



Maternal and Child Health in Snohomish County 1990 -1999

Series III: A report on the health of infants age birth to 12 months

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Introduction & Objectives

Maternal and Child Health in Snohomish County, a Series of Four Reports

INTRODUCTION

Maternal and child health (MCH) is a key program area in public health. Many public health programs focus on the health of at-risk and underserved women and children. Through education, policy development, and services, public health can help this target population enjoy better health and decreasing morbidity and mortality.

Public health services include a variety of community-based programs. Tobacco programs provide education on hazards of tobacco use, encourage smoke-free policies to limit exposure to environmental tobacco smoke, and sponsor smoking cessation classes. Community health programs assist clients in making informed choices about contraceptive methods and family planning. Public health nurses make home visits to pregnant and parenting women to educate them about smoking, breastfeeding, parenting, and child development. Childhood immunizations and dental sealants are provided in clinics.

OBJECTIVES

A variety of data resources is currently available about populations of women and children and their health. However, information is not compiled in a single location or not presented specific to MCH needs. Thus, the Health Statistics and Assessment program at Snohomish Health District is preparing a series of four reports addressing important indicators for mothers and children living in Snohomish County (For details see following page).

The objectives of the data included in these reports were to:

- ◆ Provide information for outcomes or indicators applicable to existing programs or activities;
- ◆ Provide estimates to assist in the evaluation of program effectiveness;
- ◆ Assist health care providers and agencies in identifying, planning and developing future programs; or
- ◆ Identify gaps in existing data measures or surveillance activities.

Four-Part Series

Data were separated into four reports, each focusing on a distinct population, to provide potentially more meaningful results for service agencies and providers. When appropriate, Washington State data are presented for comparison along with national Healthy People 2000 or 2010 goals.

The following descriptions provide an overview of the content of each report:

Series I: Women of Childbearing Age (15-44 years)

- ◆ Demographics—age, race, income
- ◆ Family structure—marital status, education, insurance, parenting
- ◆ Health & Prevention—birth control, checkups
- ◆ Hospitalizations—rates and leading causes
- ◆ Domestic violence
- ◆ Tobacco use
- ◆ Alcohol use
- ◆ Mortality—rates and leading causes

Series II: Children (1-17 years)

- ◆ Demographics—age, race
- ◆ Family structure—foster care, poverty, child abuse
- ◆ Health & Prevention—immunizations, checkups, special health care needs, overweight, physical activity, weight loss, asthma, seatbelt use
- ◆ Tobacco & Alcohol use
- ◆ Hospitalizations—rates and leading causes
- ◆ Mortality—rates and leading causes

Series III: Infants (Younger than 1 year)

- ◆ Demographics—sex, race
- ◆ Mortality—rates and leading causes, SIDS, congenital anomalies
- ◆ Birth outcomes—low birth weight, prematurity
- ◆ Infant care—breastfeeding, sleeping position, well-baby checks, car seat use

Series IV: Pregnant Women

- ◆ Demographics—age, race
- ◆ Pregnancy outcomes—abortions, birth
- ◆ Health & Prevention—prenatal care, folic acid
- ◆ Tobacco use
- ◆ Pregnancy experiences—unintended pregnancies, violence

GEOGRAPHY

Snohomish County is the third most populous county in Washington State. It is preceded in size by King County and Pierce County. In 1999, 51.5% of the state's population resided in these three counties. Snohomish County is located north of King County and the Seattle metropolitan area. Most of the urban areas are in the southwestern part of the county between Everett and the King County line along Interstate 5 and Highway 99. North of Everett is the Tulalip Indian Reservation. Only 5.5% of Snohomish County is used for farmland, which is located in the western part of the county. Eastern Snohomish County is largely mountainous wilderness.

SUMMARY OF DATA SOURCES

Data in this report came from multiple sources. The reference for each data source is located in the body of the report. The following is a summary of sources used:

- ◆ Birth and death certificates
- ◆ US Census Bureau, 1990 and 2000
- ◆ Behavioral Risk Factor Surveillance Survey (BRFSS)
- ◆ Pregnancy Risk Factor Assessment Monitoring System (PRAMS) survey
- ◆ Local Health Jurisdiction Immunization Assessment Capacity Building Project
- ◆ National Immunization Survey
- ◆ Risk and Protection Profile for Substance Abuse Prevention in Snohomish County
- ◆ Healthy People 2000 and Healthy People 2010
- ◆ Youth Risk Behavior Survey (YRBS)
- ◆ Comprehensive Hospital Abstract Reporting System (CHARS)

METHODS

When possible all pertinent data were included. However, there were some areas where appropriate data were not available or were lacking. Measures of prevalence and incidence were based on 1999 data as these were the most current data available consistently across topics and populations. In addition to the 1999 data, time trends are also presented. Except where noted, information provided in this report represents population-based estimates. Where appropriate the denominators used in calculations are presented and are noted by "N=" followed by the population count. Numerator counts are identified using an "n=".

Confidence intervals (CI) are ranges of numbers that indicate the accuracy of the statistics reported. This series uses 95% as the level of probability, which means the "true" population value will be within the CI 95% of the time. Washington State values are compared to Snohomish County CIs. If the state value is within the CI of Snohomish County, there is no statistically significant difference between Snohomish County and Washington State.

Summary of Major Findings for Infants Age Birth to 12 Months in Snohomish County

HEALTH AND PREVENTION

- ◆ No significant change occurred in the infant death rate between 1990-1999.
- ◆ Neonatal death rates increased and post-neonatal deaths decreased significantly from 1990-1999.
- ◆ Women age 15-19 years had the highest rate of fetal death.
- ◆ The leading causes of infant deaths were congenital anomalies and perinatal conditions.
- ◆ The occurrence of SIDS significantly decreased between 1990-1999. However, a significant increase was observed June-July 2001, although not for the entire year.
- ◆ Premature birth rates increased significantly beginning in 1996-1997.
- ◆ Women age 35-44 years had the highest premature birth rates.
- ◆ Between 1990-1999 the rate of low birth weight infants significantly increased among women age 20-34 years.
- ◆ The highest rate of low birth weight infants was seen among women age 15-19 years and Black women.
- ◆ The proportion of infants that were breastfed increased with the age of the mother.
- ◆ White women had the highest rate of breastfeeding and Black women had the lowest.
- ◆ A higher proportion of older women placed their infant on its back to sleep.
- ◆ Women over 34 years of age had the lowest proportion of sufficient well baby visits.
- ◆ Hispanics had the lowest proportion of sufficient well baby visits.
- ◆ Nearly all women used a car seat for their infant.

Demographics Data Source

To calculate county-wide rates and age- and sex-specific rates, preliminary 2000 census data were used to calculate intercensal estimates. Because of unpredicted changes from 1990 to 2000 in the Snohomish County population, interim census estimates based on 1990 provide inaccurate counts. Final data for 2000 were not available at the time analysis for this report was done. However, it is believed that the preliminary 2000 interim estimates are more accurate than the 1990-based estimates.

Calculations of the intercensal estimates by race, however, are not yet available from the 2000 US Census. In addition, the methods and categorization of race categories changed in the 2000 US Census. Thus, interim rates for race are based on the estimates of the 1990 US Census. Race was categorized as White, Black, Native American, and Asian/Pacific Islander. Hispanics were considered an ethnicity and may be of any race.

Age & Sex

AGE

In 1999 Snohomish County had 591,590 residents representing 10.1% of Washington State's total population. Infants less than one year old represented 1.4% of the population in both Snohomish County and Washington State. Between 1990-1999 there was a gradual decrease in the percent of infants in the population. The proportion of Snohomish County infants decreased from 1.7% of the population in 1990 and Washington State infants decreased from 1.6% in 1990.

SEX

The infant population consisted of 51% males and 49% females in both Snohomish County and Washington State. This ratio held constant for every year between 1990-1999.



Race & Ethnicity

RACE

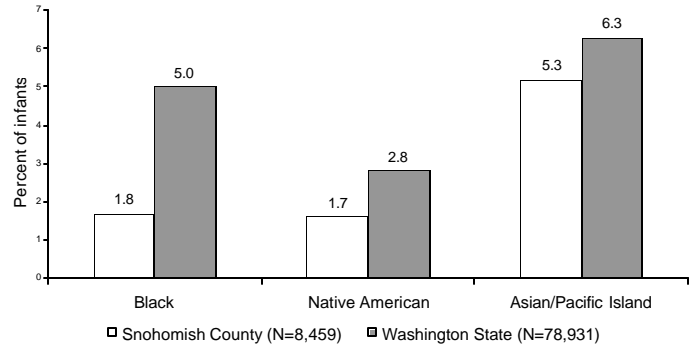
The predominant race among infants in Snohomish County and Washington State was White. In 1999 White infants represented 91.2% and 85.9% of infants in Snohomish County and Washington State, respectively. Asian and Pacific Islander infants comprised the second largest race, 5.3% in Snohomish County and 6.3% in Washington State (Figure 1).

From 1990 to 1999 the proportion of the infant population represented by Whites decreased 1.7% in Snohomish County and 2.0% statewide (Figure 2). In the same time period the proportion of Asian and Pacific Islander infants increased 1.3% in Snohomish County and 1.4% in Washington State.

HISPANICS

Hispanic infants represented 4.8% of infants in Snohomish County and 11.2% in Washington State. From 1990 to 1999 the Hispanic infant population increased 1.1% in Snohomish County and 2.7% statewide. The increase in the Hispanic infant population followed an increase in Hispanic women of childbearing age as presented in the first report of the Maternal & Child Health in Snohomish County series.

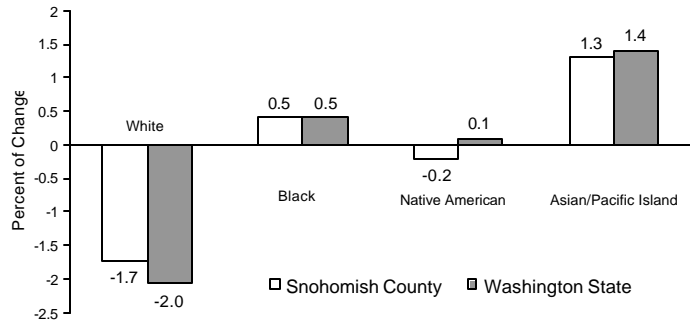
Non-White Infants by Race
Snohomish County & Washington State, 1999



Source: Estimate of 1999 based on 1990 US Census

Figure 1

Changes in the Proportion of Infants by Race
Snohomish County & Washington State, 1990-1999



Source: Estimate of 1999 based on 1990 US Census

Figure 2

Mortality Data Source

Death counts were obtained from the Washington Department of Health, Center for Health Statistics. Death certificates were used to count deaths and their causes. Fetal death counts were obtained from fetal death certificates. The Washington State Department of Health defines fetal death as death prior to complete expulsion or extraction of a product of human conception from its mother, irrespective of the duration of pregnancy. Fetal deaths are only reported for pregnancies of 20 weeks gestation or greater.

Fetal death statistics may be presented using two methods. The fetal death ratio is the number of fetal deaths/the number of live births X 1,000. The fetal death rate is the number of fetal deaths/(the number of live births plus the number of fetal deaths) X 1,000. Because the Washington State Department of Health reports fetal death statistics as a ratio, we have reported the ratio. Since the Healthy People goals use the fetal death rate we calculated the rate for comparison to these goals. The number of fetal deaths was small, so there was no overall difference in the fetal death ratio or rate for each year between 1990-1999.

In 1999 International Classification of Diseases (ICD) codes used to classify causes of death changed from ICD-9 to ICD-10. Comparability ratios were applied to convert ICD-10 1999 causes of death to ICD-9. The adjustment made a minimal difference and the order of leading causes of death was not affected.

Infant Death

In 1999 Snohomish County had an infant (<1 year) death rate of 5.2 per 1,000 live births (95% CI=3.8, 7.0). There was no significant difference between the 1999 rate in Snohomish County and Washington State (5.0 per 1,000 live births). The infant death rate in Snohomish County fluctuated between 1990 and 1999, but had no significant trend (p=0.9) (Figure 3). In contrast, Washington State had a significant decrease (p<0.001) between 1990 and 1999.



Key Findings

Between 1990-1999 the infant death rate did not change in Snohomish County.

The Healthy People 2000¹ goal was to decrease infant deaths to a rate of 7 per 1,000 live births. Snohomish County and Washington State both met this goal. If current trends continue, Washington State will reach the Healthy People 2010² goal of 4.5 deaths per 1,000 live births, but Snohomish County may not meet the goal.

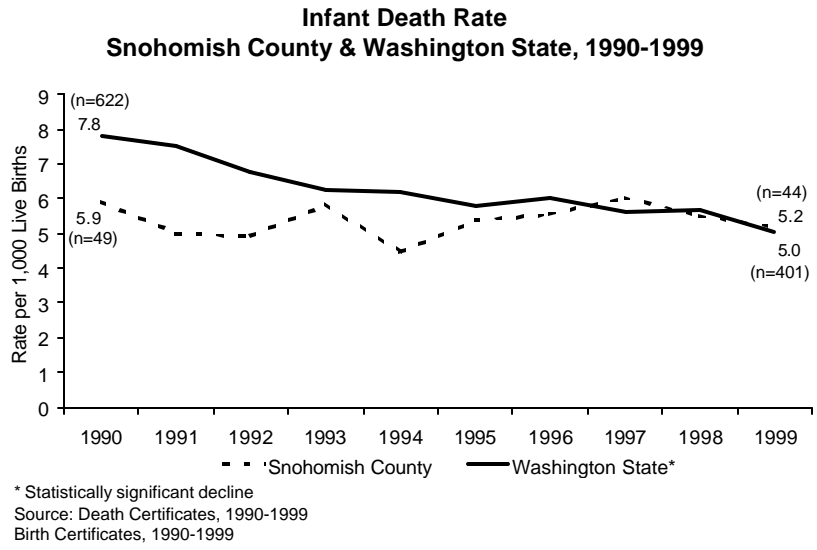


Figure 3

Neonatal Death

In 1999 Snohomish County had a neonatal (0-28 days) death rate of 3.5 per 1,000 live births (95% CI=2.4, 5.0). This was not significantly different from the 1999 Washington State rate of 3.2 per 1,000 live births. Although the rate of neonatal death fluctuated between 1990 and 1999, overall there was a statistically significant increase in the Snohomish County neonatal death rate from 2.9 per 1,000 live births to 3.5 per 1,000 live births (p=0.02) (Figure 4). In contrast, Washington State had a significant decrease during the same time period (p=0.004). The significant change statewide occurred between 1990 and 1993. There was no significant change from 1994 to 1999.

Both Snohomish County and Washington State were below the Healthy People 2000¹ goal of 4.5 neonatal deaths per 1,000 live births. If current trends continue, Washington State may reach the Healthy People 2010² goal of 2.9 neonatal deaths per 1,000 live births, but Snohomish County was moving away from the goal.

Blacks had the highest neonatal death rate in Washington State (8.9 per 1,000 live births) (Table 1, Appendix). Snohomish County rates by race and ethnicity could not be calculated because of infrequent occurrence.



Key Findings

Between 1990-1999 the neonatal death rate increased and the post-neonatal death rate decreased in Snohomish County.

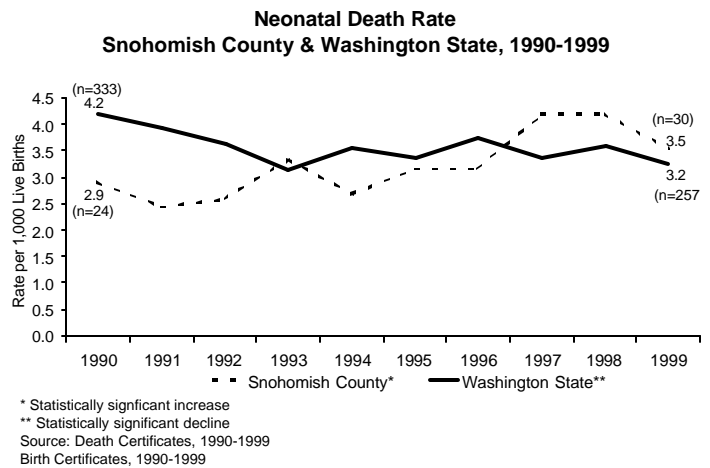


Figure 4

Post-Neonatal & Fetal Death

POST-NEONATAL DEATH

In 1999 Snohomish County had a post-neonatal (29-364 days) death rate of 1.7 per 1,000 live births (95% CI=0.9, 2.8). This was not significantly different than the 1999 Washington State rate of 1.8 per 1,000 live births. Both Snohomish County and Washington State had a significant decrease in the post-neonatal death rate between 1990 and 1999. Snohomish County decreased from a rate of 3.0 per 1,000 live births in 1990 (p=0.01) and Washington State decreased from 3.6 per 1,000 live births in 1990 (p<0.001).

FETAL DEATH

In 1999 Snohomish County had a fetal death ratio of 6.6 for 1,000 live births (95% CI=5.0, 8.6) which was not significantly different from Washington State (6.0 for 1,000 live births). Both Snohomish County and Washington State need to decrease the fetal death rate to meet both the Healthy People 2000¹ goal of 5.0 fetal deaths per 1,000 live births plus fetal deaths and the lower Healthy People 2010² goal of 4.1 fetal deaths per 1,000 live births plus fetal deaths.

Women age 15-19 years in Snohomish County and Washington State had the highest fetal death ratio. There were no significant differences by age group between Snohomish County and Washington State (Figure 5; Table 2, Appendix). The fetal death ratio in Snohomish County significantly increased from 4.6 per 1,000 live births in 1990 to 6.6 per 1,000 live births in 1999 (p=0.05). There was no significant change in the fetal death ratio in Washington State from 1990-1999.

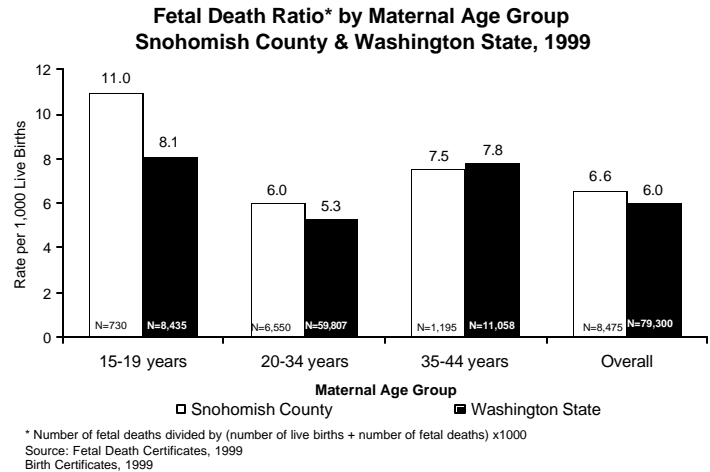


Figure 5

Cause of Death

The 1999 leading causes of infant death in Snohomish County were congenital anomalies, maternal factors, other perinatal conditions, and SIDS (Table 3, Appendix). In Washington State the leading causes were congenital anomalies, other perinatal conditions, SIDS, hypoxia and respiratory conditions, and maternal factors. Snohomish County had a significantly higher rate of infant death from maternal factors than Washington State (1.1 per 1,000 live births, 95% CI=0.5, 2.0, and 0.5 per 1,000 live births, respectively). Maternal factors include conditions such as incompetent cervix, multiple pregnancy, and problems with the placenta. There were no significant differences between the county and the state for any other cause of death.

Deaths from perinatal conditions may occur after birth. However, the origination of the condition is from the perinatal period.³ This may include exposure to toxic substances, maternal medical conditions, complication of labor and delivery, birth trauma, infections, endocrine and metabolic disturbances, and feeding problems.



Key Finding

- The leading cause of death was birth defects.

Deaths from Congenital Anomalies

Congenital anomalies were the leading cause of death among infants in 1999 for both Snohomish County and Washington State. Death from congenital anomalies among Snohomish County infants occurred at a rate of 1.6 per 1,000 live births (95% CI=0.9, 2.6). The 1999 rate was about the same as it was in 1990 (1.5 per 1,000 live births, 95% CI=0.8, 2.5). Between 1990-1999 the death rate from congenital anomalies fluctuated producing no discernable trend among infants in Snohomish County. There was no significant difference between Snohomish County and Washington State yearly rates. Washington State saw a slight decrease in the rate of deaths from congenital anomalies from 1.9 per 1,000 live births in 1990 to 1.4 in 1999 ($p=0.06$) (Figure 6).

The Healthy People 2010² goal is 1.1 deaths from congenital anomalies per 1,000 live births. Both Snohomish County and Washington State need to decrease the number of infant deaths from congenital anomalies to reach the goal.

Data on congenital anomalies by age and race were not available for 1999. In 1998, when examined by race, there was no difference between the rate of White infants in Snohomish County (1.3 per 1,000 live births, 95% CI=0.6, 2.4) and Washington State (1.4). The number of deaths by other

(Continued on page 10)

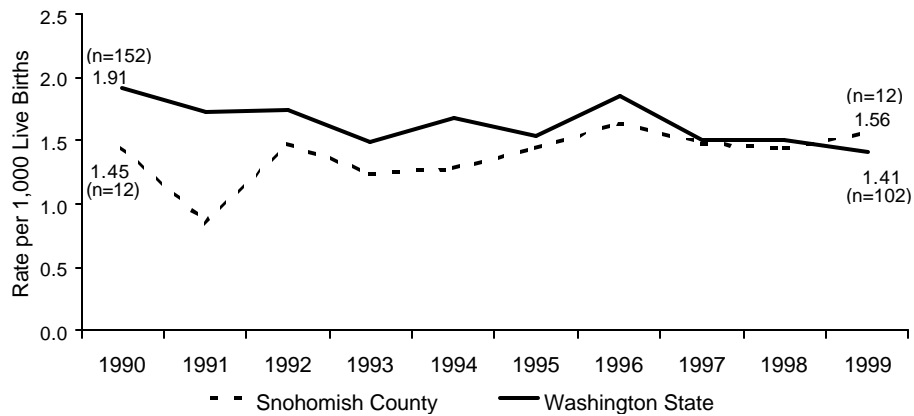
Deaths from Congenital Anomalies

(Continued from page 9)

races or ethnicity was too small for comparison (Table 4, Appendix).

Washington State's 1998 death rates from congenital anomalies were similar by mother's age group (Table 4, Appendix). There were too few occurrences in Snohomish County for a comparison to be made by age group.

**Infant Deaths from Congenital Anomalies
Snohomish County & Washington State, 1990-1999**



Source: Death Certificates, 1990-1999
Birth Certificates, 1990-1999

Figure 6

Sudden Infant Death Syndrome (SIDS)

Sudden Infant Death Syndrome (SIDS) is the sudden death of an infant which is unexplained after a review of clinical history, circumstances of death, and a postmortem examination. Snohomish County had a 1999 SIDS rate of 0.7 cases per 1,000 live births (95% CI=0.3, 1.5). The 1999 Washington State SIDS rate (0.9 per 1,000 live births) was not significantly different from Snohomish County.

Significant declines in SIDS rates were seen from 1990-1999 in both Snohomish County ($p=0.04$) and Washington State ($p<0.001$) (Figure 7). Because more recent data were available through the Snohomish County Child Death Review committee, and the results are important, they were included in this report. A statistically significant increase ($p=0.02$) was observed in SIDS cases that occurred in Snohomish County between January and July 2001 compared to the same time period in the previous five years. At the end of 2001 the increase was close to statistically significant ($P=0.06$) when compared to 1996-2000.

The Healthy People 2010² goal is to reduce SIDS to 0.25 cases per 1,000 live births. Both Snohomish County and Washington State need to decrease SIDS deaths to meet that goal.

(Continued on page 12)



Key Findings

- SIDS rates decreased significantly between 1990-1999 in both Snohomish County and Washington State.
- In 2001 Snohomish County had an increase in the number of SIDS deaths compared to 1996-2000.

Sudden Infant Death Syndrome (SIDS)

(Continued from page 11)

The number of SIDS cases was few, which made a stratified analysis difficult. Information on SIDS cases by race and maternal age were not available for 1999. When 1998 data were evaluated, there were not enough cases in Snohomish County to determine rates by age groups or race and ethnicity. In Washington State, infants of mothers age 35-44 years had the lowest SIDS rate (0.6 per 1,000 live births) and Black infants had the highest rate (1.7 per 1,000 live births) (Table 5, Appendix).

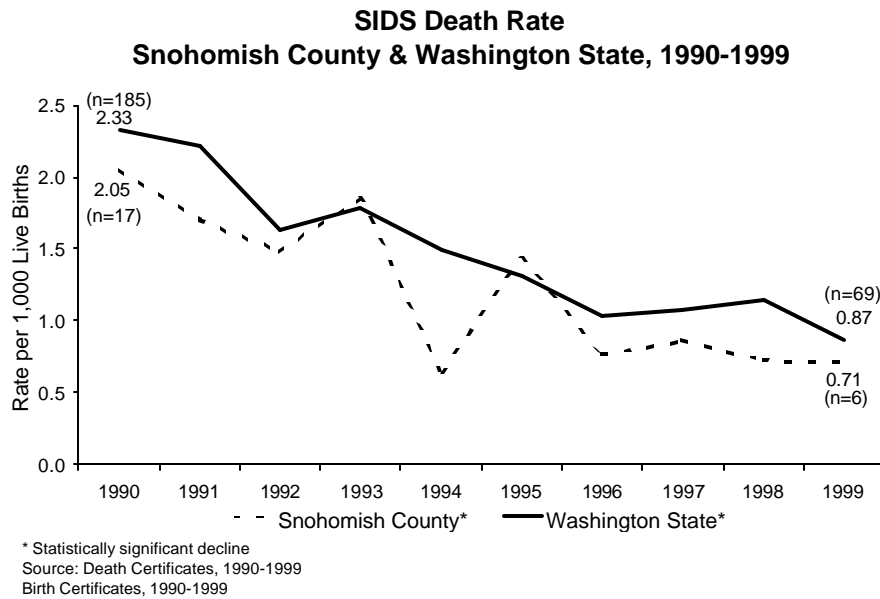


Figure 7

Birth Outcomes Data Source

Birth outcomes were obtained from the Washington Department of Health, Center for Health Statistics. Birth certificates were used to identify prematurity and low birth weight (LBW). A premature birth was defined as less than 37 weeks calculated gestational age. LBW was defined as less than 2500 grams (5.5 pounds). Both weeks of gestation and weight at birth were reported on birth certificates.



Premature Births

In 1999 women age 15-44 years in Snohomish County had premature births at a rate of 12.2% (95% CI=11.4%, 12.9%). This was significantly higher than the 1990 rate of 9.2% (95% CI=8.5%, 9.9%). Washington State showed a similar pattern increasing from 10.5% in 1990 to 12.7% in 1999 (Figure 8). The trend between 1990-1999 for premature births in both Snohomish County and Washington State showed a significant increase ($p<0.001$). In Snohomish County the significant increase in the trend appears to begin between 1996-1997. A more detailed analysis is underway and results will be available in the near future.

The Healthy People 2010² target goal for prematurity is 7.6% of births. Both Snohomish County and Washington State were higher than the Healthy People 2010² goal.

In 1999 Snohomish County women age 35-44 years had the highest rate of premature births at 14.6% (95% CI=12.5%, 16.9%) (Figure 9; Table 6, Appendix). Women age 15-19 years in Washington State had the highest rate (16.4%), which was significantly higher than Snohomish County women of the same age (12.6%, 95% CI=10.1%, 15.4%). When the ten-year trend was examined by maternal age groups, Washington State showed an increase for all age groups. Snohomish County showed an increase among women age 20-34 and 35-44 years, but not in women age 15-19 years.



Key Finding

Premature births rates increased significantly from 1990-1999 in both Snohomish County and Washington State.

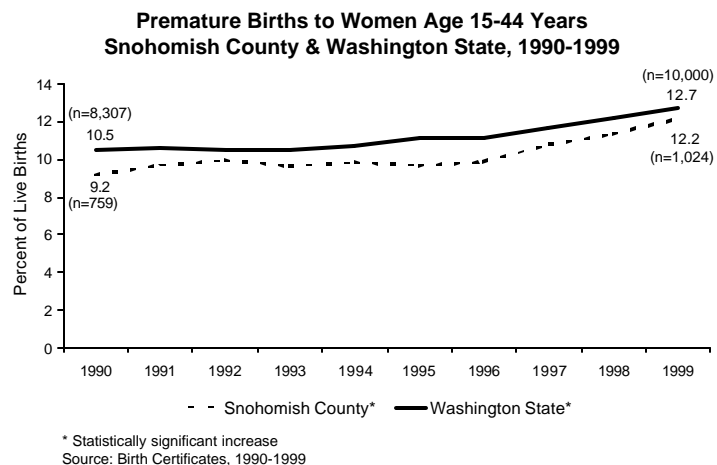
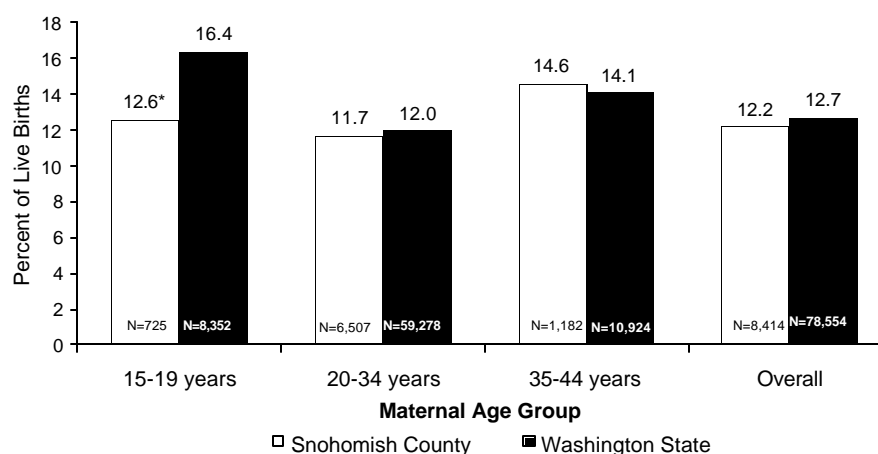


Figure 8

Premature Births Continued

In 1999 Native Americans in Snohomish County had the highest rate of premature births (16.6%, 95% CI=11.0%, 24.0%) compared to other races (Table 6, Appendix). Statewide, Black women had the highest rate of premature births (16.3%). However, there were no significant differences in rates by race and ethnicity between Snohomish County and Washington State.

**Premature Births by Maternal Age Group
Snohomish County & Washington State, 1999**



* Statistically significant difference compared to Washington State
Source: Birth Certificates, 1999

Figure 9

Low Birth Weight

In 1999 the rate of low birth rate (LBW) infants in Snohomish County was 6.0% (95% CI=5.5%, 6.6%), which was not significantly different from the Washington State LBW rate of 5.9%. The Snohomish County LBW rate increased from 4.8% (95% CI=4.3%, 5.3%) in 1990 to 6.0% in 1999. There was also an increase in Washington State from 5.3% in 1990 to 5.9% in 1999 (Figure 10). Although the increase during the ten-year period was small, there was a significant increasing trend among women age 15-44 years in both Snohomish County and Washington State ($p < 0.001$).

The LBW target for both Healthy People 2000¹ and Healthy People 2010² target was 5.0%. Snohomish County and Washington State are both moving away from the target goal, assuming current trends continue.

This increase in LBW rates may be one contributor to the increase in the neonatal death rate noted on page six. LBW infants have a much higher risk of neonatal death.



Key Finding

The low birth weight rate increased significantly from 1990-1999 in both Snohomish County and Washington State.

Low Birth Weight Rates for Mothers Age 15-44 Years Snohomish County & Washington State, 1990-1999

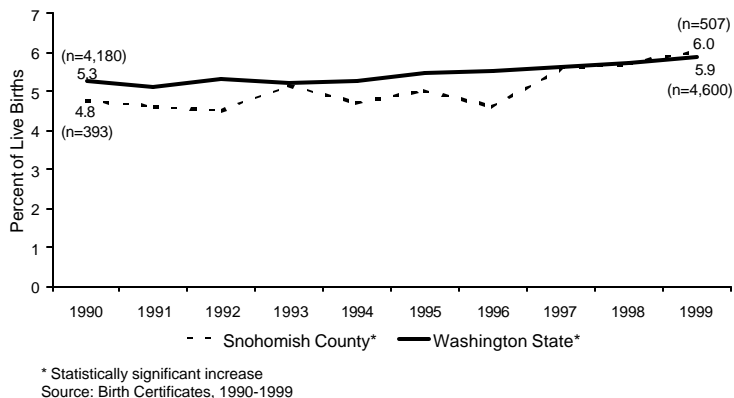


Figure 10

Low Birth Weight by Maternal Age, Race & Ethnicity

MATERNAL AGE

In 1999 there were no differences between Snohomish County and Washington State in LBW rates by maternal age group (Table 7, Appendix). Women age 15-19 had the highest LBW rate in both Snohomish County (6.8%, 95% CI=5.0%, 8.9%) and Washington State (7.6%). The 1990-1999 trend, when examined by age, showed a significant increase in LBW among all age groups in Washington State. Snohomish County only saw a significant increase among women age 20-34 years from 4.2% to 5.9% ($p < 0.001$).

RACE & ETHNICITY

In 1999 LBW rates varied by race and ethnicity. Among racial groups, Blacks had the highest rate, 9.5% (95% CI=5.1%, 16.2%) in Snohomish County and 10.7% in Washington State. Whites had the lowest rate (5.5%) in Washington State, while in Snohomish County Native Americans had the lowest rate (3.6%) (Figure 11). Hispanics had a LBW rate of 6.1% in Snohomish County and 5.4% in Washington State. The differences between Snohomish County and Washington State LBW rates by race and ethnicity were not significant (Table 7, Appendix).

Low Birth Weight Rate among Women Age 15-44 Years
by Race and Ethnicity
Snohomish County & Washington State, 1999

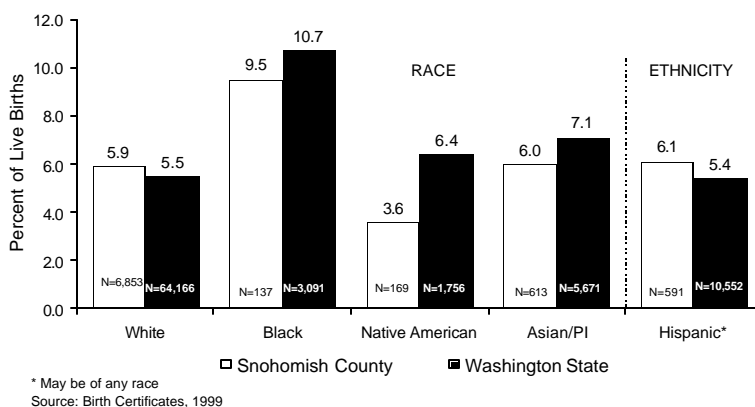


Figure 11

Infant Care Data Source

Information on experiences of mothers prior to pregnancy, during pregnancy, and shortly after pregnancy were obtained from the Pregnancy Risk Assessment Monitoring System (PRAMS). PRAMS is an ongoing population based surveillance system sponsored by the Centers for Disease Control and Prevention (CDC) that surveys new mothers who are representative of all registered births to Washington State residents. The Washington State Department of Health has collected PRAMS data since 1993. Data are collected from a sample of all mothers and may include women who are outside the usual childbearing age of 15-44 years. Non-White mothers are over-sampled in order to have large enough samples to measure differences. Approximately 238 Snohomish County mothers and 3,007 mothers statewide were sampled annually from 1993 through 1998. PRAMS information for Snohomish County was reported using combined data from 1993-1998.⁴ Washington State data includes 1996 through 1998.⁵



Breastfeeding by Duration

The PRAMS survey revealed that 91.5% (95% CI=86.6%, 94.7%) of women in Snohomish County and 86.5% of women in Washington State initiated breastfeeding.⁴⁵ This difference was statistically significant. Those who started breastfeeding, but did so for less than one week, represented 4.0% (95% CI=1.9%, 8.0%) of women in Snohomish County and 3.0% in Washington State. The proportion who breastfed between one week and two months was 31.3% (95% CI=25.1%, 38.3%) in Snohomish County and 31.7% in Washington State. At more than 2 months after delivery, 56.2% (95% CI=49.0%, 63.1%) of mothers in Snohomish County and 51.8% in Washington were still breastfeeding.

Healthy People 2000¹ set a goal of 75% of mothers to breastfeed. Healthy People 2010² kept the same goal. For initiation of breastfeeding, Snohomish County and Washington State were above the Healthy People 2010 goal of 75%. However, at two months postpartum both were below the goal.



Key Finding

- Nine out of ten mothers initiated breastfeeding, but only half were still breastfeeding two months postpartum.

Breastfeeding by Maternal Age, Race & Ethnicity

MATERNAL AGE

The percent of women who continued to breastfeed at 2 months increased as the age of the mother increased⁴⁵ (Figure 12; Table 8, Appendix). Women less than 20 years of age were the least likely to breastfeed after 2 months in both Snohomish County and Washington State, 28.6% (95% CI=12.3%, 53.4%) and 40.7%, respectively. This difference was not statistically significant. However, among women age 20-24 years, Snohomish County had a significantly lower proportion that breastfed at 2 months compared to Washington State. There were no significant differences for the other age groups.

RACE & ETHNICITY

When examined by race and ethnicity, White women were the most likely to continue to breastfeed at 2 months in both Snohomish County (56.8%, 95% CI=48.3%, 65.1%) and Washington State (63.9%)⁴⁵ (Figure 13; Table 8, Appendix). Black women were the least likely in both Snohomish County 49.2% (95% CI=35.1%, 63.5%) and Washington State 53.8%. There was no significant difference between Snohomish County and Washington State in breastfeeding by race and ethnicity.

Breastfeeding at Two Months Postpartum by Maternal Age Group Snohomish County & Washington State

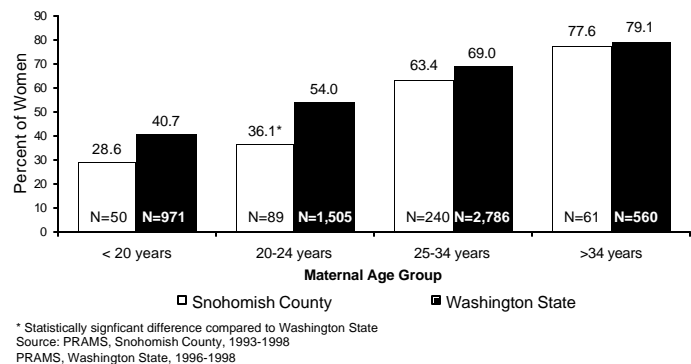


Figure 12

Breastfeeding at Two Months Postpartum by Race and Ethnicity Snohomish County & Washington State

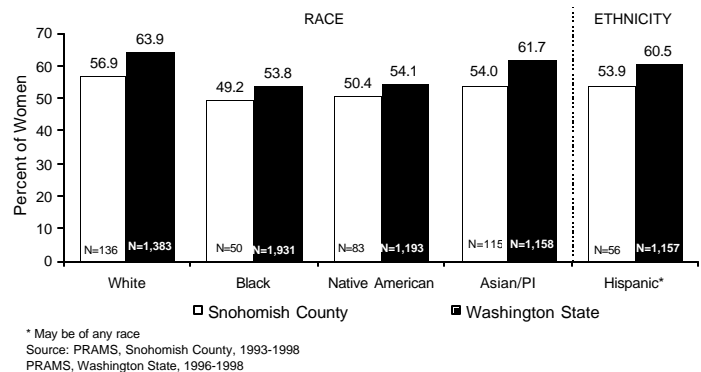


Figure 13

Sleeping Position

Healthy infants who sleep on their backs have a reduced risk of SIDS. The PRAMS survey asked women about the position in which they placed their infant to sleep. Sixty-two percent (95% CI=54.9%, 68.0%) of women in Snohomish County and 54.2% of women in Washington State replied they used the supine position.⁴ Compared to Washington State, significantly more infants in Snohomish County were placed on their backs to sleep.

Healthy People 2010² set a goal of 70% of infants to be put to sleep on their backs. Both Snohomish County and Washington State were below the target goal. A higher proportion of older women used the supine sleeping position for their infants in Snohomish County and Washington State.⁴ Significantly more Snohomish County women age 35 years and older placed their infant on their back to sleep, (78.1%, 95% CI=60.3%, 89.3%) compared to Washington State (58.0%). This was the only significant difference by maternal age group between Snohomish County and Washington State (Table 9, Appendix).

In Snohomish County, White women and those who described their race as 'other' were significantly more likely to use the back position than women of other racial and ethnic groups ($p<0.01$). Hispanic women placed their infants on their backs significantly less often than non-Hispanic women ($p<0.05$). This difference was also noted for women in Washington State (43% of Hispanics and 56% of non-Hispanics; $p<0.001$)⁴ (Table 9, Appendix).



Well-Baby Visits

A sufficient number of well-baby visits was defined as two or more completed visits when the mother was surveyed at two to six months postpartum. Ninety-one percent (95% CI=88.0%, 93.6%) of Snohomish County infants and 92.6% of Washington State infants had sufficient well-baby visits.⁴

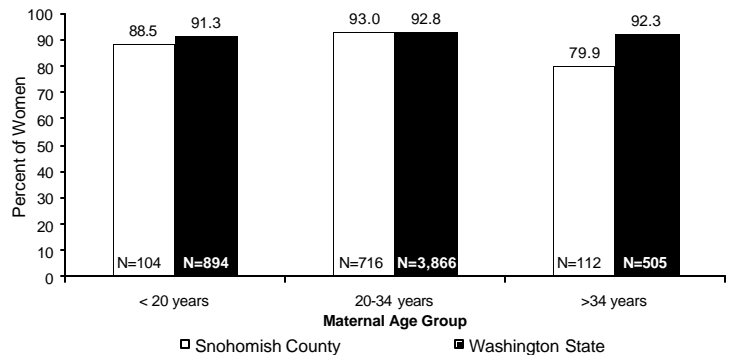
When examined by maternal age group, Snohomish County women age 35 years and older had the smallest proportion of sufficient well-baby visits (79.9%, 95% CI=62.8%, 90.4%) (Figure 14; Table 10, Appendix). These Snohomish County women age 35 years and older were significantly less likely to report sufficient well-baby visits than women in the same age group in Washington State (92.3%). After adjusting for race/ethnicity, marital status, education and income levels in a multivariate analysis, women age 35 years and older were three times more likely to have insufficient well-baby visits compared to women age 20-34 years ($p=0.03$).⁴



Key Finding

Women over 34 years in Snohomish County were less likely to have sufficient well-baby visits compared those statewide.

Sufficient Well-Baby Visits* by Maternal Age Group
Snohomish County & Washington State



* 2 or more well baby visits reported at 2-6 months postpartum
Source: PRAMS, Snohomish County, 1993-1998
PRAMS, Washington State, 1996-1998

Figure 14

Well-Baby Visits Continued

Infants with a sufficient number of well-baby visits varied by race and ethnicity. The races with the highest proportion of sufficient well-baby visits were Blacks in Snohomish County (92.7%, 95% CI=84.3%, 96.7%) and Whites in Washington State (93.6%) (Table 10, Appendix). Native Americans had the lowest proportion of infants with sufficient well-baby visits in both Snohomish County and Washington State, 89.3% (95% CI=82.8%, 93.5%) and 90.4%, respectively. Among Hispanics, 82.8% (95% CI=73.8%, 89.2%) in Snohomish County and 87.4 % in Washington State had sufficient well-baby visits.



Car Seat Use

The PRAMS survey asked mothers if their infant was in a car seat the last time they rode in a car. Nearly all women reported using a car seat for their infant, 99.7% in Snohomish County and 99.2% in Washington State.⁴ Healthy People 2010² set a goal for infant car seat use of 100%. Snohomish County and Washington State are very near to the Healthy People 2010 goal of 100%.

In Snohomish County, Whites and Native Americans reported 100% use. Blacks reported 98% use and 96% of Asian/Pacific Islanders used car seats. In Washington State, all races reported 99% car seat use. Hispanics in Washington State used car seats 98% of the time and 100 % in Snohomish County.



Appendix

Table 1. Neonatal* Death Rate by Race and Ethnicity, Snohomish County and Washington State, 1999

Race	Snohomish County			Washington State
	Rate per 1,000 Live Births	95% CI [†]	Number of Deaths	Rate per 1,000 Live Births
Total	3.5	2.4, 5.0	30	3.2
White	2.6	1.6, 4.1	18	2.8
Black	‡			8.9
Native American	‡			3.9
Asian/ PI [¶]	‡			2.6
Ethnicity				
Hispanic	‡			3.7

* 0-28 days

† 95% Confidence Interval

‡ Unable to calculate rates because n<5

¶ Pacific Islander

Source: Death Certificates: WA State Department of Health

Table 2. Fetal Death* Rate by Maternal Age Group, Snohomish County and Washington State, 1999

Maternal Age	Snohomish County			Washington State
	Rate per 1,000 Live Births	95% CI [†]	Number of Deaths	Rate per 1,000 Live Births
15-44 years	6.6	5.0, 8.6	56	6.0
15-19 years	11.0	4.7, 21.5	8	8.3
20-34 years	6.0	4.2, 8.1	39	5.3
35-44 years	7.5	3.5, 14.3	9	7.8

* Death prior to complete expulsion or extraction of a product of human conception from its mother, irrespective of the duration of pregnancy. Fetal deaths only reported for 20 weeks gestation or greater.

† 95% Confidence Interval

Source: Fetal Death Certificates: WA State Department of Health

Table 3. Infant Death Rate and Leading Causes of Death, Snohomish County and Washington State, 1999

Snohomish County				Washington State	
Cause of Death	Number of Deaths	Rate per 1,000 Live Births	95% CI*	Cause of Death	Rate per 1,000 Live Births
Total	44	5.2	3.8, 7.0	Total	5.0
Congenital Anomalies	12	1.4	0.7, 2.5	Congenital Anomalies	1.3
Maternal Factors	9	1.1	0.5, 2.0	Other Perinatal Conditions	1.1
Other Perinatal Conditions	7	0.8	0.3, 1.7	SIDS	0.9
SIDS	6	0.7	0.3, 1.5	Hypoxia and Respiratory Conditions	0.6
†				Maternal Factors	0.5

* 95% Confidence Interval

† Because n<5, rates for more detailed causes of death cannot be calculated

Source: Death Certificates : WA State Department of Health

Table 4. Infant Death Rates From Congenital Anomalies by Maternal Age Group, Race, and Ethnicity, Snohomish County and Washington State, 1998

Maternal Age	Snohomish County		Number of Deaths	Washington State
	Rate per 1,000 Live Births	95% CI*		Rate per 1,000 Live Births
15-44 years	1.4	0.7, 2.5	12	1.5
15-19 years	†			1.9
20-34 years	1.4	0.7, 2.7	9	1.4
35-44 years	†			1.6
Race				
White	1.3	0.6, 2.4	9	1.4
Black	†			†
Native American	†			†
Asian/PI [‡]	†			1.7
Ethnicity				
Hispanic	†			1.1

* 95% Confidence Interval

† Unable to calculate rates because n<5

‡ Pacific Islander

Source: Death Certificates: WA State Department of Health

Table 5. SIDS Death Rates by Maternal Age Group, Race, and Ethnicity, Snohomish County and Washington State, 1998

Maternal Age	Snohomish County		Number of Deaths	Washington State
	Rate per 1,000 Live Births	95% CI*		Rate per 1,000 Live Births
15-44 years	0.7	0.3, 1.6	6	1.1
15-19 years	0.7	0.2, 1.5	5	1.0
20-34 years	†			1.1
35-44 years	†			0.6
Race				
White	0.7	0.2, 1.6	5	1.1
Black	†			1.7
Native American	†			†
Asian/PI‡	†			1.1
Ethnicity				
Hispanic	†			0.8

* 95% Confidence Interval

† Unable to calculate rates because n<5

‡ Pacific Islander

Source: Death Certificates: WA State Department of Health

Table 6. Premature* Birth by Maternal Age Group, Race, and Ethnicity, Snohomish County and Washington State, 1999

Snohomish County				Washington State
Maternal Age	Percent of Live Births	95% CI†	Number of Premature Births	Percent of Live Births
15-44 years	12.2	11.4, 12.9	1024	12.7
15-19 years	12.6	10.1, 15.4	91	16.4
20-34 years	11.7	10.9, 12.6	761	12.0
35-44 years	14.6	12.5, 16.9	172	14.1
Race				
White	11.2	10.4, 12.0	765	11.7
Black	15.2	9.4, 23.3	21	19.9
Native American	16.6	11.0, 24.0	28	16.3
Asian/ PI‡	16.0	13.0, 19.5	98	16.3
Ethnicity				
Hispanic	12.4	9.7, 15.5	73	12.3

* <37 weeks calculated gestational age

† 95% Confidence Interval

‡ Pacific Islander

Source: Birth Certificates: WA State Department of Health

Table 7. Low Birth Weight* by Maternal Age Group, Race, and Ethnicity, Snohomish County and Washington State, 1999

Snohomish County				Washington State
Maternal Age	Percent of Live Births	95% CI [†]	Number Born With Low Birth Weight	Percent of Live Births
15-44 years	6.0	5.5, 6.6	507	5.9
15-19 years	6.8	5.0, 8.9	49	7.6
20-34 years	5.9	5.4, 6.6	386	5.4
35-44 years	6.1	4.8, 7.7	72	6.9
Race				
White	5.9	5.3, 6.5	401	5.5
Black	9.5	5.1, 16.2	13	10.7
Native American	3.6	1.3, 7.6	6	6.4
Asian/ PI [‡]	6.0	4.3, 8.3	37	7.1
Ethnicity				
Hispanic	6.1	4.3, 8.4	36	5.4

* <2500 grams

† 95% Confidence Interval

‡ Pacific Islander

Source: Birth Certificates: WA State Department of Health

Table 8. Breastfeeding Two Months Postpartum by Maternal Age Group, Race, and Ethnicity, Snohomish County* and Washington State†

Age Group	Snohomish County				Washington State
	Number Breastfeeding	N	% Breastfeeding	95% CI‡	% Breastfeeding
Total	242	440	56.2	49.0, 63.1	86.5
<20 years	22	50	28.6	12.3, 53.4	40.7
20-24 years	42	89	36.1	23.3, 51.2	54.0
25-34 years	139	240	63.4	54.0, 71.9	69.0
35+ years	39	61	77.6	59.1, 89.2	79.1
Race					
White	78	136	56.9	48.3, 65.1	63.9
Black	26	50	49.2	35.1, 63.5	53.8
Native American	43	83	50.4	39.4, 61.3	54.1
Asian/ PI§	64	115	54.0	39.4, 63.1	61.7
Ethnicity					
Hispanic	31	56	53.9	40.4, 66.9	60.5

* 1993-1998 combined data

† 1996-1998 combined data

‡ 95% Confidence Interval

§ Pacific Islander

Source: Pregnancy Risk Assessment Monitoring System (PRAMS)

Table 9. Infant Sleep Position by Maternal Age Group, Race, and Ethnicity, Snohomish County* and Washington State†

Age Group	Snohomish County				Washington State
	Number Placed to Sleep on Back	N	% Placed to Sleep on Back	95% CI‡	% Placed to Sleep on Back
Total	245	446	61.7	54.9, 68.0	54.2
<20 years	33	54	58.4	34.0, 79.3	48.4
20-34 years	176	333	59.5	51.8, 66.8	54.8
35+ years	36	59	78.1	60.3, 89.3	58.0
Race					
White	137	88	64.2	56.1, 71.6	56.6
Black	50	23	49.4	35.3, 63.7	41.3
Native American	87	47	53.8	43.1, 64.2	54.5
Asian/ PI§	116	62	53.3	44.1, 62.3	54.8
Ethnicity					
Hispanic	56	25	44.4	31.6, 58.1	43.1

* 1993-1998 combined data

† 1996-1998 combined data

‡ 95% Confidence Interval

§ Pacific Islander

Source: Pregnancy Risk Assessment Monitoring System (PRAMS)

Table 10. Sufficient Well-Baby Visits* by Maternal Age Group, Race, and Ethnicity, Snohomish County[†] and Washington State[‡]

Age Group	Snohomish County				Washington State
	Number With Sufficient Well Baby Visits	N	% With Sufficient Well Baby Visits	95% CI [§]	% With Sufficient Well Baby Visits
Total	839	932	91.2	88.0, 93.6	92.6
<20 years	92	104	88.5	73.4, 95.5	91.3
20-34 years	650	716	93.0	89.9, 95.2	92.8
35+ years	97	112	79.9	62.8, 90.4	92.3
Race					
White	330	362	91.7	88.0, 94.4	93.6
Black	81	87	92.7	84.3, 96.7	93.3
Native American	139	155	89.3	82.8, 93.5	90.4
Asian/ PI [¶]	210	232	90.4	85.6, 93.7	90.8
Ethnicity					
Hispanic	79	96	82.8	73.8, 89.2	87.4

* Two or more well-baby visits at the time of survey (2-6 months postpartum)

† 1993-1998 combined data

‡ 1996-1998 combined data

§ 95% Confidence Interval

¶ Pacific Islander

Source: Pregnancy Risk Assessment Monitoring System (PRAMS)

1. U.S. Department of Health and Human Services, Public Health Service. *Health People 2000: National Health Promotion and Disease Prevention Objectives*. Washington DC: U.S. Government Printing Office, DHHS Publication No. (PHS) 91-50212.
2. U.S. Department of Health and Human Services. *Healthy People 2010: Understanding and Improving Health*. 2nd ed. Washington, DC: U.S. Government Printing Office, November 2000.
3. Puckett, CD. 1998. *The Educational Annotation of ICD-9_CM*. 4th ed. Channel Publishing, Reno, NV.
4. Snohomish Health District, *The Health of Mothers and Infants in Snohomish County: The Findings of the Pregnancy Risk Assessment Monitoring Survey (PRAMS) 1993-1998*, December 2000
5. Eaglin, ME, Robbins, JM, VanBuren J, Bell, TM. *1996-1998 Washington State PRAMS Surveillance Report – Volume I*. Olympia, WA: Maternal and Child Health Assessment Section, Community and Family Health, Washington State Department of Health, 2001.

