

Appendix B: Primary Data Sources

Most chapters in *The Health of Washington State* present data from data systems maintained by the Washington State Department of Health. Brief descriptions of the major data system used in this report follow. These include:

- [Behavioral Risk Factor Surveillance System](#)
- [Birth Certificate System](#)
- [Cancer Registry](#)
- [Census Population Counts and Inter-censal Estimates](#)
- [Death Certificate System](#)
- [Healthy Youth Survey](#)
- [Hospitalization Data](#)
- [Infectious Disease Reporting Databases](#)
- [Pregnancy Risk Assessment Monitoring System](#)

Readers need to review this appendix carefully. Accurate interpretation of data depends on understanding the strengths and limitations of the data systems.

Behavioral Risk Factor Surveillance System (BRFSS)

Description of the System

- **Purpose.** BRFSS provides indicators of health risk behavior, preventive practices, health care use and access, knowledge and attitudes about health-related behaviors and practices, and prevalence of selected diseases in Washington.
- **Coverage.** BRFSS surveys adults ages 18 and older in households in Washington with landline telephones. From 1987-2002, BRFSS included only English speakers.

Since 2003, BRFSS has been administered in English and Spanish. In addition to the statewide sample, since 2003, BRFSS has oversampled small counties to allow reporting of BRFSS information by county. In 2006, BRFSS surveyed 23,760 adults statewide.

- **Years.** BRFSS data are available from 1987-present, with annual data generally available six months after the close of the calendar year. The 2006 BRFSS dataset became available midway through the process of writing *The Health of Washington State, 2007*. Some authors incorporated the 2006 data, while others presented data through 2005. The 2006 data are most important for point estimates of the state as a whole, such as when determining progress toward *Healthy People 2010* targets. Relationships among subgroups, mostly assessed by combining several years of data, are likely to be similar whether analysts used BRFSS data from 2003-2005 or 2004-2006.
- **Key data elements.** BRFSS data include information on health-risk behaviors (e.g., smoking, physical inactivity, nutrition); use of preventive and other health care services (e.g., cancer screening); attitudes and knowledge about health-related behavior (e.g., signs of stroke); socio-demographics (e.g., age, income, education); and health conditions (e.g., asthma, diabetes).
- **Reporting system.** Data are from a randomly selected sample of adults living in households with landline telephones. A survey firm under contract to the Washington State Department of Health conducts the survey following administrative protocols established by the U.S. Centers for Disease Control and Prevention (CDC). The questionnaire includes core questions used by all states and questions on topics of specific interest to Washington. Beginning in 2003, Washington BRFSS began administering more than one form of the questionnaire each year. The core questions are on all forms administered during a calendar year, while most of the state-added questions appear on only one form each year. Thus, sample sizes vary for core and state-added questions. The BRFSS is supported in part by cooperative agreements with CDC, U58/CCU002118-1 through 16 (1987-2002), U58/CCU022819-01 through 03 (2003-2006).
- **Data quality procedures.** The survey contractor uses several procedures to improve response rates, such as call-backs to difficult-to-

reach households. To further improve response rates, in 2005, the contractor began to send advance letters to households where telephone numbers could be matched to addresses. Interviewers use computer-assisted interview software to minimize errors. CDC tests all questions to assure that respondents understand them and can answer using specific categories for replies. CDC has assessed many, but not all questions for reliability and validity. Interviewers receive professional training, and supervisors and project directors regularly monitor calls to assure that interviewers maintain quality standards.

Issues Related to Race and Hispanic Origin

- BRFSS respondents identify their race and whether they are of Hispanic origin 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 2001, interviewers recorded only one race. Beginning in 2001, interviewers could record up to six responses. For respondents who report more than one race, interviewers ask, “Which one of these groups would you say BEST represents your race?” Unless otherwise noted, *The Health of Washington State, 2007* uses the respondent’s one preferred race.
- People of Hispanic origin, Pacific Islanders, and American Indians and Alaska Natives might be under-represented, because Washington residents in these groups might be less likely to live in households with landline telephones. (See Caveats, second bullet, below.)
- People in some race groups might be under-represented because they are more likely to speak languages other than English or Spanish.

Caveats

- The response rate for the BRFSS decreased from 61% in 1995 to 47% in 2006. Other states and other telephone surveys have experienced similar decreases. 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. (National BRFSS Conference, March 13, 2002, Peter Mariolis, Ph.D., CDC Behavioral Surveillance Branch)

- BRFSS might under-represent poorer, more mobile, and younger populations, as well as people of Hispanic origin and non-Hispanics who are races other than Asian, black, or white. These groups are less likely to live in homes with landline telephones. The 2006 National Health Interview Survey found that of adults living in households with only wireless telephone service about
 - Half lived with unrelated roommates
 - Half were less than 30 years old
 - One fourth rented their homes
 - 20% lived below the federal poverty level
 - 15% were Hispanic origin.
 (Blumberg S. J. and Luke J. V. Wireless substitution: Early release of estimates based on data from the National Health Interview survey, July-December 2006. National Center for Health Statistics. Available from <http://www.cdc.gov/nchs/data/nhis/earlyrelease/wireless200705.pdf>, last accessed August 1, 2007.)
- BRFSS does not represent people who do not speak English or Spanish.
- BRFSS does not represent people who live in institutions or other group settings, such as dormitories, group homes, hospitals, in-patient drug treatment facilities, jails, or prisons.
- Characteristics of people who refuse to participate are unknown.
- BRFSS might underestimate health risk behavior because people might be reluctant to report behaviors that others might not find acceptable.
- BRFSS might underestimate use of preventive services because people might not recall correctly. Respondents might overestimate use of preventive services because they think they “should” have had a particular service.

Best Uses

- Provide estimates of the prevalence of health risk behaviors, use of preventive services, use of and access to health care, and 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 use, 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, 2007* were developed by Washington State Department of Health data analysts using datasets for all 50 states and the District of Columbia. The datasets were downloaded from CDC in 2006 from http://www.cdc.gov/brfss/technical_infodata/surveydata.htm. National BRFSS percentages were developed using Sudaan or Stata statistical programs and weights and stratification variables developed by CDC.
- BRFSS data in *The Health of Washington State, 2007* are sometimes different from data presented on the CDC BRFSS website. First, national data in *The Health of Washington State, 2007* are percentages of for the entire U.S. population; the contribution from each state varies according to the state's population. The CDC BRFSS website provides median values of all states and the District of Columbia; half of the states are above the median and half are below, and each state counts once independent of its size. Second, most of the BRFSS data in *The Health of Washington State, 2007* have been age-adjusted; the CDC BRFSS website does not currently provide age-adjusted percents.

For Further Information

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

Washington State BRFSS web site:
<http://www.doh.wa.gov/BRFSS>

CDC Behavioral Surveillance Branch:
<http://www.cdc.gov/BRFSS>

Birth Certificate System

Description of the System

- **Purpose.** Birth certificates establish legal rights associated with birth, paternity, and adoption and provide public health information about births and newborns.
- **Coverage.** The birth certificate system covers all births to Washington State residents, including those for residents who give birth in other states; it is estimated to be more than 99% complete.
- **Years.** The system maintains paper records from 1907-1991 and computerized records from 1968-present. *The Health of Washington State, 2007* uses computerized records from 1980-2005. Annual data are generally available eight to ten months after the close of the calendar year.
- **Key data elements.** Data elements include 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, and complications.
- **Reporting system.** The Washington State Department of Health (Department) implemented the Electronic Birth Certificate system 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. Hospitals and birth attendants file approximately 99% of birth records electronically with the remaining 1% filed as paper forms. Information comes from medical records and worksheets completed by mothers.
- **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 (U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention, NCHS, Hyattsville, MD).
- **Data quality procedures:** The Department 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 Hispanic Origin

- The birth certificate collects data on race and Hispanic origin of the mother and father by asking the mother for the information. Since 1989, the standard for tabulating data has been to use the race of the mother, and the *Health of Washington State, 2007* uses this standard.
- Birth certificates use open-ended reporting of race, allowing for multiple racial entries. Multiple race data have not been used in this report. In 2005, 3.3% of non-Hispanic mothers reported more than one race. This is comparable to the proportions of women of childbearing age (15-44) in the 2000 U.S. Census and the 2004 and 2006 estimates from the Washington State Office of Financial Management, indicating that the birth certificate might be adequately identifying mothers of more than one race. Nonetheless, the number of mothers in any one multiple race category is too small for accurate reporting, and there is no scientific basis for grouping all mothers with more than one race. [Parker, J. (2006). The role of reported primary race on health measures for multiple race respondents in the National Health Interview Survey, Public Health Reports, 121, 160-168.] *The Health of Washington State, 2007* follows the NCHS algorithm for assigning mothers with more than one race to a single race group. For a description of this process, see NCHS Procedures for Multiple-Race and Hispanic Origin Data: Collection, Coding, Editing, and Transmitting, Division of Vital Statistics, NCHS, Centers for Disease Control and Prevention, May 7, 2004, http://www.cdc.gov/nchs/data/dvs/Multiple_race_documentation_5-10-04.pdf.
- 3.6% of birth certificates in 2003-2005 combined had missing data for Hispanic origin or missing race for non-Hispanic

mothers. These certificates were not included in the analyses.

Caveats

- High unknowns in some fields (such as the month prenatal care began and pre-pregnancy obesity) may make patterns and trends difficult to interpret.
- Differences between counties might reflect incomplete extraction of information from medical records by some hospitals. For example, prenatal care can be under-reported if hospital staff are unfamiliar with a patient's history and do not have access to prenatal records.
- Smoking during pregnancy on the birth certificate is underestimated compared to smoking during pregnancy reported on the [Pregnancy Risk Assessment Monitoring System](#) (Department's Office of Maternal and Child Health Assessment, unpublished data). Both of these systems use self-reports.
- *The Health of Washington State, 2007* low birth weight analyses follow NCHS conventions and do not include birth certificates with birth weights less than 227 grams or greater than 8,165 grams (NCHS Instruction Manual, part 12. Computer Edits for Natality Data, Effective 1993. Hyattsville, MD. 1995, available at <http://www.cdc.gov/nchs/about/major/dvs/im.htm>. These records may be included in other Department reports.

Best Uses

- Provide information on all births to Washington residents
- Examine trends in births over time
- Compare local, state, national, and international trends
- Compare population subgroups (e.g., race and 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, 2007* are from the National Vital Statistics Reports published annually by the 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:
http://www.doh.wa.gov/EHSPHL/CHS/CHS-Data/birth/bir_main.htm

Cancer Registry

Description of the System

- **Purpose.** The Washington State Cancer Registry (WSCR) monitors the incidence of cancer to understand, control, and reduce the occurrence and burden of cancer in Washington (RCW 70.54.230).
- **Coverage.** WSCR includes information on residents of Washington, including those diagnosed and treated in other states; it is estimated to be more than 95% complete.
- **Years.** WSCR has information from 1992-present. Annual data are generally available 18 months after the end of a calendar year. *The Health of Washington State, 2007* includes cancer incidence data from 1992-2004.
- **Key data elements.** Data elements include year of diagnosis, age, gender, race, ethnicity, type of cancer (site), stage at diagnosis, first course of treatment, treatment facility, and county, ZIP code, and census tract of residence; clinical information such as histology, nodal involvement, and tumor size is also available.
- **Reporting system.** Health care providers and facilities, such as hospitals, independent laboratories, radiation/oncology treatment centers, and ambulatory surgery centers, are required to report cases to WSCR either directly or through contracted vendors. The

Cancer Surveillance System at the Fred Hutchinson Cancer Research Center has operated under contract to WSCR since 1992 to collect and quality assure data for the 13 western Washington counties surrounding the Puget Sound. WSCR collaborates with other state or central registries to collect case information on Washington residents diagnosed and treated outside Washington. WSCR has data-exchange agreements with 34 other states. The majority of Washington's out-of-state cases are reported by the population-based registries in Oregon and Idaho, followed by Texas and Arizona.

- **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." Reporting is also required for cancer *in situ* (that is, a cancer that has not yet spread to surrounding tissue), except for cancer *in situ* of the uterine cervix. The record format in WSCR follows North American Association of Central Cancer Registries standards. Primary site, histology, and behavior coding are based on the International Classification of Diseases for Oncology (ICD-O). In 2001, WSCR began using the Third Edition of the ICD-O, and cases diagnosed prior to 2001 were updated accordingly. WSCR reports on the stage of disease at diagnosis using the National Cancer Institute's Surveillance Epidemiology and End Results (SEER) guidelines for General Summary Stage 1977 and 2000. This staging information is calculated via Collaborative Staging schema for cases diagnosed in 2004 or later.
- **Data quality procedures.** Many health care facilities have in-house certified cancer registrars to initiate case reports to WSCR. For facilities without registrars and for physician offices, WSCR staff provide tools and instructions for reporting cases. WSCR 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 Hispanic origin, and hospital audits to determine the completeness of case finding and the accuracy of data abstraction and coding. In addition, WSCR 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. The North American Association of Central Cancer

Registries and the CDC National Program of Cancer Registries review the data annually for quality and completeness. The national program also conducts in-depth audits of WSCR on a regular basis. WSCR continues to be recognized by both organizations for the completeness and quality of its data.

Issues Related to Race and Hispanic Origin

- Those reporting cancer cases to WSCR record information on race and Hispanic origin from the medical record or other reliable sources available at the time. Using information from the medical record alone historically resulted in underreporting of American Indian and Alaska Native race and Hispanic origin. To increase appropriate recording of American Indian and Alaska Native race, WSCR links its records with records from the Indian Health Service and the Northwest Portland Area Indian Health Board. WSCR uses two standard practices to assure the appropriate recording of Hispanic origin: (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 1% of current WSCR records have more than one race. Following standards set by the North American Association of Central Cancer Registries, WSCR assigns records with two races to the non-white race or to the first race recorded if both races are non-white. When more than two races are recorded, WSCR selects the first non-white race.
- To assess the quality of race, WSCR staff linked WSCR data from 1998-2001 with death certificate data from 1998-2002 and compared race and Hispanic origin in the two data sources. Approximately 99% of those recorded as white, 98% recorded as black, 96% recorded as Asian and Pacific Islander, 87% recorded as American Indian and Alaska Native, and 91% recorded as Hispanic origin on the death certificate were recorded as such in WSCR. Additionally, about a fourth of people recorded as American Indian and Alaska Native in WSCR were recorded as white on the death certificate, and about 30% of those recorded

as Hispanic origin in WSCR were recorded as non-Hispanic on the death certificate. It is difficult to determine whether WSCR is assigning people to these groups who should not be assigned or whether they are misreported on the death certificate, but there is evidence that American Indian and Alaska Native race, and to a lesser extent, Hispanic origin are underreported on the death certificate. (Centers for Disease Control and Prevention, National Center for Health Statistics. (1999). *Quality of Death Rates by Race and Hispanic Origin: A Summary of Current Research, 1999*. http://www.cdc.gov/nchs/data/series/sr_02/sr02_128.pdf, retrieved August 8, 2007.)

Caveats

- Data for American Indian and Alaska Native race and Hispanic origin are likely not comparable to national data.
- Data are not collected for non-invasive cervical cancer and non-melanoma skin cancer.
- There is limited ability to use WSCR to monitor the impact of interventions aimed at primary prevention because cancer usually takes a long time to develop.
- There are increasing challenges with collecting data in a timely manner as treatment in outpatient settings and from multiple health care professionals becomes more common.
- It is difficult to use WSCR data to assess community concerns about cancer clusters because of long latency periods for most types of cancer combined with a relatively mobile society, and the relatively small numbers of events in most potential community clusters.

Best Uses

- Examine time trends in cancer incidence
- Compare cancer incidence to mortality trends
- Compare local, state, and national trends
- Compare population subgroups
- Investigate spatial patterns and correlates, including assisting with response to public concerns regarding potential clusters
- Assist with assessing disparities in treatment and screening practices

National Data

- National incidence data for trends back to 1980 were developed by WSCR staff using SEER*Stat 6.2.4, released in April 2006 by the National Cancer Institute. The data include cancer incidence from nine SEER sites across the United States 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 (888) 302-2227

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

Census Population Counts and Intercensal and Postcensal Estimates

Description of the System

- **Purpose.** The U.S. Constitution mandates a count of people living in the United States (the U.S. Decennial Census) every 10 years to determine how many seats each state will have in the U.S. House of Representatives. The U.S. Decennial Census is also used for political redistricting, distribution of federal and state funds, and other governmental needs. Locally developed intercensal and postcensal estimates provide population counts for non-census years. Organizations and individuals use population counts for diverse purposes. *The Health of Washington State, 2007* uses intercensal and postcensal counts to describe Washington's population and as denominators for calculating rates of health events.
- **Coverage.** The U.S. Decennial Census attempts to count everyone living in Washington on April 1 of the census year. In March 2001, the U.S. 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.cmcb.gov>. Intercensal and postcensal estimates also provide

population counts of everyone living in Washington.

- **Years.** For most analyses, *The Health of Washington State, 2007* uses population from the U.S. Decennial Census for 1980, 1990, and 2000; the Washington State Office of Financial Management (OFM) Forecasting Division's intercensal estimates for 1981-1989 and 1991-1999; and OFM's postcensal estimates for years after 2000. Analyses of death rates by education used population counts for 2004 and 2005 from the U.S. Census Bureau's American Community Survey. Hospitalization rates by county for 2002-2004, state-level death rates by race and Hispanic origin for 2003-2005, and regional analyses for 2001-2005 used population estimates developed by Krupski Consulting.
- **Key data elements.** The U.S. Census Bureau provides population counts by age, gender, race, Hispanic origin, residence (block, block group, tract, county, and state), education, income. OFM provides annual population estimates at the state and county levels by age and gender. For even-numbered years, OFM provides estimates by age, gender, race and Hispanic origin. OFM also provides annual estimates of the numbers of people living in census block groups. Krupski Consulting estimates include population counts at the census block and ZIP code levels by age, gender, race, and Hispanic origin.
- **Reporting systems.**
U.S. Census. The Bureau of the Census, located in the U.S. 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 U.S. territories. Information for recent censuses has been 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 and 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. Beginning in 1996, the Census Bureau began administering the American Community Survey to a sample of counties. This survey is currently administered to a sample of all U.S. counties. It collects information similar to that collected on the long form and will replace the long form in the 2010 U.S. Census. More information on the decennial census and the American Community Survey is available at <http://www.census.gov/>.

Intercensal interpolations and postcensal estimates. OFM provides intercensal interpolations for years between censuses and postcensal estimates for years following the most recent census. OFM develops these estimates 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. These estimates include population counts by age, gender, and county. OFM also estimates population counts by age, gender, county, race, and Hispanic origin in even-numbered years, and they estimate the number of people living in census blocks annually. More information on how these estimates are developed is available at www.ofm.wa.gov/pop/annex/process/overview.pdf.

Krupski Consulting. The Washington State Department of Health Center for Health Statistics contracts with Krupski Consulting to estimate postcensal population counts for census blocks and ZIP codes by age, sex, race, and Hispanic origin. These estimates can be aggregated to develop information at the county, regional, or state level. Krupski Consulting used 1) the 2000 U.S. Census; 2) the NCHS race bridging coefficients (see *Issues Related to Race and Hispanic Origin*, below); 3) OFM's annual postcensal estimates by age, sex, and county; 4) OFM's even-year estimates by age, sex, county, race, and Hispanic origin; and 5) OFM's annual estimates of block group populations to develop their population counts. For postcensal estimates, they extrapolated from earlier trends and adjusted their

estimates to match OFM's postcensal county and block group totals.

- **Data quality procedures.** U.S. Census data are subject to quality procedures employed by the U.S. 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 and postcensal estimates is available at <http://www.ofm.wa.gov/pop/coagemf/technotes.pdf>. Information on data quality for estimates developed by Krupski Consulting is available from the Center for Health Statistics, (360) 236-4324 or (360) 236-4326.

Issues Related to Race and Hispanic Origin

- The 2000 U.S. 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 American or Negro; American Indian or Alaska Native;" and 11 other groups that the census mostly classifies as Asian or Native Hawaiians and other Pacific Islanders.
- The National Center for Health Statistics (NCHS) developed a bridging algorithm to apportion people who chose more than one race in the 2000 U.S. Census to a single race. The apportionment was based on National Health Interview Survey data from 1997-2000. This survey first asked respondents "What race do you consider yourself to be? Please select one or more of these categories" [from a flashcard that had been handed to them]. For those selecting more than one race, the survey 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. Krupski Consulting used the coefficients developed through the NCHS study to develop single race estimates for Washington's population for census blocks and ZIP codes by age, and gender.

Caveats

- Although the Census Bureau attempts to obtain information from every known household, homeless people, undocumented people who deliberately avoided the census for fear of disclosure to the Immigration and Naturalization Service, urban poor living over commercial addresses, and others are often not counted by the census. There is also a small group of people who are counted more than once. The 2000 U.S. Census, however, was less affected by these problems than previous censuses. The U.S. Census Bureau estimated that nationally, non-Hispanic blacks were undercounted by about 2%, non-Hispanic whites were overcounted by about 1%, and other major race and Hispanic origin groups were neither under nor overcounted. [Fenstermaker D. and Haines D. (2002). Summary of Estimated Net Coverage. U.S. Census Bureau, <http://www.census.gov/dmd/www/pdf/pp-54r.pdf>; retrieved August 14, 2007.]
- The 2000 census allowed reporting of only up to six people per household, and so counts of 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' residences. 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.
- The American Community Survey is limited to the household populations and excludes

people living in institutions, college dormitories, and other group quarters. Data are based on a sample and are subject to sampling variability.

Best Uses

- Provide information on the numbers of people at the state, county, and sub-county levels by age, gender, race, and Hispanic origin

For Further Information

U.S. Bureau of Census: <http://www.census.gov>.

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

Krupski Consulting estimates: The Washington State Department of Health, Center for Health Statistics, (360) 236-4324 or (360) 236-4326.

Death Certificate System

Description of the System

- **Purpose.** Death certificates establish legal benefits and provide information about causes of death and characteristics of decedents.
- **Coverage.** The Death Certificate System covers all deaths in Washington and those of Washington residents who die in other states; it is estimated to be 99% complete.
- **Years.** The system maintains paper records from 1907-present and computerized records from 1968-present. *The Health of Washington State, 2007* uses computerized records from 1980-2005. Annual data are generally available eight to ten months after the close of the calendar year.
- **Key data elements.** Data elements include age, gender, race and ethnicity, date of death, underlying and contributing causes of death, place of residence, place of occurrence, ZIP code of residence, occupation, and education.
- **Reporting system:** Funeral directors gather demographic information; the attending physician, coroner, or medical examiner reports the cause of death. Funeral directors file the certificate with the local health jurisdiction, which retains it for about 60 days for local issuance purposes and then files it with the Washington State Department of Health (Department). Beginning in 2005, an Electronic Death Registry System was implemented in some counties to collect death data and signatures electronically.

The local health jurisdiction receives the electronic death certificate after the funeral director and medical certifier have completed and signed their sections of the certificate. The completed death certificate is then sent to the Department. In 2005, approximately 3% of death certificates were filed electronically.

- **Classification and coding.** Classification and coding on Washington death records use the National Center for Health Statistics (NCHS) guidelines as defined in *Vital Statistics Instruction Manuals* parts 1–20 (U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention, NCHS, 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; and Tenth Revision (ICD-10) for 1999 and later.
- **Data quality procedure.** The Department's Center for Health Statistics provides instruction manuals to physicians, coroners, and medical examiners, as well as local health jurisdictions and others involved in completing and managing death certificates. It uses standardized computer edits and a physician query system to check for internal consistency and for logic and completeness of cause of death. For records that are filed through the Electronic Death Registry System, standardized computer edits occur before they can be signed and submitted.

Issues Related to Race and Hispanic Origin

- Death certificates use open-ended reporting of race, allowing for multiple racial entries. Multiple race data have not been used in this report because they are of uncertain quality and completeness. The NCHS developed an algorithm for assigning people with multiple races on the death certificate to a single race. *The Health of Washington State, 2007* follows the NCHS conventions. See http://www.cdc.gov/nchs/data/dvs/Multiple_race_documentation_5-10-04.pdf for a description of this process.
- The death certificate began collecting data on Hispanic origin separately from 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 origin and other or Hispanic as a race are counted as white. In 2005, 641 or 1.5% of all white deaths had race classified using this guideline.

- Reporting of race and Hispanic origin 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 American Indians and Alaska Natives, some of the Asian subgroups, and people of Hispanic origin. Thus, for some causes of death, death rates based on death certificate data can be lower than true death rates for these groups. See Caveats, below, for more information.

Issues Related to Education

- Prior to 2004, the death certificate collected information on the number of years of education with a range of 0-17. In 2004, the death certificate began collecting eight categories of education. The lowest category was 8th grade or less, and the highest category was a doctorate or professional degree. These categories match the categories used in the 2000 U.S. Census. Due to this change, *The Health of Washington State, 2007* presents death data by education for 2004 and 2005 only.

Caveats

- Unless otherwise noted, mortality rates in *The Health of Washington State, 2007* use the underlying cause of death. For example, if a person dies from 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 from pneumonia as a complication of a stroke, the underlying cause of death is reported as a stroke.
- Death rates can underestimate the magnitude of health problems for deaths that might be underreported due to social stigma (such as AIDS and suicide) and for conditions that diminish the quality of life but are not fatal (such as chronic alcoholism).
- A national study using data from the 1980s concluded that death rates for Asians and Pacific Islanders, American Indians and Alaska Natives, and to a lesser extent, people of Hispanic origin were underestimated, due primarily to misclassification of the decedent's

race and Hispanic origin. Conversely, rates for blacks were overestimated, because of underestimation of denominators needed to develop rates. [Centers for Disease Control and Prevention, National Center for Health Statistics. (1999). *Quality of Death Rates by Race and Hispanic Origin: A Summary of Current Research, 1999*.

http://www.cdc.gov/nchs/data/series/sr_02/sr02_128.pdf, retrieved August 8, 2007.] The extent to which this applies to death data in *The Health of Washington State, 2007*, is unknown. The national findings have not been updated and Washington State does not have data needed to conduct such a study.

- Differences in causes of death among counties might reflect differences in 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 1999-2005 are coded following the ICD-10. Ratios of the number of deaths recoded to ICD-10 to the number originally coded using ICD-9 (obtained from a study of a large sample of 1996 U.S. deaths) can assist analysis of time trends independent of coding changes. The ratios are called comparability ratios. For more information on the change from ICD-9 to ICD10, see the Department's Center for Health Statistics ICD-10 Information Page, http://www.doh.wa.gov/ehsphi/chs/chs-data/death/dea_icd.htm. For causes of death in *The Health of Washington State, 2007*, the comparability ratios are close to one, and so the change of coding does not substantively affect the trend from 1980-2005.

Best Uses

- Understand causes of death in Washington and in Washington counties
- Examine trends in mortality over time
- Compare causes of death in Washington and Washington counties to those in other

counties and states and to national and international data

- Compare population subgroups (e.g., race, age, gender, occupation)
- Investigate spatial patterns and correlates (e.g., social and 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, 2007* 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 Certificate information: <http://www.doh.wa.gov/EHSPHL/CHS/CHS-Data/death/deatmain.htm>

Healthy Youth Survey (HYS)

Description of the System

- **Purpose.** The HYS provides indicators of health-related risk and protective factors and health status among youth.
- **Coverage.** State and county samples and county censuses include public school students in grades 6, 8, 10, and 12. The survey is offered in English and Spanish.
- **Years.** Since 2002, the HYS has been administered in October of even years with data generally available the following February. Many questions on the HYS are comparable to the 1999 Washington Youth Risk Behavior Survey and the Washington State Survey of Adolescent Health Behaviors from 1992, 1995, 1998, and 2000. *The Health of Washington State, 2007* includes HYS data through 2006.
- **Key data elements.** Data elements include demographics (e.g., age, race, Hispanic origin, grade, and language spoken at home); health risk behaviors (e.g., alcohol, tobacco, and other drugs, nutrition, physical activity, safety behaviors, and violence); health status (e.g., mental health, asthma, and diabetes); and risk

and protective factors at the school, community, family, peer, and individual levels.

- **Reporting system.** Statewide data are from random samples of public schools serving grades 6, 8, and 10 or 12. Within schools, all students in grades 6, 8, 10, and 12 are asked to participate. Schools that are not selected for the state sample have an opportunity to administer the survey in order to generate data at the school, district, and county levels. For county-level data, samples are drawn in five large counties (King, Kitsap, Snohomish, Pierce, and Spokane), and the remaining counties strive for participation by all schools and students. The Joint Survey Planning Committee plans the survey and oversees its administration. The committee is composed of representatives from the state departments of Health, Social and Health Services, and Community, Trade, and Economic Development; the Office of Superintendent of Public Instruction; and the Family Policy Council.
- **Data quality procedures.** State sample schools that fail to register are contacted and encouraged to participate. Most questions are from other surveys, such as the U.S. Center for Disease Control and Prevention's (CDC) Youth Risk Behavior Survey (YRBS), the CDC Youth Tobacco Survey, or the U.S. Substance Abuse and Mental Health Services Administration's Monitoring the Future Survey. Questions from these surveys have been field-tested, and some have also been assessed for reliability and validity. The Washington State Department of Health generally organizes focus groups to assess construct validity for questions that are not from other well-documented surveys. The survey contractor provides materials and training to survey administrators from participating schools to increase consistency in administration procedures and to assure confidentiality. The contractor checks surveys for internal consistency and discards surveys based on an algorithm regarding inconsistencies and other evidence of dishonesty.

Issues Related to Race and Hispanic Origin

- HYS respondents identify their race and whether they are of Hispanic origin by

answering the question, "How do you describe yourself? (Select one or more responses.)" Responses include: American Indian or Alaska Native, Asian or Asian American, black or African-American, Hispanic or Latino/Latina, Native Hawaiian or Pacific Islander, white or Caucasian, and other. The final dataset includes a category of "more than one race."

Caveats

- The response rate for the statewide sample has been increasing, but it remains relatively low. In 2006, the response rates were 78% for grade 6, 70% for grade 8, 63% for grade 10, and 51% for grade 12. Bias analysis for 2002 and 2004 found that the survey likely cannot be generalized to students in alternative schools, but otherwise, it did not find evidence of bias.
- Self-reported information is not verified through other means, although some questions have been validated through special studies done elsewhere.
- *The Health of Washington State, 2007* often provides information for 10th graders. A larger proportion of 10th graders complete the survey compared to 8th graders, and so information for items near the end of the questionnaire is more representative for 10th compared to 8th graders. Some questions might also be answered more accurately by 10th compared to 8th graders. The effect of high school dropouts on this dataset is less in 10th grade than 12th grade.

Best Uses

The data can be used by schools, school districts, and local, county, and state agencies and organizations to:

- Monitor trends in behavioral risks, health status, safety, nutrition, physical activity, obesity, and substance use
- Assess needs to support program planning and grant applications for funding
- Examine impacts of intervention and prevention programs.

National Data

- For health indicators, HYS data can be compared to the national YRBS, which is administered in the spring of the same school year as the HYS. Thus, for example, the fall 2004 HYS is in the same school year as the

2005 YRBS, the most recent year for which national data were available for this report. The YRBS surveys grades 9-12, and so *The Health of Washington State* often compares HYS 10th graders to YRBS 10th graders. To compare to *Health People 2010* targets, *The Health of Washington State, 2007* uses synthetic estimates for the 2006 HYS for grades 9-12.

For Further Information

Washington State Department of Health, HYS page: <http://www3.doh.wa.gov/HYS/>

Hospitalization Data

To develop as complete a picture of hospitalization among Washington residents as possible, the Washington State Department of Health (Department) Center for Health Statistics compiles information from several datasets that are described below. At the time of writing *The Health of Washington State, 2007*, information from some of these datasets was available through 2005. Oregon data, however, were available only through 2004. Thus, most of the hospitalization data in *The Health of Washington State, 2007* are through 2004 only. Datasets used in the analyses include:

- The Comprehensive Hospital Abstract Reporting System (CHARS)
- Washington residents hospitalized in Oregon
- Washington residents hospitalized in U.S. Department of Veterans Affairs (VA) hospitals

Description of the System: CHARS

- **Purpose.** CHARS was developed to monitor hospitalization payment rates and is 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.** CHARS includes 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, U.S. military hospitals, 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 are generally available six months after the close of the calendar year. CHARS data were available through 2005 when the Department developed data for *The Health of Washington State, 2007*.
- **Key data elements:** Data elements include hospital, ZIP code of residence, birth date, age, gender, length of stay, discharge status, total charges, payer, primary and secondary diagnoses, primary and secondary procedures, physician, diagnosis related groups (DRGs) and DRG relative weight, external cause of injury code, and an encoded patient identifier.
- **Reporting system.** Hospitals summarize information from the uniform billing form, code diagnoses and procedures, and submit the information to the Department by electronic file transfer within 45 days of the end of the month.
- **Classification and coding.** Reasons for hospitalization are coded according to the International Classification of Disease, Clinical Modification, Ninth Revision (ICD-9-CM). The reason in the first diagnosis field is considered to be the primary reason the patient was admitted to the hospital. Since 1993, up to eight other diagnosis fields have been included for additional conditions that affected 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. Reporting an external cause is mandatory and less than 1% of records were missing external cause codes in 2002. This increased to about 4% for 2004-2005.
- **Data quality procedures.** The CHARS data collection system 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. Several Department studies have confirmed high accuracy for diagnoses using three-digit ICD-9 codes. [For information contact Washington State Department of Health, Center for Health Statistics (360) 236-4328.]

Description of the System: Washington Residents Hospitalized in Oregon

- **Purpose.** Washington obtains 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.** Data include inpatient stays for Washington residents hospitalized in state-licensed hospitals in Oregon.
- **Years.** Oregon data from 1988-1999 are from the Oregon Hospital Discharge Dataset (OHDD). Data from 2002-2004 are from the Oregon Healthcare Cost and Utilization Project (Oregon HCUP). Oregon HCUP data generally available in August about 18 months after the close of the calendar year. Oregon data were available through 2004 when data the Department developed data for *The Health of Washington State, 2007*.
- **Key data elements.** Data elements include hospital, ZIP code of residence, birth date, age, gender, length of stay, discharge status, payer, primary and secondary diagnoses, primary and secondary procedures, DRGs, and external cause of injury codes. Oregon data do not include an encoded patient identifier.
- **Reporting system.** Hospitals summarize information from the uniform billing form, code diagnoses and procedures, and submit the information to a contractor working for the Oregon State Hospital Association. The contractor prepares the database and gives it to the Oregon State Hospital Association. The hospital association releases copies to the Oregon State Office for Health Policy and Research and the federal Agency for Healthcare Research and Quality (AHRQ) to use for the national HCUP dataset. Washington received the OHDD through the Oregon State Office for Health Policy and Research and the Oregon HCUP data from AHRQ.
- **Classification and coding for causes of hospitalization.** Similar to CHARS, the Oregon datasets use the ICD-9 to code the reasons for hospitalization, and there are fields for the primary and secondary diagnoses. The number of fields for secondary diagnoses increased from five to

eight in 1995. Beginning in 1998, there has been separate coding for the external cause of an injury. Unlike in Washington, however, reporting of external cause is not mandatory. In 2002, about 20% of records with injury or poisoning codes lacked external cause codes; in 2003 and 2004, about 9% lacked these codes. (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.

Description of the System: VA Hospitals

- **Purpose.** Due to the relatively large numbers of military and former military personnel in Washington, information on Washington residents hospitalized in VA hospitals provides a more complete picture of hospitalization in Washington than can be obtained from CHARS and Oregon data alone. The Department obtains these data through voluntary cooperative agreements.
- **Coverage.** The VA data include information on Washington residents with inpatient hospitalizations at any VA hospital in the United States. From 2002-2004, more than 98% of these hospitalizations were in Washington or Oregon.
- **Key data elements.** The key data elements are similar to those in CHARS and the Oregon data sets. As with Oregon, VA hospital data do not include an encoded patient identifier.
- **Years.** The Department obtained VA hospital data from 2000-2005.
- **Classification and coding.** VA hospital data use classification and coding systems similar to those in CHARS but allow for up to 13 (first plus 12 secondary) diagnoses. In the dataset received by the Department, the external cause codes were mixed with the other diagnoses, suggesting there are not separate fields for external cause. For 2002-2004, about 17% of records with injury or poisoning codes lacked external cause codes, suggesting that coding an external cause of injury or poisoning is not mandatory.

Issues Related to Race and Hispanic Origin (CHARS, Oregon, VA hospitals)

- The CHARS and Oregon hospitalization datasets do not collect information on patients' race and Hispanic origin, and so hospitalization data cannot be analyzed by race and Hispanic origin. The VA hospitals collect this information, but the Department did not request it because it is not available in the other hospitalization datasets.

Caveats (CHARS, Oregon, VA Hospitals)

- 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 such as diabetes, it is necessary to examine both "hospitalization from" the condition as well as "hospitalization with" the condition. In 2004, for example, about 6,000 hospitalizations occurred for which diabetes was listed as the first diagnosis, but more than 76,000 hospitalizations for which diabetes was listed either first or as a secondary diagnosis.
- Unless otherwise noted, the unit of observation is the hospitalization episode, not the individual. Thus, one person hospitalized three times in a year counts as three hospitalizations for that year. 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 from Oregon and VA hospitals do not include a patient identifier, it is not possible to count individuals when using the combined hospitalization dataset.
- Hospitalization rates for conditions requiring external cause coding are lower than they should be due to missing data. Moreover, external cause codes are missing more frequently from the Oregon and VA hospital datasets than from CHARS. Different amounts of missing data from these

datasets will disproportionately affect counties where a relatively large portion of the population uses Oregon or VA hospitals. In *The Health of Washington State, 2007*, this primarily affects Falls Among Older Adults.

- The hospitalization dataset does not include any outpatient information, such as visits to emergency departments; hospital-based outpatient clinics; hospital-based outpatient surgery; and non-hospital-based surgical, birthing, mental health, substance abuse, and rehabilitation centers.
- Hospitalization data for *The Health of Washington State, 2007* were not available for Washington residents hospitalized outside Washington, Oregon, or the VA system. (See [Appendix A, Geographic Variation](#).)
 - Lack of data from the naval hospitals in Bremerton and Oak Harbor and the Madigan Army Medical Center hospital meant that hospitalizations were undercounted in counties where large portions of the population use these facilities. Kitsap and Island counties were not included in the county-level hospitalization data; hospitalizations for Pierce and Thurston counties are likely underreported. Hospitalization data in *The Health of Washington State, 2007* might differ from data presented in other reports that include hospitalizations in military hospitals.
 - Inability to obtain hospitalization data from Idaho affects Asotin and Garfield counties and these counties were not included in county-level data.
- Changes in hospitalization practices or coding conventions might affect trends over time.
- Residence is based on five-digit ZIP codes.
 - About 7% of Washington ZIP codes cross county boundaries. In this report, these ZIP codes were assigned to the county in which the majority of the population lived. If the population was equally distributed, the ZIP code was assigned to the county based on the physical location of the post office. Thus, some hospitalizations were assigned to the wrong county. This misclassification is unlikely to have a substantive impact on hospitalization rates, because population denominators for ZIP codes that cross county boundaries were calculated from ZIP code population counts in the same manner as the hospitalizations. [See [Appendix A](#),

[Rates](#) and [Census Population Counts](#) (Krupski Consulting).]

- In 2004, about 2% of hospitalization records included a postal box ZIP code. These hospitalizations were assigned to a county based on the physical location of the post office.
- 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)
- Monitor use of inpatient health care resources and hospital costs
- Monitor sources of payment
- Assess access to care by examining trends in potentially avoidable hospitalizations

For Further Information

CHARS:

<http://www.doh.wa.gov/ehsphl/hospdata/default.htm>

Washington State Department of Health, Center for Health Statistics, (360) 236-4328.

Infectious Disease Reporting Databases

Description of the System

- **Purpose.** This system is used to monitor the incidence of selected infectious diseases and health conditions and to characterize populations at high risk for those diseases and conditions.
- **Coverage.** The database covers all Washington residents, but under-reporting is an issue (see Caveats, below).
- **Years.** Years of coverage vary depending on the disease or health condition, but information on most of the current notifiable infectious diseases began in the 1980s; data are generally available on an ongoing basis with annual data compiled six months after the end of a calendar year.
- **Key data elements.** Data elements include diagnosis, age, gender, race and Hispanic origin, and county of residence

- **Reporting system.** Following WAC 246-101, health care providers, hospitals, laboratories, and veterinarians 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, for some conditions, these requirements are not met.
- **Classification and coding.** Standard case definitions are developed by the Council of State and Territorial Epidemiologists in cooperation with Centers for Disease Control and Prevention 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 a small number of case definitions are based only on a health care provider's diagnosis.

Issues Related to Race and Hispanic Origin

- Racial and ethnic categories reflect the U.S. Census categories.
- Race and Hispanic origin 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 groups or people of Hispanic origin.
- Relatively greater use of public health care facilities by certain racial groups or people of Hispanic origin can result in over-reporting for those groups.

Caveats

- Underestimates incidence of the diseases and health conditions because of under-detection, under-diagnosis, and under-reporting
- Inconsistent level of detection or 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 are more likely to be under-diagnosed and under-reported than diseases with more severe health consequences.

National Data

- Unless otherwise noted, national data on infectious disease used in *The Health of Washington State, 2007* 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,
Notifiable Conditions home page:
<http://www.doh.wa.gov/notify/list.htm>

Washington State Department of Health, Office
of Epidemiology, Communicable Disease
Epidemiology Section, (206) 418-5500

Washington State Department of Health,
Infectious Disease and Reproductive Health
Assessment Office, (360) 236-3458

Pregnancy Risk Assessment Monitoring System (PRAMS)

Description of the System

- **Purpose.** PRAMS supplements birth certificate data to generate information for planning and evaluating perinatal health programs.
- **Coverage.** PRAMS surveys 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.** PRAMS data are from June 1993-present, with annual data generally available 14 months after the close of the calendar year. *The Health of Washington State, 2007* includes PRAMS data through 2005.
- **Key data elements.** Data elements include age, race, ethnicity, education level, socioeconomic information, health-related behaviors, health care during pregnancy, and infant health care.
- **Reporting system.** Participants are selected from birth certificate data using a stratified random sample that over-samples Asian and Pacific Islander, African American, American Indian and Alaska Native, and Hispanic mothers. There are two regional samples: women in King and Snohomish counties, who account for about 30% of Washington births, are sampled as a region; and women from all other counties comprise a region. Survey information is collected by mail through a self-administered questionnaire. Women who do not return the self-administered questionnaire are contacted by telephone for telephone interviews. Information for about a fourth of respondents in the 2005 PRAMS was obtained through telephone interview.
- **Data quality procedures.** The Centers for Disease Control and Prevention (CDC) protocols require several procedures to improve response rates, including multiple mailings and telephone call-backs to difficult-to-reach households. The overall weighted response rate was 75% in 2005. Interviewers use computer-assisted interview software to minimize errors. CDC tests all questions to assure that respondents understand them and can answer using specific categories for replies. CDC has assessed many, but not all, questions for reliability and validity. Interviewers receive training, and supervisors

regularly monitor calls to assure that interviewers maintain quality standards.

Issues Related to Race and Hispanic Origin

- PRAMS uses race and Hispanic origin as reported on the birth certificate (see [Birth Certificate System](#)).

Caveats

- For 2003-2005, the response rate for African Americans was 59%, the response rate for American Indians and Alaska Natives was 62%, and the response rate for Asians and Pacific Islanders was 70%. Pending bias analysis, PRAMS data for these groups should be used cautiously.
- Collection of information two to six months after delivery might affect responses to some 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, 2007* 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 impacts of intervention and prevention programs

For Further Information

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