DELAWARE VITAL STATISTICS SUMMARY REPORT- 2003

Delaware Health Statistics Center

Division of Public Health
Department of Health and Social Services

This report was prepared by Barbara Gladders, Health Statistics Administrator of the Delaware Health Statistics Center, Division of Public Health, Department of Health & Social Services.

Winter, 2006

2003 SELECTED CHARACTERISTICS

Population	Number*	Percent
Delaware	817,501	100.0
Kent	134,382	16.4
New Castle	515,079	63.0
Sussex	168,040	20.6

Marriages	Number*	5-yr Rate[1]
Delaware	4,923	6.5
Kent	923	7.4
New Castle	2,784	5.9
Sussex	1,216	7.6

Divorces	Number*	5-yr Rate[1]
Delaware	3,178	3.9
Kent	673	5.4
New Castle	1,834	3.4
Sussex	671	4.2

Live Births	Number*	5-yr Rate[2]
Delaware	11,337	62.3
Kent	2,062	66.0
New Castle	7,174	60.3
Sussex	2,101	67.0
Births to Teenagers (15-19)		
White	681	36.4
Black	493	80.3
Delaware	1,206	46.9
Kent	241	51.1
New Castle	697	41.9
Sussex	268	60.5

Race	Number*	Percent
White	7,823	69.0
Black	2,865	25.3
Hispanic Origin[4]	1,382	12.2
Marital Status		
Married	6,595	58.2
Single	4,742	41.8
Births to Single Mothers[3]		
White	2,583	33.0
Black	1,997	69.7
Hispanic	811	58.7
Low Birth Weight (<2500 gms)		
All Races	1,069	9.4
White	605	7.7
Black	409	14.3
Hispanic	106	7.7

First Trimester Care	Number*	Percent
White	6,771	86.6
Black	2,254	78.7
Hispanic	992	71.8
Delaware	9,508	83.9
Kent	1,614	78.3
New Castle	6,355	88.6
Sussex	1,539	73.3

Reported Pregnancies	Number*	5-yr Rate[5]
Delaware	14,523	82.5
Kent	2,546	83.9
New Castle	9,505	82.3
Sussex	2,472	81.9

Pregnancy Outcomes	Number*	Percent
Live Births	11,337	78.1
Fetal Deaths	63	0.4
Induced Terminations (ITOP)	3,123	21.5

ITOP by Place of Residence		
Delaware	3,123	74.8
Kent	474	15.2
New Castle	2,292	73.4
Sussex	357	11.4
Other States	1,053	25.2

Infant Mortality	Number*	5-yr Rate[6]
Delaware	107	9.1
White	53	6.9
Black	53	16.7
Hispanic	15	8.1

Mortality	Number*	Adj. Rate[7]
Delaware	7,067	832.8
Kent	1,114	833.7
New Castle	4,129	837.6
Sussex	1,824	823.3
Race and Gender		
White Male	2,842	958.4
White Females	2,940	676.1
Black Males	644	1274.0
Black Females	597	905.6

Leading Causes of Death	Number*	Percent
Heart Disease	2,027	28.7
Cancer	1,718	24.3
Stroke	407	5.8
Chronic Lower Respiratory Disease	339	4.8
Unintentional Injuries	287	4.1

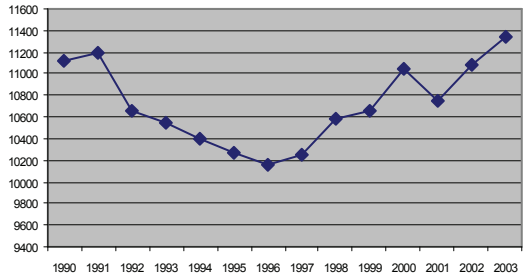
Notes:

* Numbers are for 2003.

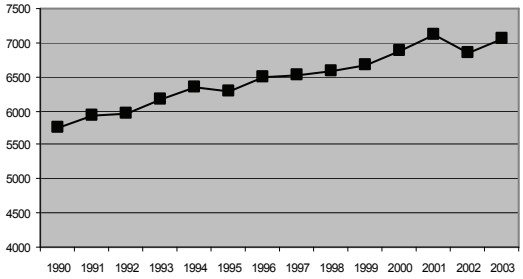
1. The 5-year Rate is per 1,000 population and refers to the period 1999-2003.
2. The 5-year Rate refers to total live births per 1,000 women 15-44 years of age during the 1998-2003 period.
3. Percentages for births to single mothers are based on total births for the race-group.
4. Persons of Hispanic origin may be of any race. The percentage is based on total resident births for 2003.
5. Pregnancy rates represent the number of reported pregnancies to women of all ages per 1,000 women 15-44 years of age for 1999-2003.
6. The 5-year (1999-2003) infant mortality rates represent the number of deaths to children under one year of age per 1,000 live births.
7. The 2003 mortality rates (deaths per 100,000 population) for Delaware and counties are age-adjusted to the 2000 U.S. population.

Source: Delaware Health Statistics Center

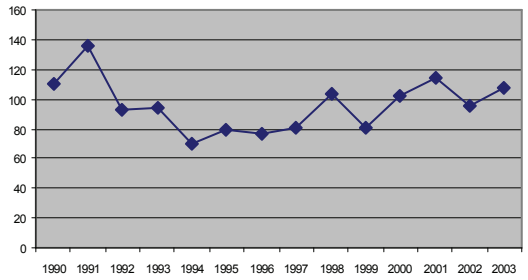
Live Births
Delaware, 1990-2003



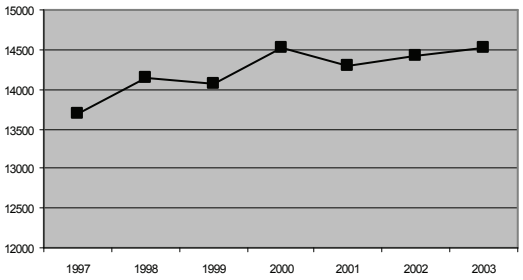
Deaths
Delaware, 1990-2003



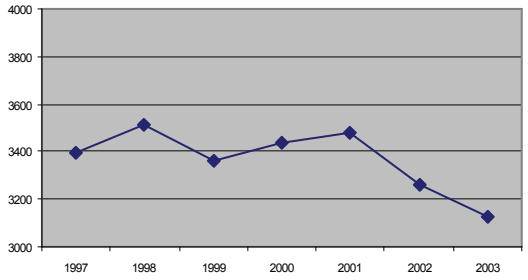
Infant (< 1 year of age) Deaths
Delaware, 1990-2003



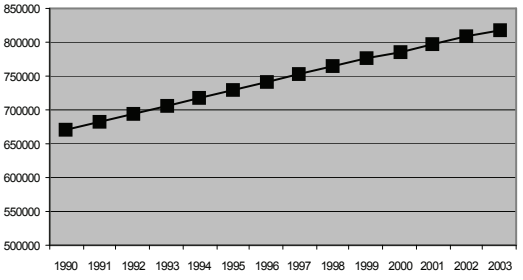
Reported Pregnancies
Delaware, 1997-2003



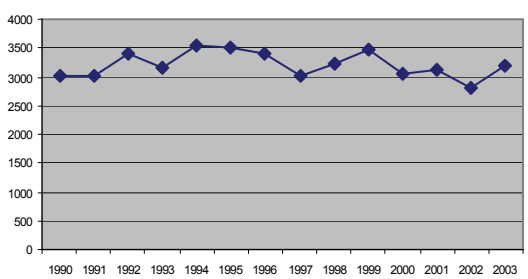
Abortions
Delaware, 1997-2003



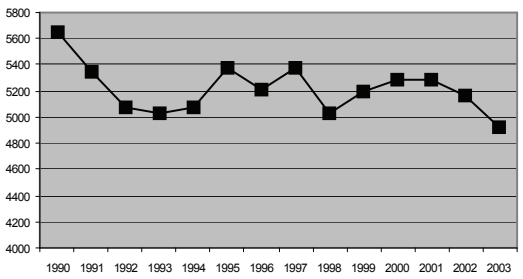
Population
Delaware, 1990-2003



Divorces
Delaware, 1990-2003

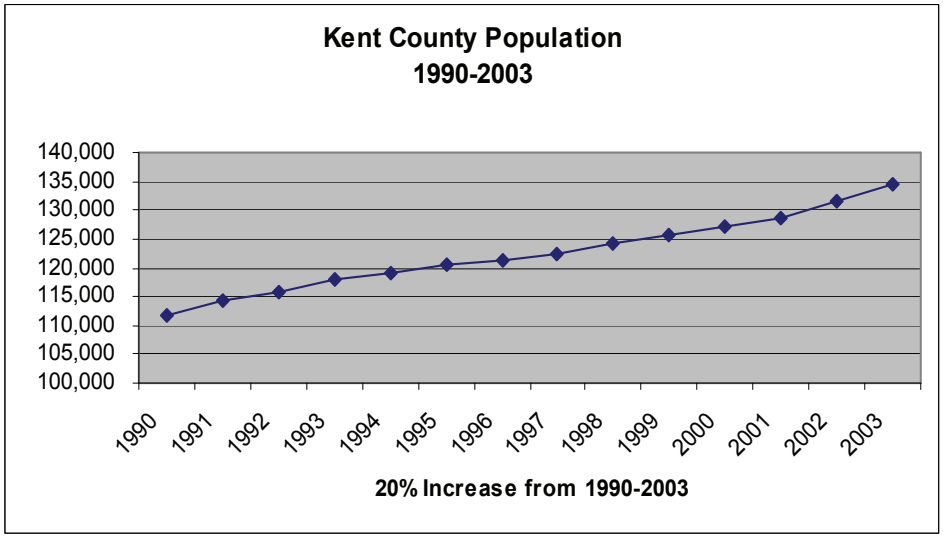


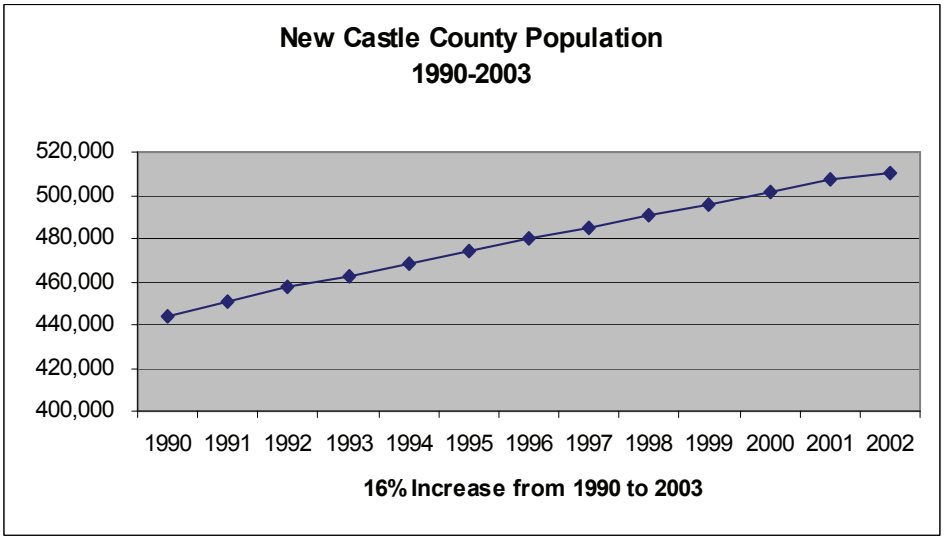
Marriages
Delaware, 1990-2003



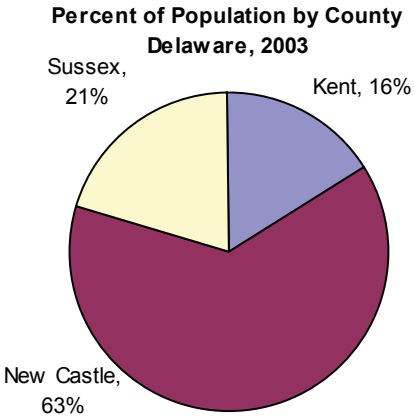
POPULATION

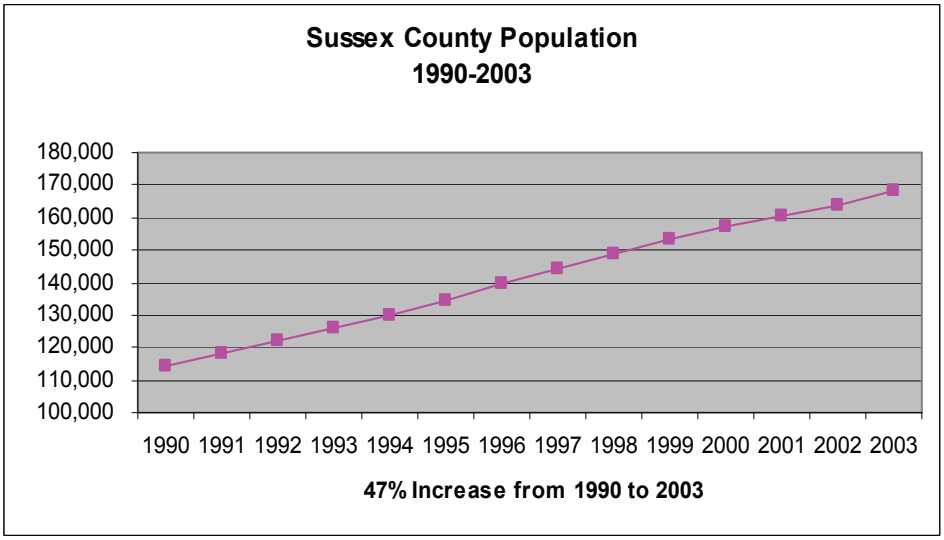
Each of Delaware's three counties continued their increasing population trend, though they grew at different rates. Looking at the recent period from 2000 to 2003, county populations grew annually by 1.9 percent for Kent, .9 percent, for New Castle, and 2.2 percent for Sussex.



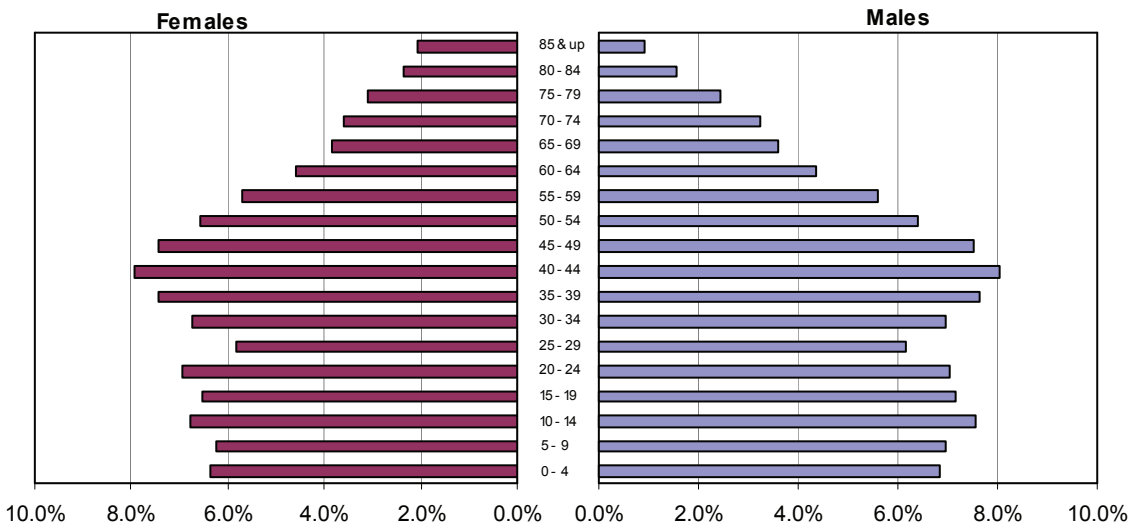


Over half of Delaware's population resides in New Castle County.

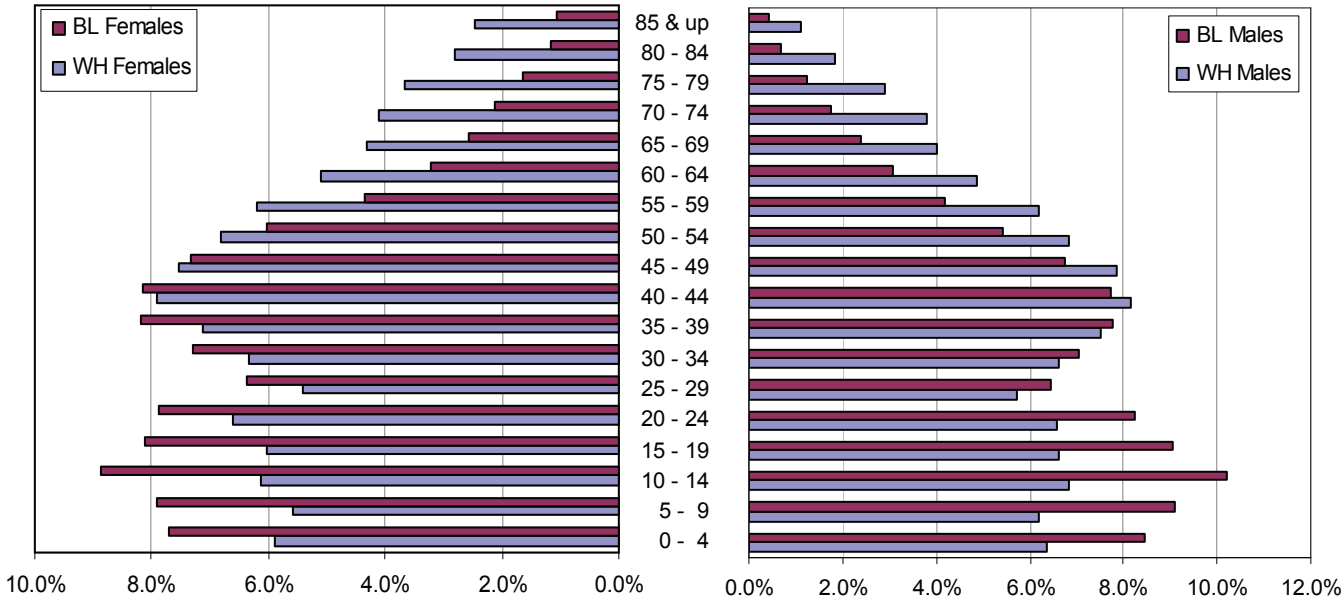




Just over 50 percent of Delaware's population is female. The age composition of males and females is very similar until you reach the older age groups, which reflect the longer female life expectancy. Delaware females born in 2003 could expect to live an average of 80 years, versus males, who could expect to live 74.5 years.



When the population is broken down by race, the higher proportion of females in the older age groups appears in the black population as well. However, both black males and females have a greater percentage of their population in the 0-39 year age range than whites; in the 40 and above age range, whites make up a greater proportion of the population.



Marriage

Male		Female	
Youngest:	16	Youngest:	15
Oldest:	88	Oldest:	86

Marriage with greatest age difference between bride and groom: 44 years.

The five-year average marriage rate decreased to 6.5 in 1999-2003, continuing a long, decreasing trend.

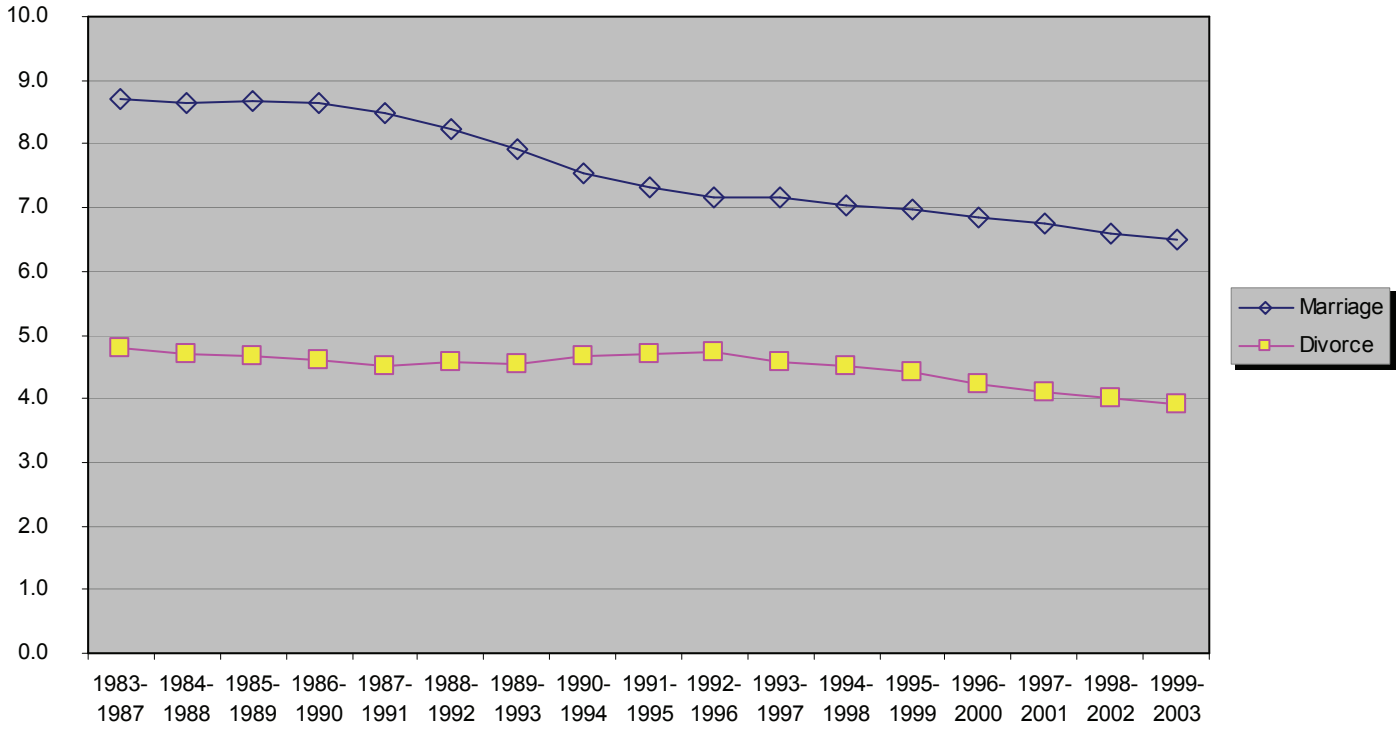
Divorce

Male		Female	
Youngest:	19	Youngest:	16
Oldest:	87	Oldest:	94

Marriage of shortest duration: 29 days
Marriage of longest duration: 50.8 years

The five-year average divorce rate decreased to 3.9 in 1999-2003, continuing a long, decreasing trend.

Five-year Average Marriage and Divorce Rates per 1,000 Population
Delaware, 1983-2003

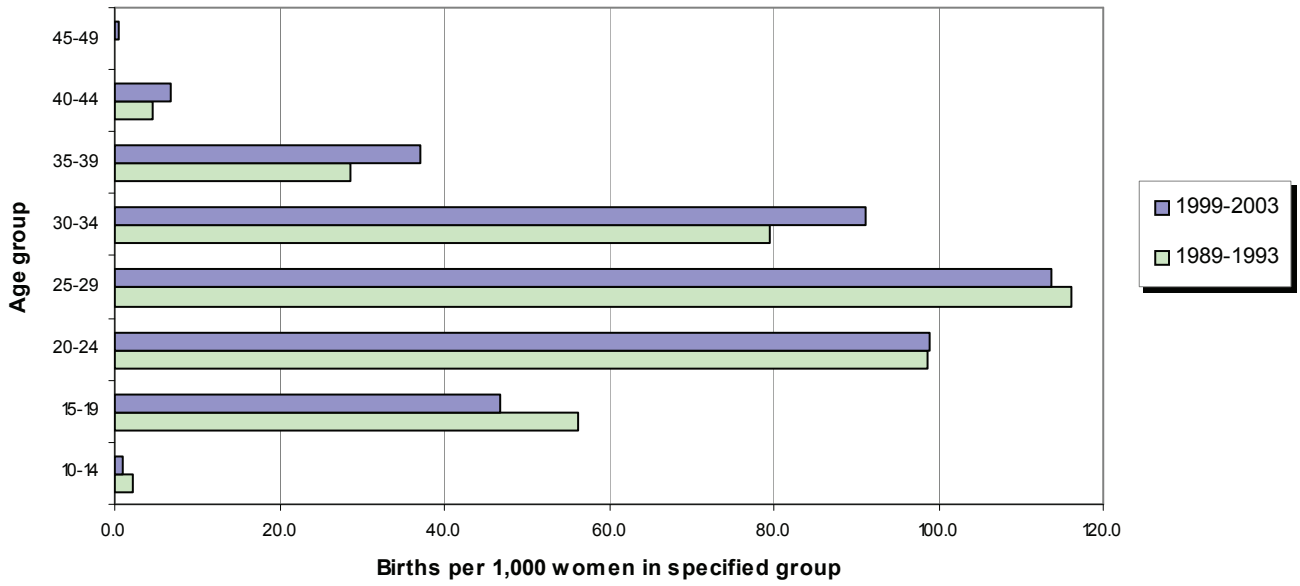


LIVE BIRTHS

In 2003, there were 12,120 births in Delaware, 10,821 were to Delaware residents and 1,299 were to non-residents. Additionally, 516 births to Delaware residents occurred out of state, for a total of 11,337 Delaware resident births, 254 more than 2002.

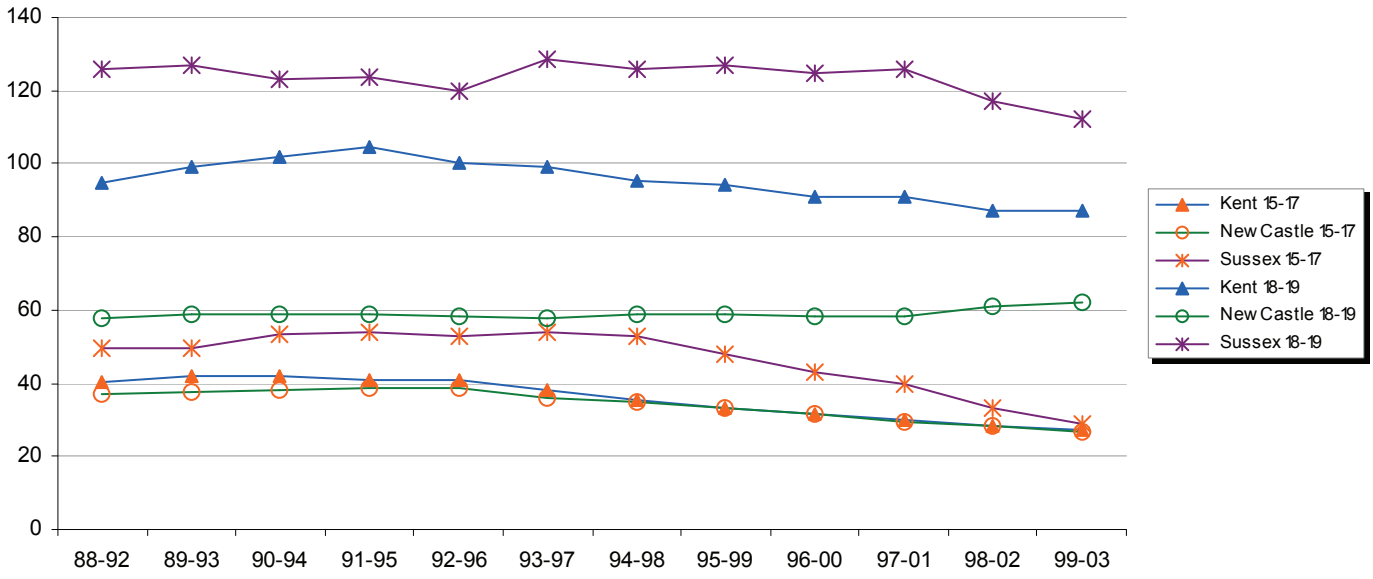
- Delaware's general fertility rate (for all women 15-44) increased slightly, to 63.1 live births per 1,000 females aged 15-44 years in 1999-2003. However, when broken down into specific age groups, birth rates and trends vary substantially and display a shift toward older mothers in the distribution of birth rates.

Five-year Average Live Birth Rates by Age of Mother
Delaware, 1989-1993 and 1999-2003



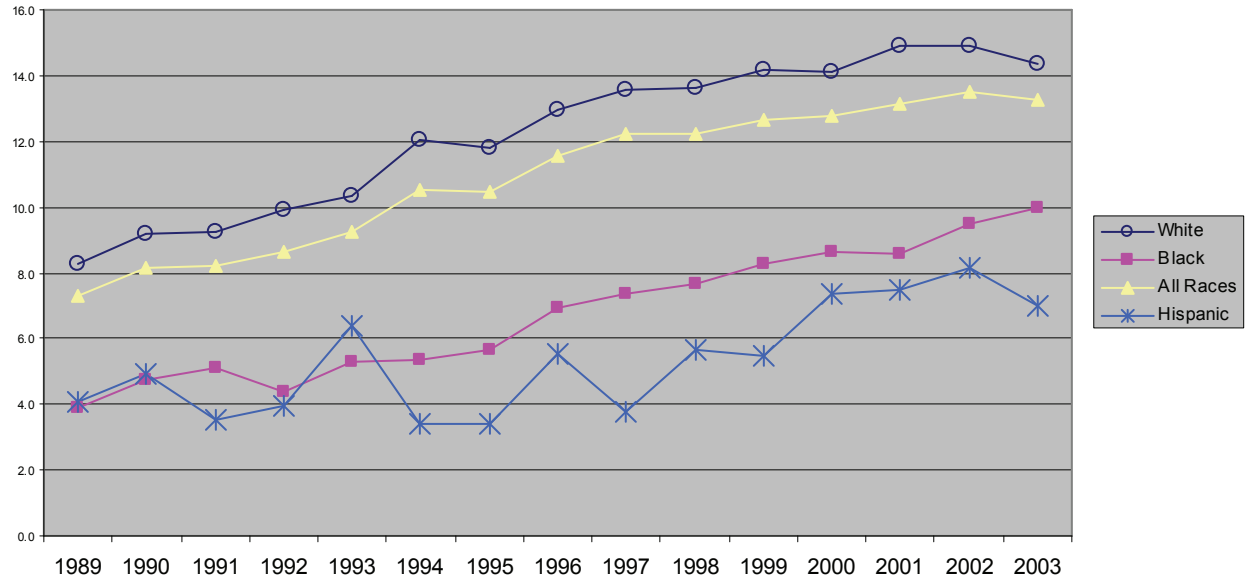
The teen (15-19) birth rate continued its decline, though rates vary by county and by specific teen birth rates. Although Sussex County's teen birth rates declined in 2003, they continue to have the highest teen births rates, with 112 births per 1,000 females aged 18-19, and 29.1 births per 1000 females aged 15-17.

Five-year Teen Live Birth Rates by County and Age Group
Delaware, 1988-2003



Though the percent of white and Hispanic births to women 35 and over decreased in 2003, the overall trend for births to women of all races and ethnicities, aged 35 and older, has been increasing. With the exception of the dip in 2003, this same trend is even more pronounced when looking at the percent of live births to first-time mothers 35 and older.

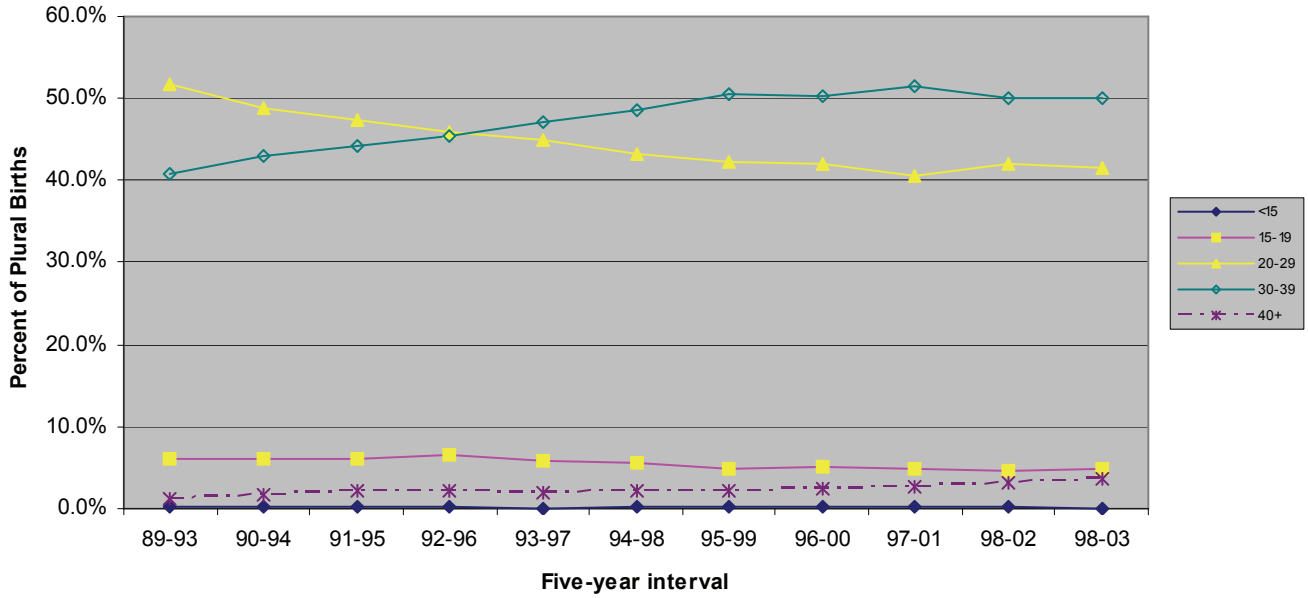
Annual Percent of Live Births to Women 35 or Older by Race and Hispanic Origin*
Delaware, 1989-2003



*Hispanic may be of any race.

As women wait longer to have their children, the distribution of both single and plural births has shifted toward older mothers. For instance, in 1989-1993, 51.8 percent of the total plural births were to women ages 20-29. In the 1999-2003 period that number had decreased to 41.6 percent of total plural births, and mothers ages 30-39 and 40+ absorbed the difference, increasing from 40.8 to 50 percent and 1.3 to 3.6 percent respectively.

Five-year Average Percent of Plural Births by Mother's Age Group
Delaware, 1989-2003

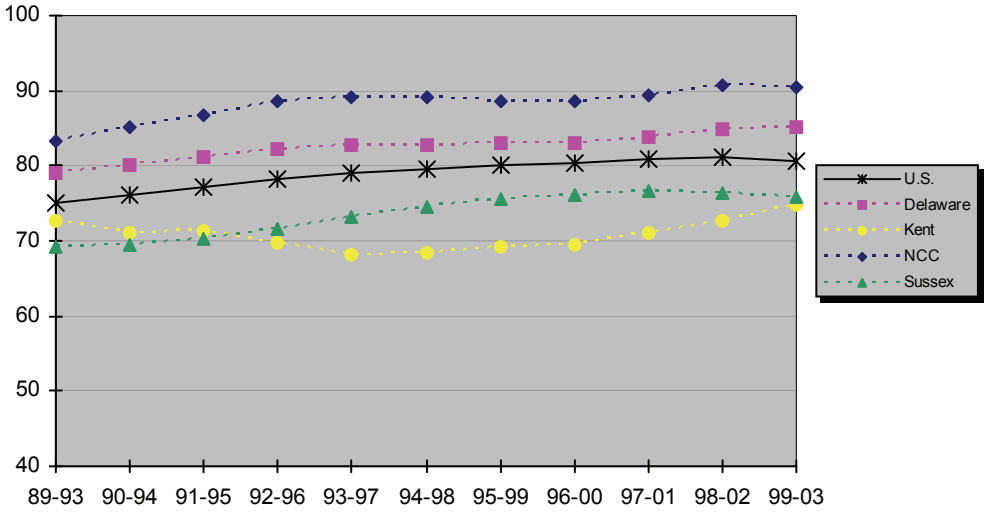


LIVE BIRTHS

Delaware has consistently increased the percentage of women receiving prenatal care (PNC) in the first trimester, from 79 percent in 1989-1993 to 85.1 percent in 1999-2003, surpassing the U.S. average over the same time periods.

Over the same time period, Wilmington, normally an area where maternal risk factors are the worst, showed a 23 percent increase in the number of women receiving prenatal care in the first trimester, from 68.1 percent in 89-93 to 83.7 percent in 99-03. Wilmington's increase was apparent in births to both black and white mothers.

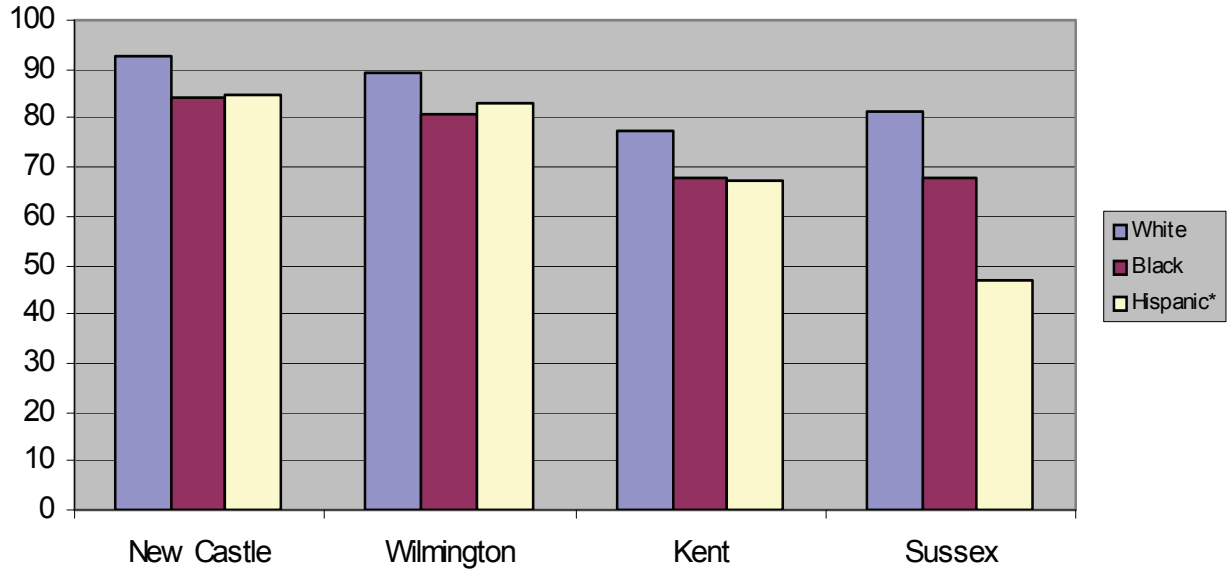
Five-Year Average Percentage of Births to Mothers Beginning Prenatal Care in the First Trimester U.S., Delaware and Counties, 1989-2003



Kent County has the lowest percentage of white and black mothers receiving prenatal care in the first trimester, at 77.5 and 67.8 respectively. Sussex county has the lowest percentage of Hispanic mothers receiving prenatal care in the first trimester, at 46.7 percent.

The graph below illustrates how the percentages of prenatal care differ between racial and ethnic groups, and between the counties as well. New Castle county has the highest rates of women receiving prenatal care in the first trimester, regardless of race; isolating Wilmington produces similar results. Another observation unique to Wilmington and New Castle County is that mothers of Hispanic origin receive higher percentages of prenatal care in the first trimester than black mothers.

Five-Year Average Percentage of Mothers Receiving PNC in First Trimester by County and Race, Delaware 1999-2003

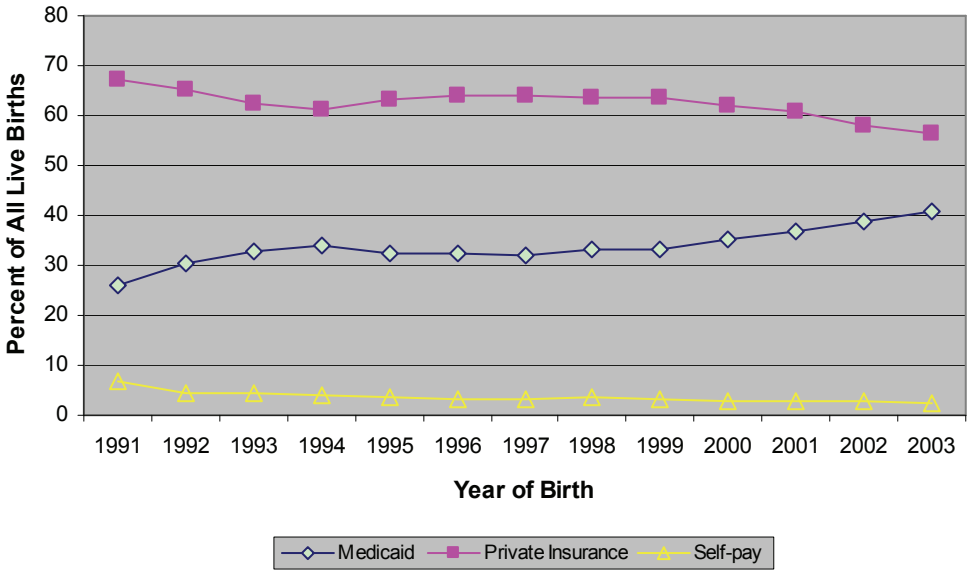


*Hispanics may be of any race.

The increasing trend of women using Medicaid as their primary source of payment continued in 2003.

- For the majority of mothers under 20 years of age, Medicaid was the primary source of payment, ranging from 74.4 percent for white mothers to 84.4 percent for mothers of other races.
- Over half of Hispanic and Black mothers of all ages used Medicaid as the primary source of payment for delivery.

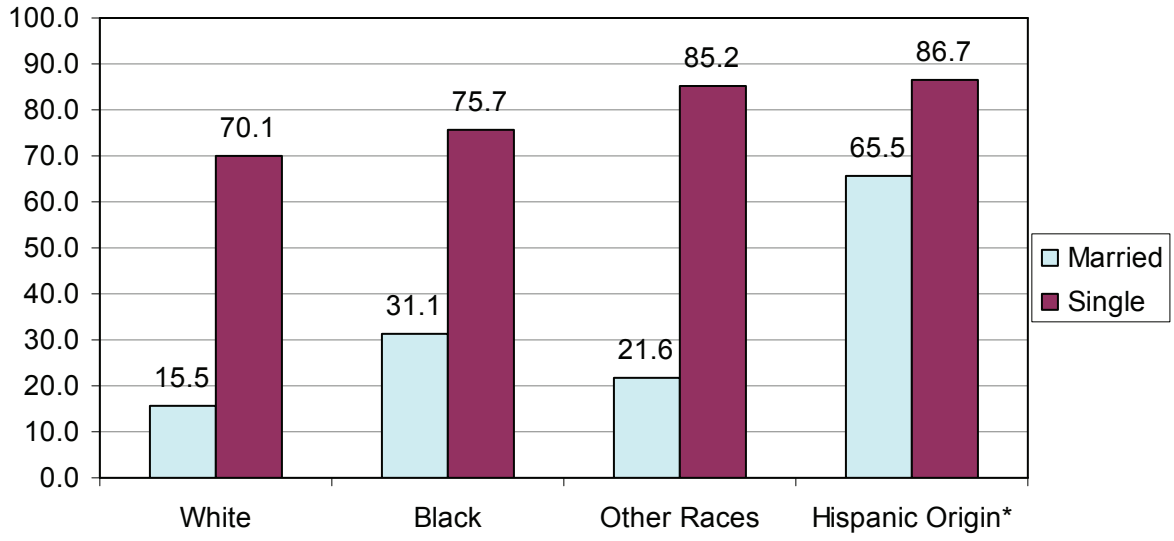
Percent of Births by Source of Payment for Delivery
Delaware, 1991-2003



Marital status has a tremendous effect on the use of Medicaid as a primary source of payment for delivery:

- 15.5 percent of white married women used Medicaid as their primary source of payment, but that number more than quadrupled, to 70.1 percent, if the mother was single.
- 31.1 percent of black married women used Medicaid as their primary source of payment, but that number more than doubled, to 75.7 percent, if the mother was single.
- 65.5 percent of Hispanic married women used Medicaid as their primary source of payment, but that number increased to 86.7 percent, if the mother was single.
- 21.6 percent of married women of other races used Medicaid as their primary source of payment, but that number increased almost four times, to 85.2 percent, if the mother was single.

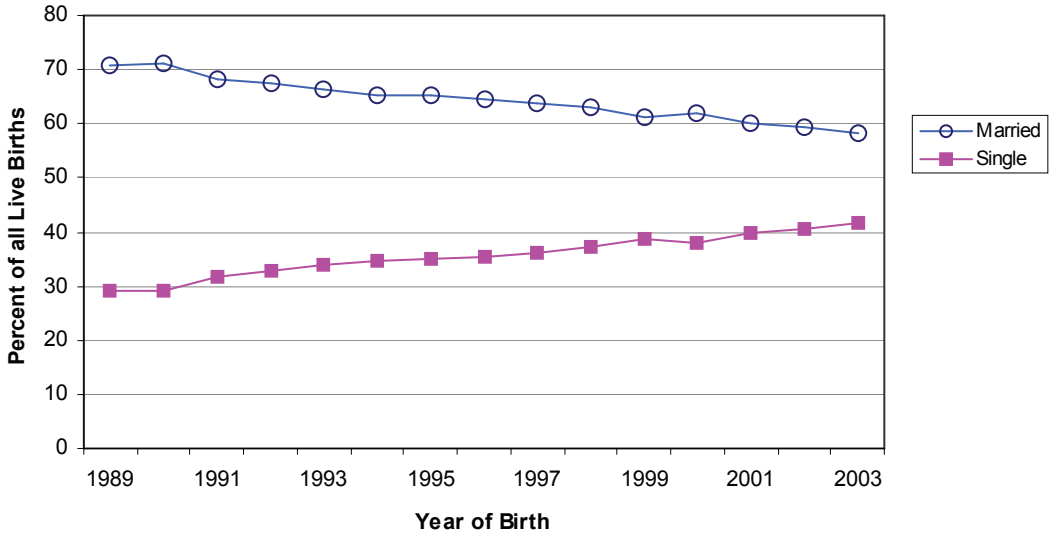
Percent of Births by Race, Hispanic Origin, Marital Status, and Medicaid as Primary Source of Payment
Delaware, 2003



*Hispanic may be of any race.

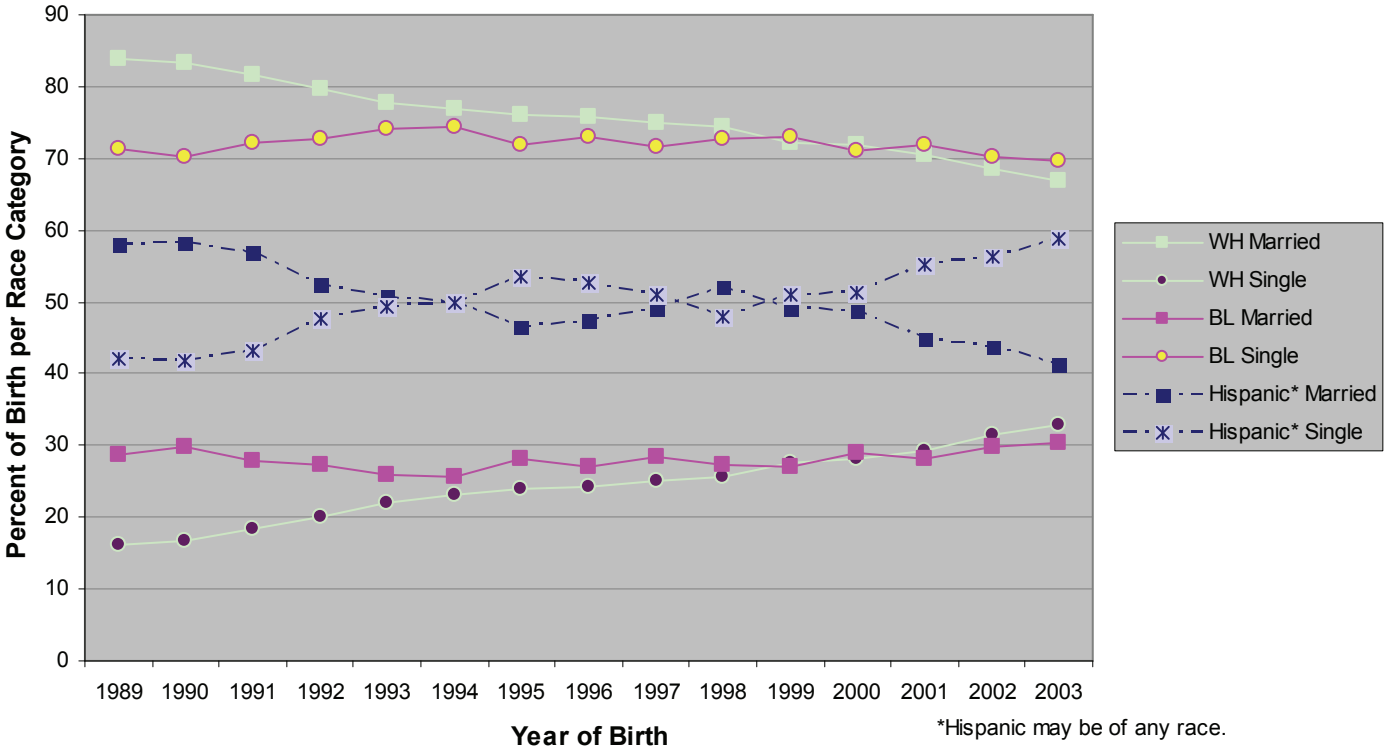
The percent of births to unmarried women rose again in 2003, to 41.8 percent of all births. The steadily increasing trend began in 1990, when 29 percent of all births were to unmarried women.

Annual Percent of Births by Mother's Marital Status
Delaware, 1989-2003



However, this shift in the distribution of mother's marital status is only apparent in births to white and Hispanic women, whose percentage of births to unmarried women increased from 16 percent to 33 percent , and 42 percent to 59 percent from 1989 to 2003. During this same time period, the percent of births to unmarried black women has remained the same, at about 70 percent of all black births.

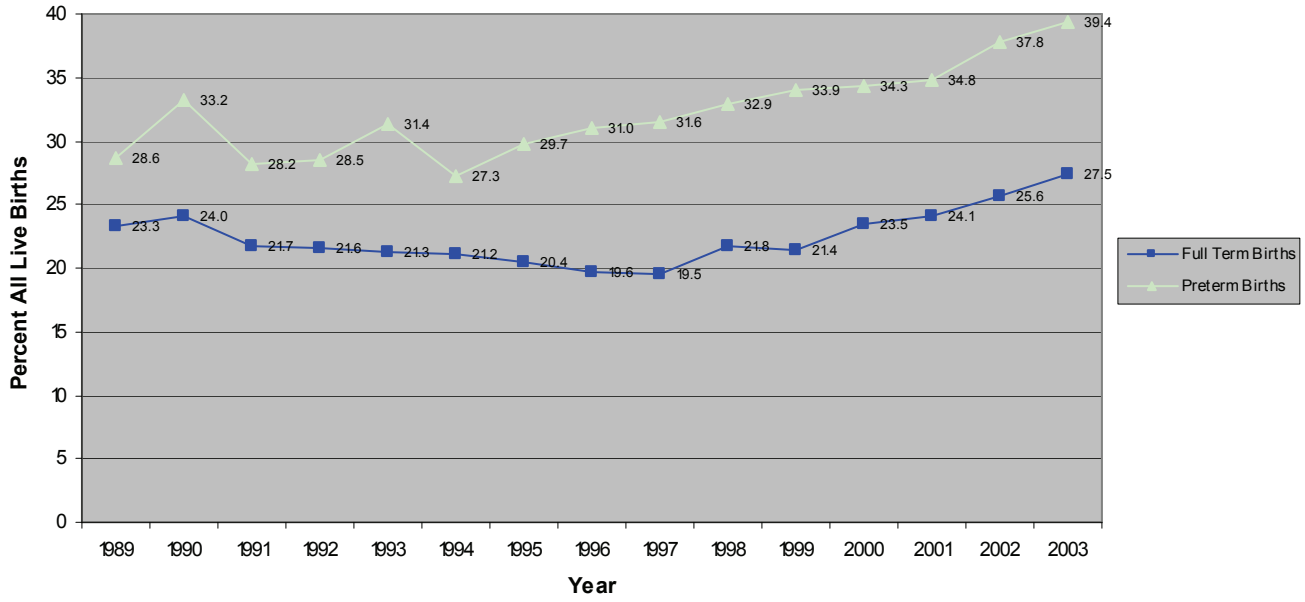
Percent of Live Births by Mother's Race, Ethnicity, and Marital Status
Delaware, 1989-2003



*Hispanic may be of any race.

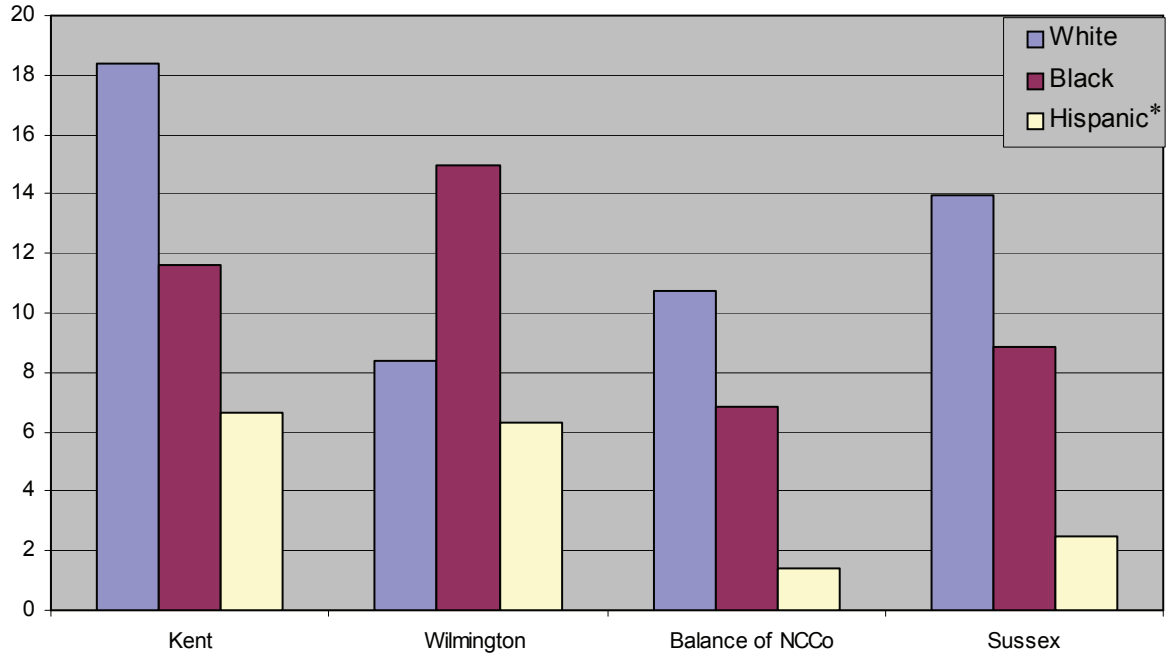
The percentage of cesarean deliveries continued its upward trend by increasing from 27.3 in 2002 to 29.1 in 2003. While this was evident in deliveries of both preterm (<37 weeks gestation) and full term (37+ weeks gestation) infants, preterm infants were significantly more likely to be delivered by c-section than full term infants.

Annual Percent of Cesarean Deliveries by Gestational Category
Delaware, 1989-2003



In 2003, the percentage of Delaware mothers who used tobacco while pregnant decreased from 12.8 to 11.3 , with the highest percentage in Kent County (16.1). White Delaware mothers were more likely to smoke while pregnant (12.6 percent) than Black mothers (10.2 percent), with Kent county having the highest percentage of white mothers who smoked (18.4). The one exception to this racial trend was Wilmington, where more Black mothers smoked (15 percent) than white mothers (8.4 percent).

Percent of Mothers who Smoked while Pregnant by Race and Hispanic Status
Delaware Counties and City of Wilmington, 2003

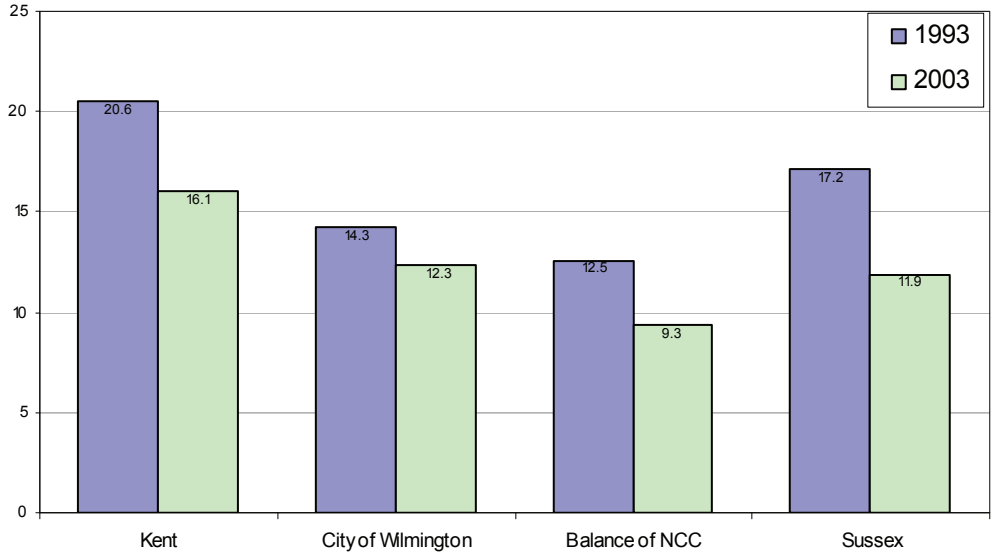


*Hispanic may of any race.

Though the percent of Delaware mothers who smoked while pregnant continued to decline, it remains higher than the percent of U.S. women who smoked while pregnant.

From 1993 to 2003, Sussex County experienced the largest decrease in the percent of women who smoked while pregnant.

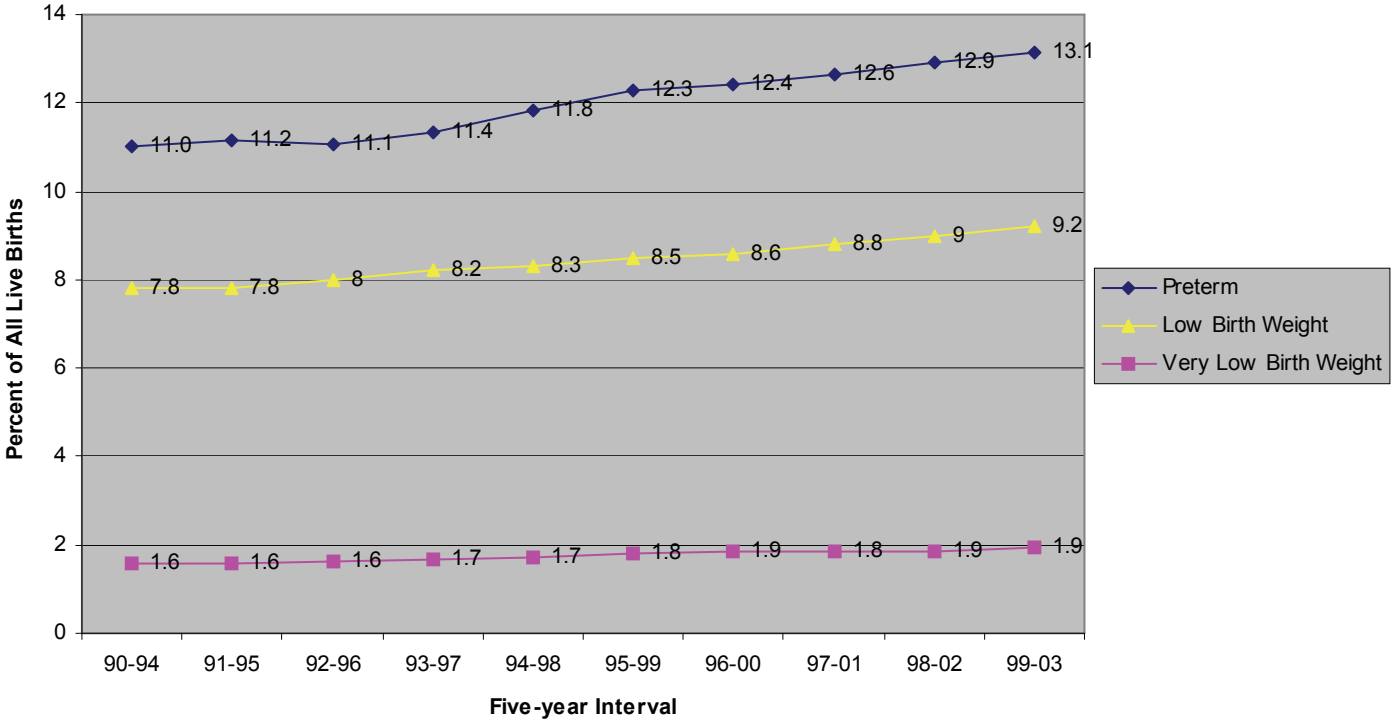
Percent of Mothers who Smoked while Pregnant
Delaware Counties and City of Wilmington, 1993 and 2003



15.1 percent of Delaware women who smoked while pregnant gave birth to low birth weight babies (< 2500 grams), versus the significantly lower percentage (8.7) of non-smokers who gave birth to low birth weight babies.

Since 1993-1997, the five-year percentages of both preterm and low birth weight births have increased 14.9 percent and 12.2 percent respectively.

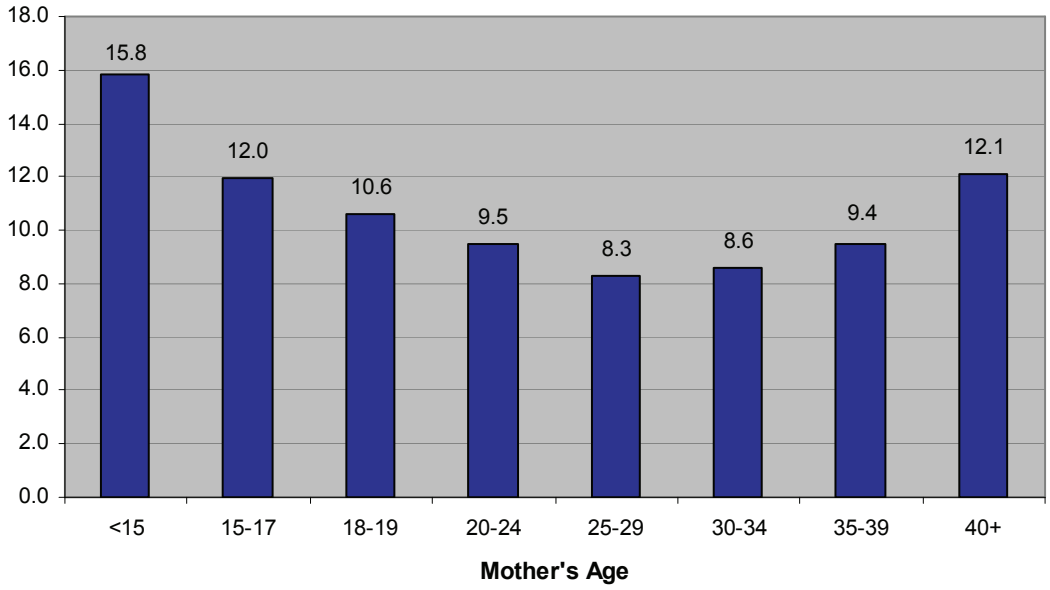
Five-year Average Percentage of Preterm and Low Birth Weight Births
Delaware, 1990-2003



The five-year average percentage of low birth weight births (LBW) continued its upward trend during the last four time periods; very low birth weight (VLBW) births have remained relatively stable. Percentages of LBW births were greatest for the under 15 and 40 plus age groups.

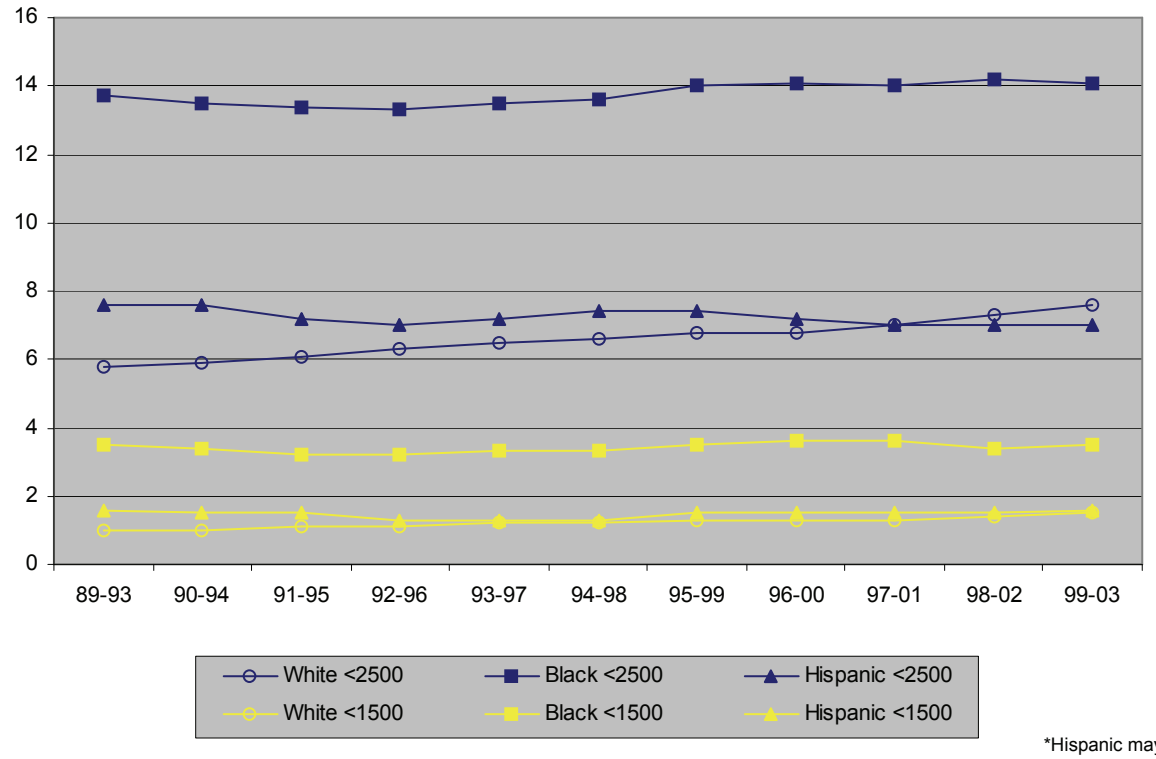
With the exception of mothers under 15, black mothers of every age group had higher percentages of LBW births than white or Hispanic mothers.

Five-year Percent of Live Births Born Under 2500 Grams by Mother's Age
Delaware, 1999-2003



Among mothers of all ages, black mothers had the highest percentage of LBW and VLBW births, at 14.1 percent and 3.5 percent respectively.

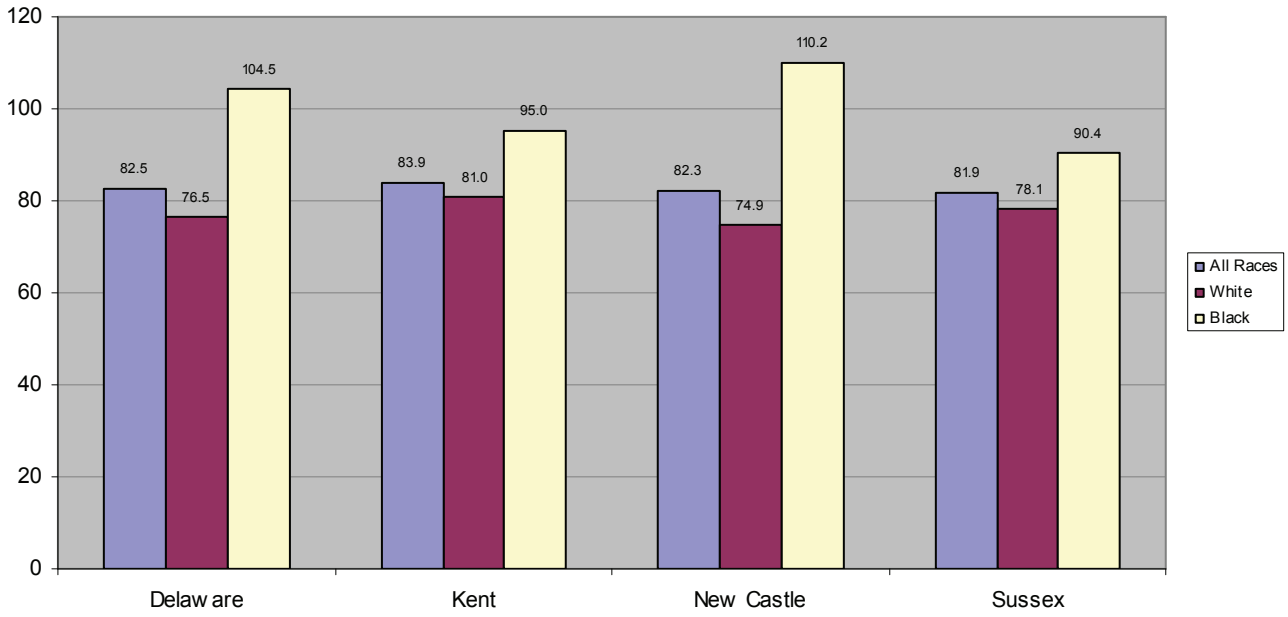
Five-year Average Percent of Low (<2500 grams) and Very Low Birth Weight Births
(<1500 grams) by Race and Hispanic Origin*
Delaware, 1989-2003



*Hispanic may be of any race.

At 82.5 reported pregnancies per 1,000 women ages 15–44, the 1999-2003 rate of reported pregnancies changed very little from 1998-2002. Although pregnancy rates of black mothers were significantly higher than those of white mothers in every county, New Castle County's difference between white (74.9) and black (110.2) was the largest among all the counties.

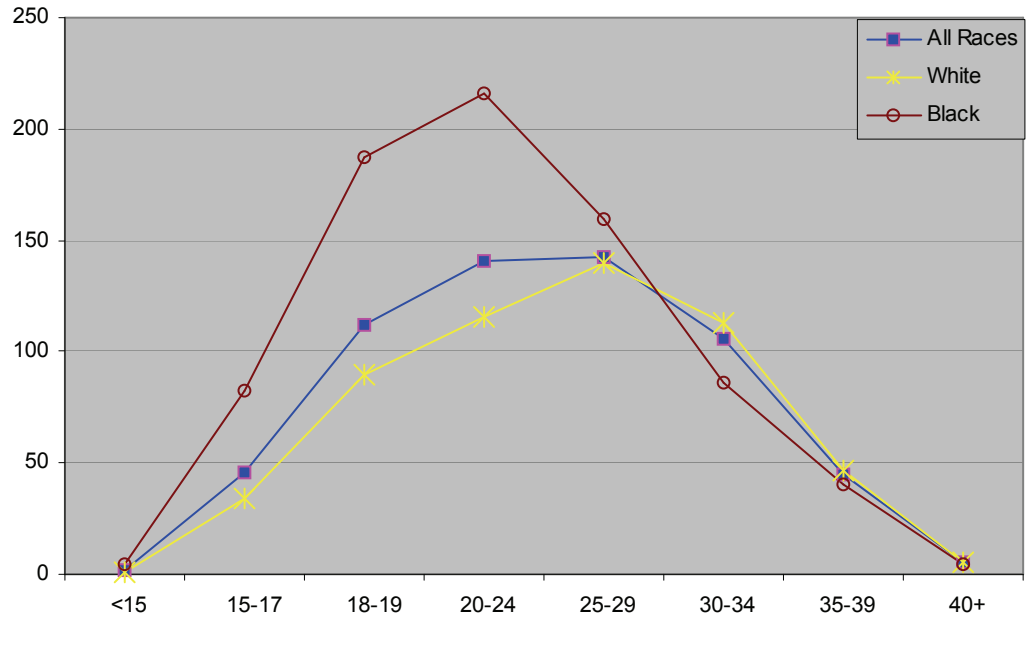
Five-year Average Rate of Reported Pregnancies by Race
Delaware and Counties, 1999-2003



In a change from the last five-year period, the highest rate of reported pregnancies for all races shifted from the 20-24 age group to the 25-29 age group.

Black women under 30 had higher pregnancy rates than white women of the same age group; from age 30 and up, white women had higher pregnancy rates.

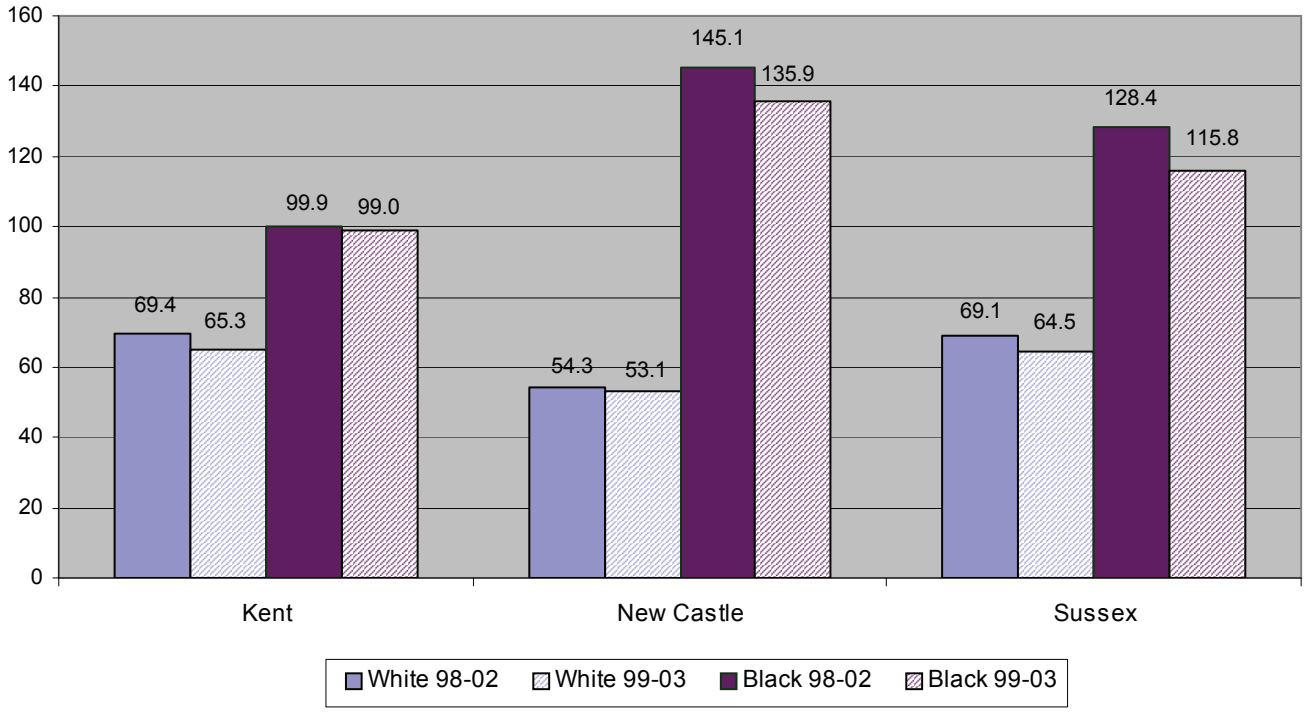
Five-year Average Rate of Reported Pregnancies by Age and Race of Woman
Delaware, 1999-2003



REPORTED PREGNANCIES

From 1998-2002 to 1999-2003, teen (15-19) pregnancy rates for each race and county group declined, ranging from a decrease of .9 percent (for black women in Kent county) to 9.8 percent (for black women in Sussex county).

Five-year Average Teenage (15-19) Pregnancy Rates by County and Race
Delaware, 1998-2003

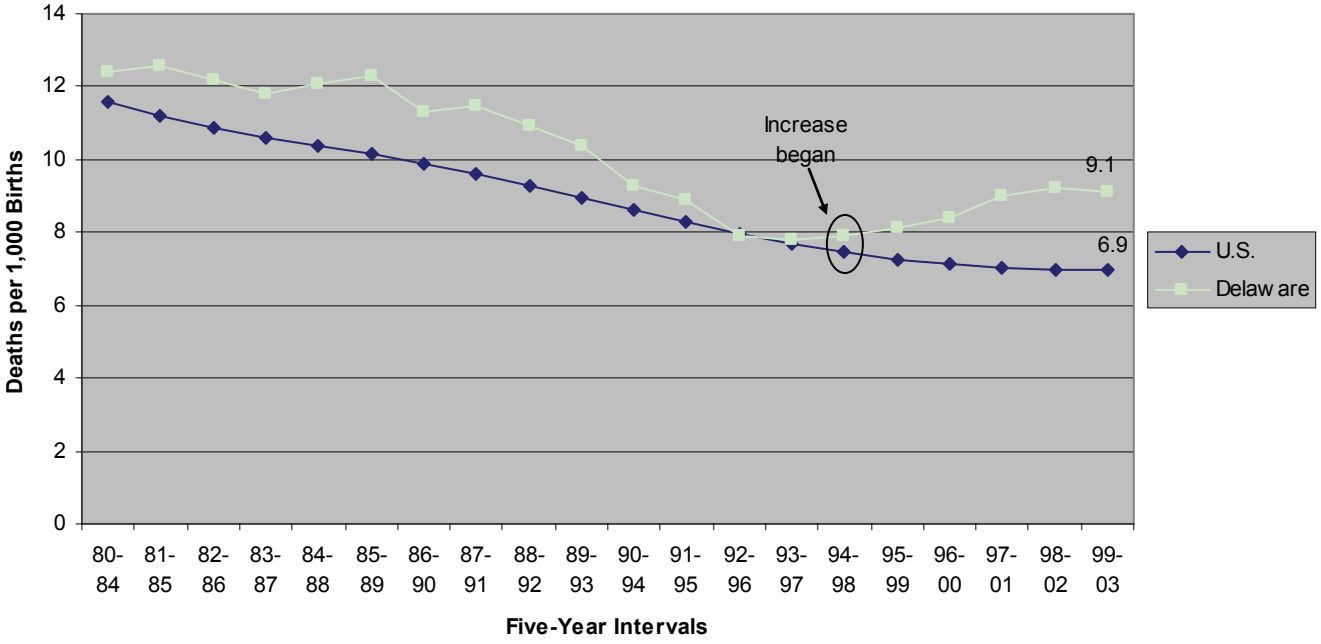


- In 2003, there were 4176 abortions performed in Delaware, 3123 to Delaware residents and 1053 to non-residents.
- Over half of all pregnancies to females under 15 ended in termination.
- 37.5 percent of pregnancies to white mothers under 15, and 64.5 percent of pregnancies to black mothers under 15 ended in terminations.
- 4.7 percent of pregnancies to white married women ended in termination and 13.6 percent of pregnancies to black married women ended in termination. When the mothers were unmarried, these numbers increased to 33.2 and 37.6 percent respectively.
- There were 65 fetal deaths of Delaware residents in 2003.
- There were 11,037 live births to Delaware residents in 2003.

INFANT MORTALITY

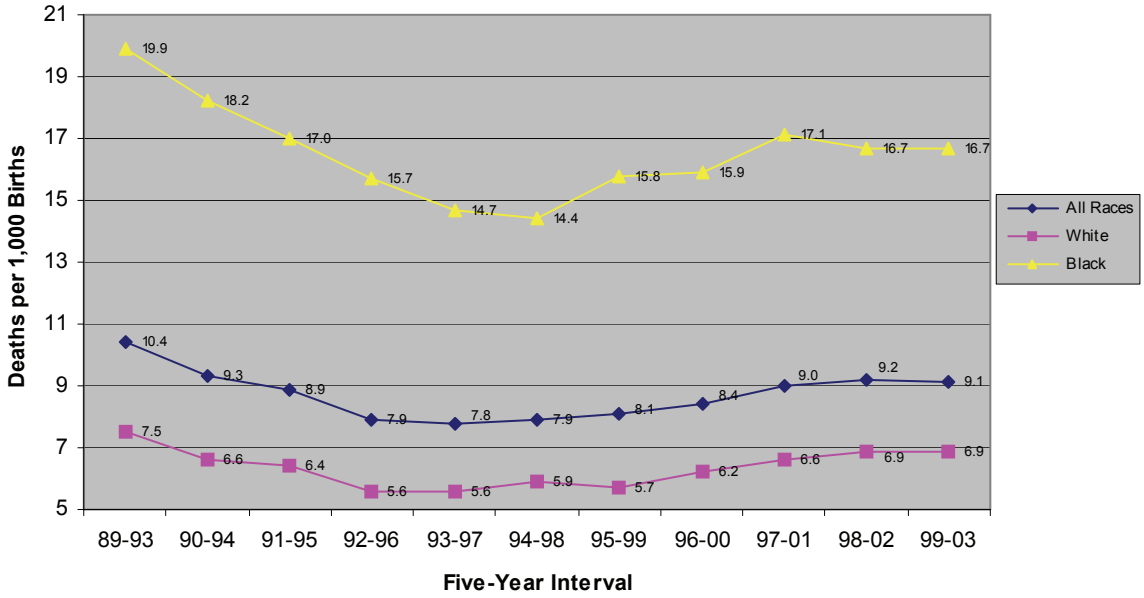
Although Delaware's infant mortality rate (IMR) was significantly higher than national rate throughout most of the 1980s, Delaware followed the nation's downward trend to a point where the U.S. and Delaware rates were very similar. The 1994-1998 time period signaled a reversal of this trend and Delaware's rates have risen almost every five-year interval since then, with the most recent period, 1999-2003, showing a rate of 9.1 infant deaths per 1,000 births, significantly higher than the U.S. rate.

Five-year Average Infant Mortality Rates
Delaware and U.S., 1980-2003



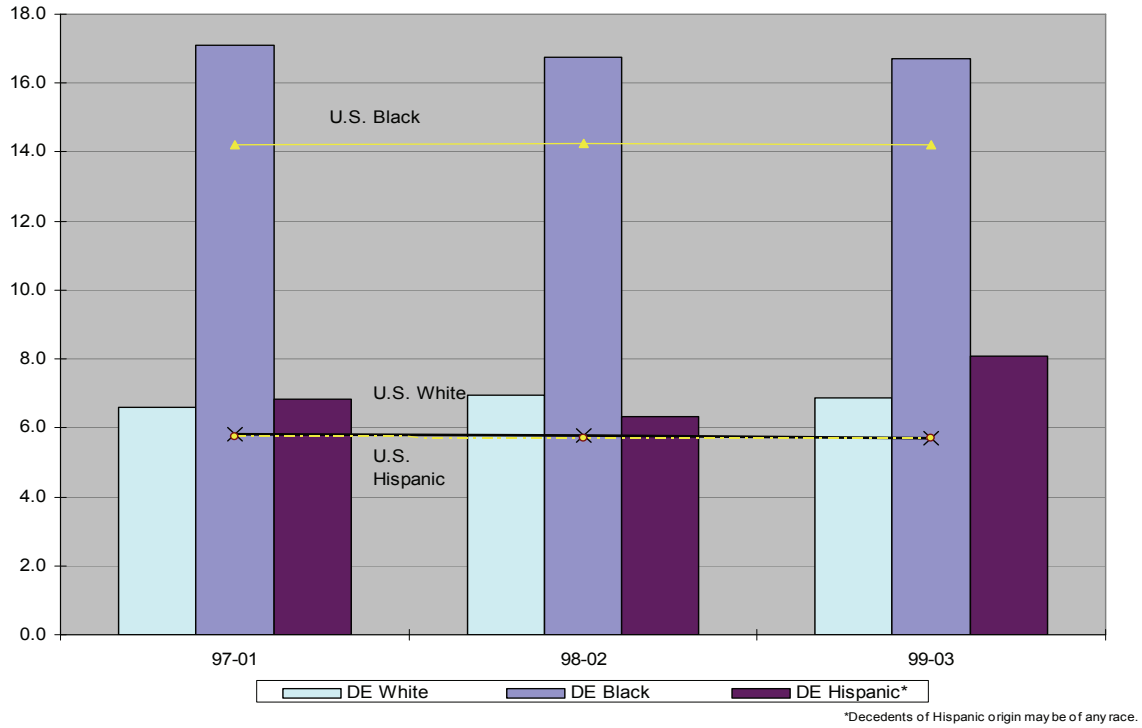
Five-year Average Infant Mortality Rates by Race
Delaware, 1989-2003

Although the number of infant deaths was slightly higher in 2003, the 5-yr infant mortality rates (IMR) for 1999-2003 remained fairly stable.



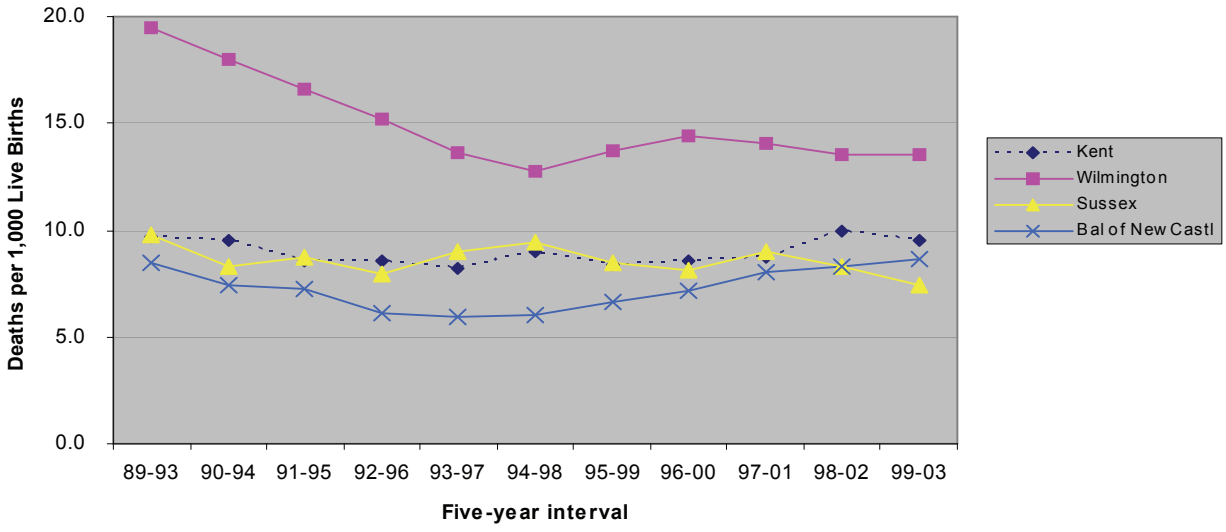
In the 1999-2003 time period, the black infant mortality rate (16.7) was more than double the white (6.9) and Hispanic (8.1) infant mortality rates. U.S. infant mortality rates demonstrate similar racial disparities between black and white infants, though Delaware has significantly higher rates for each racial and ethnic group.

Five-year Average Infant Mortality Rates by Race and Hispanic Origin
Delaware, 1997-2003



Sussex County's IMR decreased for the second five year period in a row, and remained the county with the lowest IMR (7.4) for 1999-2003. Kent County's IMR decreased to 9.5 New Castle County's IMR continued its increase, and rose to 9.5, driven by rising rates in the portion of the county outside Wilmington.

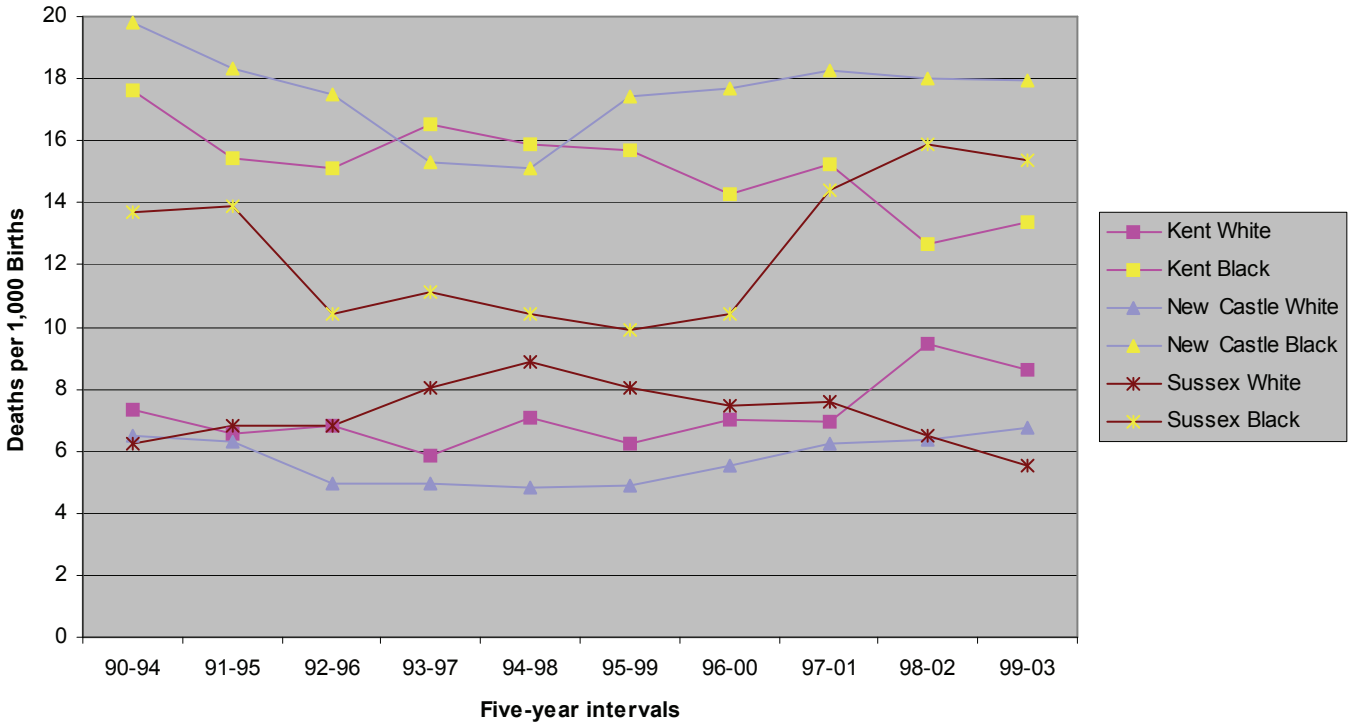
Five-year Average Infant Mortality Rates by County and City of Wilmington
Delaware, 1989-2003



INFANT MORTALITY

The graph below shows that New Castle County's overall rate increased due to a 4.6 percent increase in the white IMR, not the black IMR, which remained the same from 1998-2002 to 1999-2003. Kent County's white rate decreased while the black rate increased during the same period. Sussex county experienced declines in both black and white IMRs from 1998-2002 to 1999-2003.

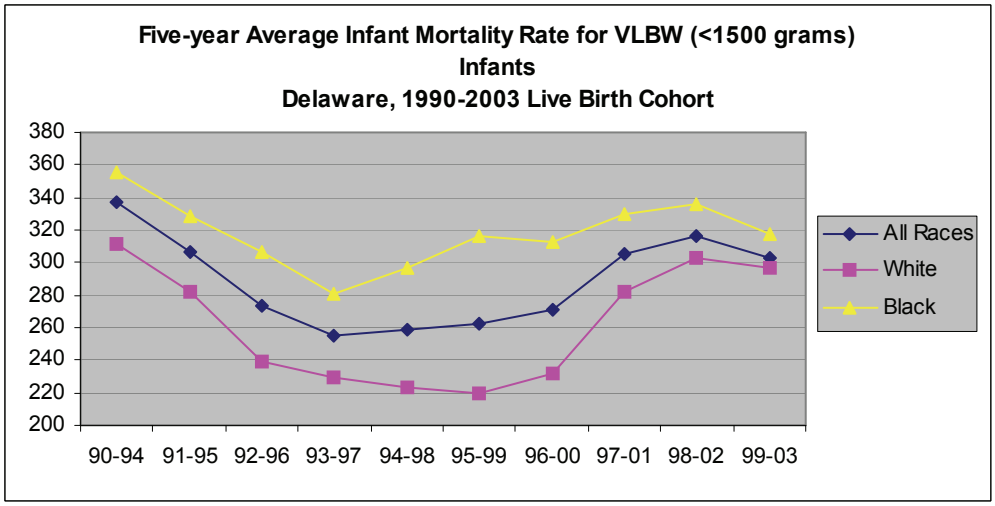
Five-year Average Infant Mortality Rates by County and Race
Delaware Counties, 1990-2003

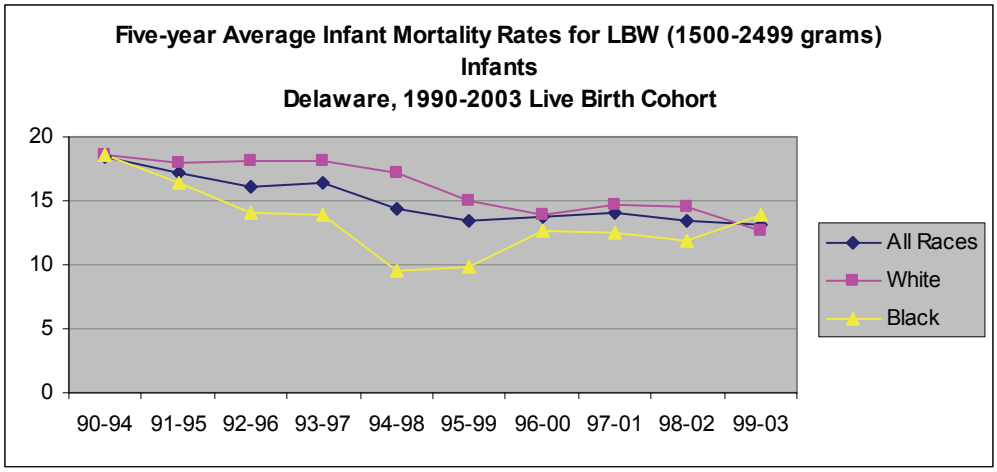


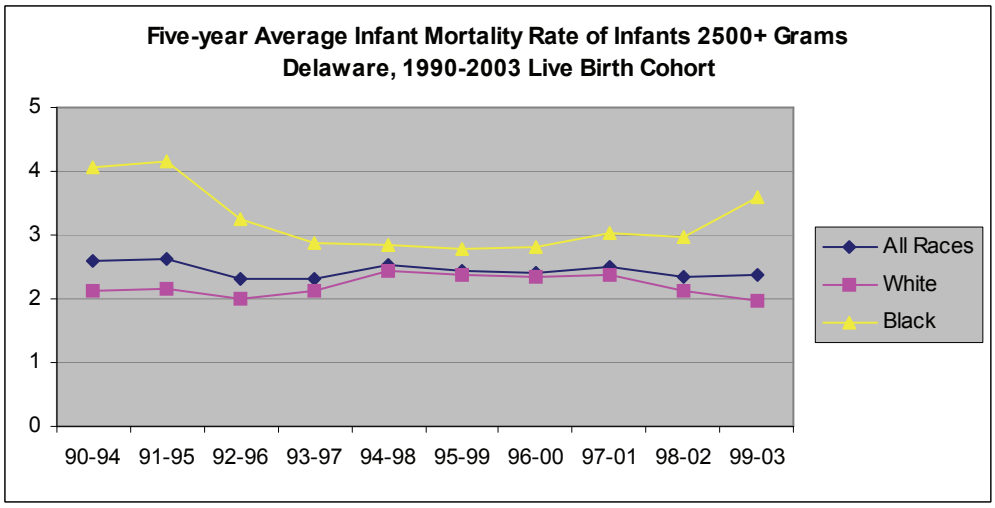
The rise in infant mortality rates is greatly impacted by the infant mortality rate of very low birth weight (<1500 grams) infants. These same infants have IMRs roughly 23 times that of moderately low birth weight infants (1500-2499), and approximately 126 times that of normal birthweight infants.

While the IMRs of very low birth weight (<1500 grams) infants has risen 19 percent since 93-97, the IMR of moderately low birth weight babies (1500-2499 grams) has declined 20 percent, and the IMR of babies 2500+ grams has increased by 3 percent since 1993-1997.

Most recently, black infant mortality rates for infants 1500+ (both 1500-2499 and 2500+ gram birthweight categories) increased from 1998-2002 to 1999-2003 while white IMRs for the same birthweight categories decreased.





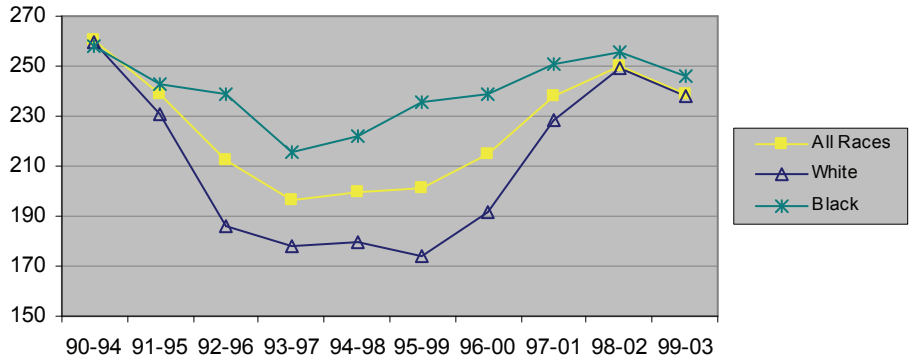


Like birthweight, an infant's gestational age is also considered one of the most important predictors of infant health and mortality risk. Infants born too small or too early have a much greater risk of mortality than those who reach a normal weight (2500+ grams) or full-term gestation (37+ weeks).

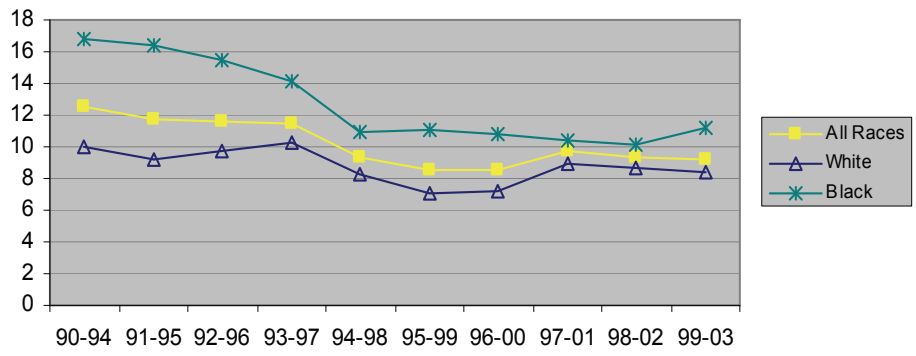
IMRs for full-term (37+ weeks gestation) births to all races remained stable from 1998-2002 to 1999-2003. Though white IMRs of full- term infants continued to decline, black IMRs of full- term infants increased in 1999-2003. Black moderately preterm IMRs also increased as white IMRs decreased. These trends mirror those shown on the previous page.

For the first time since 1995-1999, infant mortality rates for very premature infants declined for both black and white infants.

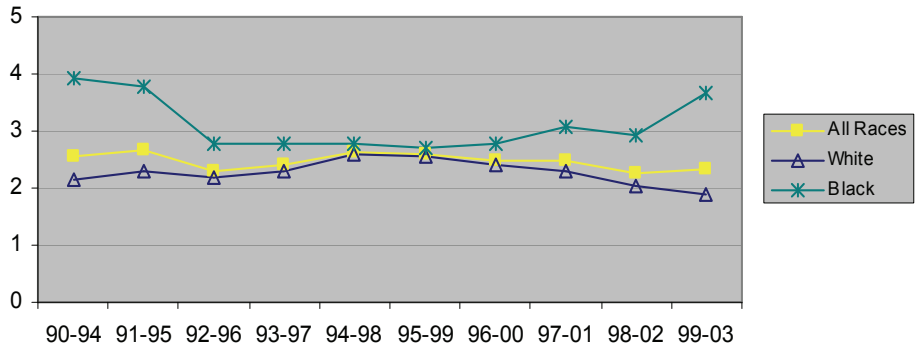
Five-year Average Infant Mortality Rates for Very Premature (<32 wks gestation) Infants by Race Delaware, 1990-2003 Live Birth Cohort



Five-year Average Infant Mortality Rates for Moderately Premature (32-36 wks gestation) Infants by Race Delaware, 1990-2003 Live Birth Cohort

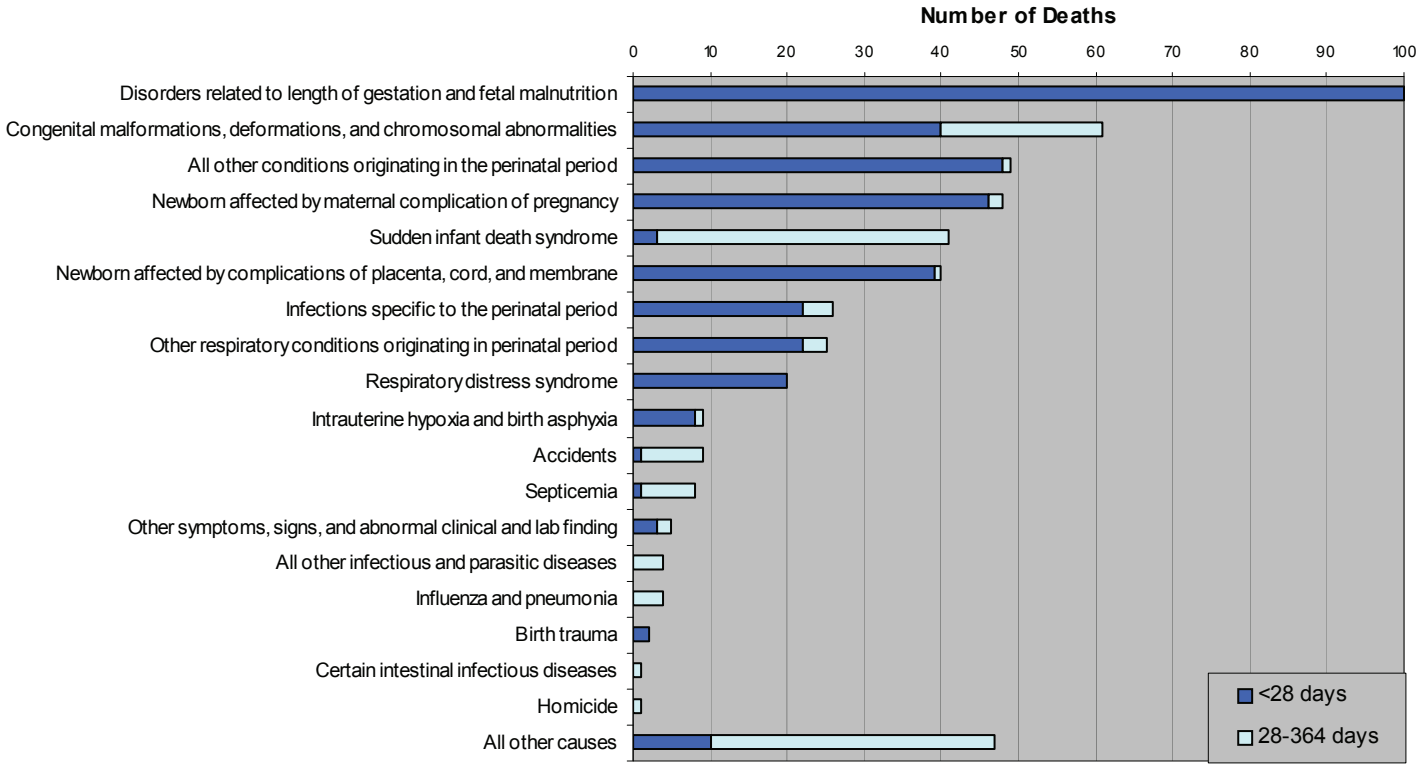


Five-year Average Infant Mortality Rates of Full-Term Infants (37+ wks gestation) by Race Delaware, 1990-2003 Live Birth Cohort



Approximately 95 percent of all infant deaths occur within the first six months of life, and 70 percent of all infant deaths occur within the first 28 days of life. The graph below displays the classification of deaths by specific cause and the infant's age classification at death, neonatal (<28 days) or postneonatal (28-364 days).

Leading Causes of Infant Death
Delaware, 1999-2003



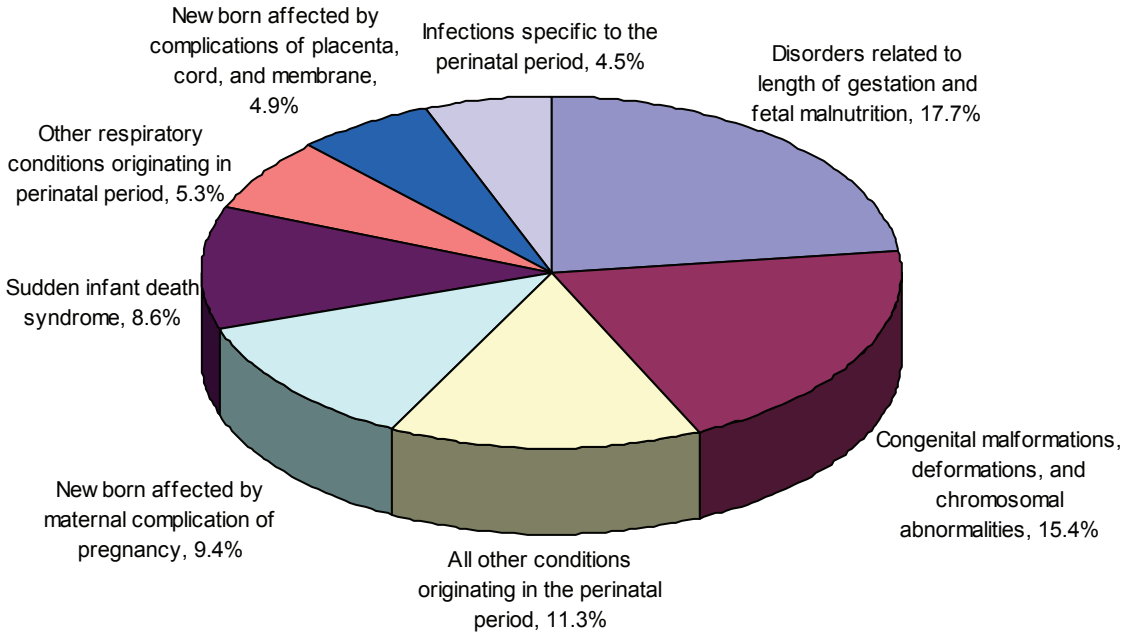
- Disorders related to length of gestation and fetal malnutrition accounted for the greatest number of infant deaths in 1999-2003; all of these deaths occurred in the neonatal period.
- Sudden infant death syndrome (SIDS) is the only one out of the top five causes of death that has the majority of deaths occurring in the postneonatal period, with a mean age at death of 92 days.
    - 14.6 percent (6 out 41) of the SIDS deaths were associated with co-sleeping with adults and/or sleeping on soft surfaces, such as couches. During that same time period, there were 7 additional infant deaths, coded under a different cause of death, that were associated with co-sleeping and/or sleeping on a soft surface.

From 1999-2003 the three leading causes of infant death were

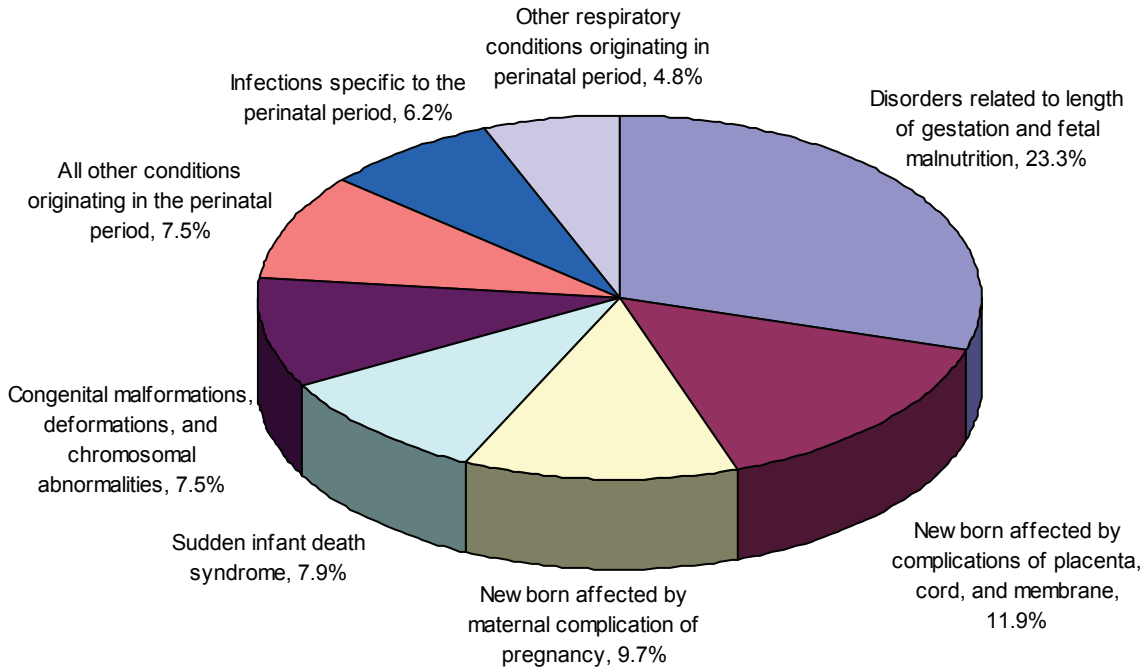
- disorders related to length of gestation and fetal malnutrition (20 percent of infant deaths),
- congenital anomalies (12 percent of infant deaths), and
- all other conditions originating in the perinatal period (10 percent of infant deaths).

While disorders related to length of gestation and fetal malnutrition was the top cause of death for both black and white infants, the number 2 and 3 spots varied by race, as shown in the pie charts below.

1999-2003 Leading Causes of White Infant Death



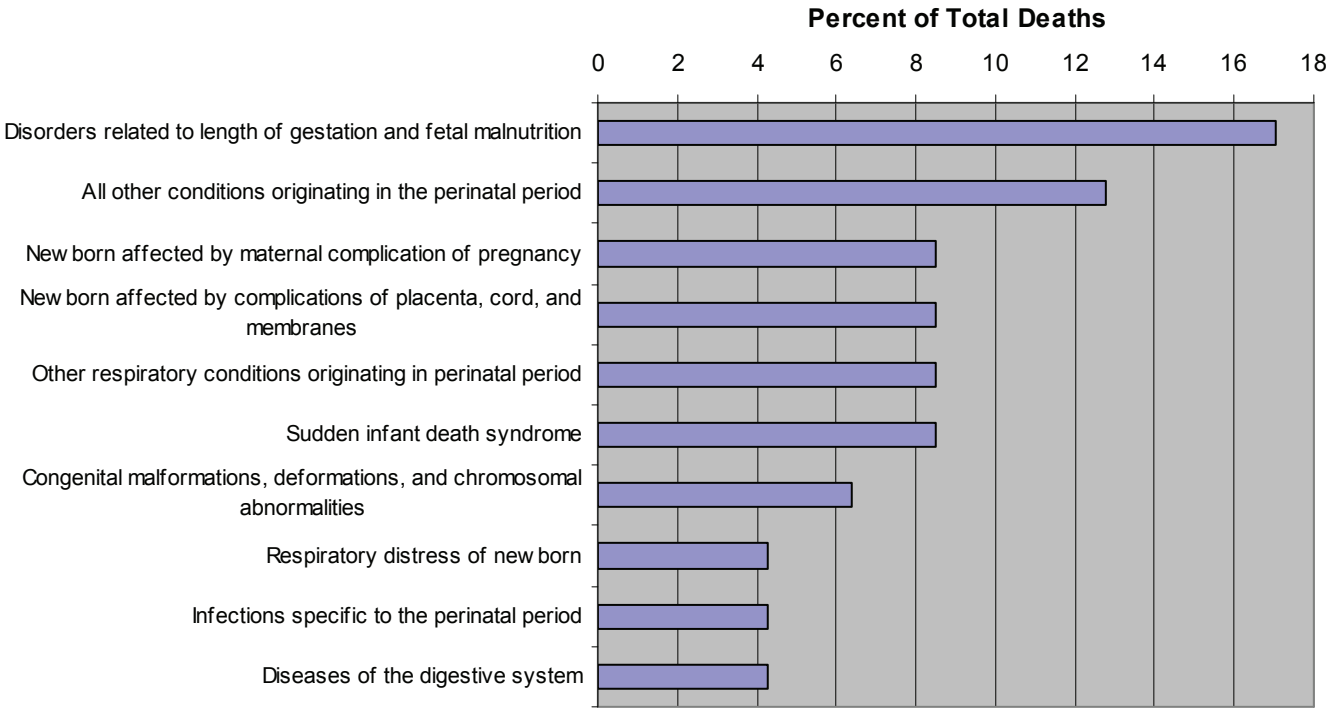
1999-2003 Leading Causes of Black Infant Death



Though Hispanics had historically accounted for only about 3 percent of all live births and infant deaths, the number of births to Hispanics mothers has been increasing. In the most recent five year period, 1999-2003, 10.3 percent of all live births were to Hispanic mothers, and 9.4 percent of all infant deaths were of Hispanic origin.

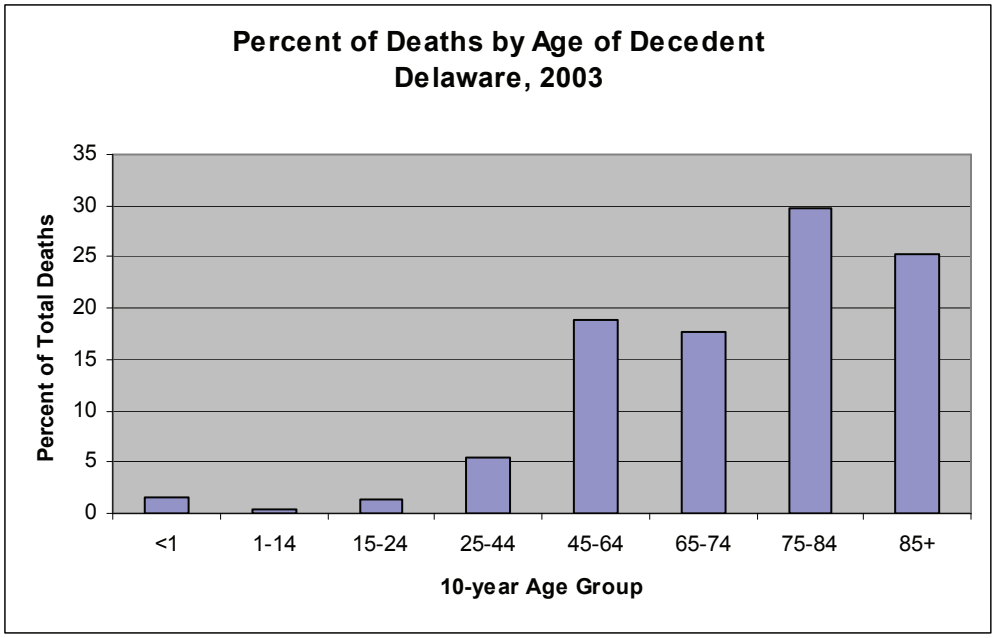
The leading cause of death for infants of Hispanic origin was Disorders related to length of gestation and fetal nutrition, followed by All other conditions originating in the perinatal period, which includes breech delivery complication, cardiac failure, bleeding, and digestive orders.

1999-2003 Leading Causes of Hispanic Infant Death



More Delaware residents died in 2003 than in 2002. A total of 7067 residents died, 107 of which were children under the age of 1. 50.4 percent of Delaware deaths were females and 49.6 percent were males. Heart disease and cancer continued to be the leading and second leading causes of death, accounting for 53 percent of all deaths in 2003.

- One quarter of the Delawareans who died in 2003 were 85 or older. Deaths to those 75 and older accounted for more than half of all Delaware deaths.

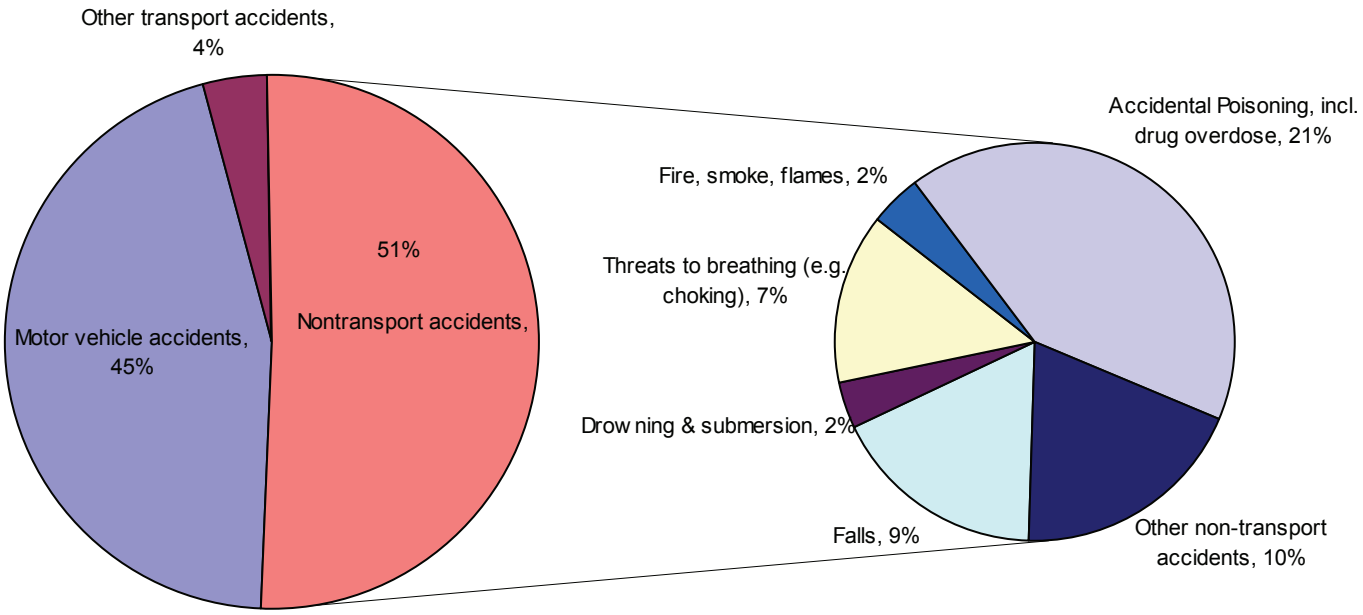


- A Delaware resident born in 2003 could expect to live an average of 76.9 years.
- Life expectancy at birth differs by race and sex; females have higher life expectancy (80.0) than males (74.5), and whites (78.1) have a higher life expectancy than blacks (72.6). As a result, white females have the highest life expectancy (80.7) and black males have the lowest (69.2).
- Cancer, heart disease, and accidents (unintentional injuries) accounted for 51 percent of the total years of potential life lost due to premature death (prior to age 75).
- In 2003, the ten leading causes of death for residents of all ages were almost identical to the top 10 in 2002, with the main difference being movement among the rankings.

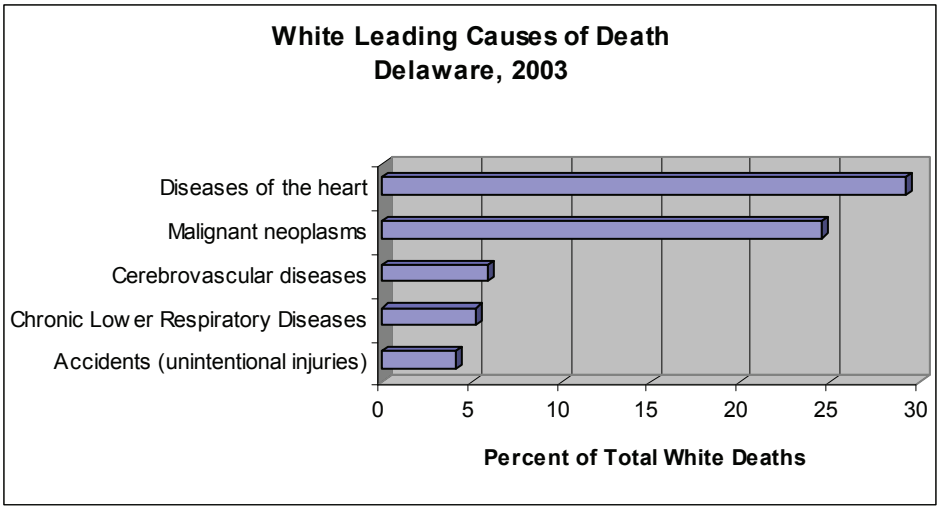
Rank	Leading Cause of Death	Deaths
1	Diseases of the heart	2027
2	Malignant neoplasms	1718
3	Cerebrovascular diseases	407
4	Chronic Lower Respiratory Diseases	339
5	Accidents (unintentional injuries)	287
6	Diabetes mellitus	239
7	Alzheimers Disease	147
8	Nephritis, nephrotic syndrome, and nephrosis	130
9	Septicemia	130
10	Influenza and pneumonia	126

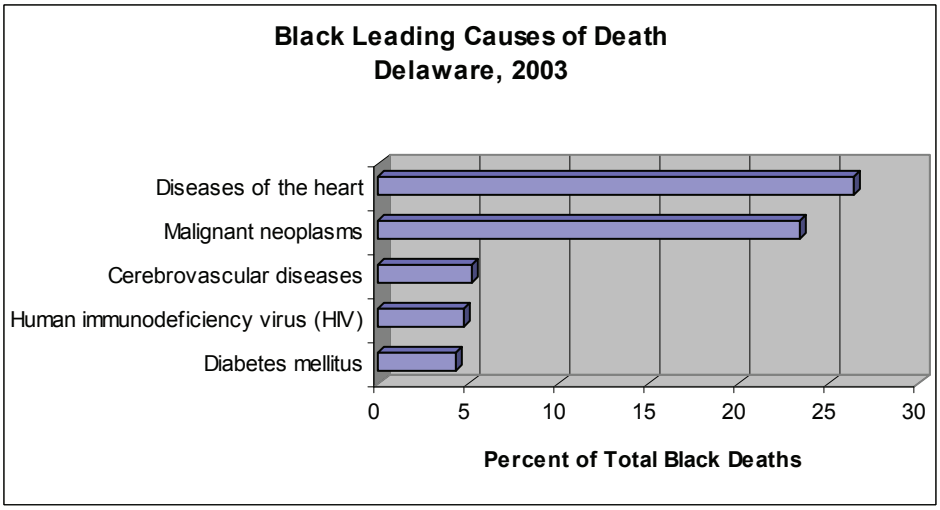
- There were 287 deaths due to accidents in 2003; 45 percent of which were due to motor vehicle accidents and 51 percent of which were due to nontransport accidents. Almost half of the 146 nontransport accidents were caused by unintentional poisonings, primarily drug overdoses and adverse reactions.

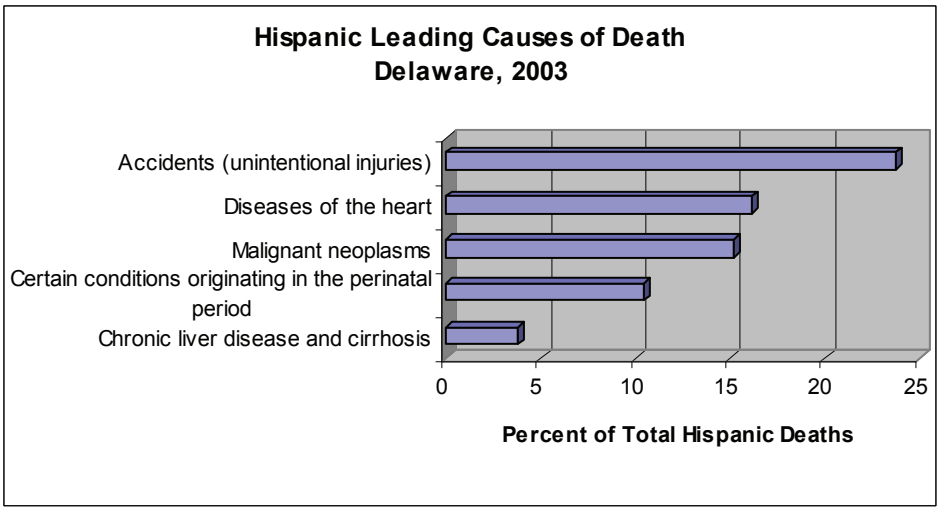
Accidental Causes of Death by Specific Category of Accident
Delaware, 2003



- The leading causes of death vary by race and ethnic group. The top five leading causes of death for white, black, and Hispanic Delawareans in 2003 are shown below.

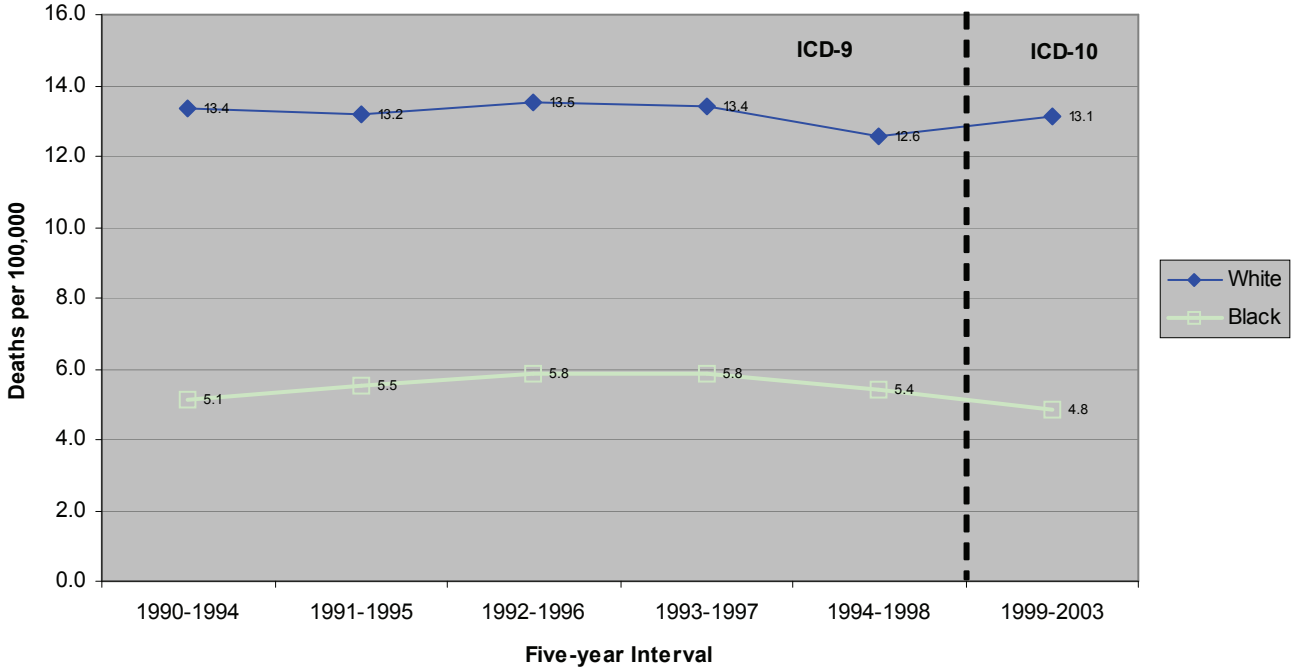




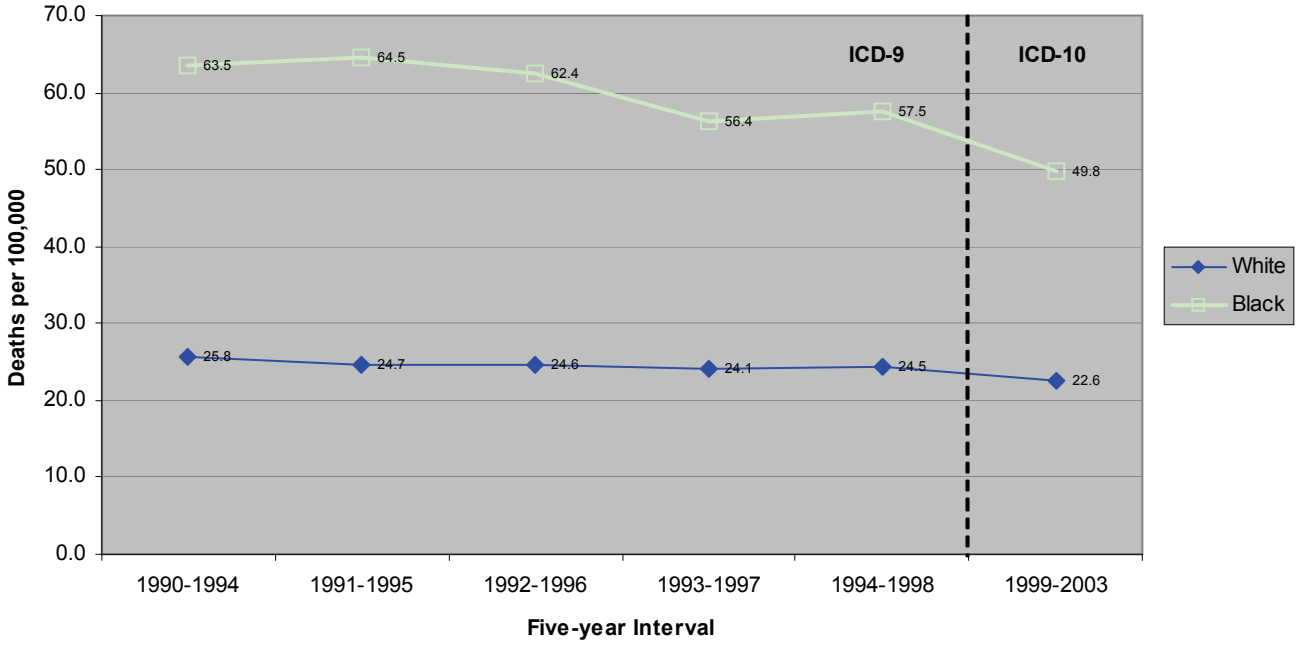


- Whites have suicide rates over 2 1/2 times that of blacks, while black mortality rates for diabetes, homicide, and HIV are 2, 4, and 13 times, respectively, that of whites.

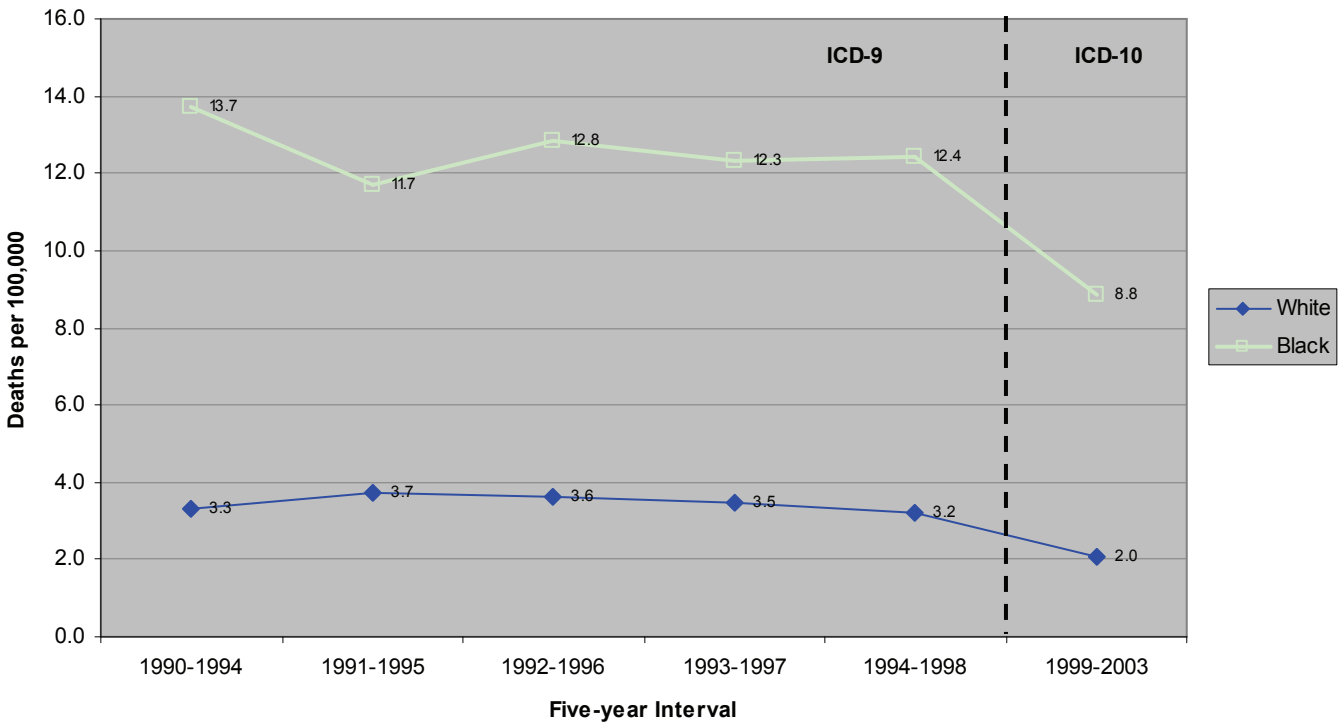
Five-year Age-Adjusted Suicide Mortality Rates by Race
Delaware, 1990-2003



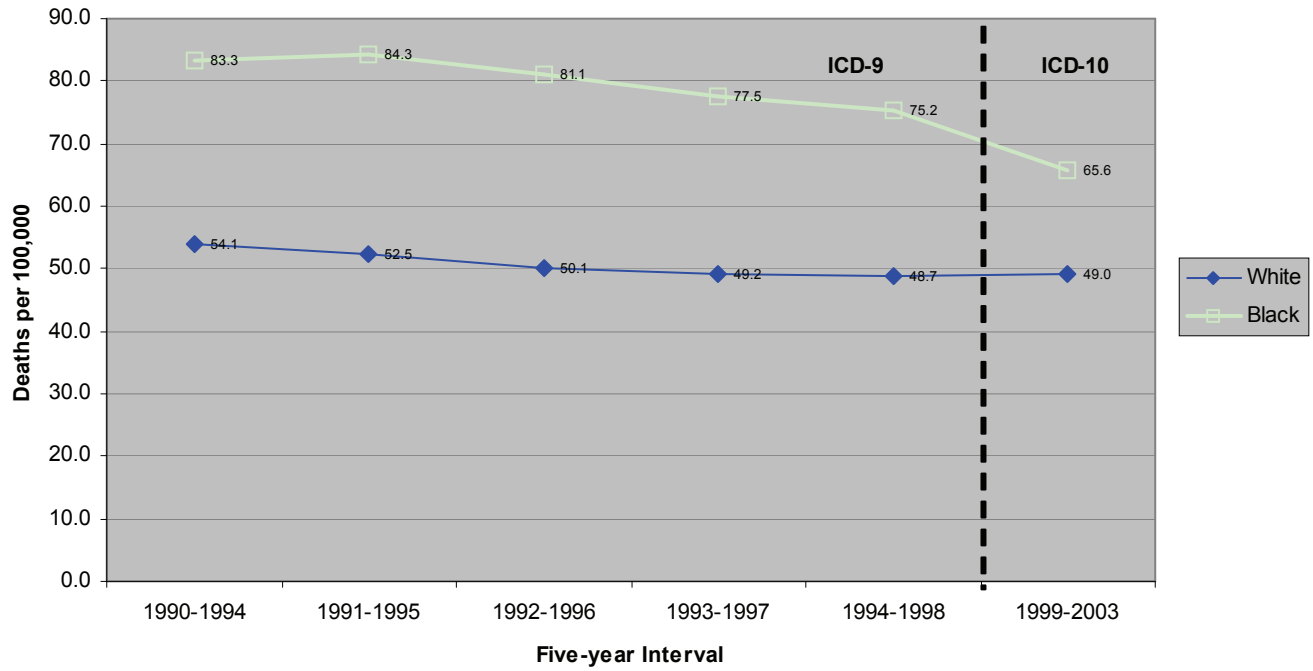
Five-year Age-Adjusted Diabetes Mortality Rates by Race
Delaware, 1990-2003



Five-year Age-Adjusted Homicide Mortality Rates by Race
Delaware, 1990-2003

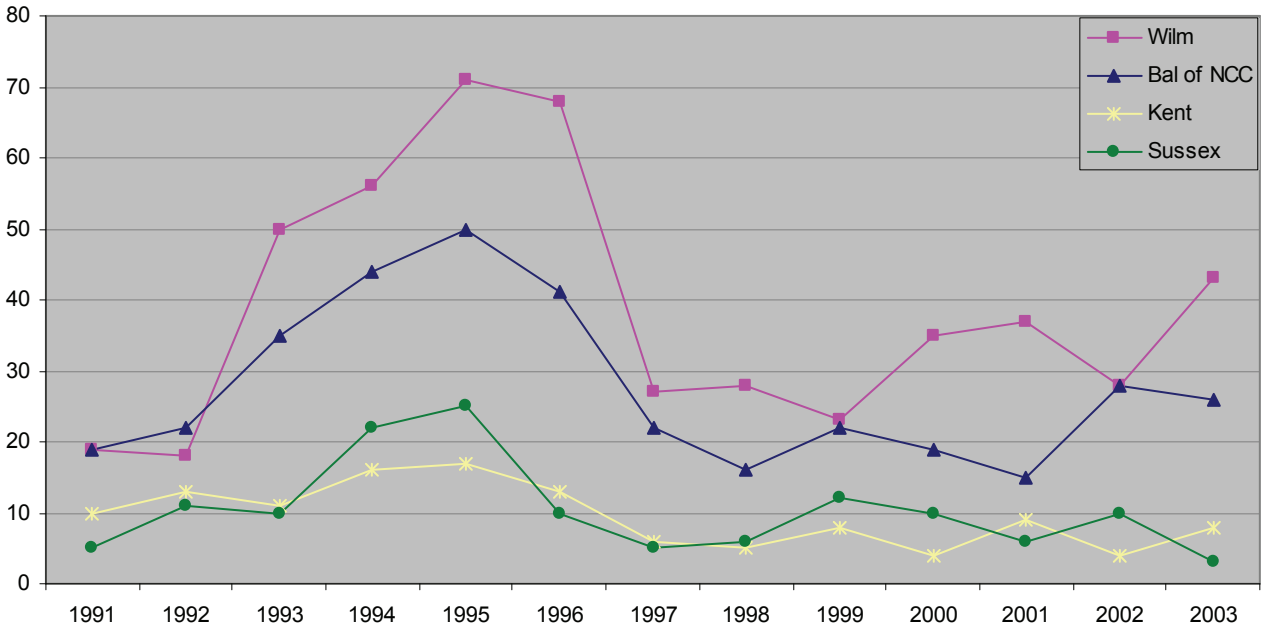


Five-year Age-Adjusted Stroke Mortality Rates by Race
Delaware, 1990-2003



No HIV deaths were identified in Delaware prior to 1986, at which time total deaths numbered less than five. In the early 1990's HIV mortality increased sharply to its 1995 peak.

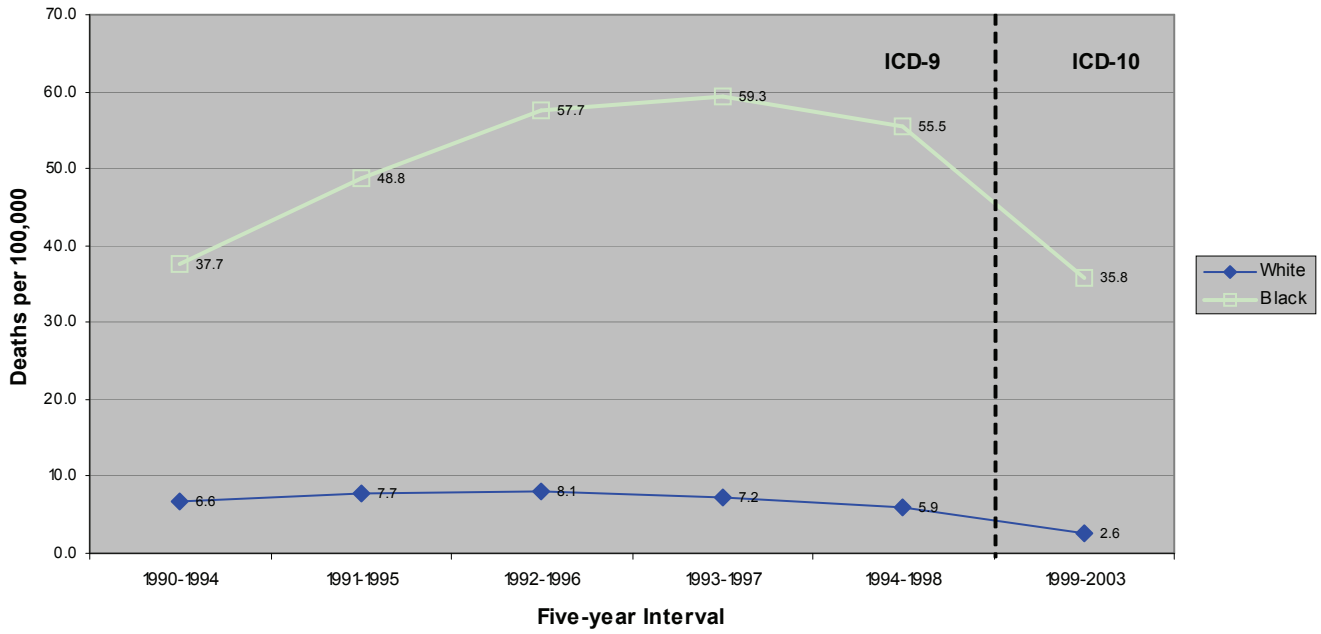
Delaware HIV Deaths, 1991-2003



Although the city of Wilmington represented 9.6 percent of Delaware's total population from 1993-2003, it accounted for 44.6 percent of Delaware's total HIV deaths that occurred during the same time.

HIV mortality rates varied greatly by geography and race; the five-year average mortality rates for 1999-2003 were highest for Wilmington residents (48.0) and Black Delawareans (35.8).

Five-year Age-Ajusted HIV Mortality Rates by Race
Delaware, 1990-2003



BASIC DEFINITIONS

The following definitions apply throughout this report:

AGE-ADJUSTED MORTALITY RATE (Direct Method) is a method used to eliminate differences caused by variations in age composition, to allow comparisons between populations and over time. More specifically, age-adjustment involves weighting age-specific death rates by standard population weights. The standard population used in this report is the 2000 U.S. population.

AGE-SPECIFIC FERTILITY RATE is the number of resident live births to women in a specific age group (e.g., 20-24 years) per 1,000 women in the same age group.

BIRTH COHORT consists of all children born during a specific period of time.

BIRTH WEIGHT is the first weight of the fetus or newborn obtained after birth. This weight should be measured within the first hour of life before significant postnatal weight loss has occurred.

CAUSE OF DEATH refers to deaths classified by cause according to the International Classification of Diseases, Ninth & Tenth Revisions, of the World Health Organization.

DEATH is the permanent disappearance of any evidence of life at any time after live birth.

DIVORCE is the final legal dissolution of a marriage.

EDUCATION is the highest level of formal education completed.

FETAL DEATH is a death prior to the complete expulsion or extraction from the mother of a product of conception, which weighs at least 350 grams or if weight is unknown, reached at least 20 weeks of gestation; the death is indicated by the fact that, after such expulsion or extraction, the fetus does not breathe or show any other evidence of life, such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles. Heartbeats are to be distinguished from transient cardiac contractions; respirations are to be distinguished from fleeting respiratory efforts or gasps.

FIVE-YEAR AVERAGE RATE is the number of vital events (births, infant deaths, etc.) that took place during a particular five-year period per 1,000 or 100,000 population (or other appropriate denominator).

INTERNATIONAL CLASSIFICATION OF DISEASES, TENTH REVISION (ICD-10) is an internationally recognized system of processing, classifying, and presenting mortality statistics, implemented in 1999 (see Appendix D for cause of death codes and categories).

INDUCED TERMINATION OF PREGNANCY (ITOP) means the purposeful interruption of an intrauterine pregnancy with the intention other than to produce a live-born infant, and which does not result in a live birth. This definition excludes management of prolonged retention of products of conception following fetal death.

INFANT DEATH is the death of a live-born infant occurring during the first year of life.

INFANT MORTALITY RATE measures the risk of death during the first year of life. It relates the number of deaths under one year of age to the number of live births during the same time period. It is expressed as the number of infant deaths per 1,000 live births. Since it is not dependent on a population census or estimate, it can be computed for any area and time period for which the numbers of infant deaths and live births are available.

LIVE BIRTH is the complete expulsion or extraction from the mother of a product of human conception, irrespective of the duration of pregnancy, which, after such expulsion or extraction, breathes or shows any other evidence of life, such as beating of the heart, pulsation of the umbilical cord, or definite movement of the voluntary muscles whether or not the umbilical cord has been cut or the placenta is attached. Heartbeats are to be distinguished from transient cardiac contractions; respirations are to be distinguished from fleeting respiratory efforts or gasps.

LOW BIRTH WEIGHT BIRTH refers to a newborn weighing less than 2,500 grams (5 pounds, 8 ounces).

MARRIAGE is the legal union of persons of opposite sex.

MEAN is commonly used to describe the average score in a large data set. The mean is obtained by summing the scores in a data set and dividing the result by the total number of scores.

NEONATAL DEATH is the death of a live-born infant before the infant becomes 28 days old (up to and including 27 days, 23 hours, 59 minutes from the moment of birth).

NEONATAL MORTALITY RATE measures the risk of death before reaching 28 days of life. This rate relates the number of deaths to infants less than 28 days of age to the total number of live births. It is expressed as the number of neonatal deaths per 1,000 live births.

OCCURRENCE DATA refer to vital events reported by the place where the event actually occurred. When occurrence data are reported for Delaware, the numbers include only those events that took place in Delaware, regardless of the place of residence of the individuals involved. Marriages, divorces, and annulments are reported as occurrence data.

PLURALITY represents the number of siblings born as the result of a single pregnancy.

POSTNEONATAL DEATH is the death of a live-born infant of 28 days to 364 days of age.

POSTNEONATAL MORTALITY RATE measures the risk of death during the period from 28 to 364 days of age. It is expressed as the number of postneonatal deaths per 1,000 live births.

REPORTED PREGNANCY is a live birth, fetal death, or induced termination of pregnancy reported via the vital statistics system.

REPORTED PREGNANCY RATE is the total reported pregnancies (live births, fetal deaths, and induced terminations of pregnancy) per 1,000 women in a particular age group.

RESIDENCE DATA refer to vital events reported by the usual place of residence for the persons to whom the events took place. When residence data are reported for Delaware, the numbers include events taking place to Delaware residents in and outside of Delaware. For births and fetal deaths, residence is defined as the mother's usual place of residence. For deaths, residence is defined as the decedent's usual place of residence. Unless otherwise noted, the numbers in all tables and figures provided in this report are residence data.

TEENAGE BIRTH RATE is the number of resident live births to women 15-19 years of age per 1,000 women 15-19 years of age.

UNDERLYING CAUSE OF DEATH is either the disease or injury that initiated a chain of events leading directly to death or the circumstances of an accident or violence, which produced a fatal injury.

VERY LOW BIRTH WEIGHT BIRTH refers to a newborn weighing less than 1,500 grams (3 pounds, 5 ounces).

WEEKS OF GESTATION are the number of weeks elapsed between the first day of the last normal menstrual period (LMP) and the date of birth. When the date of the LMP is incompletely reported or the length of gestation as computed from the LMP is inconsistent with the reported birth weight, the "clinical estimate of gestation" is used. Gestations of fewer than 17 weeks or more than 47 weeks are coded as unknown. For more information, see the Technical Notes section of this report.

CALCULATION OF RATES

$$\text{Crude Birth Rate} = \frac{\text{Number of Live Births}}{\text{Total Population}} \times 1{,}000$$

$$\text{General Fertility Rate} = \frac{\text{Number of Live Births}}{\text{Female Population Ages } 15\text{-}44} \times 1{,}000$$

$$\text{Teenage Fertility Rate} = \frac{\text{Number of Live Births to Women Ages } 15\text{-}19}{\text{Female Population Ages } 15\text{-}1},$$

$$\text{Live Birth Order Fertility Rate} = \frac{\text{Number of Live Births of a Specific Live Birth Order}}{\text{Female Population Ages } 15\text{-}44} \times 1{,}000$$

$$\text{Age-Specific Fertility Rate} = \frac{\text{Number of Live Births in a Specific Age Group}}{\text{Female Population in the Same Specific Age Group}} \times 1{,}000$$

$$\text{Reported Pregnancy Rate} = \frac{\text{Number of Reported Pregnancies in a Specific Age Group}}{\text{Female Population in the Same Specific Age Group}} \quad 1{,}000$$

$$\text{Crude Mortality Rate} = \frac{\text{Number of Deaths}}{\text{Total Population}} \times 100{,}000$$

$$\text{Age} - \text{Specific Mortality Rate} = \frac{\text{Number of Deaths in a Specific Age Group}}{\text{Population in the Same Specific Age Group}} \times 100{,}000$$

$$\text{Age} - \text{adjusted Death Rate} = \sum_i W_i \bullet \left(\frac{\#\text{Deaths}_i}{\text{Pop}_i} \times 100{,}000 \right)$$

$$\text{where } W_i = \frac{\text{Standard Population}_i}{\text{Total Standard Population}}$$

$$\text{and } _i = \text{agegroup}$$

$$\text{Marriage Rate} = \frac{\text{Number of Marriages}}{\text{Total Population}} \times 1{,}000$$

$$\text{Divorce Rate} = \frac{\text{Number of Divorces and Annulments}}{\text{Total Population}} \times 1{,}000$$

$$\text{Infant Mortality Rate} = \frac{\text{Number of Infant Deaths}}{\text{Total Live Births}} \times 1{,}000$$

$$\text{Neonatal Mortality Rate} = \frac{\text{Number of Neonatal Deaths}}{\text{Total Live Births}} \times 1{,}000$$

$$\text{Postneonatal Mortality Rate} \equiv \frac{\text{Number of Postneonatal Deaths}}{\text{Total Live Births}} \times 1{,}000$$

SOURCES OF DATA

BIRTHS, DEATHS, FETAL DEATHS, MARRIAGES, AND DIVORCES: Birth, death, fetal death, marriage, and divorce certificates were the source documents for data on vital events to Delaware residents.

INDUCED TERMINATIONS OF PREGNANCY: Beginning on January 1, 1997, all induced terminations of pregnancy (ITOP) were required to be reported to the Department. ITOP reports are filed directly with the DHSC. The reports are filed for statistical purposes only and are shredded and discarded when all reports for the data year have been coded. ITOP records are currently not being exchanged among the states, so events to Delaware residents occurring out-of-state are not included in this report.

REPORTED PREGNANCIES: Reported pregnancies refer to live births, fetal deaths, and induced terminations of pregnancy (ITOP). It should be kept in mind that both births and fetal deaths of Delaware residents are reported regardless of state of occurrence, while induced terminations are reported for only those that occur in Delaware.

POPULATION PROJECTIONS: The state, county and city population figures used in this report are estimates and projections produced by the Delaware Population Consortium (DPC). The DHSC is a member of the DPC and supplies birth and death data used in making the projections. Copies of the most recent projections for Delaware's population by age, race, sex, and geographic location are available at http://www.cadsr.udel.edu/demography/consortium.htm.

RATES

Absolute counts of births and deaths do not readily lend themselves to analysis and comparison between years and various geographic areas because of differences in population characteristics (e.g., age, sex, and race). In order to account for such differences, the absolute number of events is converted to a relative number such as a percentage, rate, ratio, or index. These conversions are made by relating the number of events to the population at risk in a particular area at a specified time.

Precautions should always be taken when comparing any rates based on vital events. Both the number of events and the characteristics of the population are important to take into account when interpreting a rate. In general, rates will not be presented for events which have numerators less than 20, or in cases where the population estimates are not produced by the Delaware Population Consortium (DPC).

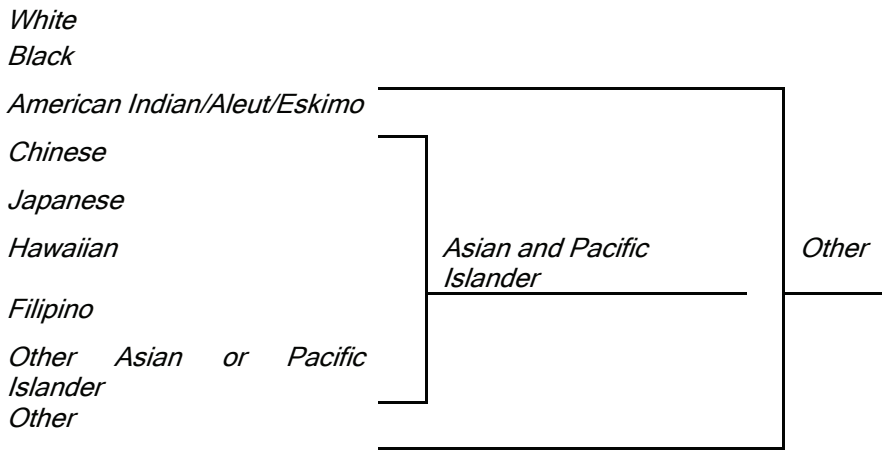
All statistics are subject to random variation. Rates based on a relatively small number of events tend to be subject to more random variation than rates based on a large number of events.

In addition to the problem of small numbers, demographic characteristics of populations (i.e., age, race and sex) can affect the comparability of rates. Since mortality rates vary substantially by age, race and sex, comparisons between rates from populations that differ in these characteristics could be misleading. However, there are two methods that can be used separately or in combination to improve the comparability of mortality rates. The first method involves comparing rates for specific age, race, and/or sex groups in the populations of interest. With this method, the rates are easily calculated and very specific groups may be compared. However, when very specific groups are compared the numbers are often small, and relationships between the overall populations are difficult to determine.

The second method is a more sophisticated technique that statistically "adjusts" for demographic differences between populations and allows direct comparisons between overall population rates. The major disadvantages of adjusted rates are that they can be cumbersome to calculate without the aid of a computer and they only have meaning when compared to other rates adjusted in the same manner.

RACE

All Delaware vital records contain an item(s) regarding race. Race is self-reported in all records except on death certificates where it is provided by an informant. Although the question allows for a free form response, all race data are grouped for purposes of data analysis into the following categories established by NCHS:



The categories *Chinese*, *Japanese*, *Hawaiian*, *Filipino*, and *Other Asian or Pacific Islander* can be combined to form the category *Asian or Pacific Islander*. For purposes of this report, *American Indian/Aleut/Eskimo*, *Chinese*, *Japanese*, *Hawaiian*, *Filipino*, *Other Asian or Pacific Islander*, and *Other* have been combined to form the category *Other*.

In the case of death, race of decedent from the death certificate is reported in all tables except in the birth cohort (see next paragraph). However, in the case of birth and fetal death, race is indicated on the birth and fetal death certificates for the mother and father only (i.e., race of the newborn is not given). Consequently, birth and fetal death data are reported by race of the mother in most tables throughout this report. However, some tables containing historical birth data prior to 1989 are reported by race of child. For these tables, race of child was imputed using criteria established by NCHS.

In the birth cohort section of this report, birth certificate data for infants dying in the first year of life are combined with information from their death certificates. Therefore, data are available for race of the mother and race of the deceased infant for each case. In the vast majority of these cases, the race listed for the mother and infant are the same. However, in a small number of cases the race of the mother and infant differ. In order to maintain consistency with data in the natality section, race of the mother is used for all tables in the birth cohort section.

HISPANIC ORIGIN

Beginning in 1989, a specific question regarding Hispanic origin was added to the birth and death certificates. This question is considered to be separate from the Race question. Therefore, a person may

report Hispanic origin in combination with any race category. The Hispanic question has two parts. The first simply asks whether the person is of Hispanic origin (Yes or No). The second part is a free-form item that asks for the specific origin (e.g., *Cuban*, *Mexican*, *Puerto Rican*, etc.).

SOURCE OF PAYMENT FOR DELIVERY

Beginning with the 1991 data year, the Center began obtaining information regarding the source of payment for delivery on birth certificates (private insurance, Medicaid, and self pay). However, this information was not available for Delaware resident mothers giving birth in other states (approximately 5 percent of all resident births). For purposes of this report, all such mothers were assigned to the private insurance category. This assignment was based on detailed analyses of the characteristics of these mothers. These analyses indicated that the demographic characteristics of these mothers very closely matched the characteristics of Delaware resident mothers who gave birth within the State and had private insurance listed as their source of payment. Furthermore, an examination of Medicaid data indicated that it is extremely rare for Medicaid mothers to give birth out-of-state.

2000 POPULATION STANDARD

Beginning with the 1999 report, all mortality rates were age-adjusted using the projected 2000 U.S. population standard. All previous versions of the vital statistics report used the 1940 U.S. population standard from the census of the same year. All historical mortality data have been adjusted to the new standard to allow comparisons over time. Comparisons between rates using the old standard and the new standard are not valid and should not be made.

A more detailed explanation of the rationale for updating the population standard can be found in a special report from NCHS (Anderson and Rosenberg, 1998).

RANDOM VARIATION

In this report, the number of vital events represent complete counts for the U.S., Delaware, and county populations. Therefore, they are not subject to sampling error, although they are subject to certain errors in the registration process such as age misreporting. However, the number of events and the corresponding rates are subject to random variation. That is, the rates that actually occurred may be considered as one of a large number of possible outcomes that could have arisen under the same circumstances (National Office of Vital Statistics, 1961). As a result, rates in a given population may tend to fluctuate from year to year even when the health of the population is unchanged. Random variation in rates based on a relatively small number of events, tends to be larger than for rates based upon events that occur more frequently. Delaware rates for some events (e.g., infant deaths) are particularly subject to such variations due to the small number of events that occur by definition in a relatively small population. Therefore, caution should be exercised when drawing conclusions about rates based on small numbers.

The issue of random variation was addressed in three ways in this report. First, multi-year average rates were reported instead of annual rates. This tended to reduce the effects of random variation since the number of events in a five-year period was much larger. Second, tests of statistical significance were used to make comparisons between Delaware/county and U.S. rates when appropriate. These statistical tests were used to determine the chance that the observed differences would occur in populations with equal rates by random variation alone. The methods used to calculate infant mortality rates are described in Appendix B. Third, in accordance with the policy of the National Center for Health Statistics, rates based on fewer than 20 events were supressed due to the fact that the rate would not be considered statistically reliable.

METHODS FOR CALCULATION AND STATISTICAL ANALYSIS OF FIVE-YEAR AVERAGE INFANT MORTALITY RATES

Due to the small number of infant deaths in Delaware, slight year-to-year changes in the number of deaths can lead to substantial fluctuations (referred to in statistics as random variation) in annual rates. In many cases, this problem makes interpretation of annual rates extremely difficult, if not impossible. Since there is far less random fluctuation in five-year average (FYA) rates, they are much better for assessing the health status of infants in Delaware. When running FYA rates (e.g., rates for 1980-1984, 1981-1985, and 1982-1986) are used, the patterns of changes in infant mortality over a number of years can be determined.

A description of the methods used to calculate the running FYA rates and the statistical methodology used to compare Delaware and U.S. rates are described below.

FIVE-YEAR AVERAGE INFANT MORTALITY RATES: Running FYA infant, neonatal, and postneonatal mortality rates (see Definitions) were calculated by race for the U.S., Delaware, and Delaware's three counties. The rates (i.e., infant, neonatal, or postneonatal) were computed by dividing the total number of deaths over each five-year period by the total number of live births over the same five-year period and multiplying the result by 1,000. Rates were calculated for five-year periods beginning with 1978-1982 to provide running FYA rates.

STATISTICAL TESTS: The observed differences between Delaware and U.S. FYA rates were tested statistically to determine whether they were a reflection of actual differences or a result of random variation. Due to the small number of infant deaths by county, differences between county and U.S. rates were not tested for significance and should be interpreted with caution.

The Delaware and U.S. rates were considered to be significantly different (two-tailed test; alpha level = 0.05) if the observed difference between the rates exceeded twice the estimated standard error of the differences (National Center for Health Statistics, 1988). The standard error of the differences (SE), an estimate of random variation, was calculated as follows:

$$SE = 2\sqrt{\frac{R^2_{U.S.}}{N_{U.S.}} + \frac{R^2_{DE}}{N_{DE}}}$$

where $R_{U.S.}$ and R_{DE} are the observed rates for the two populations, and $N_{U.S.}$ and N_{DE} are the number of deaths on which the rates were based.

When the number of events for one or both of the rates was less than 100, comparisons between rates were based on the confidence intervals for each. If they overlapped, the difference was not significant. The formula for calculating confidence intervals for rates based on less than 100 events is shown below:

Lower: IMR • L (.95, D_{adj})

Upper: IMR • U(.95,D_{adj})

where $D_{adj} = \frac{D \bullet B}{D + B}$ and

L (.95,D_{adj}) and U (.95,D_{adj}) refer to the values in Appendix C.

Table 1. Values of L and U for calculating 95-percent confidence limits for numbers of events and rates when the number of events is less than 100.

N	L	U	N	L	U
1	0.02532	5.57164	51	0.74457	1.31482
2	0.12110	3.61234	52	0.74685	1.31137
3	0.20622	2.92242	53	0.74907	1.30802
4	0.27247	2.56040	54	0.75123	1.30478
5	0.32470	2.33367	55	0.75334	1.30164
6	0.36698	2.17658	56	0.75539	1.29858
7	0.40205	2.06038	57	0.75739	1.29562
8	0.43173	1.97040	58	0.75934	1.29273
9	0.45726	1.89831	59	0.76125	1.28993
10	0.47954	1.83904	60	0.76311	1.28720
11	0.49920	1.78928	61	0.76492	1.28454
12	0.51671	1.74680	62	0.76669	1.28195
13	0.53246	1.71003	63	0.76843	1.27943
14	0.54671	1.67783	64	0.77012	1.27698
15	0.55969	1.64935	65	0.77178	1.27458
16	0.57159	1.62394	66	0.77340	1.27225
17	0.58254	1.60110	67	0.77499	1.26996
18	0.59266	1.58043	68	0.77654	1.26774
19	0.60207	1.56162	69	0.77806	1.26556
20	0.61083	1.54442	70	0.77955	1.26344
21	0.61902	1.52861	71	0.78101	1.26136
22	0.62669	1.51401	72	0.78244	1.25933
23	0.63391	1.50049	73	0.78384	1.25735
24	0.64072	1.48792	74	0.78522	1.25541
25	0.64715	1.47620	75	0.78656	1.25351
26	0.65323	1.46523	76	0.78789	1.25165
27	0.65901	1.45495	77	0.78918	1.24983
28	0.66449	1.44528	78	0.79046	1.24805
29	0.66972	1.43617	79	0.79171	1.24630
30	0.67470	1.42756	80	0.79294	1.24459
31	0.67945	1.41942	81	0.79414	1.24291
32	0.68400	1.41170	82	0.79533	1.24126
33	0.68835	1.40437	83	0.79649	1.23965
34	0.69253	1.39740	84	0.79764	1.23807
35	0.69654	1.39076	85	0.79876	1.23652
36	0.70039	1.38442	86	0.79987	1.23499
37	0.70409	1.37837	87	0.80096	1.23350
38	0.70766	1.37258	88	0.80203	1.23203
39	0.71110	1.36703	89	0.80308	1.23059
40	0.71441	1.36172	90	0.80412	1.22917
41	0.71762	1.35661	91	0.80514	1.22778
42	0.72071	1.35171	92	0.80614	1.22641
43	0.72370	1.34699	93	0.80713	1.22507
44	0.72660	1.34245	94	0.80810	1.22375
45	0.72941	1.33808	95	0.80906	1.22245
46	0.73213	1.33386	96	0.81000	1.22117
47	0.73476	1.32979	97	0.81093	1.21992
48	0.73732	1.32585	98	0.81185	1.21868
49	0.73981	1.32205	99	0.81275	1.21746
50	0.74222	1.31838			

APPENDIX D

Comparable category codes and comparability ratios for selected causes of death.

Cause of death	Category codes according to ICD-10[1]	ICD-9[2]	Comparability Ratio[3]
Diseases of the Heart	I00-I09, I11, I13, I20-I51	390-398, 402, 404, 410-429	0.9858
Malignant Neoplasms	C00-C97	140-208	1.0068
Cerebrovascular Diseases	I60-I69	430-434, 436-438	1.0588
Chronic Lower Respiratory Diseases	J40-J47	490-494, 496	1.0478
Diabetes mellitus	E10-E14	250	1.0082
Influenza and pneumonia	J10-J18	480-487	0.6982
Alzheimer's Disease	G30	331.0	1.5536
Nephritis, nephrotic syndrome, and nephrosis	N00-N07, N17-N19, N25-N27	580-589	1.232
Septicemia	A40-A41	038	1.1949
Intentional self-harm (suicide)	*U03, X60-X84,Y87.0	E950-E959	0.9962
Chronic liver disease and cirrhosis	K70, K73-K74	571	1.0367
Assault (Homicide)	*U01-*U02, X85-Y09, Y87.1	E960-E969	0.9983
Certain conditions originating in the perinatal period	P00-P96	760-771.2, 771.4-779	1.0658
Congenital malformations	Q00-Q99	740-759	0.8470
Human immunodeficiency virus (HIV)	B20-B24	042-044	1.0637
Accidents (unintentional injuries)	V01-X59,Y85-Y86	E800-E869, E880-E929	1.0305
Essential (primary) hypertension and hypertensive renal disease	I10, I12	401, 403	1.1192
Aortic aneurysm and dissection	I71	441	1.0012
Atherosclerosis	I70	440	0.9637

1. International Classification of Diseases, Tenth Revision.
2. International Classification of Diseases, Ninth Revision.
3. Comparability ratios are preliminary estimates by the National Center for Health Statistics presented in National Vital Statistics Report, Vol. 49, No. 2.

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