

STATISTICAL NEWS

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Potential Years of Life Lost

A Study of Premature Mortality in Pennsylvania

Mortality statistics, such as crude or age-adjusted death rates, are often used in public health to compare the relative importance of different causes of death. They are also used to find changes in death rates over time or differences in rates by sex, race or geography. These death rate statistics are very useful, but they do not give a complete picture of mortality in a population. Since most deaths occur in older age groups, the crude and age-adjusted death rate are mostly influenced by deaths in the elderly population.

A statistic that is often used to show mortality trends in the young is “potential years of life lost” (PYLL). This statistic is a better measure of premature mortality than a crude or age-adjusted death rate. It weighs deaths that occur in younger people more heavily than deaths that occur in the older population. PYLL is calculated as follows. First, an upper age limit is chosen that is close to the average life expectancy. This article uses an age that is often used in calculating PYLL, 75 years old. Then, for every death that occurs in a population, a value is calculated by subtracting the age at death from 75. This is a way of putting more weight on deaths that occur at younger ages. All of these corresponding values for each death are added together to find a total PYLL. Finally, the total PYLL is divided by the population under age 75. Any death that occurs at 75 years of age or greater is excluded from the calculation.

Potential years of life lost can be calculated for any group in a population. For example, to calculate the PYLL rate for female residents of Pennsylvania in the year 2010, use

Chart 1
Potential Years of Life Lost by Sex
Pennsylvania Residents, 1980, 1990, 2000 and 2010

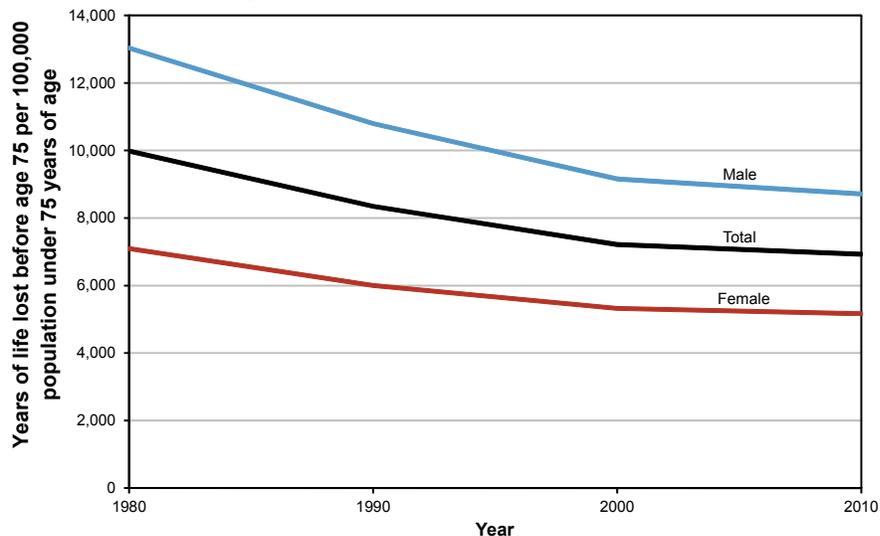
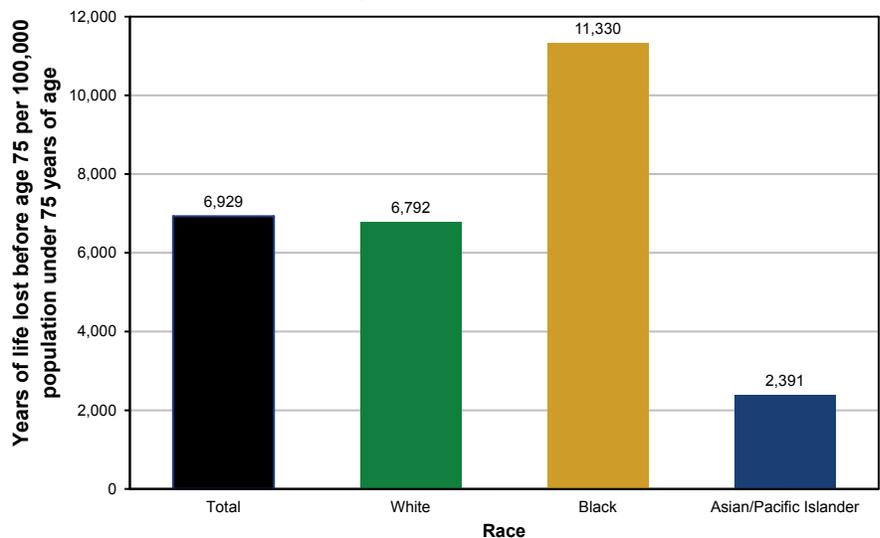


Chart 2
Potential Years of Life Lost by Race
Pennsylvania Residents, 2010



Sources: Pennsylvania Certificates of Death; U.S. Census Bureau

deaths and the population in this group in the calculations. This article describes some of the relevant PYLL statistics for Pennsylvania residents.

Chart 1 shows the changes over time in PYLL by sex (male, female and total) for Pennsylvania residents for 1980, 1990, 2000 and 2010. The

PYLL for males had the greatest decrease in this 30-year period, from a rate of 13,031 PYLL per 100,000 population under age 75 to a rate of 8,712 (1980 to 2010). This is a decrease of 33.1 percent. The PYLL rate for females in the same time

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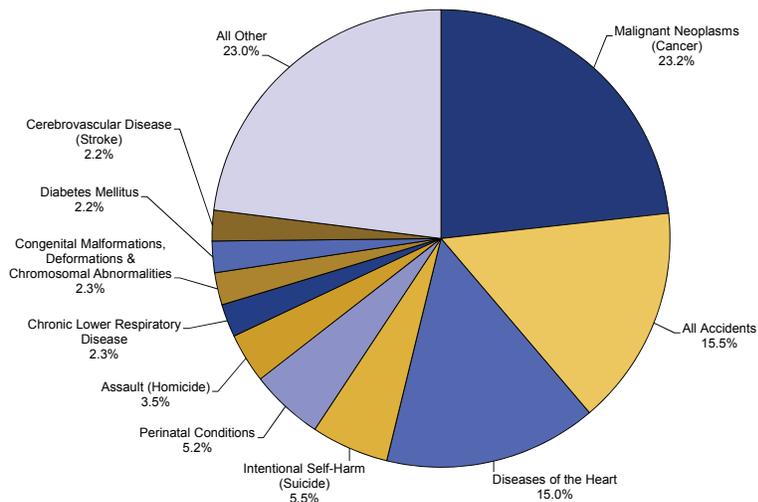
Potential Years of Life Lost

period went from 7,096 in 1980 to 5,167 in 2010, a decrease of 27.2 percent. The PYLL rate for females still remains significantly lower than for males. The overall PYLL rate for Pennsylvania residents went from 9,983 in 1980 to 6,929 in 2010, a decrease of 30.6 percent.

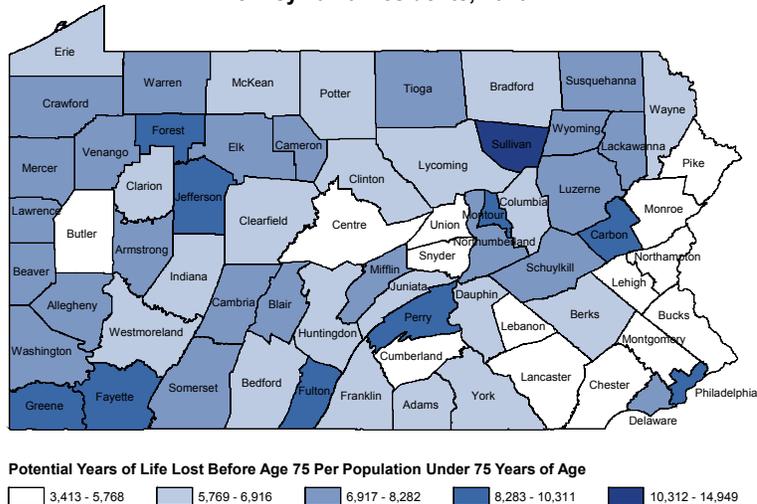
Chart 2 (see page 2) shows large differences in PYLL rates by race in Pennsylvania for 2010. Whites had a rate of 6,792 PYLL per 100,000 population under age 75. This was 2.0 percent lower than the overall rate of 6,929. Blacks had a rate of 11,330, which was 63.5 percent higher than the total rate. Asians/Pacific Islanders had a rate of 2,391, which was 65.5 percent lower than the total rate. This shows a vast difference in premature mortality between races.

Chart 3 shows the top ten leading causes of death by percent of potential years of life lost for all Pennsylvanians. Similar to a crude or age-adjusted death rate that includes deaths at all ages, the cause of death with the highest number of PYLL is malignant neoplasms (cancer), which accounted for 23.2 percent of the total using the method of calculation described earlier. The second leading cause of death, all accidents, was much higher on this list than it usually would be for a normal cause of death ranking. Total accidents accounted for 15.5 percent of the total PYLL in Pennsylvania in 2010. The remaining top ten causes of death by PYLL, starting with number three, were: diseases of the heart, intentional self-harm (suicide), perinatal conditions, assault (homicide), chronic lower respiratory disease, congenital malformations, diabetes mellitus and cerebrovascular disease (stroke).

Chart 3
Potential Years of Life Lost, Percent by Selected Leading Causes
Pennsylvania Residents, 2010



Map 1
Potential Years of Life Lost by County
Pennsylvania Residents, 2010



Sources: Pennsylvania Certificates of Death; U.S. Census Bureau

Suicide, perinatal conditions, homicide and congenital malformations stood out as significantly higher on this ranking than they usually would be, based on ranking the age-adjusted death rates, while stroke was significantly lower than the ranking of age-adjusted rates.

Potential years of life lost also varied significantly across the state by geography in 2010. Map 1 shows that the PYLL rate by county ranged from 3,413 to 10,311, not including the outlier of Sullivan County (14,949), which has a relatively

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Potential Years of Life Lost

small population. There also seemed to be a general trend that counties in the southeastern part of Pennsylvania tended to have lower PYLL rates than did other parts of the state. Higher rates generally were found in rural counties. Overall, there were 14 counties with a PYLL rate at or be-

low 5,768, 20 between 5,769 and 6,916, 23 between 6,917 and 8,282, nine between 8,283 and 10,311, and one above 10,312.

If you have any questions about this article, please contact the Bureau of Health Statistics and Research at 717-783-2548. Additional vital sta-

tistics can be obtained on the [Birth, Death and Other Vital Statistics](#) Web page and are also available on [EpiQMS](#), our online interactive data dissemination tool.

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Pennsylvania's 2012 Synar Survey Results

Tobacco Sales to Youth Remain Low

An estimated nine percent [95% Confidence Interval (CI): ± 2] of Pennsylvania's cigarette retailers sold cigarettes to minors in 2012, according to the latest Pennsylvania Synar survey. The estimated retail violation rate (RVR) was based on attempts by underage students to purchase cigarettes from a sample of cigarette retailers.

The Synar survey measures cigarette retailers' noncompliance with youth tobacco laws and indicates if a state is in compliance with the Center for Substance Abuse Prevention's (CSAP) maximum allowable RVR. Pennsylvania's 2012 RVR was significantly below the 20 percent RVR mark. In fact, Pennsylvania has been significantly below the RVR mark for the past 11 years (see Chart 1). Chi-Square tests demonstrated that the 2012 violation rate was not statistically different from the 2004, 2005, 2006, 2007 and 2011 violation rates but was statistically different from the 2008, 2009 and 2010 rates.

The 2012 sample was selected from a sampling frame created from a list of outlets that had a license to sell cigarettes in Pennsylvania. Each outlet on the list had a non-zero probability of selection. In 2012, Pennsylvania surveyed 1,072 of the 15,617 outlets accessible to minors.

After an attempt by a youth surveyor to purchase cigarettes, the adult supervisor defines the type of outlet into one of thirteen categories. Outlets that were categorized as convenience-grocery had the highest frequency. This category was defined as a store that sells a limited variety of food and an assortment of convenience items but does not belong to a regional or national chain. It was

Chart 1
CSAP Maximum Rate vs Survey Rate
Synar Survey, 1999-2012

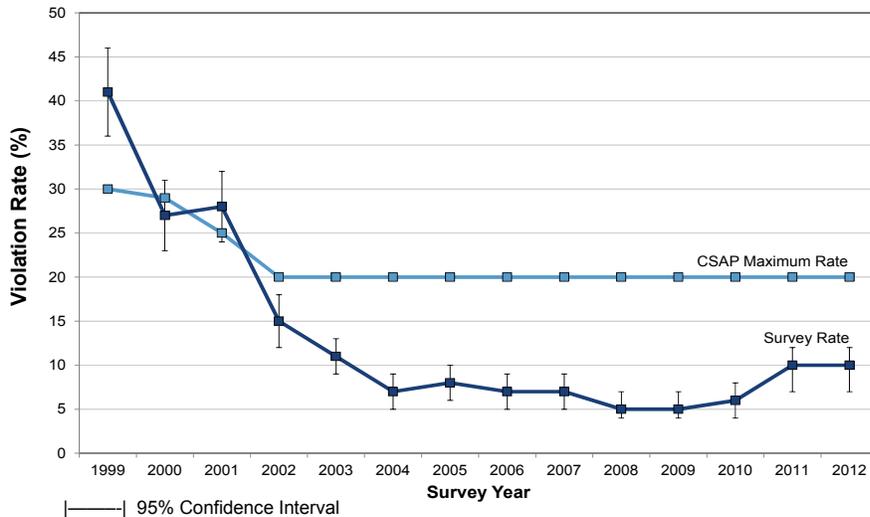


Table 1
Outlets Surveyed and Violation Rate, by Outlet Category
Pennsylvania Synar Survey, 2012

Outlet Category	# of Outlets Surveyed	RVR*	Lower Limit	Upper Limit
Bar/tavern	9	Unreliable	Unreliable	Unreliable
Beer Distributor	73	13%	3%	22%
Convenience-chain	217	6%	3%	10%
Convenience-grocery	285	12%	7%	17%
Deli	39	Unreliable	Unreliable	Unreliable
Drug store	79	8%	1%	16%
Gas station/auto	135	10%	4%	16%
News outlet	20	Unreliable	Unreliable	Unreliable
Restaurant/eat-in	20	Unreliable	Unreliable	Unreliable
Restaurant/takeout	16	Unreliable	Unreliable	Unreliable
Supermarket	97	2%	0%	5%
Tobacco	51	6%	0%	12%
Other	31	Unreliable	Unreliable	Unreliable

*Retail violation rate
Notes: 95% confidence limit based on t-distribution
Unreliable means that the number of outlets surveyed is less than 50

estimated that this category had a RVR of 12 percent (CI: ± 5). Table 1 shows the weighted RVR for every type of outlet sampled.

Chi-square and odds ratio calculations were used to examine the relationships between outlets with more than 40 visits. Results showed that beer distributors in Pennsylvania

were six times more likely to sell cigarettes to minors than supermarkets. A convenience-grocery outlet was 5.7 times more likely to sell cigarettes to a minor than a supermarket, and gas stations were 4.6 times more likely than a supermarket to sell cigarettes to minors.

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Pennsylvania's 2012 Synar Survey Results

Male youth attempted to purchase cigarettes in 590 outlets, while females attempted this in 482 outlets (see Table 2). The relationship between the rates at which cigarettes were sold to males and females was examined, and the significance test showed that the rates were statistically different. Moreover, a female minor was 3.5 times more likely to be sold cigarettes than a male minor.

The age of the youth surveyors ranged from 15 to 17 years old in the 2012 survey (see Table 3). A significance test and odds ratio calculation was used to examine the relationships between the age of the buyer and the violation rate. There was a significant difference between the rate at which outlets sold cigarettes to 15-year-olds and the rate they sold to 16-year-olds. There was also a significant difference between the rate at which outlets sold to 15 and 17-year-olds. Based on the odds ratio, a 16-year-old is 3.7 times more likely to be sold cigarettes than a 15-year-old, and a 17-year-old is six times more likely to be sold cigarettes than a 15-year-old.

Sub-state estimates are valid at the regional level, where multiple counties are grouped together. Table 4 details the number of outlets visited per region. If the number of outlets surveyed in a region was greater than 50, the RVR is displayed along with a 95% confidence interval based on the t-distribution.

For the past 14 years, Pennsylvania has used a probabilistic sampling method with which outlets are stratified and clustered. The first stage of sampling selects the clusters by method of probability proportionate to size. The second and final

Table 2
Sex of Buyer and Violation Rate
Pennsylvania Synar Survey, 2012

Sex of Buyer	# of Outlets Surveyed	RVR*	Lower Limit	Upper Limit
Male	590	5%	3%	7%
Female	482	15%	11%	19%

Table 3
Age of Buyer and Violation Rate
Pennsylvania Synar Survey, 2012

Age of Buyer	# of Outlets Surveyed	RVR*	Lower Limit	Upper Limit
15 years old	286	3%	1%	5%
16 years old	712	11%	8%	14%
17 years old	74	17%	6%	27%

Table 4
Survey Region and Violation Rate
Pennsylvania Synar Survey, 2012

Survey Region	# of Outlets Surveyed	RVR*	Lower Limit	Upper Limit
Northcentral	81	12%	3%	21%
Northeast	157	11%	5%	16%
Northwest	78	3%	0%	6%
Southcentral	130	7%	3%	10%
Southeast	209	6%	2%	10%
Southwest	144	6%	2%	10%
Allegheny	78	1%	0%	4%
Delaware	39	Unreliable	Unreliable	Unreliable
Erie	39	Unreliable	Unreliable	Unreliable
Philadelphia	117	20%	12%	27%

*Retail violation rate

Notes: 95% confidence limit based on t-distribution

Unreliable means that the number of outlets surveyed is less than 50

stage, randomly selects from within the chosen clusters. CSAP requires that the survey's statewide standard error is less than or equal to 1.82. The survey error for the 2012 Pennsylvania Synar survey was 1.10.

The Annual Synar Report was submitted to CSAP with detailed explanations. For additional information about the Synar survey, you can visit the [Synar website](#). This

website is maintained by the United States Department of Health and Human Services. For any questions regarding this article or the Pennsylvania Synar survey, please contact the Bureau of Health Statistics and Research at 717-783-2548 or visit the [PA Synar website](#).

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Weight Change During Pregnancy for Pa. Mothers

Normal Weight Rates Have Been Declining

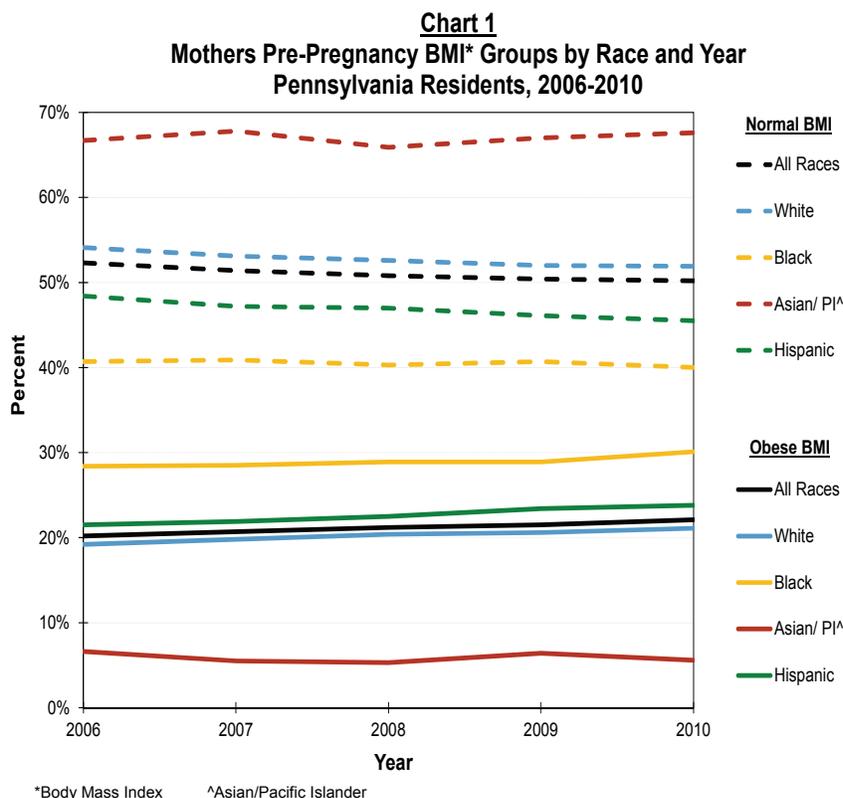
Gaining weight is typically considered a detriment to a person's health, but it is usually a requirement for a healthy pregnancy. Weight gain during pregnancy is generally encouraged by medical professionals, but just how much weight should be gained?

Mother's weight is recorded on the Pennsylvania certificate of live birth for two time periods — prior to the pregnancy and at the time of delivery. The mother self-reports her pre-pregnancy weight and height on the "Mother's Worksheet," a sheet filled out by the mother before leaving the hospital. As with most self-reported information, over- or under-reporting of the measurement must be considered. The delivery weight is collected on the "Facility Worksheet," which is usually filled out after delivery by a medical professional at the facility where the child was born.

Pregnancy weight difference is calculated by subtracting the pre-pregnancy weight from the delivery weight. Such a simple calculation is not sufficient enough at identifying healthy weight gain. According to the Mayo Clinic, the best way to identify healthy weight gain is to categorize mothers by their pre-pregnancy weights into body mass index (BMI) groups.

$$BMI = 703 \times \frac{Weight \ (lbs)}{Height \ (in)^2}$$

For use in this article, these indices are grouped into the categories of underweight (BMI of less than 18.5), normal weight (BMI of 18.5 to 24.9), overweight (BMI of 25.0 to 29.9) and obese (BMI of 30.0 or more). According to the March of Dimes, a



healthy weight gain is defined as 28 to 40 pounds for underweight, 25 to 35 pounds for normal weight, 15 to 25 pounds for overweight, and 11 to 20 pounds for obese.

The majority of Pennsylvania resident women who had a live birth between 2006 and 2010 fell into the normal BMI group, but this may change if the current trend continues (see Chart 1). The rate of mothers who are of normal BMI is falling, while at the same time the rate of mothers who are of an obese BMI is growing. Asian/Pacific Islander mothers had little change in the normal and obese BMI rates between 2006 and 2010 (from 66.7 to 67.6 for normal weight and 6.6 to 5.6 for obese). There are slight fluctuations in the rates, but overall, they have the highest rates of normal BMI and

lowest rates of obese BMI. Black mothers have the highest rates of obese BMI and the lowest rates of normal BMI (40.0 for normal BMI and 30.1 for obese, in 2010).

Plural births (non-singleton) are often atypical, so determining pregnancy weight gain, birth weights and development of the fetuses have extreme variances. Therefore, only Chart 1 refers to all births, while all other charts and statistics presented in this article are for singleton births.

According to the American Pregnancy Association, pregnancy weight gain can be broken down into several groupings, as shown in the following example. A woman who gains 30 pounds during pregnancy can expect to have seven and a half pounds of fetus weight, 10 pounds of

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Weight Change During Pregnancy for Pa. Mothers

extra blood and fluid, seven pounds of fat, and five and a half pounds of extra body mass. The Department of Health and Human Services, Women's and Children's Health Section states that this weight gain typically does not occur at an even pace. Very little weight gain is needed in the first trimester (1.1-6.6 pounds depending on BMI), and increasing diets by 150 to 200 calories a day should be enough. The second and third trimesters are when substantial weight is gained. On average, women gain one half to one pound per week during the final two trimesters, depending on pre-pregnancy BMI. Caloric intake should be increased by 300 to 400 calories per day from a normal pre-pregnancy diet.

The proportion of mothers who gained the recommended amount of weight during pregnancy generally increased as the age of the mother increased (see Table 1). Over 26 percent of mothers less than 20 years old gained the recommended amount of weight while 32.6 percent of mothers forty and over gained the recommended amount of weight during pregnancy. One out of four black mothers gained the recommended amount of weight, while nearly two out of every five Asian/ Pacific Islander mothers gained the recommended amount of weight during pregnancy. The rate at which mothers gained the recommended amount of weight during pregnancy consistently decreased for all age groups and races as BMI increased.

A mother's BMI can also be related to the birth weight of the child (see Chart 2). Mothers with higher body mass indices tend to

Table 1
Mothers Who Gained the Recommended Amount of Pregnancy Weight
by Demographic and BMI* Group
Pennsylvania Residents, 2006-2010

	Underweight	Normal	Overweight	Obese	Total
Age					
Less than Twenty	39.0%	31.3%	17.5%	13.9%	26.2%
Twenties	43.1%	35.5%	20.1%	18.5%	27.9%
Thirties	47.4%	39.9%	21.9%	20.6%	31.0%
Forty and Older	44.6%	41.0%	26.8%	22.7%	32.6%
Race/Ethnicity					
White	43.9%	37.6%	20.1%	19.7%	29.6%
Black	38.7%	32.0%	21.6%	17.9%	25.0%
Asian/ Pacific Islander	50.5%	41.9%	28.3%	21.4%	38.8%
Hispanic	40.3%	33.4%	21.7%	17.7%	26.6%

Chart 2
Average Birth Weight by Mothers BMI* Group
Pennsylvania Residents, 2006-2010

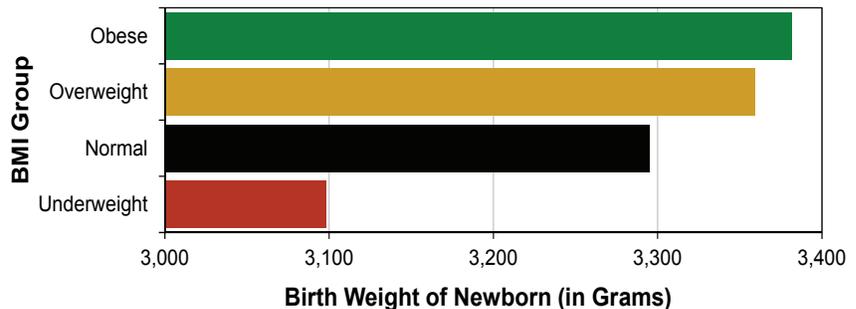
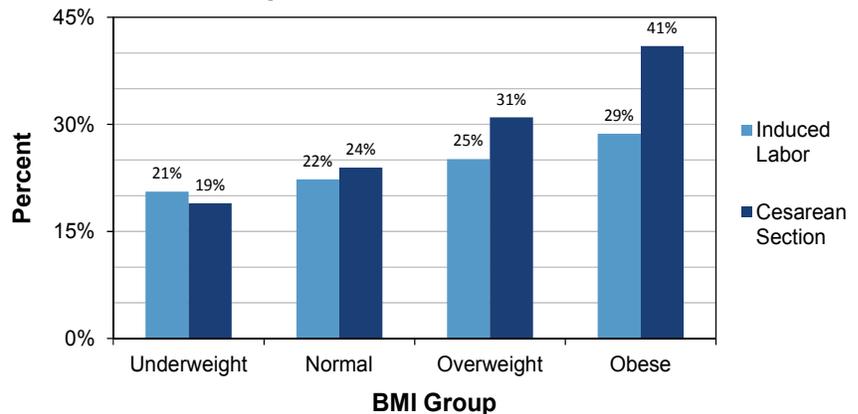


Chart 3
Induced Labor and Cesarean Section
Percents by BMI* Group
Pennsylvania Residents, 2006-2010



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*Body Mass Index

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Weight Change During Pregnancy for Pa. Mothers

have higher birth weight babies. In fact, each of the four BMI groups had statistically significant differences in average birth weights during this time.

Larger babies often result in more induced labor and Cesarean section births. This relationship appears to hold true when analyzing induced labor and Cesarean section births by mother's BMI group (see Chart 3, page 8). Mothers in the obese BMI group have the highest rates of induced labor (29 percent) and Cesarean sections (41 percent). In fact, the obese rate of Cesarean sections is more than double that of underweight mothers.

The weight of mothers and the amount of weight gained during pregnancy can impact the health of both the newborn and mother. The increasing number of mothers in the obese BMI group is a concern for public health. Obesity is a growing problem and can influence the health of future generations.

This article has presented the current statistics available on weight during pregnancy in Pennsylvania based on the certificate of live birth. If you are pregnant now or plan on becoming pregnant, please consult with a medical professional on the amount of weight gain considered healthy and appropriate for you.

If you have any questions about this article, please contact the Bureau of Health Statistics and Research at 717-783-2548. Additional birth and pregnancy statistics for Pennsylvania can be found on the [Birth, Death, and Other Vital Statistics](#) Web page and are also available on [EpiQMS](#), our online interactive data dissemination tool.

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PA-SIIS Successfully Deploys New System

The Centers for Disease Control and Prevention's (CDC) new Vaccine Tracking System (VTrcks) is a component of the Vaccine Management and Business Improvement Project, a Health and Human Services initiative to improve all publicly purchased vaccine processes. In 2010, the CDC piloted VTrcks for vaccine ordering and management of Vaccines for Children (VFC) and publicly funded vaccines in four locations. After completing modifications, based on feedback from the pilot grantees, VTrcks deployment to all remaining grantees began in mid-2012.

Since the Pennsylvania Statewide Immunization Information System (PA-SIIS) already supported vaccine ordering and inventory tracking, efforts were focused on

implementing the VTrcks External Information System (ExIS) interface. Use of the ExIS interface enables Pennsylvania to add vaccine ordering capabilities to existing infrastructure while taking advantage of providers' existing familiarity with PA-SIIS. Through the ExIS interface, PA-SIIS staff are able to upload provider vaccine orders to VTrcks and download shipment information, providing for near real-time vaccine inventory visibility.

In February of 2013, the PA-SIIS successfully deployed the new vaccine ordering module internally and began submission of orders to VTrcks. A series of web-based trainings were conducted for VFC-enrolled practices, and on March 1st, the vaccine ordering system went live. A total of 1,971 VFC program

locations are now active in PA-SIIS. Order and shipment data are now exchanged with VTrcks on a daily basis. Since implementation, 607 practice sites have placed orders for 3,748 vaccine items via PA-SIIS.

The Pennsylvania Department of Health is very excited about using VTrcks since it combines vaccine ordering, forecasting, and budget and contract management into one application, which allows staff to monitor, review and process vaccine orders through an efficient web-based system.

Additional information on the immunization registry can be found on the Department's website under the [PA-SIIS](#) section. For questions about this article, please call the PA SIIS staff at 717-783-2548.

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