generally attributed to an increased risk for breast cancer among women who delay or have no pregnancies – characteristics that are more common among women living in high-income areas. Conversely, the risk for *late-stage* female breast cancer is generally higher among poor, minority, and urban women. This is in part due to barriers to screening. A number of factors contribute to lower rates of breast cancer screening in some populations. These include difficulties in accessing screening services (such as transportation problems and language and cultural barriers), lack of education regarding the benefits of screening, excessive fear of cancer, and lack of funds to pay for screening services.¹ Physician referral for mammography appears to be an important predictor: a significant proportion of women who had mammograms did so because their doctors recommended they get one.²



Source: WSCR 1992-1999

Treatment for certain cancers may also differ by geographic region. For instance, women with General Summary Stage I breast cancer in eastern Washington appear to be treated more often by mastectomy than women in western Washington, although the difference seems to be getting smaller. This may reflect differences in preferences of the women on the east and west sides of the state, differences in the practice styles of their physicians, differences in access to radiation treatment facilities, or some combination of all three.

Variations in treatment become particularly concerning when adherence to treatment guidelines differ according to insurance payer and/or patients' socioeconomic status. A recent study identified such variations in Washington State for stage III colon cancers.³ After accounting for age, co-morbid conditions and geographic locale, patients with Medicare or Medicaid as the primary payer were at significantly increased risk for not having their treatment plans include the National Cancer Institute recommended adjuvant chemotherapy. In addition to (and independent of) payer type, stage III colon cancer patients from the lowest quartile per capita income communities were also found to be at significantly increased risk for not having this therapy included in their treatment plans. Patients who had both risk factors – government payer and living in a poorer community – had four times the risk of not getting the recommended therapies compared to those patients with private payers and living in more affluent communities.

Race is also a factor that has been widely reported to be associated with differential—and sometimes less than optimal—treatment or access to services.⁴ In Washington State the latter was observed in an analysis of risk factors associated with late-stage breast cancer: women who were black, urban, and poor were found to be at more than four times the risk of having late-stage breast cancer than women who were white, not poor, and living in rural communities.

Different cancers also appear to be associated with different people of different races, as well as different outcomes. Prostate cancer, for example, is well known to occur more frequently among African Americans; stomach cancers are significantly higher among Asians and Pacific Islanders; and melanoma of the skin is highest among whites. However, looking at cancer incidence worldwide as well as following the cancer incidence of immigrant populations over time seems to suggest that, with the exception of melanoma, these differences by race are more a function of socioeconomic, cultural, or lifestyle factors than genetics: blacks in Africa do not have as high a rate of prostate cancer as blacks in America do, and second and third generation Asian Americans do not have stomach cancers at any higher rate than the general population.

Similarly, the differences in outcomes among races (as measured by five-year survival rates) is likely less a function of genetics than differences in access to diagnosis and treatment, delays in treatment, previous negative experiences with the health care system, and cultural beliefs or fatalism.

A regression analysis⁴ assessing the risk factors associated with dying for seven leading types of cancer in Washington—breast, prostate, lung, colorectal, melanoma of the skin, non-Hodgkin's lymphoma (NHL), and pancreas—found that after controlling for age, length of disease, stage, grade, and histology:

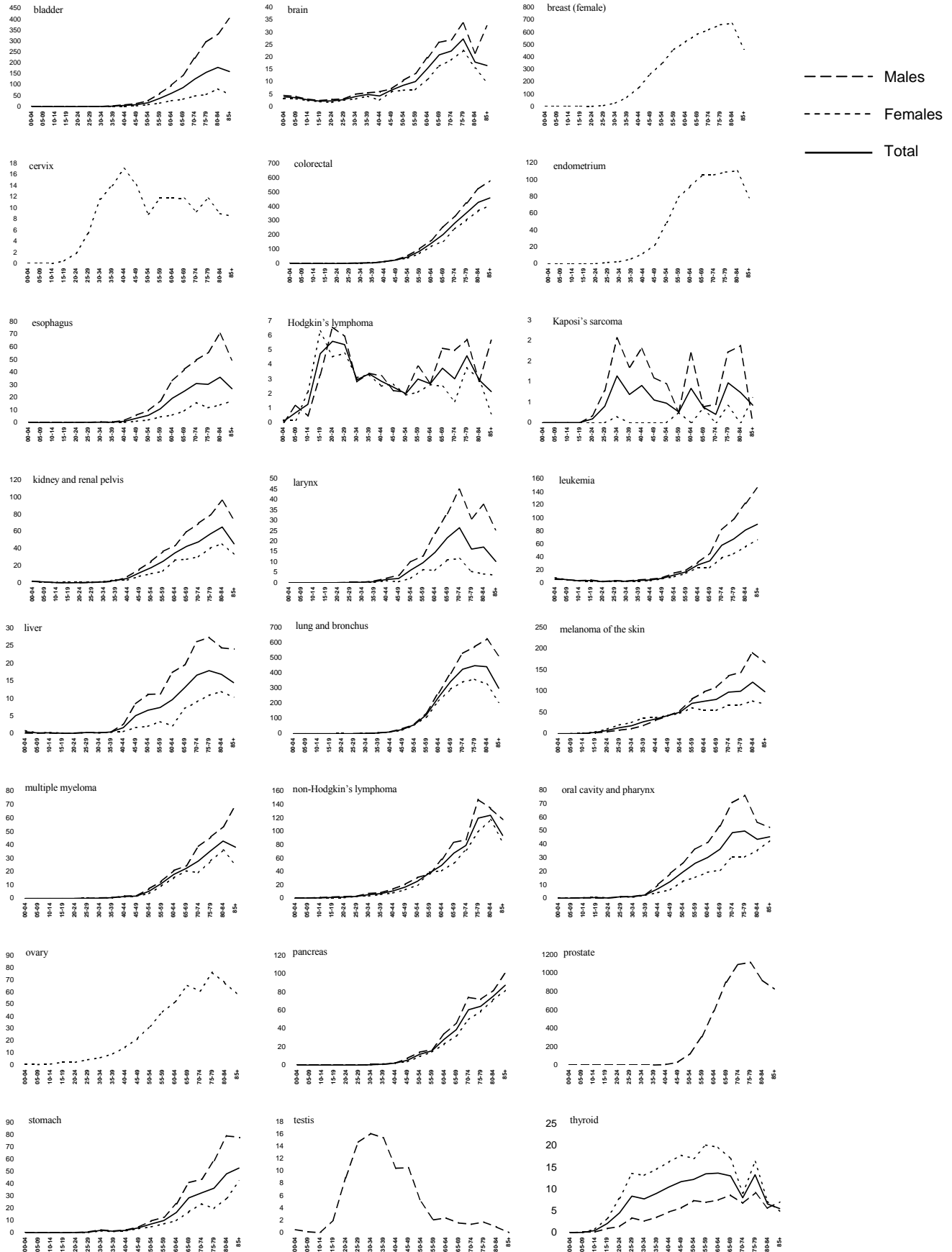
- ▶ Poverty was significantly associated with increased mortality for all cancers examined except pancreatic cancer.

- ▶ African-American race was significantly associated with increased mortality for breast, prostate and NHL.
- ▶ Male gender was significantly associated with increased mortality for all non-gender specific cancers except pancreatic cancer.

Interestingly, living in rural areas was not significantly associated with mortality, and a secondary analysis suggested urban locale might be a risk factor. Thus, while the burden of cancer weighs on everyone, it is apparent it weighs more heavily on some than on others.

The burden of cancer may also vary according to sexual orientation. The recently released Healthy People 2010 Companion Document for Lesbian, Gay, Bisexual, and Transgender (LGBT) Health is the first comprehensive document on the health status of LGBT.⁵ The section of the report on cancer summarizes the state of research on LGBT and cancer. According to the report, research evidence suggests that LGBT may be at higher risk for some types of cancer such as breast cancer, cancers related to AIDS, lung cancer, and cancers caused by human papillomavirus. Research is hampered by the lack of data collection on sexual orientation in national surveys and cancer registries. The report highlights the need for better data collection and more research to better identify cancer-related disparities among the LGBT population.

**Age-specific rates (per 100,000 population) for 24 major cancers
Washington State (1997-1999 combined)**



Primary Prevention

Cancer is not inevitable...many cancers are preventable.

Primary prevention means stopping a disease before it starts to develop. Primary prevention of cancer involves efforts to reduce or eliminate exposure to risk factors and to promote protective factors. Risk factors are characteristics that are associated with an increased risk of developing disease or poor health. Risk factors for cancer include age, sex, heredity, environmental exposure to carcinogens, some infectious agents, and certain lifestyle behaviors. Protective factors are characteristics that reduce the likelihood of disease or poor health. Some protective factors and risk factors represent different ends of the same continuum. For example, lack of physical activity is associated with increased risk for some cancers while moderate levels of physical activity may be protective. Since age, sex, and heredity cannot be changed, reducing or eliminating risk behaviors, limiting exposure to carcinogens, and promoting healthy behaviors are the goals for primary prevention of cancer.

The American Cancer Society (ACS) estimates that 26,700 new cases* of cancer will be diagnosed and 11,200 people will die from cancer in the state of Washington in 2003.⁶ Cancer occurs frequently enough that it may seem that developing cancer is virtually inevitable. However, some scientists estimate that more than 50% of all cancer deaths may be prevented through reducing unhealthy behaviors.⁷ Smoking alone is estimated to cause about one-third of all US deaths from cancer.⁷

This section focuses on six major behavioral risk factors related to cancer including tobacco use and exposure, heavy alcohol use, nutrition, physical activity, obesity, and sun exposure. Exposure to environmental carcinogens and infectious agents, and family history of cancer are also addressed.

Tobacco Use and Exposure

Scientific evidence linking tobacco use and exposure to cancer

Cigarette smoking causes several kinds of cancer including those of the lung, larynx, esophagus, pharynx, mouth, and bladder. Over 85 percent of lung cancers occur because of tobacco smoking.⁸ Smoking also contributes to cancers of the pancreas, kidney, and probably cervix. More than 8,300 people die each year in Washington as a direct result of tobacco use.⁹ In 1992,

*American Cancer Society incidence estimates do not include in situ cases of breast cancer.

the US Environmental Protection Agency (EPA) classified environmental tobacco smoke as a Group A carcinogen. Group A carcinogens are the most dangerous cancer-causing agents for humans. Although information is not available for Washington alone, nationally, exposure to secondhand smoke contributes to the deaths of an estimated 3,000 nonsmokers from lung cancer each year.¹⁰ Other tobacco products, such as smokeless tobacco, cigars, pipe tobacco, and novelty tobacco products, such as clove cigarettes (kreteks) and bidis, also pose serious health risks and are not safe alternatives to cigarettes.

Prevalence of Tobacco Use and Exposure

According to Washington BRFSS data, 23% ($\pm 1\%$) of adults in Washington reported being current smokers in 2001 (see Appendix F for technical notes on BRFSS). Data from the Pregnancy Risk Assessment Monitoring System (PRAMS) indicate that in 1999, 11% ($\pm 2\%$) of Washington resident mothers reported smoking during their third trimester of pregnancy (see Appendix G for technical notes on PRAMS). Data from the Healthy Youth Survey (HYS) show that 15% ($\pm 1\%$) of 10th graders and 23% ($\pm 2\%$) of 12th graders were current smokers in 2002 (see Appendix H for technical notes on HYS).

In Washington, trends in tobacco use vary by age. Data from BRFSS indicate that the use of cigarettes among adults remained essentially constant from the late 1980s to 2001. Since 1990, adult smoking has remained between 20% and 25%. Unlike adults, smoking prevalence for adolescents has decreased in recent years. From 1999 to 2002, smoking among 10th grade students dropped from 25% ($\pm 4\%$) to 15% ($\pm 1\%$) and among 12th grade students, smoking dropped from 35% ($\pm 6\%$) to 23% ($\pm 2\%$).

Disparities

The prevalence of smoking varies in Washington based on certain demographic characteristics of the population. According to 2001 BRFSS data, the rate of cigarette smoking in adults decreases with age from 30% ($\pm 3\%$) for ages 18 to 24 years to 10% ($\pm 2\%$) for adults aged 65 years and older.

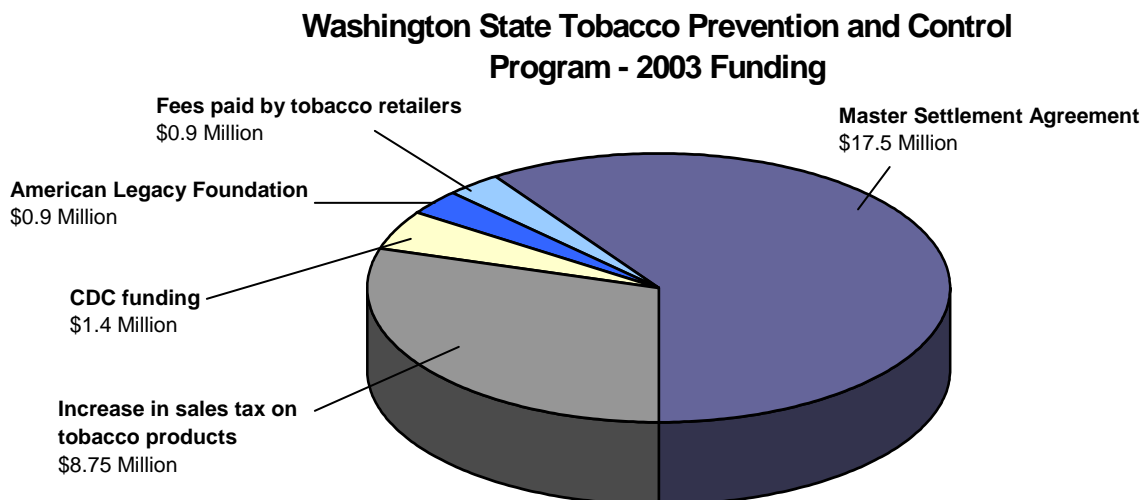
According to 2001 BRFSS data, American Indian and Alaska Native adults have the highest prevalence of cigarette smoking. Thirty-seven percent ($\pm 8\%$) of American Indians and Alaska Natives smoke compared to 24% ($\pm 7\%$) of African Americans, about 23% ($\pm 4\%$) of Hispanics, 22% ($\pm 1\%$) of whites, and 18% ($\pm 4\%$) of Asians and Pacific Islanders. The comparatively low prevalence of current smoking among Asians and Pacific Islanders can be deceptive. There are significant cultural differences around tobacco among subpopulations within this group, and there are significant gender differences in tobacco use within these communities as well. The low overall group prevalence probably masks high use rates among males within specific subgroups. One study conducted in King County found that the prevalence of smoking among Korean and Vietnamese men was about 30%, while smoking among women in these same populations was about 4%.¹¹

Data from the 2000 PRAMS indicate that American Indian and Alaska Native women have the highest prevalence of smoking during pregnancy (42% ± 6%) followed by whites (25% ± 4%), African Americans (21% ± 5%), Asians and Pacific Islanders (11% ± 4%), and Hispanics (8% ± 3%). According to the 2002 Washington HYS, American Indian and Alaska Native youth (10th graders) reported a significantly higher rate of smoking (31% ± 10%) than Asian and Pacific Islander (12% ± 4%) and Hispanic (11% ± 3%) youth. Among African American youth, 17% (± 7%) reported smoking in 2002.

Data from BRFSS for 1999-2001 combined did not show differences in smoking rates between people living in rural versus urban areas, although differences were seen with variation in education and income. People having less than 12 years of education were more likely to smoke (38% ± 4%) than those with some college education (17% ± 1%), and increasing household income was associated with decreasing rates of cigarette smoking [$< \$25,000/\text{yr}$: 31% (± 2%); $\$25,000-50,000/\text{yr}$: 25% (± 2%); $\$50,000+/\text{yr}$: 16% (± 1%)].

Current Policy Environment

Washington State receives about \$160 million each year from its portion of the settlement of the states' lawsuit with the major tobacco companies. The state legislature approved a \$26.5 million budget for the Washington State DOH Tobacco Prevention and Control Program in state fiscal year 2003. Additional funding is obtained through the American Legacy Foundation, CDC, fees paid by tobacco retailers, and state tobacco taxes. The total program budget for 2003 is \$29.4 million. Although a significant amount of funding is being allocated to the state program, current funding is still below the minimum level recommended for an effective state program by the CDC. Based upon an analysis of comprehensive state tobacco control programs, the CDC estimates recommended total program costs for an effective program in Washington to be from \$33.3 million to \$89.4 million (see Appendix I).¹²



Studies have shown that increasing taxes on tobacco is an effective way to reduce initiation and decrease consumption.¹³ The Washington State excise tax rate on cigarettes is currently \$1.425 per pack, making it the sixth highest in the country.¹⁴ Voters approved a new tax on tobacco products in November 2001, which sets aside approximately \$14 million a year for tobacco prevention and control activities. The CDC estimates the total costs due to smoking in Washington at \$10.25 per pack of cigarettes sold.¹⁵

Smoking bans are effective in reducing exposure to second hand smoke.¹⁶ A number of Washington laws and regulations, including the Washington Clean Indoor Air Act of 1985, prohibit or limit smoking in offices, state facilities and vehicles, and other public places. However, many businesses and public areas are exempt from these regulations and much remains to be done to create healthy, smoke-free environments. Washington has also been hampered by the ambiguous legal question of “preemption.” While the tobacco industry argues that there is a clause that prevents local communities from passing local laws about secondhand smoke that are more stringent than the state law passed by the Legislature, to date no local government has tested the standing in the courts. Some local jurisdictions are currently exploring their authority to protect worker and public health by passing comprehensive standards that will likely lead to a court challenge and, at some point, provide the needed clarity of local authority.

Examples of Current Activities to Reduce Tobacco Use and Exposure

Reducing tobacco use among adults, pregnant women, and children in this state is one of the top ten priorities of DOH, and is included as one of the DOH 2003 Performance Agreement Goals with the Governor. Overall goals of the state Tobacco Prevention and Control Program include: preventing youth from beginning to use tobacco, helping youth and adults quit, reducing exposure to secondhand smoke, and reducing tobacco use in high-risk groups.

The state program works with local health agencies, tribes, schools, and community organizations to deliver integrated anti-tobacco interventions to all Washington residents. The program takes a comprehensive approach to tobacco control that includes support for community and school programs, a public awareness and media campaign, a cessation program, efforts to prevent the sale of tobacco to minors, efforts to reduce exposure to secondhand smoke, and assessment and evaluation of all program activities. The program provides funding and support to local health departments and tribes to help them plan, implement, and evaluate tobacco prevention and control activities tailored to meet their needs.

Current program activities include a statewide youth-focused counter-marketing media campaign, retailer education and compliance checks and enforcement activities, and efforts to ensure that school districts implement comprehensive school-based prevention and education programs. A cross cultural work group on tobacco recently developed a strategic plan to expand DOH's

outreach to populations with high rates of tobacco use. The plan to identify and address disparities in tobacco use will be implemented in 2004. However, some efforts are currently targeted to high-risk populations. For example, funding is provided to 24 of the 29 tribes for tobacco prevention and control among Native American youth.

The state Tobacco Quit-Line provides Washington residents with a free service to help them quit using tobacco. Some uninsured or Medicaid callers may receive Nicotine Replacement Therapy usually in the form of patches or gum. Potential callers can learn more about the quit line by visiting <http://www.quitline.com/>. The state program also works with insurance companies to include coverage for smoking cessation in their benefit plans, and trains doctors and nurses to help their patients quit smoking. In 2003, about 1,200 health care providers serving low-income pregnant women have been trained to teach their clients how to improve their babies' health by quitting smoking and eliminating secondhand smoke in their homes. The program also currently works with partners including the Office of the Attorney General, Liquor Control Board, and local law enforcement to enforce secondhand smoke regulations. Detailed information on the efforts of the state Tobacco Prevention and Control Program can be found on their website, at <http://www.doh.wa.gov/tobacco>.

The Washington Industrial Safety and Health Act regulates tobacco smoke from people smoking in office work environments. The regulation bans smoking in workplaces, except specially ventilated areas, and requires control of smoke entering buildings from the outside. Workplace smoking regulations are administered by the Washington State Department of Labor and Industries. The department enforces the regulation by conducting inspections in response to employee complaints.

Gaps

Although the state is implementing a comprehensive program to reduce initiation of tobacco use and promote cessation, the program does not address all aspects and groups at risk for using tobacco products. For example, school programming is limited to the 5th through 9th grades. Activities designed to address tobacco use and cessation in young adults aged 18-24, the group for which current cigarette smoking is highest, are yet to be developed. Tobacco dependence treatment is not covered by many health insurance plans, including Medicaid. Medicaid does, however, cover tobacco dependence treatment for pregnant women.

Although funding has been provided to support local efforts to reduce exposure to secondhand smoke, statewide efforts have been launched by the state Tobacco Prevention and Control program only in the past year. Policy change for "clean indoor air" is needed since some workplaces still allow smoking indoors.

Effective Interventions to Reduce Tobacco Use and Secondhand Smoke Exposure

The CDC's Guide to Community Preventive Services makes recommendations regarding interventions that communities, policymakers, and public health providers can employ to reduce tobacco initiation by children, adolescents, and young adults; reduce exposure to environmental tobacco smoke; and increase cessation. The recommendations are based on systematic reviews of the evidence of intervention effectiveness from the scientific literature. The table below shows the interventions that are recommended.

Table 1: Tobacco—Effective interventions

Intervention	Recommendation
Strategies to reduce exposure to environmental tobacco smoke (secondhand smoke)	
Smoking bans and restrictions	Recommended (strong evidence)
Strategies to reduce tobacco use initiation by children, adolescents, and young adults	
Increasing the unit price for tobacco products	Recommended (strong evidence)
Mass media education (campaigns) when combined with other interventions	Recommended (strong evidence)
Strategies to increase tobacco cessation	
Increasing the unit price for tobacco products	Recommended (strong evidence)
Mass media education (campaigns) when combined with other interventions	Recommended (strong evidence)
Interventions appropriate for health care systems – provider reminder systems alone	Recommended (sufficient evidence)
Interventions appropriate for health care systems – provider reminder systems plus provider education (with or without patient education)	Recommended (strong evidence)
Interventions appropriate for health care systems – reducing patient out-of-pocket costs for effective treatments for tobacco use and dependence	Recommended (sufficient evidence)
Interventions appropriate for health care systems – patient telephone support (quit lines) when combined with other interventions	Recommended (strong evidence)

Adapted from: Tobacco Use Prevention and Control. Guide to Community Preventive Services.

URL: <http://www.thecommunityguide.org/tobacco/tobac.pdf>

General Recommendations

1. **Reduce tobacco use among youth**—Preventing youth from initiating tobacco use is the single most important strategy for reducing cancer incidence and mortality in Washington. The average age of initiation for adults in Washington who currently smoke is about 15 years.¹⁷ Reducing smoking in youth not only protects young people from immediate and long-term health consequences, but also will reduce the size of the future adult smoking population.
2. **Increase adult cessation especially among high-risk populations such as American Indians and Alaska Natives**—American Indians and Alaska Natives have the highest adult and youth smoking rates in the state. Access to tobacco dependency treatment programs needs to be improved and coverage for such programs should be included in all medical insurance plans.
3. **Reduce exposure to secondhand smoke in private and public places**—Secondhand smoke is classified as a Group A carcinogen by the EPA. Studies have shown that smoking bans in workplaces can reduce exposure to secondhand smoke by 72%.¹⁶
4. **Support the efforts of the Washington State Tobacco Prevention and Control Program**—Existing efforts to reduce tobacco use and exposure through comprehensive statewide programs should be sustained or enhanced.
5. **Monitor emerging science**—Published research on public health interventions should be monitored to identify effective approaches for reducing tobacco use and exposure particularly among high-risk populations.

Goal 1

Reduce the impact of tobacco use and exposure on cancer incidence and mortality in Washington.

Objective 1.1

By 2008, reduce the proportion of students who are current smokers to 10% for 10th grade and 15% for 12th grade.

Baseline: 15% (\pm 1%) in 10th grade, 23% (\pm 2%) in 12th grade. Data Source: 2002 HYS.

Strategies

- ▶ Increase taxes on all tobacco products to a level at least equal to the cost tobacco use imposes on the public.
- ▶ Promote efforts focused on reducing tobacco use among pregnant teens.
- ▶ Expand support for school-based programming to include grades 10 through 12.
- ▶ Prohibit free distribution of tobacco products.
- ▶ Reduce tobacco advertising and curtail promotion of tobacco products.
- ▶ Ban product sampling, single cigarette sales, and novelty products (e.g., bidis).
- ▶ Reduce youth access to tobacco by requiring all tobacco products to be in locked cabinets or located behind counters (no open placement).
- ▶ Increase funding for public health intervention research (e.g., preventing initiation and promoting cessation among youth).

Objective 1.2

By 2008, reduce the proportion of adult current smokers to 17%.

Baseline: 23% (\pm 1%). Data Source: 2001 BRFSS.

Strategies

- ▶ Raise awareness of the Quit-Line and other systems support options for cessation (e.g., physician chart reminders and pharmacy reminders).
- ▶ Promote efforts focused on reducing tobacco use among pregnant women.
- ▶ Increase taxes on all tobacco products to a level commensurate with the cost tobacco use imposes on the public.
- ▶ Develop interventions specifically targeting adults ages 18 to 24.
- ▶ Prohibit tobacco use on all state-supported campuses and in public transit buildings.
- ▶ Work with insurance companies to ensure coverage for smoking cessation.

Objective 1.3

By 2008, reduce involuntary exposure to secondhand smoke in public places.

Baseline: To be established. Data Source: To be established.

Strategies

- ▶ Support the development of partnerships among state and local agencies focusing on policy development and enforcement.
- ▶ Develop and implement a statewide public awareness campaign designed to increase awareness of dangers of secondhand smoke.
- ▶ Develop capacity to measure involuntary exposure to secondhand smoke in public places.
- ▶ Prohibit smoking in all public places (including doorways to public buildings) by strengthening public and private policies.
- ▶ Advocate for the removal of statewide preemption to allow local governments to enact clean indoor air ordinances that are stricter than the state standard.
- ▶ Promote smoke-free work places through policy change.

Objective 1.4

By 2008, increase total funding for the state Tobacco Prevention and Control Program to at least the minimum level recommended by the Centers for Disease Control and Prevention (Range = \$33.3 million to \$89.4 million – see Appendix I).

Baseline: \$29.4 million in 2003. Data Source: State Tobacco Prevention and Control Program.

Strategies

- ▶ Generate funds through increased taxes on tobacco products and earmark for tobacco prevention and control efforts.
- ▶ Collaborate with the CDC and other national organizations to develop and implement program promotion strategies.
- ▶ Advocate for a larger percentage of tobacco settlement funds to be allocated for tobacco prevention and control.

Alcohol

Alcohol consumption increases the risk of some cancers, especially when used in combination with tobacco. For cancer prevention, alcohol should be consumed only in moderate amounts or not at all. Moderate alcohol consumption is defined as one drink per day for adult women and two drinks for men. One drink of alcohol is considered to be a glass of wine, a bottle of beer, or a shot of liquor.

Scientific Evidence Linking Alcohol Consumption to Cancer

The US Department of Health and Human Services (DHHS) lists alcoholic beverages as a known human carcinogen, but reports that the extent of cancer risk is influenced by other factors.¹⁸ Alcohol potentiates the carcinogenic effect of tobacco smoke on the upper aerodigestive tract,¹⁹ presumably by affecting the tissues that come in direct contact with the alcohol.²⁰ Consequently, cancers commonly associated with alcohol use include cancer of the mouth, pharynx, larynx, and esophagus. Alcohol may also contribute to liver cancer directly, or indirectly by causing cirrhosis.^{19, 21} In addition, alcohol consumption may increase the risk of breast cancer.^{19, 21, 22, 23}

Prevalence of Alcohol Consumption in Washington

Alcoholic beverage sales have declined by 24% between 1977 and 1998, suggesting that overall alcohol consumption by Washington residents has decreased. This is consistent with a decrease from the mid-1980s through the mid-1990s in the proportion of residents reporting drinking five or more drinks on one occasion. Since mid-1990, this decrease seems to have leveled off, and in 2002, about 15% of adult respondents to the Washington Behavioral Risk Factor Surveillance System reported drinking five or more drinks on at least one occasion in the last month. BRFSS data for 2002 also show about 6% of Washington adults consume alcohol at higher than moderate amounts (i.e. more than two drinks per day for men and more than one drink for women).²⁴ According to the HYS in 2002, almost 20% of students in Washington public schools in grade 10 and more than one quarter in grade 12 reported drinking more than five drinks on one occasion in the past two weeks.²⁵

Disparities

Consuming alcohol in more than moderate amounts or consuming five or more drinks on one occasion varies by age and gender. Younger men and women in Washington report both of these measures more often than older men and women. Men report drinking five or more drinks on one occasion more often than women. This association is consistent across age, racial, and ethnic groups. However, an equal proportion of men and women report drinking alcohol at higher than moderate amounts. Combined data from the 1997, 1999, and 2001 BRFSS surveys indicate that Washington Native American and Alaska Native adults have a higher prevalence of drinking five or more drinks on one occasion than people of other races.²⁶

Examples of Current Activities

The Washington State DHHS, Division of Alcohol and Substance Abuse (DASA) provides alcohol and substance abuse prevention and treatment services. The DASA Prevention Program aims to prevent alcohol, tobacco, and other drug use and abuse; reduce the negative consequences of substance abuse; and minimize future needs for chemical dependency treatment. The

DASA Treatment Services are designed to provide indigent, low-income individuals, and their families, who are experiencing a range of abuse and addiction problems with alcohol and other drugs, with a wide range of contracted certified treatment services. Services are designed to address the gender, age, culture, ethnicity, and sexual orientation of individuals and their families.

Crisis counseling and referral services are available through the Alcohol and Drug 24-Hour Help Line (see <http://www.adhl.org> for more information). Additional information about available services can be found at the Washington State Alcohol/Drug Clearinghouse (<http://clearinghouse.adhl.org>).

Gaps

More research is needed on the relationship between alcohol and cancer. Additional information is also needed on effective intervention approaches to increase awareness of alcohol as a risk factor for cancer, and to reduce heavy drinking, particularly among Native Americans, Alaska Natives, and young adults and adolescents.

Effective Interventions for Reducing Alcohol Abuse

Several intervention strategies have been shown to reduce alcohol consumption, although the size and longevity of the effects vary.

- ▶ **School-based interventions**—Some school-based interventions focusing on social influences have shown long-term effects in reducing alcohol use, although the size of the effects has been modest.²⁷
- ▶ **Brief interventions**—Brief intervention, which may include advice from a health care provider to reduce or stop drinking, monitoring alcohol consumption, or use of a self-help manual, was the most effective form of alcohol treatment identified in a review of alcohol treatment approaches.²⁸ Brief interventions are generally done with heavy drinkers who have not been diagnosed with substance disorders. Studies indicate that heavy drinkers were twice as likely to reduce their drinking and/or sick days if they received a brief intervention,²⁹ and that a brief intervention may reduce drinking in high-risk college students for four years.³⁰
- ▶ **Public policy**—Public policies that limit availability of alcohol (such as increasing the tax rate) have been associated with reductions in alcohol consumption.²⁷

General Recommendations

1. **Promote awareness of alcohol as a risk factor for cancer, particularly when used in combination with tobacco**—Alcohol is a known human

carcinogen, and potentiates the carcinogenic effect of tobacco smoke. The public, especially those individuals who smoke tobacco, should be aware of the increased cancer risk associated with alcohol consumption.

2. **Monitor emerging science**—Scientific research investigating the relationship between alcohol and cancer should be monitored on an ongoing basis. Published research on public health interventions should also be monitored to identify effective approaches for reducing heavy drinking and promoting only moderate consumption of alcohol for those who choose to drink.

Goal 2

Reduce the impact of alcohol consumption on cancer incidence and mortality in Washington.

Objective 2.1

By 2008, decrease the proportion of adults who drink more alcohol than the recommended moderate level (one drink per day for adult women and two drinks for men).

Baseline: 5% (\pm 1%). Data Source: 2001 BRFSS.

Strategies

- ▶ Increase awareness of services available through the Department of Social and Health Services, Division of Alcohol and Substance Abuse.
- ▶ Educate the public on the relationship between alcohol and cancer.
- ▶ Support new and existing public health and public safety programs that address alcohol consumption.

Nutrition, Physical Activity, and Obesity

Diet, physical activity, and obesity are interrelated lifestyle factors that influence individual risk for a variety of chronic diseases and conditions (e.g., cardiovascular diseases, hypertension, diabetes, osteoporosis, and some cancers). The development of obesity is associated with dietary and physical activity patterns. Although many epidemiologic studies have established an association between diet, physical activity, and obesity and an altered risk of some cancers, the reasons for these associations are not certain. However, eating a healthy diet, participating in regular physical activity, and maintaining a healthy body weight are widely accepted as important strategies for maintaining or improving overall health. More research is needed to determine the impact of these strategies on reducing cancer incidence and mortality. Supporting

existing efforts to encourage eating a healthy diet, getting regular physical activity, and maintaining a healthy body weight is a reasonable approach to promoting health that will likely have the added benefit of reducing the burden of some cancers.

Nutrition

Many studies have found an association between eating a healthy diet and a reduced risk of cancer. A diet low in saturated fats and red meats, and high in fruits and vegetables and whole grains, seems to be consistently associated with a reduced risk of many cancers.

Scientific Evidence Linking Unhealthy Diet to Cancer

It is not possible to quantify the magnitude of the effect diet has on cancer, but it is likely high. Increasing the consumption of fruits and vegetables appears to have a protective effect in reducing the incidence of multiple types of cancer, including cancer of the mouth, pharynx, larynx, esophagus, lung, stomach, colon, rectum, bladder, and cervix.³¹ It is unknown whether the apparent cancer-protective effect is due to any specific substance or combination of substances. Many mechanisms have been postulated, but none has been conclusively proven. However, regardless of the mechanisms, epidemiologic evidence consistently links higher consumption of fruits and vegetables to lower rates of cancer.³²

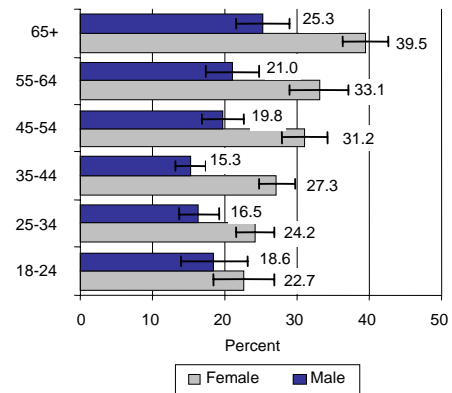
Studies have shown that whole grains may have a cancer-protective effect. Consumption of whole grains are associated with decreased risk for cancer of the colon, gastric cancer, and possibly hormonally-dependant cancers such as breast and prostate.³³ In addition, red meat and animal fat consumption has been positively associated with increased risk for some cancers, specifically cancer of the colon.³⁴ Although dietary supplements including nutrients found in fruits, vegetables, and whole grains may be recommended for special populations, in general, supplementation is unnecessary and does not seem to protect people from developing cancer. In fact, it sometimes seems to increase risk.²²

The American Institute for Cancer Research, together with the World Cancer Research Fund released one of the most comprehensive reviews of scientific research in diet and cancer in 1997. The report, *Food, Nutrition, and the Prevention of Cancer: a global perspective* includes the following basic dietary guidelines for the prevention of cancer as well as other chronic diseases: choose a diet rich in a variety of plant-based foods; eat plenty of vegetables and fruits; drink alcohol in moderation, if at all; limit consumption of red meat if eaten at all; limit fatty foods, particularly those from animal sources; select foods low in fat and salt; and prepare and store foods safely.²²

Prevalence of Unhealthy Diet

Washington does not have detailed information on the eating patterns of its residents, although nationally, over 80% of Americans eat fewer fruits, vegetables, and grain products and more saturated and total fat than recommended by the US DHHS 2000 Dietary Guidelines for Americans.³⁵ The guidelines encourage eating at least two servings of fruit and three servings of vegetables each day. The DHHS Healthy People 2010 objective for fruit and vegetable consumption is to increase the proportion of persons aged 2 years and older who consume at least two daily servings of fruit to 75% and those who consume at least three daily servings of vegetables to 50%. While the Healthy People 2010 objective separates fruits and vegetables and measures *servings*, the Washington Behavioral Risk Factor Surveillance System measures the number of *times* each day adults consume fruits and vegetables combined. In 2000, only 25% (\pm 1%) of Washington State adults reported consuming fruits and vegetables at least five times a day. This likely corresponds to about 50% who eat at least five servings of fruits and vegetables daily.³⁶ Too few years of data exist to determine whether improvements in fruit and vegetable consumption are occurring and Washington data for other food groups are not available.³¹

Fruit and Vegetable Intake by Age and Gender – Washington State BRFSS, 1996, 1998, 2000



Disparities

The highest levels of fruit and vegetable consumption are in the oldest segment of the population. Individuals aged 65 years and older in Washington were most likely to report eating fruits and vegetables five times daily. Additionally, females were significantly more likely to report consuming fruits and vegetables five times a day than males for adults over age 24. In addition to age and gender, level of education also seems to have an impact on fruit and vegetable intake in Washington adults. As educational level increases, the percent of adults consuming fruit and vegetables at least five times daily also increases.³¹

Examples of Current Activities to Promote a Healthy Diet

The Washington State Department of Health, through a cooperative agreement with the CDC and in collaboration with multiple state partners, developed and published a state plan for physical activity and nutrition in June 2003. The plan focuses on policy and environmental strategies to increase access to healthy foods, increase physical activity, and decrease the prevalence of obesity in the state. The Washington State Nutrition and Physical Activity Advisory Group guides this project. In addition, the CDC recently awarded the state DOH a five-year grant (\$800,000 per year) to implement the plan.

DOH staff will be working with partners across the state to implement the plan.

There are several current state programs that promote a healthy diet among Washington residents. The Women, Infants and Children Supplemental Food Program (WIC) addresses the dietary needs of pregnant women, infants, and young children. The program provides counseling as well as food. The Basic Food Nutrition Education Program (used to be known as the Food Stamp Program in Washington State) enhances client understanding of nutrition and healthy eating for low-income residents eligible to receive food stamps. The 5-A-Day program, which promotes the consumption of vegetables and fruits, encourages collaboration between private industry, public health, and produce advocates. More information on these programs can be obtained from the State DOH website at: <http://www.doh.wa.gov/>.

The University of Washington Center for Public Health Nutrition funds community projects that focus on increasing healthy activities and dietary intake, and supports other agencies and organizations with research and technical assistance. The Alliance for Reducing Cancer Northwest at the University of Washington Health Promotion Research Center is a collaborative team of cancer prevention and control experts. The purpose of the alliance is to design, conduct, and evaluate community-based research to fill gaps in current knowledge. Two of their focus areas are nutrition and physical activity. The CDC and the National Cancer Institute fund the alliance.

The Washington State Public Health Association has a resolution “Calling upon school health officials to partner with public health officials to improve student diets, dietary messages and levels of physical activity” encouraging schools to improve the availability of healthy foods at school, and increase student knowledge of healthy dietary choices. In addition, there are over 80 Farmers Markets in Washington State that provide access to fresh fruits and vegetables throughout the state.

Gaps

More information is needed on the relationship between diet and cancer. Better evidence is needed to determine what type of dietary changes will decrease the incidence of cancer. Little research has been done on consumers’ attitudes toward eating fruits and vegetables. However, barriers mentioned frequently in two studies, including one of the general population of adults in Washington, were cost, availability, and personal and family preference.^{37, 38}

General Recommendations

1. **Increase consumption of a healthy diet particularly fruits and vegetables**—Eating a healthy diet (e.g., low in saturated fat; low in red meat; and high in fruits, vegetables, and whole grains) can reduce major risk factors for chronic disease such as obesity, high blood pressure, and high blood cholesterol. Despite these known benefits, the value of a

healthy diet for cancer prevention is less certain. Although no specific food or nutrient has been shown to cause or prevent any cancer, the component of a healthy diet most consistently associated with reduced rates of cancer is high consumption of fruits and vegetables.

2. **Support efforts to implement the Washington State Nutrition and Physical Activity Plan**—The plan is the product of a statewide group including representatives from advocacy, education transportation, agriculture, parks and recreation, economic development, and health care organizations as well as state and local agencies. Implementation of the plan is a major initiative for promoting healthy nutrition in Washington.
3. **Monitor emerging science**—Scientific research investigating the relationship between diet and cancer should be monitored on an ongoing basis. Published research on public health interventions should also be monitored to identify effective approaches for promoting healthy dietary practices.

Goal 3

Reduce the impact of poor diet on cancer incidence and mortality in Washington.

Objective 3.1

By 2008, increase the proportion of youth and adults who eat fruits and vegetables at least five times a day to 35%.

Baseline: Adults – 25% (\pm 1%). Data Source: 2000 BRFSS.

Baseline: Youth – 27% (\pm 2%) in 8th grade, 22% (\pm 2%) in 10th grade, 20% (\pm 2%) in 12th grade. Data Source: 2002 HYS.

Strategies

- ▶ Educate the public on the relationship between eating five servings of fruits and vegetables each day and health.
- ▶ Increase access to fruits and vegetables for all residents of Washington (e.g., in schools and worksites).
- ▶ Support existing programs focused on increasing fruit and vegetable intake.
- ▶ Promote policies that reduce barriers to consumption of fruits and vegetables.

Physical Activity

Physical activity is defined as bodily movement produced by the contraction of skeletal muscle that substantially increases energy expenditure.³⁹ Physical activity includes normal daily activities such as walking, climbing stairs, or doing yard work, as well as recreational activities and other more structured forms of exercise. According to the 1996 Surgeon General's Report, significant health benefits can be obtained through moderate amounts of physical activity done regularly.⁴⁰ Regular physical activity has been associated with reductions in all-cause mortality.^{41, 42, 43} Physical activity has also been associated with reductions in the risk of developing and dying from some cancers.

Scientific Evidence Linking Physical Activity to a Reduced Risk for Cancer

Numerous epidemiological studies have investigated the association between physical activity and cancer. A reduction in risk has been implicated in both breast and colon cancer. According to the International Agency for Research on Cancer, an estimated 11% to 15% of breast and colon cancers may be attributable to lack of physical activity.⁴⁴

The Harvard Center for Cancer Prevention estimates that sedentary lifestyle accounts for 5% of all cancer deaths.⁴⁵ The Institute of Medicine states that physical inactivity is a significant risk factor for cancer and other diseases and should be addressed through interventions targeted to the general and high-risk population.²³

Prevalence of Physical Activity

The CDC and the American College of Sports Medicine recommend that every adult engage in moderate-intensity physical activities for at least 30 minutes (in at least 10-minute intervals) on five or more days of the week. The recommendation can also be met by participating in vigorous-intensity physical activities for at least 20 minutes on three or more days of the week.

Washington BRFSS data show that in 2001, 56% ($\pm 2\%$) of adults in Washington met the recommendations for physical activity (moderate or vigorous levels) through household, transportation or leisure-time activities; this does not include physical activity while at work. This proportion was higher than the state-specific national median of about 45%. When work-related activity was considered along with other activities, the percentage of Washington adults who were active increased to 64% ($\pm 2\%$).

According to the HYS in 2002, 75% ($\pm 2\%$) of students in 8th grade, 73% ($\pm 3\%$) of students in 10th grade, and 64% ($\pm 2\%$) of students in 12th grade reported engaging in vigorous physical activity three or more days a week. An additional 3% to 5% of students did not meet recommendations for vigorous physical activity, but did meet recommendations for moderate physical activity.

An additional Healthy People 2010 objective for adolescent physical activity focuses on the amount of time students spend being physically active during physical education class. The objective is to increase the proportion of adolescents who spend at least 50% of school physical education class time being physically active from 38% to 50%. This is measured as the proportion of students who report being active for an average of 20 minutes per physical education class and who attend physical education classes at least three days each week. According to 2002 HYS data, 54% ($\pm 5\%$) of students in 8th grade, 46% ($\pm 7\%$) in 10th grade, and 30% ($\pm 4\%$) in 12th grade reported spending more than 20 minutes actually exercising or playing sports during physical education class time on three or more days per week.

Disparities

Washington BRFSS data from 2001 show that the overall prevalence of household, transportation or leisure-time-related physical activity does not differ significantly between men and women. However, when work-time physical activity is included, men were somewhat more likely to meet physical activity recommendations than women. Younger adults were more likely to meet recommendations for physical activity compared to people in older age groups, both with and without the inclusion of activity at work.

When excluding work-related activity, 2001 BRFSS data show that college graduates are more likely to meet recommendations for physical activity than Washington adults with less education. These differences do not persist when work-related activity is included. Moreover, adults with average annual household incomes below \$15,000 may be less likely to meet the recommendations for physical activity than people in higher income groups (56% $\pm 7\%$ and 65% $\pm 2\%$, respectively).

Examples of Current Efforts to Promote Physical Activity

The DOH Physical Activity Program manages various efforts to promote physical activity. The Preventive Health and Health Services Block grant provides funding to support projects in Spokane, Skagit, and Kitsap Counties. The campaign “Be Healthy. Be Active.” promotes awareness statewide of physical activity and a more active lifestyle.

The American College of Sports Medicine Northwest Chapter; Washington Alliance for Health, Physical Education, Recreation, and Dance; University of Washington Health Promotion Research Center, and DOH founded the Washington Coalition for Promoting Physical Activity. The coalition has over 125 active members and has been active in developing public awareness campaigns. The coalition maintains a website (<http://www.beactive.org/>) that provides educational information and links to resources.

Through a cooperative agreement with CDC and in collaboration with multiple state partners, DOH developed and published the Washington State Nutrition

and Physical Activity Plan in June 2003. One of the overarching goals includes increasing the proportion of Washington State residents who get at least 30 minutes of moderate activity on five or more days of the week. The plan is intended to serve as a framework in which policy makers can work together to make it easier for Washington residents to choose to be physically active. The plan focuses on policy and environmental approaches to creating healthy environments. The CDC also recently awarded DOH a five-year grant (\$800,000 per year) to implement the plan. Department of Health staff will be working with partners across the state to implement the plan.

The US DHHS recently awarded DOH a five-year grant to address physical activity among other health-related risk factors and chronic conditions. The grant is part of the national “STEPS to a Healthier US” initiative. DOH will be working with lead agencies in four communities: 1) Chelan/Douglas and Okanogan Counties, Chelan/Douglas Health District; 2) Clark County, Community Choices 2010; 3) Confederated Tribes of the Colville Reservation; and 4) Thurston County Department of Public Health and Social Services. Funding for the first year of the grant is \$1,553, 969 which began in September 2003. In addition to the grant awarded to the state, Public Health – Seattle and King County received an award in the “large cities” category.

Other activities within the state occur at the local level. The state Physical Activity and Nutrition program is assisting with a community-wide campaign in Moses Lake to prevent obesity. Promoting physical activity is a major component of the campaign. Many communities have participated in the Rails-to-Trails initiative and are building bike lanes. A few school districts, such as the City of Seattle, have progressive programs focused on life-long physical activity.

Gaps

Although there are various efforts to promote physical activity at the state and community level in Washington, there are no comprehensive, statewide programs. At the school level, there are no statewide standards for the types of activities students do for physical education or for the length of time that students are actually physically active during physical education classes. More information is needed on the relationship between physical activity and cancer.

Effective Interventions to Promote Physical Activity

The CDC’s Guide to Community Preventive Services has made recommendations regarding interventions that communities, policymakers, and public health providers can employ to promote physical activity. The recommendations are based on systematic reviews of the evidence of intervention effectiveness from the scientific literature. Physical activity interventions were categorized into three different types of approaches—informational, behavioral and social, and environmental and policy. Table 2 shows the interventions that were recommended.

Table 2: Physical activity — effective interventions

Intervention	Recommendation
Informational approaches to increasing physical activity	
Community-wide campaigns	Recommended (strong evidence)
“Point-of-decision” prompts to encourage stair use	Recommended (sufficient evidence)
Behavioral and social approaches to increasing physical activity	
School-based physical education (PE)	Recommended (strong evidence)
Social support interventions in community settings	Recommended (strong evidence)
Individually adapted health behavior change programs	Recommended (strong evidence)
Environmental and policy approaches to increasing physical activity	
Creation of or enhanced access to places for physical activity combined with informational outreach activities	Recommended (strong evidence)

Adapted from: Promoting Physical Activity. Guide to Community Preventive Services.

URL: <http://www.thecommunityguide.org/pa/pa.pdf>

General Recommendations

1. **Increase physical activity among youth and adults**—Increasing the prevalence of regular physical activity would have significant benefits for chronic disease prevention in general and may also reduce the incidence of cancer. Supporting ongoing efforts to promote physical activity is a potential means of reducing the burden of cancer.
2. **Support efforts to implement the Washington State Nutrition & Physical Activity Plan**—The plan is the product of a diverse statewide group. Implementation of the plan is a major initiative for promoting physical activity in Washington.
3. **Monitor emerging science**—Scientific research investigating the relationship between physical activity and cancer should be monitored on an ongoing basis. Published research on public health interventions should also be monitored to identify effective approaches for promoting regular physical activity.

Goal 4

Reduce the impact of physical inactivity on cancer incidence and mortality in Washington.

Objective 4.1

By 2008, increase to 80% the proportion of adolescents who report engaging in at least 20 minutes of vigorous physical activity on three or more days per week.

Baseline: 75% (\pm 2%) for 8th grade, 73% (\pm 3%) for 10th grade, 64% (\pm 2%) for 12th grade.

Data Source: 2002 HYS.

Strategies

- ▶ Support implementation of the Physical Activity and Health Essential Learning Requirements.
- ▶ Support the development and implementation of statewide physical activity initiatives that employ effective interventions.

Objective 4.2

By 2008, increase the proportion of youth who report being physically active for 20 minutes or more during school physical education class time on three or more days per week to 60%, 55%, and 40% for students in grades 8, 10, and 12, respectively.

Baseline: 54% (\pm 5%) of students in 8th grade, 46% (\pm 7%) in 10th grade, and 30% (\pm 4%) in 12th grade. Data Source: 2002 HYS.

Strategies

- ▶ Promote increased time requirement for physical activity during physical education classes in school.
- ▶ Support implementation of the Physical Activity and Health Essential Learning Requirements.

Objective 4.3

By 2008, increase to 60% the proportion of adults who report engaging in regular (5 or more days per week) moderate-intensity physical activity for at least 30 minutes per day for at least 10 minutes at a time or vigorous-intensity physical activity 3 or more days per week for at least 20 minutes per day.

Baseline: 56% (\pm 2%). Data Source: 2001 BRFSS.

Strategies

- ▶ Support the development and implementation of statewide physical activity initiatives that employ effective interventions.
- ▶ Place signs by elevators and stairs to promote stair use.
- ▶ Increase access to safe environments for physical activity.

Obesity

The National Heart, Lung, and Blood Institute of the National Institutes of Health established clinical guidelines for the identification of overweight and obesity in 1998.⁴⁶ According to these guidelines, overweight in adults is defined as having a body mass index (BMI) from 25 to 29.9. Obesity is defined as having a BMI of 30 or more.* According to guidelines from the Centers for Disease Control and Prevention, children and adolescents are classified as being “overweight” rather than obese.

Overweight in children and adolescents is defined as having a BMI greater than or equal to the 95th percentile for age and sex based on CDC standardized growth charts.⁴⁷ Children who are overweight have an increased chance of being overweight or obese as an adult. Obese and overweight individuals are at an increased risk for many health problems, including several types of cancer.⁴⁸

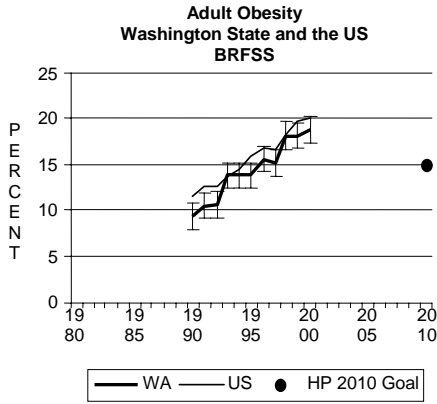
Scientific Evidence Linking Obesity to Cancer

Obesity has been associated with breast, colon, prostate, endometrial, kidney and gall bladder cancers, and also may increase the risk for cancer of the liver, pancreas, rectum, and esophagus.⁴⁹ A recent study by the American Cancer Society suggests that nationally, obesity and overweight could account for as many as 20% of cancer deaths in women and 14% in men. The study also concluded that there is an association between increased body weight and increased death rates for all cancers combined.⁵⁰ In addition, obesity is closely linked with dietary risk factors and physical inactivity, both of which may increase the risk of some cancers. In fact, the International Agency for Research on Cancer suggests that prevention of obesity be based on healthy eating habits and regular physical activity and should begin early in life.⁴⁹

Prevalence of Obesity

Overweight in youth and obesity in adults are leading health indicators for Healthy People 2010. For adults aged 20 years and older, the objective is to reduce the proportion of obese individuals to 15%. According to Washington BRFSS data, in 2001, almost 20% of adults in Washington State were obese

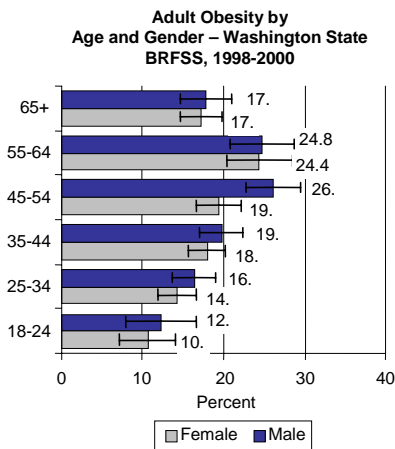
*body mass index = weight (kg) / height (m²) or weight (lbs) / height (in²) x 704.5



and an additional third were overweight. Therefore, approximately half of the adult population in Washington is either overweight or obese. The Healthy People 2010 objective for children and adolescents age 6-19 is to reduce the proportion of overweight individuals to 5%. According to the 2002 HYS, over one quarter of 8th graders and over one fifth of 10th and 12th graders in Washington were “at risk of overweight” or “overweight.” Trend data indicate that the problem is growing. In Washington, obesity in adults has increased from under 10% in 1990 to almost 20% in 2001. Trends in rates of overweight status for children and youth parallel those for adults over the past 10 years nationally.⁴⁸

Disparities

Overall, the prevalence of obesity in Washington is nearly equal among men and women, although for people age 45-54 years, obesity prevalence is significantly higher for men. Disparities are also seen by race and ethnicity.



African Americans, American Indians and Alaska Natives have the highest prevalence of obesity in Washington, with about 30% being obese according to BRFSS data from 1998-2000 combined. Asian and Pacific Islanders have the lowest prevalence of obesity according to the same data, with fewer than 10% being obese. Nationally, African Americans and Hispanic females have the highest prevalence of obesity.⁴⁸ Education and annual income also seem to be associated with obesity prevalence in Washington. College graduates have a much lower prevalence of obesity than individuals that have not graduated from college (approximately 13% and 21% respectively), and the prevalence of obesity in women is lower for women with annual income over \$50,000 (about 13%) than those with lower incomes (over 20%).⁴⁸

Examples of Current Activities to Reduce Obesity

Prevention of overweight in young people and slowing the rate of increase in obesity in adults are priority areas for the Washington State DOH. The Washington State Nutrition and Physical Activity Plan, developed under a cooperative agreement with CDC, addresses obesity at the institutional, community, and policy levels. The plan focuses on decreasing obesity by increasing physical activity and improving nutrition. The CDC also recently awarded DOH a five-year grant (\$800,000 per year) to implement the plan. DOH staff will be working with partners across the state to implement plan strategies.

The Physical Activity and Nutrition Program is also conducting a community-wide campaign, Healthy Communities, in Moses Lake to prevent obesity. Plans are for Healthy Communities to be implemented in other cities around the state in the future. In addition, the DOH has been an active partner in the

Northwest Obesity Prevention Project, which works to build capacity to address issues of obesity in the state.

The US DHHS recently awarded DOH a five-year grant to address obesity among other chronic conditions and risk factors. The grant is part of the national “STEPS to a Healthier US” initiative. DOH will be working with lead agencies in four communities: 1) Chelan/Douglas and Okanogan Counties, Chelan/Douglas Health District; 2) Clark County, Community Choices 2010; 3) Confederated Tribes of the Colville Reservation; and 4) Thurston County Department of Public Health and Social Services. Funding for the first year of the grant is \$1,553,969 which began in September 2003. In addition to the grant awarded to the state, Public Health – Seattle King County received an award in the “large cities” category.

Gaps

Despite the recently awarded “STEPS” grants and existing efforts at the state Department of Health, there are no comprehensive, statewide programs that address obesity prevention and control in Washington. In addition, more research is needed to better understand the effect of obesity on the development of cancer.⁴⁹ Research is also needed on interventions that are effective at preventing or reducing obesity.

General Recommendations

1. **Reduce the proportion of youth and adults who are overweight or obese**—Obesity rates are rapidly increasing in Washington State similar to the increase seen in the nation as a whole. Reducing obesity rates will improve overall public health and may contribute to a decrease in the incidence of some cancers.
2. **Support efforts to implement the Washington State Nutrition & Physical Activity Plan**—The plan is the product of a statewide group including representatives from advocacy, education transportation, agriculture, parks and recreation, economic development, and health care organizations as well as state and local agencies. Implementation of the plan is a major initiative for promoting strategies to reduce obesity in Washington.
3. **Monitor emerging science**—Scientific research investigating the relationship between obesity and cancer should be monitored on an ongoing basis. Published research on public health interventions should also be monitored to identify effective approaches for reducing obesity and promoting maintenance of a healthy weight.

Goal 5

Reduce the impact of obesity on cancer incidence and mortality in Washington.

Objective 5.1

By 2008, slow the increase in the proportion of adults who are obese.

Baseline: From 1990 – 2002, the average annual increase has been 7% (\pm 2%).
Data source: 1990-2002 BRFSS.

Strategies

- ▶ Support efforts to increase access to healthy food and beverage choices and physical activity opportunities in workplaces and other institutional settings and reduce access to less healthy foods.
- ▶ Support community-wide campaigns to promote healthy choices for food and beverages and physical activity.
- ▶ Support public health approaches to increasing access to and availability of obesity treatment.

Objective 5.2

By 2008, decrease the number of children and adolescents who are overweight.

Baseline: 11% (\pm 1%) for 8th grade, 10% (\pm 2%) for 10th grade, 9% (\pm 1%) for 12th grade

Data Source: 2002 HYS.

Strategies

- ▶ Support the implementation of the Washington State Nutrition and Physical Activity Plan.
- ▶ Support efforts to increase access to healthy food and beverage choices in schools and other institutional settings and reduce access to less healthy foods.
- ▶ Support community-wide campaigns to promote healthy choices for food and beverages and physical activity.
- ▶ Promote increased time requirement for physical activity during physical education classes in school.
- ▶ Support implementation of the Physical Activity and Health Essential Learning Requirements.

Sun Exposure

Ultraviolet (UV) radiation from sun exposure is known to be the leading cause of skin cancer. Skin cancer is the most common cancer in the US and incidence rates are rising in Washington. However, skin cancer is largely preventable when sun protection measures (e.g., sunscreen, protective clothing) are used consistently. In addition, most skin cancers are curable if detected in the earliest stages.

Scientific Evidence Linking Sun Exposure to Cancer

Epidemiologic studies show that exposure to high levels of UV radiation is associated with an increased risk for two of the three major forms of skin cancer (basal cell and squamous cell carcinoma). The most serious type of skin cancer is melanoma. Severe sunburns in childhood⁵¹ and intense, intermittent sun exposure are associated with an increased risk of melanoma. For most people, sunlight is the major source of UV radiation; however, artificial sources of sunlight, such as tanning booths and sunlamps, also produce UV radiation. The majority of melanomas (an estimated 65%) are the result of sun exposure.⁵² Intermittent acute sun exposure appears to increase risk more than lower level, chronic, or cumulative sun exposure even if total UV radiation amount is the same.⁵³

Burden of Skin Cancer in Washington

According to WSCR data, there were 2,211 new cases of melanoma in 2000 in Washington (age-adjusted incidence rate = 38.6 per 100,000). Melanoma is the fifth leading cancer in Washington State. The age-adjusted incidence rate has been increasing since 1992 by an average of 5.6% per year. Though the incidence of melanoma is lower than basal cell or squamous cell carcinoma, its mortality is higher. In 2000, 139 people died of melanoma in Washington (age-adjusted mortality rate = 2.5 per 100,000). Despite being the most deadly form of skin cancer, melanoma is responsible for only a small proportion of total cancer mortality. In 2000, melanoma caused 1.3% of cancer deaths in Washington. While mortality rates for some of the major causes of cancer death in Washington have been falling (e.g., colorectal, prostate, and breast cancers), the mortality rate for melanoma is rising. The age-adjusted mortality rate has increased an average of 1.7% per year from 1980 to 2000. Melanoma also strikes younger adults leading to higher potential years of life lost.

Although the mortality rate for non-melanoma skin cancers is lower than melanoma, the incidence rate is higher. Non-melanoma skin cancer can cause significant morbidity. Basal cell carcinomas are locally destructive and require surgical resection or reconstruction.

Prevalence of Sun Protective Behavior

Sun protective behaviors include the use of barriers such as clothing, hats, and sunscreen (UV-A and UV-B protection with sun-protection factor of ≥ 15); avoiding sun exposure at midday (10:00 a.m. to 4:00 p.m.); and seeking shade when outside during midday. According to the 2000 Washington BRFSS data, almost 60% of adults in Washington reported that they used at least one sun protective behavior always or nearly always. Among people with the most sun-sensitive skin (i.e., poor tanning ability and light skin, eye, or hair color), almost three quarters report that they always or nearly always use at least one method of sun protection. Although this rate is higher than that of the general population, over 25% of the most susceptible population are not being adequately protected from the sun's UV rays.

Disparities

Melanoma is more common among older people. Incidence rates are especially high among people age 65 and older. In younger age groups, women have higher incidence rates than men, but after age 65, the incidence rates for men are twice the rates for women. Whites are much more likely to develop melanoma than African Americans or Asians and Pacific Islanders. WSCR data from 1998 to 2000 show an age-adjusted incidence rate for melanoma of the skin of approximately 3 per 100,000 for Asians and Pacific Islanders and for African Americans, compared to almost 37 per 100,000 for whites. Data are not available for American Indians/Alaska Natives and Hispanics. Melanoma incidence rates are somewhat higher in urban areas of the state than in more rural areas.⁵⁴

The use of sun protection varies in the population. For example, among people age 18 to 34, 44% ($\pm 4\%$) reported that they always or nearly always use one or more form of sun protection compared with 73% ($\pm 4\%$) of people age 65 and older. Men are less likely than women to report that they always or nearly always use one or more forms of sun protection. People in rural areas of Washington are more likely than people in urban areas to report that they always or nearly always use at least one of the recommended methods of sun protection.

Examples of Current Activities to Reduce Sun Exposure

The Washington State DOH does not offer any programs or interventions specifically aimed at promoting sun protective behavior. Though there are no statewide initiatives in Washington, national level campaigns have been developed. The CDC's Choose Your Cover campaign and the Environmental Protection Agency's Sun Wise Program make various publications and other educational materials available. Australia has the highest melanoma rates in the world. Evaluation of their "Slip! Slop! Slap!" intervention campaign has shown significant improvement in sun protective behavior and decreased sun burning.⁵⁵

Gaps

There are no statewide initiatives or programs aimed at promoting sun protective behavior. More research is needed on effective intervention approaches to promote sun protective behavior and reduce exposure to UV radiation.

Effective Interventions to Promote Sun Protective Behavior

The CDC’s Guide to Community Preventive Services has made recommendations regarding interventions that communities, policymakers, and public health providers can employ to promote sun protective behavior. The recommendations are based on systematic reviews of the evidence of intervention effectiveness from the scientific literature. The table below shows the interventions that were recommended. The CDC has also developed Guidelines for School Programs to Prevent Skin Cancer. These guidelines are available at <http://www.cdc.gov/cancer/nscpep/guidelines.htm>.

Table 3: Sun exposure—Effective interventions

Intervention	Recommendation
Setting-specific interventions	
Educational/policy interventions in primary schools	Recommended (sufficient evidence – in improving children’s sun protective “covering up” behavior)
Educational/policy interventions in recreational/tourism settings	Recommended (sufficient evidence – in improving adult sun protective “covering up” behavior)

Adapted from: Promoting Physical Activity. Guide to Community Preventive Services.
 URL: <http://www.thecommunityguide.org/cancer/cancer-int-reduce-uv.pdf>

General Recommendations

1. **Increase sun protective behavior particularly among children—**
 Although melanoma ranks low in mortality, it is the fifth most frequently diagnosed cancer in Washington and incidence rates are rising. Sun exposure is a risk factor for melanoma, particularly sunburns during childhood. Promoting sun protective behaviors to reduce intense, intermittent sun exposures, especially among children, may reduce the incidence of melanoma.
2. **Monitor emerging science—**Published research on public health interventions should be monitored to identify effective approaches for promoting sun protective behavior and reducing exposure to UV radiation.

Goal 6

Slow the increase in the incidence of malignant melanoma in Washington.

Objective 6.1

By 2008, increase the proportion of adults who report using at least one sun protective behavior always or nearly always to 75%.

Baseline: 57% (\pm 2%). Data Source: 2000 BRFSS.

Objective 6.2

By 2008, increase the proportion of adults at highest risk for melanoma (i.e., poor tanning ability and light skin, eye, or hair color) who report that they always or nearly always use at least one method of sun protection to 85%.

Baseline: 74% (\pm 4%). Data Source: 2000 BRFSS.

Objective 6.3

By 2008, increase the proportion of parents who report regularly using some form of sun protection for their children.

Baseline: To be established.

Strategies

- ▶ Develop programs to promote awareness and use of sun protective behaviors.
- ▶ Incorporate educational information on sun protection into school-based curricula.

Infectious Agents

Infectious agents are microorganisms that are capable of being transmitted from one person to another or via contaminated food and water or by vectors. Several infectious agents have been associated with cancer, including human papillomavirus (HPV), hepatitis B, human immunodeficiency virus (HIV), *Helicobacter pylori*, and human T-cell leukemia/lymphoma virus (HTLV-1), among others. The majority of infectious agents that are associated with cancer are spread via sexual contact. Methods, other than sexual contact, known to transmit these infections include intravenous drug use, mother-to-child transmission, and transfusion of cellular blood products. Sexual behaviors that increase the risk of transmitting infectious agents associated with cancer include sexual intercourse without the use of a condom and multiple sex partners.

Background information is provided below on several infectious agents linked to cancer. Most infectious agents are associated with rare types of cancer and most people who contract these infections never develop cancer. Of these agents, only HPV is known to be associated with a large number of cancers. Since sexual contact is the most common form of transmission for cancer related infections, decreasing high-risk sexual behavior may reduce cancers associated with infectious causes.

Human Papillomavirus

HPV is the infectious agent most commonly associated with cancer. There are over 100 types of HPV, and more than 30 are spread via sexual contact.⁵⁶ Infection with high-risk types of HPV, specifically HPV-16 and HPV-18, is probably a necessary cause of cervical cancer.⁵⁷ HPV infection is also a risk factor for anal, vulvar, and penile cancer.

HPV infection is the most common sexually transmitted infection, and most experts believe that approximately 80% of all women contract HPV at some point in their life. HPV infection is most common in women under age 35. Infection with “high risk” or cancer-associated types (HPV 16, HPV 18 and others) is also common. Although there is no cure for HPV, in most circumstances infections are transient, produce no symptoms and clear by themselves. In fact, 70% of high-risk HPV types and 90% of low-risk types will regress within three years.⁵⁸ However, studies suggest that factors such as smoking, immunosuppression, and infection with other viruses (e.g. HIV) may interact with HPV and influence the development of cancer. Recent research suggests that a vaccine against cancer related HPV infections might be ready for use within the next decade.

Hepatitis B Virus

Hepatitis viruses, particularly hepatitis B (HBV), have been associated with hepatocellular carcinoma.⁵⁹ Approximately 25% of hepatocellular carcinomas are related to HBV. HBV is spread through direct exposure to infected blood, serum, or sexual fluids of an infected person. Transmission can occur through various means including unintentional needle sticks, transfusion of untested blood, perinatal exposure, sexual contact, sharing equipment used to inject drugs, or sustained close contact to someone with an acute or chronic infection.

Washington State began surveillance for acute hepatitis B in 1981, and both acute and chronic hepatitis B became reportable in December 2000. Accurate hepatitis B incidence is difficult to obtain because many infections are mild and produce no symptoms. In 2002, there were 82 cases of acute hepatitis B reported in Washington. In contrast, approximately 1,000 acute cases were reported each year between 1986 and 1989.⁵⁹

Hepatitis B rates in Washington are highest among adults aged 30-49 years, with men having higher rates of infection than women in almost all age

groups.⁵⁹ Although Washington-specific data on race and HBV infection are not available, incidence rates are higher for some racial and ethnic groups. Infection rates are also higher among immigrants from endemic areas.

Infection with HBV can be prevented through vaccination. The hepatitis B vaccine is recommended as a routine preventive measure for children, adolescents, and adults at risk for HBV.

Human Immunodeficiency Virus

HIV has been linked with lymphoma and anal cancer among homosexual men as well as Kaposi's sarcoma. Interactions between HIV and other infectious agents such as HPV, Epstein-Barr-Virus and herpes simplex virus type 8 introduce a greater risk for developing cancer.⁶⁰ While HIV is associated with these cancers, there are many other reasons to control HIV apart from its association with cancer.

HIV can be transmitted through sexual intercourse, sharing drug injection equipment, and childbirth. Transmission through blood transfusions and improper or accidental breakdown of infection control practices is rare.

Approximately 12,000 people in Washington are living with HIV infection.⁶¹ Although incidence rates and deaths from acquired immunodeficiency syndrome (AIDS) in Washington have declined since the mid 1990s, this does not necessarily reflect a decrease in the incidence of HIV. Washington data on HIV incidence, separate from AIDS, is incomplete and needs further evaluation. However, estimates indicate that incidence rates decreased until 1996-1997, followed by an increase in 1998-1999. Although there is no cure for HIV or AIDS, there have been significant advances in antiretroviral therapies allowing infected individuals to live with HIV infection for a longer period of time. This may increase the cancer problem in long-term survivors.

HIV is more prevalent among men than women of all age groups, especially men who have sex with men (MSM). About 92% of people with AIDS in Washington are men. Rates are also high among injection drug users. Although the rates of HIV infection among MSM have decreased in Washington since 1988, the majority of new AIDS cases are still diagnosed in MSM. From 1998-2000, 56% of new AIDS cases were in MSM and 13% were among injection drug users.⁶¹ Of AIDS diagnoses in men between 1998 and 2000, 72% were white, 13% black, and 11% Hispanic. Of AIDS diagnoses among women during the same time period, 44% were white, 35% black, and 11% Hispanic. These percentages seem heavily weighted towards whites, but because the majority of Washington's general population is white, the rates for people of color, particularly blacks and Hispanics, are proportionally higher. HIV rates are also significantly higher in urban areas than in rural parts of Washington state, with the highest prevalence of AIDS cases being in King County.

Helicobacter Pylori

Helicobacter pylori is associated with gastric cancer and although the mechanism of infection has not been positively identified, experts believe it to be spread via oral-oral and oral-fecal routes.⁶² The overall prevalence of Helicobacter pylori is low in the US, although certain populations are disproportionately affected. Helicobacter pylori is most prevalent in emigrants from developing countries.⁶²

Human T-cell Leukemia/Lymphoma Virus

Human T-cell leukemia/lymphoma virus (HTLV-1) is associated with adult T-cell leukemia/lymphoma (ATLL),⁶³ but is rare in the US. HTLV-1 remains endemic in emigrants from several geographic areas including parts of Japan, the Caribbean basin, South America, South Pacific, and West Africa.⁶³

Prevalence of Sexual Behaviors Known to Transmit Infectious Agents

Sexual intercourse without the use of a condom and having multiple sex partners increases the risk of infections associated with cancer. Early age at intercourse is also associated with an increased risk for developing cervical cancer. The Washington BRFSS survey asks people age 18 and older questions about sexual behavior. In Washington in 1999, almost 80% of respondents said that they had had sexual intercourse with at least one partner and about 10% indicated that they had had sexual intercourse with two or more partners in the last 12 months. Married people were less likely to report multiple partners. Of people with multiple partners, 51% (\pm 6%) reported use of a condom compared to 29% (\pm 4%) of those with one partner. Also, single people in general and younger sexually active people in particular, were more likely to use a condom at last intercourse.⁶⁴

Washington data on sexual activity among youth are not available. Nationally, among youth in grades 9-12, the rate of those who reported ever having sexual intercourse is declining. However, teens and young adults are more likely to have multiple sex partners. Additionally, despite a reported increase in condom use, the prevalence of sexually transmitted infections in youth aged 15-19 years remains high.

Disparities

Some populations are more susceptible to infections from specific infectious agents than others. For instance, during sexual intercourse between men and women, women are at higher risk for acquiring a sexually transmitted infection because these infections are more easily spread from male to female.

Examples of Current Activities to Reduce Risks Associated With Infectious Agents

Researchers are studying how changes from HPVs can be prevented in normal cells. Vaccines intended to produce immunity to several types of HPV are also

being researched.⁶⁵ Vaccines for HPV-16 and HPV-18 are already being studied in clinical trials for cervical cancer,⁵⁶ but are not expected to be available to the public for another 5-10 years.

The Family Planning Program at the Washington State DSHS provides annual Pap tests, some sexually transmitted disease services, sexuality education, and contraceptives, including barrier methods, to eligible women and men. The Family Planning and Reproductive Health Program at the Washington State Department of Health provides services for men and women including cervical cancer screening, sexually transmitted disease (STD) tests, and contraceptives, among others. Local health departments also provide services. For example, the Public Health-Seattle & King County Family Planning Program provides many affordable services for men and women, including but not limited to Pap tests, male exams, STD checks, and contraceptives.

Multiple public health programs in Washington address sexual health. The Office of HIV Prevention and Education Services at the Washington State DOH conducts prevention-focused public awareness programs across the state and the STD Program offers educational material, clinical advice, and services for the prevention and treatment of STDs across the state.

Gaps

There is a need for increased awareness of the relationship between sexually transmitted infectious agents and cancer. Resources are needed to ensure that health care providers have access to the education and client materials needed to ensure good communication with patients regarding sexual health issues. Additional funding is needed to develop targeted interventions for high-risk populations as well as to develop the capacity to assess sexual risk behaviors in all populations in the state. There is a need for continued enhancement of community social marketing campaigns that promote sexual health.

General Recommendations

1. **Improve awareness that some sexually transmitted infectious agents increase the risk for cancer**—Early age at first intercourse is associated with an increased risk for developing cervical cancer. Discouraging sexual risk behaviors, especially among high-risk populations, may reduce the risk of some cancers.
2. **Increase hepatitis B immunization rates**—The HBV vaccine is effective at preventing hepatitis B thus reducing the risk of hepatocellular cancer.
3. **Monitor emerging science**—Scientific research investigating the relationship between infectious agents and cancer should be monitored on an ongoing basis. Published research on public health interventions should

also be monitored to identify effective approaches for reducing exposure to infectious agents associated with cancer and reducing sexual risk behaviors.

Goal 7

Reduce the impact of infectious agents on cancer incidence and mortality in Washington.

Objective 7.1

By 2008, increase awareness of sexual behaviors associated with an increased risk for developing cancer (i.e., sexual intercourse without the use of a condom and multiple sex partners).

Strategies

- ▶ Encourage health care providers to provide appropriate counseling on the prevention of sexually transmitted infectious agents.
- ▶ Incorporate cancer risk information into public awareness campaigns and written materials addressing infectious agents used by existing programs.
- ▶ Promote efforts to increase access to sexual health programs and services.
- ▶ Develop surveillance capacity for determining high-risk sexual behavior in youth.

Environmental Carcinogens

The International Agency for Research on Cancer (IARC) conducts evaluations of the cancer risk that specific chemicals pose to humans. The science behind these evaluations is well established. A number of chemicals in the environment have been clearly linked to an increased risk of cancer in humans. In this plan, “environmental carcinogens” refers to those chemicals and physical agents that IARC has evaluated as carcinogenic or probably carcinogenic to humans.

Quantifying the cancer risk posed by these chemicals is challenging due to the difficulty in measuring exposure. Human exposure to any given environmental carcinogen is highly variable and depends on a number of factors including the concentration of the carcinogen in the environment, individual behaviors (e.g., location of residence, frequency of contact with soil), and how the carcinogen

is taken into the body. Furthermore, each person's exposure to environmental carcinogens can vary greatly over a lifetime. For these reasons, it is not possible to provide a reliable estimate of the cancer burden associated with any particular environmental carcinogen in Washington State.

Two factors were used to determine which environmental carcinogens to address in this plan. First, only chemicals that IARC had evaluated and concluded were carcinogenic or probably carcinogenic to humans were considered. Second, despite not having precise estimates of exposure, the potential for exposure to a large population was considered. Arsenic, radon, and diesel exhaust were identified as the known or probable environmental carcinogens with the greatest potential impact on public health in Washington.

Many studies have examined the issues of environmental justice, that is, whether and to what extent minorities and/or those who are disenfranchised suffer disproportionate environmental exposures. The first specific issues studied regarded the location of hazardous waste incinerators and chemical manufacturing plants. Recently, the Washington State Board of Health completed a comprehensive study of environmental justice in Washington.⁶⁶ While there is little definitive data regarding the extent of this problem, a 1995 study by the Department of Ecology found that there are a greater number of industrial facilities in low-income and minority communities, which may be resulting in higher exposures among these residents.⁶⁷ There are also concerns that since a higher proportion of minority and low-income residents reside in urban areas, these groups may be exposed to higher than average levels of diesel exhaust. While data do not exist to assess the extent of environmental justice issues regarding the exposures discussed in this chapter, one of the recommendations is to conduct such an analysis for exposure to diesel exhaust.

Arsenic

There are three potentially significant sources of arsenic in the environment: contaminated soil, contaminated drinking water, and outdoor wood structures (such as playground equipment) built using wood treated with chromated copper arsenic (CCA).

Soils over large areas of Washington State are contaminated by arsenic as a result of past emissions from smelters and from the historic use of the pesticide lead-arsenate in agricultural areas. For smelter-contaminated soil, arsenic concentrations tend to be higher in areas closer to the location of the smokestack and along the paths of prevailing winds. Economic factors have promoted conversion of agricultural and industrial properties into residential developments, resulting in more people living in areas with contaminated soils.

Arsenic can also leach from naturally occurring subsurface geologic formations into aquifers used for public and private water supplies. In October 2001, the Environmental Protection Agency (EPA) lowered the maximum contaminant level (MCL) for public water supplies from 50 to 10 parts per billion (ppb)

effective in 2006.⁶⁸ While this revised MCL will apply to larger public water supplies, private wells and most smaller public water systems in Washington are not subject to this regulation.

Most wood used in outdoor playground equipment has been treated with CCA. Outside surfaces of treated wood also contain CCA. Arsenic is present at the surface of the wood, and arsenic from the interior of the wood will continue to leach to the surface for years or decades as a source of exposure.

Scientific Evidence Linking Arsenic to Cancer

Arsenic has been classified by IARC and the EPA as carcinogenic to humans and has been associated with lung, bladder, skin, liver, and kidney cancer.^{69, 70}

Potential for Exposure

The Washington State DOH estimates that approximately one million people in Washington State live in areas with more than 20 ppb arsenic in the soil, (the state Department of Ecology's health-based hazardous waste clean-up level). These people may be exposed via incidental ingestion (the predominant exposure pathway) and/or inhalation of soil and dust particles. Young children have the greatest potential for exposure because of their close and more frequent contact with soil and dust outside and inside the home, and their frequent hand-to-mouth contact. Gardeners, yard maintenance, and construction workers are also more likely to ingest significant amounts of soil.

Some people are exposed to ground water containing more than 10 ppb arsenic that is found in many locations across Washington. Based on data from 1993-2003, DOH estimates that approximately 5% of Group A systems and 1% of Group B systems might exceed 10 ppb arsenic.⁷¹ Not all of these systems will be regulated under the new rule. The DOH does not have information to estimate the number of private wells that might exceed 10 ppb arsenic. Approximately one million Washington residents get water from individual private wells. Another five million residents get water in their homes from more than 16,000 public water systems.⁷²

Children's hands may become contaminated with arsenic by playing on decks or playground equipment made of CCA-treated wood. Ingestion may result from hand-to-mouth contact.

Examples of Current Activities

Limited soil sampling has been conducted by private parties and by federal, state, tribal and local governments. On June 30, 2003, the Area-Wide Soil Contamination Task Force released its report containing advice on ways to address economic, liability, and public health issues related to widespread arsenic-contaminated soil.⁷³

Larger public water systems will be required to comply with the new, more stringent federal drinking water standard for arsenic, which lowered the MCL

for public water supplies to 10 ppb. Water systems not covered by the Safe Drinking Water Act (e.g., systems with fewer than 15 service connections) are not currently required to meet this standard.⁷⁴ Private wells are exempt from federal and state regulations, although newly constructed wells in some counties are not approved if the water has more than 10 ppb arsenic.

Manufacturers have agreed to phase out the use of CCA-treated wood for most residential applications.

Gaps

For many areas in Washington, arsenic concentrations in soil are not known. Several local health jurisdictions in Washington state have developed or compiled materials recently, but these may not be available statewide.

Many small water supplies and most private wells have not been tested for arsenic. Educational materials regarding water testing and options for treatment to reduce arsenic levels need to be further developed and distributed.

The number of wood-based playground units in Washington State is not known. Educational materials regarding potential of exposure from CCA-treated wood and methods to reduce exposure need to be further developed and distributed.

General Recommendations

1. **Reduce exposure to arsenic in soil**—Conducting additional soil sampling will help to identify and better characterize contaminated areas. In addition, methods to estimate exposures resulting from living on or working in contaminated soils need to be improved. Finally, more educational materials that describe ways to minimize exposure to arsenic-contaminated soil need to be developed and distributed.
2. **Reduce exposure to arsenic in drinking water**—Sampling of small drinking water systems in areas with a high potential for arsenic contamination should be promoted. In addition, educational materials regarding arsenic sampling and treatment options should be developed and distributed to owners of private wells.
3. **Reduce exposure to arsenic in CCA-treated wood**—Educational materials aimed at reducing children’s exposure to arsenic through hand washing and sealing CCA-treated wood should be developed and distributed. In addition, sealing or replacing of wooden playground equipment in schools and parks should be promoted.

Radon

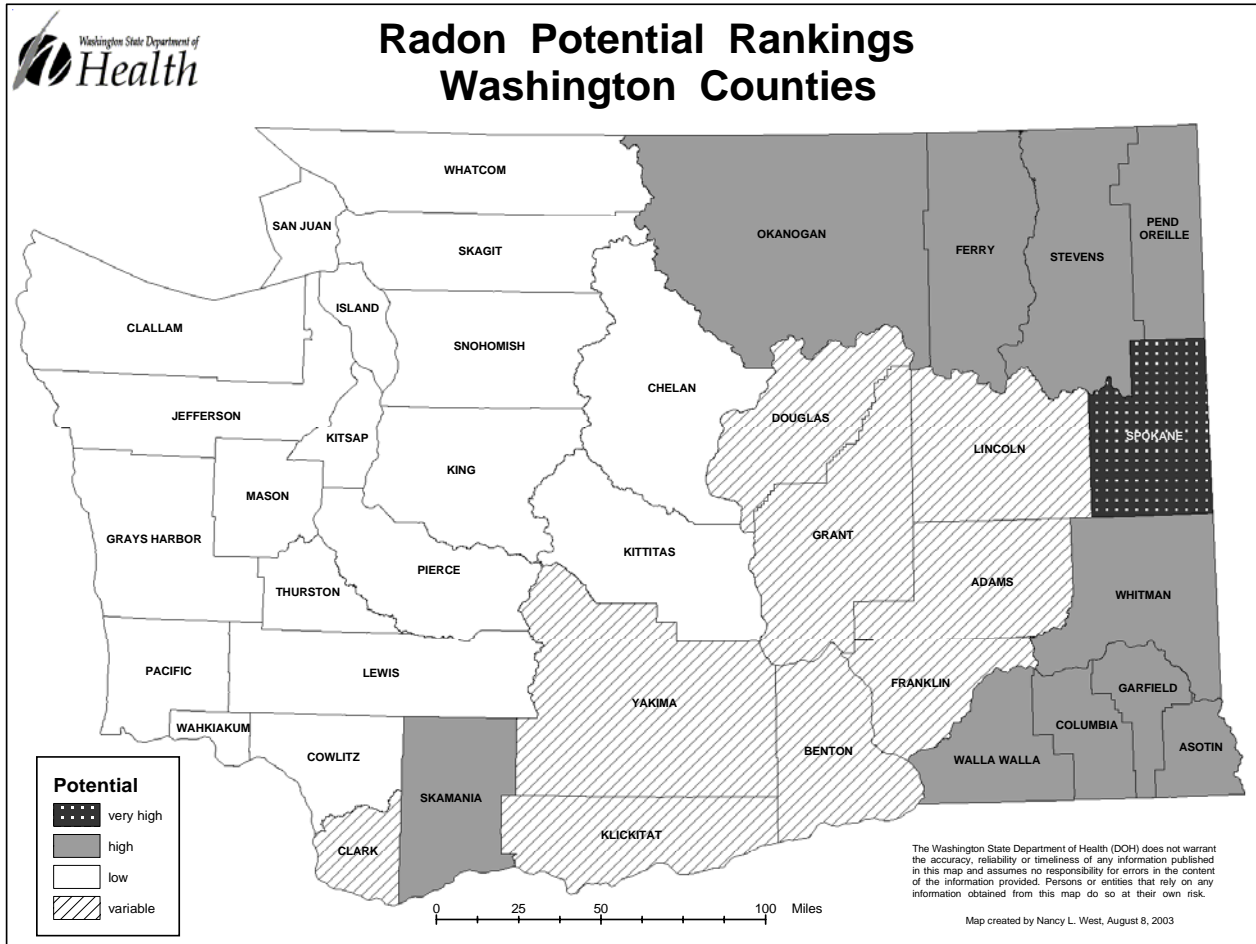
Radon is a radioactive gas. It originates from the decay of elemental radium that naturally occurs in some soils and earth formations. In areas where there is elemental uranium in the soil or underlying rock, radon gas can seep into homes and buildings through cracks or holes in the foundation. Radon may also dissolve into the groundwater. People can be exposed by simply breathing the contaminated air in their homes or by inhaling contaminated air or water vapor while showering.

Scientific Evidence Linking Radon to Cancer

Radon has been classified by IARC as carcinogenic to humans.⁷⁵ Further, IARC has determined that there is an association between exposure to radon in the home and lung cancer. The EPA estimates that at an indoor air radon concentration of 4 pico curies/liter, two people out of a thousand would develop lung cancer over their lifetime. For smokers, the risk would increase to 29 out of a thousand.⁷⁶

Potential for Exposure

The EPA and DOH sampled approximately 2,000 homes for radon between 1991 and 1992. Based on this sampling and other indicators, ten counties were classified as having 'high' radon potential, and one county was classified as having a 'very high' radon potential (see map).⁷⁷ Currently, there are an estimated 400,000 Washington residents living in homes with a high or very high radon potential.⁷⁷



Washington State Department of Health, Environmental Health Programs, Environmental Radiation Program. Special Report: Radon in Washington, June 1994.

Examples of Current Activities

Spokane County currently provides radon test kits and consultation at very low cost to county residents. The county also keeps records of radon test results and has a residential building code that requires radon-resistant home construction methods.

Gaps

Except for Spokane County, there are limited data on the number of homes with elevated radon levels. According to 1997 Washington BRFSS data, among households in the eleven counties rated as having a high or very high radon potential, approximately 7% indicated having tested their home for radon in the past three years.

General Recommendations

1. **Identify homes with high radon levels**—Home testing in those areas with ‘high’ or ‘very high’ radon potential should be encouraged. When

homes are tested, DOH recommends that homeowners with residential radon levels of 4 to 10 pCi/l should consider mitigating their homes, and those at levels of 10pCi/l or above should mitigate.

Diesel Exhaust

Diesel exhaust comes from combustion of diesel fuel by trucks, buses, boats, and off-road power generators. It is a combination of fine particulate matter, as well as more than 40 substances that are listed as hazardous pollutants by the EPA.⁷⁸ The EPA will be phasing in regulations affecting new, heavy-duty vehicles mandating both new pollution technology and the use of low-sulfur fuels. However, these regulations won't apply to older vehicles.⁷⁹

Scientific Evidence Linking Diesel Exhaust to Cancer

IARC has classified diesel exhaust as probably carcinogenic to humans. Diesel exhaust has been associated with lung and bladder cancer.⁸⁰

Potential for Exposure

People are exposed to diesel exhaust when they breathe contaminated air. The highest exposures are most likely to occur among people who drive on or live closest to freeways or who live in urban centers.^{81, 82} The amount of diesel used in Washington has increased by 260% since 1981.⁸³

Examples of Current Activities

Washington State Legislature recently provided funding to the air pollution control authorities and the Department of Ecology to retrofit school buses with exhaust emission control devices and to allow school bus fleets to use alternative, cleaner fuel.⁸⁴ Approximately 5,000 school buses, more than half of the existing fleet statewide, will be retrofitted over the next five years.⁸⁵

Gaps

The new EPA regulations do not apply to the large, existing fleet of heavy-duty commercial vehicles. Diesel on-road engines last for over a million miles and are rebuilt multiple times, therefore these vehicles are expected to continue to be a major source of diesel emissions for many years.

General Recommendations

1. **Increase use of clean fuel and retrofitting**—Increase the use of clean sulfur fuel and the retrofitting of existing vehicles with clean diesel technology.
2. **Reduce vehicle idling**—Minimize vehicle idling, especially at schools, ferry terminals, and heavily populated urban areas.

Goal 8

Reduce the impact of environmental carcinogens on cancer incidence and mortality in Washington.

Objective 8.1

By 2008, reduce population exposure to arsenic-contaminated soil.

Strategies

- ▶ Support expanded soil sampling in regions where arsenic contamination is likely.
- ▶ Support research to better characterize exposure to arsenic resulting from living on and working in contaminated soil.
- ▶ Provide support for the development and distribution of educational materials regarding ways to minimize exposure to arsenic-contaminated soil.

Objective 8.2

By 2008, reduce the number of people that are drinking arsenic-contaminated water at levels above 10 parts per billion (ppb).

Baseline: To be established. Data source: To be established.

Strategies

- ▶ Support funding for distribution of educational material on the occurrence of arsenic in drinking water, the associated cancer risk, and the available options to reduce exposure.
- ▶ Work with the local health departments to distribute educational material to private well owners.
- ▶ Support water testing in areas with known or potential arsenic contamination of groundwater.

Objective 8.3

By 2008, reduce children's exposure to CCA-treated wood.

Strategies

- ▶ Encourage either yearly sealing of CCA-treated wood in playground equipment or replacing playground equipment with alternative materials at schools and public parks.

- ▶ Support development and dissemination of educational materials to inform parents on how to reduce or eliminate their children's exposure to CCA treated wood.

Objective 8.4

By 2008, increase to 10% the number of homes that have been tested for radon in regions classified as having a high or very high radon potential.

Baseline: 7% (\pm 3%). Data Source: 1997 BRFSS.

Strategies

- ▶ Provide support for the distribution of educational materials regarding home testing and mitigation strategies for radon. Target those counties with high to very high radon potential for distribution of materials.
- ▶ Provide support to assist those who cannot afford to test their homes for radon.
- ▶ Promote indoor radon testing at the time of home sale in areas with high or very high radon potential.

Objective 8.5

Reduce population exposure to diesel exhaust.

Strategies

- ▶ Support local government efforts to retrofit their existing vehicles with clean diesel technology and increase their use of clean sulfur fuel.
- ▶ Advocate for legislation to establish programs and create incentives that support retrofitting older diesel vehicles and utilization of low sulfur fuel.
- ▶ Encourage existing coalitions (such as the Puget Sound Clean Air, Diesel Solution program) in their efforts to bring clean diesel technology to Washington.
- ▶ Support campaigns to reduce vehicle idling, with a focused effort at schools, ferry terminals and other high-population-density areas.
- ▶ Attempt to estimate the cancer burden attributable to diesel exhaust and assess the relative burden of exposure among relevant minorities and income groups.

Family History of Cancer

Having a family history of cancer may put an individual at greater risk for developing cancer. Assessing an individual's family history of cancer usually identifies people at moderately increased risk, possibly due to the presence of a *common* genetic variation known to increase susceptibility to cancer. In fewer instances, family history of cancer is indicative of a high lifetime risk due to an *inherited* predisposition. However, cancer is common in the general population and thus, assessment of the family history should be undertaken by trained health care professionals.

Screening for cancer typically refers to the routine administration of tests to the general population for the purpose of detecting cancer in its early stages. Genetic screening, however, is a means of identifying people who are at *greater risk* of developing cancer as opposed to having early stage cancer. Genetic screening includes taking a family history to assess individual risk and identify individuals and families who may benefit from genetic testing. Individuals identified as being at high risk may be referred for genetic counseling to refine risk assessment, discuss cancer prevention and/or management, and, when indicated, receive genetic testing. Genetic testing for cancer involves analyzing DNA to look for genetic alterations that indicate an increased risk for developing cancer.

Scientific Evidence Linking Family History of Cancer to Cancer

Women who have a family history of breast cancer are at higher risk to develop breast cancer than women who do not. A positive family history is among the strongest risk factors. Women who have a first-degree relative (a mother, father, sister, or daughter) with breast cancer have approximately double the risk.⁸⁶ About 5 to 10 percent of breast cancers are thought to be due to inheritance of particular forms of a breast cancer susceptibility gene such as BRCA-1, BRCA-2, and others.

One of the greatest risk factors identified for developing ovarian cancer is having a family history of the disease and/or a mutation in BRCA1 or BRCA2. Having a single first-degree relative with ovarian cancer increases a woman's risk approximately three-fold and women with two or three relatives with ovarian cancer have almost five times the risk compared to those without a family history.⁸⁷

The risk for developing colorectal cancer is also increased by having a family history of the disease. Studies have consistently found that people with a first-degree relative with colorectal cancer are at a two-fold to three-fold increased risk of developing the cancer themselves.^{88, 89, 90, 91, 92, 93}

Prevalence

Genetic factors account for a relatively small proportion of the total population risk for cancer. An estimated 5% to 10% of all cancers have a hereditary component. About 5% of patients with colorectal cancer have an

inherited genetic abnormality that causes the cancer.⁹⁴ There are rare inherited causes of cancer that also confer a high lifetime risk of cancer (e.g., dysplastic nevus syndrome; Von Hippel Lindau and others). Rare hereditary cancer syndromes include a large spectrum of cancers making the family history assessment challenging to an untrained professional.

Examples of Current Activities to Promote Genetic Family History Risk Assessment

The Washington State DOH has a Genetic Services Section that supports access to genetic services including genetic family history risk assessment. It currently funds seven Regional Genetics Clinics in the state with medical geneticists from Children’s Hospital and the University of Washington providing board certified medical geneticists for consultation at the Regional Genetics Clinics. These clinics provide genetic family history risk assessments, genetic counseling, resources, referrals, and genetic testing when indicated. More information on these clinics can be found at: http://www.doh.wa.gov/cfh/mch/genetics_regional_clinics.htm. Trained genetic counselors and medical geneticists are available throughout Washington and education is available for primary care providers.

In 1997, DOH facilitated the development of the Washington State Genetics Education Plan. The plan emphasizes the need for public awareness of family history as well as awareness among providers. DOH also provides genetics education for primary care providers through a partnership with the March of Dimes and funding from the Health Resources and Services Administration. Genetics and Your Practice is an educational module that includes a chapter on taking a detailed family history.⁹⁵

The University of Washington established the Center for Genomics and Public Health (CGPH) in October of 2001 through a three-year cooperative agreement with the Association of Schools of Public Health, Centers for Disease Control and Prevention, and the Agency for Toxic Substances and Disease Registry. The CGPH mission is to integrate advances in genetic technology into public health practice and offer research and educational opportunities for public health students and professionals.

General Recommendations

1. **Promote public awareness of family history as a potential risk factor for the development of cancer**—Having a family history of cancer may put an individual at greater risk for developing cancer. The general public should be educated on the value of knowing their family history. The public should be encouraged to find out and share their family history with their provider. A strong family history may suggest the need for genetic counseling and testing or more intensive screening. Messages should be carefully developed to avoid promoting a perception that absence of a family history of cancer equates with absence of risk. Likewise, it is

important for the public to understand that the presence of a family history of cancer may increase risk, but does not indicate the inevitability of cancer.

2. **Encourage providers to take family histories**—Providers should be educated on the importance of taking a family history, the importance of genetics in specific cancers (e.g., breast and colon), and the role of genetic counseling. At least a three-generation family history should be taken, looking for pattern of inheritance and differentiating hereditary syndromes. Providers should also recognize the importance of genetic counseling, particularly with patients who are interested in genetic testing. According to the Washington State Genetics Education Plan, progress in the field is so fast that some providers worry that they cannot keep pace with new discoveries. The plan emphasizes the need for genetics education. It is recommended that counseling occur both pre-and post-testing by a genetics professional who is board certified by the American Board of Medical Genetics or the American Board of Genetic Counseling. It is important for providers to be aware of, have access to, and utilize cancer-related genetics resources to provide good triage.
3. **Monitor emerging science**—The science and technology in the field of genetics is evolving rapidly. Emerging science should be monitored on an ongoing basis.

Goal 9

Increase the early identification of individuals at risk for developing cancer due to genetic susceptibility or inherited predisposition.

Objective 9.1

By 2008, increase proportion of adults who are aware of their family history of cancer.

Baseline: To be established. Data Source: To be established

Strategies

- ▶ Educate the public regarding the importance of knowing their family history of cancer and sharing it with their provider.
- ▶ Educate providers regarding the importance of soliciting family history of cancer from their patients.

- ▶ Educate providers on the importance of genetics in specific cancers, particularly breast, ovarian, and colon cancers.
- ▶ Promote awareness of, access to, and utilization of information on genetics and cancer necessary to support appropriate triage and referral for genetic services of high-risk patients.
- ▶ Increase access to genetic services for people without insurance.
- ▶ Promote legislation/policies that protect from genetic discrimination individuals who undergo predictive testing for cancer.

Secondary Prevention

Some cancers can be detected early, improving the likelihood of survival.

Secondary prevention of cancer means reducing morbidity and mortality by identifying disease early and providing appropriate treatment. Early detection is a component of secondary prevention – identifying disease in its early stages. Early detection usually involves the administration of various tests to identify cancer, or precursors to cancer, before the onset of symptoms. The rationale for early detection is that cancer is generally more treatable when identified in its early stages.

Screening is a method of attempting to detect cancer early. It is a public health strategy that refers to the routine administration of tests to the general population. The goal of cancer screening programs is to identify people with cancer, or at high risk of cancer (e.g., colon polyps, cervical dysplasia, persistent high-risk human papillomavirus infection), among people who are asymptomatic. Further diagnostic testing (e.g., biopsy) may be required to identify cancer or pre-cancerous lesions. Screening is an important public health approach to reducing cancer mortality. This section focuses on four cancers (breast, cervical, colorectal, and prostate) for which screening tests are currently available and utilized.

Screening for Breast Cancer

Breast cancer screening is the primary approach in the effort to reduce deaths due to breast cancer. Mammography, clinical breast examination, and breast self-examination are the three most common methods of screening for breast cancer. Scientific evidence shows that breast cancer can be detected early and lives can be saved through regular mammography screening.

Burden of Breast Cancer in Washington

Breast cancer is the most frequently diagnosed cancer and the second leading cause of cancer death among Washington women. According to WSCR data, in 2000 there were 5,344 new cases* of breast cancer in Washington women for an age-adjusted rate of 178.4 per 100,000 women. In 2000, 747 women in Washington died of breast cancer resulting in an age-adjusted mortality rate of 24.4 per 100,000 women.

*18% of cases were ductal carcinoma in situ (DCIS) and lobular carcinoma in situ (LCIS)

Based on WSCR data beginning in 1992 the age-adjusted incidence rate of breast cancer (including in situ cases) among Washington women has increased from 159.6 per 100,000 (1992-1994) to 182.6 per 100,000 (1998-2000). Despite the increase in incidence, age-adjusted mortality rates have declined over the same time period from 30.2 per 100,000 (1992-1994) to 24.7 per 100,000 (1998-2000).

Disparities in the Burden

Data from WSCR for 1998-2000 combined show that breast cancer incidence rates for Washington women are highest for ages 75-79. More than half of the cases of breast cancer in Washington occur after age 65.

Breast cancer mortality in Washington women also increases with age. From 1998-2000, the mortality rate in women under age 40 is less than 6 per 100,000. This increases to 16.8 per 100,000 for women aged 40-49, then increases to 45.8 per 100,000 for women aged 50-59. The rate continues to rise with age, with a rate of 188.6 per 100,000 for women aged 85 and older.

Incidence rates for breast cancer in Washington are highest among white women. According to WSCR data for 1996-2000 combined, the age-adjusted incidence rate for white women was 185.5 per 100,000 compared to 144.1 per 100,000 for African American women and 102.3 per 100,000 for Asian and Pacific Islander women. Incidence data are not available for American Indian/Alaska Native and Hispanic women. Despite having a lower incidence rate than white women, African American women have a higher mortality rate from breast cancer in Washington. Combined mortality data for 1996-2000 show an age-adjusted mortality rate of 34.9 per 100,000 for African American women compared to 25.1 per 100,000 for white women. Similar patterns have been found nationally. In addition, according to recent research conducted at the Fred Hutchinson Cancer Research Center, among American women, Hawaiians and Mexicans had poorer breast cancer survival rates, and Japanese and Chinese women had better breast cancer survival rates than white women.⁹⁶ Investigating the significant differences in mortality rates is a focus for researchers and practitioners in the public and private sectors.

Scientific Evidence of Screening Effectiveness

Screening mammography involves taking X-ray images of the breasts to detect cancer early. Several large randomized trials of screening mammography have shown that screening decreases breast cancer mortality in women aged 40-69, particularly among women aged 50-69. Some of these studies, however, have had problems that resulted in questions regarding their validity, creating controversy about the effectiveness of screening. While the US Preventive Services Task Force (USPSTF) was concerned about these problems in their recent review of these studies, they concluded that the problems were unlikely to have seriously influenced the trial results. A review of the scientific evidence by the International Agency for Research on Cancer estimated that

mammography screening reduced the risk of dying by about 35% among women 50-69 years old and about 19% among women 40-49 years old.⁹⁷ The USPSTF currently recommends mammography screening every one to two years for women starting at age 40.⁹⁸

Clinical breast examination (CBE) involves a thorough physical examination of the breasts by a health care professional. According to the USPSTF, the scientific evidence currently available is insufficient to recommend for or against routine CBE alone to screen for breast cancer. Although the evidence is insufficient for CBE alone, it may be a reasonable adjunct to mammography screening. Clinical breast exams may find cancers that are missed by mammography. It is unknown whether this small increase in case finding leads to decreased breast cancer mortality.

Breast self-examination (BSE) is a systematic, thorough self-examination of the breasts. BSE has not been shown to be an effective approach for reducing breast cancer mortality. Recent research concluded that teaching BSE to large numbers of healthy women does not reduce mortality from breast cancer.⁹⁹ Although systematic efforts to teach BSE have not been found to be effective, researchers have not discouraged women from performing BSE or being familiar with their breast anatomy and reporting any changes. Many health care providers still recommend that women perform regular BSE. Early detection of breast cancer is important and women should seek evaluation of a breast lump as soon as it is discovered regardless of how it is discovered. Women should be aware, however, that performing BSE might lead to unnecessary biopsies and associated anxiety. New guidelines on breast cancer screening from the American Cancer Society released in May 2003, emphasize the need for communicating about the benefits and limitations of BSE. They note that BSE is one way for women to notice changes in their anatomy, but that it is acceptable for women to choose not to perform BSE.¹⁰⁰

At this time, mammography is the only screening approach of proven efficacy available for reducing breast cancer mortality. Based on the available scientific evidence, this plan focuses on mammography as the most effective screening approach for reducing breast cancer mortality.

Examples of Current Activities to Promote Screening

The Washington State Breast and Cervical Health Program (WBCHP) at the Washington State Department of Health administers a breast and cervical cancer early detection program for eligible women. WBCHP is part of a nationwide program funded by the Centers for Disease Control and Prevention and supported with additional funding from the state and the Puget Sound affiliate of the Susan G. Komen Foundation. Women who are at or below 200% of the federal poverty level, 40-64 years of age, and are uninsured or underinsured are eligible for the program. Nearly 49,000 women meet the eligibility criteria and over 9,000 women are enrolled and screened annually statewide. Unfortunately, due to lack of funding, it is estimated that only 10-15% of the eligible women across the United States are actually receiving

services in the program. Washington State slightly exceeds that percentage in the number of eligible women served.

WBCHP services are available statewide and include screening, public education, professional education, quality assurance, tracking/surveillance, case management, and evaluation of service delivery components. Contractors administer the program regionally. Clinics, private physicians, hospitals, local health departments, laboratories, and radiology facilities provide services. Community-based organizations, including local health departments, provide outreach activities including public education with community involvement.

Washington State law (RCW §§ 41.05.180, 48.20.393, 48.21.225, 48.44.325, 48.46.275) currently requires that insurance policies, which provide coverage for hospital or medical expenses, also provide coverage for screening mammography. The law applies to disability insurance policies, group disability policies, health care service contracts, health maintenance organizations, and public employee health plans.

Another effort to promote breast cancer screening is the Washington State Collaborative. The Collaborative is modeled after the Institute for Healthcare Improvement Breakthrough Series (Collaborative) first held in 1995. The initial purpose of the Collaboratives was to improve chronic care for people with diabetes through partnerships and efficient, evidence-based practice.¹⁰¹ With the recent addition of an Adult Preventive Services track, the focus will also include screening mammography among other preventive services. Participating primary care clinics seek to improve their screening rates among women aged 40 and older.

Other statewide organizations involved in promoting breast cancer screening are the American Cancer Society, the Puget Sound Affiliate of the Susan G. Komen Breast Cancer Foundation, the recently formed Komen Foundation affiliate in eastern Washington, and the Cancer Information Service – Pacific Region (a program of the National Cancer Institute) located at the Fred Hutchinson Cancer Research Center in Seattle.

Current Screening Rates and Stage of Diagnosis

According to BRFSS data for 1998-2000 combined, 83% ($\pm 2\%$) of women aged 40-49 and 93% ($\pm 1\%$) of women 50 and older in Washington reported ever having received a mammogram. In addition, 66% ($\pm 3\%$) of women aged 40-49 and 78% ($\pm 2\%$) of women 50 and older in Washington reported having had a mammogram in the preceding two years.

Disparities are apparent in the prevalence of screening in Washington. Statewide BRFSS data for 1998–2000 showed that women ages 40 and older living in urban and suburban areas reported a significantly higher rate of mammography in the previous two years (75% $\pm 2\%$) than those in large town

or small town/rural areas (68% ± 4%). A similar pattern is observed among women ages 50 and older.

Mammography screening utilization is strongly associated with income and education. This is evident in Washington BRFSS data from 1998–2000. Among women aged 40 and older, self-reported mammography rates in the previous two years were significantly higher among those in households with total income over \$20,000 per year (76% ± 2%) than those in less affluent households (65% ± 4%). Mammography in the past two years was reported by 75% (± 2%) of women with more than high school education compared with 63% (± 6%) of women who did not graduate from high school. The patterns are the same among women ages 50 and older.

According to WSCR data, of all breast cancer cases diagnosed in Washington in 2000, 18% were in situ (non-invasive), 51% were locally invasive, 25% had spread regionally, and 3% had distant spread or metastasis. The remaining 3% were unstaged at diagnosis.

The earlier the stage at the time of diagnosis, the better the five-year survival rate, and studies have shown consistent racial differences in stage at diagnosis. Nationally, African American women,^{102, 103, 104, 105, 106, 107, 108} Hispanic women,^{102, 103, 108, 109, 110, 111} and American Indian women,^{109, 112} are more likely to be diagnosed with an advanced stage breast cancer and have poorer survival rates when compared to white women. According to recent research conducted by the Fred Hutchinson Cancer Research Center,⁹⁶ in addition to the above-mentioned disparities, Filipinos, Hawaiians, Indians and Pakistanis, Mexican, South and Central American, and Puerto Rican women were more likely, and Japanese women were less likely, than white women to be diagnosed with late-stage breast cancer. The table below shows the stage of diagnosis for breast cancer for different races in Washington.

Table 4: Stage of diagnosis for breast cancer by race

Breast (Female)												
ICD-0: C50.0-C50.9, excluding morphology codes 9590-9970												
			In Situ		Localized		Regional		Distant		Unstaged	
Year	Race	TotObs	Obs	%	Obs	%	Obs	%	Obs	%	Obs	%
1998-2000	A	512	118	23	245	48	126	25	11	2	12	2
1998-2000	B	274	49	18	113	41	88	32	11	4	13	5
1998-2000	W	14765	2521	17	7899	53	3510	24	429	3	406	3
1998-2000	T	16079	2814	18	8504	53	3831	24	464	3	466	3

Races – Asian/Pacific Islander (A), Black (B), White (W), Total all races (T)

Source: Washington State Cancer Registry.

URL: <http://198.187.3.183/wscr/ASP/WSCRQryResultStage.asp>

Gaps

In 2001, the Puget Sound affiliate of the Susan G. Komen Foundation completed a comprehensive needs assessment for the 16 western Washington counties in their region. The assessment included development of a model for breast health services, collection of breast health indicator data, identification of breast health resources, and key informant interviews with providers and community leaders in each of the 16 counties. Some of the overarching gaps identified included:

- ▶ Inadequate funding as a barrier to breast health services.
- ▶ Lack of providers.
- ▶ Limited or lack of transportation.
- ▶ A climate of restrictive reimbursement and regulations related to the provision of mammograms.
- ▶ Limited reach of WBCHP (expand to reach more eligible women).
- ▶ Limited awareness of available information, education, and outreach opportunities among public and providers.
- ▶ Limited case management and follow-up.

Effective Interventions for Promoting Mammography Screening

The CDC's Guide to Community Preventive Services has made recommendations regarding interventions that communities, policymakers, and public health providers can employ to promote mammography screening. The recommendations are based on systematic reviews of the evidence of intervention effectiveness from the scientific literature. The table below shows the interventions that are recommended.

Table 5: Breast cancer screening—Effective interventions

Intervention	Recommendation
Community oriented (groups and individuals) to promote screening	
Mass media	Recommended (sufficient evidence)
Small media education (tailored or non-tailored)	Recommended (sufficient evidence)
One-on-one education (tailored or non-tailored)	Recommended (sufficient evidence)
Health care system oriented (groups and individuals) to promote screening	
Client reminders	Recommended (strong evidence)
Incentive programs for clients (in conjunction with reminders)	Recommended (sufficient evidence)

Adapted from: Improving the Use of Breast, Cervical, and Colorectal Cancer Screening. Guide to Community Preventive Services. URL: <http://www.thecommunityguide.org/cancer/cancer-int-screening.pdf>

General recommendations

1. **Increase screening mammography rates among women 50 and older**—Screening mammography is currently the only effective approach for reducing mortality due to breast cancer. Breast cancer is the most common cancer and the second leading cause of cancer death among Washington women. Evidence of a benefit from screening is strongest and the estimated reduction in mortality is greatest for women 50 and older.
2. **Increase screening mammography rates among women 40 and older**—Though specific guidelines vary, the USPSTF and most other organizations recommend that women begin receiving mammography screening at age 40.
3. **Monitor emerging science**—Scientific research investigating new breast cancer screening technologies should be monitored on an ongoing basis. Published research on public health interventions should also be monitored to identify effective approaches for increasing screening rates particularly among populations with low rates of screening (e.g., women of color, low income, low education, small town/rural areas).

Goal 10

Reduce mortality from breast cancer in Washington.

Objective 10.1

By 2008, increase to 85% the proportion of women aged 50 and older who have had a screening mammogram within the past two years.

Baseline: 78% (\pm 2%). Data source: 1998, 2000 (combined) BRFSS.

Objective 10.2

By 2008, increase to 72% the proportion of women aged 40-49 who have had a screening mammogram within the past two years.

Baseline: 66% (\pm 3%). Data source: 1998, 2000 (combined) BRFSS.

Strategies

- ▶ Educate women regarding the value of screening mammography and risk factors for breast cancer.
- ▶ Support the development of evidence-based interventions to overcome identified barriers.

- ▶ Target intervention efforts to populations with lower screening rates and later stage of diagnosis.
- ▶ Encourage more clinics to participate in the Washington State Collaborative – Adult Preventive Services Track (mammography is a required measure for participating clinics).

Screening for Cervical Cancer

Invasive cervical cancer is one of the most preventable types of cancer. In fact, if cervical cancer is detected and treated in the earliest stage (in situ), it rarely becomes invasive and the overall five-year survival rate is over 99%. Such early-stage, non-invasive carcinomas of the cervix occur much more frequently than invasive cervical cancer, but if left undiagnosed and untreated they can develop into distant-stage cancer, having a survival rate of only 14%.¹¹³

Infection with high-risk human papillomavirus (HPV-16, 18, etc.) is probably a necessary factor in the development of cervical cancer. High-risk types of HPV are found in approximately 99.7% of cervical cancers.¹¹⁴

There are effective and widely available methods for cervical cancer screening. Screening is fast, inexpensive, and reliable. The most widely used method of cervical cancer screening is the Pap test, which tests for abnormal cell changes of the cervix. If abnormalities are found, additional tests, including an HPV test or colposcopy and biopsy may also be performed.

Burden of Cervical Cancer in Washington

Despite the effectiveness of current screening methods, late-stage cervical cancer is still diagnosed in Washington. According to data from the WSCR, there were 223 new cases of invasive cervical cancer diagnosed in 2000 (age-adjusted rate = 7.4 per 100,000).^{*} Additionally, 61 deaths that year were attributed to invasive cervical cancer (age-adjusted rate = 2.0 per 100,000). Invasive cervical cancer is the 14th most frequently diagnosed cancer and 17th most frequent cause of cancer death among Washington women. Although the burden does not seem as large as some other cancers, it is significant because if available screening methods were consistently utilized, it could be nearly eliminated, and if current screening efforts were reduced, mortality would increase. Age-adjusted incidence rates of invasive cervical cancer in Washington decreased about 2.1% yearly from 1992-1999.¹¹³ Despite the decrease in incidence, the age-adjusted mortality rate in Washington has changed little since 1990, ranging from 2.0 per 100,000 to 3.1 per 100,000.

^{*}In-situ or noninvasive carcinomas are not reported in Washington.

Disparities in the Burden

There are disparities evident in the incidence and mortality rates of invasive cervical cancer in Washington. The incidence is highest among women aged 35-44 years. Additionally, rates of invasive cervical cancer are significantly higher in small towns and rural areas than in urban areas.¹¹³ The 2002 Health of Washington State Report also indicates that people with less education and lower income have higher incidence rates for invasive cervical cancer. WSCR data for 1998-2000 combined do not show differences in incidence rates among African American, Asian and Pacific Islanders and white women. Rates are not available for American Indian/Alaska Native and Hispanic women.

According to mortality data for 1998-2000 combined, the mortality rate for invasive cervical cancer is highest for women aged 60-64 and 75-79 (6.5 per 100,000 and 6.7 per 100,000 respectively). Additionally, rates for Asian and Pacific Islanders are higher than for whites (3.7 per 100,000 and 2.1 per 100,000 respectively). Mortality rates among Washington women based on geographical variation, education, and income level are not currently available.

Although Washington incidence data are not available for Hispanics, national data show that Latina women have double the incidence of cervical cancer when compared to non-Hispanic white women.^{115, 116} Nationally, mortality from cervical cancer among Hispanic women is 40% higher than among other groups.¹¹⁵

Scientific Evidence of Screening Effectiveness

The Pap test has been called “medicine’s most successful screening test.”¹¹⁷ There is clear evidence that screening women who are sexually active or over 21 years of age with regular Pap tests reduces invasive cervical cancer incidence and mortality. The US Preventive Services Task Force (USPSTF) strongly recommends screening for cervical cancer in women who have been sexually active and have a cervix.¹¹⁸ The upper age limit at which such screening ceases to be effective is unknown although the USPSTF recommends against screening women over age 65 if they have had adequate recent screening with normal Pap smears and are not at high risk for cervical cancer.

Examples of Current Activities to Promote Screening

There are many programs statewide that offer cervical cancer screening. The WBCHP administers a cervical cancer early detection program for eligible women. The program emphasizes reaching women rarely or never screened for cervical cancer. Women diagnosed with cervical cancer, or precancerous cervical conditions, while enrolled in the program can receive full Medicaid coverage if they require treatment and do not have health insurance coverage. The WBCHP is described in more detail in the previous section on Screening for Breast Cancer.

Another effort to promote cervical cancer screening is the Washington State Collaborative. The Collaborative is modeled after the Institute for Healthcare

Improvement Breakthrough Series (Collaborative) first held in 1995. The initial purpose of the Collaborative was to improve chronic care for people with diabetes through partnerships and efficient, evidence-based practice.¹⁰¹ With the recent addition of an Adult Preventive Services track, the focus among other preventive services will include Pap test for detecting cervical cancer. Participating primary care clinics seek to improve their screening rates among women.

Current Screening Rates

According to Washington BRFSS 1998–2000 combined data, 96% ($\pm 1\%$) of Washington women 18 and older (including women without a uterine cervix), reported ever having received a Pap test. However, based on the BRFSS, the percent of women reporting Pap smears in the last three years has decreased from 88% ($\pm 1\%$) for 1991–1993 combined to 81% ($\pm 1\%$) for 1998–2000 combined.

There are disparities associated with Pap test screening prevalence in Washington. According to BRFSS 1998–2000 combined data, about 80% ($\pm 5\%$) of women 18 and older with less than a high school education report Pap testing in the past three years compared to about 87% ($\pm 1\%$) of women with at least a high school education. Women 18 and older with household incomes under \$20,000 per year report a lower rate of Pap testing in the past three years (79% $\pm 3\%$) than women with household incomes of more than \$20,000 per year (89% $\pm 1\%$).¹¹³ Among Washington women (who have not had a hysterectomy) age 65 and older surveyed in 1998–2000, 74% ($\pm 5\%$) reported receiving a Pap smear in the past three years, compared to 88% ($\pm 1\%$) of women aged 18–64.

Gaps

Regardless of the many services available to women in Washington, a large number of women are still not consistently being screened. Although over 9,000 women are enrolled in WBCHP and are screened annually, many more are eligible who do not utilize the program. According to WBCHP, nearly 49,000 women in Washington are eligible to receive free cervical cancer screening through this program alone. There are also other programs that provide free or low-cost cervical cancer screening. Outreach efforts are needed that focus on raising awareness of the importance of cervical cancer screening and educating the public regarding available services.

Effective Interventions for Promoting Cervical Cancer Screening

The CDC's Guide to Community Preventive Services has made recommendations regarding interventions that communities, policymakers, and public health providers can employ to promote cervical cancer screening. The recommendations are based on systematic reviews of the evidence of intervention effectiveness from the scientific literature. The table below shows the interventions that were recommended.

Table 7: Cervical cancer screening—Effective interventions

Intervention	Recommendation
Community oriented (groups and individuals) to promote screening	
Mass media	Recommended (sufficient evidence)
Health care system oriented (groups and individuals) to promote screening	
Client reminders	Recommended (strong evidence)
Incentive programs for clients (in conjunction with reminders)	Recommended (sufficient evidence)

Adapted from: Improving the Use of Breast, Cervical, and Colorectal Cancer Screening. Guide to Community Preventive Services. URL: <http://www.thecommunityguide.org/cancer/cancer-int-screening.pdf>

General recommendations

1. **Increase cervical cancer screening rates in women 21 to 65 years old**—Despite the availability of a safe, effective, and inexpensive test, women still die in Washington from cervical cancer.
2. **Increase awareness of the importance of regular cervical cancer screening**—The Pap test is effective at detecting cervical cancers at an early stage and precursors. Women who are never or rarely screened are at greater risk for developing invasive cervical cancer.
3. **Monitor emerging science**—Scientific research investigating the new cervical cancer screening technologies should be monitored on an ongoing basis. Published research on public health interventions should also be monitored to identify effective approaches for increasing screening rates particularly among populations with lower screening rates or higher incidence rates of cervical cancer.
4. **Monitor the incidence of invasive cervical cancer**—Use WSCR and BRFSS to identify groups of women at increased risk of invasive cervical cancer who should receive high priority for screening.

Goal 11

Reduce mortality from invasive cervical cancer in Washington women.

Objective 11.1

By 2008, increase the percentage of women aged 21-65 years old that report having had a Pap test in the previous 3 years to 90%.

Baseline: 84% (\pm 2%). Data Source: 2002 BRFSS.

Strategies

- ▶ Educate providers on the importance of Pap tests and appropriate follow-up care during women's health exams.
- ▶ Educate women on the importance of cervical cancer screening and encourage them to talk to their medical provider.
- ▶ Promote programs that focus on increasing knowledge of and access to cervical cancer screening services.

Screening for Colorectal Cancer

Colorectal cancer can be both prevented and detected early through screening tests that are available. The primary screening modalities include the fecal occult blood test, flexible sigmoidoscopy, and colonoscopy. Pre-cancerous polyps can be identified and may be removed during sigmoidoscopy or colonoscopy to prevent the development of cancer; cancers can also be detected at an early curable stage. Colorectal cancer is a major cause of cancer death in Washington and screening offers a significant opportunity to save lives.

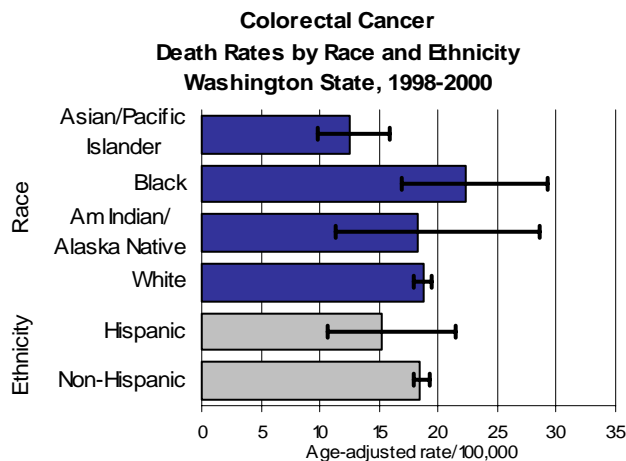
Burden of Colorectal Cancer in Washington

According to data from the WSCR, in 2000 there were 2,911 new cases of colorectal cancer diagnosed (age-adjusted rate = 53.3 per 100,000). Colorectal cancer is the fourth most common cancer in Washington State. In 2000, colorectal cancer caused 991 deaths (age-adjusted rate = 18.2 per 100,000) making it the second leading cause of cancer deaths in Washington. Although incidence rates have declined since the early 1980s, rates in Washington have fluctuated little since 1992, ranging between 55.0 and 57.0 per 100,000 according to WSCR data for 1992-2000. Mortality rates have declined since 1980.

Disparities in the Burden

Colorectal cancer is rare in people younger than 45 but increases rapidly after age 50. According to WSCR data for 1998-2000 combined, the incidence rate for people aged 50-54 is 51.4 per 100,000 and increases to a rate of 465.0 per 100,000 for people aged 85 and older. In addition, incidence rates are greater in men than in women. According to 2000 data, the age-adjusted incidence rate is 63.9 per 100,000 for men and 45.2 per 100,000 for women. There are also racial differences in the incidence rates of colorectal cancer in Washington. According to WSCR data from 1998-2000 combined, the rates are 59.1 per 100,000 for African Americans, 55.4 per 100,000 for whites, and 42.2 per 100,000 for Asians and Pacific Islanders. Data for American Indians/Alaska Natives and Hispanics are not available.

Colorectal cancer mortality rates increase sharply with age. The age-specific mortality rate for Washington residents aged 50-54 is 11.1 per 100,000, and



increases steadily to 271.9 per 100,000 for ages 85 and older (WSCR 1998-2000 data). Age-adjusted mortality rates for men and women are 21.9 per 100,000 and 15.4 per 100,000 respectively. There are also racial differences in mortality rates for colorectal cancer in Washington. According to mortality data for 1998-2000 combined, the age-adjusted mortality rates are 22.3 per 100,000 for African Americans, 18.7 per 100,000 for whites, 18.2 per 100,000 for American Indians/Alaska Natives, 15.3 per 100,000 for Hispanics, and 12.5 per 100,000 for Asians and Pacific Islanders.

Although Washington incidence data are not available, national data show that colorectal cancer is the third most commonly diagnosed cancer among Hispanics/Latinos. Nationally, colorectal cancer ties with prostate cancer as the second leading cause of cancer death among Hispanic/Latino men and is the third leading cause of cancer death among Hispanic/Latina women.¹¹⁹

Scientific Evidence of Screening Effectiveness

Screening tests commonly used for early detection of colorectal cancer include the fecal occult blood test (FOBT), flexible sigmoidoscopy, and colonoscopy. Double contrast barium enemas may also be efficacious, but are rarely used. Screening has a proven benefit for the early detection of colorectal cancer and reduction in mortality. The comparative benefit of various types of colorectal cancer screening methods has not been determined. The evidence for a mortality benefit is strongest for FOBT, but FOBT has been available longer than flexible sigmoidoscopy and colonoscopy and has more research to support it. Colonoscopy is the definitive test for diagnosing colorectal cancer, but it is less available, more expensive, and carries higher risk than the other modalities.

Various organizations and expert panels have made recommendations based on their review of research findings in the scientific literature. The age recommended for beginning colorectal cancer screening in persons of average risk is usually 50. There is no consensus on the upper age limit for routine screening, although some national groups cite age 80. The USPSTF recommends that clinicians screen men and women 50 years of age or older for colorectal cancer. This recommendation applies to men and women with average risk for developing colorectal cancer and applies only to screening tests. The USPSTF further recommends that the “specific screening strategy should be based on patient preferences, medical contraindications, patient adherences, and available resources for testing and follow-up.”¹²⁰ The USPSTF recommends that FOBT be completed annually if it is the sole modality for screening. Screening should occur every 5–10 years if flexible

sigmoidoscopy or colonoscopy is utilized. The American Cancer Society recommends screening the general population beginning at age 50 annually if by FOBT, every 5 years if by flexible sigmoidoscopy, annually and every 5 years respectively if using FOBT and flexible sigmoidoscopy combined, every 5 years if by double contrast barium enema, and every 10 years if by colonoscopy.¹²¹ Other professional bodies offer similar recommendations.

Examples of Current Activities to Promote Screening

The Washington State Colorectal Cancer Task Force (Task Force) was organized by the Washington State DOH in January 2001 to develop sustainable strategies to. The Task Force has a website (<http://www.doh.wa.gov/colorectal>) with information about colorectal cancer and Task Force activities. The group determined that increasing rates of colorectal cancer screening would be their initial goal. The Task Force has sponsored focus groups to assess patient knowledge, attitudes and beliefs about colorectal cancer and related screening, barriers to screening, and strategies to overcome barriers. The Task Force used information from the focus groups to develop a patient education brochure encouraging adults over 50 to get screened, using cancer survivors to deliver the message. Limited public awareness activities were also done. Since 2003, the Task Force has been working on the development of an action plan to increase the quality and quantity of colorectal cancer screening in the state.

The Task Force was also integrally involved in obtaining funding from the CDC for colorectal cancer prevention and control in July 2003. The grant will support implementation of strategies in this plan and will fund dedicated staff to support the Task Force and manage colorectal cancer prevention and control activities.

The Alliance for Reducing Cancer Northwest (ARC NW) at the University of Washington, funded by CDC and the National Cancer Institute, is a regional collaborative team of cancer prevention and control experts. The team evaluates and responds to gaps in knowledge regarding effective interventions identified in the Guide to Community Preventive Services. ARC NW is working in partnership with the Washington State DOH to conduct assessment, surveillance, and evaluation activities for the CDC grant.

Another effort to promote colorectal cancer screening is the Washington State Collaborative. The Collaborative is modeled after the Institute for Healthcare Improvement Breakthrough Series (Collaborative) first held in 1995. The initial purpose of the Collaborative was to improve chronic care for people with diabetes through partnerships and efficient, evidence-based practice.¹⁰¹ With the recent addition of an Adult Preventive Services track, an optional measure for colorectal cancer screening is included as well as other preventive services. Participating primary care clinics seek to improve their screening rates among adults aged 50 and older.

Current Screening Rates and Stage of Diagnosis

According to Washington BRFSS data from 2002, 53% ($\pm 3\%$) of people aged 50 and older in Washington, have been screened for colorectal cancer in accordance with the ACS recommendations. This is significantly higher than the 45% ($\pm 2\%$) seen in the 1997-1999 combined data.

Data from 1997-1999 combined also show disparities associated in colorectal screening in Washington. People aged 65 and older were more likely to have been screened according to the ACS recommendations than people aged 50-64. Screening prevalence for people aged 50 and older was higher in urban areas than in rural areas, 49% ($\pm 3\%$) and 38% ($\pm 6\%$) respectively. In addition, 49% ($\pm 3\%$) of people aged 50 and older with more than a high school education followed screening guidelines, compared to 36% ($\pm 6\%$) of those with less education. Health care insurance coverage also contributed to the disparities associated with colorectal screening rates in Washington; 46% ($\pm 2\%$) of those with insurance coverage had been screened, compared to 17% ($\pm 9\%$) of those without current coverage.

According to WSCR data, in 2000, 6% of new colorectal cases were in situ at diagnosis, 31% were localized, 41% had spread regionally, and 16% were distant. The remaining 6% of new colorectal cancer cases in 2000 were unstaged at diagnosis. Data from 1998-2000 combined show similar distributions by stage for African Americans, Asian and Pacific Islanders, and whites.

Gaps

The Task Force has identified a number of gaps. Some insurance plans do not cover all of the screening tests for colorectal cancer. In addition, the uninsured face barriers including minimal access to screening and no coverage for treatment. Patient perceptions can present additional barriers to appropriate screening.

There are also gaps in knowledge regarding effective approaches for promoting colorectal cancer screening. The CDC's Guide to Community Preventive Services has reviewed evidence for interventions that communities, policymakers, and public health providers can employ to promote colorectal cancer screening. Currently, there is insufficient evidence in the scientific literature to recommend specific intervention strategies for increasing colorectal cancer screening rates.

Other gaps exist within the health care system. Health care professionals do not consistently advise patients 50 and older to obtain screening. Funding to provide training and professional education is needed. Electronic medical records systems that support tracking, patient and provider reminders, and clinical quality improvement efforts are lacking. Despite the need for interventions to increase the proportion of adults who are appropriately screened, it is unknown whether there is sufficient endoscopic capacity in

Washington to meet increased demand should these recruitment efforts prove successful. The CDC recently selected Washington as a study site for assessing endoscopic capacity. Results are expected in early 2005.

General Recommendations

1. **Increase colorectal cancer screening rates among adults aged 50 and older**—Screening has been shown to be effective at reducing mortality due to colorectal cancer. The most appropriate modality for screening should be decided through a discussion between patients and their provider. The modality chosen determines the interval for screening.
2. **Increase awareness of the importance of regular colorectal cancer screening**—Colorectal cancer presents a unique opportunity for primary prevention through screening. Every healthy adult should begin screening for colorectal cancer at age 50. Barriers that prevent the public from being screened whether they exist within the public, provider, or payer settings must be identified and addressed.
3. **Identify and screen high-risk populations**—Identify and screen carriers of certain single gene, autosomal dominant forms of colorectal cancer such as hereditary non-polyposis colorectal carcinoma, juvenile polyposis, and familial adenomatous polyposis using a family history tool.
4. **Monitor emerging science**—Scientific research investigating the comparative benefit of the various colorectal cancer screening technologies should be monitored on an ongoing basis. Published research on public health interventions should also be monitored to identify effective approaches for increasing screening rates particularly among populations with lower screening rates.

Goal 12

Reduce mortality from colorectal cancer in Washington.

Objective 12.1

By 2008, increase to 60% the proportion of people aged 50 and older that have had colorectal cancer screening according to ACS recommendations for FOBT and endoscopy.

Baseline: 53% (\pm 3%). Data Source: 2002 BRFSS data.

Strategies

- ▶ Identify gaps in colorectal cancer screening utilization in adults aged 50 years and older.
- ▶ Reduce barriers to colorectal cancer screening for all adults 50 years or older.
- ▶ Develop public education and awareness programs to encourage people over age 50 to seek colorectal cancer screening.
- ▶ Educate providers regarding the importance of regularly counseling their eligible patients about the benefits of colorectal screening.
- ▶ Develop interventions to promote screening and appropriate follow-up.
- ▶ Promote policy changes (e.g., legislation) to ensure insurance coverage for screening tests.

Objective 12.2

By 2008, increase the capacity of the health care system to perform high-quality colorectal cancer screening.

Baseline: To be established. Data Source: To be established.

Strategies

- ▶ Conduct a capacity study to assess the availability of endoscopic services in Washington.
- ▶ Assess provider practices.
- ▶ Determine provider barriers to recommending, referring to, and/or performing colorectal cancer screening.
- ▶ Promote systems changes that enhance the quality of colorectal cancer screening and follow-up provided in clinical settings.
- ▶ Develop a model colorectal cancer screening and follow-up system utilizing the chronic care model and systems change theory.
- ▶ Promote taking family history of colorectal cancer.

Screening for Prostate Cancer

Prostate cancer screening has the potential to identify cancer in an early stage, although the advantages and disadvantages associated with such screening continue to be controversial. It is important for all men to be knowledgeable of current information regarding screening options, including potential advantages and disadvantages. Prostate-specific antigen testing (PSA) and digital rectal examination (DRE) are the two primary methods of prostate

cancer screening. Although evidence for the effectiveness of screening is insufficient, PSA testing in combination with DRE is currently the best approach available for the early detection of prostate cancer.

Burden of Prostate Cancer in Washington

The burden of prostate cancer is significant both nationally and in Washington. Washington State Cancer Registry (WSCR) data indicates that in 2000 there were 4,234 new cases of prostate cancer diagnosed (age-adjusted rate = 174.0 per 100,000), making it the number one cancer in Washington men. Prostate cancer is also the most common cancer in men throughout the nation.

Prostate cancer is the second leading cause of cancer death among men nationally and in Washington, accounting for 574 Washington deaths in 2000 (age-adjusted mortality rate = 27.6 per 100,000).

Since 1992, the incidence rate of prostate cancer among men in Washington has decreased from an age-adjusted rate of 236.5 per 100,000 in 1992 to 174.0 per 100,000 in 2000, this 26% decrease may be the result of less screening in the late 1990s and 2000 compared to earlier years. In addition, mortality rates have declined over the same time period from 38.2 per 100,000 in 1992 to 27.6 per 100,000 in 2000.

Disparities in the Burden

Prostate cancer incidence is higher in men aged 50 and older and increases markedly with age. According to 2000 WSCR data, the age-specific incidence rate for men ages 45-49 is 34.3 per 100,000. For men ages 50-54, the age-specific rate is 139.0 per 100,000 and increases with age to 1162.7 per 100,000 among men aged 75-79. Mortality rates also increase with age. In 2000, the vast majority of prostate cancer deaths (99.7%) in Washington occurred in men aged 50 and over. Men aged 85 and older had the highest mortality rate from prostate cancer in 2000 (697.6 per 100,000), and men aged 75 and over accounted for more than 70% of the total deaths.

There are significant racial disparities in the incidence and mortality rates of prostate cancer in Washington. According to WSCR data for 1998-2000, the age-adjusted incidence rate for African American men is significantly higher than the rate for white men (258.3 per 100,000 and 173.8 per 100,000 respectively); the rate for Asian and Pacific Islanders is significantly lower (86.6 per 100,000). Incidence data are not currently available for American Indian/Alaska Natives and Hispanics.

Disparities in mortality rates are even more pronounced with African American men in Washington having mortality rates that are more than double those of whites and almost five times higher than those of Asians and Pacific Islanders. This is consistent with African American men having the highest mortality rate from prostate cancer in the world. National data show that prostate cancer is the most commonly diagnosed cancer among Hispanic/Latino men. It is the second leading cause of cancer death among Hispanic/Latino men.¹¹⁹

Evidence of Screening Effectiveness

Although prostate cancer screening may lead to the early detection of cancer, scientific evidence does not conclusively show that lives can be saved through regular screening of asymptomatic men. There has been ongoing controversy over the effectiveness of PSA testing in reducing mortality from prostate cancer, and the evidence is still evolving regarding the benefit of prostate cancer screening. Screening may lead to unnecessary medical procedures, emotional distress, and financial costs for a man and his family. Though population-level screening is not currently recommended by professional organizations such as the USPSTF, major organizations agree that the decision to screen should be made between men and their physicians.

Major scientific and professional organizations and expert panels currently offer a variety of recommendations and guidelines for public health practice. The American Urological Association (AUA) encourages physicians to routinely *offer* prostate cancer testing to men who have an anticipated lifespan of 10 years or more and who are over the age of 50, or over the age of 40 for African Americans, or if there is a family history of prostate cancer. According to the AUA, early detection is best accomplished through the use of both PSA and DRE tests.¹²² The AUA also recommends that each man with his physician make a personal decision regarding testing after discussing the advantages and disadvantages of early detection and treatment.¹²³ The American Cancer Society currently recommends that PSA and DRE be offered annually beginning at age 50 (age 45 for men at high risk) to men who have at least a 10-year life expectancy. Information should be provided to men regarding potential risks and benefits of early detection and treatment of prostate cancer.¹²⁴ The USPSTF released their updated recommendations on prostate cancer screening in December 2002 based on a systematic review of the evidence. The USPSTF concluded that there is insufficient evidence to recommend for or against using PSA or DRE to screen for prostate cancer, a change from their 1996 recommendation against screening.¹²⁵ Research is critical and ongoing clinical trials may provide more conclusive evidence on the health outcomes of screening.

Examples of Current Activities Addressing Prostate Cancer

The Washington State DOH was recently awarded funding by the CDC to initiate activities to address prostate cancer in Washington. The BRFSS conducts an annual survey of the state population. An optional module on prostate cancer was included in 2001 and contained questions on PSA and DRE testing. According to data obtained from the module, almost 60% (\pm 3%) of men age 40 and over reported ever having had a PSA test. The proportion of men screened increased with age and over 83% (\pm 5%) of men age 65 and older reported having been tested. The module did not include questions on provider counseling, though a state-added question will be included in 2004. In addition, questions regarding prostate cancer screening will be part of the core questionnaire in 2004.

The American Cancer Society’s “Man to Man” community-based national program provides education about prostate cancer diagnosis and treatment options, as well as support for prostate cancer patients and survivors through organized support groups. It also promotes awareness of prostate cancer issues through free meetings, educational materials, and a “Man to Man” newsletter. Other statewide organizations involved in prostate cancer include the American Cancer Society, Washington State Urology Society, Washington State Prostate Cancer Coalition, and Us Too.

Gaps

According to the USPSTF, there is currently insufficient evidence to recommend for or against prostate cancer screening. Continued research is needed and ongoing clinical trials must be supported to provide more conclusive evidence on the health outcomes of prostate cancer screening, particularly whether screening prolongs life or enhances the quality of life.

There are also gaps in knowledge regarding effective approaches for promoting informed decision making regarding prostate cancer screening. The CDC’s Guide to Community Preventive Services is currently reviewing evidence for interventions that communities, policymakers, and public health providers can employ to promote informed decision making regarding cancer screening.

There is a lack of assessment data regarding current levels of awareness among providers and the community regarding prostate cancer screening issues.

General Recommendations

1. **Increase awareness of prostate cancer among adult men**—All adult men should be aware of prostate cancer—what it is, who is at increased risk, types of screening available, potential advantages and disadvantages of screening, and treatment options.
2. **Promote informed decision making between men and their providers**—Men age 50 and older and men at higher risk (e.g. men with a family history or African-American race) may benefit from prostate cancer screening and should be strongly encouraged to consult their physician to make an individual decision based on a discussion of individual risk and the potential advantages and disadvantages.
3. **Improve data collection and assessment**—Limited data are available to assess provider awareness and practice and community awareness with respect to prostate cancer screening. Enhanced data capacity will lead to better assessment of the issues and will guide the development of interventions.
4. **Monitor emerging science**—Scientific research investigating the health risks and benefits of prostate cancer screening should be monitored on an

ongoing basis. Published research on public health interventions should also be monitored to identify effective approaches for promoting informed decision making particularly among high-risk populations.

Goal 13

Improve informed decision-making between men and their providers regarding prostate cancer screening.

Objective 13.1

By 2008, increase the number of men who have talked with their provider about screening for prostate cancer.

Baseline: To be established. Data Source: BRFSS

Strategies

- ▶ Develop methods to assess provider knowledge and understanding of prostate cancer screening issues.
- ▶ Assess currently available resources for developing interventions to promote awareness (provider and community) and informed decision making.
- ▶ Identify or develop effective training programs aimed at enhancing health care professionals' knowledge and available resources, including culturally appropriate communication tools, involving prostate cancer screening issues.
- ▶ Identify or develop interventions to promote informed decision-making.
- ▶ Supplement the Behavioral Risk Factor Surveillance System with additional questions regarding prostate cancer screening.
- ▶ Encourage men age 50 and older to consult with their physician and participate in shared-decision making regarding prostate cancer screening.
- ▶ Encourage men with a family history of prostate cancer or of African-American descent to consult their physician and participate in shared-decision making regarding prostate cancer screening.
- ▶ Continue to monitor the science and organizational recommendations regarding prostate cancer screening.

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Medical Care

Quality cancer care is more than just medical treatment alone.

Cancer is a complex group of chronic diseases that requires a broad continuum of care. Providing conventional medical care alone is not sufficient to address all the needs of most cancer patients and their families. A diagnosis of cancer not only affects the physical wellness of the patient, but may also impact many social and emotional aspects of the patient and his or her family and loved ones' lives. Services addressing the emotional and social repercussions of a cancer diagnosis are critical components of the overall care that patients need. Cancer care consists of a range of services including preventive, therapeutic, palliative, rehabilitative and end-of-life care.

Because every individual has a unique set of values derived from past experiences, cultural beliefs, and personal preferences, strategies for cancer care may vary significantly. The manner in which needed services are provided reflects on the overall quality of the cancer care experience. Decisions related to cancer care made by the patient and medical providers have the potential to impact the length and quality of life for cancer patients and may also affect family members and friends who are emotionally involved with the patient. The availability and accessibility of appropriate, high quality care is essential to patients with cancer, regardless of the extent to which treatment options are utilized.

This section focuses on cancer issues related to medical care. The Medical Care work group used multiple sources of data and information to assess the issues and to set goals and objectives. Washington specific data were used when available as well as national data, reports and recommendations from national experts (e.g., Institute of Medicine), and local experts on cancer care issues. In general, less Washington-specific data were available for topics in this section compared to topics in the Primary Prevention or Secondary Prevention sections of the plan. Therefore, baseline data were not provided and measurable targets were not set for some of the objectives in this section.

Since the scope of the plan is broad, priorities will need to be set among plan goals prior to implementation. Baseline data will be necessary to measure progress toward implementation goals and overall evaluation of comprehensive cancer control. Further assessment will be conducted as necessary to develop baselines for medical care goals identified as priorities. Objectives associated with priority goals may need to be refined.

Access to Cancer Care

Access to care means that people are able to get the cancer care services they need, when they need them, and in a way that they can use and benefit from them. Adequate cancer care means that services are both available and accessible. Availability is an obvious prerequisite for access to care. However, accessibility is especially important because available services are only beneficial if cancer patients can obtain and use them when needed. Some factors that influence whether or not cancer patients benefit from available care have been identified. Factors such as no or limited medical insurance coverage, long distance to a cancer care facility, no primary care provider, and transportation limitations may pose barriers to receiving care. Language and cultural barriers may also reduce the potential benefit of cancer care that is provided.¹²⁶

Availability of Cancer Care in Washington

Cancer care is widely available in Washington. There are 109 hospitals in the state and of those, 41 facilities have cancer programs that are approved by the Commission on Cancer (COC) of the American College of Surgeons (ACOS). These programs are distributed throughout 16 of Washington's 39 counties. According to 2000 US Census data, about 88% of Washington's population resides in one of the 16 counties having at least one ACOS COC approved program. Only ten states, each of which has a larger population than Washington, have more than 41 COC approved programs.

Disparities in Access to Cancer Care

The President's Cancer Panel 2000-2001 report indicated that the major barriers to accessing cancer care include financial barriers, physical barriers, and barriers related to the organization and operation of the health care system.¹²⁷

The cost of cancer care and inability to pay is a major barrier to accessing cancer care for many people. According to the federal Agency for Healthcare Research and Quality and the Institute of Medicine, lack of health insurance is linked with decreased access to health care.^{128, 129} In addition, people without health insurance have much poorer health status¹²⁹ and are more likely to be diagnosed with later-stage cancer.¹³⁰ According to the 2002 BRFSS data, 12% ($\pm 1\%$) of Washington adults report being without health insurance at some point during the year. This has ranged between 10% and 14% since first being measured in 1991.

Other populations in Washington who are more likely to be uninsured include men, young adults, racial and ethnic minorities, people with lower income and educational levels, and rural residents, especially those with low incomes.¹²⁶ Underinsured individuals also face financial barriers in access to cancer care. Health coverage plans often exclude specific services or medications and covered services are often coupled with expensive co-pays and deductibles.¹²⁷

Washington residents living a long distance from a cancer care facility may experience increased difficulty accessing cancer care. Cancer care resources are

often concentrated in urban areas creating a distance barrier for those individuals living in rural communities.¹²⁷ Such communities often have limited public transportation. In fact, no public transportation services exist in half of Washington's rural counties.¹²⁶ In addition, many cancer patients may be physically unable to drive the long distance in order to access needed services.

There are other barriers within the health care system itself. Limited access to primary care can serve as an indicator of limited access to an array of health services including cancer care. Of Washington adults, 86% (\pm 1%) reported having a usual place of primary care in 2000.¹³¹ In addition, poor coordination between payers and decreased reimbursement rates create financial hardships for cancer care providers.¹²⁷

Examples of Current Activities to Improve Access to Cancer Care

Protecting and improving access to health care in rural communities is one of the top ten priorities of the Washington State DOH and one of the Secretary's 2003 Performance Agreement Goals with the Governor. In addition, the Washington State Board of Health created a Committee on Access to address needs within the public health system in Washington. The Board listed cancer-specific screening and surveillance and specialty cancer treatment as two of the recommended critical health services for Washington State residents.¹³²

Hospitals are required to provide needed care to indigent persons, regardless of the person's ability to pay for the care, including a sliding fee schedule to qualifying patients as outlined in RCW 70.170.060.

The Washington State Medical Assistance Administration (MAA), within the DSHS, currently administers Washington State's Medicaid program as well as state-funded health financing to assist more than 900,000 low-income residents overcome access and cost barriers to medical care in Washington. Approximately half of MAA clients receive their health care in a managed care setting through a health plan, while the remainder obtain fee-for-service financed health care. These programs include the Categorically Needy (CN) programs for low-income children, families, elderly and disabled residents; the Medically Needy program which serves primarily elderly and disabled citizens whose income is slightly greater than CN program eligibility limitations; the state-funded General Assistance program for incapacitated adults who are not eligible for the federal Medicaid program; the State Children's Health Insurance Program for children with household income from 200 to 250% of Federal Poverty Level; and an Alien Emergency Medical program for non-US citizens who are ineligible for other Medicaid programs due to citizenship or alien status requirements.

MAA also provides interpreter services to medical assistance program members who have difficulties speaking or understanding English. The Transportation Services Program within the MAA pays for transportation

services to and from needed non-emergency medical visits for residents enrolled in one of the state health care programs.

Gaps

MAA currently provides services to low-income residents of Washington who qualify for existing programs. However, budget limitations will result in several changes to MAA programs and eligibility requirements such as:

- ▶ The Medically Indigent program, which funded hospitalization costs for seriously ill persons without resources, was eliminated June 30, 2003.
- ▶ Adults will be required to contribute co-pays for durable medical equipment and services.
- ▶ Those children whose Medicaid coverage is Optional will be required to pay a premium.

Few programs aimed at improving access to quality care are available to aid residents who do not qualify for MAA assistance. The state-funded Basic Health program, which provides health care coverage to low-income Washington residents, started limiting new enrollment in February 2003 due to budget cutbacks in the 2001-2003 state budget. In addition, the program needed to find ways to maintain its current enrollment costs within budget as costs for health care coverage continued to increase. The changes resulted in higher monthly premiums and new member cost-sharing requirements (such as coinsurance and an annual deductible) for 2004. In addition, inadequate coverage or funding may exist in other federal programs such as the Indian Health Service. In an environment of budget cutbacks, limitations of funds designated to support cancer care issues will likely present additional service gaps for cancer patients in the future.

The type of insurance coverage a person has may also impact their ability to access cancer care. Research to determine how different types of insurance affect cancer care and outcomes is needed.

General Recommendations

1. **Ensure that all Washington residents have access to appropriate cancer care**—Every cancer patient in Washington should have access to quality cancer care. Uninsured and underinsured people are particularly vulnerable due to the substantial financial cost of cancer care. Inability to pay for services should not prevent cancer patients from receiving needed care. In addition, residents should have access to quality cancer care regardless of the geographical area in which they reside.
2. **Increase the number of people who have a usual source of primary care**—Limited access to primary care can serve as an indicator of broader access to needed health services, including cancer preventive and screening

services and cancer care. Increasing access to primary care will also facilitate better and more timely access to cancer care.

Goal 14

Improve access to cancer care in Washington.

Objective 14.1

By 2008, reduce financial barriers to cancer care.

Baseline: 12% (\pm 1%) of Washington residents reported being uninsured at some time during the year in 2002. Data Source: 2002 BRFSS.

Strategies

- ▶ Increase health insurance coverage for all Washington residents.
- ▶ Implement a standard benefits package for cancer care through consensus reached by public and private payers.
- ▶ Provide immediate medical coverage for the uninsured and supplemental coverage for the underinsured upon a diagnosis of cancer.
- ▶ Provide reimbursement for medically accepted anti-cancer agents, supportive medications (e.g., anti-emetics, pain medications), and cancer preventive agents regardless of method of administration.
- ▶ Provide consistent and realistic health care provider reimbursement between urban and rural locations.
- ▶ Promote balanced restructuring of federal cancer care finance system.

Objective 14.2

By 2008, reduce geographic barriers to cancer care.

Baseline: To be established. Data source: To be established.

Strategies

- ▶ Extend state-of-the-art cancer care to rural and other underserved areas by expanding the use of telemedicine and providing a reimbursement system that facilitates expansion of telemedicine to geographically underserved areas.
- ▶ Assess medically underserved areas to identify whether there is an insufficiency of cancer care.
- ▶ Increase incentives to practice in medically underserved areas.

- ▶ Promote the development of resources to help communities coordinate, promote, and support community-based programs, including patient navigator programs that help people obtain cancer information, screening, treatment, and supportive services.

Objective 14.3

By 2008, reduce cultural and educational barriers to cancer care.

Baseline: To be established. Data source: To be established.

Strategies

- ▶ Promote the development and use of culturally and linguistically appropriate materials for cancer care and education.
- ▶ Enhance cultural competency of health care providers.
- ▶ Ensure appropriate translation and interpreter services are provided for all who need it.
- ▶ Promote framework for ethical decision-making on information and service provision.
- ▶ Promote educational standards for cancer awareness and literacy in medical educational systems.
- ▶ Encourage minorities and members of other underserved populations to enter cancer care professions.
- ▶ Promote responsible, accurate, and balanced media coverage of cancer-related issues.
- ▶ Use innovative and culturally relevant approaches to reach minority and medically underserved communities.

Objective 14.4

By 2008, reduce or eliminate legal and regulatory barriers to cancer care.

Baseline: To be established. Data source: To be established.

Strategies

- ▶ Oppose efforts that interfere with patient choice and provider decision-making throughout the continuum of cancer care.
- ▶ Increase collaborative consultation with medical associations and constituents prior to making decisions involving the continuum of cancer care.

Objective 14.5

By 2008, increase the proportion of Washington residents who report having a usual source of primary care to 90%.

Baseline: 86% (\pm 1%). Data Source: 2000 BRFSS.

Strategies

- ▶ Promote programs that provide incentives for medical professionals to work in primary care.
- ▶ Educate the public regarding the importance of establishing a usual source of primary care.
- ▶ Discourage the use of emergency departments for primary care services.

Quality of Cancer Care

Quality of cancer care includes the quality of both the care and the delivery of care to cancer patients, beginning with the initial diagnosis and lasting through permanent remission or end-of-life. High quality cancer care means every patient is provided the appropriate services in a manner that is sensitive to their individual values and lifestyle. High quality cancer care is also technically competent and includes the use of good communication skills while consistently involving the patient in shared decision-making.¹³³ The Institute of Medicine measures quality of health care by the extent that it increases the likelihood of desired health outcomes and is consistent with current professional knowledge. Poor quality cancer care may include overuse, underuse, or misuse of tests, medications, and/or procedures, and may not involve the patient in discussions and decisions related to care options.¹³³ The consequences of poor quality cancer care may include reduced survival and decreased quality of life.

Quality of Cancer Care in Washington

The President's Advisory Commission on Consumer Protection and Quality in the Health Care Industry noted that there is a large need for coordination of quality-of-care efforts and, therefore, encourages that issues related to quality of cancer care be addressed at the state and national levels. The commission's recommendations included the development of broad national aims with specific measurable objectives for quality improvement and the development and use of standardized sets of quality indicators in all sectors of the health care system.¹³⁴

The indicators of quality cancer care are continually changing as knowledge and technology improve, making it difficult to assess quality specific to cancer care. However, according to the National Cancer Policy Board

(NCPB), the highest quality of care, including care known to be effective for specific conditions, is not provided to all cancer patients. The magnitude of the problem is not known at the national or state level, but is thought to be significant.¹³⁵

Disparities in the Quality of Cancer Care

Disparities in quality of care have been noted in many studies. Nationally, there are disparities in health outcomes by race and income. In general, people in racial and ethnic minority groups and people with lower income having poorer outcomes. This is attributed in part to disparities in the process and delivery of health care, including untreated disease, avoidable procedures, and treatment of late-stage cancer.¹³⁶ African Americans are less likely to receive high quality care, including many types of medical services and procedures.¹³⁷ Disparities in cancer care specific to African Americans include less intensive hospital care, fewer lung resections for non-small cell lung cancer, and less aggressive prostate cancer treatment. Latinas receive fewer mammograms and less analgesia for metastatic cancer, and both Latinas and Asian Americans receive fewer Pap tests. Additionally, racial and ethnic minorities report lower overall satisfaction in health care.¹³⁶

Data specific to Washington are limited and may mimic national trends. Recent research conducted by the Washington State DOH utilizing WSCR data assessed the quality of care provided for colorectal cancer patients. The purpose of the study was to determine if treatment according to National Cancer Institute recommendations varied by socioeconomic and demographic factors after controlling for clinical factors. Data from the WSCR, hospital discharge records, and the US Census were linked and analyzed. The study findings suggest that disparities exist in Washington in the provision of recommended treatment for colorectal cancer related to socioeconomic status and age.³

Examples of Current Activities to Promote High Quality Cancer Care

The Commission on Cancer (COC) of the American College of Surgeons (ACOS) regularly reviews and certifies programs. The COC was established in 1922 to set standards for the delivery of quality cancer care in hospitals. The COC sets standards by which treatment facilities may become ACOS approved in one of nine specific categories.¹³⁷ Once approved, facilities are encouraged to implement multidisciplinary cancer programs to improve their quality of cancer care in prevention, early detection, pretreatment evaluation, staging, treatment, rehabilitation, disease surveillance, psychosocial support, and end-of-life care. Accredited cancer programs are also encouraged to offer prevention, screening, nutritional counseling, community outreach, and support services. Programs approved by COC also provide information to the National Cancer Data Base (NCDB), which is used for pattern of care studies. Nationally, approximately one in five hospitals have a cancer program that is ACOS-approved. There are currently 41 ACOS-accredited cancer programs in Washington State.¹³⁹

The National Cancer Institute (NCI) sets standards for cancer research programs and designates institutions as Comprehensive or Clinical Cancer Centers. Facilities having the most extensive research experience are designated Comprehensive Cancer Centers and facilities that focus on basic and clinical science are designated Clinical Cancer Centers. Recognition as an NCI designated center indicates that patients will likely have access to research scientists and research trials. The Fred Hutchinson Cancer Research Center is currently the only NCI-designated Comprehensive Cancer Center in Washington.

In addition, the NCI established a national Center to Reduce Cancer Health Disparities (CRCHD) and addresses quality of cancer care issues through research programs.¹²⁸ The Special Populations Network (SPN) is an initiative of the CRCHD. The purpose of the SPN is to help large research institutions and community-based programs to work together to find ways of addressing important questions about the burden of cancer in minority communities.¹⁴⁰ There are two SPNs with regional programs in the State of Washington: The Spirit of EAGLES American Indian/Alaska Native Leadership Initiative on Cancer and the Asian American Network for Cancer Awareness, Research and Training (AANCART).

The Washington State Department of Health established the WSCR in 1991, as mandated by RCW 70.54.230, to monitor the incidence of cancer in the state of Washington. The registry provides data useful to understand, control, and develop strategies to reduce the occurrence of cancer in this state. Data from the WSCR provide information that can be used to assess incidence trends, stage of diagnosis, and disparities by demographic factors. Another potential use of registry data is for assessment of quality of care issues.

Gaps

A critical obstacle faced by the cancer care community is that improvement in quality of care issues is difficult to assess in the absence of data. Registry data are available and have the potential to increase assessment capabilities, however this resource has been minimally utilized. The NCPB notes the need for studies focusing on the reasons high-quality care is not consistently delivered and on the patient-to-patient variability of appropriate standards. In addition, health care providers do not consistently collect data on race and ethnicity, therefore changes in racial and ethnic disparities are difficult to determine.¹³⁷

Reimbursement rates for cancer care services throughout the system continue to decrease, resulting in financial challenges for some providers. To overcome these challenges, some providers must see more patients, reducing one-on-one time with each patient. Although providers strive to consistently deliver high quality care, limiting time with patients has the potential to affect the quality of care provided.

General Recommendations

1. **Promote studies and data collection focused on improving quality of care**—Detailed quality of cancer care information, including data specific to Washington State, is limited. Registry data offer the potential for assessing quality of care in Washington and attempts should be made to make better use of this resource. It is also important to encourage all health care providers to consistently collect race and ethnicity data in order to better understand disparities associated with quality of cancer care.
2. **Ensure that all cancer patients in Washington receive the highest quality of cancer care available**—Every cancer patient in Washington should be provided with appropriate services in a manner that is consistently sensitive and technically competent. However, it is difficult to consistently provide the highest-quality care when time and resources are limited. Additionally, as reimbursement rates continue to decrease, providers face financial challenges that force them to see more patients in shorter periods of time. Increased access to resources and appropriate reimbursement for cancer care providers' time and services would allow providers to spend additional time with each patient and ensure that the highest quality cancer care is consistently delivered.

Goal 15

Improve the quality of cancer care provided in Washington.

Objective 15.1

By 2008, improve the accessibility and utility of cancer registry data for quality assessment and improvement purposes.

Strategies

- ▶ Identify data elements required to assess optimal patient care and outcomes.
- ▶ Identify the costs and barriers associated with the collection of such data.
- ▶ Establish and maintain an accessible online information system that provides information from the statewide cancer registry, which has been identified by health care providers as most appropriate for their needs.

Objective 15.2

By 2008, increase access to nationally recognized treatment guidelines among health care providers.

Strategies

- ▶ Establish a website to provide links to online information that provides current evidence-based cancer treatment guidelines.
- ▶ Utilize the NCI Physician Data Query to provide links to online cancer information.
- ▶ Encourage medical care organizations to promote the development of ongoing educational programs for all levels of cancer care providers that address best practices in screening, diagnosis, and treatment.

Objective 15.3

By 2008, increase the ability of cancer patients to make informed decisions regarding their care.

Strategies

- ▶ Encourage medical care providers to define a process to assist all patients in understanding their care options (i.e., patient navigator).
- ▶ Encourage medical care providers to develop and disseminate information on navigating the cancer care system that is geared especially toward those with special needs (e.g., low medical literacy).

Objective 15.4

By 2008, improve cancer care coordination and delivery.

Strategy

- ▶ Encourage consultation between the medical care team and patient to identify an individual designated as responsible for coordinating care at any point in time during the course of treatment.

Objective 15.5

By 2008, increase the number of cancer patients who participate in appropriate clinical trials.

Strategies

- ▶ Encourage providers designated as responsible for coordinating care to inform patients of clinical trials germane to their condition within a reasonable time from diagnosis.
- ▶ Encourage appropriate reimbursement for phase II and III clinical trials from public and private insurers.

Objective 15.6

By 2008, increase the utilization of recognized quality improvement practices among medical care organizations.

Strategy

- ▶ Promote the provision of all primary cancer care by physicians and other caregivers who are affiliated with an American College of Surgeons Commission on Cancer accredited program.

Objective 15.7

By 2008, improve appropriate reimbursement for cancer care providers.

Strategies

- ▶ Advocate for appropriate reimbursement from all payers.
- ▶ Promote systematic improvements in the reimbursement of cancer care services.

Psychosocial Services, Palliative Care, and End-of-Life Care

Cancer is a chronic disease with an insidious onset and an unpredictable course of indefinite duration. The disease has sustained a strong negative stigma for decades. An individual's adaptation after a diagnosis of cancer is influenced by biological, environmental, social, cultural and psychological components. Genetic testing, screening, diagnosis, treatment, survival, palliation and, for some, dying and death, are all components in the cancer care continuum. Each event and process within the continuum can be extremely stressful and can affect all areas of a person's life. The costs can be high emotionally and financially. Adequate pain management and timely referral to hospice is frequently problematic and inadequate. Even when patients successfully complete treatment, feelings of vulnerability and other problems do not necessarily abate. Issues related to a cancer diagnosis (or even a genetic predisposition for a cancer diagnosis) can impact the course of an individual's life indefinitely.

The 2001 Institute of Medicine report, *Improving Palliative Care for Cancer*, highlights access and quality issues for minority populations. Despite higher incidence and death rates from cancer, African Americans and other minorities underutilize palliative and hospice care services.¹⁴¹ According to the National Hospice and Palliative Care Organization, in 2001, about 8% of the hospice care population served was African American and about 3% was Hispanic or Latino.¹⁴² Underutilization among minority populations may be due to unequal access; limited provider knowledge of care options; lack of knowledge among minorities regarding federal, state, and local benefits; or cultural issues.

Accessible, high quality psychosocial services, palliative care and end-of-life care are related and integral components of a comprehensive cancer control plan. There must be an ongoing and evolving effort to guarantee patient-centered care with quality of life at its core, especially in supportive and palliative care.

Psychosocial Services

Psychosocial cancer care services provide education and support for patients and family members following a diagnosis of cancer. Emotional responses to cancer diagnosis vary and therefore a variety of services including support groups, spiritual care, and psycho-oncology counseling for patients and their family members are important aspects of cancer care. Financial counseling and social work may also be appropriate.

Goal 16

Ensure the provision of adequate psychosocial services starting from diagnosis throughout the continuum of care.

Objective 16.1

By 2008, increase awareness of the need for and value of psychosocial services.

Strategies

- ▶ Promote demonstration projects to assess the value of psychosocial services.
- ▶ Educate individuals – patients, physicians, and caregivers – on issues related to psychosocial services.
- ▶ Educate organizations – public and private payers, government, and employers – on issues related to psychosocial services.
- ▶ Conduct a public media campaign addressing psychosocial services.

Objective 16.2

By 2008, increase the availability and utilization of psychosocial services.

Strategies

- ▶ Assess current geographic availability and provider capacity.
- ▶ Create a clearinghouse of information on available services statewide.
- ▶ Advocate for reimbursement of psychosocial services with demonstrated value.

- ▶ Review license and certification regulations for providers of psychosocial services.
- ▶ Promote utilization of available services.

Palliative Care

The World Health Organization defines palliative care as the “active total care of patients whose disease is not responsive to curative treatment.” Many aspects of palliative care are also applicable earlier in the course of illness in conjunction with cancer treatment.¹⁴³ Palliative care is an attempt to provide the best possible quality of life by relieving physical pain and other disease-related symptoms while providing support and counseling to maintain emotional and spiritual health.

In 2002, the American Hospital Association conducted a survey to determine how many hospitals in the United States offer palliative care programs for patients and formal pain management education programs for employees. Nationally, 42% reported having formal pain management education programs for employees, and 14% reported offering palliative care programs to patients. Washington’s percentages were similar to the rest of the nation with about 40% of hospitals reporting pain management education programs and about 17% reporting having palliative care programs for patients.¹⁴⁴

In addition to hospital-based programs, physicians and nurses can earn independent certification from the American Board of Hospice and Palliative Medicine and the Hospice and Palliative Nurses Association, respectively. However, these certification programs are relatively new, and to date, few physicians and nurses who work in palliative care have earned independent certification.

Pain control is a major aspect of palliative care. According to the Washington-Alaska Cancer Pain Initiative, pain is experienced by 65%-90% of cancer patients. Terminally ill patients with advanced-stage cancers are especially susceptible to cancer pain. Pain control standards for health care facilities have been set by multiple organizations including the Joint Commission on Accreditation of Healthcare Organizations and the federal Agency for Health Care Policy and Research. In addition, the National Comprehensive Cancer Network and the American Cancer Society collaborated to produce their own set of guidelines for the treatment of cancer pain.

Goal 17

Ensure the provision of adequate palliative care.

Objective 17.1

By 2008, reduce barriers to palliative care.

Baseline: To be established. Data source: To be established.

Strategies

- ▶ Assess and promote best practices for removing barriers (e.g., medical, political, economic, and social).
- ▶ Assess current geographic availability and provider capacity.
- ▶ Create a clearinghouse of information on available services statewide.
- ▶ Advocate for more appropriate reimbursement of medically necessary palliative care.
- ▶ Increase awareness and promote utilization of available services.
- ▶ Include palliative care options in informed consent guidelines.
- ▶ Educate providers about effective pain management procedures.
- ▶ Educate patients about effective pain management

End-of-Life Care

End-of-life care is delivered during the last phase of life and includes medical care and supportive services for patients and their families. Although similar to palliative care, end-of-life care is unique. While palliative care is applicable throughout curative cancer treatments, end-of-life care begins when the focus changes from an attempt to extend life to ensuring maximal comfort only. Good communication between patient, provider, and family members is a critical aspect of end-of-life care. Legal and ethical information regarding care options should be discussed in order to avoid the provision of care that the patient would consider demeaning, undignified, painful or undesirable. Ensuring as much patient autonomy as possible should be an overriding goal throughout end-of-life cancer care.

Important aspects of end-of-life care include the availability of hospice care and the opportunity to complete an advanced directive. Hospice care focuses on managing pain and other symptoms without attempting to cure, while offering emotional, psychological, and spiritual support to both the patient and their loved ones. In 2000, about 24% of those who died in Washington were individuals who had received hospice care.¹⁴⁴ An advanced directive is a legal document that allows the patient to specify which medical services should be

administered or to appoint someone to make medical decisions on their behalf should a situation arise in which the patient is unable to communicate with medical providers. Advanced directives seek to provide patient autonomy during the vulnerable moments preceding death. According to the Last Acts Report released in 2002, Washington State performs only average in the provision of advanced directive services.

Goal 18

Ensure the provision of adequate end-of-life care that enables patient autonomy.

Objective 18.1

By 2008, increase access to end-of-life care.

Baseline: To be established. Data source: To be established.

Strategies

- ▶ Provide patients complete and accurate information regarding all legal and ethical end-of-life care options.
- ▶ Improve the provision of advanced directive services.
- ▶ Educate providers about strategies for discussing end-of-life care.
- ▶ Educate providers about effective pain management procedures.
- ▶ Assess gaps in availability and use of hospice care.

Integrating Complementary Therapy into Cancer Care

Complementary therapy offers services that can be used in addition to conventional medicine that may enhance the cancer care experience for patients. Among the services delivered by complementary care providers, such as naturopathic physicians (NDs), acupuncturists, massage therapists, chiropractors, and others, are additional sources of pain control, nutritional supplements, and healthcare guidance. Although most of the traditional methods used by NDs and other complementary care providers have not undergone rigorous scientific study of efficacy, many believe that these therapies have the potential to improve the quality of life for both patients undergoing conventional treatments such as chemotherapy and also for those who choose palliative and end-of-life care only. Acupuncture is a complementary therapy that has been rigorously studied. A panel of experts at the 1997 National Institutes of Health (NIH) Consensus Conference concluded that acupuncture is an effective complementary therapy for managing nausea

and vomiting associated with chemotherapy and for controlling pain after surgery.¹⁴⁵ Complementary care also has the potential to aid in cancer prevention by promoting healthy lifestyles, assessing patient risk factors such as heredity and susceptibility, and working with patients to create personal interventions aimed at preventing illness.

Complementary Therapy in Washington

The use of complementary therapies, especially herbal medicines, megavitamins, and visits to naturopathic providers has increased nationally since 1990.¹⁴⁶ A recent Fred Hutchinson Cancer Research Center survey estimated that over 70% of adults with cancer in western Washington use alternative therapies, including dietary supplements, massage, spiritual therapy, mental or energy-based therapy (e.g., hypnotism), and others.¹⁴⁷ In addition, more licensed naturopathic physicians live and work in Washington than in any other state.¹⁴⁶ According to the Washington State Department of Health, Division of Health Systems Quality Assurance, there are currently 581 licensed NDs in Washington. Bastyr University, a well known naturopathic medical university, is located in Washington. In addition to training naturopathic physicians, Bastyr participates in research involving complementary therapies, including cancer-related research.

Washington is also one of only two states in the nation that has mandated insurance coverage for licensed NDs. According to RCW 18.36A.040, the treatment of malignancies and neoplastic disease by NDs is only lawful when provided in concert with an allopathic or osteopathic physician (primary oncologist). However, NDs can treat cancer adjunctively if the patient has elected not to pursue allopathic treatment after diagnosis and medical evaluation is performed by an allopathic or osteopathic physician and can do so by informed consent. Other complementary services covered by some insurance plans in this state include acupuncture, massage therapy, and chiropractic services.

Disparities

Washington data describing disparities in access to complementary cancer care are not currently available. However, the recent Fred Hutchinson Cancer Research Center survey suggests that some cancer patients in western Washington are more likely to use complementary therapies than others. According to the survey results, college-educated females were twice as likely to take dietary supplements and five times more likely to obtain services from an alternative health care provider than other cancer patients. In addition, patients 60 years of age and younger were nearly twice as likely to use alternative therapies than those over age 70.¹⁴⁷

Differences in the quality of complementary care are also likely to exist. All naturopathic care is not the same. Some naturopathic providers are not licensed and, therefore, do not have the same training and may not provide the same quality of care as licensed providers. The American Association of

Naturopathic Physicians is currently working to establish national requirements for licensure for NDs; however, at this time license requirements vary from state to state. Requirements for licensure in Washington are outlined in RCW 18.36A.090. Obtaining naturopathic care from any provider in Washington that is not licensed in Washington may not be safe or effective. In addition, obtaining naturopathic services from other licensed health care providers who are not appropriately trained may increase the risk for harmful therapies and drug interactions.

Examples of Current Activities to Provide Integrated Care

Federal and state organizations are involved with complementary medicine and its use in cancer care.¹⁴⁸ The National Center for Complementary and Alternative Medicine at the National Cancer Institute (NCI) is the government's lead agency for scientific research on complementary and alternative medicine (CAM) therapies.* In addition, the NCI's Office of Cancer Complementary and Alternative Medicine provides information about cancer-related CAM to health providers and oversees the Best Case Series program, which develops follow-up research strategies for CAM approaches with therapeutic potential.¹⁴⁹ In March 2000, a White House Commission on Complementary and Alternative Medicine Policy was formed to develop recommendations regarding CAM therapies.¹⁵⁰ Finally, a Naturopathic Advisory Committee in Washington state exists as part of a group of boards and commissions which are legislatively mandated to set program goals and policies, and to provide advice regarding health professions' regulation and discipline.¹⁵¹

Some centers around the country, such as the Memorial Sloan-Kettering Cancer Center, the Columbia Presbyterian Medical Center, and the M.D. Anderson Cancer Center, have incorporated complementary approaches into their traditional cancer treatment strategies. Although Washington is still in the early stages of such collaboration, some activities, such as clinical seminars at the University of Washington School of Medicine, University of Washington Medical Cancer Center, and the Fred Hutchinson Cancer Research Center, among others, have taken place. Bastyr University and Fred Hutchinson Cancer Research Center have also recently collaborated on cancer-related research. In addition, Bastyr has secured research funding from the NIH to evaluate naturopathic medical treatments.¹⁵²

Gaps

In general, there is little communication regarding complementary therapies between cancer patients and their allopathic or osteopathic medical providers. A 1997 national survey indicated that only about 40% of alternative therapies used by patients are discussed with their allopathic or osteopathic doctor.¹⁴⁶ A separate report published in 2001 indicates that up to 70% of patients who use

*NCCAM website with current clinical trial information, URL: <http://nccam.nih.gov/clinicaltrials>

herbal supplements do not notify their clinicians that they are doing so. In addition, physicians do not routinely ask patients about non-traditional medications being used. These patients may be at risk for potentially harmful drug interactions.¹⁵² This lack of communication may result from patient concerns regarding their physician's reaction. In addition, many patients are not aware that natural products have the potential to be harmful when used in association with conventional cancer therapies. Finally, if a patient sees both a conventional physician and naturopathic physician, these providers may not routinely communicate with each other. In a 2002 survey of naturopathic physicians treating patients with breast cancer, approximately one-third reported having conventional medical records for all of their breast cancer patients.¹⁵³

Few rigorous studies have been performed on complementary cancer care therapies, particularly in combination with conventional treatments. The NIH began funding naturopathic studies in 1998, but no phase III or phase IV cancer trials involving a combination of conventional and naturopathic therapies have taken place.

General Recommendations

1. **Increase awareness of available complementary cancer therapies**—Integrating complementary therapies into cancer care may enhance the overall cancer care experience for patients. Both allopathic/osteopathic providers and patients should be aware of the potential benefits of complementary therapies as well as the potential risks. Patients should also be aware of the potential harms of self-prescribing naturopathic medications.
2. **Increase the amount of research involving complementary cancer therapies**—More funding is needed to study the value of using complementary therapies alone and in association with conventional cancer care.

Goal 19

Ensure the opportunity for safe and effective use of complementary medicine in cancer care.

Objective 19.1

By 2008, increase patient, provider, and institutional awareness of available complementary cancer therapies.

Strategies

- ▶ Educate allopathic/osteopathic medical providers on the potential contribution of complementary therapies in cancer care.
- ▶ Educate patients on the potential harm associated with self-prescribed care.
- ▶ Educate allopathic/osteopathic medical providers and patients about the difference between licensed and unlicensed naturopathic providers.
- ▶ Establish a method that will enable allopathic/osteopathic providers and patients to easily identify and access licensed naturopathic providers and other licensed or certified complementary care providers.

Objective 19.2

By 2008, increase the number of research studies involving complementary cancer therapies.

Strategy

- ▶ Promote research involving the integration of conventional and naturopathic cancer therapies.

Informed Consent

Informed consent is the process in which a patient participates with a medical care provider in making decisions that will direct the patient's care. Informed consent is based on the belief that each person has a legal and ethical right to make decisions that will affect his or her own body. The American Medical Association set guidelines regarding what information should be presented to the patient during the informed consent process. Currently, the guidelines state that the patient must be informed of their diagnosis, available treatment methods, alternatives to such treatment, risks and benefits of treatment and alternative methods, and risks and benefits of not receiving treatment or alternative care at all.

Informed consent is especially important in cancer cases for several reasons. First, many cancer treatment options carry significant risks that may affect the quality of the patient's life. Second, since cancer often has no proven cure, many patients may choose to participate in a research trial with unknown risks and benefits. Finally, a competent cancer patient may refuse treatment altogether and, therefore, must be completely aware of the potential consequences of such a decision.

The current standards defining the informed consent process are guided by past legal actions including the Nuremberg Code in 1947, the Declaration of Helsinki in 1964, and the *Arato v. Avedon* California Supreme Court decision in 1993. Additionally, Title VI of the Civil Rights Act of 1964, the Americans

with Disabilities Act, and the Health Insurance Portability and Accountability Act of 1996 (HIPAA) regulate how informed consent information must be presented to the patient and who may have access to the patient's information. Finally, the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) monitors medical care facilities in many areas of patient care, including informed consent, to assure that guidelines are being followed.

Informed Consent in Washington

Most states, including Washington, have legislation to determine how much information must be provided to the patient during the informed consent process. In the state of Washington, a patient must be provided with enough information about the procedure or treatment such that an average patient could participate in an informed decision. Specific information that is required to be included in a medical consent form in Washington is outlined in RCW 7.70.060. In addition, RCW 7.70.065 states that if a patient is considered not competent, an authorized person may give consent on the patient's behalf. For research trials, the federal Office for Human Research Protections outlines the general requirements for informed consent in the Code of Federal Regulations, Title 45: Public Welfare, Part 46: Protection of Human Subjects, Section 46.116. Institutional review boards set standards for readability of informed consent forms for research subjects ranging from a 5th to 10th grade level,¹⁵⁴ and JCAHO requires communication in a language and at a level that a patient and the patient's family can understand. In addition, Title VI of the Civil Rights Act of 1964 requires that all information and services be provided in any appropriate language if the provider receives federal funding, as many health care facilities do.

Disparities in Informed Consent

Despite the guidelines, mechanisms to ensure adequate informed consent for cancer care are not universally in place. Many consent forms are so complicated that patients have trouble understanding them. According to a national survey published in the Journal of the American Medical Association, 60% of those surveyed could not comprehend a standard informed consent document.¹⁵⁵ Factors such as a college education and the use of English as the primary language at home have been shown to increase the level of patient understanding when reading consent forms.¹⁵⁶ The National Center for Cultural Competence reported that the problem is greatest for non-English speaking patients in rural areas due to the low availability of interpretation and translation services in rural communities.

In addition to difficulty with comprehension, some patients, particularly some elderly patients, may have difficulty reading consent forms due to poor vision. Consent forms commonly are written in small print with little space between words.

Current Activities

Regulations that include informed consent issues are frequently updated. Most recently, on April 14, 2003, HIPAA became effective, requiring that any patient information be kept private unless the patient has given specific consent for the sharing of such information.

The Department of Health and Human Services, Office of Inspector General report in May 2002 indicated that websites providing informed consent information specific to research trials may be a promising means of providing more thorough informed consent.

Gaps

Despite changes in the guidelines over the years, many cancer care providers are not involved in continuing education on informed consent issues. This may result in discrepancies in the thoroughness of informed consent and poor communication between patient and provider when discussing cancer care options. Additionally, patients are commonly provided with and asked to sign a consent form immediately before receiving a service. This often leaves little time to carefully read the consent form or obtain additional information.

Due to a shortage of qualified translation and interpretation services, informed consent forms may not be available in all languages. In addition, common medical terms often have no equivalent in other languages.¹⁵⁷

General Recommendations

- 1. Provide education on informed consent issues to providers and patients**—Providers should be familiar with all aspects of informed consent to ensure that patients receive sufficient information to participate in the informed decision-making process. Patients should also be aware of the informed consent guidelines and expect that their cancer care provider share the required information with them and ensure that they understand it.
- 2. Ensure that high-quality consent forms are consistently provided to patients**—Patients should have the opportunity to understand any consent form that they are asked to sign. Factors such as language, level of education, and visual impairments should not impede a patient from receiving thorough informed consent information. Adequate time should be allowed for a patient to read a consent form, or forms should be provided ahead of time, to ensure that patients have the opportunity to understand the consent form prior to receiving a service.

Goal 20

Improve the informed consent process for cancer patients in Washington.

Objective 20.1

By 2008, increase support for patient informed decision-making by cancer care providers.

Strategies

- ▶ Educate cancer care providers on the elements and challenges of the informed consent process.
- ▶ Provide cancer care providers with templates outlining each aspect of informed consent.
- ▶ Encourage patients and providers to know what information should be addressed during the informed consent process.
- ▶ Ensure appropriate translation and interpreter services are provided for all who need it.
- ▶ Promote the expectation that institutional leadership (i.e., Board of Directors) take ultimate responsibility for the integrity of the informed consent process at their institution.

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Appendices

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Appendix A: CCCP – Vision, Mission, Roles, and Values

Our **vision** for Washington State is a place where:

- ▶ Individuals will not get preventable cancers.
- ▶ Those individuals with detectable cancers are diagnosed in the earliest stage of the disease possible.
- ▶ Those individuals with treatable cancers are given the highest quality state-of-the-art care necessary to maximize their survival and quality of life.
- ▶ Those individuals in the end stages of incurable cancers are cared for in a way that maximizes the quality of their life and death.
- ▶ Full support is given to research directed toward understanding the causes of cancers and toward improving prevention, early detection, treatment, and palliation.

Our **mission** is to:

- ▶ Reduce cancer incidence, morbidity, and mortality.
- ▶ Increase equity in access to appropriate preventive, screening, diagnostic, treatment, and palliative care.
- ▶ Maximize the quality of life for all individuals with cancer.
- ▶ Promote research.
- ▶ Educate consumers, providers, payers, and policy makers on cancer issues.

Our **role** is to provide leadership in and advocacy for:

- ▶ Identifying and prioritizing statewide needs for cancer prevention and control.
- ▶ Identifying interventions and resources.
- ▶ Coordinating activities.
- ▶ Promoting the availability of sufficient health workforce, equipment, and service availability.
- ▶ Seeking financial resources to fund plan initiatives.

- ▶ Supporting efforts to increase awareness and share strategies to reduce the burden of cancer disparities faced by ethnically diverse and underserved populations.

We **value** a process that encourages broad participation and is prevention-oriented, science-based, data-driven, culturally competent, survivor informed, outcome-oriented, comprehensive in nature, and respectful of individual autonomy and rights including the right to fully informed consent.

Appendix B: Healthy People 2010

Healthy People 2010 is a comprehensive set of disease prevention and health promotion objectives for the nation to achieve over the first decade of the new century. Created by scientists both inside and outside the government, it identifies a wide range of public health priorities and specific, measurable objectives.

The Central Goals of Healthy People 2010

Healthy People 2010 is designed to achieve two overarching goals:

- ▶ Increase quality and years of healthy life
- ▶ Eliminate health disparities

These two goals are supported by specific objectives in 28 focus areas. Each objective was developed with a target to be achieved by the year 2010.

Focus Area 3 – Cancer

Co-Lead Agencies: Centers for Disease Control and Prevention, National Cancer Institute

Goal: Reduce the number of new cancer cases as well as the illness, disability, and death caused by cancer.

Objectives (short title):

- 3-1 Cancer deaths
- 3-2 Lung cancer deaths
- 3-3 Breast cancer deaths
- 3-4 Cervical cancer deaths
- 3-5 Colorectal cancer deaths
- 3-6 Oropharyngeal cancer deaths
- 3-7 Prostate cancer deaths
- 3-8 Melanoma deaths
- 3-9 Sun exposure
- 3-10 Provider counseling about preventive measures
- 3-11 Pap tests
- 3-12 Colorectal cancer screening

- 3-13 Mammograms
- 3-14 Statewide cancer registries
- 3-15 Cancer survival

More information about Healthy People 2010 can be found at: <http://www.healthypeople.gov>

Source: U.S. Department of Health and Human Services. Healthy People 2010: Understanding and Improving Health. Washington, DC: U.S. Department of Health and Human Services, Government Printing Office. 2000.

Appendix C: Washington State Cancer Registry (WSCR)

Description of the System

- ▶ **Purpose:** The Washington State Cancer Registry (WSCR) monitors the incidence of cancer in order to understand, control, and reduce the occurrence and burden of cancer in this state (RCW 70.54.230).
- ▶ **Coverage:** All residents of Washington including those diagnosed and treated in other states; estimated 95% complete.
- ▶ **Years:** Data collection began in 1991, but the first complete year of reliable data is 1992. Annual data are generally available 18 months after the end of a calendar year.
- ▶ **Key Data Elements:** Year of diagnosis, age, gender, race, type of cancer (site), stage at diagnosis, first course of treatment, treatment facility, and county, zip code, and census tract of residence; detailed clinical information such as histology, nodal involvement, and tumor size also available.
- ▶ **Reporting System:** Cancer cases are collected through a combination of contracts with two regional tumor registries (the Cancer Surveillance System of the Fred Hutchinson Cancer Research Center and the Blue Mountain Oncology Program) and cases from independent reporting facilities (such as hospitals and clinics) with in-house cancer registry programs. Contractors and reporting facilities obtain reports of cases from hospitals, pathology laboratories, ambulatory surgical centers, and physicians; abstract information from the reports; and report to the state registry. Thirty other states, including Idaho and Oregon, report Washington cases to the WSCR.
- ▶ **Classification and Coding:** The cancer reporting rules (246-102 WAC) define reportable cancers as “any malignant neoplasm, with the exception of basal and squamous cell carcinoma of the skin.” Cancer in situ (that is, a cancer that has not yet spread to surrounding tissue) except cancer in situ of the uterine cervix is also included. Record format in the WSCR follows the North American Association of Central Cancer Registries (NAACCR)

standards. International Classification of Diseases for Oncology, Second Edition (ICD-O-2) codes are used in reporting the primary site, histology, and behavior. Stage at diagnosis is coded using the National Cancer Institute's Surveillance Epidemiology and End Results guidelines for General Summary Stage.

- ▶ **Data Quality Procedures:** DOH staff perform quality assurance activities including standardized computer edits, review of a statistical sample of records to determine the accuracy of data items such as race and ethnicity, and hospital audits to determine the completeness of case finding and the accuracy of data abstraction and coding. In addition, DOH links the annual death file with records in the cancer registry to assure that all Washington residents who died from cancer are appropriately included in the registry. DOH staff provides training to hospital staff on data standards and appropriate methods for documenting data items. The North American Association of Central Cancer Registries and the CDC National Program of Cancer Registries audit the data annually. The state registry is generally awarded the highest level of accuracy and completeness by these organizations.

Issues related to Race and Ethnicity

- ▶ Information on race and Hispanic ethnicity are abstracted from the medical record and reported to the WSCR.
- ▶ Comparisons of race and ethnicity between the WSCR and the death files suggest that American Indian race and Hispanic ethnicity are underreported in the WSCR. Thus, race data are considered reliable for Asians and Pacific Islanders, blacks, and whites only. (See "Cancer by Race" in the WSCR 1998 Annual Report, <http://www3.doh.wa.gov/WSCR/HTML/WSCR1998RPT.SHTM>).

Caveats

- ▶ Inaccurate, poorly defined, or out-of-date reporting of some information abstracted from medical record, such as patient ethnicity, occupation, and delayed treatment.
- ▶ Data not collected for non-invasive cervical cancer and non-melanoma skin cancer.
- ▶ Limited ability to monitor the impact of interventions aimed at primary prevention because cancer usually takes a long time to develop and be diagnosed.

- ▶ Limited ability to assess perceived clustering of cancer in communities because most cancer takes a long time to develop and the number of cases is usually relatively small.

Best Uses

- ▶ Examine trends in cancer incidence.
- ▶ Compare cancer incidence to mortality trends.
- ▶ Compare local, state, and national trends.
- ▶ Compare population subgroups.
- ▶ Investigate spatial patterns and correlates.
- ▶ Assess discrepancies in treatment and screening practices.

National Data

- ▶ Unless otherwise noted, national incidence data were developed by DOH using SEER*Stat 4.0, released April 2001 by the National Cancer Institute. The data include cancer incidence from 11 SEER sites across the US and represent estimates of national incidence rates. More information about SEER is available at <http://seer.cancer.gov/>.

For Further Information

Washington State Department of Health, Washington State Cancer Registry
(360) 236-3676 or 1-888-302-2227.

Washington State Cancer Registry web page: <http://www3.doh.wa.gov/WSCR/>.

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Appendix D: Age Adjustment

Age-adjusted incidence rates were developed using the direct method. They were standardized to the age distributions of the United States 2000 standard population. Following the age-adjustment procedures used by the National Cancer Institute we used five-year age groups in calculating age-adjusted rates. The age distribution of the 2000 US standard population is shown below.

US Standard Populations Proportions

Age group	2000 proportion	Age group	2000 proportion
0-4	0.0691	45-49	0.0721
5-9	0.0725	50-54	0.0627
10-14	0.0730	55-59	0.0485
15-19	0.0722	60-64	0.0388
20-24	0.0665	65-69	0.0343
25-29	0.0645	70-74	0.0318
30-34	0.0710	75-79	0.0270
35-39	0.0808	80-84	0.0178
40-44	0.0819	85+	0.0155

Direct method of age adjustment

Multiply the age-specific rates in the target population by the age distribution of the standard population.

$$\hat{R} = \sum_{i=1}^m s_i(d_i/P_i) = \sum_{i=1}^m w_i d_i$$

Where m is the number of age groups, d_i is the number of deaths in age group i , P_i is the population in age group i , and s_i is the proportion of the standard population in age group i . This is a weighted sum of Poisson random variables with the weights being (s_i/P_i) .

Confidence Intervals

Confidence intervals for the age-adjusted rates were calculated with a method based on the gamma distribution (Fay and Feuer, 1997). This method produces valid confidence intervals even when the number of cases is very small. When the number of cases is large, the confidence intervals produced with the gamma method are equivalent to those produced with the more traditional

methods, as described by Chiang (1961) and Brillinger (1986). The formulas for computing the confidence intervals are given below. Although the derivation of this method is based on the gamma distribution, the relationship between the gamma and Chi-squared distributions allows the formulas to be expressed in terms of quantiles of the Chi-squared distribution, which can be more convenient for computation.

$$\text{Lower Limit} = \frac{v}{2y} (\chi^2)_{\frac{2y^2}{v}}^{-1}(\alpha/2)$$

$$\text{Upper Limit} = \frac{v + w_M^2}{2(y + w_M)} (\chi^2)_{\frac{2(y+w_M)^2}{v+w_M^2}}^{-1}(1 - \alpha/2)$$

where y is the age-adjusted death rate, v is the variance as calculated as shown below, w_M is the maximum of the weights $s_i p_i$, $1 - \alpha$ is the confidence level desired (e.g., for 95% confidence intervals, $\alpha = 0.05$), and χ^2 is the inverse of the χ^2 distribution with x degrees of freedom.

$$v = \sum_{i=1}^m d_i (s_i / P_i)^2$$

References

Brillinger, D. R. The natural variability of vital rates and associated statistics [with discussion]. *Biometrics* 42:693-734, 1986.

Chiang, C. L. Standard error of the age-adjusted death rate. *Vital Statistics, Special Reports* 47:271-285, USDHEW, 1961.

Fay, M.P. and Feuer, E.J. Confidence intervals for directly rates: a method based on the gamma distribution. *Stat Med* 16:791-801, 1997.

Appendix E: Death Certificate System (mortality data)

Description of the System

- ▶ **Purpose:** To establish legal benefits; to provide public health information.
- ▶ **Coverage:** All deaths in Washington and those of Washington residents who die in other states; estimated 99% complete.
- ▶ **Years:** Paper records: 1907-present; computerized records: 1968 – present; annual data generally available eight to ten months after the close of the calendar year.
- ▶ **Data Elements** (examples): Age, gender, race/ethnicity, date of death, underlying and contributing causes of death, place of residence, place of occurrence, zip code of residence, occupation, education.
- ▶ **Reporting System:** Demographic information is gathered by the funeral director; cause of death is reported by the attending physician or the coroner/medical examiner. Certificate is filed with the local health jurisdiction, retained for about 60 days for local issuance purposes, then filed with DOH.
- ▶ **Classification and Coding for Causes of Death:** Classification and coding of data on Washington death records follow the National Center for Health Statistics (NCHS) guidelines as defined in Vital Statistics Instruction Manuals parts 1 – 20 (Published by US Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention, National Center for Health Statistics, Hyattsville MD). Causes of death are coded according to the International Classification of Disease, World Health Organization, Eighth Revision (ICD-8) for 1968 – 1978; Ninth Revision (ICD-9) for 1979 – 1998; Tenth Revision (ICD-10) for 1999 and later.
- ▶ **Data Quality Procedures:** Instruction manuals are provided to physicians, coroners, and medical examiners, as well as local health jurisdictions and others involved in completing and managing death certificates. Edits and a physician query system are used to check for internal consistency and logic/completeness of cause of death.

Issues Related to Race and Ethnicity

- ▶ Death certificates use open-ended reporting of race, allowing for multiple racial entries. However, the multiple race data have not been used in this report because they are of uncertain quality and completeness. The determination of race when more than one race is reported follows decision rules established by the National Center for Health Statistics (NCHS). In most cases, the first race given is assigned as the person's race.
- ▶ Hispanic origin was added as an ethnic category in the vital records system and collected as a separate item (in addition to race) in 1988. Prior to 1988, Hispanic data were provided by a racial category of "Mexican/Chicano" or "Mexican American."
- ▶ Following national guidelines, people who report Hispanic ethnicity and other or Hispanic as a race are counted as white. In 2000, 589 or 1.4% of all white deaths had race classified using this guideline.
- ▶ In a few instances, Hispanic ethnicity is marked unknown, and Hispanic is given as the person's race. Beginning in 1992, if a person's ethnicity is marked as unknown and his/her race is given as Hispanic, then that person's ethnicity is counted as Hispanic. About 60 deaths each year are reclassified in this way. However, the increase results in a 14% increase in the number of Hispanics at death.
- ▶ Reporting of race/Hispanic origin on death certificates is sometimes based on observing the decedent rather than questioning the next of kin. This procedure causes an underestimate of deaths for certain groups, particularly Native Americans, some of the Asian subgroups, and Hispanics. Thus, death rates based on death certificate data are lower than true death rates for these groups. See caveat below for more information.

Caveats

- ▶ Unless otherwise noted, the mortality rates in The Washington State Comprehensive Cancer Control Plan use the underlying cause of death. For example, if a person dies of a brain tumor that has spread to the brain from a tumor in the breast, the underlying cause is reported as breast cancer. Likewise, if a person dies of pneumonia as a complication of a stroke, the underlying cause of death is reported as a stroke.
- ▶ Death rates can underestimate the magnitude of certain public health problems for deaths that might be under-reported due to social stigma (such as AIDS and suicide) or that diminish the quality of life, but are not fatal (such as chronic alcoholism).

- ▶ The number of deaths in certain racial subgroups (such as Asians and Native Americans) and for people of Hispanic origin might be underestimated because of the misclassification of deaths for some people in those groups to white, non-Hispanic. See Quality of Death Rates by Race and Hispanic Origin: A Summary of Current Research, 1999 (http://www.cdc.gov/nchs/products/pubs/pubd/series/sr02/130-121/sr2_128.htm).
- ▶ Differences in causes of death between counties could reflect cause of death reporting practices by local physicians, coroners, or medical examiners.
- ▶ Revisions in ICD codes create a discontinuity in trends that must be accounted for when comparing mortality rates between time periods using different revisions. In this document, mortality rates from 1980 – 1998 are coded following the ICD-9. Mortality rates for 1999 and 2000 are coded following the ICD-10. Ratios of the number of deaths recoded using ICD-10 to the number originally coded using ICD-9 (obtained from a study of a large sample of 1996 US deaths) can assist when trying to determine whether a trend noted in the 1980 – 1998 period has continued in 1999 and 2000. The ratios are called comparability ratios. For more information, see Washington State Department of Health Center for Health Statistics ICD-10 Information Page (http://www.doh.wa.gov/ehsph/chs/chs-data/death/dea_icd.htm) or Comparability of Cause of Death Between ICD-9 and ICD-10: Preliminary Estimates (http://www.cdc.gov/nchs/data/nvsr/nvsr49/nvsr49_02.pdf).
- ▶ Because of revisions in the ICD codes, we multiplied 1998 death rates by the comparability ratios (see above) to develop three-year averages for 1998 – 2000.

Best Uses

- ▶ Represent entire population of the state.
- ▶ Examine trends in mortality over time.
- ▶ Compare local, state, national, and international trends with comparable data.
- ▶ Compare population subgroups (e.g., race, age, gender, occupation).
- ▶ Investigate spatial patterns and correlates (e.g., social, environmental factors).
- ▶ Support public health surveillance in a cost-efficient manner.

National Data

- ▶ National death data are available from several sources within the federal government.

For Further Information

Washington State Department of Health, Center for Health Statistics, (360) 236-4324

Washington State Department of Health, Center for Health Statistics, web page: <http://www.doh.wa.gov/EHSPHL/CHS/CHS-Data/death/deatmain.htm>.

Appendix F: Behavioral Risk Factor Surveillance System (BRFSS)

Description of the System

- ▶ **Purpose:** To provide indicators of health risk behavior, preventive practices, attitudes, health care use and access, and prevalence of selected diseases in Washington.
- ▶ **Coverage:** English-speaking adults age 18 years and older in households with telephones; sample size was 3,584 in 2000.
- ▶ **Years:** 1987-present; annual data generally available six months after the close of the calendar year.
- ▶ **Data Elements** (examples): Health-risk behaviors (smoking, physical inactivity, nutrition); use of preventive services (cancer screening); use of health care; attitudes about health-related behavior; socio-demographics (age, income, education); health conditions (asthma, diabetes).
- ▶ **Reporting System:** Data are gathered from a randomly selected sample of adults living in households with telephones. Interviews are conducted in English by a survey firm under contract to DOH following survey administration protocols established by CDC. The questionnaire includes core questions used by all states and questions on topics of specific interest to Washington. The BRFSS is supported in part by a cooperative agreement with the Centers for Disease Control and Prevention, U58/CCU002118-1 through 16 (1987-2002).
- ▶ **Data Quality Procedures:** Survey administration procedures (e.g., callbacks to difficult-to-reach households) are used to improve the representativeness of the sample, efforts are made to achieve response rates recommended by CDC, and computer-assisted interviewing is used to minimize errors by interviewers. CDC does cognitive testing on all questions and has assessed many, but not all, questions for reliability and validity. Interviewers are trained professionally and calls are monitored regularly.

Issues Related to Race and Ethnicity

- ▶ BRFSS respondents are asked to identify their race and ethnicity by answering two questions: “Are you Hispanic or Latino/a?” and “Which one or more of the following would you say is your race? White, Black or African American, Asian, Native Hawaiian or Other Pacific Islander, American Indian, Alaska Native or something else?” Before 2000, one race was recorded. Beginning in 2000, up to five races can be recorded.
- ▶ Some racial and ethnic groups are underrepresented because fewer households have telephones or fewer households speak English. (See “Caveats.”)

Caveats

- ▶ The response rate for the BRFSS has changed from 61% in 1995 to 44% in 2000. Similar changes have been seen in all other states and in other telephone surveys. The drop is due to a combination of people being less willing to cooperate and new technology allowing people to screen phone calls. CDC has assessed the impact of low response rates and has concluded that as long as the response rate is between 30% and 80%, the results are not biased due to response rate.
- ▶ BRFSS might under-represent poorer, more mobile, and non-white populations because they are less likely to live in homes with telephones. For example, based on 1990 census data, the mean income for household with telephones was \$37,613 and the mean income for households without telephones was \$15,650. Moreover, 3.1% of whites did not have a phone compared to 8.3% of non-whites. (See Washington State Population Survey—Characteristics of Households With and Without Telephones: Analysis with 1999 Census Data, <http://www.ofm.wa.gov/ResearchBriefs/brief001.pdf>)
- ▶ BRFSS does not represent people who do not speak English.
- ▶ BRFSS does not represent people who live in institutions.
- ▶ Characteristics of people who refuse to participate are unknown.
- ▶ Health risk behavior might be underestimated because people might be reluctant to report behaviors that others might not find acceptable.
- ▶ Use of preventive services might be underestimated because of recall error.
- ▶ Separate analyses of subpopulations that are too small (e.g., some racial/ethnic groups, some counties) are not possible with the statewide sample.

Best Uses

- ▶ Provide estimates of the prevalence of health risk behaviors, use of preventive services, use of and access to health care, prevalence of selected health conditions and attitudes.
- ▶ Examine trends in risk behavior, use of preventive services, and other regularly measured indicators.
- ▶ Compare local (large counties or groups), state, and national BRFSS data.
- ▶ Investigate correlates of health risk behavior, health care utilization, and other indicators and compare subgroups.
- ▶ Identify high risk groups.

For Further Information

Washington State Department of Health, Center for Health Statistics (360) 236-4322.

Washington State BRFSS web page: http://www.doh.wa.gov/EHSPHL/CHS/CHS-Data/brfss/brfss_homepage.htm.

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Appendix G: Pregnancy Risk Assessment Monitoring System (PRAMS)

Description of the System

- ▶ **Purpose:** To supplement birth certificate data and to generate state-specific data for planning and evaluating perinatal health programs.
- ▶ **Coverage:** New mothers (two to six months postpartum) who are residents of Washington and can speak either English or Spanish. Approximately 2,000 new mothers are sampled each year (overall 2.5% of all births to Washington residents).
- ▶ **Years:** 1993 – present; annual data are generally available 14 months after the close of the calendar year.
- ▶ **Key Data Elements:** Age, race, ethnicity, education level, socioeconomic information, risky behaviors, health care during pregnancy, infant health care.
- ▶ **Reporting System:** Participants are selected from birth certificate data using a stratified random sample that oversamples new non-white mothers and new mothers in King and Snohomish counties. Survey information is collected by mail through a self-administered questionnaire with telephone follow-up of non-responders.
- ▶ **Data Quality Procedures:** Comparisons of data from birth certificates, the First Steps Database (Medicaid), and PRAMS have been undertaken.

Issues Related to Race and Ethnicity

- ▶ PRAMS uses race and ethnicity as reported on the birth certificate.
- ▶ PRAMS uses race and ethnicity from the birth certificate to assure that a sufficiently large number of Asian, African American, American Indian, and Hispanic mothers participate in the survey.

Caveats

- ▶ Overall response rate of 70%; lower response rates for African American and Native American mothers.

- ▶ Collection of information two to six months after delivery might impact responses to more subjective questions and limits follow-up time for outcomes.
- ▶ Self-reported information is not verified through other means.
- ▶ Sample design prevents analysis of data for most individual counties

Best Uses

- ▶ Monitor statewide trends in behavioral risks, health care, and pregnancy outcomes over time.
- ▶ Correlate birth outcomes and health-related information, socioeconomic information, and behavioral risk and protective factors.
- ▶ Examine impact of intervention and prevention programs.

For Further Information

Washington State Department of Health Office of Maternal and Child Health Assessment, PRAMS Coordinator, (360) 236-3576.

Washington State Department of Health, PRAMS web page: <http://www.doh.wa.gov/cfh/PRAMS/default.htm>.

Listing of Washington PRAMS publications: http://www.cdc.gov/nccdphp/drh/prams_wa.htm.

The national PRAMS website: http://www.cdc.gov/nccdphp/drh/srv_prams.htm.

Appendix H: Healthy Youth Survey (HYS)

Description of the System

- ▶ **Purpose:** The Healthy Youth Survey provides important information about adolescents in Washington. County prevention coordinators, community mobilization coalitions, community public health and safety networks, and others use this information to guide policy and programs that serve youth.
- ▶ **Coverage:** Students in 6, 8, 10 and 12th grade in public schools statewide.
- ▶ **Years:** The Healthy Youth Survey was first conducted in 2002 and will be conducted in even numbered years. Similar student surveys have been conducted in Washington in 1988, 1989, 1990, 1992, 1995, 1998, 1999, and 2000.
- ▶ **Key Data Elements:** Questions about safety and violence, physical activity and diet, alcohol, tobacco and other drug use, and related risk and protective factors.
- ▶ **Reporting System:** The survey was administered in October 2002 to students in grades 6, 8, 10 and 12 in public schools statewide. The Washington State Institutional Review Board approved the survey methods.
- ▶ Participation was voluntary for schools, parents and students. Within participating schools, prior to administration, parents and students were notified about the survey and given an opportunity to refuse participation. Also, immediately before administration, any student could decline to participate, and those students who made this choice were provided with an alternative activity chosen by the school. Students that chose to participate could skip any question that they preferred not to answer. All responses were anonymous.
- ▶ The survey was conducted during class time and took one class period. In order to include a large number of items, there were two forms (A and B) of the survey for students in grades 8, 10 and 12. These two forms were interleaved so that half of the students in each classroom received each form. Forms A and B contained about 30 identical questions called "core" questions. Form C was for grade 6.

- ▶ Forms A and B each had a set of relatively sensitive items (e.g., asking about school harassment, dating violence, and relationships with parents) which were on a separate, perforated "tear-off" sheet at the end of the questionnaires. Schools were provided the opportunity to choose whether to administer these questions or tear off these sheets prior to administration.
- ▶ The survey was available in four languages other than English. All schools were provided with Spanish language survey materials and administration directions. Survey materials were available in Russian, Korean, and Vietnamese upon request. Translated survey materials included a parent letter, a one-page survey information sheet, and camera-ready copies of forms A, B, and C. The survey coordinators duplicated the translated survey materials locally and provided them to the students. Students read the translated survey but responded on the regular answer sheet to preserve student anonymity.
- ▶ **Data Quality Procedures:** Survey administration procedures were used to encourage the students to respond honestly. The test administrator (usually the teacher) described the survey, explained that it was voluntary and offered an alternative activity. If students chose to participate, they were asked to remove a perforated, scannable form from the survey booklet and to mark their responses on this form. They were also given written instructions and a resource list with telephone numbers they could call if they had questions or concerns about issues arising from the survey. When they were through, the scannable sheets and used questionnaires were placed in an envelope and returned to the contractor for scanning.
- ▶ The vast majority of the questions on the Healthy Youth Survey have been asked before in similar settings. Most of the questions come from one of the following sources: Monitoring the Future Survey, supported by the National Institute of Drug Abuse and the Centers for Disease Control and Prevention's Youth Risk Behavior Survey, the Communities that Care survey, developed by the University of Washington, and the Youth Tobacco Survey.
- ▶ A pilot version of the Healthy Youth Survey was field-tested during the fall of 2001. Information from this effort was used to refine and improve the survey.

Issues Related to Race and Ethnicity

Students are asked to report their race by answering the following question: "How do you describe yourself? (Select one or more responses.) Asian or

Asian American, American Indian or Alaskan Native, Black or African-American, Hispanic or Latino/Latina, Native Hawaiian or other Pacific Islander, White or Caucasian, Other.”

Caveats

- ▶ The overall response rates for the state sample were relatively low: 61% in 6th grade, 65% in 8th grade, 44% in 10th grade, and 40% in 12th grade. The 2002 Healthy Youth Survey data were analyzed for bias, and from those results we conclude that the results of the 2002 Healthy Youth Survey can be generalized to all public school students in 6th, 8th, 10th and 12th grades who do not attend alternative schools.
- ▶ Alternative schools were underrepresented in the state sample. Because of the small size of these schools, this under-representation did not appear to affect the statewide estimates. However, statewide results probably are not representative of students in alternative schools.
- ▶ Caution should be exercised in using questions that were asked at the end of the non-optional portion of the questionnaires. There does not seem to be bias on the “tear-off” questions even though they were at the end of the questionnaire. While we do not know the reasons for this apparent discrepancy, completing the tear-off section was decided at the school level, while failure to complete the survey was at the individual level.

Best Uses

- ▶ The information from the Healthy Youth Survey can be used to identify trends in the patterns of behavior over time.
- ▶ The state-level data can be used to compare Washington to other states that do similar surveys and to the nation.

For Further Information

Washington State Department of Health, Office of Maternal and Child Health Assessment, HYS Coordinator, (360) 236-3567.

Healthy Youth Survey website <http://www3.doh.wa.gov/HYS/default.htm>.

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Appendix I: Washington Best Practices

for Comprehensive Tobacco Control Programs – Recommended Program Element Budgets, August 1999

NOTE: A justification for each program element and the rationale for the budget estimates are provided in Section A. An upper and a lower estimate are presented for each budget category. The funding required for implementing programs will vary depending on state characteristics, such as sociodemographic factors, tobacco use prevalence, and other factors. Therefore, the funding ranges presented here are illustrative.

I. Community Programs to Reduce Tobacco Use

Upper Estimate	\$12,421,000	Formula: \$1,200,000 (statewide training and infrastructure) + \$2.00 per capita
Lower Estimate	\$4,778,000	Formula: \$850,000 (statewide training and infrastructure) + \$0.70 per capita

II. Chronic Disease Programs to Reduce the Burden of Tobacco-Related Diseases

Upper Estimate	\$4,250,000	Formula: See section A-II
Lower Estimate	\$2,875,000	Formula: See section A-II

III. School Programs

Upper Estimate	\$7,161,000	Formula: \$750,000 (statewide training and infrastructure) + \$6 per student (K-12)
Lower Estimate	\$4,774,000	Formula: \$500,000 (statewide training and infrastructure) + \$4 per student (K-12)

IV. Enforcement

Upper Estimate	\$4,818,000	Formula: \$300,000 (inter-agency coordination) + \$0.80 per capita
Lower Estimate	\$2,565,000	Formula: \$150,000 (inter-agency coordination) + \$0.43 per capita

V. Statewide Programs

Upper Estimate	\$5,611,000	Formula: \$1.00 per capita
Lower Estimate	\$2,245,000	Formula: \$.40 per capita

VI. Counter-Marketing

Upper Estimate	\$16,832,000	Formula: \$3.00 per capita
Lower Estimate	\$5,611,000	Formula: \$1.00 per capita

VII. Cessation Programs

Upper Estimate **\$26,628,000** Formula: \$1 per adult (screening) + \$2 per smoker (brief counseling)
+ \$137.50 per served smoker (50% of program cost for 10% of smokers)
+ \$275 per served smoker (100% of program cost for 10% of publicly
financed smokers)

Lower Estimate **\$6,143,000** Formula: \$1 per adult (screening) + \$2 per smoker (brief counseling)

Subtotal (I to VII above)

Upper Estimate **\$77,721,000**

Lower Estimate **\$28,991,000**

VIII. Surveillance and Evaluation

Upper Estimate **\$7,773,000** Formula: 10% High Estimates Subtotal

Lower Estimate **\$2,900,000** Formula: 10% Low Estimates Subtotal

IX. Administration and Management

Upper Estimate **\$3,887,000** Formula: 5% High Estimates Subtotal

Lower Estimate **\$1,450,000** Formula: 5% Low Estimates Subtotal

Total Program Annual Cost		Per Capita Funding Ranges	
Upper Estimate	\$89,381,000	Upper Estimate	\$15.93
Lower Estimate	\$33,341,000	Lower Estimate	\$5.94

Source: Centers for Disease Control and Prevention. *Best Practices for Comprehensive Tobacco Control Programs—August 1999*. Atlanta GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, August 1999.

Appendix J: Acronyms

AANCART	Asian American Network for Cancer Awareness, Research and Training
ACOS	American College of Surgeons
ACS	American Cancer Society
ARC NW	Alliance for Reducing Cancer Northwest
ATLL	Adult T-cell leukemia/lymphoma
AUA	American Urological Association
BMI	Body mass index
BRFSS	Behavioral Risk Factor Surveillance System
BSE	Breast self-examination
CAM	Complementary and alternative medicine
CBE	Clinical breast examination
CCA	Chromated copper arsenic
CCC	Comprehensive Cancer Control
CDC	Centers for Disease Control and Prevention
CGPH	Center for Genomics and Public Health
CN	Categorically Needy
COC	Commission on Cancer
CRCHD	Center to Reduce Cancer Health Disparities
DASA	Division of Alcohol and Substance Abuse
DHHS	United States Department of Health and Human Services
DOH	Washington State Department of Health
DRE	Digital rectal examination
DSHS	Department of Social and Health Services
EPA	Environmental Protection Agency
FOBT	Fecal occult blood test
HBV	Hepatitis B virus
HIPPA	Health Insurance Portability and Accountability Act
HIV	Human immunodeficiency virus
HPV	Human papillomavirus
HTLV-1	Human T-cell leukemia/lymphoma virus
HYS	Healthy Youth Survey
IARC	International Agency for Research on Cancer
JCAHO	Joint Commission on Accreditation of Healthcare Organizations
LGBT	Lesbian, gay, bisexual, and transgender

NCDB	National Cancer Data Base
NCI	National Cancer Institute
NCPB	National Cancer Policy Board
ND	Naturopathic physician
NHL	Non-Hodgkin's lymphoma
NIH	National Institutes of Health
PRAMS	Pregnancy Risk Assessment Monitoring System
PSA	Prostate-specific antigen
RCW	Revised Code of Washington
SPN	Special Populations Network
STD	Sexual Transmitted Disease
US	United States
USPSTF	United States Preventive Services Task Force
UV	Ultraviolet
WBCHP	Washington State Breast and Cervical Health Program
WIC	Women, Infants, and Children
WSCR	Washington State Cancer Registry

Endnote References

1. Harper AP. Mammography utilization in the poor and medically underserved. *Cancer*. 1993;72(4 Suppl):1478-82.
2. Glasgow RE, Whitlock EP, Valanis BG, Vogt TM. Barriers to mammography and Pap smear screening among women who recently had neither, one or both types of screening. *Ann Behav Med*. 2000;22:223-28.
3. Van Eenwyk J, Campo JS, Ossiander EM. Socioeconomic and demographic disparities in treatment for carcinomas of the colon and rectum. *Cancer*. 2002;95(1):39-46.
4. Campo, J. Unpublished analysis of Medicaid data. Washington State Cancer Registry. Washington State Department of Health, 2002.
5. Gay and Lesbian Medical Association and LGBT health experts. Healthy People 2010 Companion Document for Lesbian, Gay, Bisexual, and Transgender (LGBT) Health. San Francisco, CA: Gay and Lesbian Medical Association, 2001.
6. American Cancer Society. Cancer Facts & Figures 2003. Atlanta, GA. American Cancer Society, Inc.; 2003. Available from: <http://www.cancer.org/downloads/STT/CAFF2003PWSecured.pdf>
7. Colditz G, DeJong D, Hunter D, Trichopoulos D, Willett W. Harvard Report on Cancer Prevention Volume 1: Causes of Human Cancer. *Cancer Causes and Control*. 1996;7:S55-S58.
8. Centers for Disease Control and Prevention. Annual smoking-attributable mortality, years of potential life lost, and economic costs—United States, 1995-1999. *MMWR Morb Mortal Wkly Rep*. 2002;51(14):300-3.
9. Washington State Department of Health. Tobacco and Health in Washington State: County Profiles of Tobacco Use. Washington State Department of Health, Office of Community Wellness & Prevention. Olympia, WA. DOH Pub. 345-150. December 2000.
10. National Cancer Institute. Health Effects of Exposure to Environmental Tobacco Smoke: The Report of the California Environmental Protection Agency. Smoking and Tobacco Control Monograph no.10. Bethesda, MD. US Department of Health and Human Services, National Institutes of Health. NIH Pub. No.99-4645. Available from: <http://cancercontrol.cancer.gov/tcrb/monographs/10/>
11. Smyser M, Krieger J, Solet D. The King County Ethnicity and Health Survey. Public Health – Seattle and King County. Seattle, Washington. 1998.
12. Centers for Disease Control and Prevention. Best Practices for Comprehensive Tobacco Control Programs. Atlanta, GA: US Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health. August 1999.
13. The Guide to Community Preventive Services. Increasing the unit price for tobacco products is effective in reducing initiation of tobacco use and in increasing cessation. January 2003. Available from: <http://www.thecommunityguide.org/tobacco/tobac-int-unit-price.pdf>
14. Federation of Tax Administrators. State Excise Tax Rates on Cigarettes. July 2003. Available from: <http://www.taxadmin.org/fta/rate/cigarette.html>
15. Campaign for Tobacco-Free Kids. New State-Specific Tobacco's Toll Data from CDC. April 2002. Available from: <http://www.tobaccofreekids.org/research/factsheets/pdf/0195.pdf>
16. The Guide to Community Preventive Services. Effectiveness of Smoking Bans and Restrictions to Reduce Exposure to Environmental Tobacco Smoke (ETS). Available from: <http://www.thecommunityguide.org/tobacco/tobac-int-smoke-bans.pdf>
17. The Health of Washington State – A statewide assessment of health status, health risks, and health care services. Tobacco Use and Exposure. Washington State Department of Health, July 2002.

18. US Department of Health and Human Services. National Toxicology Program. Report on Carcinogens, Tenth Edition. Washington D.C. US Department of Health and Human Services. December 2002.
19. Bagnardi V, Blangiardo M, La Vecchia C, Corrao G. Alcohol Consumption and the Risk of Cancer: A Meta-Analysis. National Institute on Alcohol Abuse and Alcoholism. Available from: <http://www.niaaa.nih.gov/publications/arh25-4/263-270-text.htm>
20. Thomas D, Uhl C, Hartge P. Bladder Cancer and Alcoholic Beverage Consumption. *Am J Epidemiol.* 1983;118(5):720-7.
21. National Institute on Alcohol Abuse and Alcoholism. Alcohol Alert. Maryland. No. 21 PH 345, July 1993. Available from: <http://www.niaaa.nih.gov/publication/aa21.htm>
22. World Cancer Research Fund (WCRF) and the American Institute for Cancer Research (AIRC). Food, Nutrition and the Prevention of Cancer: a Global Perspective. Available from: <http://www.wcrf.org/pdfs/englishsummary.pdf> and <http://www.aicr.org/reports/summary/res.html>
23. Curry SJ, Byers T, Hewitt M, editors. Fulfilling the Potential of Cancer Prevention and Early Detection. National Cancer Policy Board. Institute of Medicine National Research Council of the National Academies. Washington, D.C.: The National Academies Press; 2003.
24. Behavioral Risk Factor Surveillance System [database on the Internet]. Atlanta (GA): The Centers for Disease Control and Prevention. 2003. Available from: <http://apps.nccd.cdc.gov/brfss/Trends/trendchart.asp?qkey=10110&state=WA>
25. Washington Healthy Youth Survey [database on the Internet]. Olympia (WA): Washington State Department of Health. 2003. Available from: <http://www3.doh.wa.gov/HYS/ASP/HYSQueryResult.ASP>
26. Washington State Department of Health. Non-Infectious Conditions Epidemiology. 2003.
27. US Department of Health and Human Services. 10th Special Report to the US Congress on Alcohol and Health: Highlights from Current Research. US Department of Health and Human Services. 2000. NIH Pub. No. 00-1583.
28. Miller WR, Brown JM, Simpson TL, et al. What works? A methodological analysis of alcoholism treatment outcome literature. In RK Hester & WR Miller, editors. Handbook of alcoholism treatment approaches: Effective alternatives. 2nd Edition. Boston:Allyn & Bacon; 1995. p 12-40.
29. Wilk AL, Jensen NM, Havighurst TC. Meta-analysis of randomized control trials addressing brief interventions in heavy alcohol drinkers. *J Gen Intern Med.* 1997;12:274-83.
30. Baer JS, Kivlahan DR, Blume AW, McKnigfht P, Marlatt GA. Brief intervention for heavy-drinking college students: 4-year follow-up and natural history. *Am J Pub Health.* 2001; 91: 1310-16.
31. The Health of Washington State – A statewide assessment of health status, health risks, and health care services. Nutrition. Washington State Department of Health, July 2002.
32. National Cancer Institute. 5 A Day for Better Health Program Evaluation Report: Evidence. Available from: http://dccps.nci.nih.gov/5ad_2_evi.html
33. Slavin JL. Mechanisms for the impact of whole grain foods on cancer risk. *J Am Coll Nutr.* 2000;19(3 Suppl):300S-307S.
34. American Cancer Society. American Cancer Society Guidelines on Diet and Cancer Prevention. 1997. Available from: http://www.cancer.org/docroot/MED/content/MED_2_1X_American_Cancer_Society_guidelines_on_diet_and_cancer_prevention.asp
35. US Preventive Services Task Force. Recommendations and Rationale: Behavioral Counseling in Primary Care to Promote a Healthy Diet. 2002. Available from: <http://www.ahcpr.gov/clinic/3rduspstf/diet/dietrr.htm>
36. Bensley LS, VanEenwyk J, Bruemmer BA. Measuring fruit and vegetable consumption: Providing serving size information doubles estimated percent eating 5 a day. *J Am Diet Assoc* 2003;103:1530-32.
37. Quan T, Salomon J, Nitzke S, Reicks M. Behaviors of low-income mothers related to fruit and vegetable consumption. *J Am Diet Assoc* 2000;100(5):567-576.
38. Dittus KL, Hillers VN, Beerman KA. Benefits and barriers to fruit and vegetable intake: relationship between attitudes and consumption. *J Nutr Ed* 1995;27:120-6.

39. Casperson CJ. Physical activity epidemiology: concepts, methods, and applications to exercise science. *Exerc Sport Sci Rev.* 1989(17):423-473.
40. US Department of Health and Human Services. Physical Activity and Health: A Report of the Surgeon General. Atlanta, GA: US Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, 1996.
41. Paffenbarger RS, Hyde RT, Wing AL, Lee IM, Jung DL, Kampert JB. The association of changes in physical activity level and other lifestyle characteristics with mortality among men. *N Engl J Med.* 1993;328(8):538–545.
42. Paffenbarger RS, Kampert JB, Lee IM, Hyde RT, Leung RW, Wing AL. Changes in physical activity and other lifeway patterns influencing longevity. *Medicine and Science in Sports and Exercise* 1994;26(7):857–865.
43. Blair SN, Kohl HW III, Barlow CE, Paffenbarger RS, Gibbons LW, Macera CA. Changes in physical fitness and all-cause mortality: a prospective study of healthy and unhealthy men. *JAMA.* 1995;273(14):1093–1098.
44. International Agency for Research on Cancer. 2002. IARC Handbooks of Cancer Prevention: Weight Control and Physical Activity. Lyon, France: IARC Press.
45. Harvard Center for Cancer Prevention. Harvard Reports on Cancer Prevention Volume 1: Human Causes of Cancer. Available from: http://www.hsph.harvard.edu/cancer/publications/reports/vol1_summary.html
46. National Heart, Lung, and Blood Institute. Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults. 1998. Available from: http://www.nhlbi.nih.gov/guidelines/obesity/ob_gdlns.pdf
47. The Expert Committee on Clinical Guidelines for Overweight in Adolescent Preventive Services, 1994. Guidelines for overweight in adolescent preventive services: Recommendations from an expert committee. *Am J Clin Nutr.* 1994;59(2):307.
48. The Health of Washington State – A statewide assessment of health status, health risks, and health care services. Obesity and Overweight. Washington State Department of Health, July 2002.
49. National Cancer Institute: Cancer Facts. Obesity and Cancer. 2001. Available from: http://cis.nci.nih.gov/fact/3_70.htm
50. Calle E, Rodriguez C, Walker-Thurmond K, Thun M. Overweight, Obesity, and Mortality from Cancer in a Prospectively Studied Cohort of US Adults. *N Engl J Med.* 2003;248(17):1625-38.
51. Elwood JM, Jopson J. Melanoma and sun exposure: an overview of published studies. *Int J Cancer* 1997;73(2):198-203.
52. Armstrong BK, Krickler A. How much melanoma is caused by sun exposure? *Melanoma Research* 1993;3(6):395-401.
53. Centers for Disease Control and Prevention. Guidelines for school programs to prevent skin cancer. *MMWR.* 2002;51(RR-4):1-16.
54. The Health of Washington State – A statewide assessment of health status, health risks, and health care services. Melanoma of the Skin. Washington State Department of Health, July 2002.
55. Emmons KM, Colditz GA. Preventing excess sun exposure: It is time for a national policy. *J Natl Cancer Inst.* 1999;91(15):1269-70.
56. National Cancer Institute. Cancer Facts: Human Papillomaviruses and Cancer. 2002. Available from: http://cis.nci.nih.gov/fact/3_20.htm
57. Bosch F, Lorincz A, Munoz N, Meijer C, Shah K. The causal relationship between human papillomavirus and cervical cancer. *J Clin Pathol* 2002;55:244-65
58. Saslow D, Runowicz C, Solomon D, Moscicki A, Smith R, Eyre H, Cohen C. American Cancer Society Guideline for the Early Detection of Cervical Neoplasia and Cancer. *CA Cancer J Clin* 2002;52:342-362.
59. The Health of Washington State – A statewide assessment of health status, health risks, and health care services. Hepatitis B. Washington State Department of Health, July 2002.

60. International Agency for Research on Cancer. Evaluation of Carcinogenic Risks to Humans: Human Immunodeficiency Viruses. Available from: <http://www.cic.iarc.fr/htdocs/monographs/vol67/67-hiv.html>
61. The Health of Washington State – A statewide assessment of health status, health risks, and health care services. HIV/AIDS. Washington State Department of Health, July 2002.
62. International Agency for Research on Cancer. Evaluation of Carcinogenic Risks to Humans: Infection with HELICOBACTER PYLORI. Available from: <http://www.cic.iarc.fr/htdocs/monographs/vo161/m61-3.htm>
63. International Agency for Research on Cancer. Evaluation of Carcinogenic Risks to Humans: Human T-Cell Lymphotropic Viruses. Available from: <http://www.cic.iarc.fr/htdocs/monographs/vol67/67-htlv.html>
64. The Health of Washington State – A statewide assessment of health status, health risks, and health care services. Sexual Behavior. Washington State Department of Health, July 2002.
65. American Cancer Society: What's New in Cervical Cancer Research and Treatment. Available from: http://www.cancer.org/docroot/CRI/content/CRI_2_4_6X_Whats_new_in_cervical_cancer_research_and_treatment_8.asp?sitearea
66. Washington State Board of Health. Final Report State Board of Health Priority: Environmental Justice. Washington State Department of Health. 2001 Jun. Available from: <http://www.doh.wa.gov/sboh/Pubs/2001EJReport.pdf>.
67. Hazardous Waste and Toxics Reduction Program. A Study of Environmental Equity in Washington State. Washington State Department of Ecology. 1995 Oct. Available from: <http://www.ecy.wa.gov/pubs/95413.pdf>.
68. Environmental Protection Agency. Arsenic in Drinking Water. Ground Water and Drinking Water. 2001 Jan. Available from: <http://www.epa.gov/safewater/arsenic.html>
69. International Agency for Research on Cancer. Some Metals and Metallic Compounds. IARC monograph on the evaluation of carcinogenic risks to humans. Vol. 23. Lyons: IARC, 1980
70. United States Environmental Protection Agency. Integrated Risk Information System, IRIS Quickview, Arsenic, Inorganic. Available from: http://cfpub.epa.gov/iris/quickview.cfm?substance_nmbr=0278
71. Maxfield, M. Washington State Department of Health. Office of Drinking Water. 2003.
72. The Health of Washington State – A statewide assessment of health status, health risks, and health care services. Drinking Water Quality. Washington State Department of Health, July 2002.
73. Area-Wide Soil Contamination Task Force Report, June 30, 2003. Available from: http://www.ecy.wa.gov/programs/tcp/area_wide/Final-Report/index.htm
74. Safe Drinking Water Act. Understanding the Safe Drinking Water Act. United States Environmental Protection Agency. 1999 Dec. Available from: <http://www.gov.epa.gov/safewater/sdwa/understand.pdf>.
75. International Agency for Research on Cancer. Some Internally Deposited Radionuclides . IARC monograph on the evaluation of carcinogenic risks to humans. Lyon: IARC, 2001. Vol. 78.
76. Radon Risk Comparison Charts. Indoor-Air Radon. United States Environmental Protection Agency. Available from: <http://www.epa.gov/iaq/radon/riskcht.html>.
77. Washington State Department of Health, Environmental Health Programs, Environmental Radiation Program. Special Report: Radon in Washington, June 1994.
78. California Environmental Protection Agency. For the Proposed Identification of Diesel Exhaust as a Toxic Air Pollutant Part B: Health Risk Assessment for Diesel Exhaust. Office of Environmental Health Hazard Assessment. Air Toxicology and Epidemiology Section, May 1998.
79. United States Environmental Protection Agency. Final Emission Standards for 2004 and Later Model Year Highway Heavy-Duty Vehicles and Engines. Available from: <http://www.epa.gov/otaq/regs/hd-hwy/2000frm/f00026.pdf>
80. International Agency for Research on Cancer. Diesel and Gasoline Engine Exhaust and Some Nitroarenes. IARC monograph on the evaluation of carcinogenic risks to humans. Lyon: IARC, 1989. Vol. 45.
81. Korenstein S, Piazza B. An exposure assessment of PM10 from a major highway interchange: are children in nearby schools at risk?. J Environ Health 2003;65(2):9-17.

82. Brauer M, Hoek G van Vliet P, Meliefste K, Fischer P, et al. Estimating long-term average particulate air pollution concentrations: application of traffic indicators and geographic information systems. *Epidemiology*. 2003;14(2):228-39.
83. The Health of Washington State – A statewide assessment of health status, health risks, and health care services. *Outdoor Ambient Air Quality*. Washington State Department of Health, July 2002.
84. Washington State Legislature, Engrossed Substitute Senate Bill 6072, An Act Relating to funding pollution abatement and response. April 26, 2003.
85. Puget Sound Clean Air Agency. Diesel Solutions, Clean School Bus Program. Available from: <http://www.pscleanair.org/dieselsolutions/schoolbus/index.shtml>
86. Pharoah PD, Day NE, Duffy S, Easton DE, Ponder BA. Family history and the risk of breast cancer: a systematic review and meta-analysis. *Int J Cancer*. 1997;71(5):800-9.
87. Kerlikowske K, Brown JS, Grady DG. Should women with familial ovarian cancer undergo prophylactic oophorectomy? *Obstet Gynecol*. 1992;80(4):700-7.
88. Fuchs CS, Giovannucci EL, Colditz GA, Hunter DJ, Speizer FE, Willett WG. A prospective study of family history and the risk of colorectal cancer. *N Engl J Med*. 1994;331(25):1669-74.
89. Slattery ML, Kerber RA. Family history of cancer and colon cancer risk: the Utah Population Database. *J Natl Cancer Inst*. 1994;86(21):1618-26.
90. Negri E, Braga C, La Vecchia C, Franceschi S, Filiberti R, et al. Family history of cancer and risk of colorectal cancer in Italy. *Br J Cancer*. 1998;77(1):174-9.
91. St John DJ, McDermott FT, Hopper JL, Debney EA, Johnson WR, Hughes ES. Cancer risk in relatives of patients with common colorectal cancer. *Ann Intern Med*. 1993;118(10):785-90.
92. Duncan JL, Kyle J. Family incidence of carcinoma of the colon and rectum in north-east Scotland. *Gut*. 1982;23(2):169-71.
93. Rozen P, Fireman Z, Figer A, Legam C, Ron E, Lynch HT. Family history of colorectal cancer as a marker of potential malignancy within a screening program. *Cancer*. 1987;60(2):248-54.
94. American Cancer Society. Colorectal Cancer: Early Detection. 2003. Available from: http://www.cancer.org/docroot/CRI/content/CRI_2_6X_Colorectal_Cancer_Early_Detection_1_0.asp?sitearea
95. Washington State Department of Health. Genetics and Your Practice. Third Edition. 2000 Aug. Available from: <http://mchneighborhood.ichp.edu/wagenetics/index.html>.
96. Li C, Malone K, Daling J. Differences in breast cancer stage, treatment, and survival by race and ethnicity. *Arch Intern Med*. 2003;163(1):49-56.
97. International Agency for Research on Cancer. 2002 Mar. Press Releases: Mammography Screening Can Reduce Deaths from Breast Cancer. Available from: <http://www.iarc.fr/>
98. US Preventive Services Task Force. Screening for Breast Cancer. Recommendations and Rationale. 2002 Feb. Available from: <http://www.ahcpr.gov/clinic/3rduspstf/breastcancer/brcanrr.htm>.
99. Thomas DB, Gao DL, Ray RM, Wang WW. Randomized trial of breast self-examination in Shanghai: final results. *J Natl Cancer Inst*. 2002;94(19):1445-57.
100. American Cancer Society. 2003. Updated Breast Cancer Screening Guidelines Released. URL: American Cancer Society. Updated Breast Cancer Screening Guidelines Released. 2003 May 15. Available from: http://www.cancer.org/docroot/NWS/content/NWS_1_1x_Updated_Breast_Cancer_Screening_Guidelines_Released.asp.
101. Washington State Collaborative. Diabetes and Adult Preventive Services Handbook. Washington State Department of Health. 2002.
102. Hsu JL, Glaser SL, West DW. Racial/ethnic differences in breast cancer survival among San Francisco Bay Area women. *J Natl Cancer Inst*. 1997;89(17):1311-2.
103. Boyer-Chammard A, Taylor TH, Anton-Culver H. Survival differences in breast cancer among racial/ethnic groups: a population-based study. *Cancer Detect Prev*. 1999;23(6):463-73.
104. Chevarley F, White E. Recent trends in breast cancer mortality among white and black US women. *Am J Public Health*. 1997;87(5):775-81.
105. Joslyn SA, West MM. Racial differences in breast carcinoma survival. *Cancer*. 2000;88:114-123.

106. Elmore JG, Mocerri VM, Carter D, Larson EB. Breast carcinoma tumor characteristics in black and white women. *Cancer*. 1998;83:2509-2515.
107. Edwards MJ, Gamel JW, Vaughan WP, Wrightson WR. Infiltrating ductal carcinoma of the breast: the survival impact of race. *J Clin Oncol*. 1998;16:2693-2699.
108. Elledge RM, Clark GM, Chamness GC, Osborne CK. Tumor biologic factor and breast cancer prognosis among white, Hispanic, and black women in the United States. *J Natl Cancer Inst*. 1994;86:705-712.
109. Frost F, Tollestrup K, Hunt WC, Gilliland F, Key CR, Urbina CE. Breast cancer survival among New Mexico Hispanic, American Indian, and non-Hispanic white women (1973-1992). *Cancer Epidemiol Biomarkers Prev*. 1996;4:861-866.
110. Zaloznik AJ. Breast cancer stage at diagnosis: Caucasians vs. Hispanics. *Breast Cancer Res Treat*. 1997;42:121-124.
111. Bentley JR, Delfino RJ, Taylor TH, Howe S, Anton-Culver H. Differences in breast cancer stage at diagnosis between non-Hispanic white and Hispanic populations, San Diego County 1988-1993. *Breast Cancer Res Treat*. 1998;50:1-9.
112. Sugarman JR, Dennis LK, White E. Cancer survival among American Indians in western Washington State (United States). *Cancer Causes Control*. 1994;5(5):440-8.
113. The Health of Washington State – A statewide assessment of health status, health risks, and health care services. Invasive Cervical Cancer. Washington State Department of Health, July 2002.
114. Walboomers JM, Jacobs MV, Bosch FX, Kummer JA, et al. Human papillomavirus is a necessary cause of invasive cervical cancer worldwide. *J Pathol*. 1999;189(1):12-9.
115. Ries LAG, Eisner MP, Kosary CL, et al, editors. SEER Cancer Statistics Review, 1973-1999. National Cancer Institute. Maryland. 2002. Available from: http://seer.cancer.gov/csr/1973_1999.
116. Centers for Disease Control and Prevention. Invasive Cervical Cancer Among Hispanic and Non-Hispanic Women – United States, 1992-1999. *Morb Mortal Wkly Rep*. 2002. 29;51(47):1067-70.
117. Austin RM, McLendon WW. The Papanicolaou smear. *JAMA*. 1997;277:754-755.
118. US Preventive Services Task Force. Screening for Cervical Cancer. Recommendations and Rationale. Available from: <http://www.ahcpr.gov/clinic/3rduspstf/cervcan/cervcanrr.htm>
119. American Cancer Society. Cancer Facts & Figures for Hispanics/Latinos 2003-2005. Available from: http://www.cancer.org/docroot/STT/stt_0.asp
120. US Preventive Services Task Force. Screening for Colorectal Cancer. Recommendations and Rationale. Available from: <http://www.ahcpr.gov/clinic/3rduspstf/colorectal/colorr.htm>
121. American Cancer Society. ACS Updates Colorectal Screening Guidelines. Available from: [http://www.cancer.org/docroot/NWS/content/NWS_1_1x_ACS_Updates_Colorectal_Screening_Guidelines .asp](http://www.cancer.org/docroot/NWS/content/NWS_1_1x_ACS_Updates_Colorectal_Screening_Guidelines.asp)
122. American Urological Association. Prostate-Specific Antigen (PSA) Best Practice Policy. *Oncology*. 2000;14(2):267-72, 277-8, 280.
123. American Urological Association. Prostate Cancer Awareness for Men. A doctor's guide for patients developed by the American Urological Association. 2000. Available from: http://www.auanet.org/timssnet/products/guidelines/patient_guides/prostate_awareness.pdf
124. American Cancer Society. ACS Cancer Detection Guidelines. 2003 May. Available from: http://www.cancer.org/docroot/PED/content/PED_2_3X_ACS_Cancer_Detection_Guidelines_36.asp?sitearea=PED.
125. US Preventive Services Task Force. Screening for Prostate Cancer: Recommendation and Rationale. *Ann Int Med*. 2002;137(11):915-916.
126. Office of Community and Rural Health. Washington Rural Health Assessment Project: Access to Primary Care Services. Washington State Department of Health. 2002.
127. National Cancer Institute. Voices of a Broken System: Real People, Real Problems: President's Cancer Panel Report, 2000-2001. National Institutes of Health. 2001 Oct.
128. Agency for Healthcare Research and Quality. Access to Care: Millions face obstacles in accessing medical care. URL: Agency for Healthcare Research and Quality. Access to Care: Millions face obstacles in accessing medical care. Available from: <http://www.ahcpr.gov/research/nov97/ra2.htm>.

129. Institute of Medicine. Care Without Coverage: Too Little, Too Late. Committee on the Consequence of Uninsurance. Washington, D.C.: The National Academies Press; 2002.
130. Roetzheim R, Pal N, Tennant C, Voti L, Ayanian J, Schwabe A, et al. Effects of health insurance and race on early detection of cancer. *J Natl Cancer Inst.* 1991;91(16):1409-15.
131. The Health of Washington State – A statewide assessment of health status, health risks, and health care services. Access to Primary Health Care Services. Washington State Department of Health, July 2002.
132. Washington State Board of Health, Access to Critical Health Services. Final Report, July 2001.
133. Lohr KN, editor. Institute of Medicine. Medicare: A Strategy for Quality Assurance, Volume I. Washington, D.C.: National Academy Press. 1990.
134. Presidents Advisory Commission on Consumer Protection and Quality in the Health Care Industry. Quality First: Better Health Care for All Americans. Washington, D.C. 1998. Available from: <http://www.hcqualitycommission.gov/final/>.
135. Ensuring Quality Cancer Care. Maria Hewitt and Joseph V. Simone, editors. National Cancer Policy Board, Institute of Medicine and Commission on Life Sciences, National Research Council. Washington, D.C.: The National Academies Press; 1999.
136. Fiscella K, Franks P, Gold M, Clancy C. Inequality in quality: Addressing socioeconomic, racial, and ethnic disparities in health care. *JAMA.* 2000;283(19):2579-84.
137. Schneider EC, Zaslavsky AM, Epstein AM. Racial disparities in the quality of care for enrollees in medicare managed care. *JAMA.* 2000;287(10):1288-94.
138. American College of Surgeons: Commission on Cancer. What is an approved cancer program? 2003 Aug. Available from: <http://www.facs.org/dept/cancer/coc/whatis.html>.
139. Approved Cancer Programs [database on the Internet]. Chicago (IL): American College of Surgeons. 203. Available from http://web.facs.org/cpm/CPMApprovedHospitals_Search.htm
140. National Cancer Institute [homepage on the Internet]. Special Populations Networks for Cancer Awareness, Research, and Training. Available from: <http://crchd.nci.nih.gov/spn/introduction>
141. Institute of Medicine, National Cancer Policy Board. 2001. Improving Palliative Care for Cancer. Washington, D.C. : National Academies Press; 2001.
142. National Hospice and Palliative Care Organization. NHPCO Facts and Figures. Updated July 2003. Available at URL: http://www.nhpco.org/files/public/facts_and_figures_0703.pdf
143. Cancer pain relief and palliative care. World Health Organ Tech Rep Ser. 1990;804:1-75.
144. Last Acts. Means to a Better End: A Report on Dying in America Today. 2002 Nov. Available from: <http://www.lastacts.org/files/misc/meansfull.pdf>.
145. National Institutes of Health. Acupuncture. NIH Consensus Statement Online 1997;15(5):1-34. Available at URL: http://consensus.nih.gov/cons/107/107_statement.htm#7_Conclus
146. Eisenberg DM, Davis RB, Ettner SL, Appel S, et al. Trends in alternative medicine use in the United States, 1990-1997: results of a follow-up national survey. *JAMA.* 1998;280(18):1569-75.
147. Fred Hutchinson Cancer Research Center. News and Events. URL: <http://www.fhcrc.org/news/science/2002/09/04/alternative.html>
148. National Cancer Institute. National Center for Complementary and Alternative Medicine. Available from: http://cis.nci.nih.gov/fact/9_14.htm.
149. National Cancer Institute. Office of Cancer Complementary and Alternative Medicine. Available from: <http://www3.cancer.gov/occam/>.
150. White House Commission on Complementary and Alternative Medicine Policy: final report. 2002 Mar. Available from: http://www.whccamp.hhs.gov/pdfs/fr2002_document.pdf.
151. Health Services Quality Assurance. 1999-2001 Biennial Report: Health Professions Quality Assurance and Regulatory Activities. Washington State Department of Health, Health Systems Quality Assurance. 2002.
152. Hough HJ, Dower C, O'Neil EH. Profile of a Profession: Naturopathic Practice. Center for the Health Professions University of California. California. 2001.

153. Viejo A, Standish L, Greene K, Greenlee H, Kim J, Grosshans C. Complementary and alternative medical treatment of breast cancer: A survey of licensed North American naturopathic physicians. *Alternative Therapies in Health and Medicine*. 2002;8(4):74-81.
154. Paasche-Orlow MR, Taylor HA, Brancati FL. Readability standards for informed consent forms as compared with actual readability. *N Engl J Med*. 2003;348(8):721-6.
155. Williams MV, Parker RM, Baker DW, Parikh NS, Pitkin K, Coates WC, et al. Inadequate functional health literacy among patients at two public hospitals. *JAMA*. 1995;274(21):1677-82.
156. Joffe S, Cook EF, Cleary PD, Clark JW, Weeks JC. Quality of informed consent in cancer clinical trials: A cross-sectional survey. *Lancet*. 2001;358(9295):1772-7.
157. Perkins J. Overcoming Language Barriers to Health Care. *Popular Government*. 1999;65(1):38-44.