CANCER IN ARIZONA

CANCER INCIDENCE AND MORTALITY
2008-2009

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2008-2009

May 10, 2013

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MISSION
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For electronic version see:
http://www.azdhs.gov/phs/phstats/cancer-registry/index.htm

Cancer Incidence and Mortality in Arizona

The 2008-2009 Annual Report for The Arizona Cancer Registry

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Executive Summary

The Arizona Cancer Registry (ACR) is a population-based surveillance system funded by the state of Arizona with assistance from the Centers for Disease Control and Prevention (CDC) Cooperative Agreement 1U58DP003858. The registry is designed to collect, manage and analyze information on incidence and survival of Arizona residents diagnosed with cancer.

The ACR received approximately 94% of cases expected to be reported in Arizona in 2008 and 96% of its cases in 2009. Incomplete data is the result of missing cases from pathology laboratories and physicians, as well as some rural hospitals. Case counts in Maricopa and Pima Counties have been affected by non-reported data from Veterans Hospitals for the years 2005-2009. This resulted in lower counts and rates. As data are received updates will be made available through the ACR website: http://www.azdhs.gov/phs/phstats/cancer-registry/index.htm.

Highlights of the findings for Arizona in 2008-2009 include:

Cancer Incidence in Arizona, 2008-2009

- An average of 27,175 cases of cancer (all invasive and *in situ* bladder) were diagnosed and reported per year in the state with an average annual age-adjusted rate of 405.3 per 100,000.
- Among both sexes combined lung cancer was the most common type of cancer diagnosed with an average annual age-adjusted rate of 54.1 and 56.3 per 100,000 in 2008 and 2009 respectively.
- Prostate cancer was the most common type of cancer diagnosed in males (105.0 in 2008 and 101.8 in 2009 per 100,000 males) and breast cancer was the most common type of cancer diagnosed in females (115.5 in 2008 and 113.2 in 2009 per 100,000 females).
- Trends of cancer incidence rates in Arizona have shown very little change over the last 9 years. Arizona rates have consistently been slightly lower than national rates.

Cancer Mortality in Arizona, 2008-2009

- An average of 10,055 cancer deaths was reported per year in the state with an average annual age-adjusted rate of 148.7 per 100,000.
- Lung cancer caused the greatest number of cancer deaths among both sexes. Prostate cancer in males and breast cancer in females caused the second highest number of cancer deaths, followed by colorectal cancer in both sexes.
- Blacks and White Non-Hispanics have the highest age-adjusted rate of cancer deaths (162.7 and 155.2 per 100,000 respectively) among all racial/ethnic groups.
- Lung cancer continues to be the deadliest cancer with 2,664 cancer deaths per year.

Accomplishments and Activities

Case Reporting:

- A total of 72 hospitals report to the ACR. The three VA hospitals and two military hospitals data was not reported for 2008 and 2009. CDC estimates the VA facilities contribute approximately 5% of Arizona resident cases to the ACR. In addition, the ACR receives cases from outpatient freestanding clinics and physician offices.
- Of the 72 hospitals, the ACR travels to 15 hospitals (less than 50 beds) to perform data collection of cancer cases. The remaining hospitals submit their reports to the ACR electronically.
- The ACR also performs case-finding at 41 freestanding and hospital pathology laboratories in order to capture unreported cases. Most cases that were identified only at pathology laboratories were prostate and melanoma.
- To collect the cases of Arizona residents traveling to other states for diagnosis and/or treatment, the ACR has several interstate data exchange agreements. Data is exchanged with all neighboring states. ACR receives Arizona resident cases from 21 states across the U.S. This includes an agreement with New Mexico and the Indian Health Service (IHS) allowing Arizona to record American Indian cases seen only at United States Public Health Service (USPHS) Indian Hospitals.
- The ACR completed data linkages with Navajo and Hopi National Breast and Cervical Cancer Early Detection Programs (NBCCEDP). The linkage provided the screening programs with staging information and it also provided the ACR with potentially missed cases.
- All information collected, abstracted and coded is consistent with the North American Association of Central Cancer Registries (NAACCR) national standards. The Arizona Coding Handbook includes the standards of the American College of Surgeons Commission on Cancer's "*Facility Oncology Registry Data Standards*" (FORDS) *Revised for 2011*.
- The ACR receives all of its case reports from hospitals and interstate exchanges through internet secure file data transfers.

Data Submissions to National/Government Organizations:

- The ACR is a member of the NAACCR, an organization for cancer registries, governmental agencies, professional associations, and private groups in North America interested in enhancing the quality and use of cancer registry data. This organization promotes and advances uniform data standards for cancer registration. It has created the data standards used to evaluate cancer registries.
  - NAACCR annually conducts registry certification of central cancer registries as part of its call for data. The registries are evaluated on its standards for completeness, accuracy, and timeliness.
  - The ACR annually submits its data for evaluation and certification by NAACCR when it participates in the NAACCR Call for Data.
  - NAACCR publishes *Cancer in North America (CINA)*, which addresses both incidence and mortality in the United States and Canada.
- The ACR submits data to Central Brain Tumor Registry of the United States (CBTRUS). This is the largest population-based database of primary brain tumors.

- The ACR submits data to the CDC, NPCR-CSS (National Program of Cancer Registries - Cancer Surveillance System). The CDC and National Cancer Institute (NCI) publish the *United States Cancer Statistics*. This is the official federal statistics on cancer incidence from registries with high quality data.

Data Submissions to State Organizations:

- The ACR provides cancer staging information on colorectal cancer and female breast and cervical cancer. The ACR provides staging information for colorectal cancer cases to the Fit at Fifty Program. Female breast and cervical cancer data is given to the Well Woman HealthCheck Program (WWHP) which is part of the National Breast and Cervical Cancer Early Detection Program administered by the CDC. The ACR has historically provided staging information to the WWHP. In 2008 annual linkages between WWHP and the ACR were initiated that provided more complete staging information while identifying cases missing from the ACR database.
- The ACR contributes statistical information to the Arizona Cancer Control (ACC) Program and provides data and guidance as a member of the Arizona Cancer Leadership Team, the steering committee for the ACC. The ACC is part of the National Comprehensive Cancer Control program administered by the CDC and provides leadership for and coordination of statewide cancer control efforts.

Data Quality, Timeliness and Completeness:

- The ACR was recognized for achieving the Gold Standard, the highest NAACCR standard certification possible for 2009 data and the Silver standard for 2008 data. The Gold standard is granted to registries submitting over 95% of their expected number of cases. The Silver Standard is given to registries submitting between 90 and 95 percent of the expected number of cases.
- Currently all data used for this report meets completion standards set by NAACCR.
- CDC NPCR-CSS evaluated ACR data for years 2008 and 2009, using the data standards developed by NAACCR, in the areas of case ascertainment, completeness of information on critical variables, data accuracy and timeliness. These criteria are used for inclusion in the *United State Cancer Statistics* (USCS).
- The ACR met the standards set for inclusion in the USCS for 2008 and 2009 data set by CDC CSS-NPCR.
- Individual elements measured by CDC CSS-NPCR were as follows:

1) ACR achievement for the % of cases that were "Death Certificate Only":	2008	2009	NAACCR Silver Standard	NAACCR Gold Standard
	2.0	3.3	< 5%	< 3%

2) Completeness of case ascertainment of the expected number of cases as estimated by the SEER U.S. incidence to mortality ratio:	2008	2009	NAACCR Silver Standard	NAACCR Gold Standard
	90.6%	96.4%	90%	95%

3) The completeness of information recorded as achieved the "Gold" standard for the rated fields of:	Percent Missing	
	2008	2009
Age at Diagnosis	0.0%	0.0%
Sex	0.0%	0.0%
Race	1.3%	1.8%
County	0.2%	0.0%

Analysis and Special Studies:

The ACR completed an average of 30 requests per year for data. The Arizona Cancer Registry is involved with research studies in Arizona. The ADHS Human Subjects Review Committee has approved the studies. A sample of the analysis done was:

- Analyzed data from a pilot study of Pima and Maricopa County dermatologists reporting of cancer
  - Concerned about low incidence counts of melanoma, the Melanoma Task Force was formed. The task force, comprised of a group of dermatologists in Pima and Maricopa Counties, faculty from the Arizona Cancer Center, and the ACR, was created to determine if melanoma was underreported to the ACR. The task force studied melanoma cases seen by dermatologists to identify the percentage of cases reported to the ACR in 2009 from selected practices in Pima and Maricopa Counties.
- Analyzed breast cancer data for Komen of Northern and Southern Arizona
  - Provided Breast cancer data for their community profiles
- Research Triangle Institute (RTI) Study of Osteosarcoma Surveillance
  - RTI is conducting an Osteosarcoma surveillance study. The primary purpose of this study is to monitor Forteo™ exposure in Osteosarcoma patients to contribute to the scientific knowledge regarding possible prevalence of demographic characteristics and medical factors in adults with this rare cancer. The ACR provides RTI with a confidential data file for cases that meet eligibility requirements for the study.
- Participated in a New York Fire Department study that identified cancer among former firefighters
  - Provided linkage data to the City of New York of cancer diagnosed in its fire fighters in Arizona to help identify the effects of occupational exposure to known and suspected carcinogens that resulted from the attack on the World Trade Center on September 11, 2001.
- ACR data was used to assess breast cancer burden Arizona
  - The ACR and Well Woman HealthCheck Program wrote a report describing breast cancer incidence, mortality, and prevalence among Arizona women for the years 2000-2009.

Access to Arizona Cancer Registry Data:

- ACR Cancer Data Query System is an interactive query system that is an Indicator Based Information System for Public Health (IBIS-PH). This system allows the public to query cancer rates, mortality rates and population estimates for Arizona. It is updated three times

annually. This query system can be accessed on the internet at: http://healthdata.az.gov/query/module_selection/azcr/AzCRSelection.html.

- Community Health Analysis Areas (CHAAs): The Arizona Department of Health Services (ADHS) developed Community Health Analysis Areas (CHAAs) to better analyze cancer and other diseases within Arizona. The CHAA geography was developed for analysis of health data. It combines census boundaries, county, and city boundaries in 126 areas that maintain community characteristics. The ACR uses this geography to report community level cancer statistics. The analysis of cancer by CHAA can be accessed on the internet at: http://www.azdhs.gov/phs/azchaa/.

Education and Training:

- The ACR completed a revised Arizona Cancer Registry Coding Handbook that included the Commission on Cancer's "*Facility Oncology Registry Data Standards*" (FORDS) *Revised for 2011* and the *Arizona Cancer Registry Supplement.*
- The registry uses blast emails to update the cancer registry community about information on cancer data, educational opportunities, coding problems and solutions, upcoming changes, and data submission procedures for facilities.
- The ACR has held annual workshops for reporting facilities with the goal of improving the quality of data submitted. These workshops serve as important conduits for information on new reporting requirements and clarification of existing requirements.
- The ACR also hosts an Introductory Workshop for beginning registrars on an ad-hoc basis. The goal of these workshops is to provide an overview of reporting requirements and coding/abstracting, with a particular emphasis on hands-on exercises.

Arizona Cancer Registry (ACR) Overview

Historical Perspective: The ACR began operating in 1980 and started collecting information in 1981. Initially, the registry was a voluntary hospital-based reporting system. Mandatory reporting of all Arizona cases became effective in January 1, 1992. The rules require hospitals, clinics and physicians to report cases.

Funding: The ACR receives its funding from state legislature appropriations to the Arizona Department of Health Services. A matching enhancement fund to support and improve the registry is provided through the National Program of Cancer Registries (NPCR) from a CDC Cooperative Agreement 1U58DP003858.

Goals of the ACR:

- To collect complete and accurate incidence information and monitor incidence patterns
- To improve and maintain high standards in the quality of information collected
- To promote and assist hospital cancer registries
- To identify population subgroups at high risk for cancer
- To assist in the identification of geographic regions of this state that need intervention programs or epidemiological research, detection, and prevention
- To perform studies
- To provide biostatistics and epidemiologic information to the medical community

***The services provided to reporting facilities include*:** exchange of follow-up information, consultation and assistance, statistical support, response to data requests, response to coding and abstracting questions (technical support), training workshops, support of cancer registry software, and provision of all forms and manuals.

The quality assurance program is a comprehensive program that includes: reviewing data to ensure completeness and accuracy, visual editing, immediate and batch edits utilizing the Rocky Mountain Cancer Data System (RMCDS) software program and the CDC/North American Association of Central Cancer Registries (NAACCR) EDITS, additional reports are reviewed for accuracy, duplicate report checking, on-site case ascertainment reviews to determine the completeness of reporting at hospitals, on-site re-abstracting studies to ascertain the validity of the data submitted, internal review, and a timeliness and completeness monitoring program.

Annual Report: This annual report represents persons diagnosed with cancer in 2008-2009 who reside in Arizona. The Arizona Cancer Registry has had complete reporting of cancer since 1995 and 2009 marks the fifteenth complete year of population-based incidence reporting. The registry collects information on all invasive cancers and *in situ* neoplasms with the exception of cervix *in situ* and basal and squamous cell skin cancer. The registry also collects cases of benign brain tumors.

We hope that this document can provide useful information to assist with cancer control activities and provide information for intervention and prevention programs.

Acknowledgments: We would like to acknowledge all participating hospitals, clinics, physicians, and pathology laboratories (freestanding and hospital-based). The hospitals account for most of the reportable cases, providing complete identification and registration of each person with a diagnosis of cancer. Without their cooperation this report would not be possible.

We would like to recognize the New Mexico Tumor Registry (NMTR), which travels into Arizona to collect information in the Indian Health Services (IHS) facilities. Through our agreement with NMTR and IHS, we are able to have complete reporting from Native Americans in the state.

Confidentiality Definition and Procedures

Confidentiality: As per A.R.S. §36-133 E. Information collected on individuals by the surveillance system that can identify an individual is confidential.

In addition, the ACR had established policies and procedures for the management and disclosure of confidential information to further protect privacy. All patient information is maintained in a confidential manner, consistent with the law, between the ACR and the reporting source. Policies do allow releasing aggregate data to anyone on request.

Copies and information: Additional information can be obtained by contacting the Arizona Cancer Registry at (602) 542-7320 or at: http://www.azdhs.gov/phs/phstats/cancer-registry/index.htm. Copies of this report are available on the website.

Introduction to the Annual Report

This annual report includes cases diagnosed in 2008 and 2009, and trend data dating back to year 2000. This report focuses on invasive cancer cases with the exception of basal and squamous cell skin cancer cases, which were not reportable to the ACR. In situ cases were included in Table 1, Cancer Cases by Primary Site and Behavior, Average Annual Count, 2008-2009. In situ urinary bladder cases were also combined with invasive urinary bladder cases in many of the tables and graphs depicting invasive cancer cases. This approach was used to create data comparable to the Surveillance, Epidemiology, and End Results (SEER) program reports. It uses the SEER definitions of the cases by cancer type, and this is presented in the tables in the Appendix.

The first chapter contains information on cancer incidence in Arizona by primary site and characteristics of the population. The second chapter contains information on cancer mortality. These chapters present cancer data that has been combined a two-year period. For year-specific data on cancer mortality refer to the Arizona Health Status and Vital Statistics Report which is available online at http://www.azdhs.gov/plan/report/ahs/index.htm.

The third and final chapter contains in depth statistics on select cancers: female breast, colorectal, and cervix.

The format of the chapters of this report was chosen so that information about cancer in Arizona would be easy to understand and meaningful in its presentation. Tables with incidence rates that were calculated based on small numerators (case counts less than 10) are denoted by a '^'.

The user of this report should take care to review the methods of collecting and presenting the data, and all footnotes attached to the tables, and graphs before interpreting the information.

Methodology

Data Sources:

The cases used for this annual report are taken from hospital, clinic, and physician case reports. Also cases identified through pathology lab review and cases identified from death certificates. Cases are also received from data exchanges with 21 state registries, linkages with the Breast and Cervical Cancer Early Detection Programs for Arizona, Hopi and Navajo tribes, and reports from Indian Health Services facilities abstracted by the New Mexico Tumor Registry (NMTR) and received through a trilateral agreement with the Indian Health Service and NMTR.

Measures:

The measures and data characteristics reported here are collected, abstracted and coded with codes consistent with the North American Association of Central Cancer Registry (NAACCR) national standards. The Arizona Coding Handbook includes the standards of the American College of Surgeons Commission on Cancer's "Facility Oncology Registry Data Standards" (FORDS) and follows NAACCR standards to insure comparability.

Primary Site and Histologic Type
Primary site and histologic type were classified according to the International Classification of Diseases for Oncology, Third Edition (a.k.a. ICD-O-3).

Behavior
Behavior code: The 5th digit of the morphology code that indicates the growth pattern of a tumor, and whether or not it is invasive.

- Invasive: A malignant tumor that has invaded the basement membrane of the tissue of origin
- *In situ*: Non-infiltrating, non-invasive intraepithelial tumor cells that have not penetrated the basement membrane or extended beyond the epithelial tissue

Race/Ethnicity
Race/Ethnicity is identified from the physician's notations and the medical record that generally contains information concerning a person's race and ethnicity. American Indian race is also identified through linkage with Indian Health Service (IHS) data. The linkage identifies cases that may be misclassified as another race. Race – Ethnicity definitions used in this report are; White non-Hispanic, White Hispanic, Black, American Indian, and Asian/Pacific Islander Incidence rates were divided into two ethnicity categories: Hispanic and non-Hispanic. For this report, all cases with an unknown ethnicity were considered non-Hispanic.

Age at Diagnosis
Age groups were divided into eight 10-year age groups for incidence counts for ages 0-79 and for all cases age 80 and above. Mortality counts were divided into eight 10-year age groups from ages 5-84, a 0-4 year age group, and an 85+ age group.

Residence at Diagnosis
The residency of cases at the time of diagnosis was grouped by county and by Arizona versus non-Arizona resident. Non-Arizona residents were excluded in the analysis.

Analytic Procedures:

Analysis Software Used

Both SAS v9.2 and IBM SPSS statistics were used to analyze data. SAS was used to calculate age adjusted rates, while SPSS was used to tabulate case counts.

Incidence Counts
Incidence counts were the number of cases diagnosed with a reportable cancer in 2008-2009 by diagnosis year. A cancer case can either be a tumor originating in one primary site or may be a systemic cancer of a specific histologic type. More than one cancer case may be reported for an individual. This "one-to-many" relationship results in a higher number of cancer cases than individual persons recorded in the registry.

Certain demographic variables may be unknown for some cases. Therefore comparing total numbers between different figures and tables may not yield equal numbers. Additionally, the totals for all categories within a figure or table may not equal the state total.

Additionally, 2008-2009 data may under-represent some rural areas of the state as case ascertainment at a few rural hospitals was not completed. The effect of this may be lower than expected rates and counts for that year for some rural counties.

Age Adjusted Incidence and Mortality Rates

Age adjustment is a process used to compare incidence and mortality rates over time or among geographic areas or populations that have different age distributions. Because most disease rates increase with increasing age, age-adjustment eliminates the confounding effect of age when comparing rates.

Beginning with the 1999 data year, federal agencies and the Arizona Cancer Registry have adopted the year 2000 projected U.S. population as the new standard for age-adjusting incidence and mortality rates. All incidence and mortality rates were adjusted using the 2000 U.S. standard population by the direct method and were presented as number of cancers per 100,000 persons.

Cancer mortality rates were calculated on counts of cancer deaths that meet all of the following criteria:

- The cancer death occurs to an Arizona resident
- The primary cause of death is coded C00 to C97 using ICD-l0*
- The case is reported to the Arizona Office of Vital Records

*The primary cause of death is classified according to the International Classification of Diseases, Injuries and Causes of Death, Tenth Revision, 1992.

Average Counts and Rates

This report contains several figures and tables that average two years of data to produce an average annual count. When doing so, each averaged number is calculated separately, and rounded to a whole number. Due to rounding the *total* rounded value may not equal the total of two individually calculated numbers in that category.

Population Denominators

The population numbers used for analysis in this report were taken from United States Census Bureau and modified by SEER. The SEER program applied a race/ethnicity bridge to the population numbers previous to the year 2000 to more accurately estimate the number of minorities in years previous to the 2000 census. New intercensal estimates were developed to reflect the actual yearly changes in populations based on the 2010 census. These changes lowered the expected population for Arizona in each year as population projections used in the past had over-estimated the state and county populations. These new populations slightly increase the rate of cancer. The ACR chose to use these population numbers for calculating age-adjusted rates in order to be comparable with other state and national cancer data.

Confidence Intervals

For this annual report, a 95 percent confidence interval is used for age adjusted incidence and mortality rates. It is expected that the age adjusted rate for the variables analyzed with a confidence bound will fall within the interval bounds 95 percent of the time. Significance is determined when no overlap is observed between the state rate and the variable measure. The incidence rate significance is evaluated in the "race by county" tables.

Confidence intervals are used to identify incidence rates that are significantly higher or lower than the Arizona incidence rate in tables 4 through 9. Cases with a higher than expected rate are denoted with '*' and with "†" when the rate is lower than expected. For figures in which the age adjusted rates in the figure are compared to the Arizona age adjusted rate the confidence bounds of the figure are represented by ⌶.

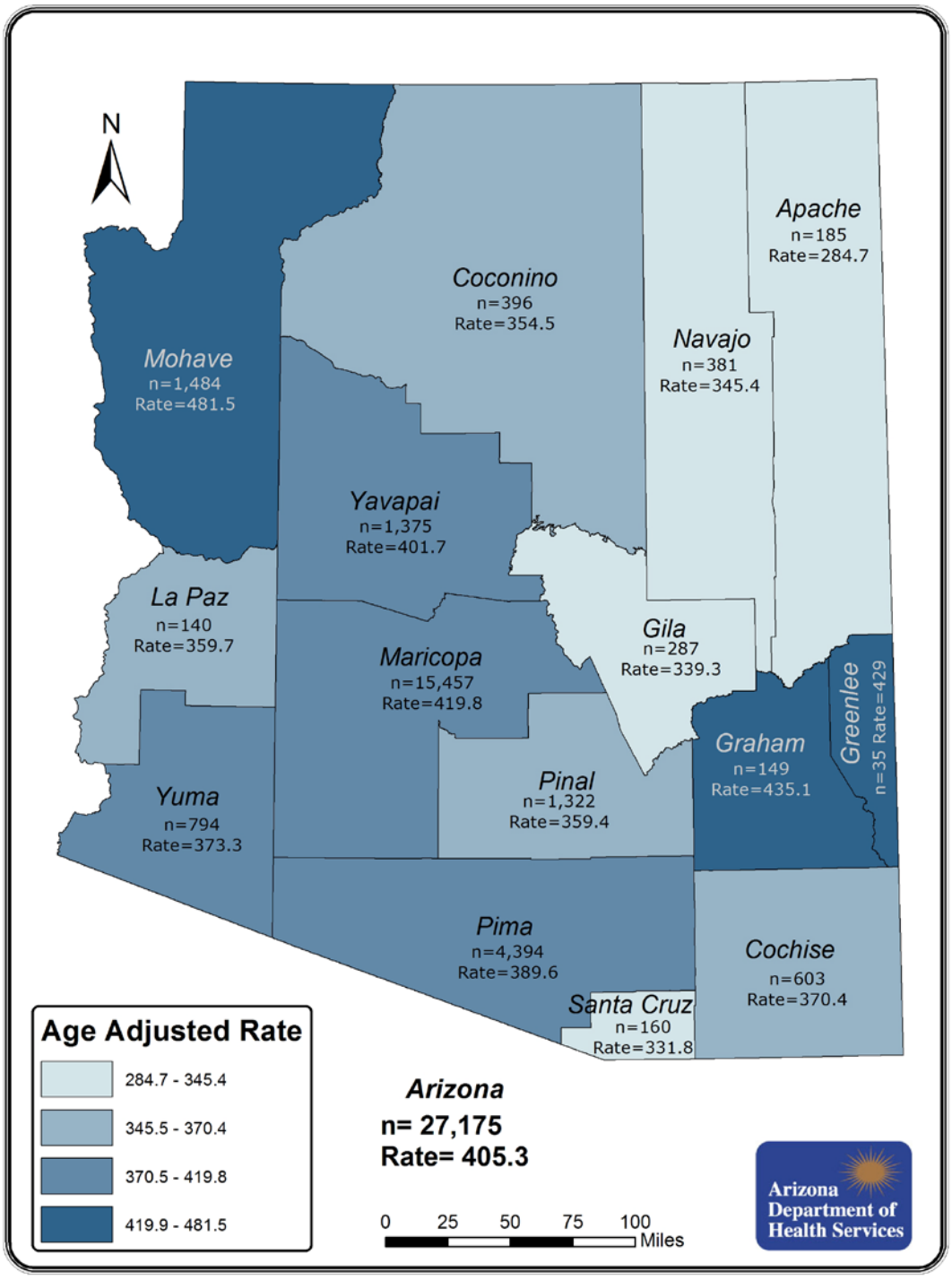
Caution in Using Small Numbers

The intent of these data is to provide the reader with useful information on cancer in Arizona. However, it is important not to mislead the data users on the meaning of this data. Rates or other analysis based on fewer than 10 cases are not considered statistically reliable and are denoted by a ' ^ ' in the rate tables. However, zero cases are denoted by 0.0 in the tables.

CHAPTER 1

Cancer Incidence
2008-2009

Incidence of Invasive Cancer in Arizona
Average Annual Counts and Age-Adjusted Rates by County
2008-2009



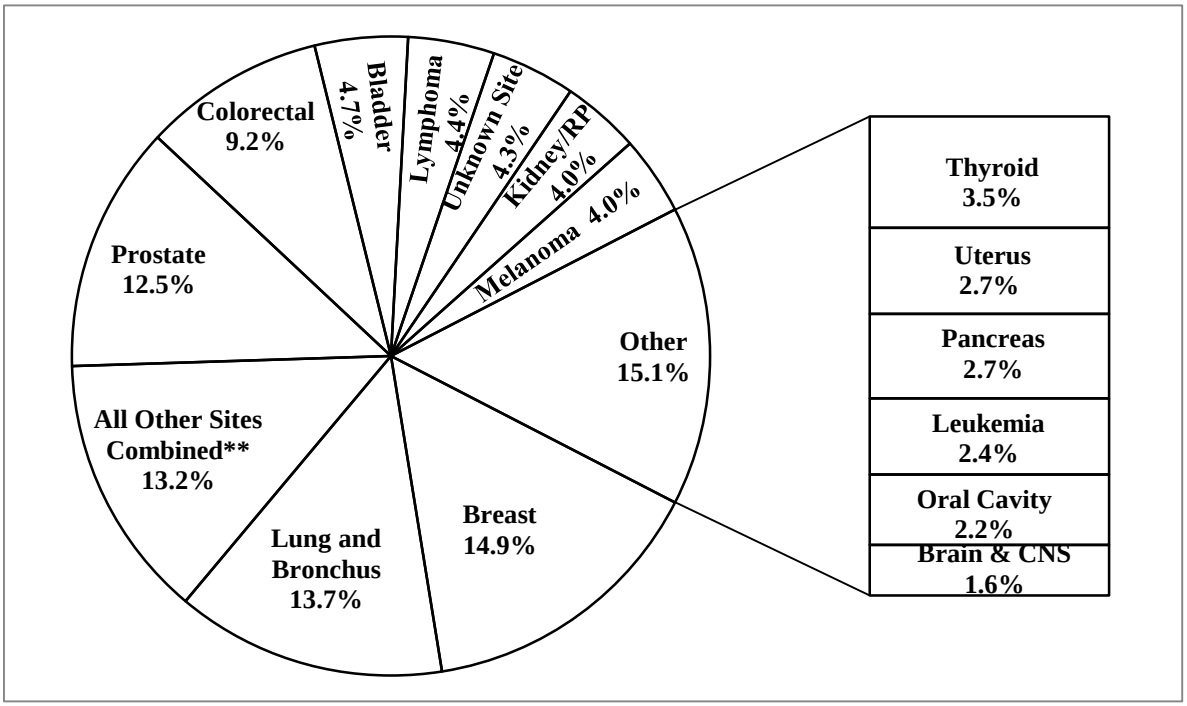
Note: The sum of the cases per county does not equal the state total listed in this map due to rounding and the inclusion of an average of 15 cases per year with an unknown county of residence.

Figure 1: Ten Leading Sites* of Invasive Cancer Cases by Site and Gender, Average Annual Count, 2008-2009

Male	Female
1. Prostate (3,400)	1. Breast (4,001)
2. Lung & Bronchus (1,959)	2. Lung & Bronchus (1,765)
3. Colorectal (1,324)	3. Colorectal (1,165)
4. Bladder, incl. *In situ* (970)	4. Uterus (738)
5. Kidney/Renal Pelvis (662)	5. Thyroid (735)
6. Melanoma of the Skin (645)	6. Lymphoma (557)
7. Lymphoma (628)	Other, NOS (553)
Other NOS (628)	7. Melanoma of the Skin (441)
8. Oral Cavity (421)	8. Ovary (420)
9. Leukemia (369)	9. Kidney/Renal Pelvis (412)
10. Pancreas (364)	10. Pancreas (362)

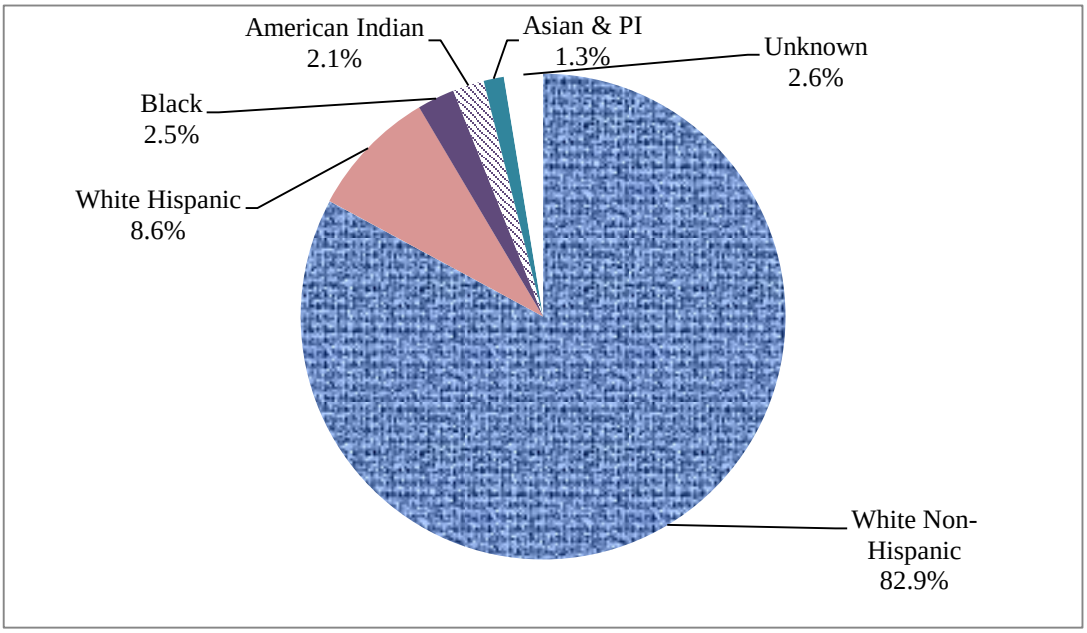
*Note: Ten Leading Sites in addition to 'Other, NOS';
Other, NOS=Ill-defined site or site not otherwise specified and unknown site of origin

Figure 2: Invasive Case Distribution by Site Based on Average Annual Count, Arizona, 2008-2009



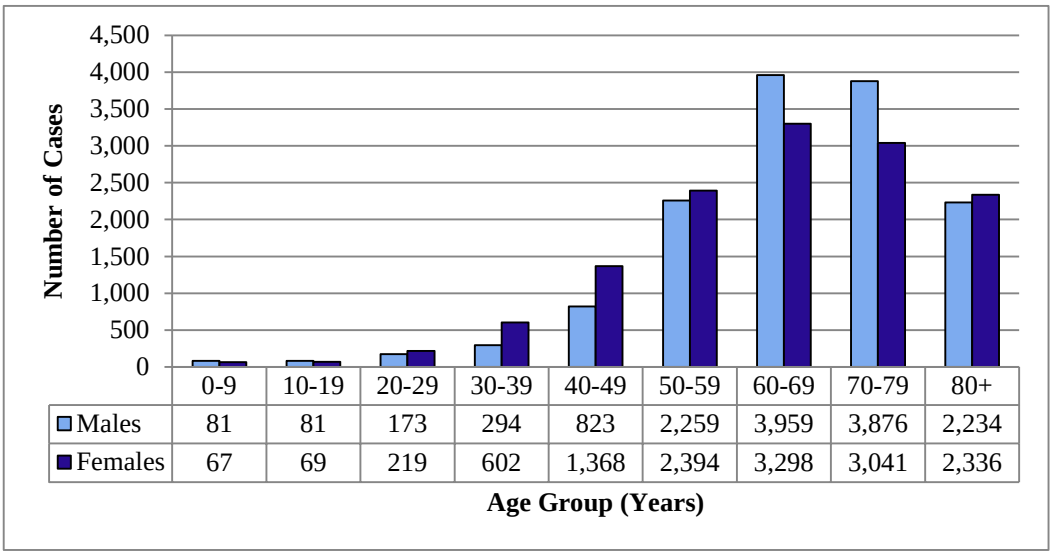
Note: *Percentage of bladder cases includes invasive and *in situ* cases.
Bladder cases include an average of 646 *in situ* cases.
** All Other Combined includes all other primary sites not specifically listed in this chart.

Figure 3: Invasive Cancer Cases by Percent of Race/Ethnicity 2008-2009



*Unknown category includes 'other' race. Self-identified race is listed as "other" when the patient does not identify a recognized racial group.

Figure 4: Invasive Cancer Cases by Age and Gender in Arizona, Average Annual Count, 2008 -2009



	0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80+
Males	81	81	173	294	823	2,259	3,959	3,876	2,234
Females	67	69	219	602	1,368	2,394	3,298	3,041	2,336

Note: Distribution by age and gender excludes an average of 2 hermaphrodites or transsexuals, and 4 cases with an unknown age for both years combined. Counts were a two-year average for diagnosis years 2008-2009. Average of total of all cases does not equal the sum of the average of each age group due to rounding.

Table 1: All Cancer Cases by Primary Site and Behavior, Average Annual Count, 2008-2009

	Behavior		
Primary Site	**In Situ**	**Invasive**	**Total**
Total, All Sites	2,544	26,529*	29,073
Oral Cavity and Pharynx	19	608	627
Lip	5	23	28
Tongue	5	199	204
Salivary Gland	0	74	74
Floor of Mouth	4	33	37
Gum and Other Mouth	2	80	82
Nasopharynx	1	30	31
Tonsil	1	109	110
Oropharynx	0	20	20
Hypopharynx	1	26	27
Other Oral Cavity and Pharynx	0	14	14
Digestive System	92	4,765	4,857
Esophagus	4	304	308
Stomach	2	338	340
Small Intestine	0	116	116
Colorectal	62	2,489	2,551
Colon excluding Rectum	41	1,820	1,861
Rectum Rectosigmoid	21	669	690
Anus	17	100	117
Liver and Intrahepatic Bile Duct	0	449	449
Liver	0	423	423
Intrahepatic Bile Duct	0	26	26
Gallbladder	3	64	67
Other Biliary	1	105	106
Pancreas	3	726	729
Retroperitoneum, Peritoneum, Omentum, Mesentery	0	54	54
Other Digestive Organs	0	20	20
Respiratory System	17	3,994	4,011
Nose, Nasal Cavity, Middle Ear	1	39	40
Larynx	11	168	179
Lung and Bronchus	4	3,725	3,729
Pleura	0	50	50
Trachea, Mediastinum and Other Respiratory Organs	1	12	13
Bones and Joints	0	62	62
Soft Tissue Including Heart	0	212	212
Skin Excluding Basal and Squamous	638	1,174	1,812
Melanoma	637	1,087	1,724
Other Skin	1	87	88
Breast**	967	4,061	5,028

Table 1: All Cancer Cases by Primary Site and Behavior, Average Annual Count, 2008-2009 (Continued)

	Behavior		
Primary Site	**In Situ**	**Invasive**	**Total**
Female Genital System	110	1,485	1,595
Cervix	0	224	224
Corpus Uteri	7	700	707
Uterus NOS	0	38	38
Ovary	2	420	422
Vagina	17	17	34
Vulva	82	61	143
Other Female Genital Organs	2	25	27
Male Genital System	12	3,601	3,613
Prostate	1	3,400	3,401
Testis	1	173	174
Penis	9	23	32
Other Male Genital Organs	1	5	6
Urinary System	696	1,759	2,455
Urinary Bladder*	646	633	1,279
Kidney and Renal Pelvis	25	1,074	1,099
Ureter	17	32	49
Other Urinary Organs	8	20	28
Eye and Orbit	3	62	65
Brain and Other Nervous System	0	449	449
Brain	0	421	421
Cranial Nerves and Other Nervous System	0	28	28
Endocrine System	2	993	995
Thyroid	2	953	955
Other Endocrine including Thymus	0	40	40
Lymphoma	0	1,185	1,185
Hodgkin's Lymphoma	0	139	139
Non-Hodgkin's Lymphoma	0	1,046	1,046
Multiple Myeloma	0	297	297
Leukemia	0	657	657
Lymphocytic Leukemia	0	301	301
Myeloid and Monocytic Leukemia	0	304	304
Other Leukemia	0	52	52
Ill Defined and Unspecified* **	0	1,181	1,181

Note: Counts were a two-year average for diagnosis years 2008-2009. Average of total of all cases does not equal the sum of the average of each cancer site due to rounding.

* The invasive case count excludes in-situ bladder cases that are included in all other figures and tables that count invasive bladder cases.

**Includes male breast cancer

***Ill-defined and unspecified site includes cases where the primary site can't be specifically identified.

Table 2: Invasive Cancer Cases by Primary Site and Gender, 2008-2009						
	2008			2009		
Primary Site	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**
Total, All Sites	13,443	13,042	26,488*	14,116	13,745	27,862*
Oral Cavity and Pharynx	417	201	618	425	169	594
Lip	21	8	29	14	3	17
Tongue	131	65	196	151	50	201
Salivary Gland	44	29	73	50	25	75
Floor of Mouth	28	15	43	15	8	23
Gum and Other Mouth	36	32	68	52	40	92
Nasopharynx	28	6	34	18	7	25
Tonsil	92	24	116	85	17	102
Oropharynx	8	9	17	14	9	23
Hypopharynx	19	9	28	17	6	23
Other Oral Cavity and Pharynx	10	4	14	9	4	13
Digestive System	2,641	2,005	4,646	2,740	2,135	4,875
Esophagus	231	49	280	261	66	327
Stomach	205	117	322	227	127	354
Small Intestine	63	48	111	72	49	121
Colorectal	1,332	1,123	2,455	1,316	1,206	2,522
Colon excluding Rectum	929	885	1,814	918	908	1,826
Rectum Rectosigmoid	403	238	641	398	298	696
Anus	35	55	90	39	70	109
Liver and Intrahepatic Bile Duct	315	113	428	344	125	469
Liver	303	100	403	328	114	442
Intrahepatic Bile Duct	12	13	25	16	11	27
Gallbladder	23	36	59	18	51	69
Other Biliary	58	48	106	60	43	103
Pancreas	349	358	707	379	365	744
Retroperitoneum, Peritoneum, Omentum, Mesentery	21	46	67	14	25	39
Other Digestive Organs	9	12	21	10	8	18
Respiratory System	2,107	1,761	3,868	2,212	1,904	4,117*
Nose, Nasal Cavity, Middle Ear	24	16	40	20	18	38
Larynx	134	35	169	127	39	166
Lung and Bronchus	1,905	1,692	3,597	2,013	1,838	3,852*
Pleura	34	12	46	47	7	54
Trachea, Mediastinum and Other Respiratory Organs	10	6	16	5	2	7
Bones and Joints	30	23	53	35	36	71
Soft Tissue Including Heart	114	84	198	126	100	226
Skin Excluding Basal and Squamous	652	422	1,075*	762	510	1,272
Melanoma	592	396	989*	698	486	1,184
Other Skin	60	26	86	64	24	88
Breast	60	3,984	4,046*	57	4,018	4,075

Table 2: Invasive Cancer Cases by Primary Site and Gender, 2008-2009 (Continued)						
	2008			2009		
Primary Site	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**
Female Genital System	0	1,429	1,429	0	1,538	1,538
Cervix	0	222	222	0	226	226
Corpus Uteri	0	662	662	0	738	738
Uterus NOS	0	33	33	0	43	43
Ovary	0	417	417	0	423	423
Vagina	0	18	18	0	15	15
Vulva	0	56	56	0	65	65
Other Female Genital Organs	0	21	21	0	28	28
Male Genital System	3,586	0	3,586	3,615	0	3,615
Prostate	3,386	0	3,386	3,413	0	3,413
Testis	172	0	172	174	0	174
Penis	23	0	23	23	0	23
Other Male Genital Organs	5	0	5	5	0	5
Urinary System**	1,606	735	2,341	1,728	739	2,467
Urinary Bladder**	953	316	1,269	987	302	1,289
Kidney and Renal Pelvis	619	394	1,013	705	429	1,134
Ureter	17	18	35	24	5	29
Other Urinary Organs	17	7	24	12	3	15
Eye and Orbit	29	26	55	28	41	69
Brain and Other Nervous System	249	197	446	249	201	450
Brain	235	183	418	235	188	423
Cranial Nerves and Other Nervous System	14	14	28	14	13	25
Endocrine System	250	744	994	230	761	991
Thyroid	225	726	951	212	743	955
Other Endocrine including Thymus	25	18	43	18	18	36
Lymphoma	600	528	1,128	655	586	1,241
Hodgkin's Lymphoma	63	67	130	79	68	147
Non-Hodgkin's Lymphoma	537	461	998	576	518	1,094
Multiple Myeloma	175	103	278	188	127	315
Leukemia	337	280	617	400	295	695
Lymphocytic Leukemia	159	131	290	185	126	311
Myeloid and Monocytic Leukemia	161	129	290	176	142	318
Other Leukemia	17	20	37	39	27	66
Ill Defined and Unspecified***	590	520	1,110	666	585	1,251

Note: NA= Not Applicable

* Total cases includes Hermaphrodite and Transsexual Cases

** Urinary bladder includes in-situ cases

***Ill-defined and unspecified site includes cases where the primary site can’t be specifically identified.

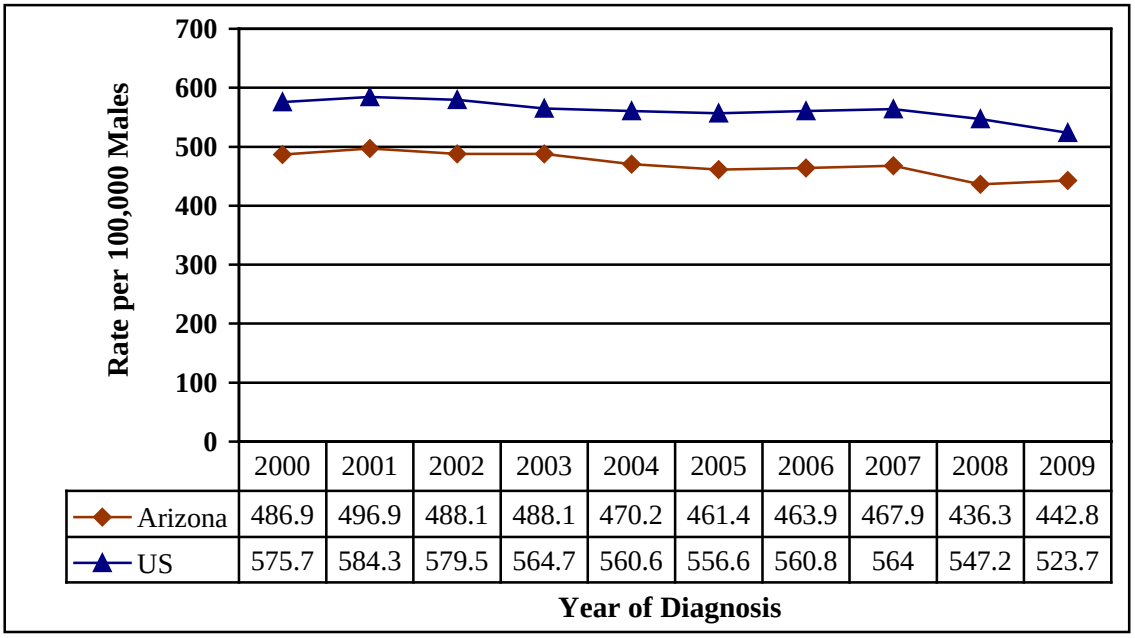
Table 3: Age-Adjusted Incidence Rates of Invasive Cancer Cases by Primary Site and Gender, 2008-2009						
	2008			2009		
Primary Site	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**
Total, All Sites	436.7	375.2	401.1	442.9	385.2	409.3
Oral Cavity and Pharynx	13.2	5.7	9.2	13.1	4.7	8.6
Lip	0.7	0.2^	0.4	0.5	0.1^	0.3
Tongue	4.1	1.9	2.9	4.6	1.4	2.9
Salivary Gland	1.5	0.8	1.1	1.6	0.7	1.1
Floor of Mouth	0.9	0.4	0.6	0.4	0.2^	0.3
Gum and Other Mouth	1.2	0.9	1.0	1.6	1.1	1.3
Nasopharynx	0.9	0.2^	0.5	0.6	0.2^	0.4
Tonsil	2.8	0.7	1.7	2.5	0.4	1.4
Oropharynx	0.3^	0.2^	0.3	0.4	0.2^	0.3
Hypopharynx	0.6	0.3^	0.4	0.5	0.2^	0.3
Other Oral Cavity and Pharynx	0.3	0.1^	0.2	0.3^	0.1^	0.2
Digestive System	86.7	56.7	70.6	86.8	58.1	71.4
Esophagus	7.5	1.3	4.2	8.1	1.8	4.7
Stomach	6.8	3.4	5.0	7.4	3.5	5.3
Small Intestine	2.1	1.3	1.7	2.3	1.4	1.8
Colorectal	44.0	32.0	37.6	41.9	31.1	37.2
Colon excluding Rectum	30.9	25.0	27.8	29.5	24.8	27.0
Rectum Rectosigmoid	13.1	7.0	9.8	12.4	8.3	10.2
Anus	1.2	1.5	1.3	1.2	1.9	1.6
Liver and Intrahepatic Bile Duct	9.8	3.1	6.3	10.6	3.3	6.7
Liver	9.4	2.7	5.9	10.0	3.1	6.3
Intrahepatic Bile Duct	0.4	0.4	0.4	0.5	0.3	0.4
Gallbladder	0.8	1.0	0.9	0.6	1.4	1.0
Other Biliary	1.9	1.4	1.6	2.0	1.2	1.5
Pancreas	11.7	10.0	10.7	12.0	9.8	10.8
Retroperitoneum, Peritoneum, Omentum, Mesentery	0.6	1.3	1.0	0.4	0.7	0.6
Other Digestive Organs	0.3^	0.3	0.3	0.3	0.2^	0.3
Respiratory System	69.4	49.0	58.1	70.0	52.0	60.0
Nose, Nasal Cavity, Middle Ear	0.8	0.5	0.6	0.6	0.5	0.5
Larynx	4.3	1.0	2.5	3.9	1.1	2.4
Lung and Bronchus	62.9	47.0	54.1	63.9	50.2	56.3
Pleura	1.1	0.3	0.7	1.5	0.2†	0.8
Trachea, Mediastinum and Other Respiratory Organs	0.3	0.2	0.2	0.1^	0.1^	0.1^
Bones and Joints	1.0	0.7	0.8	1.1	1.1	1.1
Soft Tissue Including Heart	3.8	2.4	3.1	4.0	2.9	3.4
Skin Excluding Basal and Squamous	21.6	12.6	16.7	24.6	1	19.2
Melanoma	19.5	11.9	15.3	22.4	14.1	17.8
Other Skin	2.1	0.8	1.3	2.2	0.7	1.4
Breast	1.9	115.5	61.7	1.8	113.2	60.3

Table 3: Age-Adjusted Incidence Rates of Invasive Cancer Cases by Primary Site and Gender, 2008-2009 (Continued)

	2008			2009		
Primary Site	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**
Cervix	NA	6.9	NA	NA	7.1	NA
Corpus Uteri	NA	18.5	NA	NA	20.2	NA
Uterus NOS	NA	0.9	NA	NA	1.2	NA
Ovary	NA	12.0	NA	NA	11.7	NA
Vagina	NA	0.5	NA	NA	0.4	NA
Vulva	NA	1.6	NA	NA	1.8	NA
Other Female Genital Organs	NA	0.6	NA	NA	0.8	NA
Male Genital System	111.5	NA	NA	108.4	NA	NA
Prostate	105.0	NA	NA	101.8	NA	NA
Testis	5.6	NA	NA	5.7	NA	NA
Penis	0.8	NA	NA	0.7	NA	NA
Other Male Genital Organs	0.2†	NA	NA	0.2^	NA	NA
Urinary System**	53.5	20.7	35.5	55.3	20.4	36.2
Urinary Bladder**	32.4	8.8	19.3	32.1	8.1	18.9
Kidney and Renal Pelvis	20.0	11.2	15.3	22.1	12.1	16.7
Ureter	0.6	0.5	0.5	0.8	0.1^	0.4
Other Urinary Organs	0.5	0.2	0.3	0.4	0.1^	0.2
Eye and Orbit	0.9	0.8	0.8	0.9	1.2	1.0
Brain and Other Nervous System	8.1	5.9	6.9	7.7	5.8	6.7
Brain	7.6	5.5	6.5	7.3	5.4	6.3
Cranial Nerves and Other Nervous System	0.5	0.4	0.4	0.4	0.4	0.4
Endocrine System	7.8	23.5	15.8	7.2	22.8	15.5
Thyroid	7.2	22.9	15.1	6.7	23.2	15.0
Other Endocrine including Thymus	0.8	0.5	0.7	0.5	0.5	0.5
Lymphoma	20.3	15.2	17.5	20.3	15.8	18.5
Hodgkin's Lymphoma	2.1	2.1	2.1	2.5	2.1	2.3
Non-Hodgkin's Lymphoma	18.2	13.1	15.4	18.5	14.3	16.2
Multiple Myeloma	5.8	2.8	4.2	5.9	3.4	4.6
Leukemia	11.2	8.1	9.5	12.9	8.4	10.5
Lymphocytic Leukemia	5.2	3.8	4.7	5.9	3.6	4.7
Myeloid and Monocytic Leukemia	5.4	3.8	4.8	5.7	4.1	4.8
Other Leukemia	0.6	0.5	1.0	1.3	0.7	1.0
Ill Defined and Unspecified***	19.9	13.8	16.9	22.0	16.0	17.4

^ Fewer than 10 cases reported. The rate is considered unstable

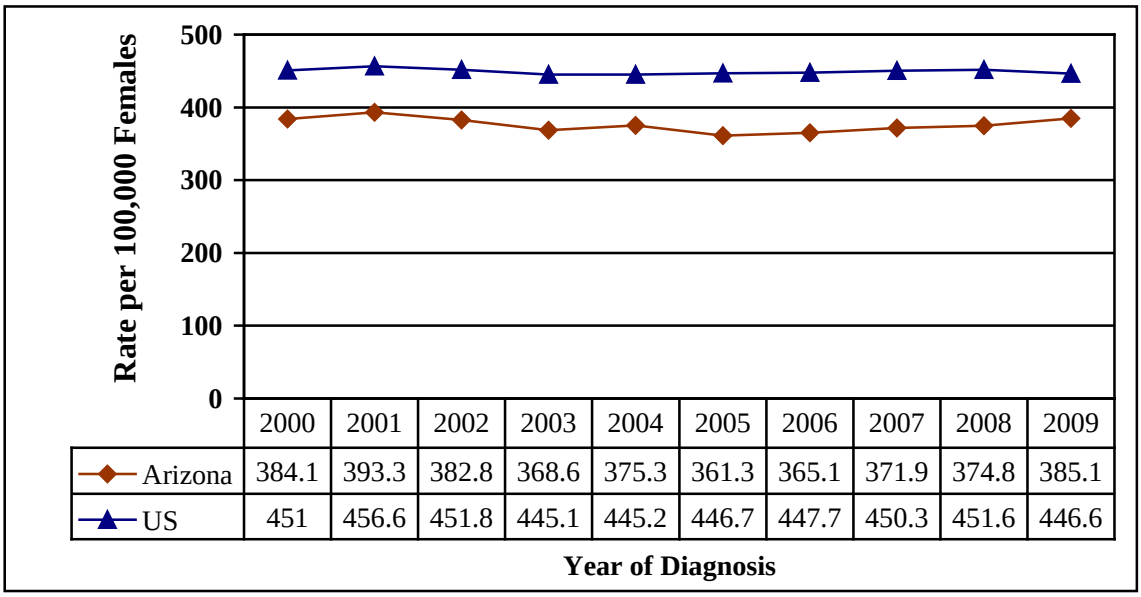
Figure 5: Comparison of U.S.* and Arizona Age-Adjusted Incidence Rates Among Males All Sites, 2000-2009



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Arizona	486.9	496.9	488.1	488.1	470.2	461.4	463.9	467.9	436.3	442.8
US	575.7	584.3	579.5	564.7	560.6	556.6	560.8	564	547.2	523.7

*United States Cancer Statistics: 1999 - 2009 Incidence, WONDER Online Database. United States Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; 2011. Accessed at http://wonder.cdc.gov/cancer-v2009.html on Feb 22, 2013

Figure 6: Comparison of U.S.* and Arizona Age-Adjusted Incidence Rates Among Females All Sites, 2000-2009



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Arizona	384.1	393.3	382.8	368.6	375.3	361.3	365.1	371.9	374.8	385.1
US	451	456.6	451.8	445.1	445.2	446.7	447.7	450.3	451.6	446.6

* United States Cancer Statistics: 1999 - 2009 Incidence, WONDER Online Database. United States Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; 2011. Accessed at http://wonder.cdc.gov/cancer-v2009.html on Feb 22, 2013

Table 4: Age-Adjusted Incidence Rates of Invasive Cancer Cases by County and Gender, All Races, in Arizona, 2008-2009

County	2008			2009		
	Male	Female	Total	Male	Female	Total
Apache	349.2†	199.0†	269.3†	378.8	236.0†	299.0†
Cochise	391.7	383.4	385.2	363.4†	350.4	355.6†
Coconino	397.6	327.1	361.6†	374.6†	327.2†	347.5†
Gila	346.7†	290.0†	313.3†	377.4†	358.8	364.9†
Graham	407.1	369.8	386.6	464.1	523.2*	482.3
Greenlee	474.0	443.2	425.7	650.2	224.2^	429.6
La Paz	431.8	270.6†	352.4	343.6†	390.1	367.1
Maricopa	459.8*	389.9*	417.9*	459.8*	395.7*	421.5*
Mohave	511.7*	418.6*	462.5*	544.7*	456.0*	500.1*
Navajo	370.3†	315.2†	338.2†	393.9	323.2†	352.5†
Pima	405.8†	363.8	381.0†	413.5†	389.4	397.8
Pinal	378.9†	339.8†	357.7†	413.9	317.8†	361.0†
Santa Cruz	356.2	270.7†	306.9†	380.9	332.2	356.1
Yavapai	442.3	369.5	403.6	433.7	370.3	399.6
Yuma	402.2	349.9	374.1†	406.4	341.6†	372.6†
ARIZONA	**436.7**	**375.2**	**401.1**	**442.9**	**385.2**	**409.3**

^ Fewer than 10 cases reported. The rate is considered unstable.
* Significantly higher than Arizona Cancer Rate by gender
† Significantly Lower than Arizona Cancer Rate by gender

Table 5: Age-Adjusted Incidence Rates of Invasive Cancer Cases by County and Gender for White Non-Hispanics in Arizona, 2008-2009

County	2008			2009		
	Male	Female	Total	Male	Female	Total
Apache	419.6	386.2	407.9	477.7	325.4	406.5
Cochise	430.8	444.6*	435.8	376.5†	410.5†	392.6
Coconino	376.7†	427.0	405.7	424.8	422.8	420.6†
Gila	325.9†	309.4	313.2†	397.9	429.3	410.2
Graham	535.5	430.4	483.7	491.4	482.1	473.2
Greenlee	448.8^	727.1	526.2	793.8	276.0	562.1
La Paz	525.3	273.9	401.5	332.6†	454.7	393.3
Maricopa	483.9	419.5*	445.0*	481.9*	429.6	449.7*
Mohave	516.5	447.3*	479.7*	536.5*	487.1*	512.0*
Navajo	405.1†	384.9	393.0	385.2†	357.6	369.7†
Pima	429.8†	385.7	403.9†	441.0†	430.6	432.1
Pinal	403.0†	371.6	386.4†	431.7	360.1†	391.9†
Santa Cruz	576.4	599.5	573.8	482.4	531.5	506.5
Yavapai	456.6	384.3	418.1	442.2	384.2†	410.9†
Yuma	468.1	449.1*	455.4	487.2	437.0	459.3
ARIZONA	**463.1**	**409.7**	**432.0**	**466.2**	**424.8**	**441.2**

^ Fewer than 10 cases reported. The rate is considered unstable.
* Significantly higher than Arizona Cancer Rate by gender
† Significantly Lower than Arizona Cancer Rate by gender

Table 6: Age-Adjusted Incidence Rates of Invasive Cancer Cases by County and Gender for White Hispanics in Arizona, 2008-2009

County	2008			2009		
	Male	Female	Total	Male	Female	Total
Apache	350.7^	0.0	151.7	52.7^	83.5^	65.8^
Cochise	262.8	168.2	206.9	302.2	191.2	238.3
Coconino	414.9	242.3	318.7†	211.5^	83.9^	142.7†
Gila	231.6^	216.8	219.7	233.6	169.6^	199.1
Graham	244.3^	162.3^	189.9	152.1^	278.5	212.9
Greenlee	505.2^	261.8^	300.7	338.1^	185.1^	250.8^
La Paz	284.9^	0.0	161.3	258.9^	157.5^	205.7^
Maricopa	287.7	246.8	261.3	278.2	223.5	246.6
Mohave	299.8	159.1†	224.0	169.4*	128.7†	148.6†
Navajo	200.1^	226.6^	214.3	170.6^	96.0^	128.1^
Pima	277.4	280.8*	277.8	254.7	225.9	235.9
Pinal	264.2	204.7	232.3	315.5	129.5†	215.8
Santa Cruz	199.3†	181.6	189.2†	313.3	243.3	272.5
Yavapai	220.7	164.3	194.2	246.5	172.1	210.3
Yuma	305.9	256.3	279.0	279.4	248.1	262.4
ARIZONA	**280.5**	**243.2**	**257.3**	**270.9**	**215.3**	**238.5**

^ Fewer than 10 cases reported. The rate is considered unstable.
* Significantly higher than Arizona Cancer Rate by gender
† Significantly Lower than Arizona Cancer Rate by gender

Table 7: Age-Adjusted Incidence Rates of Invasive Cancer Cases by County and Gender for Blacks in Arizona, 2008-2009

County	2008			2009		
	Male	Female	Total	Male	Female	Total
Apache	0.0	0.0	0.0	782.6^	0.0	467.3^
Cochise	119.1^	256.4^	182.3†	96.3^	303.6^	192.6†
Coconino	1114.1^	158.9^	560.7^	790.3^	480.0^	787.0^
Gila	0.0	0.0	0.0	0.0	775.9^	228.2^
Graham	0.0	0.0	0.0	0.0	0.0	0.0
Greenlee	1293.1^	0.0	969.8^	0.0	0.0	0.0
La Paz	0.0	0.0	0.0	0.0	0.0	0.0
Maricopa	463.0	316.7	381.0	432.6	330.4	374.5
Mohave	421.1^	185.7^	272.4^	457.4^	214.9^	351.5^
Navajo	134.6^	241.2^	180.3^	1010.9^	528.2^	773.1^
Pima	328.7	286.0	306.3	404.9	382.7	390.5
Pinal	307.2	550.3	424.6	380.5	362.2	343.4
Santa Cruz	387.7^	0.0	258.5^	0.0	0.0	0.0
Yavapai	358.2^	240.3^	293.5^	1202.6^	336.3^	757.7
Yuma	100.1^	135.3^	137.3^	431.6^	385.2^	346.3
ARIZONA	**414.0**	**306.3**	**355.8**	**429.6**	**342.8**	**379.1**

^ Fewer than 10 cases reported. The rate is considered unstable.
* Significantly higher than Arizona Cancer Rate by gender
† Significantly Lower than Arizona Cancer Rate by gender

Table 8: Age-Adjusted Incidence Rates of Invasive Cancer Cases by County and Gender for American Indians in Arizona, 2008-2009

County	2008			2009		
	Male	Female	Total	Male	Female	Total
Apache	317.0	142.8†	216.4	326.0	226.7	267.6
Cochise	0.0	186.8^	96.2^	280.1^	0.0	130.3^
Coconino	368.3	125.6	228.3	198.9	159.3^	177.3†
Gila	457.7^	317.8^	385.1	245.6^	127.5	172.0
Graham	0.0	314.9	168.9	1154.8*	1539.7*	1254.7*
Greenlee	0.0	0.0	0.0	0.0	0.0	0.0
La Paz	64.0^	269.9^	171.7^	1006.5^	267.7^	332.5^
Maricopa	271.7	278.2	277.9	288.5	303.4	299.3
Mohave	229.2^	307.5^	271.6	189.0^	135.2^	167.4^
Navajo	324.4	241.3	265.8	357.3	294.7	311.1*
Pima	318.7	257.3	273.7	311.6	228.3	263.9
Pinal	363.2	206.7	253.4	202.7	127.2	150.5†
Santa Cruz	529.6^	0.0	264.8^	0.0	0.0	0.0
Yavapai	330.0^	167.4^	233.1^	486.3^	110.3^	277.4^
Yuma	337.4^	415.1^	306.5^	132.4^	234.1^	191.7^
ARIZONA	**305.8**	**216.3**	**251.1**	**310.3**	**242.9**	**268.7**

^ Fewer than 10 cases reported. The rate is considered unstable.
* Significantly higher than Arizona Cancer Rate by gender
† Significantly Lower than Arizona Cancer Rate by gender

Table 9: Age-Adjusted Incidence Rates of Invasive Cancer Cases by County and Gender for Asians/Pacific Islanders in Arizona, 2008-2009

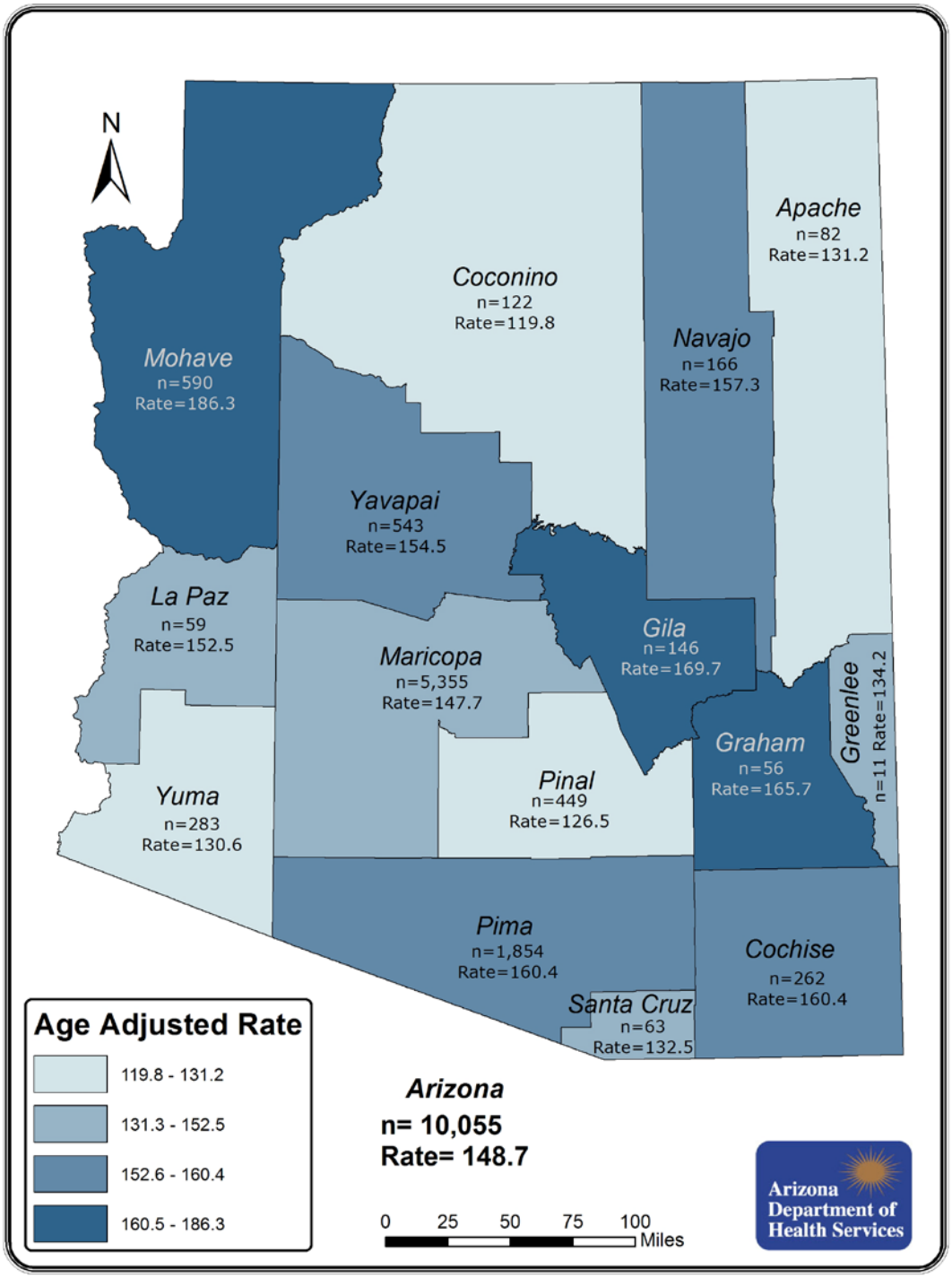
County	2008			2009		
	Male	Female	Total	Male	Female	Total
Apache	0.0	0.0	0.0	0.0	0.0	0.0
Cochise	288.5^	342.8^	299.0	248.5^	192.0^	219.0^
Coconino	105.3^	0.0	46.1^	227.0^	97.0^	165.6^
Gila	0.0	372.7^	173.1^	775.4^	297.4^	642.6^
Graham	0.0	0.0	0.0	0.0	0.0	0.0
Greenlee	0.0	0.0	0.0	2422.7^	0.0	807.6^
La Paz	0.0	0.0	0.0	397.2^	0.0	244.4^
Maricopa	244.2	251.0	246.1	241.8	246.4	241.7
Mohave	75.0^	155.2^	130.0^	187.4^	268.5^	228.6^
Navajo	204.2^	259.0^	230.4^	1380.6^	0.0	486.7^
Pima	243.0	191.7	210.8	156.3	208.9	184.5
Pinal	224.4^	74.8^	142.2†	77.4^	207.2^	152.3
Santa Cruz	548.6^	0.0	342.6^	0.0	0.0	0.0
Yavapai	398.2^	338.8^	326.5^	286.8^	265.1^	279.4^
Yuma	221.1^	45.4^	106.7^	316.5^	239.8^	262.4^
ARIZONA	**245.5**	**226.6**	**231.1**	**228.3**	**231.4**	**227.5**

^ Fewer than 10 cases reported. The rate is considered unstable.
* Significantly higher than Arizona Cancer Rate by gender
† Significantly Lower than Arizona Cancer Rate by gender

CHAPTER 2

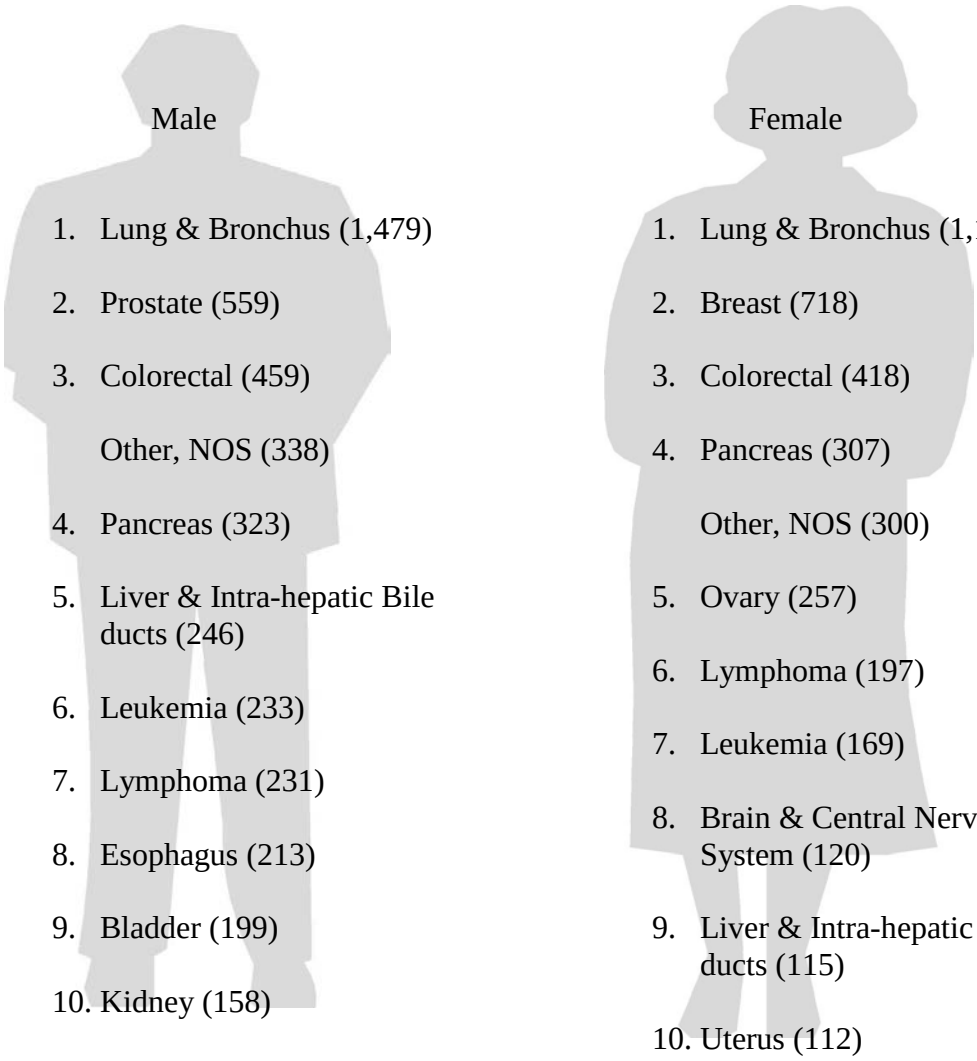
Cancer Mortality

Cancer Mortality in Arizona
Average Annual Counts and Age-Adjusted Rates by County
2008-2009



Note: County of residence for some cases is unknown. The sum of the cases per county does not equal the state total listed in this map due to rounding and the inclusion of an average of 17 cases per year with an unknown county of residence.

Figure 7: Ten Leading Sites* of Cancer Deaths by Site and Gender, Average Annual Count, 2008-2009



*Note: Ten Leading Sites in addition to 'Other, NOS';
Other, NOS=Ill-defined site, site not otherwise specified, or persons that died with more than one cancer.
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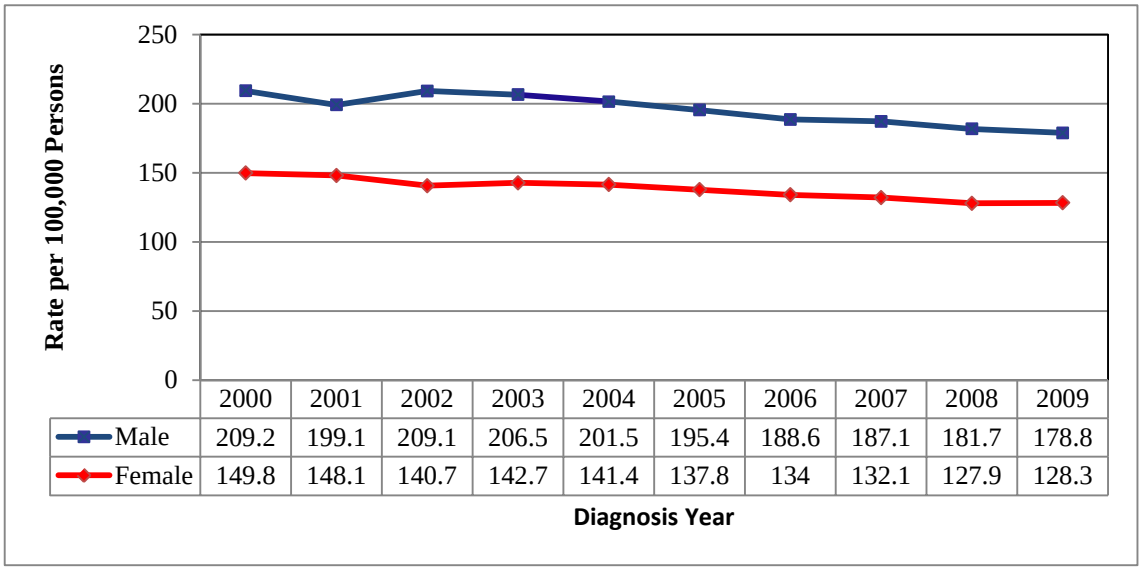
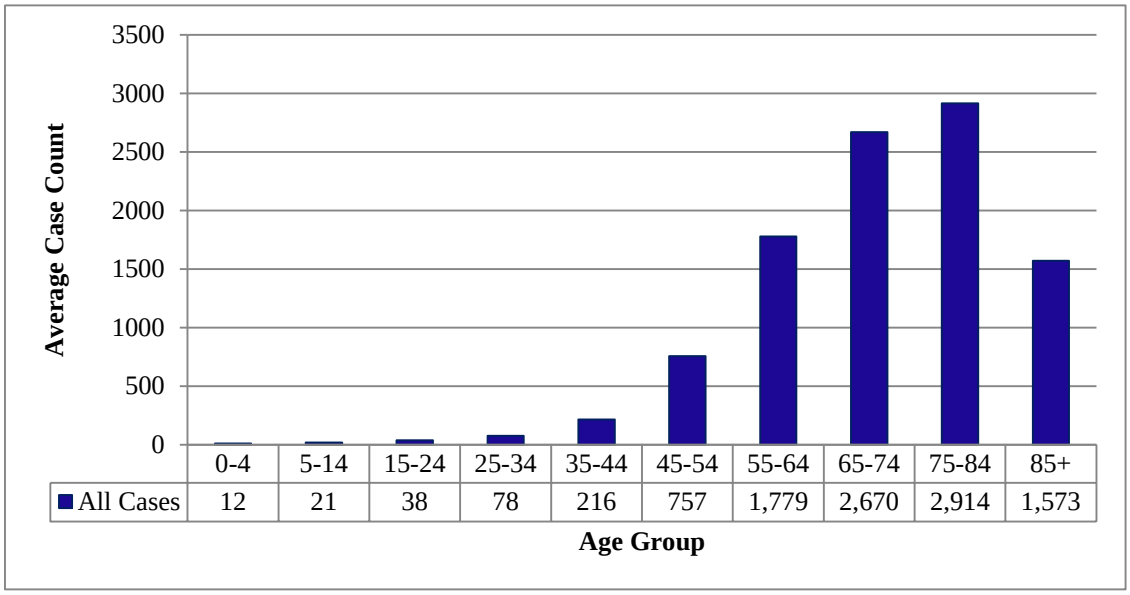
Figure 8: Age-Adjusted Cancer Mortality Rates for All Cancers by Gender and Year, Arizona, 2000-2009



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Male	209.2	199.1	209.1	206.5	201.5	195.4	188.6	187.1	181.7	178.8
Female	149.8	148.1	140.7	142.7	141.4	137.8	134	132.1	127.9	128.3

Rate age-adjusted to the 2000 U.S. standard population

Figure 9: Cancer Mortality by Age in Arizona, Average Annual Count, 2008-2009



	0-4	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85+
All Cases	12	21	38	78	216	757	1,779	2,670	2,914	1,573

Note: Average of total of all cases does not equal the sum of the average of each age group due to rounding

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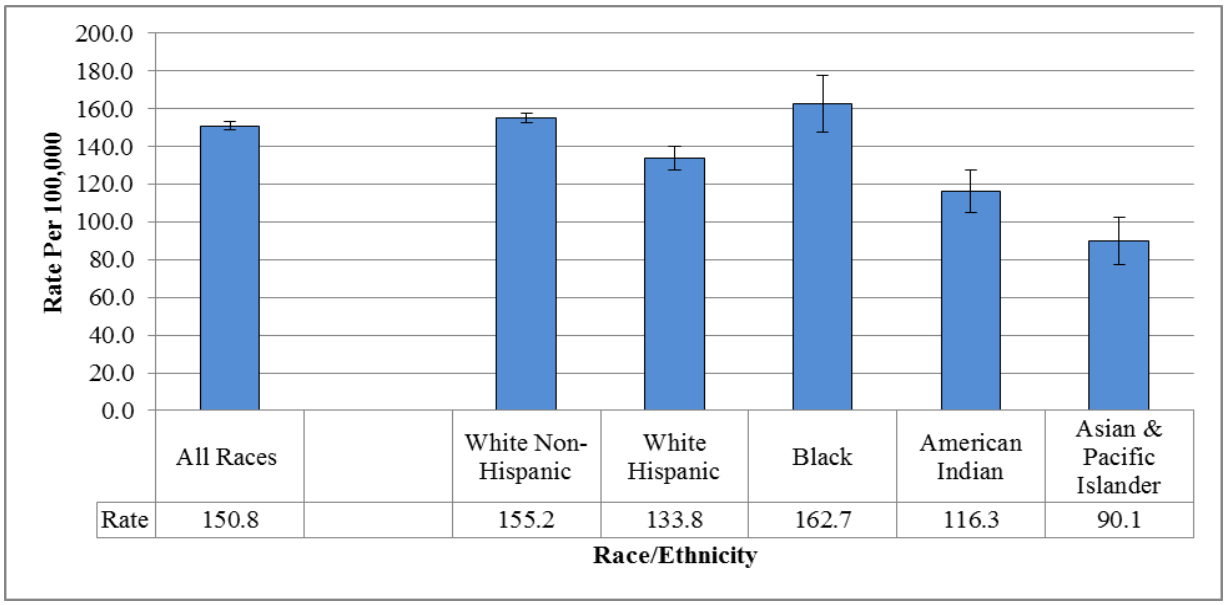
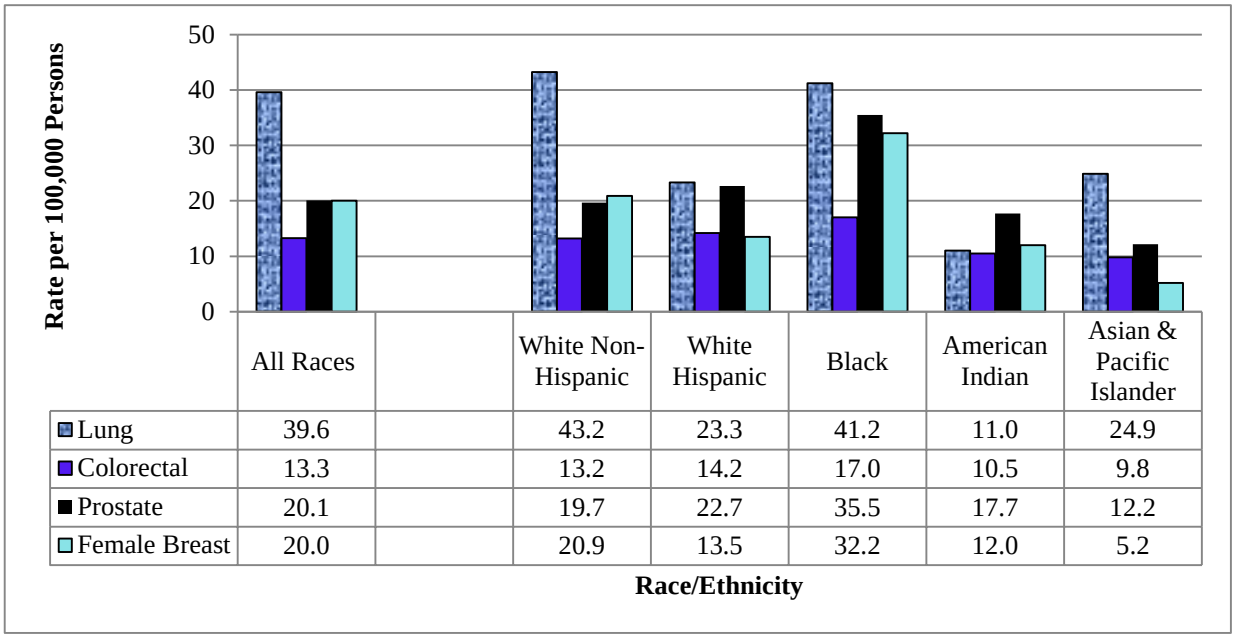
Figure 10: Average Annual Age-Adjusted Mortality Rates of Invasive Cancer Cases by Race/Ethnicity, 2008-2009



Adjusted to the 2000 standard U.S. population. The rates are per 100,000 persons.
⊥= 95% confidence bounds

Figure 11: Average Annual Age-Adjusted Mortality Rates for Select Cancers by Race/Ethnicity, Arizona, 2008-2009



Adjusted to the 2000 standard U.S. population. The rates were per 100,000 persons in specified group per year. The rates for prostate cancer were per 100,000 males. The rates for breast cancer were per 100,000 females.

CHAPTER 3

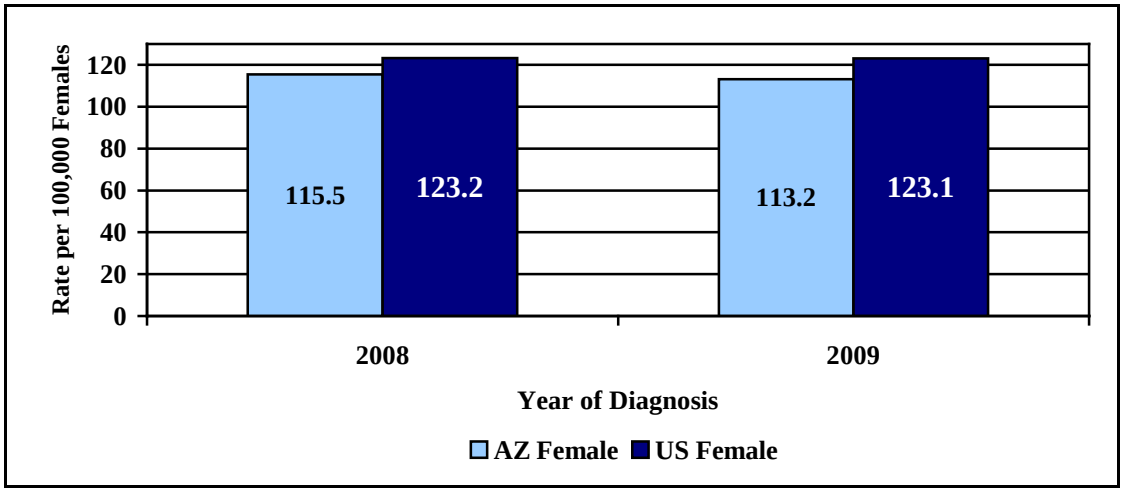
Incidence and Mortality Of Select Cancers

Female Breast Cancer
Colorectal Cancer
Cervical Cancer

Female Breast Cancer in Arizona

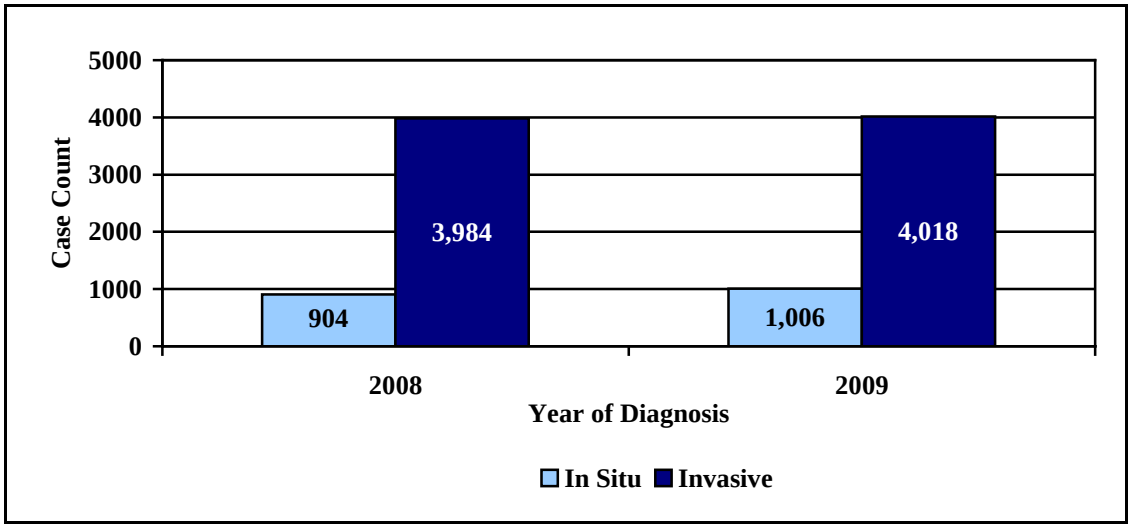
Breast cancer is the most frequently diagnosed cancer and the second most common cancer death identified among women in Arizona during 2008-2009. This cancer also continues to be the most common type diagnosed among women in the US. In 2008-2009, an average of 4,001 new invasive and 955 *in situ* cases of female breast cancer was diagnosed per year in Arizona.

Figure 12: U.S.* and Arizona Female Breast Cancer Age-Adjusted Incidence Rates, 2008-2009



***United States Cancer Statistics: 1999 - 2009 Incidence, WONDER Online Database. United States** Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; 2011. Accessed at http://wonder.cdc.gov/cancer-v2009.html on Feb 22, 2013.

Figure 13: Counts of Invasive and In Situ Female Breast Cancer In Arizona Residents, 2008-2009



About half (48%) of female breast cancer cases were diagnosed in local stage of disease, and almost one quarter (24%) were diagnosed in regional stage. While 19% of cases were diagnosed *in situ* stage, only 4% of female breast cancer cases were diagnosed in distant stage. Stage of breast cancer at diagnosis is an indicator of length of survival after diagnosis. Over 94 percent of females diagnosed in a local stage survived five years while only 26 percent of females diagnosed in a distant stage survived five years. The "All stage" category represents the combined stage of local, regional and distant stages of all females with cervical cancer. Earlier stages of diagnosis contribute to successful treatments and better prognoses.

Figure 14: Percentage of Female Breast Cancer Cases by SEER Summary Stage, 2008-2009

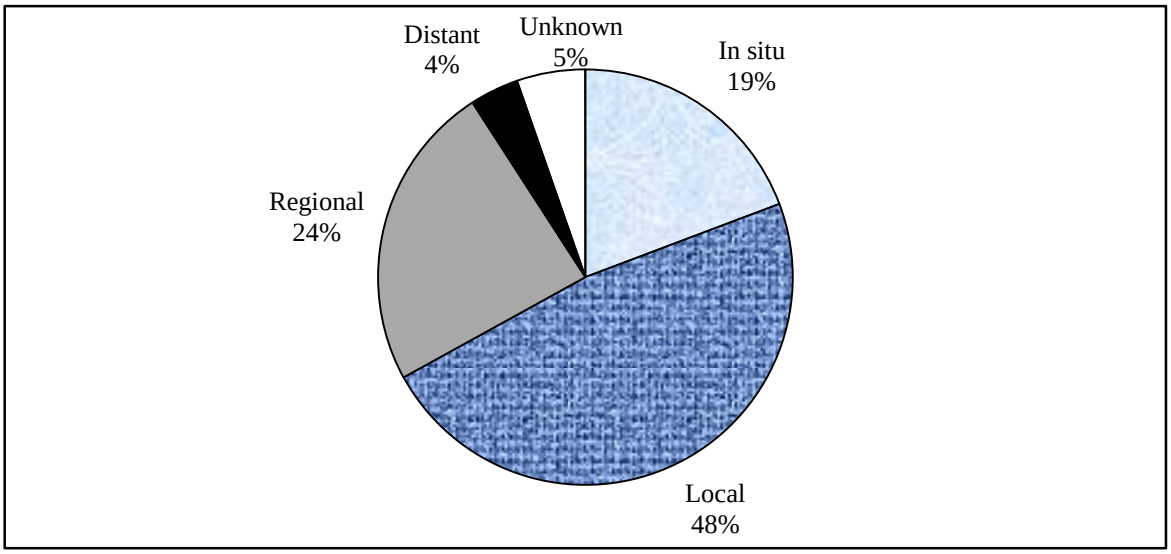
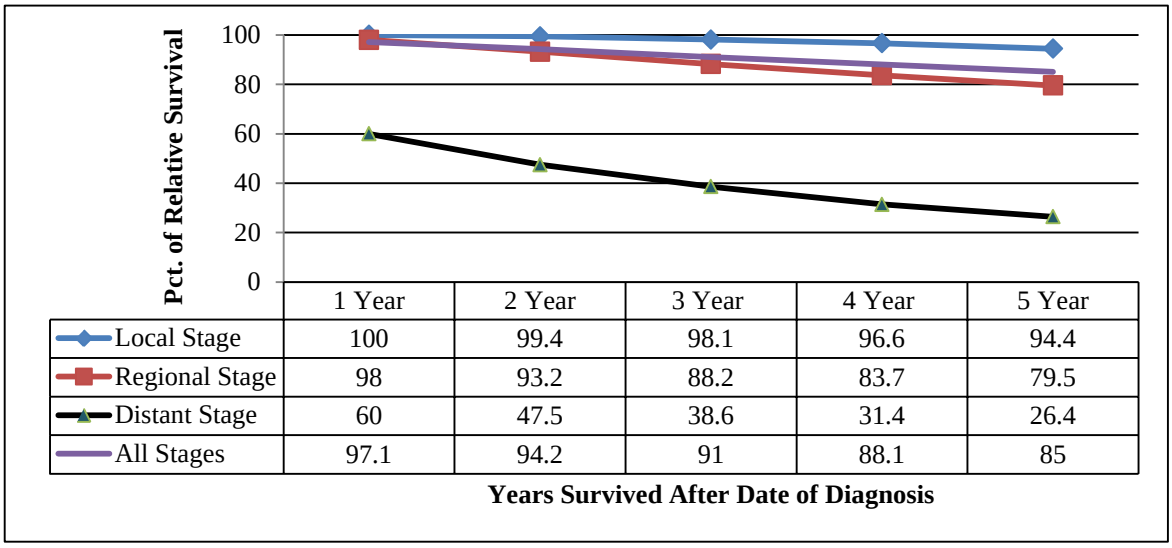


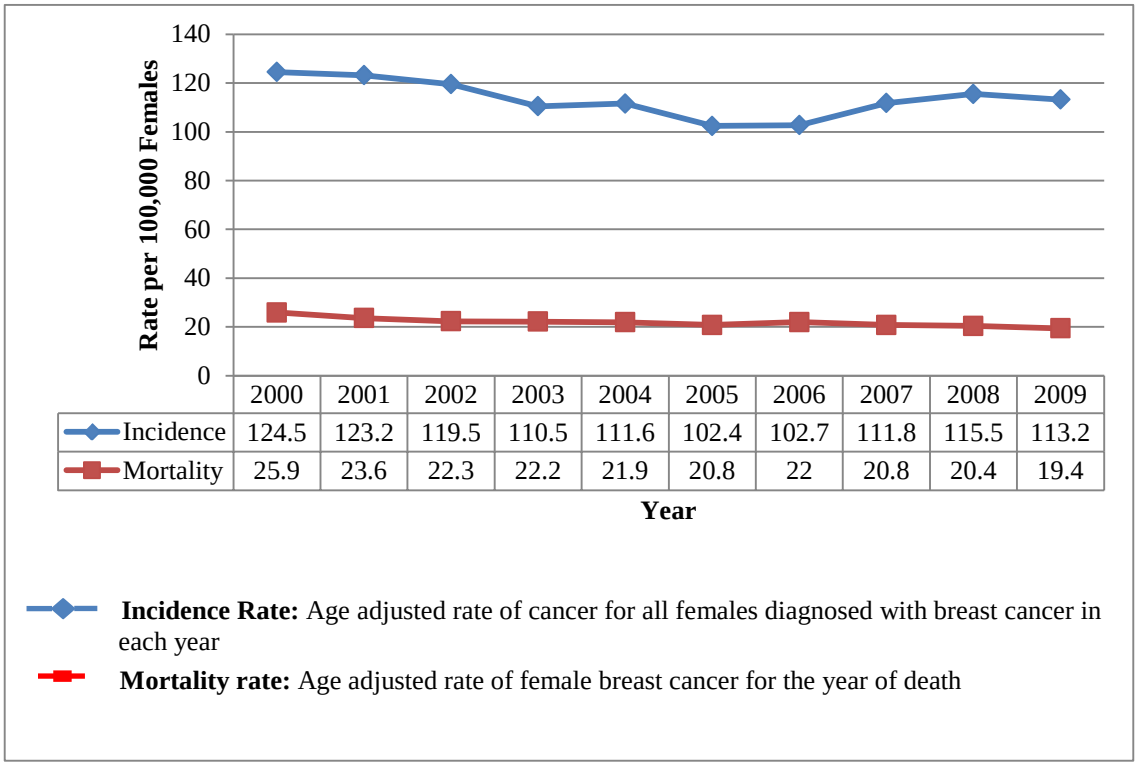
Figure 15: Five-Year Percent Relative Female Breast Cancer Survival, 1995-2006



	1 Year	2 Year	3 Year	4 Year	5 Year
Local Stage	100	99.4	98.1	96.6	94.4
Regional Stage	98	93.2	88.2	83.7	79.5
Distant Stage	60	47.5	38.6	31.4	26.4
All Stages	97.1	94.2	91	88.1	85

From 2000-2006, the age-adjusted incidence rate for breast cancer had decreased by 20 percent. However, it increased by 13 percent from 2005 to 2008. The age-adjusted mortality rate for female breast cancer had remained constant. Female breast cancer diagnoses occur over five times more frequently than do deaths caused by the same cancer. The time unit used for incidence is the year at diagnosis, while the time frame for mortality is the year of death.

Figure 16: Age-Adjusted Incidence and Mortality Rates for Female Breast Cancer in Arizona, 2000-2009



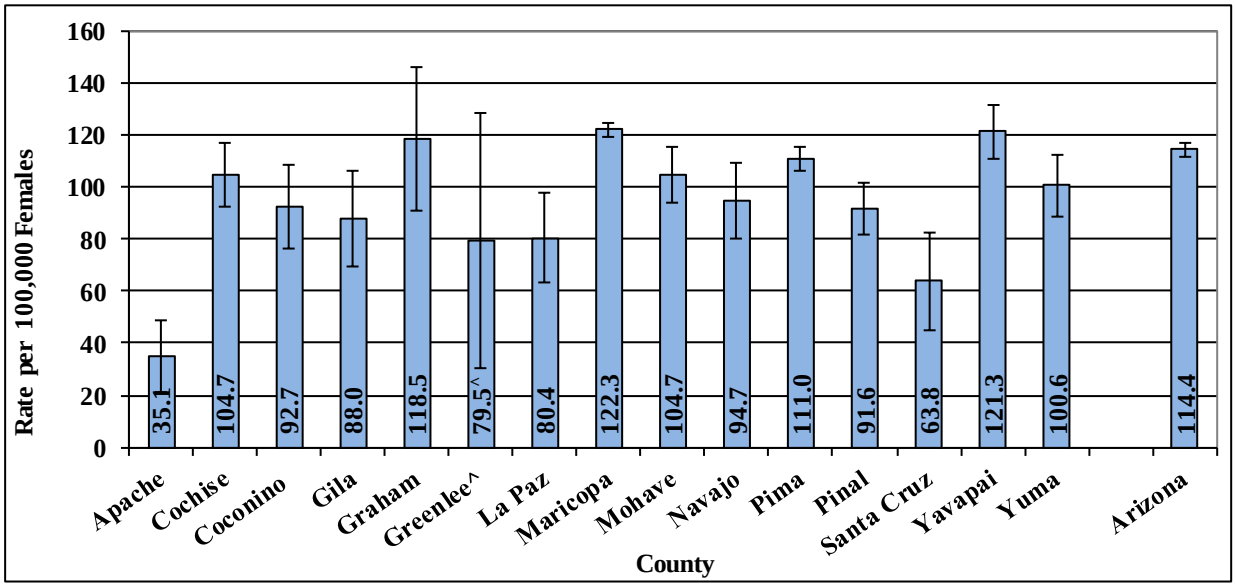
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Incidence	124.5	123.2	119.5	110.5	111.6	102.4	102.7	111.8	115.5	113.2
Mortality	25.9	23.6	22.3	22.2	21.9	20.8	22	20.8	20.4	19.4

Incidence Rate: Age adjusted rate of cancer for all females diagnosed with breast cancer in each year

Mortality rate: Age adjusted rate of female breast cancer for the year of death

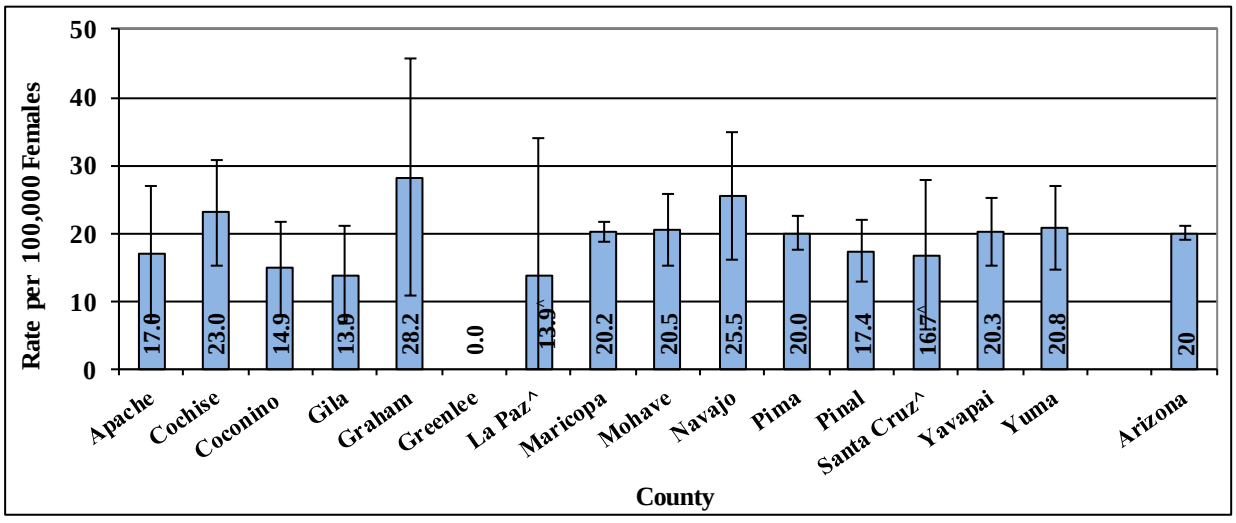
In 2008-2009, Maricopa County had the highest incidence rate (122.3) followed by Yavapai County (121.3), while Apache County (35.1) and Santa Cruz County(63.8) had the lowest incidence rates. Graham (28.2) and Navajo (25.5) Counties had the highest mortality rates for female breast cancer. The lowest mortality rates were Greenlee County, which had no female breast cancer deaths, followed by Gila and La Paz Counties (both 13.9).

Figure 17: Average Annual Age-Adjusted Incidence Rates for Female Breast Cancer by County, 2008-2009



^ Fewer than 10 cases reported. The rate is considered unstable.
⌶ Upper and lower confidence bounds

Figure 18: Average Annual Age-Adjusted Mortality Rates for Female Breast Cancer by County 2008 - 2009



^ Fewer than 10 cases reported. The rate is considered unstable.
⌶ Upper and lower confidence bounds.

When analyzed by race and ethnicity, the female breast cancer incidence rates were highest among White, non-Hispanics (126.8 per 100,000) in Arizona, and the mortality rate was highest among Blacks (32.2 per 100,000). American Indians have the lowest female breast cancer incidence (43.9 per 100,000) while the mortality rate among Asians and Pacific Islanders (PI) (5.2 per 100,000) is the lowest among race/ethnicity groups.

Figure 19: Average Annual Age-Adjusted Incidence Rates for Female Breast Cancer by Race/Ethnicity, 2008-2009

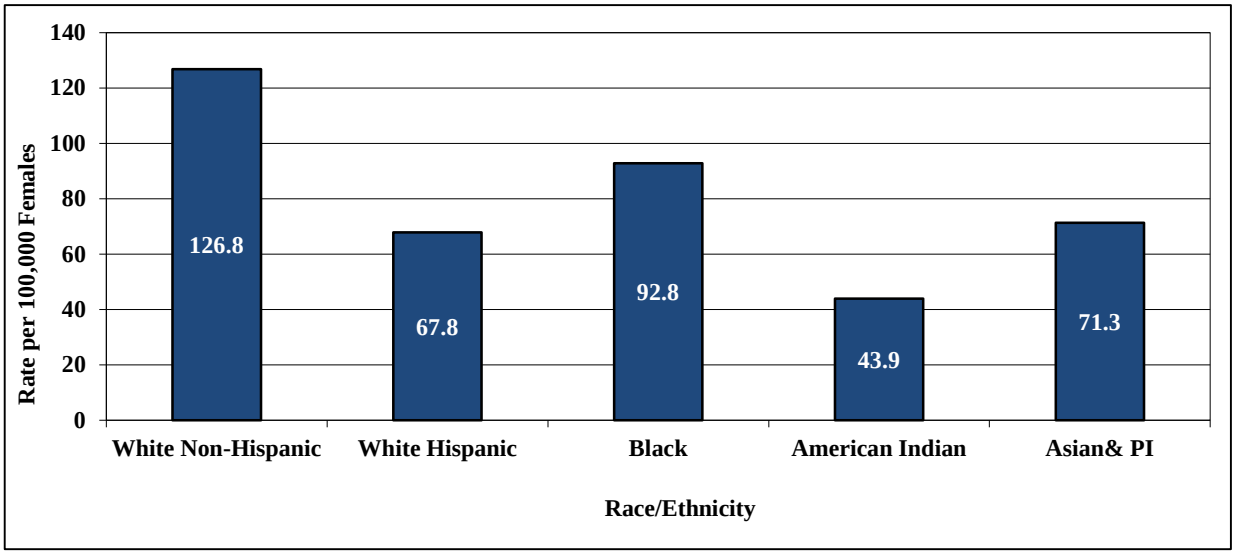
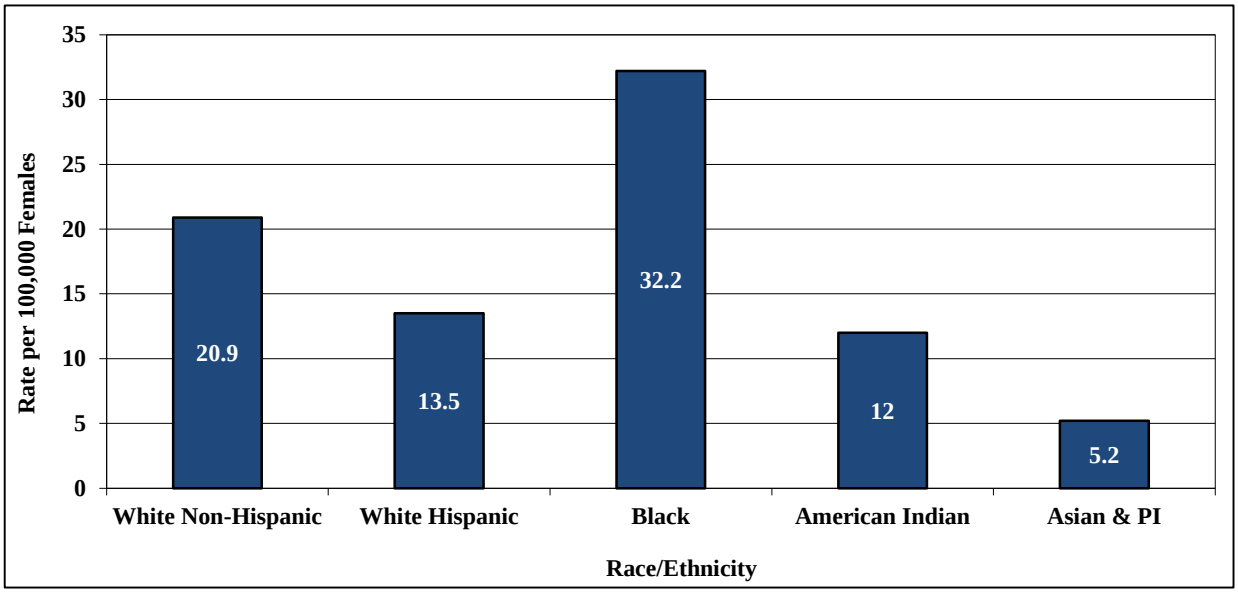


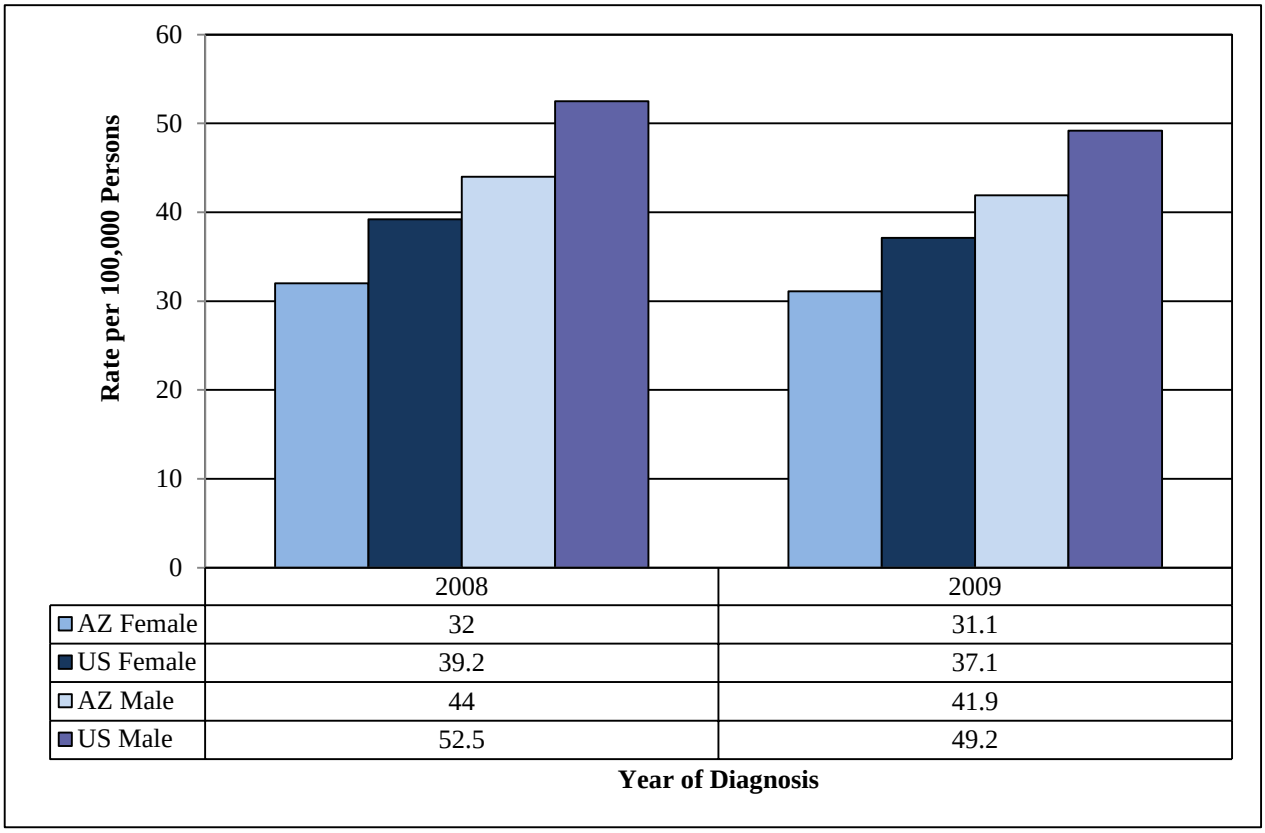
Figure 20: Average Annual Age-Adjusted Mortality Rates for Female Breast Cancer by Race/Ethnicity, 2008-2009



Colorectal Cancer in Arizona

Colorectal cancer was the third most frequently diagnosed cancer among Arizonans in 2008-2009 (see Figure 1). An average of 1,324 and 1,165 cases of invasive colorectal cancer per year were reported in men and women, during this time period. The percentage change in the incidence of colorectal cancer increased 3% for Arizona females and decreased 5% for Arizona males between 2008 and 2009.

Figure 21: U.S.* and Arizona Age-Adjusted Incidence Rates for Colorectal Cancer by Gender, 2008-2009



	2008	2009
AZ Female	32	31.1
US Female	39.2	37.1
AZ Male	44	41.9
US Male	52.5	49.2

***United States Cancer Statistics: 1999 - 2009 Incidence, WONDER Online Database. United States** Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; 2011. Accessed at http://wonder.cdc.gov/cancer-v2009.html on Feb 22, 2013.

When analyzed by stage, slightly more cases of colorectal cancer cases were diagnosed in local stage as in regional stage (38% and 30% respectively), and those stages combined accounted for nearly two-thirds of all diagnosed cases. Continued efforts to raise awareness about the importance of colorectal screenings in the community will help identify colorectal cancer in its earliest stages. Increased early stage detection will help increase the survival time of persons diagnosed with colorectal cancer. Over 94 percent of persons diagnosed in a local stage survived five years while only 9 percent of persons diagnosed in a distant stage survived five years.

Figure 22: Percentage of Colorectal Cancer Cases by SEER Summary Stage, 2008-2009

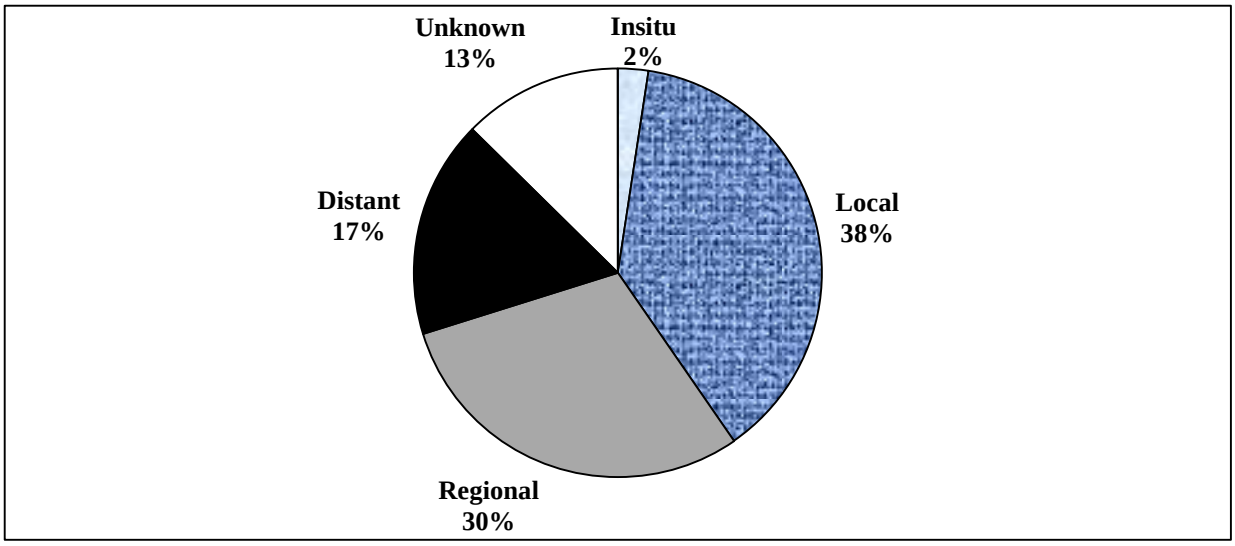
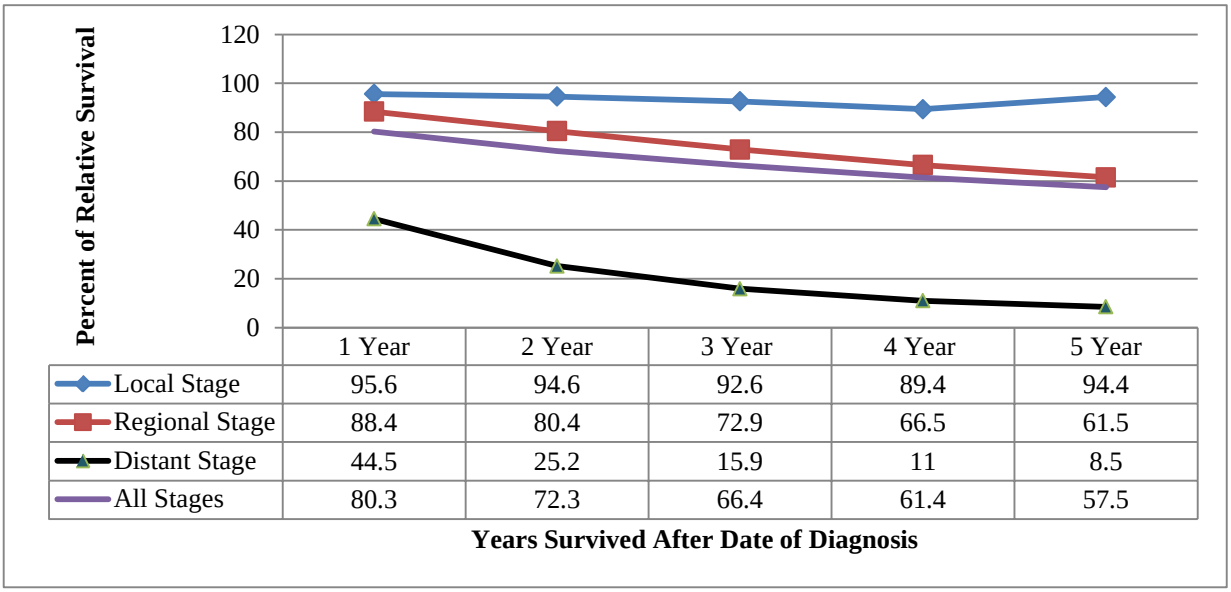


Figure 23: Five-Year Percent Relative Colorectal Cancer Survival, 1995-2006

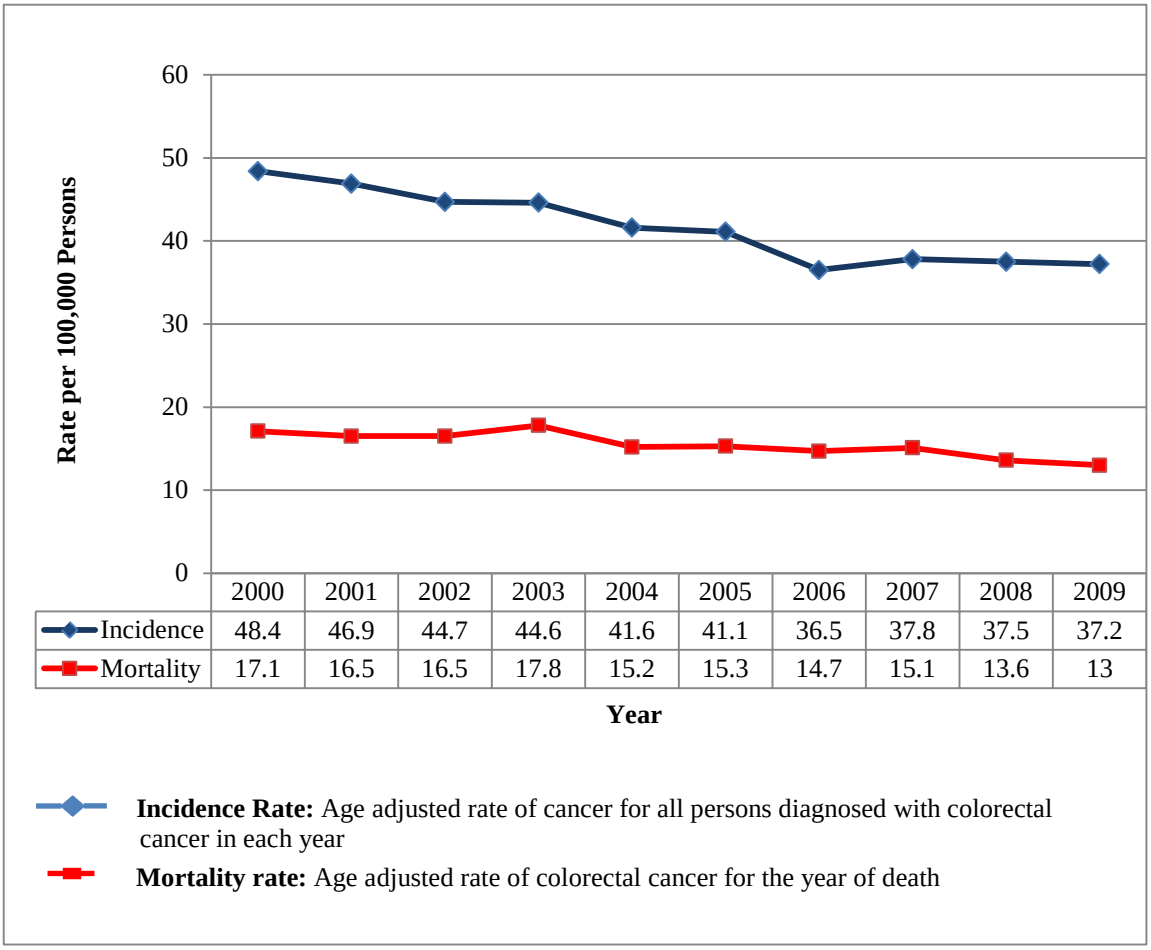


	1 Year	2 Year	3 Year	4 Year	5 Year
Local Stage	95.6	94.6	92.6	89.4	94.4
Regional Stage	88.4	80.4	72.9	66.5	61.5
Distant Stage	44.5	25.2	15.9	11	8.5
All Stages	80.3	72.3	66.4	61.4	57.5

Years Survived After Date of Diagnosis

From year 2000 to 2006, the age-adjusted incidence rate decreased 27 percent and then increased slightly between year 2006 and 2009. The colorectal cancer mortality rate in Arizona has decreased 24 percent between years 2000 and 2009. The time unit used for incidence is the year at diagnosis, while the time frame for mortality is the year of death.

Figure 24: Age-Adjusted Incidence and Mortality Rates for Colorectal Cancer In Arizona, 2000-2009



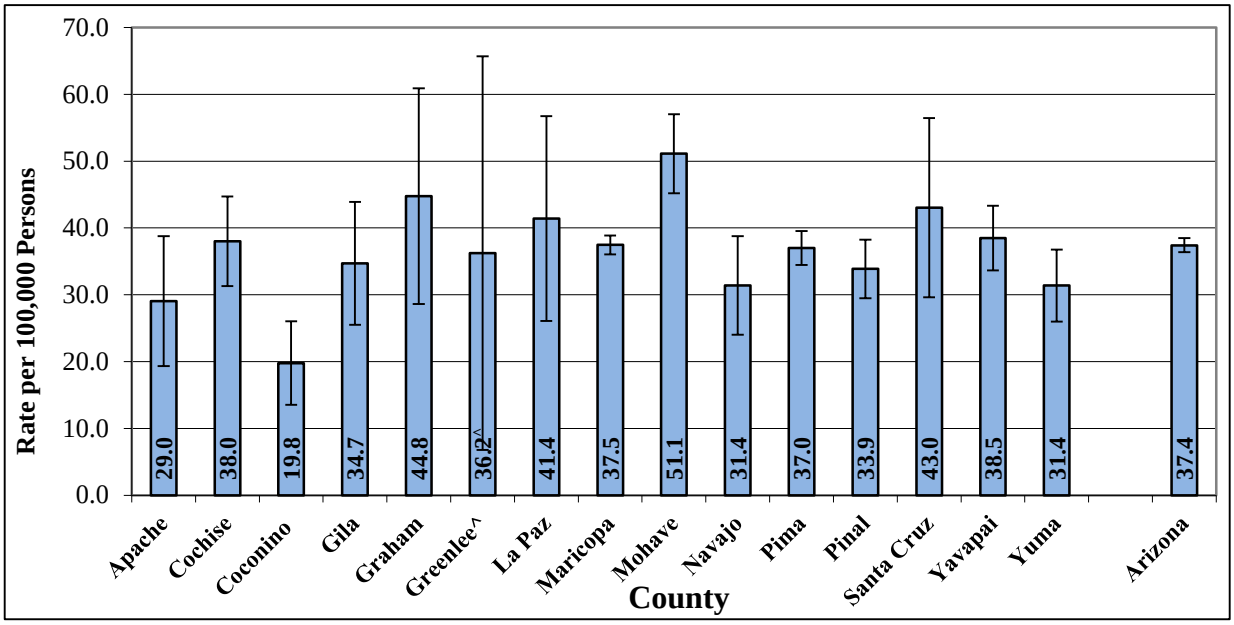
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Incidence	48.4	46.9	44.7	44.6	41.6	41.1	36.5	37.8	37.5	37.2
Mortality	17.1	16.5	16.5	17.8	15.2	15.3	14.7	15.1	13.6	13

Incidence Rate: Age adjusted rate of cancer for all persons diagnosed with colorectal cancer in each year

Mortality rate: Age adjusted rate of colorectal cancer for the year of death

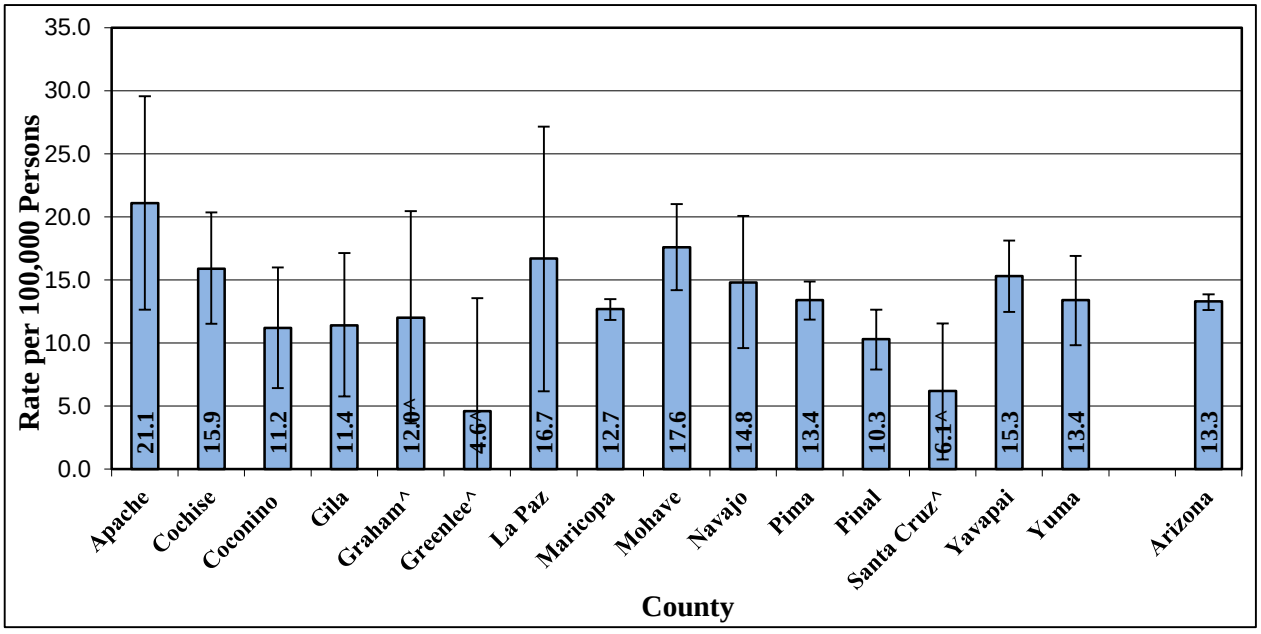
When analyzed by county in 2008-2009, Mohave County (51.1) had the highest colorectal cancer incidence rate followed by Graham County (44.8). The lowest colorectal cancer incidence rates were recorded in Coconino County (19.8) and Apache County (29.0). Apache County had the highest mortality rate (21.1) followed by Mohave County (17.6). The lowest mortality rates (in counties with enough deaths for a stable mortality rate) were found in Pinal (10.3) and Coconino (11.2) Counties.

Figure 25: Average Annual Age-Adjusted Incidence Rates for Colorectal Cancer By County, 2008-2009



^ Fewer than 10 cases reported. The rate is considered unstable. ⌶ Upper and lower confidence bounds.

Figure 26: Average Annual Age-Adjusted Mortality Rates for Colorectal Cancer By County, 2008-2009



^ Fewer than 10 cases reported. The rate is considered unstable. ⌶ Upper and lower confidence bounds.

When analyzed by race and ethnicity, Blacks and White Non-Hispanics have the highest rates in colorectal cancer incidence (40.3 and 38.9 per 100,000 respectively) and Blacks have the highest mortality rates in Arizona (17.0 per 100,000). American Indians and Asians/PI have the lowest colorectal cancer incidence rates (26.5 and 26.8 per 100,000 respectively). These two groups also have the lowest mortality rates for colorectal cancer (10.5 and 9.8 per 100,000 respectively).

Figure 27: Average Annual Age-Adjusted Incidence Rates for Colorectal Cancer By Race/Ethnicity, 2008-2009

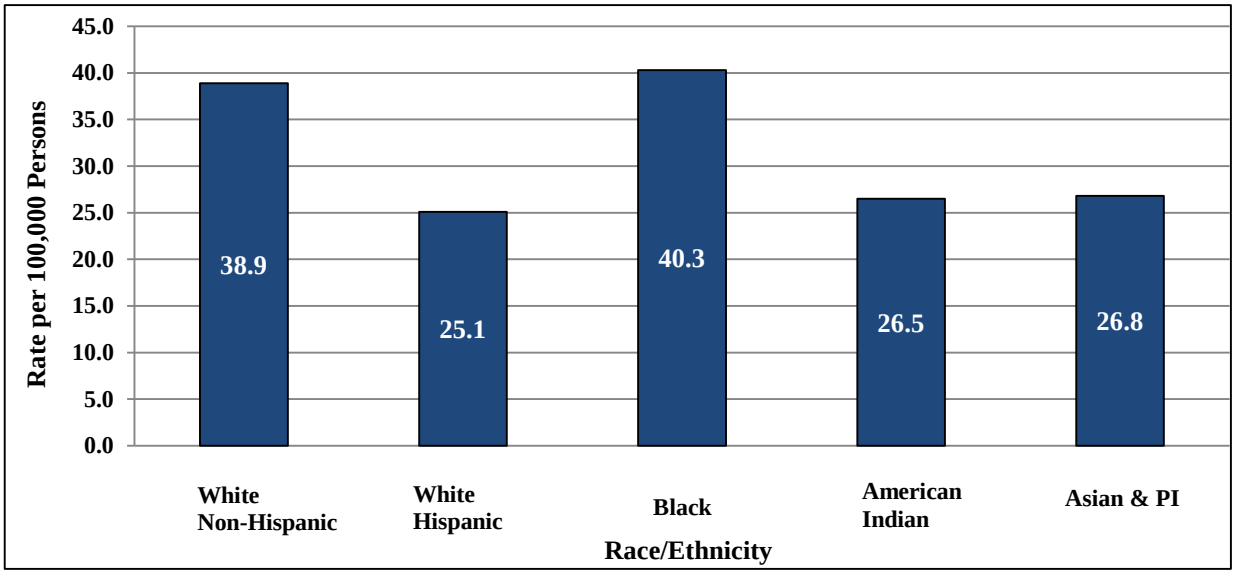
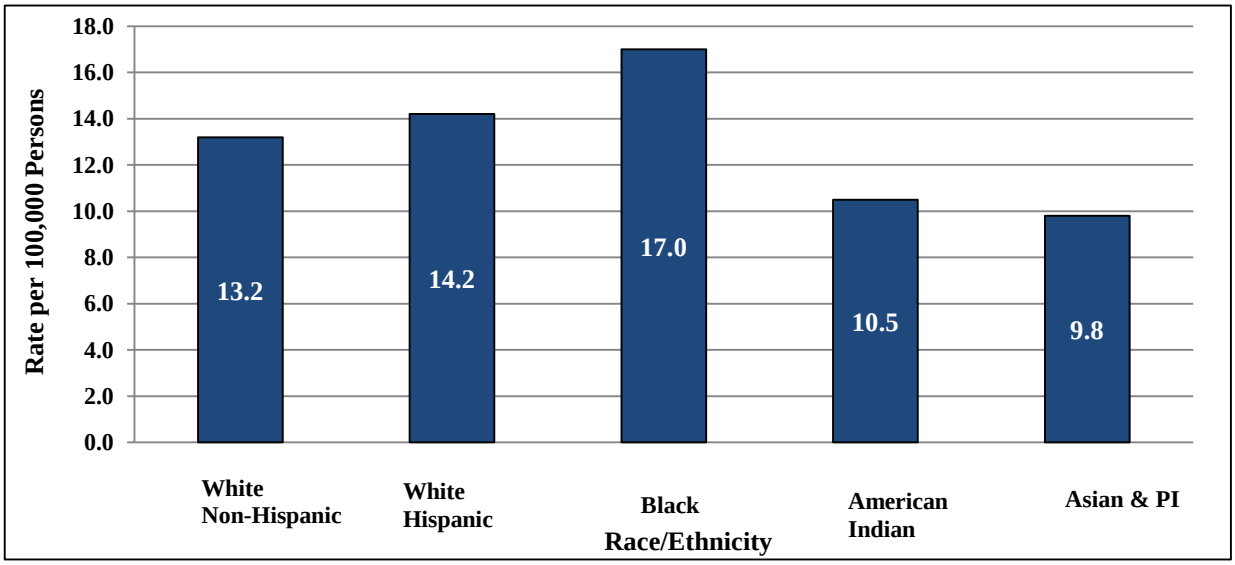


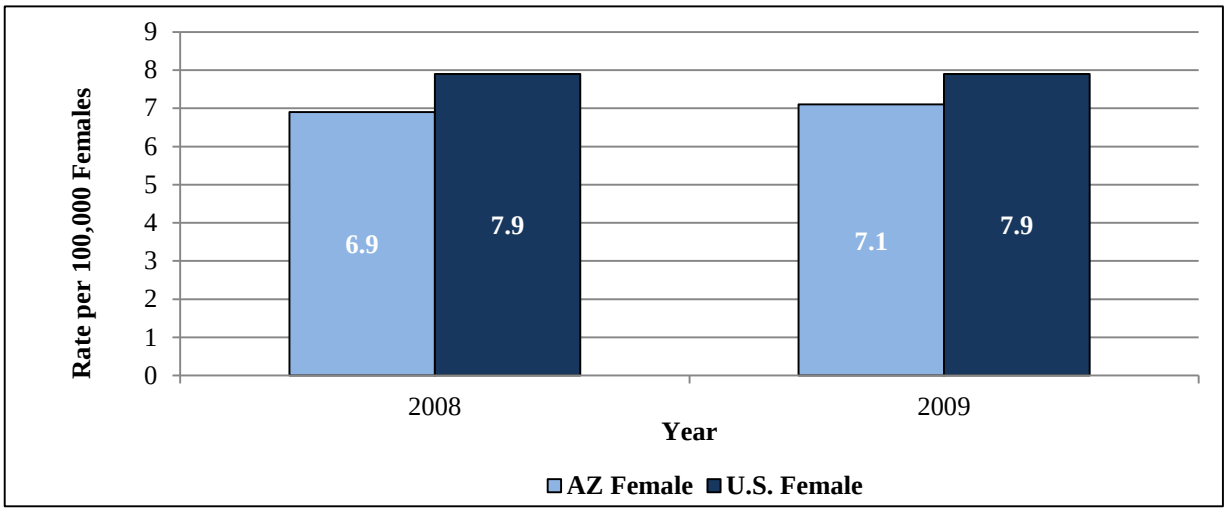
Figure 28: Average Annual Age-Adjusted Mortality Rates for Colorectal Cancer By Race/Ethnicity, 2008-2009



Cervical Cancer in Arizona

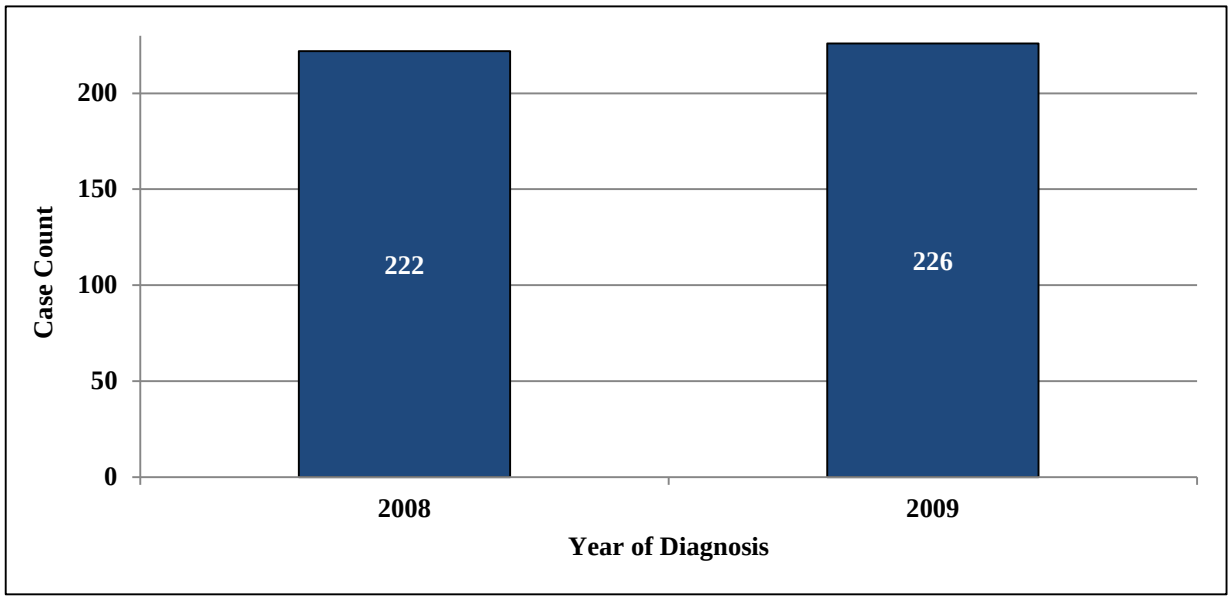
Cervical Cancer incidence averaged 224 cases per year, in 2008 to 2009. Compared to U.S. rates, the incidence of cervical cancer in Arizona was 13% lower than U.S. national rate. The widely used Papanicolaou test (Pap test) helps to identify cervical cancer at its earliest most treatable stage and has been attributed as the primary reason for the low incidence rates of invasive cervical cancer.

Figure 29: U.S.* and Arizona Cervical Cancer Age-Adjusted Incidence Rates, 2008-2009



***United States Cancer Statistics: 1999 - 2009 Incidence, WONDER Online Database. United States** Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; 2011. Accessed at http://wonder.cdc.gov/cancer-v2009.html on Feb 22, 2013.

Figure 30: Counts of Invasive Cervical Cancer In Arizona Residents, 2008-2009



Cervical cancer cases were diagnosed with local stage of disease in 41 percent of cases and one third (33%) were diagnosed with regional stage. A distant stage at diagnosis was found in 13 percent of cancer cases. The stage of disease at diagnosis impacts the length of survival of the patient. Local stage of diagnosis had an 85.7 percent five year relative survival rate. Females diagnosed in a distant stage had 19.3 percent five year relative survival rate.

Figure 31: Percentage of Cervical Cancer Cases by SEER Summary Stage, 2008-2009

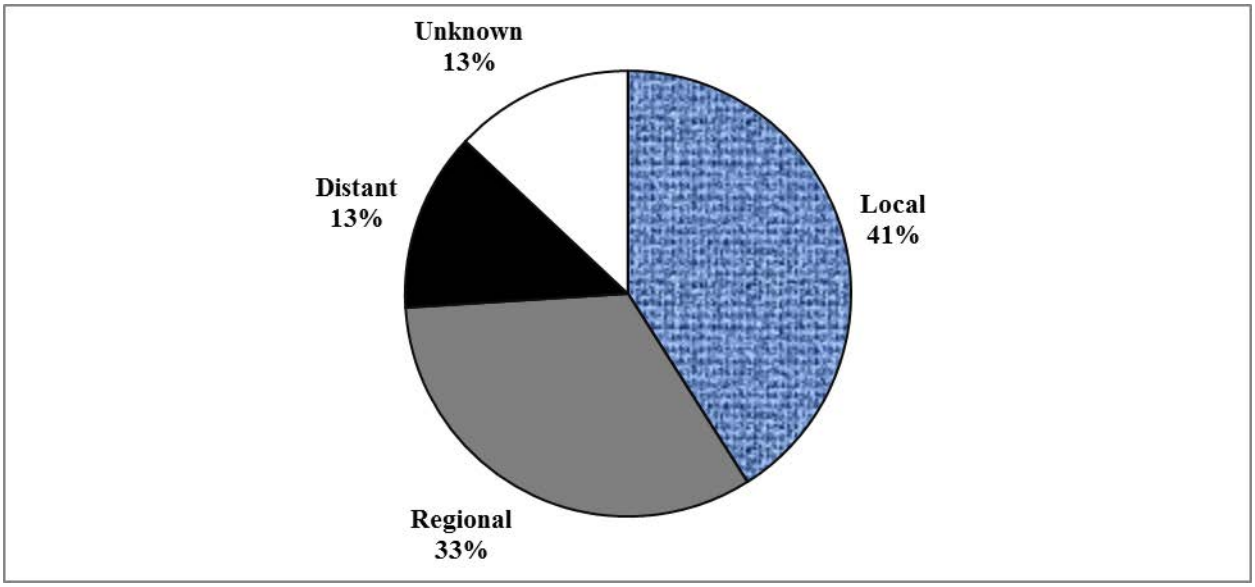
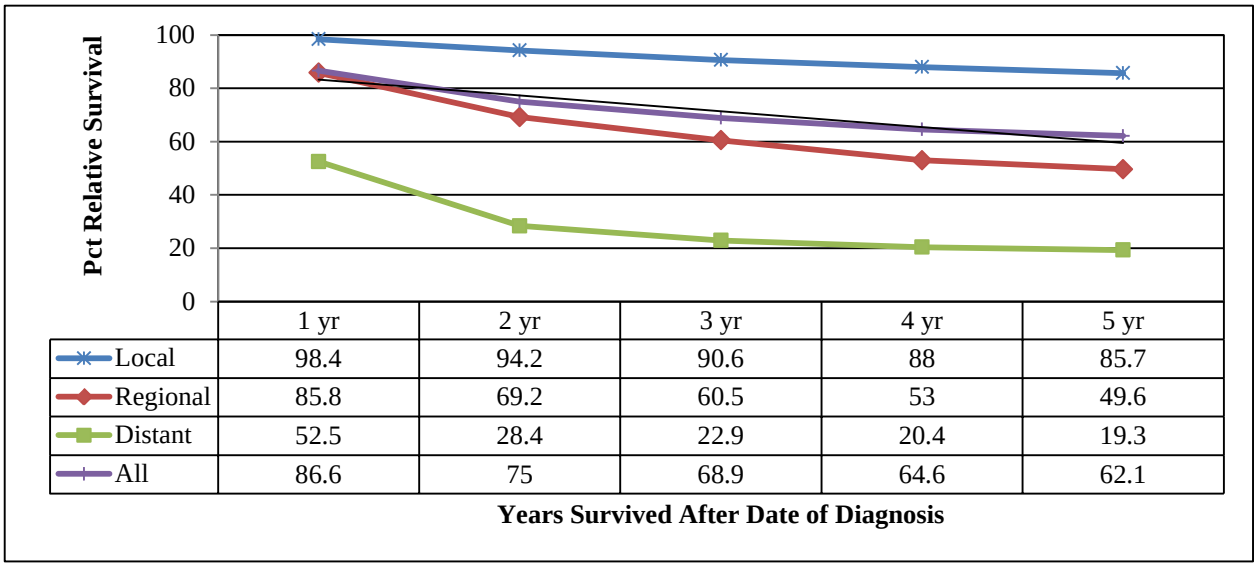


Figure 32: Five Year Relative Survival of Invasive Cervical Cancer By SEER Summary Stage for Diagnosis Years 1995-2006

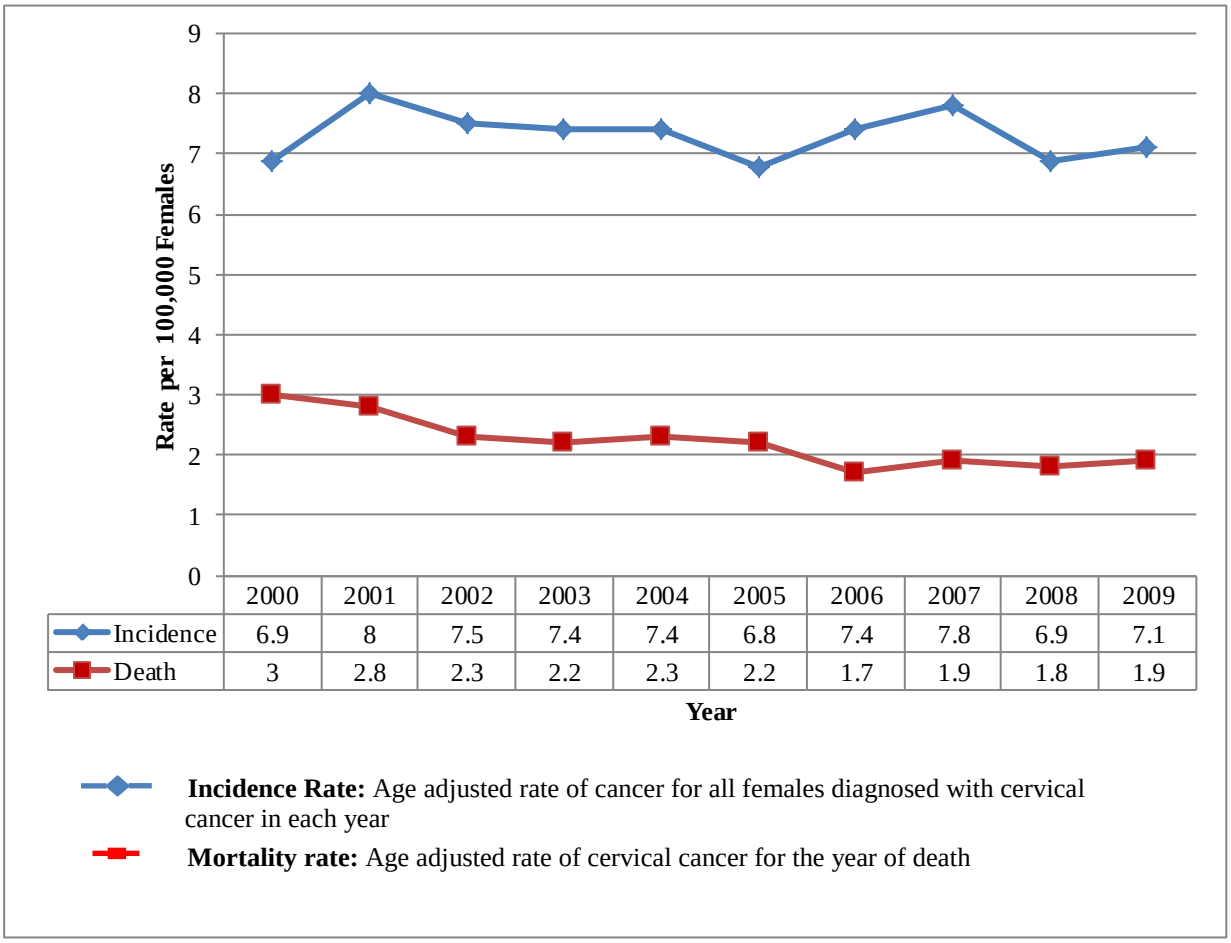


	1 yr	2 yr	3 yr	4 yr	5 yr
Local	98.4	94.2	90.6	88	85.7
Regional	85.8	69.2	60.5	53	49.6
Distant	52.5	28.4	22.9	20.4	19.3
All	86.6	75	68.9	64.6	62.1

Years Survived After Date of Diagnosis

The cervical cancer incidence rate decreased by 9 percent between the years 2007 and 2009. The age-adjusted mortality rate for cervical cancer has remained constant between 1.7 and 1.9 cases per 100,000 females since 2006. The time unit used for incidence is the year at diagnosis, while the time frame for mortality is the year of death.

Figure 33: Age-Adjusted Incidence and Mortality Rates for Cervical Cancer In Arizona, 2000-2009



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Incidence	6.9	8	7.5	7.4	7.4	6.8	7.4	7.8	6.9	7.1
Death	3	2.8	2.3	2.2	2.3	2.2	1.7	1.9	1.8	1.9

When analyzed by race and ethnicity, the cervical cancer incidence rates were highest among American Indian (4.9 cases per 100,000 females) and Blacks (4.5 cases per 100,000 females) and the mortality rate was highest among American Indians (4.9 cases per 100,000 females). Asians and Pacific Islanders have the lowest cervical cancer mortality (1.9 per cases per 100,000 females).

Figure 34: Average Annual Age-Adjusted Incidence Rates for Cervical Cancer By Race/Ethnicity, 2008-2009

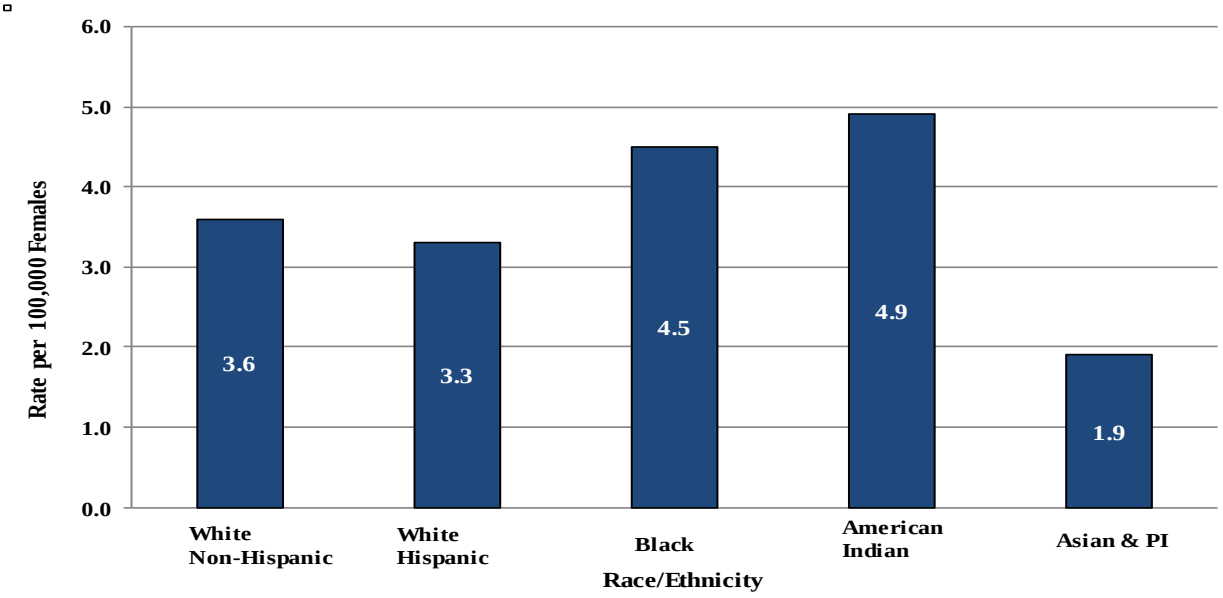
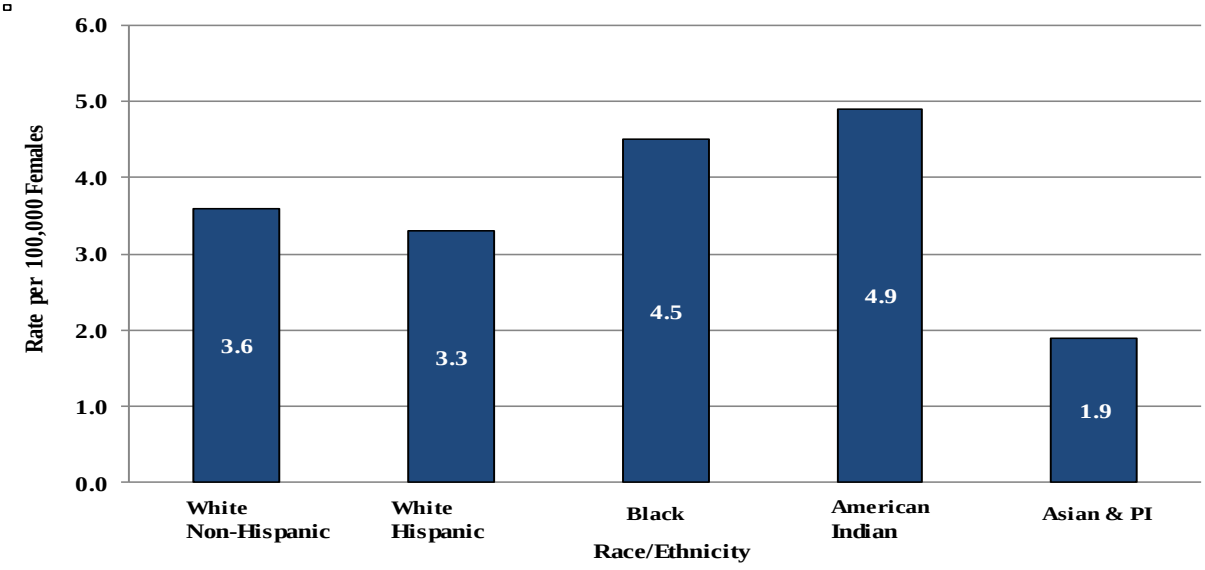


Figure 35: Average Annual Age-Adjusted Mortality Rates for Cervical Cancer by Race/Ethnicity, 2008-2009



APPENDIX

Site Group	ICD-O-3 Site	ICD-O-3 Histology (Type)
Oral Cavity and Pharynx		
Lip	C000-C009	
Tongue	C019-C029	
Salivary Gland	C079-C089	
Floor of Mouth	C040-C049	
Gum and Other Mouth	C030-C039, C050-C059, C060-C069	
Nasopharynx	C110-C119	
Tonsil	C090-C099	
Oropharynx	C100-C109	
Hypopharynx	C129, C130-C139	
Other Oral Cavity and Pharynx	C140, C142-C148	excluding 9590-9989, and sometimes 9050-9055, 9140+
Digestive System		
Esophagus	C150-C159	
Stomach	C160-C169	excluding 9590-9989, and sometimes 9050-9055, 9140+
Small Intestine	C170-C179	
Colon and Rectum		
Colon excluding Rectum		
Cecum	C180	
Appendix	C181	
Ascending Colon	C182	
Hepatic Flexure	C183	
Transverse Colon	C184	
Splenic Flexure	C185	
Descending Colon	C186	
Sigmoid Colon	C187	excluding 9590-9989, and sometimes 9050-9055, 9140+
Large Intestine, NOS	C188-C189, C260	
Rectum and Rectosigmoid Junction		
Rectosigmoid Junction	C199	
Rectum	C209	
Anus, Anal Canal and Anorectum	C210-C212, C218	excluding 9590-9989, and sometimes 9050-9055, 9140+
Liver and Intrahepatic Bile Duct		
Liver	C220	
Intrahepatic Bile Duct	C221	
Gallbladder	C239	
Other Biliary	C240-C249	excluding 9590-9989, and sometimes 9050-9055, 9140+
Pancreas	C250-C259	

Retroperitoneum	C480	
Peritoneum, Omentum and Mesentery	C481-C482	
Other Digestive Organs	C268-C269, C488	
Respiratory System		
Nose, Nasal Cavity and Middle Ear	C300-C301, C310-C319	
Larynx	C320-C329	
Lung and Bronchus	C340-C349	
Pleura	C384	
Trachea, Mediastinum and Other Respiratory Organs	C339, C381-C383, C388, C390, C398, C399	excluding 9590-9989, and sometimes 9050-9055, 9140+
Bones and Joints	C400-C419	excluding 9590-9989, and sometimes 9050-9055, 9140+
Soft Tissue including Heart	C380, C470-C479, C490-C499	excluding 9590-9989, and sometimes 9050-9055, 9140+
Skin excluding Basal and Squamous		
Melanoma of the Skin	C440-C449	8720-8790
Other Non-Epithelial Skin	C440-C449	excluding 8000-8005, 8010-8045, 8050-8084, 8090-8110, 8720-8790, 9590-9989, and sometimes 9050-9055, 9140+
Breast	C500-C509	excluding 9590-9989, and sometimes 9050-9055, 9140+
Female Genital System		
Cervix Uteri	C530-C539	excluding 9590-9989, and sometimes 9050-9055, 9140+
Corpus and Uterus, NOS		
Corpus Uteri	C540-C549	
Uterus, NOS	C559	
Ovary	C569	
Vagina	C529	
Vulva	C510-C519	
Other Female Genital Organs	C570-C589	excluding 9590-9989, and sometimes 9050-9055, 9140+
Male Genital System		
Prostate	C619	
Testis	C620-C629	excluding 9590-9989, and sometimes 9050-9055, 9140+
Penis	C600-C609	

Other Male Genital Organs	C630-C639	
Urinary System		
Urinary Bladder	C670-C679	excluding 9590-9989, and sometimes 9050-9055, 9140+
Kidney and Renal Pelvis	C649, C659	
Ureter	C669	
Other Urinary Organs	C680-C689	
Eye and Orbit	C690-C699	excluding 9590-9989, and sometimes 9050-9055, 9140+
Brain and Other Nervous System		
Brain	C710-C719	excluding 9530-9539, 9590-9989, and sometimes 9050-9055, 9140+
Cranial Nerves Other Nervous System	C710-C719	9530-9539
	C700-C709, C720-C729	excluding 9590-9989, and sometimes 9050-9055, 9140+
Endocrine System		
Thyroid	C739	excluding 9590-9989, and sometimes 9050-9055, 9140+
Other Endocrine including Thymus	C379, C740-C749, C750-C759	
Lymphoma		
Hodgkin Lymphoma		
Hodgkin - Nodal	C024, C098-C099, C111, C142, C379, C422, C770-C779	9650-9667
Hodgkin - Extranodal	All other sites	
Non-Hodgkin Lymphoma		
NHL - Nodal	C024, C098,C099, C111,C142, C379,C422, C770-C779	9590-9596, 9670-9671, 9673, 9675, 9678-9680, 9684, 9687, 9689-9691, 9695, 9698-9702, 9705, 9708-9709, 9714-9719, 9727-9729, 9823, 9827
NHL - Extranodal	All sites except C024, C098-C099, C111, C142, C379, C422, C770-C779	9590-9596, 9670-9671, 9673, 9675, 9678-9680, 9684, 9687, 9689-9691, 9695, 9698-9702, 9705, 9708-9709, 9714-9719, 9727-9729
	All sites except C024, C098-C099, C111, C142, C379, C420-C422, C424, C770-C779	9823, 9827
Myeloma		9731-9732, 9734

Leukemia		
Lymphocytic Leukemia		
Acute Lymphocytic Leukemia		9826,9835-9837
Chronic Lymphocytic Leukemia	C420, C421, C424	9823
Other Lymphocytic Leukemia		9820, 9832-9834, 9940
Myeloid and Monocytic Leukemia		
Acute Myeloid Leukemia		9840, 9861, 9866, 9867, 9871-9874, 9895-9897, 9910, 9920
Acute Monocytic Leukemia		9891
Chronic Myeloid Leukemia		9863, 9875, 9876, 9945, 9946
Other Myeloid/Monocytic Leukemia		9860, 9930
Other Leukemia		
Other Acute Leukemia		9801, 9805, 9931
Aleukemic, subleukemic and NOS		9733, 9742, 9800, 9831, 9870, 9948, 9963, 9964
	C420, C421, C424	9827
Mesothelioma +		9050-9055
Kaposi Sarcoma +		9140
Miscellaneous		9740-9741, 9750-9758, 9760-9769, 9950, 9960-9962, 9970, 9975, 9980, 9982-9987, 9989
	C760-C768, C809	excluding 9590-9989, and sometimes 9050-9055, 9140+
	C420-C424	
	C770-C779	
Invalid	Site or histology code not within valid range or site code not found in this table.	

+ The Site Recode variable can be created with or without Mesothelioma (9050-9055) and Kaposi Sarcoma (9140) as separate groupings. The table above documents both possibilities.
*Available from http://seer.cancer.gov/siterecode/icdo3_d01272003/ [Accessed May 2, 2005].

NOTES

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