

STATISTICAL NEWS

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Combined Treatment Methods Are Most Common

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Vaccinations Critical for Those with Diabetes

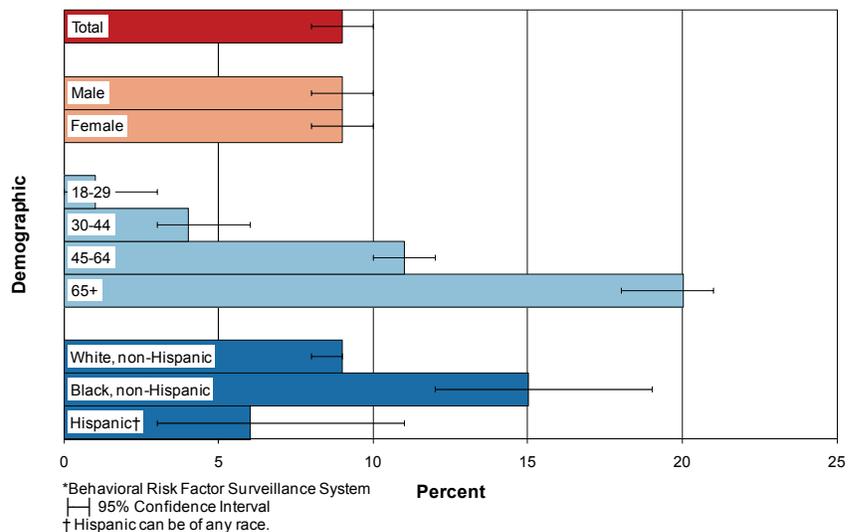
Diabetics Receiving Flu and Pneumonia Vaccinations More Often

Vaccinations are an important public health intervention in preventing illness and death, especially in individuals with diabetes. Having diabetes creates a higher risk for influenza related complications. The Centers for Disease Control and Prevention (CDC) claims: “If you have diabetes, you are six times more likely to be hospitalized and three times more likely to die from the flu and its complications than other people.” (http://www.cdc.gov/diabetes/news/docs/flu_protect.htm) The CDC also notes that, “Last year during the H1N1 pandemic, one out of every four people hospitalized with the flu had diabetes.” (<http://www.cdc.gov/diabetes/news/flu.htm>) Therefore, it is critical for those with diabetes to discuss both influenza and pneumonia vaccinations with their healthcare provider.

Diabetes Background

According to the 2011 National Diabetes Fact Sheet, diabetes affects 25.8 million people, which is about 8.4% of the U.S. population. An estimated 18.8 million people are diagnosed with diabetes while another estimated 7.0 million haven't realized they have diabetes yet (undiagnosed). (http://www.cdc.gov/diabetes/pubs/pdf/ndfs_2011.pdf) In 2009, the Pennsylvania Behavioral Risk Factor Surveillance System (BRFSS) survey estimated that 9 percent (95% Confidence Interval (CI): 8-10) of Pennsylvania adults had diabetes. However, diabetes can often go undetected for some period of time, meaning the actual percentage of Pennsylvania adults with diabetes may have been higher than the estimated 9 percent in 2009. Chart 1

Chart 1
Estimated Diabetes Prevalence by Select Demographics
2009 Pennsylvania BRFSS*



depicts the prevalence rates of diabetes and the 95% confidence intervals for some common demographic breakouts.

Diabetes prevalence varied significantly based on age and race/ethnicity, although there were no significant differences observed between genders. An estimated 20% (CI: 18-21) of Pennsylvania adults age 65+ had diabetes compared to an estimated 11% (CI: 10-12) of Pennsylvania adults age 45-64. Since these two confidence intervals do not overlap each other, it can be concluded that the diabetes prevalence of those age 65+ was significantly higher than the diabetes prevalence of those who were age 45-64. This was also true for the 45-64 age group (CI: 10-12) in comparison to the 30-44 age group (CI: 3-6). This surveillance data supports a direct relationship between diabetes prevalence and age.

The confidence interval for diabetes prevalence among Black, non-

Hispanics (CI: 12-19) did not overlap the White, non-Hispanic (CI: 8-9) or the Hispanic (CI: 3-11) race/ethnic demographic groups. Therefore, the Black, non-Hispanic group diabetes estimate (15%) was significantly higher than the White, non-Hispanic (9%) and Hispanic (6%) groups.

Influenza Vaccinations Background

For the 2010-2011 flu season, the CDC recommends vaccination for everyone 6 months or older. Rapid flu treatment with antiviral drugs is advised for those at high risk of serious flu-related complications. The high risk pool includes young children, pregnant women, those ages 65 or older, and people with certain chronic health conditions such as asthma or diabetes. (http://www.cdc.gov/flu/about/disease/high_risk.htm)

In 2009, the Pennsylvania

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Vaccinations Critical for Those with Diabetes

BRFSS survey estimated that 40 percent (CI: 39-42) of Pennsylvania adults had received an influenza vaccination in the past year. Chart 2 depicts the prevalence rates and the 95% confidence intervals for some common demographic breakouts. Flu shots varied significantly by gender and age, but there were no observed significant differences by race/ethnicity. Females had a significantly higher estimate than males for receiving a flu shot; and age groups' rates of receiving a flu shot were significantly higher with increasing age.

Pneumonia Vaccinations

Obtaining a pneumonia vaccination is also very important for individuals with diabetes. The CDC advises, "People with type 1 or type 2 diabetes are at an increased risk of developing pneumonia from the flu, therefore a pneumonia (pneumococcal) vaccine is also recommended for them." (<http://www.cdc.gov/flu/diabetes/>)

In 2009, the Pennsylvania BRFSS survey estimated that 28 percent (CI: 27-29) of Pennsylvania adults had ever received a pneumonia vaccination. Chart 3 depicts the prevalence rates and the 95% confidence intervals for some common demographic breakouts. There was a significantly higher percentage of PA adults aged 65 and older who had ever had a pneumonia vaccination compared to the younger age groupings.

Vaccinations among Diabetics

Based on results from the 2009 Pennsylvania BRFSS survey, the estimated vaccination percentages

Chart 2
Estimated Had a Flu Shot in the Past Year by Select Demographics
2009 Pennsylvania BRFSS*

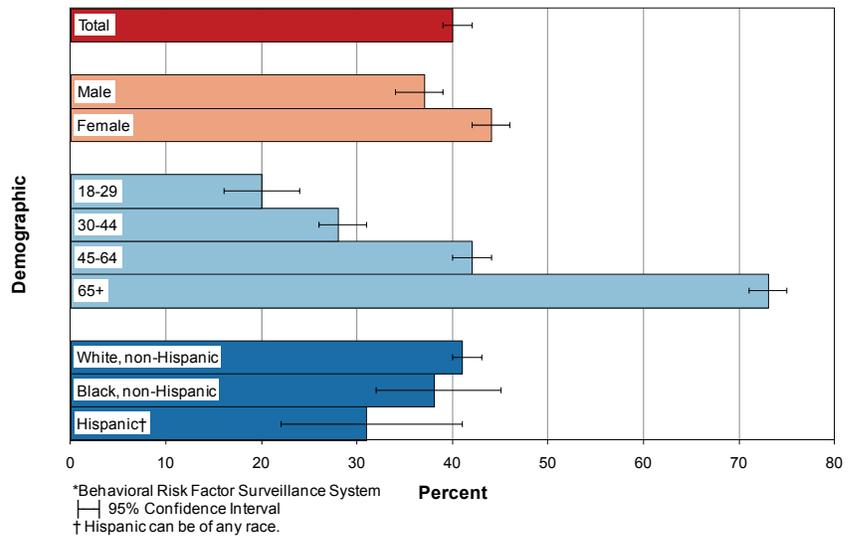
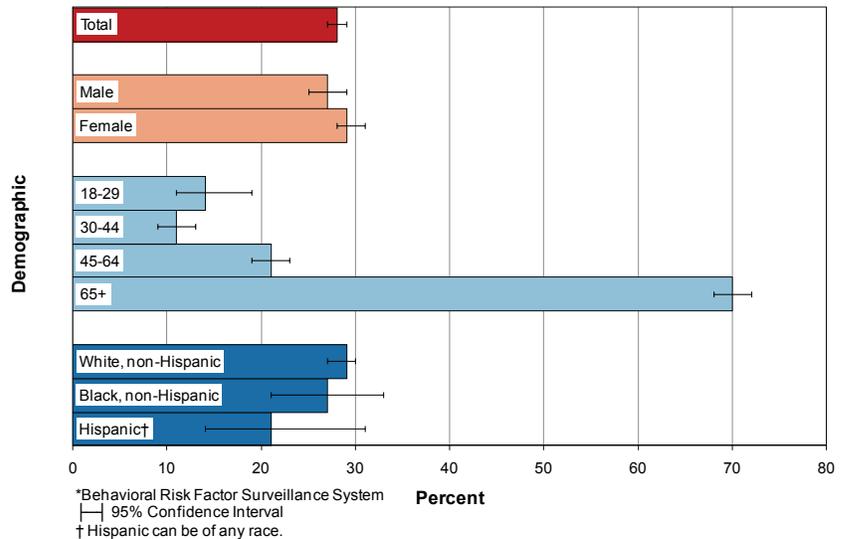


Chart 3
Estimated Ever Had a Pneumonia Shot by Select Demographics
2009 Pennsylvania BRFSS*



were significantly higher for those with diabetes. An estimated 69 percent (CI: 64-72) of Pennsylvania adults with diabetes in 2009 were estimated to have had a flu shot in the past year. An estimated 58 percent (CI: 54-62) of Pennsylvania adults with diabetes in 2009 were

estimated to have had a pneumonia vaccination. Only an estimated 38 percent (CI: 36-39) of Pennsylvania adults without diabetes in 2009 had a flu shot in the past year. Chart 4 (next page) compares gender, age, and race/ethnic breakouts of having

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Vaccinations Critical for Those with Diabetes

had a flu shot in the past year for those with or without diabetes. As evidence from the non-overlapping confidence intervals, those with diabetes were significantly higher in almost all categories. Some demographic groups expressed in previous charts (18-29, 30-44, and Hispanics) were excluded due to having an insufficient sample size. In these cases, there was not a large enough sample of respondents to provide statistically reliable estimates.

Only an estimated 25% (CI: 23-26) of Pennsylvania adults without diabetes had ever had a pneumonia vaccination. Chart 5 compares gender, age, and race/ethnic breakouts of ever having a pneumonia shot for those with or without diabetes. The confidence intervals reveal that those with diabetes had significantly higher percentages of having a pneumonia shot than those without diabetes for all demographics listed in the chart. Again, some demographic groups expressed in earlier charts (18-29, 30-44, and Hispanics) were excluded due to having an insufficient sample size.

Conclusion

Receiving and keeping up to date with vaccinations is important for your health, especially if you have diabetes. Both the influenza and pneumonia vaccinations are recommended in a diabetes management plan. It is best to discuss your diabetes management plan with your doctor. For more information on diabetes and these vaccinations, please refer to the American Diabetes Association's webpage, "[Living with Diabetes – Flu and Pneumonia Shots.](#)" To learn more about the Behavioral

Chart 4
Estimated Had a Flu Shot in the Past Year by Diabetes Status and Select Demographics, 2009 Pennsylvania BRFSS*

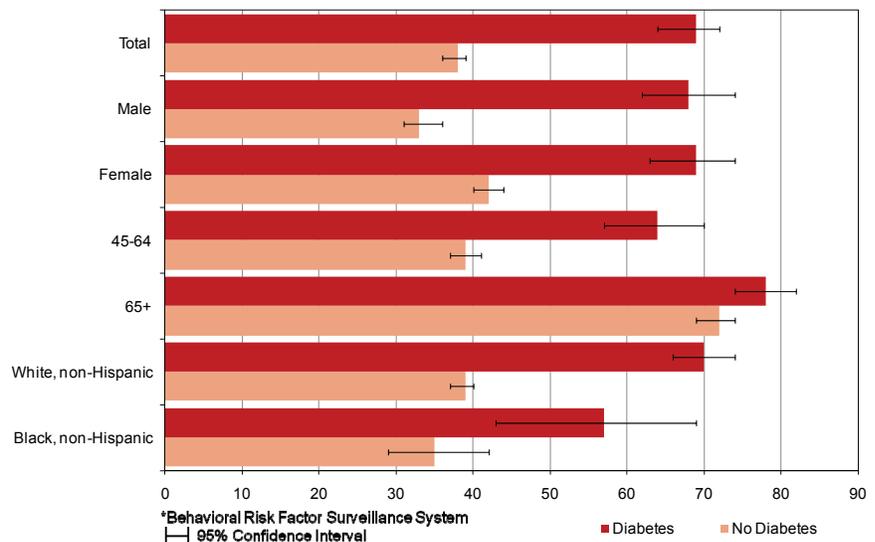
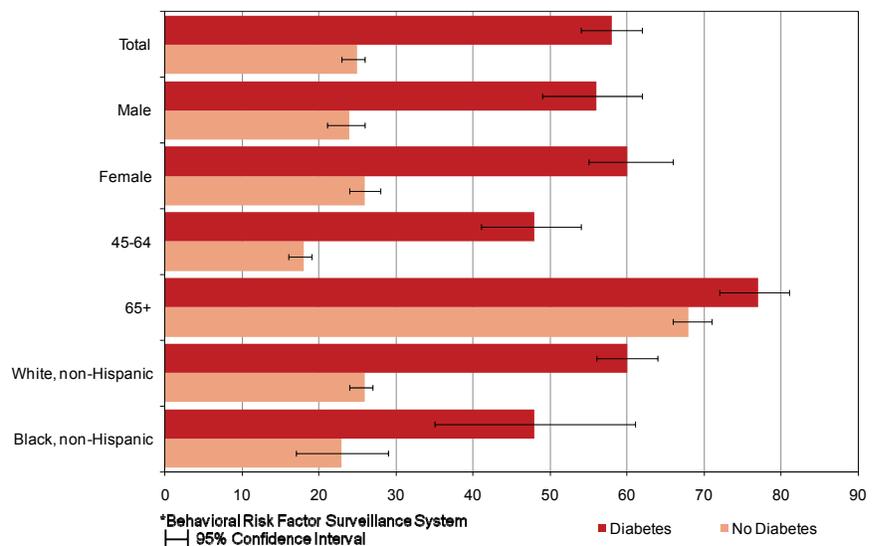


Chart 5
Estimated Ever Had a Pneumonia Shot by Diabetes Status and Select Demographics, 2009 Pennsylvania BRFSS*



Risk Factor Surveillance System survey, please visit the PA Department of Health's webpage, "[Behavioral Health Risks of Pennsylvania Adults](#)" or the CDC's BRFSS page, "[BRFSS – Turning Information Into Health.](#)" Statistics mentioned in this article, as well as

many other health statistics, can be found using the PA Department of Health's Epidemiologic Query and Mapping System ([EpiQMS](#)).

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Cesarean Section Deliveries Continue to Rise

Rates Still Increasing for Low-risk First-time Mothers

A review of recent birth statistics shows that cesarean section delivery rates are still on the rise nationally and in Pennsylvania, even among low-risk mothers giving birth for the first time. Preliminary 2009 data shows that nationally the cesarean section delivery rate rose two percent, from 32.3 in 2008 to a record high of 32.9 in 2009, marking the 13th consecutive year of increases. The same trend can be seen among Pennsylvania residents where the cesarean section delivery rate has been rising for 12 consecutive years, from 19.3 in 1997 to 31.8 in 2009. However, the cesarean section delivery rate for Pennsylvania, rising over three percent from 2008 (30.7) to 2009 (31.8), is still more than three percent lower than the U.S. rate.

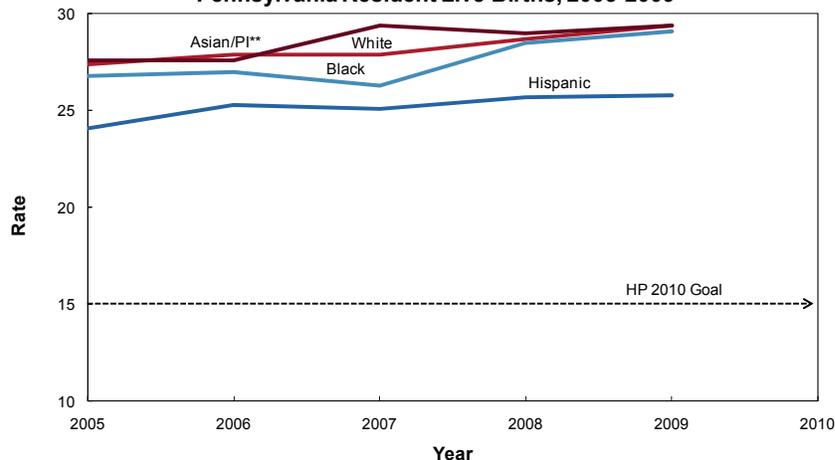
The proportion of cesarean sections for low-risk first-time mothers (full-term [37 or more weeks gestation], singleton, not breech or malpresentation) is following the same pattern -- increasing steadily in recent years, from a rate of 16.8 in 1997 to 29.0 in 2009 among Pennsylvania residents. The national Healthy People 2010 (HP2010) Objective #16-09a is to decrease the percent of low-risk first-time mothers giving birth by cesarean section to 15 percent or less.

A further review of Pennsylvania's cesarean section delivery rates for low-risk first-time mothers between 2005 and 2009 by race/ethnicity, educational status, and age follows.

Race/Ethnicity of Mother

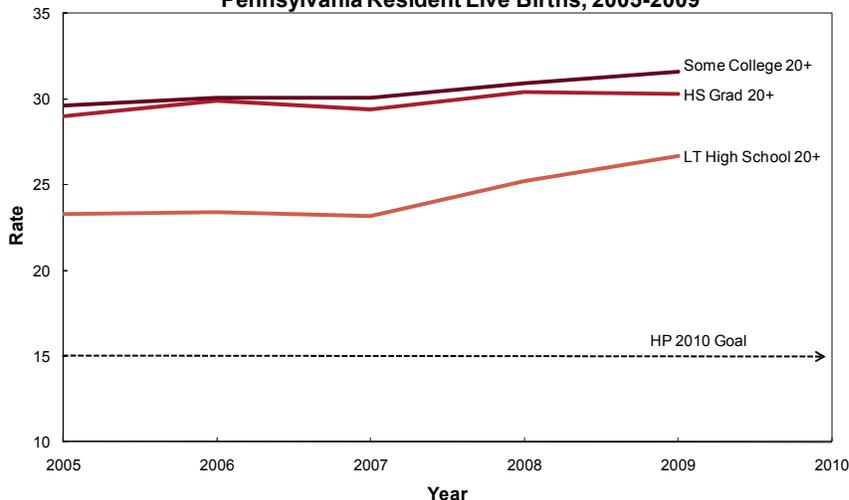
As seen in Chart 1, between 2005 and 2009 the cesarean section de-

Chart 1
Cesarean Section Delivery Rates Among Low-Risk First-Time Mothers*, By Race and Hispanic Origin† of Mother, Pennsylvania Resident Live Births, 2005-2009



*per 100 - full-term (37 or more weeks gestation), singleton, not breech or malpresentation
 **Pacific Islander
 †Hispanic can be of any race.

Chart 2
Cesarean Section Delivery Rates Among Low-Risk First-Time Mothers*, By Education of Mother, Pennsylvania Resident Live Births, 2005-2009



*per 100 - full-term (37 or more weeks gestation), singleton, not breech or malpresentation

livery rates for all race/ethnicity groups have increased. In 2009, Asian/Pacific Islander and White mothers had the highest rates, both at 29.4. From 2007 to 2009, the cesarean section delivery rates increased for Blacks from 26.3 to 29.1 and Hispanics from 25.1 to 25.8, with Hispanic mothers having

the lowest rate in 2009. (Please note that Hispanics can be of any race.) In 2009, among the four race/ethnic groups, none of the cesarean section delivery rates are close to the national HP2010 goal of 15 percent.

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Cesarean Section Deliveries Continue to Rise

Education of Mother

The rate of low-risk first-time cesarean sections by education of the mother (aged 20+) showed that the rate for births to mothers with less than a high school education was the closest to the HP2010 goal in 2001 (16.9). However, the cesarean section delivery rate for mothers with less than a high school education shows an increase from 23.3 in 2005 to 26.7 in 2009 (see Chart 2, previous page). Despite this increase, the rate for mothers with less than a high school education is still closer to the HP 2010 goal compared to the rate for high school graduates (30.3), and mothers with at least some college education (31.6 – the highest rate for these specific educational attainment levels in 2009). The cesarean section delivery rates have been on the increase since 2005 for all three educational groups, with the sharpest increase (over 14% - from 23.3 to 26.7) seen among mothers with less than a high school education. All three education groups continue to move further away from meeting the HP2010 goal of 15 percent.

Table 1
Cesarean Section Delivery Rates Among Low-Risk First-Time Mothers*
By Age of Mother and Year, Pennsylvania Resident Live Births, 2005 and 2009

	2005 Rate	2009 Rate	Rate % Change 2005 to 2009
HP 2010 Goal	15.0	15.0	
Age of Woman			
Under 15	16.1	19.0	18.0
15-19	18.9	20.1	6.3
20-24	23.3	26.0	11.6
25-29	27.5	30.0	9.1
30-34	34.0	34.2	0.6
35 & Older	43.0	47.0	9.3

*per 100 - full-term (37 or more weeks gestation), singleton, not breech or malpresentation

Age of Mother

Among low-risk first-time mothers in 2009, as seen in Table 1, the oldest mothers (ages 35+) had the highest rate (47.0) of cesarean section delivery -- over two times higher than the lowest rate for any age group (19.0 for mothers under age 15). Mothers ages 15-19 had a cesarean section delivery rate of 20.1 in 2009, compared to 26.0 for mothers ages 20-24, 30.0 for mothers ages 25-29, and 34.2 for mothers ages 30-34. The cesarean section delivery rates for all age groups increased between 2005 and 2009. Low-risk

first-time mothers under age 15 had the largest percentage increase between 2005 and 2009, from 16.1 in 2005 to 19.0 in 2009. Mothers ages 20-24 had the next largest percentage increase, followed by mothers ages 35+ and 25-29, then mothers ages 15-19 and finally mothers ages 30-34 with the smallest percentage increase. The 2009 cesarean section delivery rates for the under 15 and 15-19 age groups, 19.0 and 20.1, respectively, are the nearest to the HP2010 goal of 15 percent, but still fall short of the goal.

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Analysis of Treatment Statistics for Female Breast Cancer

Combined Treatment Methods Are Most Common

Recently, the Pennsylvania Cancer Registry began collecting detailed treatment data on cancer cases. Although cancer treatment should be administered on a case-by-case basis that best suits the patient's chances for survival, statistics can be used to monitor current treatment trends and to verify that general treatment guidelines are followed. In this analysis, female breast cancer treatments were investigated by the extent of the disease (stage) and data were used to show that integrative treatment procedures are regularly administered.

In Pennsylvania, invasive breast cancer is the most common cancer diagnosed among females. Specifically, there were 10,255 invasive breast cancers discovered in 2008 among females for an age-adjusted rate of 129.9 per 100,000. Invasive breast cancer cases accounted for approximately 27.5 percent of all Pennsylvania female cancers diagnosed in 2008. Breast cancer was also the second leading cause of cancer deaths among Pennsylvania females and accounted for 15.0 percent of all female cancer deaths in 2008.

Improved and increased breast cancer screening has led to more early diagnoses. This fact combined with additional improvements in breast cancer treatment has resulted in excellent survival rates. For 2007, the National Cancer Institute's (NCI) SEER program estimates a five-year survival rate of 89.2 percent among all U.S. females diagnosed with breast cancer.

The most common treatment for breast cancer was surgery to the primary site (see Table 1). Surgery

Table 1
Common Treatment Types for Female Breast Cancer, Pennsylvania, 2008

Surgery to Primary Site	11,791
Radiation	5,757
Hormone	5,336
Chemotherapy	3,847
No Treatment or Unknown	645

Note: Patients often have one or more combinations of treatments. Dataset run date was April 2011.

attempts to physically remove cancer tumors, cancerous lymph nodes, and other tissues from the body. Unfortunately, cancer can spread to other cells in the body and often requires additional treatments beyond surgery. The next most common forms of treatment for breast cancer included radiation therapy, hormone therapy, and chemotherapy. As you'll see later in the article, the majority of breast cancers were treated with multiple procedures (e.g., surgery combined with radiation therapy).

Radiation therapy uses ionizing radiation to disrupt the DNA of cancerous cells, which prevents cell growth or kills the cell. Hormone therapy works by eliminating or blocking natural hormones in the body. In the case of breast cancer, some hormones, such as estrogen, can encourage cancer cell growth. Chemotherapy uses drugs to kill or otherwise disrupt cancer cells from growing.

The three main types of breast cancer surgery are partial mastectomy, total simple mastectomy, and modified radical mastectomy. A partial mastectomy is surgery that either removes a tumor (e.g., lumpectomy), or part of the breast tissue in addition to the tumor (e.g., seg-

mental mastectomy). This type of surgery sometimes removes lymph nodes under the arm. A total or simple mastectomy is surgery that removes the entire breast and some of the lymph nodes under the arm. A modified radical mastectomy is surgery that removes the entire breast, many of the underarm lymph nodes, the lining of the chest muscle and sometimes part of the chest wall. A fourth type of surgery known as a radical mastectomy is rarely used and has generally been replaced with the modified radical mastectomy. Radical mastectomy is similar to a modified radical mastectomy except for the facts that all of the underarm lymph nodes are removed and the chest wall muscles are removed.

As shown in Table 2 (following page), the type of surgery used to treat breast cancer depends on the stage of the disease. For this analysis the American Joint Committee on Cancer (AJCC) staging system was used. Breast cancer cases were grouped into the AJCC stages 0, I, II, IIIA, and operable IIIC – the same groups identified in NCI's online treatment summaries, the [Physician Data Query \(PDQ\)](#). Other stages were not analyzed because of

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Analysis of Treatment Statistics for Female Breast Cancer

Table 2

Type of Surgery for Female Breast Cancers by AJCC* Stage, Pennsylvania Residents, 2008

	AJCC Stage Groups									
	0		I		II		IIIA		Operable IIIC	
	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count
Partial Mastectomy, NOS	70.2 %	1,969	73.2 %	3,413	53.8 %	1,609	32.6 %	187	25.9 %	63
Total Simple Mastectomy, NOS	21.1 %	591	17.6 %	820	21.8 %	651	21.8 %	125	18.1 %	44
Modified Radical Mastectomy	2.8 %	79	7.0 %	327	18.6 %	557	38.2 %	219	50.2 %	122
Radical Mastectomy, NOS	0.3 %	9	0.3 %	12	0.8 %	24	2.1 %	12	3.3 %	8
Other/Unknown Surgery	2.0 %	55	0.8 %	35	0.9 %	26	0.5 %	3	0.4 %	1
No Surgery	3.7 %	103	1.2 %	55	4.1 %	122	4.7 %	27	2.1 %	5
Total	100.0 %	2,806	100.0 %	4,662	100.0 %	2,989	100.0 %	573	100.0 %	243

Notes: Operable IIIC cancers did not spread to supraclavicular lymph nodes. Dataset run date was April 2011.

*American Joint Committee on Cancer.

their wide variety of treatments and reduced success rates of curing the cancer.

The statistics calculated in Table 2 show that partial mastectomies were the most common type of breast cancer surgery among Pennsylvania females in 2008 for stages 0, I, and II. Furthermore, the percentages of partial mastectomies were highest for stages 0 and I, reaching over 70 percent, but began to decrease when the cancer was diagnosed at a later stage. Partial mastectomies accounted for only 25.9 percent of all surgeries performed on operable IIIC breast cancers. Total simple mastectomies did not vary much by stage, but gener-

ally accounted for 18 to 22 percent of breast cancer surgeries. The percentages of modified radical mastectomies were very low (7 percent or lower) for stages 0 and I, but increased dramatically for later stages. Modified radical mastectomies accounted for 50.2 percent of all surgeries performed on operable IIIC breast cancers. Finally, the low occurrence of radical mastectomies in Pennsylvania supports adherence to current guidelines that recommend replacing this procedure with modified radical mastectomies.

Although surgery is the most common treatment type for breast cancer, additional treatments of radiation therapy, hormone therapy,

and chemotherapy are often integrated into the primary course of treatment. In Table 3, the various treatment combinations were calculated and grouped by AJCC staging. Looking at the stage totals, approximately 25.5 percent of breast cancer patients had surgery only, the most common scenario. However, these totals also indicate that the majority of breast cancers are treated with multiple treatment types. The combination of surgery, radiation, and hormone therapy was the second most prevalent combination.

Many stage trends were observed for the various treatment

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Table 3

Treatment Combinations for Female Breast Cancer by AJCC* Stage, Pennsylvania Residents, 2008

	AJCC Stage Groups						
	0	I	II	IIIA	Operable IIIC	Other/Unknown	Total
Total Number of Surgeries	2,666	4,596	2,858	544	201	926	11,791
Surgery Only	42.9%	21.0%	17.7%	9.2%	14.9%	34.2%	25.5%
Surgery and Radiation	22.5%	13.5%	4.4%	1.8%	3.0%	3.6%	11.8%
Surgery and Chemotherapy	0.7%	6.9%	22.3%	29.6%	32.3%	16.0%	11.4%
Surgery and Hormone Therapy	9.7%	11.4%	9.8%	5.1%	6.0%	7.8%	10.0%
Surgery, Radiation, and Hormone Therapy	20.9%	31.8%	11.5%	4.8%	6.5%	6.3%	20.7%
Surgery, Radiation, and Chemotherapy	0.2%	5.8%	10.5%	15.8%	20.9%	9.7%	6.7%
Surgery, Chemotherapy, and Hormone Therapy	0.4%	2.0%	7.1%	5.5%	4.5%	3.8%	3.2%
Surgery, Radiation, Chemotherapy, and Hormone Therapy	0.1%	4.6%	12.5%	21.5%	21.9%	6.2%	6.7%

Notes: Operable IIIC cancers did not spread to supraclavicular lymph nodes. Other/Unknown stage includes any other stage groups plus distant and metastatic cancers. Dataset run date was April 2011. Percentages will not add to 100 because only the most common treatment combinations are included.

* American Joint Committee on Cancer.

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Analysis of Treatment Statistics for Female Breast Cancer

combinations used for breast cancer. For example, the surgery and radiation combination was commonly administered for early stages 0 and I, but decreased dramatically for later stages. A similar pattern occurred for the combination of surgery and radiation with hormone therapy. On the other hand combinations that included chemotherapy usually were more common for the later stages compared to the earlier stages.

Overall the statistical patterns observed for the various combinations of surgery, radiation therapy, chemotherapy, and hormone therapy administered in the treatment of breast cancer concurred with general

treatment guidelines. In particular, early stages of breast cancer may be treated with surgery alone, but under other circumstances may be combined with radiation or hormone therapy. Physicians treating early stages may offer breast conserving methods like the partial mastectomy. In the later stages of breast cancer, modified radical mastectomies are more common, as is the use of chemotherapy.

For more detailed examination of breast cancer treatment and comparison to specific treatment guidelines, other factors influencing the prognosis (chance of recovery) and treatment options must be incorporated into the analysis. These factors

in addition to stage at diagnosis and type of surgery include information such as estrogen receptor (ER) and progesterone receptor (PR) levels in the tissue, human epidermal growth factor type 2 receptor (HER2/neu) levels in the tissue, and the type of breast cancer (histology).

For more information about the data contained in this article or data available from the Pennsylvania Cancer Registry, please contact the Bureau of Health Statistics and Research at 717-783-2548. Additional Pennsylvania cancer statistics are available on the Department of Health's [Cancer Statistics](#) webpage or from our interactive health statistics tool, [EpiQMS](#).

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