CHAPTER 4: MATERNAL AND INFANT HEALTH

In this chapter, data on birth, pregnancy, abortion, infant mortality, and birth risk factors are examined. The main indicators of maternal and infant health are summarized below in Table 4-1. More detailed information can be found in the reports, "Healthier Mothers, Healtier Babies: Declining Infant Mortality in King County" and "Infant Mortality in King County: An Update", published by the Seattle-King County Department of Public Health in 1996 and 1997, respectively.

- There were 21,573 live births to King County women in 1996.
- Of the 32,111 pregnancies, about one third were terminated by induced abortion.
- Over one third (35%) of the births to King County women from 1993-1995 were unintended at the time of conception.
- The infant mortality rate in King County was lower than the Washington State rate and the national rate. Between 1981 and 1996, infant mortality rate in King County declined significantly.
- The infant mortality rate for African Americans, while also decreasing, remained significantly higher than the rate for whites.
- The rates of low birth weight, lack of prenatal care, and teenage births were highest among African Americans, Native Americans, and Hispanics, among people living in high poverty neighborhoods, and among residents of Central Seattle, Southeast Seattle, and White Center/Skyway.
- In 1996, 11% of the women giving birth smoked cigarettes during pregnancy.

Table 4-1:
Maternal and Infant Health Indicators

	King County 1996		Seattle 1996		WA State 1996		U.S. 1996
	Rate	Number	Rate	Number	Rate	Number	Rate
Birth Rate (Per 1,000 Females Age 15-44)	57.0	21,573	48.5	6,257	63.4	77,874	65.7
Pregnancy Rate (Per 1,000 Females Age 15-44)	84.9	32,111	89.7	11,585	84.8	104,270	---
Abortion Rate (Per 1,000 Females Age 15-44)	27.8	10,538	41.3	5,328	21.5	26,396	---
Pregnancies Ending in Abortion	32.8%	10,538	46.0%	5,328	25.3%	26,396	---
Unintended Births*	35.1%	---	---	---	40.0%	---	30.8%**
Infant Mortality (Per 1,000 Live Births)	5.5	118	5.3	33	6.0	467	7.2
Low Birth Weight	6.0%	1,285	6.5%	404	5.6%	4,328	7.4%
Prenatal Care in 1st Trimester	86.6%	15,737	84.4%	4,425	83.3%	59,867	81.8%

* Data based on survey estimates for the period 1993-1995.
** 1994 estimates from the National Survey of Family Growth.

Source: Birth Certificate Data, Linked Birth/Death Certificate Data, & Abortion Report Records: Washington State Department of Health, Center for Health Statistics.

BIRTH

- In 1996, there were 21,573 live births to King County women, including 6,257 live births to women living in Seattle.
- The general fertility rate, which measures the number of live births per 1,000 women of childbearing age (15-44), was 57.0 in King County and 48.5 in Seattle.
- The general fertility rate increased from 55.6 in 1980 to 60.0 in 1989 in King County. Since 1990, the rate had declined slightly, due to a decline in the birth rate among women age 15-19. The declining trend was significant among African Americans and whites.
- Between 1989 and 1996, the general fertility rate for Hispanics increased sharply. However, data problems cannot be ruled out for the phenomenal increase.
- Averaged over 1994 to 1996, Hispanic women had the highest general fertility rate (94.4), followed by African Americans (67.9), Asians (64.3), Native Americans (58.5), and whites (51.0) (Figure 4-1).
- The total fertility rate[1] in 1996 was 1.8 births per woman for King County. The rate was 2.8 for Hispanics, 2.1 for African Americans, 2.0 for Asians, 1.7 for Native Americans, and 1.6 for whites.
- In general, King County women were more likely to have children in their late 20s and early 30s. Averaged over 1994 to 1996, the age-specific fertility rate, which is the number of live births per 1,000 women in a given age group, followed a bell-curve. The peak fertility rate occurred among those age 25-29.
- The age-specific fertility rates indicate that compared to whites and Asians, Hispanics, African Americans, and Native Americans were more likely to have children at younger age. Their age-specific fertility rates were highest in the 20-24 age group (Figure 4-2).

Figure 4-1:
General Fertility Rate By Race/Ethnicity, King County
Three Year Rolling Averages, 1980-1996

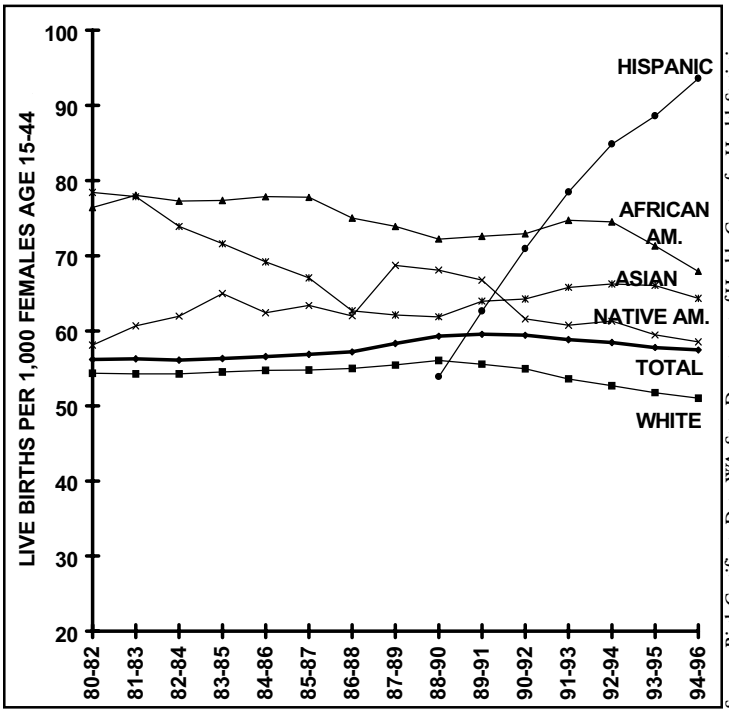
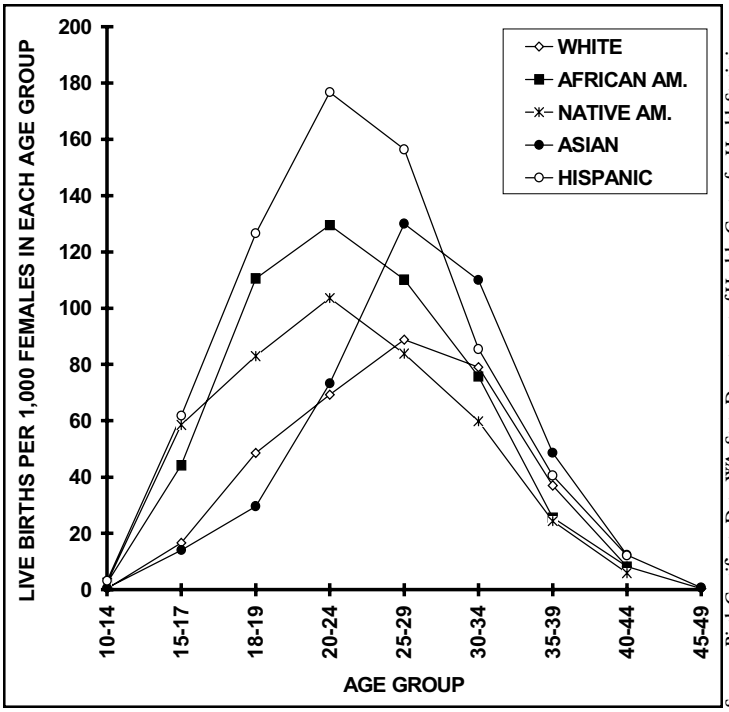


Figure 4-2:
Age-Specific Fertility Rate By Race/Ethnicity, King County
Three Year Average, 1994-1996



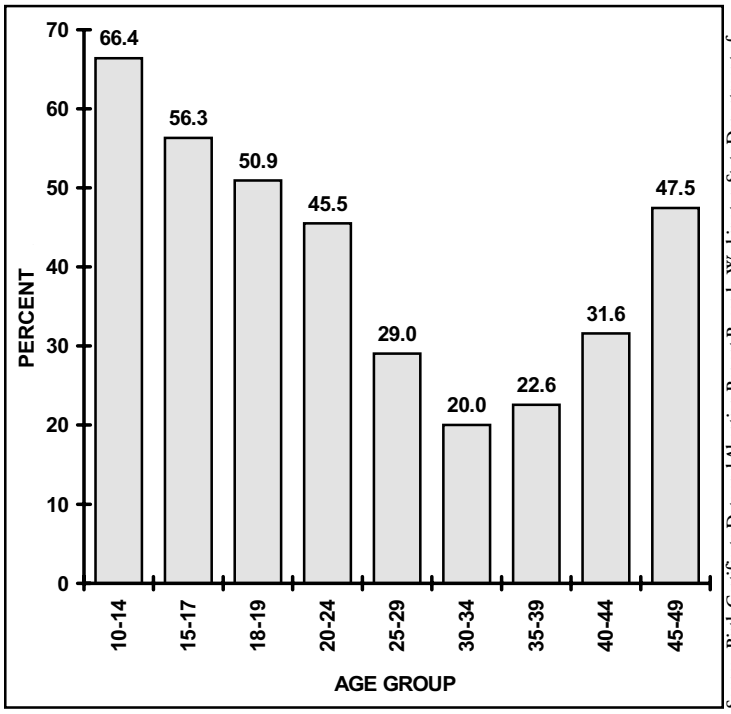
1 The total fertility rate is the expected number of children that would be born alive to a woman during her lifetime if her childbearing were to correspond with the age-specific fertility rates in the population of a given year.

PREGNANCY AND ABORTION

The pregnancy rate is the number of live births and induced abortions per 1,000 women age 15 to 44. Miscarriages and stillbirths are not included in the pregnancy rate because the data are incomplete.

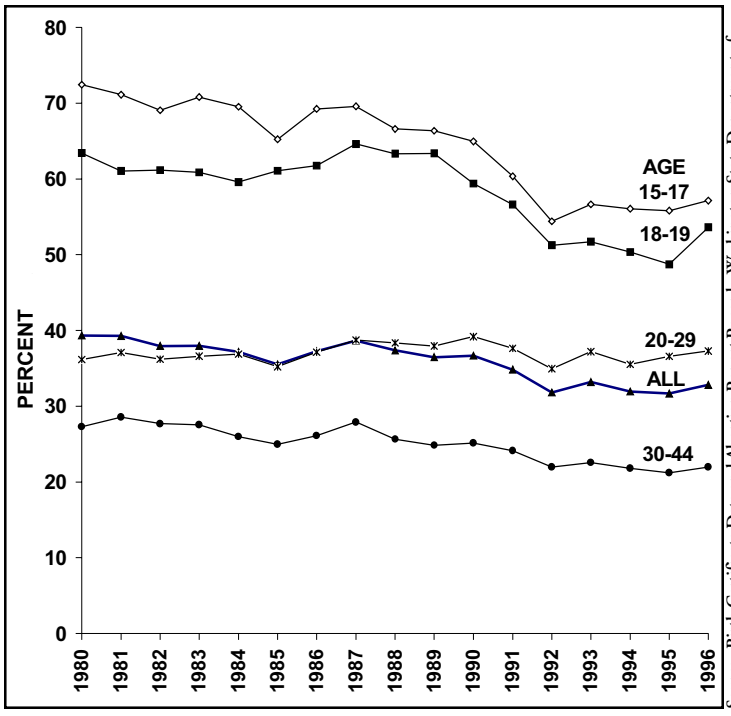
- In 1996, there were 32,111 reported pregnancies among King County women.
- The pregnancy rate per 1,000 women age 15 to 44 was 84.9.
- The overall pregnancy rate declined 10% between 1990 and 1996 due to a decline in the teen pregnancy rate. The pregnancy rates for females age 15-17 and 18-19 declined 27% and 21% respectively during the same period.
- In 1996, one-third (33%) of the pregnancies in King County ended in abortion. In Seattle, 46% of the pregnancies were ended by abortion.

Figure 4-3:
Percent of Pregnancies Ended in Abortion
By Age Group, King County
Three Year Average, 1994-1996



Source: Birth Certificate Data and Abortion Report Records: Washington State Department of Health, Center for Health Statistics.

Figure 4-4:
Percent of Pregnancies Ended in Abortion
By Age Group, King County
1980-1996



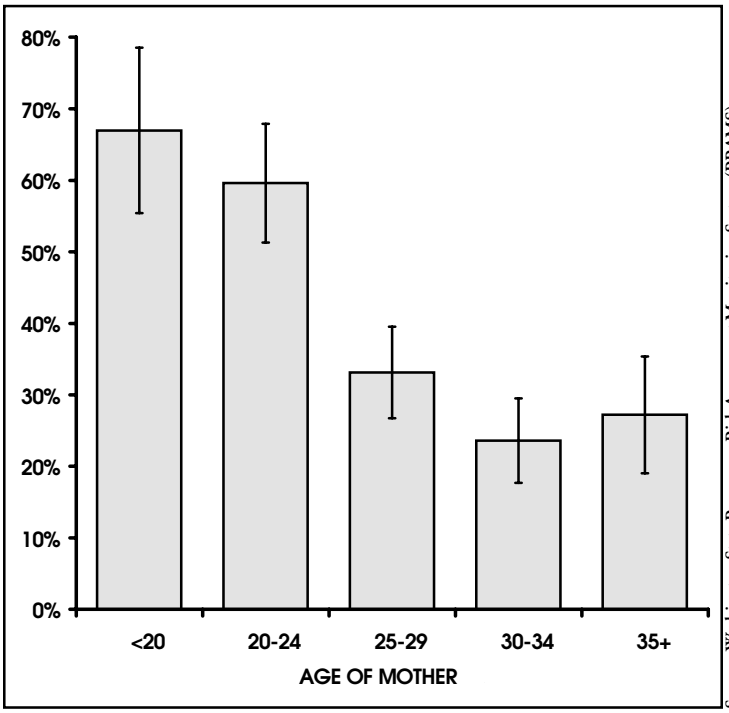
Source: Birth Certificate Data and Abortion Report Records: Washington State Department of Health, Center for Health Statistics.

- Teenagers had the highest percentage of pregnancies ended in abortion (Figure 4-3).
- Between 1980 and 1996, the proportion of pregnancies terminated by abortion among females age 15-17, 18-19, and 30-44 declined by 21%, 15%, and 19% respectively. For women age 20 to 29, there was no significant change in the abortion percent during the same period (Figure 4-4).
- The lowest abortion percent was observed among women age 30 to 34 at 20%. Because of their population size, the majority of abortions (70%) occurred among women age 20 to 34.

UNINTENDED PREGNANCY

The proportion of births resulting from unintended pregnancies is derived from the Washington State Pregnancy Risk Assessment Monitoring System (PRAMS). PRAMS is a statewide mail and telephone survey of new mothers in Washington that collects information about perinatal risk factors, including the mother's feelings about the timing of her most recent pregnancy. Mothers who report that they wanted to be pregnant at a later time or not at all are considered to have had unintended pregnancies.

Figure 4-5:
Births That Were Unintended at Conception
By Maternal Age, King County
Four Year Average, 1993-1996



Source: Washington State Pregnancy Risk Assessment Monitoring System (PRAMS).

- During the period of 1993-1995, an estimated 35%[2] of births were the result of unintended pregnancies in King County. Statewide, 40% of births during this period were unintended.
- In King County, 28% of 1993-1995 births were reported by the mother to be mistimed (i.e., she wanted to be pregnant at some point in the future, but not at the time she conceived). For 7% of births, the mother did not want to be pregnant then or at any point in the future.
- Unintended pregnancy affects all groups, regardless of age, educational attainment, or marital status. However, the percent of births that are unintended at conception is higher among mothers who are younger, unmarried, or have less than 12 years of education.
- Among mothers younger than 25 in King County, 60% of 1993-1995 births were the result of unintended pregnancy. The percent unintended declines as maternal age increases to a low of 23% among mothers age 30-34 and then rises slightly among mothers over age 35.
- Unintended pregnancy is associated with several risk factors for poor birth outcomes including late entry into prenatal care, smoking and alcohol consumption during pregnancy, and low infant birth weight. Women with unintended pregnancies are at increased risk of experiencing prenatal and postpartum depression, as well as physical violence by their partners. For women of all ages – and especially very young women – unintended pregnancy may result in economic hardship and reduced life opportunities.[3]
- Strategies that have been suggested for reducing unintended pregnancy include: 1) improving knowledge about contraception, unintended pregnancy, and reproductive health; 2) increasing access to contraception; and 3) addressing the roles that feelings, attitudes, and motivation play in using contraception and avoiding pregnancy.[3]

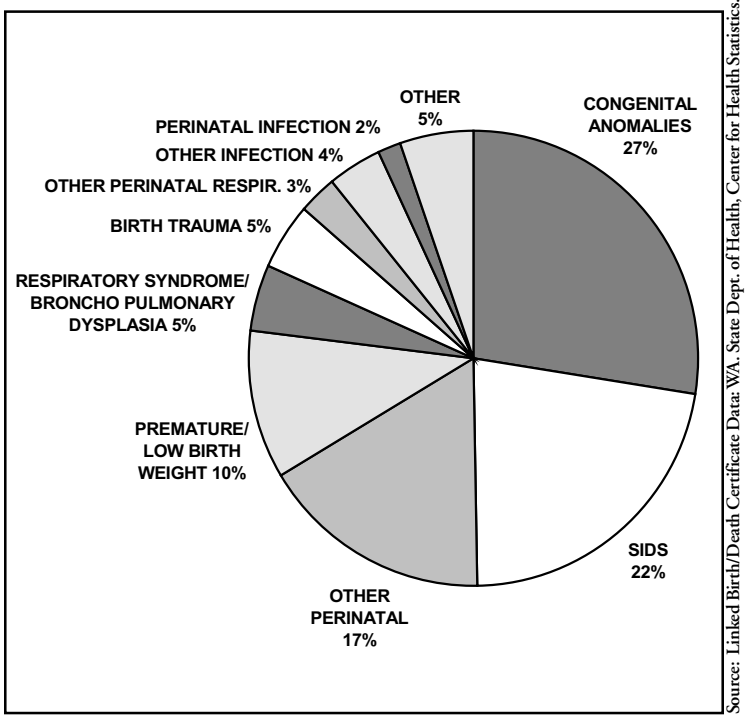
2 The King County PRAMS estimates reported here are based on provisional weights.
3 Institute of Medicine. The Best Intentions: Unintended Pregnancy and the Well-Being of Children and Families. Washington DC: National Academy Press, 1995.

INFANT MORTALITY

Infant mortality is a widely used indicator of maternal and infant health. The infant mortality rate is the number of deaths to infants under one year of age per 1,000 live births in a given year. The infant mortality rate, which is sensitive to a wide range of biological, social, health service, and environmental factors, reflects the health of pregnant women and infants, as well as the availability of intensive medical care for infants.

Averaged over 1994-1996, congenital anomalies and sudden infant death syndrome (SIDS) were the leading causes of infant death, accounting for 27% and 22% of the infant deaths respectively. Conditions related to prematurity/low birth weight accounted for 10% of the infant deaths (Figure 4-6). SIDS has recently been shown to be associated with prone sleeping position, leading to the current recommendation to put babies to sleep on their back.

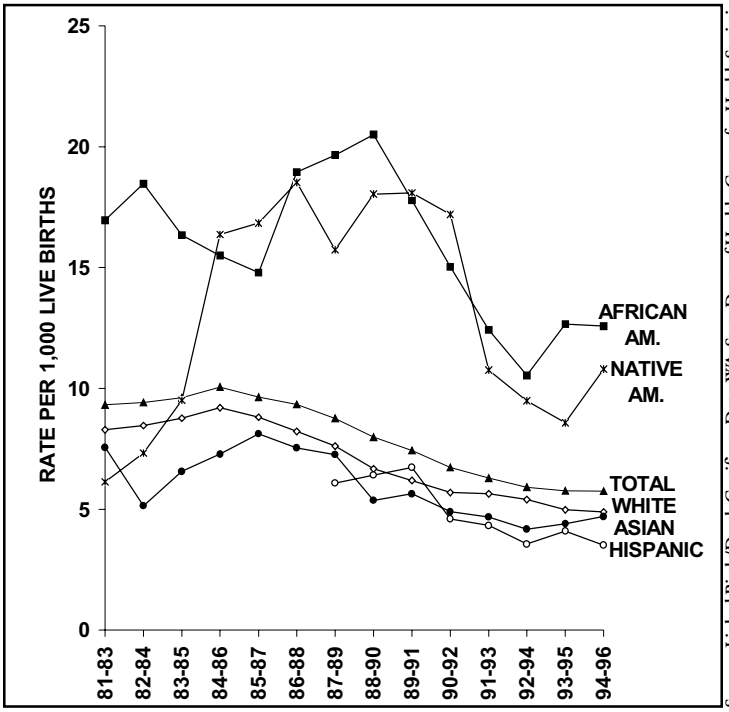
Figure 4-6:
The Causes of Infant Death
King County
Three Year Average, 1994-1996



Source: Linked Birth/Death Certificate Data: WA. State Dept. of Health, Center for Health Statistics.

- Since the events leading to the death of an infant are often complex and multifaceted, no single prevention strategy will be effective. Interventions include early and continuous prenatal care, cessation of substance use, folic acid supplementation, screening and treatment of vaginal infections, and nutritional assistance through programs such as WIC. Medical advances in perinatal care, such as the use of pulmonary surfactant in premature infants, are also critical components in preventing death. For older infants, prevention strategies focus on infant safety (e.g., unsafe sleep positions and locations and car seat use) and assuring that new parents feel supported and prepared, to reduce the risk of abuse and neglect.

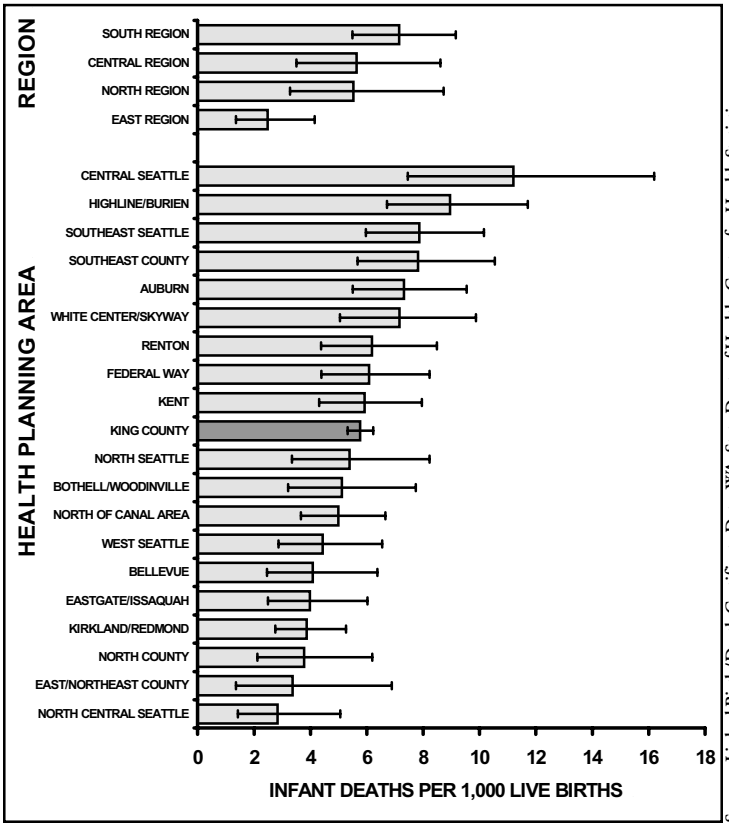
Figure 4-7:
Infant Death Rate
By Race/Ethnicity, King County
Three Year Rolling Averages, 1981-1996



Source: Linked Birth/Death Certificate Data: WA. State Dept. of Health, Center for Health Statistics.

- The 1996 infant mortality rate per 1,000 live births was 5.5 in King County (118 deaths) and 5.3 in Seattle (33 deaths).
- Between 1981 and 1996, the infant mortality rate in King County declined significantly from the higher rate of 10.1 in 1981 to 5.5 in 1996. The rate of SIDS also declined in recent years, from 2.1 (48 deaths) in 1990 to 1.0 (22 deaths) in 1996.
- Two thirds (62%) of the infant deaths between 1994 and 1996 occurred within 28 days after birth.
- Between 1985 and 1996, the infant mortality rate in King County declined significantly. The declining trend during this period was also significant for whites and Asians. For African Americans, there was a significant decline in the infant mortality rate between 1988 and 1996. The time trends for Native Americans and Hispanics could not be assessed due to small numbers. The declining trends among African Americans and Asians, however, have been leveling off in recent years.
- By mother's race/ethnicity, the infant mortality rate for African Americans was significantly higher than the rates for whites, Asians, and Hispanics during 1992-1996. The rate for Native Americans was also higher than the rate for whites, but the difference was not statistically significant (Figure 4-7).
- The infant mortality rates in Central Seattle, Highline/Burien, and Southeast Seattle were significantly higher than the overall King County rate (Figure 4-8).

Figure 4-8:
Infant Death Rate
By Region and Health Planning Area, King County
Five Year Average, 1992-1996



Source: Linked Birth/Death Certificate Data: WA. State Dept. of Health, Center for Health Statistics.

BIRTH RISK FACTORS

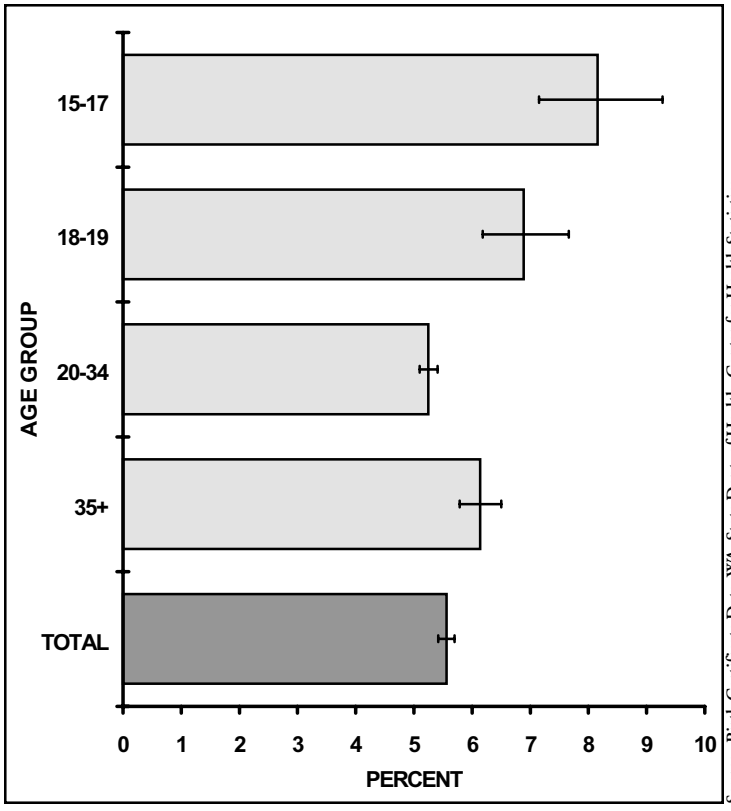
There are a number of factors that can affect the health of infants and may lead to infant death. In this section, we discuss some of these factors: low birth weight, lack of timely prenatal care, smoking and alcohol use during pregnancy, and teenage childbirth.

Low Birthweight

Over half of all infant deaths are related to low birthweight (less than 2,500 grams, about five and a half pounds). A low birthweight infant is at a higher risk not only for death during infancy but also for childhood neurological and respiratory problems. Low birthweight is potentially preventable. Factors related to low birthweight include poverty, late entry into prenatal care, teen pregnancy, unintended pregnancy, older maternal age, smoking and drug use during pregnancy, preterm labor, short interval between pregnancies, and poor maternal nutrition.

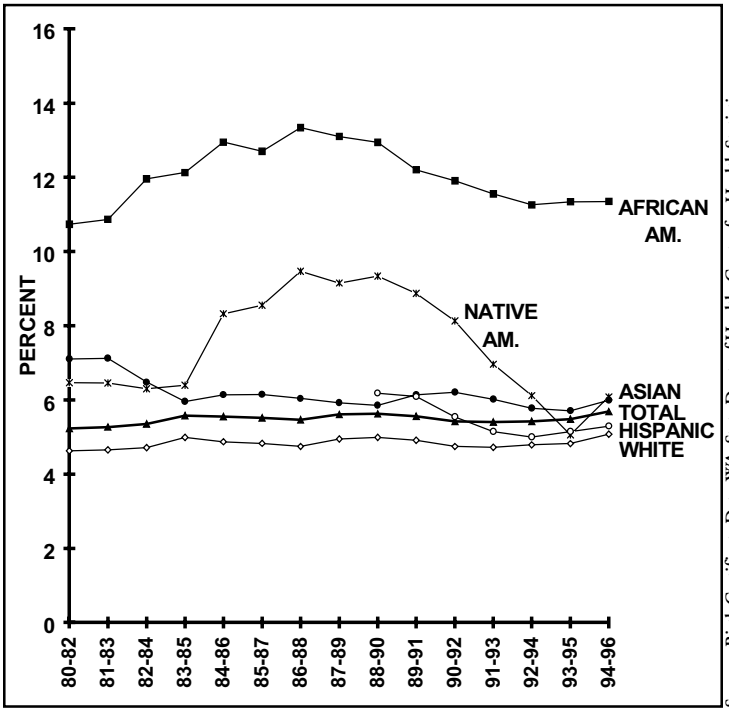
- Of the King County newborns in 1996, 6% had low birthweight.
- The rates of low birthweight among teenage mothers and among mothers age 35 and older were significantly higher than the rate seen in mothers age 20 to 34 (Figure 4-9).

Figure 4-9:
Low Birthweight Rate
By Age of Mother, King County
Five Year Average, 1992-1996



Source: Birth Certificate Data: WA. State Dept. of Health, Center for Health Statistics.

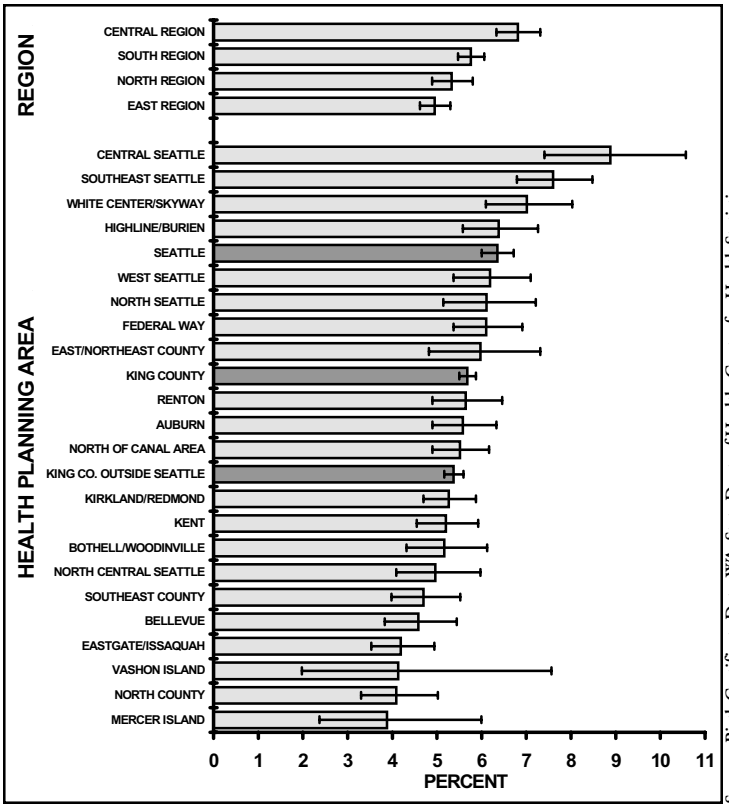
Figure 4-10:
Low Birthweight Rate
By Race/Ethnicity, King County
Three Year Rolling Averages, 1980-1996



Source: Birth Certificate Data: WA. State Dept. of Health, Center for Health Statistics.

- The low birthweight rate for African Americans was significantly higher than the rates for the other racial/ethnic groups (Figure 4-10).
- Between 1980 and 1994, there was no significant change in the rate of low birthweight. Since 1994, however, the rate increased slightly but significantly. In the 1990s, the rates for African Americans and Native Americans declined from the higher rates in the mid-1980s. The rate for whites in 1996 (5.55) increased from the previous year (4.75).

Figure 4-11:
Low Birthweight Rate
By Region and Health Planning Area, King County
Three Year Average, 1994-1996



Source: Birth Certificate Data: WA. State Dept. of Health, Center for Health Statistics.

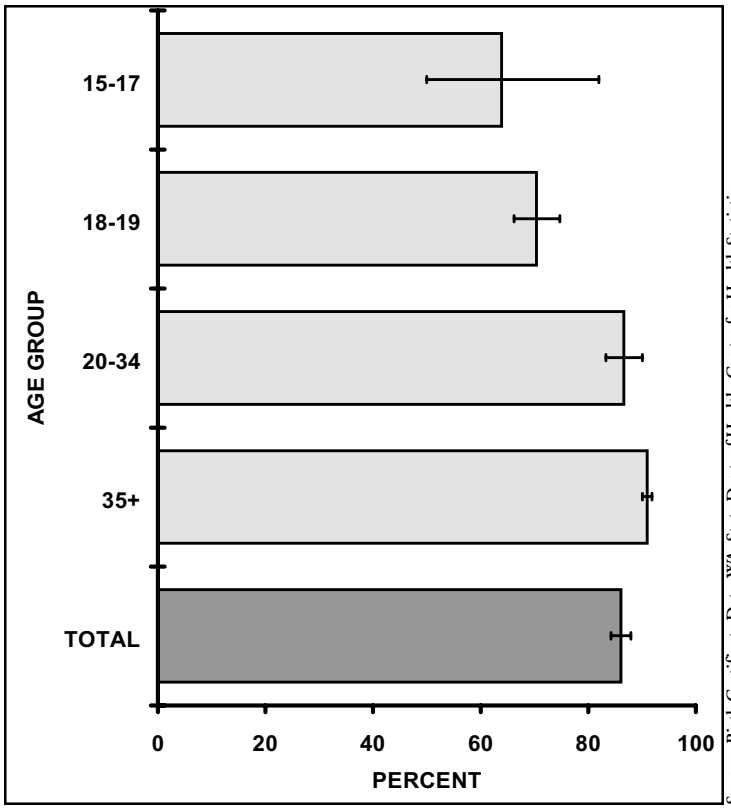
- The rate of low birth weight in high poverty neighborhoods (7.5%) was significantly higher than the rates in medium (5.8%) and low (5.0%) poverty neighborhoods.
- The rate of low birthweight in Central Region was significant higher than the rates in the other regions.
- The rates of low birthweight in Central Seattle, Southeast Seattle, and White Center/Skyway were significantly higher than the King County average (Figure 4-11).

Lack of Prenatal Care

Timely use of prenatal care, defined as first use of prenatal care in the first trimester, may reduce the risk of low birth weight and infant death. In King County 1996, the risk of infant death was 4.7 times higher for women who received no care or received care only in the last three months of pregnancy, compared to those who began care in the first trimester.

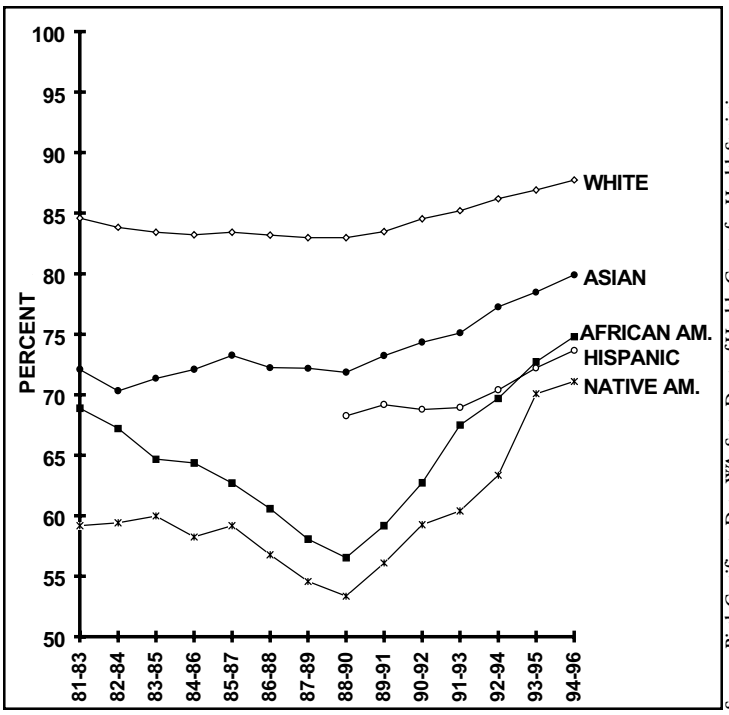
- Of the King County mothers giving birth in 1996, 87% began prenatal care in the first trimester.
- The rate of receiving prenatal care in the first trimester increased significantly between 1980 and 1996 in King County, especially since the late 1980s,
- Teenage mothers had a significantly lower rate of early prenatal care than mothers in older age groups (Figure 4-12).

Figure 4-12:
Percent of Mothers Receiving Prenatal Care
In the First Trimester
By Age of Mother, King County
Three Year Average, 1994-1996



Source: Birth Certificate Data: WA. State Dept. of Health, Center for Health Statistics.

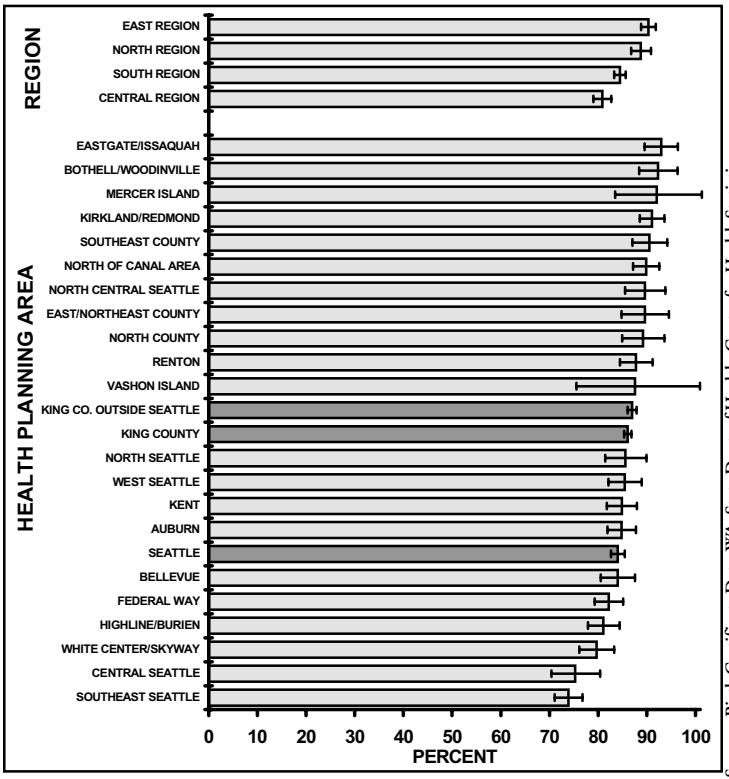
Figure 4-13:
Percent of Mothers Receiving Prenatal Care
In the First Trimester
By Race/Ethnicity, King County
Three Year Rolling Averages, 1981-1996



Source: Birth Certificate Data: WA. State Dept. of Health, Center for Health Statistics.

- The rates of early prenatal care among the minority groups were significantly lower than the rate for whites. During 1994-1996, the average rate was 87.7% for whites, 79.9% for Asians, 74.8% for African Americans, 73.6% for Hispanics, and 71.1% for Native Americans (Figure 4-13).

Figure 4-14:
Percent of Mothers Receiving Prenatal Care
In the First Trimester
By Region and Health Planning Area, King County
Three Year Average, 1994-1996



Source: Birth Certificate Data: WA. State Dept. of Health, Center for Health Statistics.

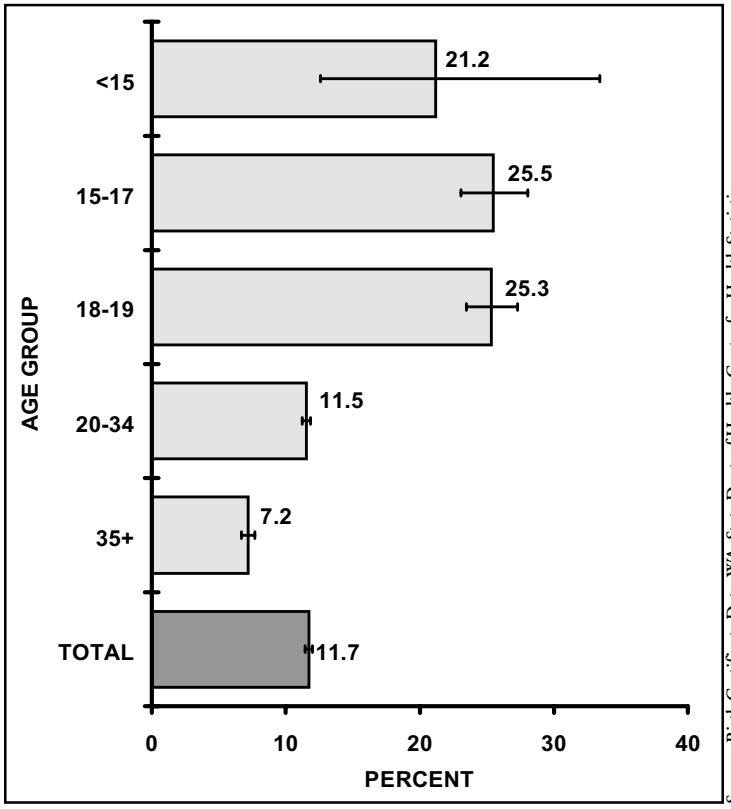
- The rate of early prenatal care for women living in high poverty neighborhoods (74.0%) was significantly lower than the rate for medium poverty neighborhoods (84.5%) and low poverty neighborhoods (91.1%) in 1996.
- The rates of early prenatal care in Central Region and South Region were significantly lower than the rates for East and North Regions during 1992-1996.
- Among the health planning areas, the rates of receiving early prenatal care in Southeast Seattle, Central Seattle, White Center/Skyway, Highline/Burien, and Federal Way were significantly lower than the county average rate (Figure 4-14).

Smoking and Alcohol Use During Pregnancy

Smoking and alcohol drinking during pregnancy are associated with an increased risk of infant death. Some of this increased risk is related to the association of smoking and alcohol drinking with higher rates of low birthweight, sudden infant death syndrome (SIDS), and preterm labor. Excessive alcohol consumption during pregnancy can also cause fetal alcohol syndrome (FAS). Although there are many symptoms, the most serious manifestation of FAS is mental retardation.

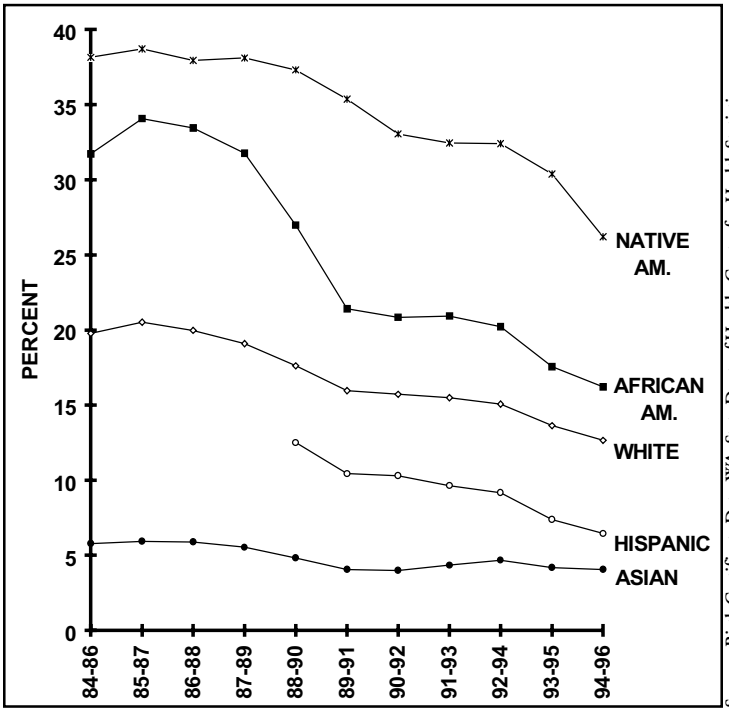
- In 1996, 11% of the King County mothers giving birth smoked cigarettes during pregnancy. For Seattle, the prenatal smoking rate was 12%.
- Between 1980 and 1996, the prenatal smoking rate in King County declined significantly from 21% in 1981 to 11% in 1996.
- Teenage mothers age 15 to 19 had the highest rate of smoking during pregnancy, 2.2 times the rate for mothers age 20 to 34, and 3.5 times the rate for mothers age 35 and older (Figure 4-15).

Figure 4-15:
Percent of Mothers Who Smoked During Pregnancy
By Age, King County
Three Year Average, 1994-1996



Source: Birth Certificate Data: WA. State Dept. of Health, Center for Health Statistics.

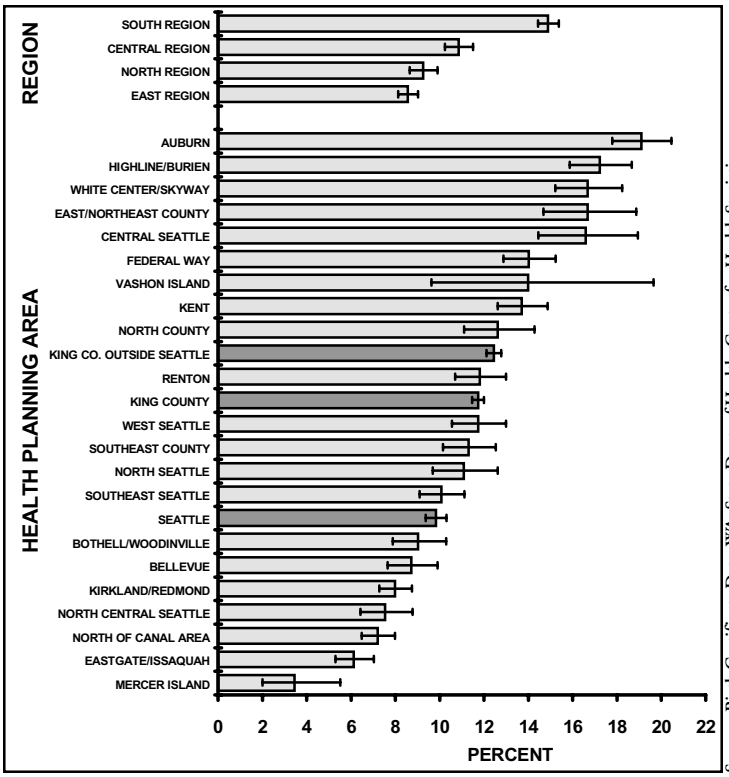
Figure 4-16:
Percent of Mothers Who Smoked During Pregnancy
By Race/Ethnicity, King County
Three Year Rolling Averages, 1984-1996



Source: Birth Certificate Data: WA. State Dept. of Health, Center for Health Statistics.

- Although the rates of smoking during pregnancy declined among all racial/ethnic groups, Native Americans continued to have the highest rate (26.2%), followed by African Americans (16.2%), whites (12.7%), Hispanics (6.4%), and Asians (4.1%) (Figure 4-16).

Figure 4-17:
Percent of Mothers Who Smoked During Pregnancy
By Region and Health Planning Area, King County
Three Year Average, 1994-1996



Source: Birth Certificate Data: WA. State Dept. of Health, Center for Health Statistics.

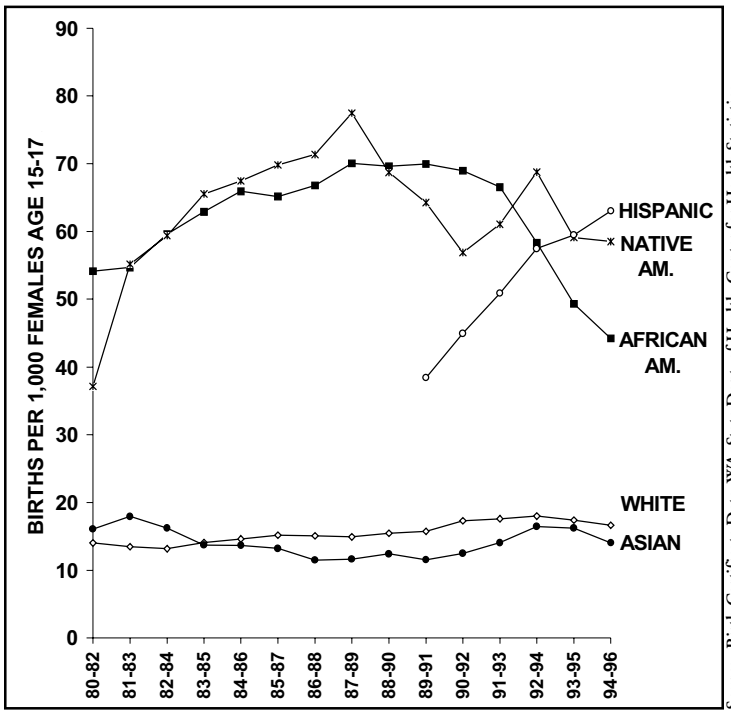
- The prenatal smoking rates in high and medium poverty neighborhoods (13.5% and 12.5% respectively) were significantly higher than the rate for low poverty neighborhoods (8.3%) in 1996.
- South Region had the highest prenatal smoking rate (14.9), followed by the Central Region (10.9%), North Region (9.3%), and East Region (8.6%) during 1994 to 1996.
- The prenatal smoking rates in Auburn, Highline/Burien, East/North East County, White Center/ Skyway, Central Seattle, Federal Way, and Kent were significantly higher than the King County average rate. Mothers living in Eastside communities, North of Canal, North Central Seattle, and Southeast Seattle had lower prenatal smoking rates than the county average (Figure 4-17).
- Among King County mothers who gave birth in 1996, 2.4% reported on the birth certificates that they consumed alcohol during pregnancy.

Teenage Childbirth

Infants born to mothers under age 18 have increased risk of mortality and low birthweight. Both the mother and the child tend to have subsequent educational, economic, and social problems. The younger the mother, the more likely such problems will occur.

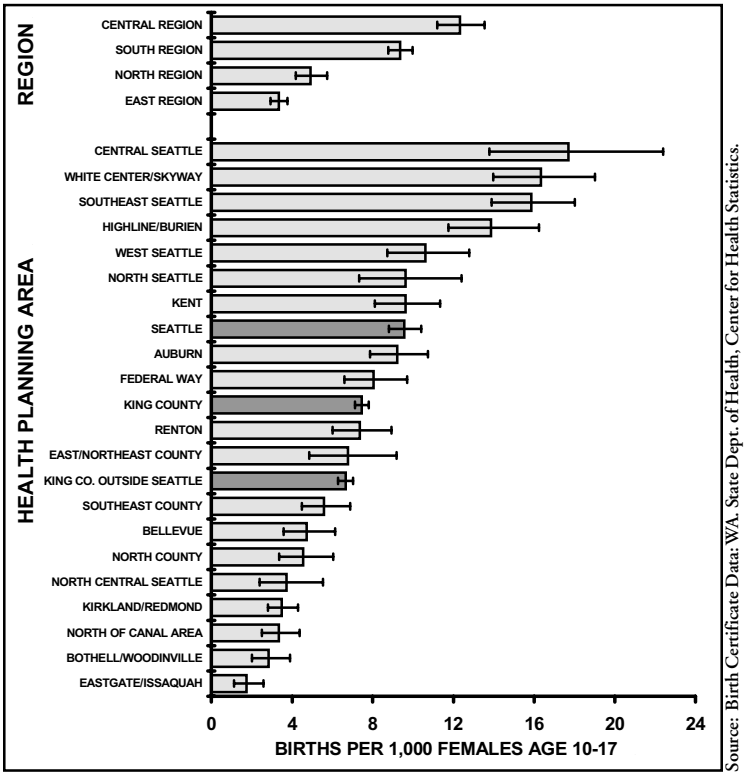
- In King County 1996, 539 infants were born to mothers age 15-17 and 15 infants were born to girls under age 15. The birth rate among girls age 15-17 was 18.4 per 1,000.
- Between 1980 and 1992, the birth rate among 15-17 year olds in King County increased significantly from 16.4 to 24.3. Since 1992, however, the rate had declined.
- In recent years, although the teenage birth rate had declined among African Americans and Native Americans, it remained stable among whites and Asians. However, the rate has increased significantly among Hispanics (Figure 4-18).

Figure 4-18:
Birth Rate Among Females Age 15-17
By Race/Ethnicity, King County
Three Year Rolling Averages, 1980-1996



Source: Birth Certificate Data: WA. State Dept. of Health, Center for Health Statistics.

Figure 4-19:
Birth Rate Among Females Age 15-17
By Region and Health Planning Area, King County
Three Year Averages, 1994-1996



Source: Birth Certificate Data: WA. State Dept. of Health, Center for Health Statistics.

Note: Vashon Island and Mercer Island are not included because of small numbers (<10).

- The birth rates among females age 15-17 were the highest among Hispanics (63.0), followed by Native Americans (58.5), African Americans (44.2), whites (16.6) and Asians (14.1) during 1994-1996.
- The birth rate among females age 15-17 was significantly associated with residence poverty level. The rates in high, medium, and low poverty neighborhoods were 44.8, 27.1, and 11.0 respectively in 1996.
- Among the health regions, the teen birth rates differed significantly during 1994-1996: 19.5 for Central Region, 17.1 for South Region, 8.8 for North Region, and 6.3 for East Region.
- The teen birth rates in Central Seattle, White Center/Skyway, Southeast Seattle, Highline/ Burien, and West Seattle were significantly higher than the county average rate (Figure 4-19).