Incidence of Cancers Associated with Modifiable Risk Factors and Late Stage Diagnoses for Cancers Amenable to Screening

Idaho 2013–2016

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BACKGROUND AND INTRODUCTION

The Idaho Comprehensive Cancer Strategic Plan 2016–2020 includes overarching goals to reduce health disparities associated with race, ethnicity, socioeconomic status, geographic location, and other characteristics.[1] This report illustrates cancer incidence in Idaho by local area for several cancers associated with modifiable risk factors and/or that have population-based screening initiatives, which can contribute to decreased morbidity and mortality through early detection. This report describes incidence of 1) breast cancer among females ≥50 years; 2) cervical cancer among females ≥20 years; 3) colon & rectum cancer among men and women ≥50 years; 4) endometrium cancer among women of all age groups; 5) esophagus cancer among men and women of all age groups; 6) kidney & renal pelvis cancer among men and women of all age groups; 7) lung & bronchus cancer among men and women of all age groups; 8) melanoma of the skin among men and women of all age groups; and 9) oral cavity & pharynx cancer among men and women of all age groups. The purpose of this report is to provide information to the Comprehensive Cancer Alliance for Idaho, the Idaho Department of Health and Welfare, and other partners working to improve cancer prevention and early detection at the local and state level.

Cancer-associated Modifiable Risk Factors

Many cancers have modifiable risk factors, such as tobacco use, excess body weight, certain HPV infections, and sun exposure. CDRI selected several primary cancer sites associated with modifiable risk factors, including endometrium, esophagus, kidney & renal pelvis, lung & bronchus, and melanoma of the skin.

Lung cancer is the most preventable form of cancer-related death in the United States.[2] Tobacco use accounts for at least 30% of all cancer deaths and 87% of lung cancer deaths. Besides lung cancer, tobacco use also increases the risk for acute myeloid leukemia and cancers of the mouth, lips, nasal cavity and sinuses, larynx, pharynx, esophagus, stomach, pancreas, kidney & renal pelvis, bladder, uterus, cervix, colon & rectum, and ovary.

[1] https://ccaidaho.webs.com/CCAI%20Strategic%20Plan-FINAL_Jan%20222015.pdf
[2] http://www.cancer.org/cancer/cancercauses/tobaccocancer/tobacco-related-cancer-fact-sheet

Excess body weight contributes to as many as 1 out of 5 cancer-related deaths.[3] Being overweight (body mass index [BMI] 25 to 29.9) or obese (BMI ≥30) is associated with an increased risk of many cancers, including breast (in post-menopausal women), colon & rectum, endometrium, esophagus, kidney & renal pelvis, and pancreas.

HPV is associated with cancers of the cervix, vulva, vagina, penis, anus, rectum, and oropharynx.[4] The most common HPV-associated cancers are cancers of the cervix among women and cancers of the oropharynx among men.

Ultraviolet (UV) radiation exposure from the sun and man-made sources, e.g. tanning beds, is associated with an increased risk of squamous and basal cell carcinomas; intermittent acute sun exposure leading to sunburn is associated with an increased risk of melanoma.[5]

U.S. Preventive Services Task Force (USPTF) Screening Recommendations

The U.S. Preventive Services Task Force (USPSTF) is "an independent panel of experts in primary care and prevention that systematically reviews the evidence of effectiveness and develops recommendations for clinical preventive services."[6] In January 2016, the USPSTF released recommendations on screening for breast cancer, including biennial screening mammography for women ages 50 to 74 years.[7] In October 2015, the American Cancer Society updated recommendations for mammography to include yearly mammograms for women ages 45 to 54, and yearly or biennial mammograms for women ≥55 years continuing as long as a woman is in good health with life expectancy of 10 years or longer.[8] Based on these recommendations, CDRI selected the measure of late stage breast cancer incidence rate among women ages 50 years and older as the indicator for inadequate breast cancer screening.

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[3] http://www.cancer.org/cancer/cancercauses/dietandphysicalactivity/bodyweightandcancerrisk/body-weight-and-cancer-risk-effects

[4] http://www.cdc.gov/cancer/hpv/

[5] https://www.cancer.gov/types/skin/hp/skin-prevention-pdq

[6] http://www.ahrq.gov/clinic/uspstfix.htm

[7] https://www.uspreventiveservicestaskforce.org/Page/Document/UpdateSummaryFinal/breast-cancer-screening1

[8] https://www.cancer.org/healthy/find-cancer-early/cancer-screening-guidelines/american-cancer-society-guidelines-for-the-early-detection-of-cancer.html

In August 2018, the USPSTF released updated cervical cancer screening recommendations. Among the general population, USPTF recommends cervical cancer screening for women ages 21 to 29 years with cytology (Pap smear) every 3 years. For women ages 30 to 65 years, USPTF recommends screening every 3 years with cervical cytology alone, every 5 years with high-risk human papillomavirus (hrHPV) testing alone, or every 5 years with hrHPV testing in combination with cytology (cotesting).[9] The American Cancer Society has similar recommendations.[8] Based on these recommendations, the availability of population estimates by age group, and Idaho's low cervical cancer screening rates,[10] CDRI selected the measure of invasive cervical cancer incidence rate among women ages ≥20 years as the indicator for inadequate cervical cancer screening and prevention.

In June 2016, the USPSTF updated 2008 recommendations on screening for colon & rectum cancers, which included using stool-based tests, sigmoidoscopy, or colonoscopy, in adults beginning at age 50 years and continuing until age 75 years.[11] The American Cancer Society recommends that, beginning at age 50, men and women follow a testing schedule depending on the type of test.[3] Based on these recommendations, CDRI selected the measure of late stage colon & rectum cancer incidence rate among adults ages ≥50 years as the indicator for inadequate colon & rectum cancer screening and prevention.

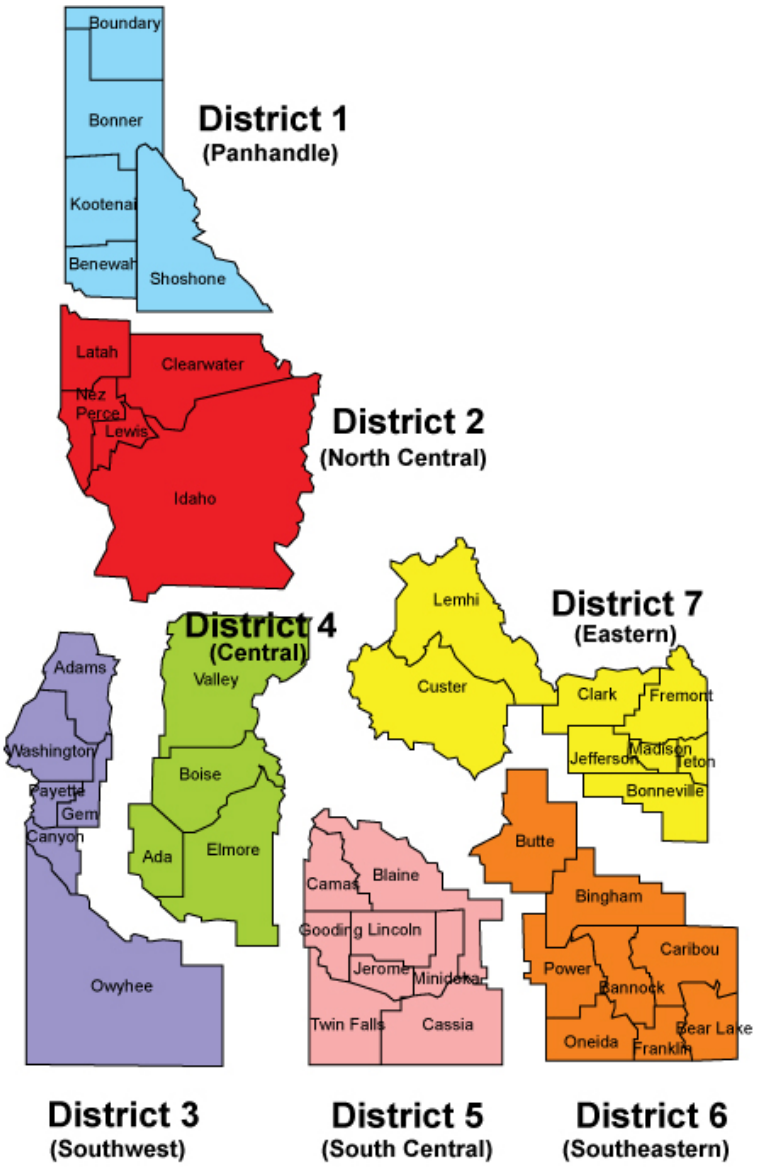
Geographic Areas Used in Analysis

This report presents cancer incidence statistics for Idaho's seven public health districts (Figure 1) and the 11 most populous of Idaho's 44 counties. The primary outlets for delivering public health services in Idaho are the independent public health districts. Each district has a board of health appointed by county commissioners within that region. Although districts are not part of any state agency, they work closely with the Idaho Department of Health and Welfare and other state and local agencies. Each

[9] https://www.uspreventiveservicestaskforce.org/Page/Document/UpdateSummaryFinal/cervical-cancer-screening2?ds=1&s=cervix
[10] http://www.cdc.gov/brfss/
[11] https://www.uspreventiveservicestaskforce.org/Page/Document/RecommendationStatementFinal/colorectal-cancer-screening2

district provides services, which correspond to local needs and vary from district to district. Many services, including some cancer prevention and control activities, are provided through contracts with the Idaho Department of Health and Welfare.

Figure 1. Map of Idaho Counties and Public Health Districts.[12]



[12] http://www.healthandwelfare.idaho.gov/?TabId=97

Statistics are also reported for the 11 most populous counties in Idaho. Each public health district contains at least one such county. Combined, these 11 counties comprise 77% of the state population. The 2016 population estimates in these counties range from 444,269 persons in Ada County to 38,781 persons in Madison County.[13] The 11 counties typically have sufficient numbers of cases to provide statistically reliable rates. Counties with smaller populations often have fewer cases by primary site, and statistically unreliable rates. Nonetheless, even among the most populous counties, there are instances when rates are based on small numbers of cases. Rates and percentages based on a numerator of 10 or fewer cases should be interpreted with caution. Table 1 shows 2016 population estimates for Idaho's public health districts and the 11 most populous counties.

Table 1. Idaho Resident Population, 2016, by Public Health District and Eleven Most Populous Counties.[13]

Geographic Area	All Ages Male & Female	20+ Female	50+	
			Female	Male
State of Idaho	1,680,026	602,048	289,858	270,570
District 1	228,572	87,882	48,635	45,170
Bonner County	42,343	16,617	10,181	10,093
Kootenai County	153,144	58,683	30,886	27,687
District 2	107,514	40,290	20,924	20,181
Latah County	38,792	14,058	5,627	5,318
Nez Perce	40,096	15,586	8,328	7,530
District 3	276,386	97,235	46,036	42,465
Canyon County	211,111	73,273	32,512	29,354
District 4	487,864	178,886	82,633	75,767
Ada County	444,269	163,135	74,382	67,372
District 5	194,024	67,350	32,943	30,990
Twin Falls	83,536	29,913	14,182	12,560
District 6	170,384	58,854	27,741	26,229
Bannock County	84,379	30,071	13,365	12,247
Bingham County	45,255	15,093	7,154	6,959
District 7	215,282	71,551	30,946	29,768
Bonneville	112,025	37,892	16,927	15,600
Madison County	38,781	11,916	3,211	2,918

[13] Source: National Center for Health Statistics, 2018. http://www.cdc.gov/nchs/nvss/bridged_race/data_documentation.htm#vintage2017

METHODS

Cancer Cases

A “cancer case” is defined as a primary cancer site (where the cancer started), not a metastatic cancer site (where the cancer spread to). Since an individual can have more than one primary cancer during their lifetime, the number of incident cancer cases is greater than the number of persons who are diagnosed with cancer. These analyses include incident cancers among Idaho residents only.

Population Estimates

Annual county population estimates by age group and sex were obtained from the National Center for Health Statistics (NCHS).[13]

Stage at Time of Diagnosis

Staging measures the extent of disease at the time of initial diagnosis. Summary staging attempts to group cases with similar prognoses into categories of:

- in-situ (non-invasive);
- localized (invasive, cancer confined to the primary site);
- regional (invasive, direct extension of tumor to adjacent organs, and/or lymph nodes);
- distant (invasive, metastasis to tissues or lymph nodes remote from the primary site); or
- unstaged (invasive).

Stage at diagnosis was collected and coded using a combination of Collaborative Stage[14] and SEER Summary Stage 2000.[15] For stage-specific incidence rate calculations, late stage was considered to mean regional and distant stages combined.

[14] Collaborative Stage Work Group of the American Joint Committee on Cancer. Collaborative Stage Data Collection System Coding Instructions, version 02.05, released October 2013. Available at: https://cancerstaging.org/cstage/software/Pages/Version-02.05.aspx.

[15] Young JL Jr., Roffers SD, Reis LAG, Fritz AG, Hurlbut AA (eds). SEER Summary Staging Manual – 2000: Codes and Coding Instructions. National Cancer Institute, NIH Pub. No. 01-4969, Bethesda, MD, 2001.

Age-Adjusted Incidence Rates

Age-adjusted incidence rates published in this report were adjusted using the direct method and standardized to the age distribution of the 2000 U.S. population,[16] and represent the average number of new cases diagnosed annually per 100,000 persons. The aging process can affect the rate of cancer incidence, and age distributions can vary over time and across geographic areas. Thus, age adjustment allows rates from one geographic area or time period to be compared with rates from other geographic areas or time periods that may have differences in age distributions. Any observed differences in age-adjusted incidence rates between populations are not due to differing age structures. Age-adjusted incidence rates, rate ratios, and 95% confidence intervals were calculated using SEER*Stat software.[16] The state of Idaho served as the reference group for rate ratio calculations.

Limitations to Data Interpretation and Comparisons

Rates based on population estimates

In non-census years, state and county population figures are estimates. Errors in the estimates will impact the rates.

Rate comparisons

Age-adjusted incidence rates based on small numbers of cases (<10 cases) may be unstable. When comparing rates across public health districts or counties, factors such as the absolute numbers of cases and differences in demographics should be considered. Interpretations without consideration of these factors may be misleading or inaccurate.

[16] Source: SEER Program, National Cancer Institute, 2019.
http://seer.cancer.gov/stdpopulations/stdpop.19ages.html

RESULTS

Breast Cancer – Females Ages 50+

During 2013–2016, 3,892 invasive and 633 in situ cases of breast cancer were diagnosed among Idaho resident females ≥50 years old. Late stage cases comprised 32.1% of invasive cases. Breast cancer case counts by public health district and county are shown in Table 2. Table 3 shows counts of late stage breast cancer cases among Idaho resident females ≥50 years old, age-adjusted rates of late stage breast cancer incidence, 95% confidence intervals (CIs) for the rates, and rate ratios comparing the rates in the public health districts and counties to the state of Idaho. Bonner County had a significantly lower rate of late stage breast cancer incidence among females ≥50 years old and Nez Perce County had a significantly higher rate than the average rate for the state of Idaho.

Cervical Cancer – Ages 20+

During 2013-2016, 199 invasive cases of cervical cancer were diagnosed among Idaho resident females ≥20 years old.[17] Late stage cases comprised 47.7% of invasive cases. Cervical cancer case counts by public health district and county are shown in Table 4. Table 5 shows counts of invasive cervical cancer cases among Idaho resident females ≥20 years old, age-adjusted rates of invasive cervical cancer incidence, 95% confidence intervals (CIs) for the rates, and rate ratios comparing the rates in the public health districts and counties to the state of Idaho. No county or health district had a significantly higher rate of invasive cervical cancer incidence among females ≥20 years old compared with the average rate for the state of Idaho.

Colon & Rectum Cancer – Ages 50+

During 2013-2016, 2,294 invasive and 40 in situ cases of colon & rectum cancers were diagnosed among Idaho residents ≥50 years old. Late stage cases comprised 59.7% of invasive cases. Colon & rectum cancer case counts by public health district and county are shown in Table 6. Table 7 shows counts of late stage colon & rectum cancer cases

[17] In situ cervix cases are not reportable according to national cancer statistics governing bodies and under Idaho Code 57-1703.

among Idaho residents ≥50 years old, age-adjusted rates of late stage colon & rectum cancer incidence, 95% confidence intervals (CIs) for the rates, and rate ratios comparing the rates in the public health districts and counties to the state of Idaho. Health District 3 and Bingham County had significantly higher rates of late stage colon & rectum cancer incidence than the average rate for the state of Idaho.

Endometrium Cancer – All Ages

During 2013-2016, 924 invasive and 6 in situ cases of endometrium cancer were diagnosed among female Idaho residents. Late stage cases comprised 27.2% of invasive cases. Endometrium cancer case counts by public health district and county are shown in Table 8. Table 9 shows counts of invasive endometrium cancer cases among female Idaho residents, age-adjusted rates of invasive endometrium cancer incidence, 95% confidence intervals (CIs) for the rates, and rate ratios comparing the rates in the public health districts and counties to the state of Idaho. Health District 4 had a significantly lower rate of invasive endometrium cancer incidence compared with the average rate for the state of Idaho.

Esophagus Cancer – All Ages

During 2013-2016, 362 invasive and 2 in situ cases of esophagus cancer were diagnosed among Idaho residents. Late stage cases comprised 73.2% of invasive cases. Esophagus cancer case counts by public health district and county are shown in Table 10. Table 11 shows counts of invasive esophagus cancer cases among Idaho residents, age-adjusted rates of invasive esophagus cancer incidence, 95% confidence intervals (CIs) for the rates, and rate ratios comparing the rates in the public health districts and counties to the state of Idaho. Health District 1 and Bonner County had significantly higher rates of invasive esophagus cancer incidence, and Health Districts 6 and 7 had significantly lower rates than the average rate for the state of Idaho.

Kidney & Renal Pelvis Cancer – All Ages

During 2013-2016, 1,200 invasive and 24 in situ cases of kidney & renal pelvis cancer were diagnosed among Idaho residents. Late stage cases comprised 29.3% of invasive cases. Kidney & renal pelvis cancer case counts by public health district and county are

shown in Table 12. Table 13 shows counts of invasive kidney & renal pelvis cancer cases among Idaho residents, age-adjusted rates of invasive kidney & renal pelvis cancer incidence, 95% confidence intervals (CIs) for the rates, and rate ratios comparing the rates in the public health districts and counties to the state of Idaho. Health District 1, 2, and 3 and Kootenai County had significantly higher , and Health Districts 4, 6, and 7 and Ada and Madison Counties had significantly lower rates of invasive kidney & renal pelvis cancer incidence than the average rate for the state of Idaho.

Lung & Bronchus Cancer – All Ages

During 2013-2016, 3,669 invasive and 11 in situ cases of lung & bronchus cancer were diagnosed among Idaho residents. Late stage cases comprised 70.8% of invasive cases. Lung & bronchus cancer case counts by public health district and county are shown in Table 14. Table 15 shows counts of invasive lung & bronchus cancer cases among Idaho residents, age-adjusted rates of invasive lung & bronchus cancer incidence, 95% confidence intervals (CIs) for the rates, and rate ratios comparing the rates in the public health districts and counties to the state of Idaho. Health Districts 1 and 2 and Bonner, Kootenai, and Nez Perce Counties had significantly higher rates of invasive lung & bronchus cancer incidence, and Health Districts 5, 6, and 7 and Ada, Bannock, Bingham, Bonneville, and Madison Counties had significantly lower rates than the average rate for the state of Idaho.

Melanoma of the Skin – All Ages

During 2013-2016, 1,984 invasive and 1,695 in situ cases of melanoma of the skin were diagnosed among Idaho residents. Late stage cases comprised 12.1% of invasive cases. Melanoma of the skin case counts by public health district and county are shown in Table 16. Table 17 shows counts of invasive melanoma of the skin cases among Idaho residents, age-adjusted rates of invasive melanoma of the skin incidence, 95% confidence intervals (CIs) for the rates, and rate ratios comparing the rates in the public health districts and counties to the state of Idaho. Health District 4 and Ada and Bonneville Counties had significantly higher rates of invasive melanoma of the skin

incidence, and Health District 3 and Canyon County had significantly lower rates than the average rate for the state of Idaho.

Oral Cavity & Pharynx Cancer – All Ages

During 2013-2016, 923 invasive and 25 in situ cases of oral cavity & pharynx cancer were diagnosed among Idaho residents. Late stage cases comprised 56.0% of invasive cases. Oral cavity & pharynx cancer case counts by public health district and county are shown in Table 18. Table 19 shows counts of invasive oral cavity & pharynx cancer cases among Idaho residents, age-adjusted rates of invasive oral cavity & pharynx cancer incidence, 95% confidence intervals (CIs) for the rates, and rate ratios comparing the rates in the public health districts and counties to the state of Idaho. Health District 1 and Bonner County had significantly higher rates of invasive oral cavity & pharynx cancer incidence, and Health Districts 6 and Bannock, Bingham, and Madison Counties had significantly lower rates than the average rate for the state of Idaho.

DISCUSSION

This report describes geographic patterns in cancer sites that are amenable to interventions, including cancer screening, diet and physical activity modifications, avoidance of excessive UV light exposure, and tobacco cessation. Significantly elevated incidence rates of late state and invasive cancers for cancer sites with effective population-based screening tests and effective treatment regimens (breast, cervix, and colon & rectum) could indicate disparities in screening rates and access to health care by public health district or county. For smoking-related cancers – in particular, lung & bronchus – there are significant geographic differences in incidence rates within Idaho.

Compared with the state of Idaho, Health District 2 and Nez Perce County had significantly higher late stage incidence rates for breast cancer among women ages 50 and older. No health district or county had a higher than the state average cervix cancer

incidence rate among women ages 20 and older. Higher rates of cervix cancer incidence have previously been observed among Hispanic women in Idaho.[18,19] For colon & rectum cancer among Idahoans ages 50 and older, District 3 and Bingham County had significantly higher late stage incidence rates than the state average. No other geographic areas had late stage incidence rates significantly higher than the statewide rate for these screening-amenable cancer sites. A previous CDRI report found significant disparities in cancer incidence patterns in Idaho by race and ethnicity and area-based contextual measures, e.g. percentage of the population with incomes below federal poverty guidelines, rural-urban commuting area.[18] The current report did not investigate differences in cancer incidence by race, ethnicity, or contextual measures. Although this report presents some evidence for geographic disparities in late stage incidence for cancers amenable to screening *within* Idaho, Idaho overall continues to have among the lowest rates of cancer screening among all U.S. states and the District of Columbia. In 2016, Idaho ranked next to lowest in the U.S. for mammography utilization, 3rd lowest for Pap test screening, and 8th lowest for colorectal cancer screening.[20] These statistics suggest that strategies are needed to improve cancer screening statewide.

Idaho ranks in the middle of U.S. states for overweight and obesity prevalence, with 64.5% of adults being overweight or obese in 2016.[20] For cancer sites associated with obesity in this report (postmenopausal breast cancer, colon & rectum, endometrium, esophagus, and kidney & renal pelvis), there were not consistent geographic patterns in incidence rates. Only Health District 1 had incidence rates significantly higher than the state of Idaho across more than one of these obesity-associated site categories (esophagus, and kidney & renal pelvis). However, other factors besides obesity,

[18] Johnson CJ, Carson SL. Cancer Disparities in Idaho, Phase I – Incidence: Understanding Disparities in Cancer Incidence Using Individual and Area-Based Measures. Boise, ID: Cancer Data Registry of Idaho; May 2007. URL: https://www.idcancer.org/ContentFiles/special/Cancer%20Disparities%20in%20Idaho%20-%20Phase%20I%20-%20Incidence%20(with%20links).pdf

[19] Johnson CJ, Carson SL. Cancer in Idaho, 2016. Boise, ID: Cancer Data Registry of Idaho; December 2018. URL: https://www.idcancer.org/ContentFiles/AnnualReports/Cancer%20in%20Idaho%202016.pdf

[20] Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Division of Population Health. BRFSS Prevalence & Trends Data [online]. 2016. [accessed Jun 03, 2019]. URL: https://www.cdc.gov/brfss/brfssprevalence/.

including tobacco use, also impact the rates of some of these cancers and may make interpreting geographic patterns difficult.

In 2016, Idaho ranked 12th lowest among states for tobacco use, with 14.5% of adults reporting being current smokers.[20] Nonetheless, lung cancer is the leading cause of cancer-related deaths in both men and women in Idaho. We noted some consistent geographic patterns in incidence rates for cancer sites associated with tobacco use in this report (cervix, colon, esophagus, kidney & renal pelvis, lung & bronchus, oral cavity & pharynx). When compared to the average rate for the state of Idaho, Health District 1 had significantly higher incidence rates for esophagus, kidney & renal pelvis, lung & bronchus, and oral cavity & pharynx cancers. Bonner County had significantly higher incidence rates for esophagus, lung & bronchus, and oral cavity & pharynx cancers. Kootenai County had significantly higher incidence rates for kidney & renal pelvis and lung & bronchus cancers. Health District 3 had significantly higher incidence rates for colorectal, and kidney & renal pelvis cancers. These similarities in incidence rates among cancers with common risk factors lend support for targeted, coordinated cancer prevention and control strategies.

HPV causes nearly all cervix cancers and about 70% of oropharyngeal squamous cell carcinomas (subset of oral cavity & pharynx). In 2016, among Idaho adolescents ages 13–17, about 39% of females and 28% of males had completed 2 or 3 dose vaccination regimens for HPV.[21] We did not note consistent geographic patterns in incidence rates for HPV-associated cancer sites included in this report (cervix, oral cavity & pharynx).

Idaho regularly has among the highest melanoma mortality rates in the United States. However, like in many other U.S. jurisdictions,[22] melanoma cases in Idaho are underreported, which underestimates the true incidence of melanoma and might impact

[21] Data source: Idaho's Immunization Reminder Information System, 2019.

[22] Melanoma reporting to central cancer registries by US dermatologists: an analysis of the persistent knowledge and practice gap. http://www.ncbi.nlm.nih.gov/pubmed/22018061

incidence rates by geographic area. CDRI is working with laboratories and dermatology offices to improve the reporting of melanoma cases statewide.

Cancer risk is multifactorial. Several of the cancer sites included in this report are related to more than one modifiable risk factor – including failure to receive appropriate screening. In addition, the population-attributable fractions of certain risk factors are not well-established for all of the cancer sites studied. Although it can be challenging to infer reasons for geographic differences and patterns in incidence rates for the cancers presented in this report, we hope that these results will serve as a guide for targeting specific geographic areas for enhanced cancer prevention and control activities.

Table 2. Idaho resident female breast cancer cases, ages 50+, by public health district and county, and stage at diagnosis, 2013-2016.

Geographic Area	Cancer Stage at Diagnosis				
	In situ	Localized	Regional	Distant	Unstaged
State of Idaho	633	2,574	1,032	216	70
District 1	137	462	141	41	26
Bonner County	33	98	20	8	3
Kootenai County	91	307	103	26	17
District 2	44	207	99	18	5
Latah County	10	65	25	2	0
Nez Perce County	24	91	44	12	4
District 3	91	416	175	39	12
Canyon County	68	303	129	23	8
District 4	188	800	287	50	9
Ada County	170	723	253	45	9
District 5	70	265	124	25	4
Twin Falls County	30	119	50	15	2
District 6	46	205	98	16	7
Bannock County	22	102	45	7	4
Bingham County	14	58	24	4	2
District 7	57	219	108	27	7
Bonneville County	33	131	62	16	3
Madison County	2	15	5	3	1

Table 3. Late stage breast cancer statistics, Idaho resident females ages 50+, by public health district and county, 2013-2016.

Geographic Area	Late Stage (Regional + Distant) Statistics					
	Rate	Lower CI	Upper CI	Cases	Rate Ratio	
State of Idaho	111.5	105.3	118.0	1,248	-	
District 1	98.9	84.7	114.7	182	0.89	
Bonner County	74.4	48.7	108.8	28	0.67	*
Kootenai County	110.8	92.2	132.1	129	0.99	
District 2	143.2	118.0	172.0	117	1.28	*
Latah County	137.4	89.5	201.0	27	1.23	
Nez Perce County	167.8	126.2	218.5	56	1.50	*
District 3	120.4	104.6	137.9	214	1.08	
Canyon County	123.1	104.0	144.7	152	1.10	
District 4	108.6	97.1	121.2	337	0.97	
Ada County	107.3	95.2	120.5	298	0.96	
District 5	114.4	96.6	134.6	149	1.03	
Twin Falls County	115.9	89.2	148.2	65	1.04	
District 6	105.7	86.9	127.2	114	0.95	
Bannock County	99.3	73.7	130.8	52	0.89	
Bingham County	100.9	66.7	146.5	28	0.91	
District 7	109.0	91.2	129.4	135	0.98	
Bonneville County	116.3	91.6	145.6	78	1.04	
Madison County	64.3	27.4	128.1	8	0.58	

* The rate ratio indicates that the rate is significantly different than the rate for Idaho ($p<0.05$).

Table 4. Idaho resident cervical cancer cases, ages 20+, by public health district and county, and stage at diagnosis, 2013-2016.

Geographic Area	Cancer Stage at Diagnosis				
	In situ	Localized	Regional	Distant	Unstaged
State of Idaho	-	96	65	30	8
District 1	-	18	11	2	4
Bonner County	-	4	1	0	0
Kootenai County	-	13	8	1	3
District 2	-	8	2	3	1
Latah County	-	5	2	0	0
Nez Perce County	-	2	0	2	0
District 3	-	25	11	5	0
Canyon County	-	19	8	4	0
District 4	-	21	18	7	2
Ada County	-	20	17	7	2
District 5	-	12	5	7	0
Twin Falls County	-	7	1	3	0
District 6	-	5	12	1	1
Bannock County	-	3	8	0	1
Bingham County	-	0	2	0	0
District 7	-	7	6	5	0
Bonneville County	-	4	4	4	0
Madison County	-	0	0	0	0

Table 5. Invasive cervical cancer statistics, Idaho resident females ages 20+, by public health district and county, 2013-2016.

Geographic Area	Invasive Cervical Cancer Statistics				
	Rate	Lower CI	Upper CI	Cases	Rate Ratio
State of Idaho	8.8	7.6	10.1	199	-
District 1	10.4	7.1	14.7	35	1.19
Bonner County	7.6	2.1	19.0	5	0.86
Kootenai County	11.1	7.1	16.6	25	1.27
District 2	9.5	5.0	16.2	14	1.08
Latah County	14.1	5.4	29.7	7	1.60
Nez Perce County	8.1	2.1	20.2	4	0.92
District 3	11.2	8.0	15.3	41	1.28
Canyon County	11.5	7.8	16.4	31	1.31
District 4	7.2	5.2	9.6	48	0.82
Ada County	7.5	5.5	10.1	46	0.85
District 5	9.4	5.9	14.1	24	1.07
Twin Falls County	10.9	5.3	19.4	11	1.24
District 6	8.3	4.9	13.0	19	0.94
Bannock County	10.3	5.3	18.1	12	1.17
Bingham County	3.4	0.3	12.5	2	0.39
District 7	6.9	4.0	11.0	18	0.79
Bonneville County	8.2	4.1	14.6	12	0.94
Madison County	0.0	0.0	11.9	0	0.00

* The rate ratio indicates that the rate is significantly different than the rate for Idaho ($p<0.05$).

Table 6. Idaho resident colon & rectum cancer cases, ages 50+, by public health district and county, and stage at diagnosis, 2013-2016.

Geographic Area	Cancer Stage at Diagnosis				
	In situ	Localized	Regional	Distant	Unstaged
State of Idaho	40	778	887	482	147
District 1	4	141	166	87	39
Bonner County	1	26	36	18	12
Kootenai County	2	83	97	55	22
District 2	1	69	63	36	12
Latah County	0	14	15	4	4
Nez Perce County	1	33	24	12	4
District 3	3	127	168	85	22
Canyon County	2	86	106	54	12
District 4	0	201	220	119	30
Ada County	0	183	192	109	24
District 5	5	80	97	55	14
Twin Falls County	1	34	52	29	3
District 6	7	49	87	51	19
Bannock County	3	22	34	18	12
Bingham County	3	13	33	17	1
District 7	20	111	86	49	11
Bonneville County	9	58	41	27	6
Madison County	2	13	7	5	1

Table 7. Late stage colon & rectum cancer statistics, Idaho residents ages 50+, by public health district and county, 2013-2016.

Geographic Area	Late Stage (Regional + Distant) Statistics					
	Rate	Lower CI	Upper CI	Cases	Rate Ratio	
State of Idaho	65.4	61.9	69.0	1,369	-	
District 1	73.0	64.1	82.7	253	1.12	
Bonner County	79.3	59.1	104.0	54	1.21	
Kootenai County	70.7	59.7	83.1	152	1.08	
District 2	59.8	48.5	73.0	99	0.91	
Latah County	49.3	29.3	77.5	19	0.75	
Nez Perce County	56.4	39.3	78.3	36	0.86	
District 3	76.5	67.2	86.7	253	1.17	*
Canyon County	71.1	60.3	83.3	160	1.09	
District 4	60.9	54.4	68.0	339	0.93	
Ada County	61.0	54.1	68.5	301	0.93	
District 5	61.4	52.0	72.2	152	0.94	
Twin Falls County	78.5	62.2	97.8	81	1.20	
District 6	66.6	55.8	78.9	138	1.02	
Bannock County	55.5	41.1	73.1	52	0.85	
Bingham County	91.5	67.7	121.1	50	1.40	*
District 7	57.3	47.9	68.0	135	0.88	
Bonneville County	54.1	41.9	68.9	68	0.83	
Madison County	54.4	27.8	95.6	12	0.83	

* The rate ratio indicates that the rate is significantly different than the rate for Idaho ($p<0.05$).

Table 8. Idaho resident endometrium cancer cases by public health district and county, and stage at diagnosis, 2013-2016.

			Cancer Stage at Diagnosis		
Geographic Area	In situ	Localized	Regional	Distant	Unstaged
State of Idaho	6	617	185	66	56
District 1	1	109	25	14	25
Bonner County	1	26	5	4	7
Kootenai County	0	57	17	7	15
District 2	0	25	16	5	10
Latah County	0	6	4	3	6
Nez Perce County	0	10	5	1	2
District 3	2	111	33	13	8
Canyon County	2	79	20	11	6
District 4	0	163	51	13	2
Ada County	0	150	44	11	2
District 5	1	79	29	10	3
Twin Falls County	0	36	14	3	3
District 6	0	67	14	6	4
Bannock County	0	34	7	2	2
Bingham County	0	19	6	4	1
District 7	2	63	17	5	4
Bonneville County	1	35	8	4	3
Madison County	1	8	3	0	0

Table 9. Invasive endometrium cancer statistics by public health district and county, Idaho 2013-2016.

	Invasive Incidence Statistics					
Geographic Area	Rate	Lower CI	Upper CI	Cases	Rate Ratio	
State of Idaho	23.8	22.2	25.4	924	-	
District 1	26.0	22.1	30.5	173	1.10	
Bonner County	27.5	19.6	38.4	42	1.16	
Kootenai County	23.5	18.9	29.0	96	0.99	
District 2	20.3	15.1	26.8	56	0.85	
Latah County	27.4	16.1	43.4	19	1.15	
Nez Perce County	16.6	9.6	27.1	18	0.70	
District 3	27.0	22.9	31.6	165	1.14	
Canyon County	26.9	22.2	32.4	116	1.13	
District 4	20.4	17.8	23.3	229	0.86	*
Ada County	20.4	17.7	23.5	207	0.86	
District 5	26.6	21.9	32.0	121	1.12	
Twin Falls County	29.8	22.2	39.1	56	1.25	
District 6	24.2	19.4	30.0	91	1.02	
Bannock County	24.8	17.9	33.5	45	1.04	
Bingham County	30.3	20.3	43.7	30	1.28	
District 7	22.0	17.6	27.2	89	0.93	
Bonneville County	22.4	16.5	29.7	50	0.94	
Madison County	24.4	12.0	43.4	11	1.03	

* The rate ratio indicates that the rate is significantly different than the rate for Idaho ($p<0.05$).

Table 10. Idaho resident esophagus cancer cases by public health district and county, and stage at diagnosis, 2013-2016.

Geographic Area	Cancer Stage at Diagnosis				
	In situ	Localized	Regional	Distant	Unstaged
State of Idaho	2	44	123	142	53
District 1	0	9	25	29	10
Bonner County	0	1	10	7	2
Kootenai County	0	8	10	17	5
District 2	0	3	15	11	4
Latah County	0	0	2	2	1
Nez Perce County	0	1	5	4	1
District 3	0	10	18	16	10
Canyon County	0	4	15	10	7
District 4	1	10	36	54	14
Ada County	1	10	31	49	11
District 5	1	3	13	10	8
Twin Falls County	1	0	4	4	2
District 6	0	4	9	7	3
Bannock County	0	1	7	6	2
Bingham County	0	1	2	0	1
District 7	0	5	7	15	4
Bonneville County	0	3	1	11	0
Madison County	0	0	2	1	1

Table 11. Invasive esophagus cancer statistics by public health district and county, Idaho 2013-2016.

Geographic Area	Invasive Incidence Statistics					
	Rate	Lower CI	Upper CI	Cases	Rate Ratio	
State of Idaho	5.5	5.0	6.1	362	-	
District 1	8.2	6.4	10.3	73	1.49	*
Bonner County	12.1	7.4	18.6	20	2.19	*
Kootenai County	6.7	4.8	9.2	40	1.22	
District 2	7.7	5.3	10.8	33	1.40	
Latah County	3.2	1.1	7.6	5	0.59	
Nez Perce County	6.9	3.4	12.3	11	1.25	
District 3	5.0	3.8	6.5	54	0.91	
Canyon County	4.4	3.1	6.1	36	0.80	
District 4	6.0	5.0	7.2	114	1.09	
Ada County	5.9	4.8	7.1	101	1.07	
District 5	4.4	3.1	6.2	34	0.81	
Twin Falls County	3.1	1.5	5.6	10	0.56	
District 6	3.4	2.2	5.1	23	0.62	*
Bannock County	4.8	2.7	7.7	16	0.87	
Bingham County	2.2	0.6	5.7	4	0.40	
District 7	3.7	2.5	5.2	31	0.67	*
Bonneville County	3.4	1.9	5.7	15	0.62	
Madison County	2.6	0.7	6.7	4	0.48	

* The rate ratio indicates that the rate is significantly different than the rate for Idaho ($p<0.05$).

Table 12. Idaho resident kidney & renal pelvis cancer cases by public health district and county, and stage at diagnosis, 2013-2016.

Geographic Area	Cancer Stage at Diagnosis				
	In situ	Localized	Regional	Distant	Unstaged
State of Idaho	24	796	173	178	53
District 1	8	167	22	31	6
Bonner County	3	21	5	7	1
Kootenai County	4	115	13	17	3
District 2	2	63	20	12	4
Latah County	0	17	2	3	1
Nez Perce County	2	24	9	3	2
District 3	2	158	28	38	4
Canyon County	1	121	22	27	4
District 4	6	204	46	38	11
Ada County	6	184	44	33	9
District 5	4	81	19	28	8
Twin Falls County	1	32	5	9	2
District 6	1	53	20	17	7
Bannock County	1	27	10	7	3
Bingham County	0	13	5	6	3
District 7	1	70	18	14	13
Bonneville County	1	44	11	6	5
Madison County	0	6	2	2	2

Table 13. Invasive kidney & renal pelvis cancer statistics by public health district and county, Idaho 2013-2016.

Geographic Area	Invasive Incidence Statistics					
	Rate	Lower CI	Upper CI	Cases	Rate Ratio	
State of Idaho	18.3	17.2	19.3	1,200	-	
District 1	25.4	22.2	28.9	226	1.39	*
Bonner County	20.5	14.2	28.7	34	1.12	
Kootenai County	25.0	21.1	29.3	148	1.37	*
District 2	23.1	18.8	28.1	99	1.27	*
Latah County	14.9	9.5	22.4	23	0.82	
Nez Perce County	23.8	16.8	32.7	38	1.30	
District 3	21.2	18.5	24.1	228	1.16	*
Canyon County	21.3	18.2	24.7	174	1.16	
District 4	15.8	14.1	17.7	299	0.87	*
Ada County	15.7	13.9	17.7	270	0.86	*
District 5	17.8	14.9	21.0	136	0.97	
Twin Falls County	14.7	10.9	19.5	48	0.81	
District 6	14.3	11.6	17.5	97	0.78	*
Bannock County	14.0	10.3	18.6	47	0.77	
Bingham County	14.9	9.8	21.7	27	0.82	
District 7	13.6	11.3	16.4	115	0.75	*
Bonneville County	15.1	11.7	19.2	66	0.83	
Madison County	7.9	4.1	13.8	12	0.43	*

* The rate ratio indicates that the rate is significantly different than the rate for Idaho ($p<0.05$).

Table 14. Idaho resident lung & bronchus cancer cases by public health district and county, and stage at diagnosis, 2013-2016.

Geographic Area	Cancer Stage at Diagnosis				
	In situ	Localized	Regional	Distant	Unstaged
State of Idaho	11	840	667	1,931	231
District 1	2	143	131	452	70
Bonner County	1	24	24	93	17
Kootenai County	1	97	80	275	38
District 2	0	69	60	188	18
Latah County	0	12	11	44	4
Nez Perce County	0	38	22	81	5
District 3	0	170	132	296	48
Canyon County	0	125	95	203	23
District 4	6	296	176	469	48
Ada County	4	272	151	410	43
District 5	1	62	74	215	21
Twin Falls County	0	31	35	91	8
District 6	2	39	40	159	16
Bannock County	0	16	23	75	9
Bingham County	1	12	11	46	4
District 7	0	61	54	152	10
Bonneville County	0	38	35	86	1
Madison County	0	2	1	3	1

Table 15. Invasive lung & bronchus cancer statistics by public health district and county, Idaho 2013-2016.

Geographic Area	Invasive Incidence Statistics					
	Rate	Lower CI	Upper CI	Cases	Rate Ratio	
State of Idaho	55.8	54.1	57.7	3,669	-	
District 1	89.5	83.4	95.9	796	1.60	*
Bonner County	95.3	81.1	111.4	158	1.71	*
Kootenai County	82.6	75.5	90.3	490	1.48	*
District 2	78.2	70.1	87.1	335	1.40	*
Latah County	46.1	36.0	58.1	71	0.82	
Nez Perce County	91.4	77.2	107.5	146	1.64	*
District 3	60.0	55.4	64.8	646	1.07	
Canyon County	54.5	49.6	59.8	446	0.98	
District 4	52.3	49.1	55.7	989	0.94	
Ada County	51.0	47.6	54.5	876	0.91	*
District 5	48.7	43.8	53.9	372	0.87	*
Twin Falls County	50.6	43.2	58.9	165	0.91	
District 6	37.5	33.0	42.4	254	0.67	*
Bannock County	36.7	30.5	43.8	123	0.66	*
Bingham County	40.3	31.6	50.7	73	0.72	*
District 7	32.9	29.1	37.0	277	0.59	*
Bonneville County	36.6	31.1	42.7	160	0.66	*
Madison County	4.6	1.9	9.5	7	0.08	*

* The rate ratio indicates that the rate is significantly different than the rate for Idaho ($p<0.05$).

Table 16. Idaho resident melanoma of the skin cases by public health district and county, and stage at diagnosis, 2013-2016.

Geographic Area	Cancer Stage at Diagnosis				
	In situ	Localized	Regional	Distant	Unstaged
State of Idaho	1,695	1,696	130	110	48
District 1	303	239	22	19	9
Bonner County	64	44	9	4	0
Kootenai County	213	164	10	13	8
District 2	110	113	9	6	2
Latah County	32	26	4	2	0
Nez Perce County	42	42	2	2	0
District 3	237	203	17	14	9
Canyon County	173	149	13	10	6
District 4	574	581	26	33	14
Ada County	530	538	26	32	13
District 5	111	188	23	18	7
Twin Falls County	34	69	10	5	2
District 6	134	144	21	11	5
Bannock County	87	70	9	9	0
Bingham County	31	36	5	2	2
District 7	226	228	12	9	2
Bonneville County	140	139	8	4	0
Madison County	19	15	1	1	0

Table 17. Invasive melanoma of the skin statistics by public health district and county, Idaho 2013-2016.

Geographic Area	Invasive Incidence Statistics					
	Rate	Lower CI	Upper CI	Cases	Rate Ratio	
State of Idaho	28.1	26.8	29.4	1,984	-	
District 1	25.1	22.1	28.4	289	0.89	
Bonner County	22.0	16.2	29.6	57	0.79	
Kootenai County	27.2	23.4	31.5	195	0.97	
District 2	24.3	20.1	29.1	130	0.86	
Latah County	23.3	15.7	33.2	32	0.83	
Nez Perce County	21.9	15.8	29.7	46	0.78	
District 3	22.1	19.4	25.2	243	0.79	*
Canyon County	23.2	19.9	26.9	178	0.83	*
District 4	33.2	30.7	36.0	654	1.18	*
Ada County	34.4	31.7	37.4	609	1.23	*
District 5	27.9	24.4	31.9	236	1.00	
Twin Falls County	23.9	19.0	29.7	86	0.85	
District 6	25.9	22.2	30.1	181	0.92	
Bannock County	26.2	20.9	32.4	88	0.93	
Bingham County	25.6	18.5	34.3	45	0.91	
District 7	31.8	27.9	36.0	251	1.13	
Bonneville County	35.7	30.1	41.9	151	1.27	*
Madison County	19.3	10.9	31.1	17	0.69	

* The rate ratio indicates that the rate is significantly different than the rate for Idaho ($p<0.05$).

Table 18. Idaho resident oral cavity & pharynx cancer cases by public health district and county, and stage at diagnosis, 2013-2016.

Geographic Area	Cancer Stage at Diagnosis				
	In situ	Localized	Regional	Distant	Unstaged
State of Idaho	25	348	389	128	58
District 1	4	37	86	23	14
Bonner County	0	11	23	6	5
Kootenai County	4	23	51	15	7
District 2	0	25	23	14	7
Latah County	0	8	8	1	1
Nez Perce County	0	7	8	9	2
District 3	7	78	61	19	9
Canyon County	5	56	41	11	6
District 4	7	102	109	39	11
Ada County	7	94	100	35	9
District 5	2	39	43	19	6
Twin Falls County	1	15	24	10	0
District 6	2	15	24	10	3
Bannock County	0	7	17	3	1
Bingham County	2	6	3	3	2
District 7	3	52	43	4	8
Bonneville County	2	28	23	0	6
Madison County	1	5	3	0	0

Table 19. Invasive oral cavity & pharynx cancer statistics by public health district and county, Idaho 2013-2016.

Geographic Area	Invasive Incidence Statistics					
	Rate	Lower CI	Upper CI	Cases	Rate Ratio	
State of Idaho	14.0	13.2	15.0	923	-	
District 1	18.0	15.3	21.0	160	1.28	*
Bonner County	27.2	19.8	36.3	45	1.93	*
Kootenai County	16.2	13.1	19.8	96	1.15	
District 2	16.1	12.5	20.4	69	1.15	
Latah County	11.7	6.9	18.5	18	0.83	
Nez Perce County	16.3	10.6	23.9	26	1.16	
District 3	15.5	13.2	18.0	167	1.10	
Canyon County	13.9	11.5	16.7	114	0.99	
District 4	13.8	12.2	15.6	261	0.98	
Ada County	13.8	12.1	15.7	238	0.99	
District 5	14.0	11.5	16.9	107	1.00	
Twin Falls County	15.0	11.1	19.9	49	1.07	
District 6	7.7	5.7	10.1	52	0.55	*
Bannock County	8.4	5.5	12.1	28	0.59	*
Bingham County	7.7	4.2	13.0	14	0.55	*
District 7	12.7	10.4	15.3	107	0.90	
Bonneville County	13.0	9.9	16.9	57	0.93	
Madison County	5.3	2.3	10.4	8	0.37	*

* The rate ratio indicates that the rate is significantly different than the rate for Idaho ($p<0.05$).