

Appendix B: Primary Data Sources

Two types of data are presented in *The Health of Washington State*. Some data were obtained from previously published material and references for these data are in each chapter. However, most of the data were developed specifically for this report from data systems maintained by the Washington State Department of Health (DOH). Brief descriptions of the major data system used in this report follow. These include

- [Behavioral Risk Factor Surveillance System](#)
- [Birth certificate system](#)
- [Cancer registry \(Updated for the 2004 Supplement\)](#)
- [Census population counts and intercensal estimates \(Updated for the 2004 Supplement\)](#)
- [Death certificate system](#)
- [Hospitalization data](#)
- [Infectious disease reporting databases](#)
- [Pregnancy Risk Assessment Monitoring System](#)

Readers are encouraged to review this appendix carefully so they fully understand the strengths and limitations of the data systems. This understanding is essential for interpreting data from these sources.

Behavioral Risk Factor Surveillance System (BRFSS)

Description of the System

- **Purpose:** To provide indicators of health risk behavior, preventive practices, attitudes, health care use and access, and prevalence of selected diseases in Washington
- **Coverage:** English-speaking adults age 18 years and older in households with telephones; sample size was 3,584 in 2000
- **Years:** 1987-present; annual data generally available six months after the close of the calendar year

- **Data Elements (examples):** health-risk behaviors (smoking, physical inactivity, nutrition); use of preventive services (cancer screening); use of health care; attitudes about health-related behavior; socio-demographics (age, income, education); health conditions (asthma, diabetes)
- **Reporting System:** Data are gathered from a randomly selected sample of adults living in households with telephones. Interviews are conducted in English by a survey firm under contract to DOH following survey administration protocols established by CDC. The questionnaire includes core questions used by all states and questions on topics of specific interest to Washington. The BRFSS is supported in part by a cooperative agreement with the Centers for Disease Control and Prevention, U58/CCU002118-1 through 16 (1987-2002).
- **Data Quality Procedures:** Survey administration procedures (e.g., call-backs to difficult-to-reach households) are used to improve the representativeness of the sample, efforts are made to achieve response rates recommended by CDC, and computer-assisted interviewing is used to minimize errors by interviewers. CDC does cognitive testing on all questions and has assessed many, but not all, of questions for reliability and validity. Interviewers are trained professionally, and calls are monitored regularly.

Issues Related to Race and Ethnicity

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

have telephones or fewer households speak English. (See “Caveats.”)

Caveats

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

Best Uses

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

National Data

- Unless otherwise noted, the national BRFSS data used in *The Health of Washington State* are from CDC Division of Adult and Community Health, Behavioral Risk Factor Surveillance System Online Prevalence Data, <http://apps.nccd.cdc.gov/brfss>.

For Further Information

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

[Washington State BRFSS web site.](#)

Birth Certificate System

Description of the System

- **Purpose:** To establish legal rights associated with birth, paternity, and adoption; to provide public health information about births and newborns
- **Coverage:** All births in Washington including those for Washington residents who give birth in other states; estimated to be more than 99% complete
- **Years:** Paper records: 1907-1991; computerized records: 1968 – present; annual data generally available eight to ten months after the close of the calendar year
- **Data Elements (examples):** date of birth, gender, race/ethnicity, place of residence, place of birth, zip code of residence, maternal and paternal education, prenatal care,

smoking, method of delivery, birth weight, congenital anomalies, medical risks, obstetric procedures, complications

- **Reporting System:** The Electronic Birth Certificate (EBC) system was implemented in 1992. With this system, hospitals and birth attendants can enter legal and confidential patient information required for the birth certificate directly into an automated information system. Approximately 99% of birth records are filed electronically with the remaining one percent filed as paper forms.
- **Source of Information:** Medical records; worksheets completed by patients
- **Classification and Coding:** Classification and coding of data on Washington birth records follow the National Center for Health Statistics (NCHS) guidelines as defined in *Vital Statistics Instruction Manuals* parts 1-20 (Published by US Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention, National Center for Health Statistics, Hyattsville MD).
- **Data Quality Procedures:** DOH provides hospital staff and birth attendants with instruction manuals and training in the completion of the birth certificate and in the use of the electronic system. Data profiles are used to show hospitals how they compare to the state for selected items. Data quality procedures include range of value checks, internal consistency edits, mandatory data entry fields, and checks for consistency in trends over time. Hospitals and birth attendants are queried about possible errors or incomplete information. Formal affidavits are required to change the record for paternities, adoptions, or corrections.

Issues Related to Race and Ethnicity

- Birth certificates use open-ended reporting of race, allowing for multiple racial entries. However, the multiple race data have not been used in this report because they are of uncertain quality and completeness. One analysis conducted by the Washington State Center for Health Statistics found that approximately 2.7% of mothers reported more

than one race. This is lower than the census figure of 3.7%. In general, we would expect the mothers to report more than one race more often than census respondents because they are younger and younger people report more than one race more often than older people. For analysis purposes, the first race given is assigned as the person's race.

- Race and Hispanic origin of the mother and father are collected by asking the mother for the information. Since 1989, the standard for tabulating data has been to use the race of the mother. In earlier years, tabulations used a child's race calculated from the parents' race by a defined algorithm. The change was made because most of the health information on the certificate pertains to the mother and because of the increasing number of births where the father's race is missing.
- Hispanic origin was added as an ethnic category in the vital records system and collected as a separate item (in addition to race) in 1988. Sometimes, people of Hispanic origin list their race as other or write in Hispanic. National guidelines require that people reporting Hispanic as a race be counted as white. Approximately 15% of births coded as white are to mothers who report their race as Hispanic.
- In a few instances, the Hispanic ethnicity question is marked unknown, and Hispanic is given as the person's race. Beginning in 1992, if a person's ethnicity is marked as unknown and his/her race is given as Hispanic, that person's ethnicity is counted as Hispanic. Only about ten births are reclassified in this way each year, resulting in a 0.1% difference in the number of Hispanics at birth.

Caveats

- Health risk behavior during pregnancy (e.g., alcohol or tobacco use) is likely to be underestimated because this information is self-reported.
- Differences between counties in adverse birth outcomes could reflect incomplete extraction of information from medical records by some hospitals.

- Prenatal care can be under-reported if hospital staff is unfamiliar with a patient's history.

Best Uses

- Provide information on all births to Washington residents and all births occurring in Washington
- Examine trends in natality over time
- Compare local, state, national, and international trends
- Compare population subgroups (e.g., race, age of mother)
- Combine with induced abortion data to produce pregnancy statistics
- Use as the denominator for infant mortality statistics
- Investigate factors that affect birth outcomes

National Data

- Unless otherwise noted, the national birth certificate data used in *The Health of Washington State* are from the National Vital Statistics Reports published annually by the National Center for Health Statistics (NCHS). These reports are available in PDF format or can be ordered from the NCHS website. <http://www.cdc.gov/nchs/>

For Further Information

Washington State Department of Health, Center for Health Statistics, (360) 236-4323

[Washington State Department of Health, Center for Health Statistics Birth Page](#)

Cancer Registry (Updated for the 2004 Supplement)

Description of the System

- **Purpose:** The Washington State Cancer Registry (WSCR) monitors the incidence of cancer in order to understand, control, and reduce the occurrence and burden of cancer in this state (RCW 70.54.230).
- **Coverage:** All residents of Washington including those diagnosed and treated in other states; estimated 95% complete

- **Years:** Data collection began in 1991, but the first complete year of reliable data is 1992. Annual data are generally available 18 months after the end of a calendar year.
- **Key Data Elements:** Year of diagnosis, age, gender, race, type of cancer (site), stage at diagnosis, first course of treatment, treatment facility, and county, ZIP code, and census tract of residence; detailed clinical information such as histology, nodal involvement, and tumor size also available
- **Reporting System:** Cancer cases are collected through a combination of contracts with two regional tumor registries (the Cancer Surveillance System of the Fred Hutchinson Cancer Research Center and the Blue Mountain Oncology Program) and cases from independent reporting facilities (such as hospitals and clinics) with in-house cancer registry programs. Contractors and reporting facilities obtain reports of cases from hospitals, pathology laboratories, ambulatory surgical centers, and physicians; abstract information from the reports; and report to the state registry. Thirty other states including Idaho and Oregon report Washington cases to WSCR.
- **Classification and Coding:** The cancer reporting rules (246-102 WAC) define reportable cancers as "any malignant neoplasm, with the exception of basal and squamous cell carcinoma of the skin." Cancer *in situ* (that is, a cancer that has not yet spread to surrounding tissue) except cancer *in situ* of the uterine cervix is also included. Record format in WSCR follows the North American Association of Central Cancer Registries (NAACCR) standards. International Classification of Diseases for Oncology, Second Edition (ICD-O-2) codes are used in reporting the primary site, histology, and behavior. Stage at diagnosis is coded using the National Cancer Institute's Surveillance Epidemiology and End Results guidelines for General Summary Stage.
- **Data Quality Procedures:** DOH staff perform quality assurance activities including standardized computer edits, review of a

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

Issues related to Race and Ethnicity

- Information on race and Hispanic ethnicity are abstracted from the medical record and reported to WSCR. However, using information from the medical record alone historically resulted in underreporting of American Indian and Alaska Native race and Hispanic ethnicity. Therefore, additional processes are used for these groups. To increase appropriate recording of American Indian and Alaska Native race, WSCR links its records with records from the Indian Health Services and the Northwest Portland Area Indian Health Board. WSCR utilizes two standard practices to insure the appropriate recording of Hispanic ethnicity: (a) direct contact with health care providers in targeted geographical areas and (b) the application of a Hispanic surname algorithm to all records followed by verification with the reporting source.
- Since 2000, WSCR has allowed for the reporting of more than one race, but only approximately 0.3% of current WSCR records have more than one race. Following standards for the North American Association of Central Cancer Registries, WSCR records reporting two races are assigned to the non-white race or to the first race recorded if both races are non-white. When more than two races are recorded, the first non-white race is selected

- Comparisons of race and ethnicity between WSCR and the death files suggest that American Indian race and Hispanic ethnicity are underreported in WSCR. Thus race data are considered reliable for Asians and Pacific Islanders, blacks, and whites only. (See "[Cancer by Race](#)" in the WSCR 1998 Annual Report.

Caveats

- Inaccurate, poorly defined, or out-of-date reporting of some information abstracted from medical record, such as patient ethnicity, occupation, and delayed treatment
- Data for American Indian and Alaska Native race and Hispanic ethnicity, likely not comparable to national cancer incidence data
- Data not collected for non-invasive cervical cancer and non-melanoma skin cancer
- Limited ability to monitor the impact of interventions aimed at primary prevention because cancer usually takes a long time to develop and be diagnosed
- Limited ability to assess perceived clustering of cancer in communities, because most cancer takes a long time to develop and the number of cases is usually relatively small

Best Uses

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

National Data

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

For Further Information

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

[Washington State Cancer Registry](#)

Census and Intercensal Interpolations (Updated for the 2004 Supplement)

Population data in the 2002 *Health of Washington State* are from the U.S. decennial census for 1980, 1990, and 2000. Population data for 1981 – 1989 and 1991 – 1999 are called intercensal interpolations. These are provided by the Washington State Office of Financial Management (OFM) Forecasting Division and include population counts by age, sex and county, but not by race and ethnicity. Population data in the 2004 *Supplement* are from the U.S. Census for 1990, the National Center for Health Statistics (NCHS) bridged race population counts for 2000, 2001 and 2002, and Public Health – Seattle & King County (PHSKC) intercensal interpolations for 1991 – 1999. The accuracy of the OFM, NCHS, and PHSKC population counts depend to a large extent on the accuracy of the U.S. Census, because the U.S. Census provides the foundation from which they were developed.

Description of the System

- **Purpose:** The United States Constitution mandates a count of people living in the United States every 10 years to determine how many seats each state will have in the US House of Representatives. The US census is also used for political redistricting, distribution of federal and state funds, and other governmental needs. The primary purpose of intercensal interpolations is to provide a count of people in Washington between the decennial censuses. Both the US census counts and the Washington intercensal estimates are also used by many other entities for a diversity of purposes, such as the denominator for calculating rates of health events.
- **Coverage:** The US census attempts to count everyone living in Washington on April 1st of the census year. In March 2001, the US

Census Monitoring Board reported that approximately 98.5% of people living in Washington in April 2000 were counted in the 2000 census. Nationally, the Board estimated that 98.8% were counted. For discussions of accuracy and undercounts, see <http://www.cmbp.gov/> or <http://www.cmbc.gov/>.

- **Years:** US census: 1980, 1990, 2000; OFM intercensal interpolations: 1981 – 1989, 1991 – 1999; NCHS bridged race: 2000, 2001, 2002; PHSKC intercensal interpolations: 1991 – 1999.
- **Key Data Elements:** US census: age, gender, race (more than one race allowed for 2000 census); OFM intercensal interpolations: age, gender; NCHS bridged race: age, gender, single race; PHSKC intercensal interpolations: age, gender, single race.
- **Reporting System:**
US Census: The Bureau of the Census located in the Department of Commerce, develops and mails census questionnaires to all known addresses where people might live including housing units and other places, such as hospitals and hotels, the United States, Puerto Rico and other US territories. Information is gathered by a *short form* sent to five out of six housing units and a *long form* sent to the remaining addresses. The short form asks basic questions, such as name, age, gender, and race of everyone in the household. The *long form* includes the questions on the short form, additional demographic questions, such as income and education, and questions about housing. Census takers visit housing units in rural and remote areas to drop off and pick up forms and visit housing units that do not return census forms. Census workers also stage a one day operation to obtain information on homeless persons and others who might be missed in the traditional enumeration of housing units and group quarters.
- **Intercensal interpolations:** OFM develops the intercensal interpolations using information from the decennial censuses, annual data on the number of births and deaths in Washington, and a variety of other data, such as housing starts, to estimate migration

into and out of Washington. More information on how these estimates are developed is available at www.ofm.wa.gov/pop/annex/process/overview.pdf.

- **NCHS bridged race population counts:** The NCHS developed population data for 2000 in which people who chose more than one race in the 2000 U.S. Census were apportioned to a single race. The apportionment was based on National Health Interview Survey data. From 1997 – 2000, 4,898 survey participants selected more than one race in response to “What race do you consider yourself to be? Please select one or more of these categories [on a flashcard that had been handed to them].” Almost 4,000 of these people selected a single “primary” race when asked, “Which of these groups would you say best represents your race?” NCHS describes their method in detail in Vital and Health Statistics, Series 2 Number 135, *United States Census 2000 Population With Bridged Race Categories*, September 2003, available at http://www.cdc.gov/nchs/data/series/sr_02/sr02_135.pdf. NCHS developed bridged race population counts for each state and county in the U.S. We used single race population counts in the *2004 Supplement*, because other data sources used in this document do not reliably record more than one race.
- **PHSKC intercensal interpolations:** PHSKC estimated the number of people in each single race, age and sex group for 1991 – 1999. They first developed counts for each year by race, sex and age group using linear interpolation between the counts in the US 1990 Census and the 2000 NCHS bridged race population data. They then adjusted these counts to OFM’s intercensal interpolations described above. In this way, the age by sex component of PHSKC’s intercensal interpolations are consistent with OFM’s intercensal interpolations. These estimates were produced on the county level and aggregated to the state totals used in this report.
- **Data Quality Procedures:** US census data are subject to quality procedures employed by the US Census Bureau prior to release. These

procedures evaluate the completeness of the count, try to remove individuals who have been counted more than once and make other adjustments required for an accurate count. More information on data quality can be found at http://www.census.gov/pred/www/eval_top_rpts.htm#COLLECTION. Information on data quality procedures used in developing the intercensal estimates is available at <http://www.ofm.wa.gov/pop/coagemf/technote.s.pdf>. The Washington State Department of Health and Public Health – Seattle & King County assessed the accuracy of the Washington bridged race population counts developed by NCHS. We developed an algorithm to apportion people who reported more than one race to a single race group based on surveys in Washington in which people who reported more than one race were asked how they would describe themselves if asked for a single race only. (<http://www.doh.wa.gov/Data/Guidelines/Raceguide3.htm#Converting>) The population counts developed using this algorithm are very similar to those provided by NCHS.

Issues related to Race and Ethnicity

- The 2000 census first asked people whether they were Hispanic or Latino/a. People were then asked to identify themselves as belonging to one or more racial groups as follows: “white; Black, African Am. or Negro; American Indian or Alaska Native;” and 11 other groups that the census generally classifies as Asian or Native Hawaiians and other Pacific Islanders in their reports. The 1980 and 1990 asked people to identify themselves as belonging to only one racial group, used somewhat different terminology in describing racial groups, combined the Asian and Pacific Islanders into one group and asked about race first and then about whether the person was Hispanic.
- The 1991 – 1999 intercensal interpolations from OFM do not include race and ethnicity.

Caveats

- In the *2002 Health of Washington State*, we did not have single race data from the 2000 census and so we were unable to develop rates

by race for some health events such as death, cancer incidence, and infectious disease. With the release of the NCHS bridged race population counts, we provided this information in the *2004 Supplement*.

- In the absence of other information, the single-race intercensal estimates for 1991 – 1999 assumed linear increases in the number of people in a specific race, age, and sex category between 1990 and 2000. This assumption should be revisited if new data (such as OFM intercensal single-race estimates) become available.
- Although the Census Bureau attempts to obtain information from every known household, homeless persons, undocumented persons who deliberately avoided the census for fear of disclosure to the Immigration and Naturalization Services, urban poor living over commercial addresses, and others are undercounted by the census. The undercount is larger for some groups than for others. For example, an April 4, 2002 memorandum from the Census Bureau (DSSD Revised A.C.E. Estimates Memorandum Series PP-2) estimates that Native Hawaiians and Other Pacific Islanders are undercounted by almost 5% and American Indians by approximately 3%. The undercount might also affect some geopolitical jurisdictions more than others. In general, the smaller the group, the greater the potential for the undercount to be relatively large. (There is also a small group of people who were counted more than once resulting in an overcount. We do not have information on overcounts in Washington, but the national estimates are relatively small, i.e. less than one half of one percent for whites and Asians.)
- The 2000 census only allowed reporting of up to six people per household and so large households may not have included everyone.
- College students are usually enumerated in the towns in which they attend college, although their health events might be reported at their parents or guardians. This has implications for several counties in Washington.
- People who are confined in institutional group quarters, such as mental hospitals and prisons,

are reported separately and these numbers are not included in the population counts used in this document. This may affect rates of health events among some age and race groups with disproportionately high rates of incarceration.

- Due to reporting rules for active military personnel, some Washington jurisdictions might have military personnel who do not actually reside in those jurisdictions counted as part of the population. This phenomenon might affect rates of some conditions in counties with a high proportion of people who are active military.
- Although ZIP code is commonly collected as a geographic identifier by health data systems, 2000 census data by ZIP code was not available while this document was being written.
- Because population counts by single race group for 2001 and 2002 were not available when we began developing the *2004 Supplement*, we have used 2000 population counts with health events from 2001 and 2002. Most likely, the number of people in all race and ethnic groups is increasing. Thus, using 2000 population counts for 2001 and 2002 rates, underestimates the number of people at risk for a health event and artificially inflates the rate. While some groups might be growing faster than others, differential growth over 2001 and 2002 is unlikely to have a large impact on our ability to discern differences among different race and ethnic groups.

Best Uses

- Provide information on the number of people by age and sex living in Washington.
- Provide information on the number of people by age and sex living in counties and smaller geographic areas, including census blocks, block groups and census tracts.

For Further Information

US Bureau of Census Website:
<http://www.census.gov> .

Washington State Office of Financial Management (OFM) <http://www.ofm.wa.gov> .

Death Certificate System

Description of the System

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

check for internal consistency and logic/completeness of cause of death.

Issues Related to Race and Ethnicity

- Death certificates use open-ended reporting of race, allowing for multiple racial entries. However, the multiple race data have not been used in this report because they are of uncertain quality and completeness. The determination of race when more than one race is reported follows decision rules established by the National Center for Health Statistics (NCHS). In most cases, the first race given is assigned as the person's race.
- Hispanic origin was added as an ethnic category in the vital records system and collected as a separate item (in addition to race) in 1988. Prior to 1988, Hispanic data were provided by a racial category of "Mexican/Chicano" or "Mexican American."

Following national guidelines, people who report Hispanic ethnicity and other or Hispanic as a race are counted as white. In 2000, 589 or 1.4% of all white deaths had race classified using this guideline.

In a few instances, Hispanic ethnicity is marked unknown, and Hispanic is given as the person's race. Beginning in 1992, if a person's ethnicity is marked as unknown and his/her race is given as Hispanic, then that person's ethnicity is counted as Hispanic. About 60 deaths each year are reclassified in this way. However, the increase results in a 14% increase in the number of Hispanics at death.

- Reporting of race/Hispanic origin on death certificates is sometimes based on observing the decedent rather than questioning the next of kin. This procedure causes an underestimate of deaths for certain groups, particularly Native Americans, some of the Asian subgroups, and Hispanics. Thus, death rates based on death certificate data are lower than true death rates for these groups. See caveat below for more information.

Caveats

- Unless otherwise noted, the mortality rates in *The Health of Washington State* use the underlying cause of death. For example, if a

person dies of a brain tumor that has spread to the brain from a tumor in the breast, the underlying cause is reported as breast cancer. Likewise, if a person dies of pneumonia as a complication of a stroke, the underlying cause of death is reported as a stroke.

- Death rates can underestimate the magnitude of certain public health problems for deaths that might be under-reported due to social stigma (such as AIDS and suicide) or that diminish the quality of life, but are not fatal (such as chronic alcoholism).
- The number of deaths in certain racial subgroups (such as Asians and Native Americans) and for people of Hispanic origin might be underestimated because of the misclassification of deaths for some people in those groups to white, non-Hispanic. See [Quality of Death Rates by Race and Hispanic Origin: A Summary of Current Research, 1999](#).
- Differences in causes of death between counties could reflect cause of death reporting practices by local physicians, coroners, or medical examiners.
- Revisions in ICD codes create a discontinuity in trends that must be accounted for when comparing mortality rates between time periods using different revisions. In this document, mortality rates from 1980 – 1998 are coded following the ICD-9. Mortality rates for 1999 and 2000 are coded following the ICD-10. Ratios of the number of deaths recoded using ICD-10 to the number originally coded using ICD-9 (obtained from a study of a large sample of 1996 US deaths) can assist when trying to determine whether a trend noted in the 1980 – 1998 period has continued in 1999 and 2000. The ratios are called comparability ratios. For more information, see [Washington State Department of Health Center for Health Statistics ICD-10 Information Page](#) or [Comparability of Cause of Death Between ICD-9 and ICD-10: Preliminary Estimates](#).
- Because of revisions in the ICD codes, we multiplied 1998 death rates by the

comparability ratios (see above) to develop three-year averages for 1998 – 2000.

Best Uses

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

National Data

- National death data are available from several sources within the federal government. Sources used in The Health of Washington State are referenced in each chapter.

For Further Information

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

[Washington State Department of Health, Center for Health Statistics, Death Page](#)

Hospitalization Data

- **Comprehensive Hospital Abstract Reporting System (CHARS)**
- **Oregon Hospital Discharge Data (OHDD)**

Description of the System (CHARS)

- **Purpose:** Initially developed to monitor hospitalization rates; now used to examine trends in causes of hospitalization, create hospital-specific case-mix indices, characterize access to and quality of health care, and monitor morbidity from selected health conditions
- **Coverage:** Inpatient stays for all patients treated in state-licensed acute care hospitals in Washington, regardless of patient residence. A hospital is defined as any health care institution that is required to qualify for a license under RCW 70.41.020. CHARS does not cover private alcoholism hospitals, no-fee

hospitals, US military hospitals, US veterans administration (VA) hospitals, or Washington State psychiatric hospitals. Eligible hospitals provide data for hospital units that are Medicare-approved, including psychiatry, rehabilitation, and bone marrow units.

- **Years:** Although data collection began in mid-1984, the first complete year of reliable data is 1987; annual data generally available six months after the close of the calendar year.
- **Key Data Elements:** Hospital, zip code of residence, birthdate, age, gender, length of stay, discharge status, total charges, payer, principal and secondary diagnoses, principal and secondary procedures, physician, diagnosis related groups (DRGs) and DRG relative weight, external cause of injury code, encoded patient identifier
- **Reporting System:** Hospitals abstract information from the uniform billing form, code diagnoses and procedures, and submit the information to the state contractor by tape, cartridge, or electronic file transfer within 45 days of the end of the month.
- **Classification and Coding for Causes of Hospitalization:** Reasons for hospitalization are coded according to the International Classification of Disease, Clinical Modification of the Ninth Revision (ICD-9-CM). The reason in the first diagnosis field is considered to be the principal reason the patient was admitted to the hospital. Beginning in 1993, there are up to eight other diagnosis fields for additional conditions that had an effect on the hospitalization. Prior to 1993, CHARS allowed for the coding of up to five additional diagnoses. Separate from the diagnosis codes, CHARS also has a code that indicates the external cause of an injury or poisoning.
- **Data Quality Procedures:** The state contractor edits the data through computerized system program checks. On a quarterly basis, hospitals certify that the number of discharges and hospital charges are 95% correct. Accuracy of the diagnosis field has been assessed in several studies conducted by DOH.

Description of the System (OHDD)

- **Purpose:** In Oregon, data are collected to monitor hospitalization indices for the Oregon Health Plan. Washington obtains the data on Washington residents hospitalized in Oregon to more accurately examine trends in causes of hospitalization, access to and quality of health care, and morbidity from selected health conditions.
- **Coverage:** Inpatient hospital stays in state-licensed hospitals in Oregon
- **Years:** Washington has data on Washingtonians hospitalized in Oregon since 1988. We are generally able to obtain the OHDD within 12 months after the close of the calendar year, although we have experienced delays of several years. We currently have OHDD through 1999.
- **Key Data Elements:** Hospital, zip code, birthdate, age, gender, length of stay, discharge status, payer, principal and secondary diagnoses, principal and secondary procedures, DRGs, and external cause of injury codes
- **Reporting System:** Hospitals abstract information from the uniform billing form, code diagnoses and procedures, and submit the information to the Oregon State Hospital Association. The Association prepares the database and releases a copy to the Oregon State Office for Health Policy and Research.
- **Classification and Coding for Causes of Hospitalization:** OHDD is similar to CHARS in that reasons for hospitalization are coded according to the International Classification of Disease, Clinical Modification of the Ninth Revision (ICD-9-CM), and there are fields for the principal and additional diagnoses. The number of fields for additional diagnoses increased from five to eight in 1995. Beginning in 1998, there has been separate coding for the external cause of an injury. However, unlike in Washington, reporting of external cause is not mandatory (see Caveats below).
- **Data Quality Procedures:** A contractor edits the data through computerized system

program checks. Hospitals certify that the number of discharges and hospital charges are 95% correct.

Issues Related to Race and Ethnicity

- Neither CHARS nor OHDD collect information on the race and ethnicity of patients.

Caveats

- Although most analyses in this report are based upon the first listed diagnosis, some analyses are based upon any listed diagnosis. This is done because some conditions, such as diabetes and high blood pressure, are contributory causes of hospitalizations where they are not listed first. To gauge the full impact of a condition like high blood pressure, it is necessary to examine both “hospitalization from” the condition as well as “hospitalization with” the condition. For example, in 1999 there were 5,086 hospitalizations where diabetes was listed as principal diagnosis, but 56,485 hospitalizations where diabetes was listed as either principal or secondary diagnosis; for high blood pressure, the difference is even greater (2,061 vs. 103,910). (Data comparisons for selected diseases and injury are in [Appendix C](#).)
- Unless otherwise noted, the unit of observation is the hospitalization episode not the individual. Thus, one person hospitalized several times will be counted several times. The number of hospitalizations gives us a better picture of the public health impact of a condition. Each hospitalization for an illness or injury is an adverse event for the person who experiences it. Many hospitalizations are potentially avoidable through reductions in the factors that cause diseases and injuries or through early detection and rapid treatment. In addition, because records in OHDD do not include a patient identifier, it is not possible to count individuals when using a combined CHARS-OHDD dataset.
- The Oregon State Health Department estimates that reporting of external cause in the OHDD is approximately 60% complete. Incomplete reporting of external cause has

been found in hospitalization data in other states without mandatory reporting. Therefore, we have not used external cause from the OHDD.

- Hospitalization excludes emergency room visits, outpatient surgery, outpatient clinics, military and VA hospitals (greatest impact on Island county because of the large proportion of residents connected with the military), free-standing surgeries, free standing mental health, substance abuse, and rehabilitation centers, birthing centers.
- CHARS does not contain data on Washington residents hospitalized outside of Washington. Data on Washington residents hospitalized in Oregon are obtained through the OHDD. However, hospitalization data are not available for Washington residents hospitalized in other states, and OHDD cannot always be combined with CHARS, as for example, when one wants to count individuals and not hospitalizations. This situation affects border counties, especially those adjacent to larger population centers in other states. Asotin and Garfield counties are particularly affected by hospitalization in Idaho.
- Changes in hospitalization practices or coding conventions might affect trends over time
- Residence is based on five-digit ZIP codes. In this report, ZIP codes have been assigned to county based on US postal service conventions that assign ZIP codes to counties based on the physical location of the post office. When ZIP codes cross county borders, some hospitalizations are assigned to the wrong county. This phenomenon may be most important for Skamania. ZIP code 98671 includes a large portion of Skamania, but all hospitalizations in that ZIP code are assigned to Clark County. Other counties are less affected, because the number of hospitalizations that are potentially assigned to the wrong county are a relatively small proportion of the total hospitalizations for that county.
- No race/ethnicity data collected
- Increases in the number of diagnosis fields can result in a discontinuity in trend data.

Best Uses

- Monitor hospitalizations due to relatively severe diseases (severe enough to warrant hospitalization consistently over time)
- Analyses on utilization of inpatient health care resources/medical care costs
- Analyses of source of payment
- Analyses on access to care by examining trends in potentially avoidable hospitalizations

For Further Information

[Washington State Department of Health Hospital Data Page](#)

Washington State Department of Health, Center for Health Statistics (360) 236-4223.

The Washington State Department of Health does not release record-level data from OHDD. For additional information on OHDD, contact the Oregon Office for Health Policy and Research at (503) 378-2422 x414.

Infectious Disease Databases

Description of the System

- **Purpose:** To monitor the incidence of selected infectious diseases and health conditions and to characterize populations at high risk for those diseases and conditions
- **Coverage:** All residents of Washington; under-reporting is an issue (See “Caveats” below.)
- **Years:** Varies depending on disease and health condition, but information on most of the current notifiable infectious diseases began in the 1980s; data generally available on an ongoing basis with annual data compiled six months after the end of a calendar year
- **Key Data Elements:** Diagnosis, age, gender, race/ethnicity, county of residence
- **Reporting System:** Following WAC 246-101, health care providers, hospitals, and labs identifying a patient with a notifiable infectious disease or condition are required by law to report the case to the local or state health department and to provide a limited amount of information about the patient. For

some notifiable infectious diseases and conditions, the health department more actively seeks out cases or collects exposure information; for other diseases and conditions, there is little health department involvement other than recording cases. Legally, each disease is to be reported within a specified length of time (e.g., immediately, within a day, within seven days); however, these requirements are often not met.

- **Classification and Coding:** Standard case definitions are developed by the Council of State and Territorial Epidemiologists to enhance national comparisons over time and in different geographic locations
- **Data Quality Procedures:** Most of the diseases reported to the notifiable infectious disease database are confirmed by laboratory testing, although some case definitions are based on a health care provider’s diagnosis only.

Issues Related to Race and Ethnicity

- Racial and ethnic categories reflect reporting forms developed by the Centers for Disease Control and Prevention and are not reported uniformly for infectious diseases.
- Race and ethnicity are often not reported or are reported based on the reporter’s opinion.
- Reduced access to health care facilities can result in under reporting for certain racial or ethnic groups.
- Relatively greater use of public health care facilities by certain racial or ethnic groups can result in over reporting for those groups.

Caveats

- Underestimate of the incidence of the disease/health condition because of under-detection, under-diagnosis, and under-reporting
- Inconsistent level of detection/reporting in different populations because of differences in access to health care, source of health care, and reporting effort
- Inaccurate or incomplete reporting of some information (such as race and ethnicity)

- Less serious diseases more likely to be under-diagnosed and under-reported than diseases considered severe

National Data

- Unless otherwise noted, national data on infectious disease used in *The Health of Washington State* are from the *Summary of Notifiable Diseases, United States* published annually by CDC as a supplement to the Morbidity and Mortality Weekly Report (MMWR).
<http://www.cdc.gov/mmwr/summary.html> .

Best Uses

- Examine trends in moderately severe disease (i.e., requiring a health care encounter but not necessarily leading to hospitalization or death) particularly if cases are confirmed through laboratory tests
- Characterize high risk populations
- Compare local, state, and national trends
- Investigate spatial patterns and correlates (including outbreak identification)
- Monitor impact of intervention and prevention activities because effects are seen rapidly owing to the relatively short time between exposure to a pathogen and onset of disease for most notifiable infectious diseases

For Further Information

Washington State Department of Health, Office of Epidemiology, Communicable Disease Unit at (206) 361-2914 to be directed to specific database

[Washington State Department of Health, Annual Communicable Disease Reports and Tables](#)

Pregnancy Risk Assessment Monitoring System (PRAMS)

Description of the System

- **Purpose:** To supplement birth certificate data and to generate state-specific data for planning and evaluating perinatal health programs
- **Coverage:** New mothers (two to six months postpartum) who are residents of Washington and can speak either English or Spanish. Approximately 2,000 new mothers are

sampled each year (overall 2.5% of all births to Washington residents).

- **Years:** 1993 – present; annual data are generally available 14 months after the close of the calendar year
- **Key Data Elements:** Age, race, ethnicity, education level, socioeconomic information, risky behaviors, health care during pregnancy, infant health care
- **Reporting System:** Participants are selected from birth certificate data using a stratified random sample that oversamples new non-white mothers and new mothers in King and Snohomish counties. Survey information is collected by mail through a self-administered questionnaire with telephone follow-up of non-responders.
- **Data Quality Procedures:** Comparisons of data from birth certificates, the First Steps Database (Medicaid), and PRAMS have been undertaken

Issues related to Race and Ethnicity

- PRAMS uses race and ethnicity as reported on the birth certificate (see [Birth Certificate System](#))
- PRAMS uses race and ethnicity from the birth certificate to assure that a sufficiently large number of Asian, African American, American Indian, and Hispanic mothers participate in the survey.

Caveats

- Overall response rate of 70%; lower response rates for African American and Native American mothers.
- Collection of information two to six months after delivery might impact responses to more subjective questions and limits follow-up time for outcomes
- Self-reported information is not verified through other means
- Sample design prevents analysis of data for most individual counties

National Data

- Sources for national PRAMS data used in *The Health of Washington State* are noted in each chapter.

Best Uses

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

For Further Information

[Washington State Department of Health, PRAMS page](#)

Listing of Washington PRAMS publications:

http://www.cdc.gov/nccdphp/drh/prams_wa.htm

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

The national PRAMS website:

http://www.cdc.gov/nccdphp/drh/srv_prams.htm.