

Division of Public Health
Department of Health
and Social Services

This brief summarizes the hospital care of women, with particular emphasis on how their hospitalizations are divided into obstetric and non-obstetric stays and how they differ from men.

Males and non-obstetric females had very similar values for source of admission and length of stay; obstetric stays were shorter and more likely to be routinely admitted.

The most common reasons for females to be hospitalized were related to pregnancy and childbirth; such obstetric discharges accounted for 13,708 hospitalizations in 2007.

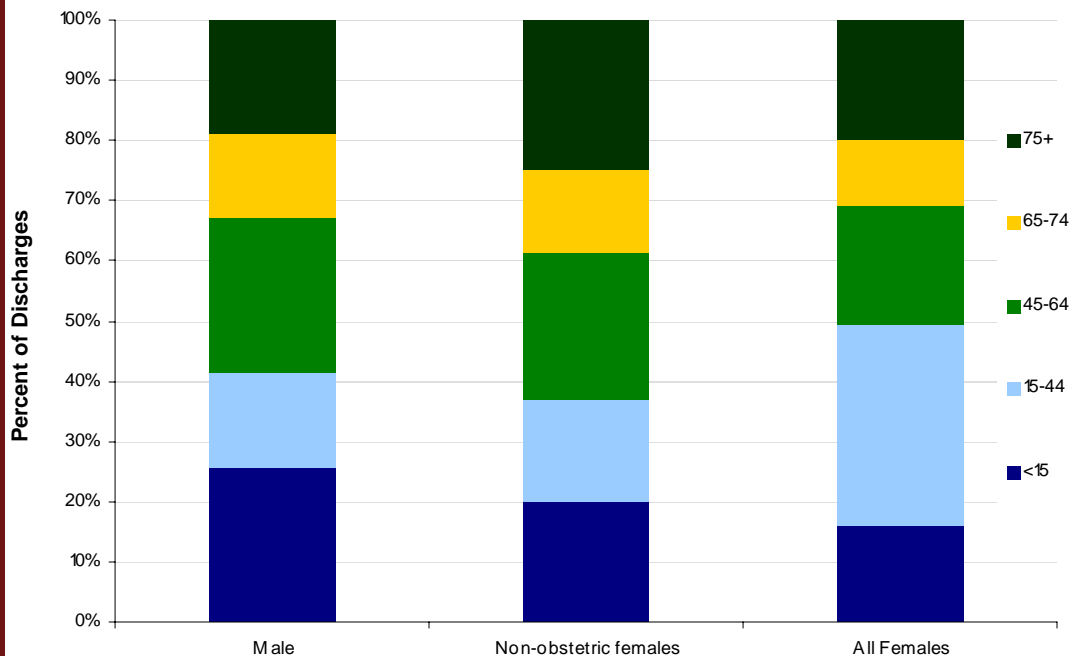
Care of Women in Delaware Hospitals

In 2007, 68,404 women were discharged from Delaware hospitals, representing 59 percent of all hospitalizations. Women whose hospital stays were obstetric-related accounted for 11.7 percent of all discharges, and 1 in 5 stays for women.

With the exception of patients ages 0-14, women accounted for the majority of patients in every age group. Three out of 4 hospitalizations of patients 15-44 were women. In the 45-64 and 65-74 age groups they made up just over half of the discharges; in the 75 and older group, 60 percent of all stays were women.

Excluding obstetric stays, the largest differences in age composition of men and women occurred in the under 15 and 75 and older groups; men had a higher proportion of their discharges occurring in the under 15 group and women had a larger proportion of their discharges occurring in the 75 and older group.

Figure 1. Age Composition by Patient Type, Delaware Hospitals, 2007



Note:

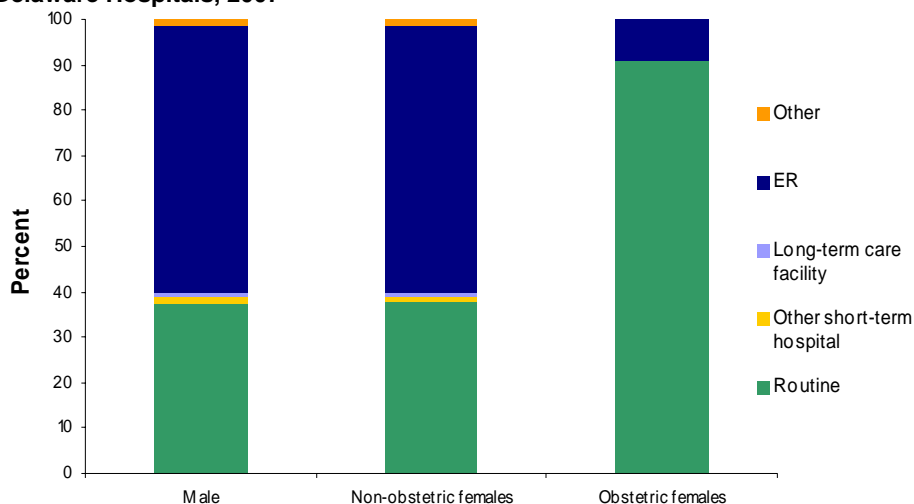
1. Non-obstetric patients were identified as female patients who did not have ICD-9-CM codes 630-677 as the primary diagnosis.

Source: Delaware Health Statistics Center

Source of Admission

Obstetric patients were most likely to be admitted through routine measures, such as a physician, clinic, or an HMO. Ninety percent of obstetric patients were routinely admitted, versus 37 percent of male and non-obstetric female patients.

Figure 2. Source of Admission Distribution by Patient Type, Delaware Hospitals, 2007



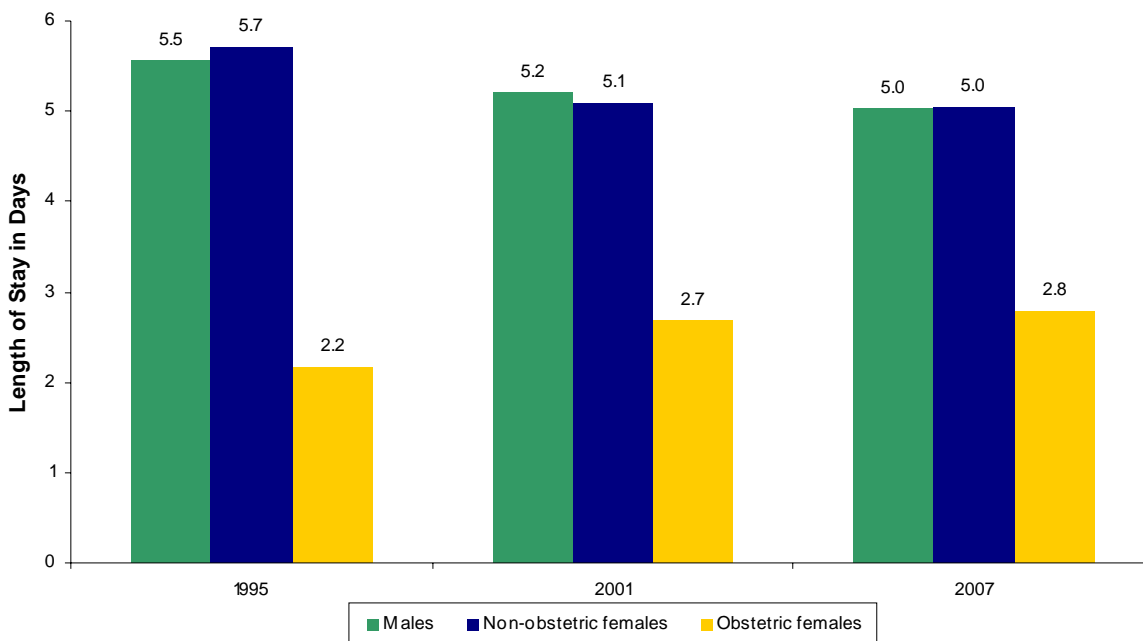
Source: Delaware Health Statistics Center

Average Length of Stay

Average length of stay was markedly shorter for obstetric females, though they displayed an increase over time not seen in males or non-obstetric females.

In 2007, males and non-obstetric females had an average length of stay of 5 days. Average stays for obstetric females were just under 3 days. Though stays for males and non-obstetric females decreased 9.1 and 12.3 percent from 1995 to 2007, stays for obstetric females increased 27 percent; nearly all of the increase occurred between 1995 and 2001.

Figure 3. Average Length of Stay by Patient Type, Delaware Hospitals, 1995-2007



Source: Delaware Health Statistics Center

Principal Diagnoses

Excluding pregnancy and childbirth, men and women had 6 of their 10 most frequent diagnoses in common. Urinary tract infections and rehabilitation care were listed fourth and fifth for non-obstetric women, but neither was listed in the 10 most common diagnoses for males. Likewise, coronary atherosclerosis was the most frequently listed diagnosis for male hospital stays, while it ranked 11th for non-obstetric females.

Figure 4. Top 10 Principal Diagnoses (CCS Defined) for Non-obstetric Female Hospitalizations Delaware Hospitals, 2007

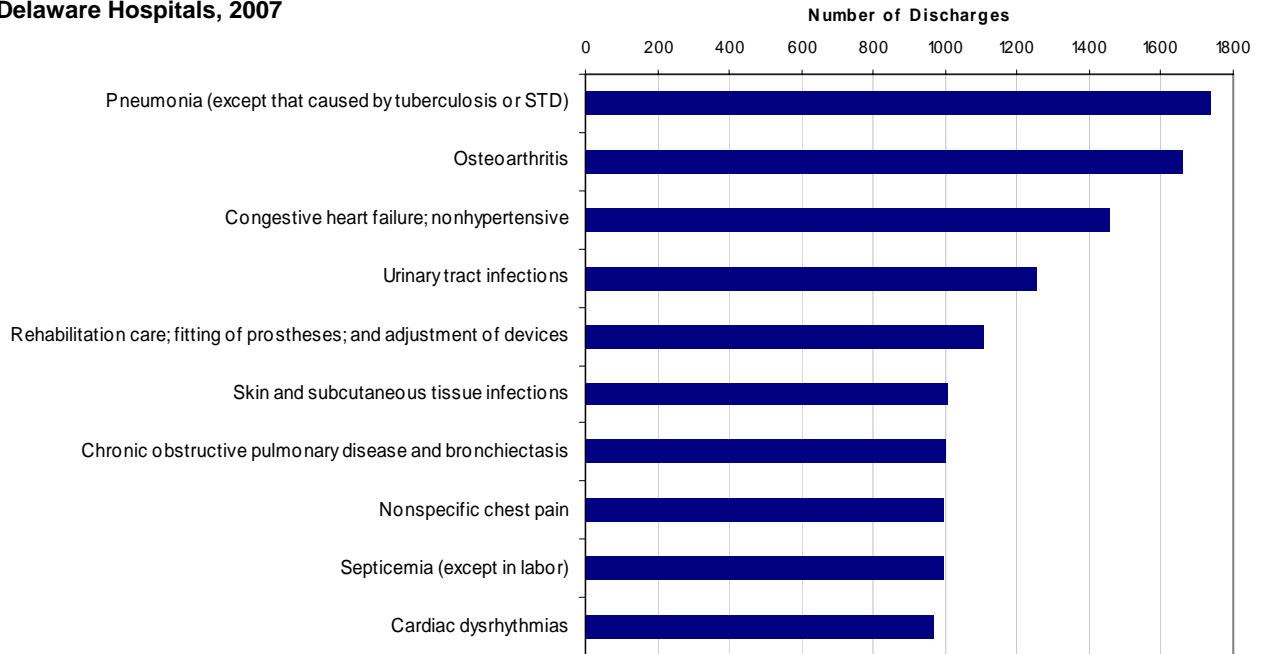
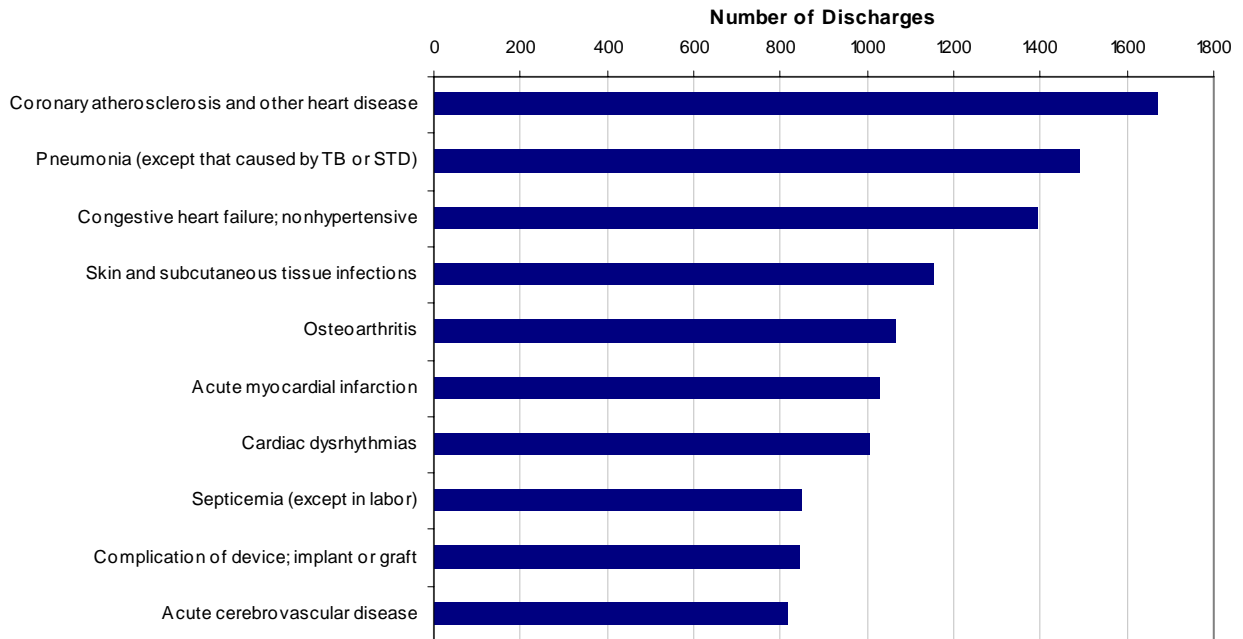


Figure 5. Top 10 Principal Diagnoses (CCS defined) for Male Hospitalizations, Delaware Hospitals, 2007



Note:

1. Excludes liveborn infants.

Source: Delaware Health Statistics Center

Diseases of the Circulatory System

Excluding pregnancy and childbirth, diseases of the circulatory system were the most common diagnoses for both men and women, and accounted for 19 and 16 percent of their total hospitalizations. The majority of hospital stays related to circulatory conditions were due to congestive heart failure, coronary atherosclerosis (hardening of the arteries), cardiac dysrhythmias (irregular heart beat), nonspecific chest pain, acute myocardial infarction (heart attack), and acute cerebrovascular disease (stroke). Of those 6 causes, more than half of the hospital stays due to congestive heart failure and nonspecific chest pain were women, and nearly two-thirds of hospitalizations due to coronary atherosclerosis were men.

Table 1. Ten Most Common Diseases of Circulatory System by Patient Type, Delaware Hospitals, 2007

CCS Classification	Male		Non-obstetric Females	
	<i>Count</i>	<i>Rank</i>	<i>Count</i>	<i>Rank</i>
<i>All Diseases of circulatory system</i>	9323		8749	
Congestive heart failure; nonhypertensive	1395	2	1456	1
Coronary atherosclerosis (hardening of the arteries)	1670	1	935	4
Cardiac dysrhythmias (irregular heart beat)	1008	4	967	3
Nonspecific chest pain	770	6	994	2
Acute myocardial infarction (heart attack)	1029	3	701	6
Acute cerebrovascular disease (stroke)	818	5	895	5
Transient cerebral ischemia (mini-stroke)	265	9	362	7
Hypertension w/ complications & secondary hypertension (high blood pressure w/ complications)	280	7	325	8
Peripheral and visceral atherosclerosis (hardening of arteries other than heart)	269	8	307	9
Phlebitis; thrombophlebitis and thromboembolism (inflammation and blood clots in the veins)	249	10	298	10

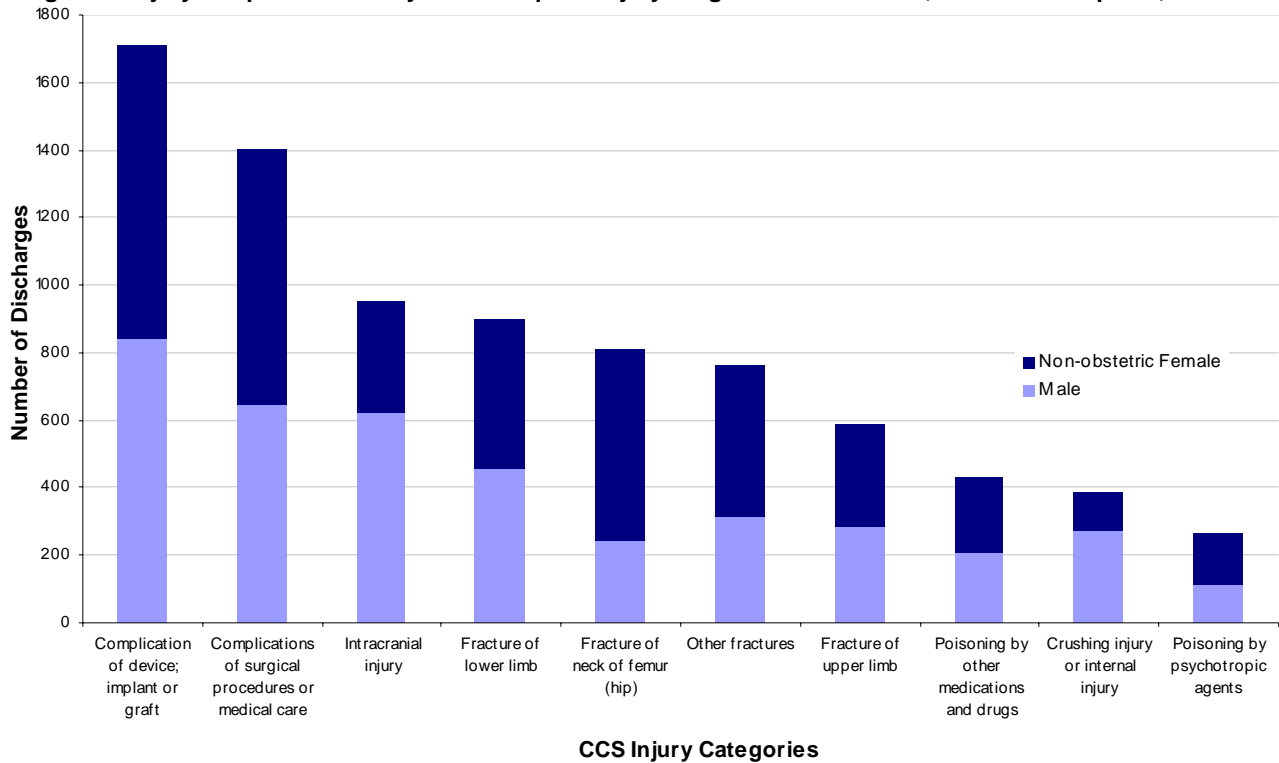
Source: Delaware Health Statistics Center

Injuries

Approximately 1 in 12 hospitalizations was injury-related. The most common diagnoses for injury-related hospitalizations were complications of device and complications of surgical procedures or medical care, followed by intracranial (brain) injuries and fractures of lower limb (leg).

- Men and non-obstetric women experienced very similar numbers of leg fractures, but women were more than twice as likely to be hospitalized for hip fractures, 94% of which were caused by falls.
- Men accounted for nearly 2 of every 3 hospitalizations for brain injuries, which were most commonly caused by falls, motor vehicle accidents, and being struck by or against something.
- Men had more than twice the number of hospitalizations as females due to skull and face fractures, crushing or internal injuries, open wounds, and spinal cord injuries.
 - Motor vehicle accidents were the most common cause of spinal cord and crushing or internal injuries, and accounted for 41.7 and 29.8 percent of injuries.
 - Cutting and piercing injuries were the most common cause of open wounds of the head, neck, trunk, and extremities.
 - Being struck by or against something was the most common cause of skull and face fractures.

Figure 6. Injury Hospitalizations by Most Frequent Injury Diagnosis and Gender, Delaware Hospitals, 2007



Source: Delaware Health Statistics Center

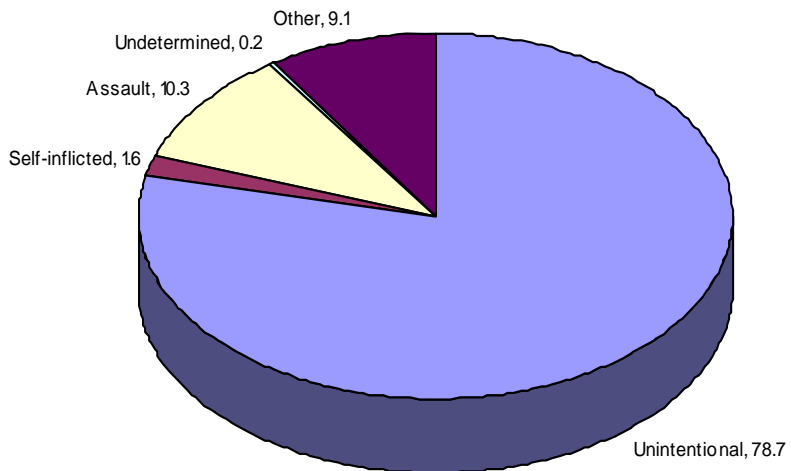
External Cause of Injuries

Due to the fact that obstetric females are defined by having a primary diagnosis related to pregnancy, childbirth, and the puerperium, they cannot have an injury as their primary diagnosis. However, female obstetric patients with an external cause of injury code (ECODE) related discharge were reviewed and compared to both non-obstetric female and male patients.

In 2003-2007, nearly 1 percent of obstetric females had an ECODE-related diagnosis, compared to approximately 10 percent of males and non-obstetric females. Obstetric females had nearly double the proportion of assault-related hospitalizations as males, and 8.5 times that of non-obstetric females.

Among obstetric patients, falls and motor vehicle accidents accounted for the vast majority of unintentional injury hospitalizations; being struck or hit accounted for over three-quarters of assault hospitalizations.

Figure 7. Distribution of Ecodes for Obstetric Females Delaware Hospitals, 2003-2007



Source: Delaware Health Statistics Center

Mental Health and Substance Abuse (MHSA) Disorders

In 2007, 18 percent of hospital stays involved a mental health and substance abuse diagnosis. More women than men had at least one MHSA diagnosis and they accounted for 58 percent of all MHSA diagnoses; obstetric patients accounted for 1 in 12 female MHSA diagnoses.

The most frequent MHSA diagnosis among hospitalized males was alcohol-related disorders. Mood disorders were the most frequent diagnosis for non-obstetric females, and miscellaneous mental disorders, which include dissociative disorders, eating disorders, sleep disorders, and other miscellaneous mental conditions, were the most common MHSA diagnosis for obstetric females.

Hospitalizations associated with alcohol-related disorders were more than three times as common among men as non-obstetric women; fewer than one percent of MHSA related hospitalizations of obstetric females were related to alcohol disorders. In contrast, hospital stays associated with substance-related disorders were the second most frequently listed MHSA disorder for obstetric females.

Table 2. Top 5 All-listed MHSA Diagnoses by Patient Type, Delaware Hospitals, 2007

CCS Diagnosis	Male		Non-obstetric Females		Obstetric Females	
	#	%	#	%	#	%
Alcohol-related disorders	3163	24.2	1089	6.6		
Mood disorders	2955	22.6	5917	1.0	321	22.6
Substance-related disorders	2201	16.9	1708	10.3	365	25.7
Delirium/dementia/amnestic/other cognitive disorders	1832	14.0	3441	20.8		
Anxiety disorders	1000	7.7	2321	14.0	103	7.2
Miscellaneous mental disorders					574	40.4

Notes:

1. All-listed MHSA diagnoses refers to all MHSA diagnoses listed on the discharge record (excluding Screening and history of mental health & substance abuse); patients can have more than 1 MHSA diagnosis.

2. Percent is calculated as the percent of total MHSA diagnoses by patient type.

Source: Delaware Health Statistics Center

Obesity-related Hospital Care

According to the CDC, the prevalence of obese adults in the U.S. doubled between 1980 and 2004, and in 2005 and 2006, 34 percent of U.S. adults were obese, including 33 percent of men and 35 of women. Obesity is associated with increased morbidity from a variety of conditions, as well as increased health care utilization.

Though there was little difference in the obesity prevalence among men and women, in 2007 non-obstetric females accounted for 87 percent of patients whose primary reason for hospitalization was treatment of obesity, the majority of whom had bariatric procedures such as gastric bypass and gastric band surgeries.

Despite having an average length of stay less than half that of other patients, the average charge per hospital stay for patients treated principally for obesity was slightly higher because their average charge per day was 3 times that of other patients.

Looking at both primary and secondary diagnoses showed that obesity was present in 4.5 percent of male hospital stays, 7.3 percent of non-obstetric female hospital stays and 1.8 percent of obstetric female hospital stays.

In addition to difficulties in pregnancy assessment and fetal monitoring⁷, obese women have an increased risk of complications. As a result, obesity during pregnancy is associated with higher use of healthcare services and longer lengths of stay⁶. In 2007, obese and/or overweight obstetric patients had average charges that were 25 percent higher and average lengths of stay that were 14 percent longer than obstetric patients who were not classified as obese or overweight.

Procedures:

Three out of every four hospitalizations involved at least one procedure, and there were three or more procedures performed for one-third of all hospital stays. Obstetric females were least likely to have a stay with no procedures; only 4.5 percent of obstetric females, compared to 31 percent of non-obstetric females, and 25 percent of males, had hospital stays without any sort of procedure.

Excluding obstetrical procedures, the most commonly performed procedures on males and females were cardiovascular, digestive, and musculoskeletal. Males had more cardiovascular procedures; 41 percent of male hospital stays involved a cardiovascular procedure, compared to 28 percent of females stays. Diagnostic cardiac catheterization; coronary arteriography was the most commonly performed cardiovascular procedure among both sexes, though men underwent the procedure more often. The second most commonly performed procedure was other vascular catheterization; not heart, which was more frequently seen in women.

In general, CT scans, diagnostic ultrasounds, and MRIs were more commonly performed on non-obstetric women, while men underwent more diagnostic cardiac catheterizations and OR procedures on vessels other than the head and neck.

Nearly 7 in 10 discharges of obstetric females involved other procedures to assist delivery and close to half of all obstetric-related stays included fetal monitoring procedures. The third most commonly performed procedure for obstetric women was repair of current obstetric laceration.

Table 3. Top 10 All-listed Procedures by Patient Type, Delaware, 2007

All-listed Procedures	Males		Non-obstetric females		Obstetric females	
	#	%	#	%	#	%
Diagnostic cardiac catheterization	7,090	14.6	5,002	9.1		
Circumcision	4,892	10.1				
Respiratory intubation and mechanical ventilation	3,675	7.6	3,292	6.0		
(CT) scan; head	3,495	7.2	3,888	7.1		
Blood transfusion	3,321	6.8	3,572	6.5		
Diagnostic ultrasound of heart (echocardiogram)	2,959	6.1	3,258	6.0		
Other OR procedures on vessels other than head and neck	2,727	5.6				
Other vascular catheterization; not heart	2,512	5.2	2,867	5.2		
Other diagnostic ultrasound	2,460	5.1	3,205	5.9	368	2.7
CT scan; abdomen	2,299	4.7	3,067	5.6		
Magnetic resonance imaging			2,907	5.3		
Diagnostic ultrasound of abdomen or retroperitoneum			2,048	3.7		
Other procedures to assist delivery					9,364	68.3
Fetal monitoring					6,244	45.6
Repair of current obstetric laceration					4,181	30.5
Cesarean section					3,909	28.5
Artificial rupture of membranes to assist delivery					3,057	22.3
Forceps; vacuum; and breech delivery					964	7.0
Ligation or occlusion of fallopian tubes					775	5.7
Episiotomy					540	3.9
Other therapeutic obstetrical procedures					368	2.7

Notes:

1. Percents are calculated using the total number of discharges.
2. "All-listed procedures" refers to all procedures performed during a hospital stay; patients often receive more than 1 procedure. Miscellaneous minor diagnostic and therapeutic procedures are excluded.
3. Procedures that occurred more than once on the same discharge were only counted once.

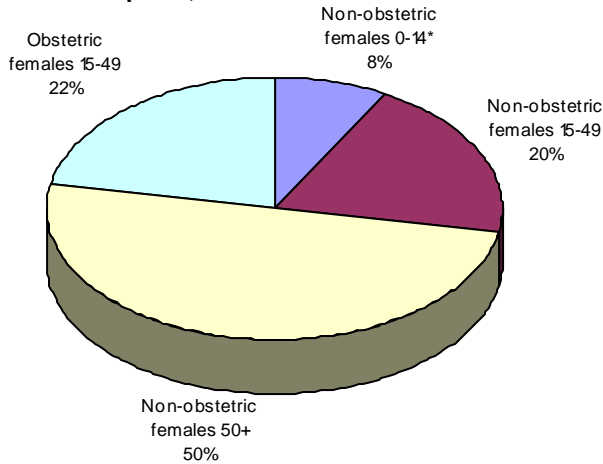
Source: Delaware Health Statistics Center

Non-obstetric females and obstetric females of reproductive age (15-49)

Excluding liveborn infants (infants who were hospitalized by virtue of being born in the hospital), non-obstetric females 50 and older accounted for half of all female hospitalizations in 2007; 8 percent were non-obstetric females under 15.

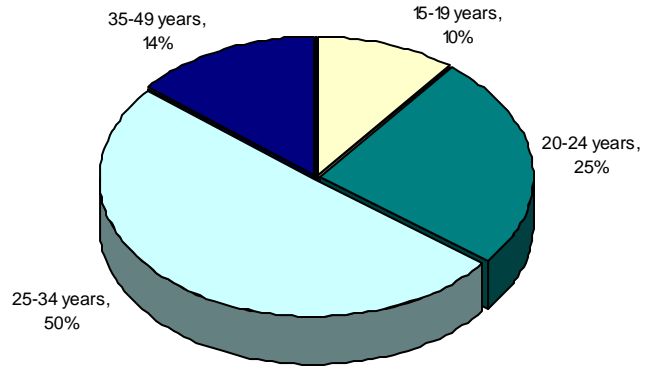
Patients 25-34 made up half of all obstetric hospitalizations. One in ten obstetric hospitalizations was a teen 15-19 years of age.

Figure 7. Age composition of Female Patients Delaware Hospitals, 2007



Source: Delaware Health Statistics Center

Figure 8. Age composition of Obstetric Female Patients, Delaware Hospitals, 2007

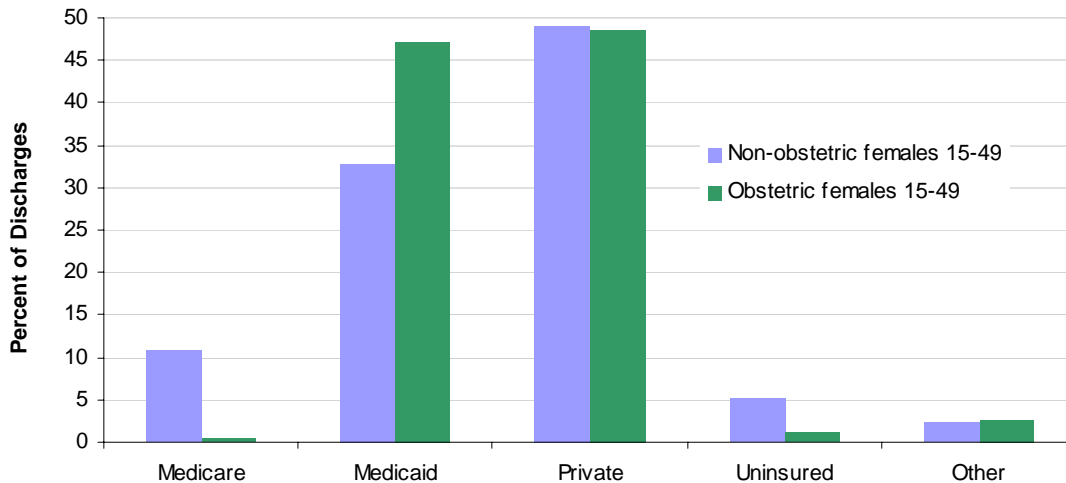


Source: Delaware Health Statistics Center

Compared to obstetric females 15-49 years of age, non-obstetric females of the same age have longer lengths of stay (4.2 versus 2.8 days) and higher average charges (\$17,452 versus \$7,024) per stay.

Private insurance was the primary payer for nearly half of all hospital stays for all women 15-49. Obstetric females were more likely to have Medicaid as their primary payer, while non-obstetric females were 4 times as likely to have no coverage.

Figure 9. Distribution of Primary Payer by Type of Female Patient 15-49, Delaware Hospitals, 2007



Source: Delaware Health Statistics Center

The most common diagnoses for obstetric females varied little between age groups, OB-related trauma and other complications of birth affecting management of the mother were present in all four age groups; previous c-section replaced complications of pregnancy as age increased and women were more likely to have had a previous birth.

Two of the four age groups (20-24 and 25-34) of non-obstetric females had mood disorders as their most commonly listed principal diagnosis; biliary tract (gallbladder) disease was the second most frequently listed principal diagnosis for the same age groups.

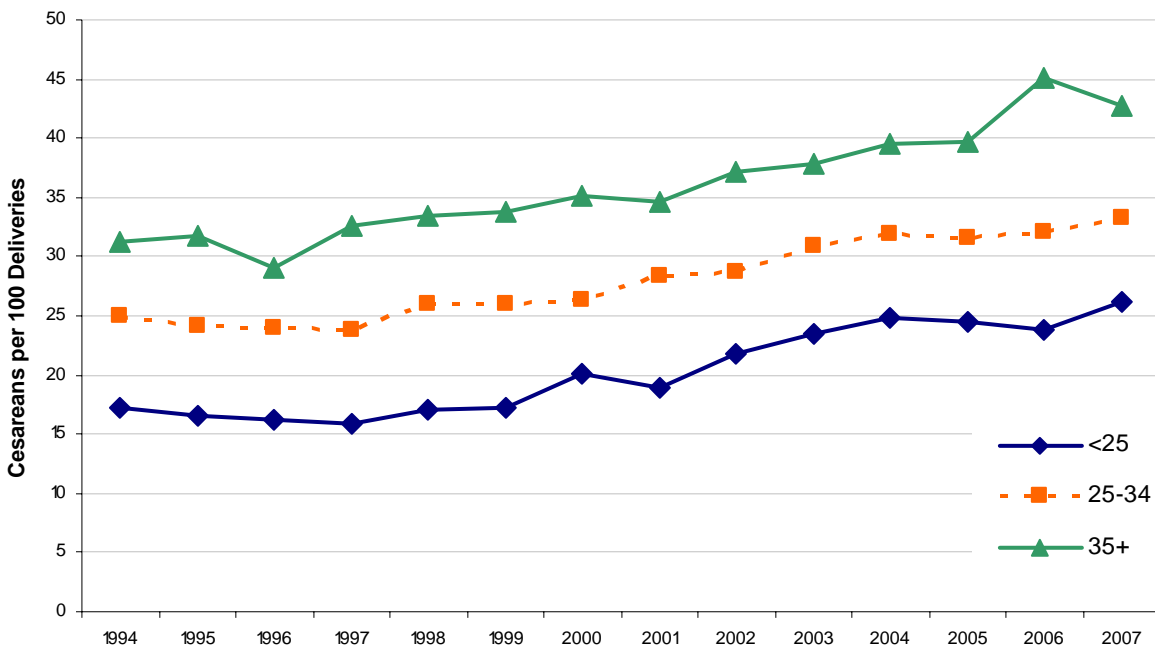
Table 4. Three most frequently listed Principal diagnoses for females 15-49 by age group and patient type.

Age Group	Obstetric females	Non-obstetric females
15-19	OB-related trauma to perineum and vulva	Urinary tract infections
	Other complications of birth; puerperium affecting mgmt of mother	Headache; including migraine
	Other complications of pregnancy	Appendicitis and other appendiceal conditions
20-24	OB-related trauma to perineum and vulva	Mood disorders
	Other complications of birth; puerperium affecting mgmt of mother	Biliary tract disease
	Other complications of pregnancy	Skin and subcutaneous tissue infections
25-34	OB-related trauma to perineum and vulva	Mood disorders
	Previous C-section	Biliary tract disease
	Other complications of birth; puerperium affecting mgmt of mother	Abdominal pain
35-49	Other complications of birth; puerperium affecting mgmt of mother	Benign neoplasm of uterus
	Previous C-section	Nonspecific chest pain
	OB-related trauma to perineum and vulva	Spondylosis; intervertebral disc disorders; other back problems

Source: Delaware Health Statistics Center

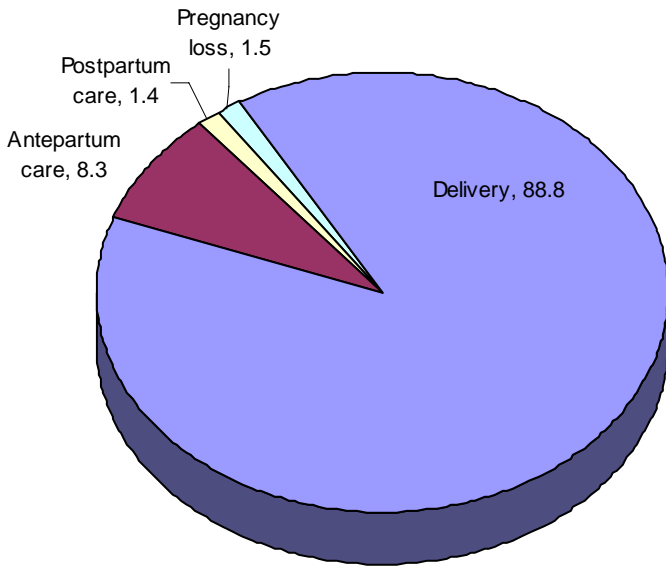
The 2007 cesarean section rate was 32.2 per 100 deliveries, 40% higher than in 1994. Rates were highest for older mothers, those 35 and older had a rate of 42.8 per 100, versus those under 25 with a rate of 26.3.

Figure 10. Annual Cesarean Delivery Rates by Mother's Age, Delaware Hospitals, 1994-2007



Source: Delaware Health Statistics Center

Figure 11. Distribution of Obstetric Patients' Hospitalizations, Delaware Hospitals, 2007



Deliveries accounted for the vast majority of obstetric stays in 2007, nearly one-third of which were by cesarean section.

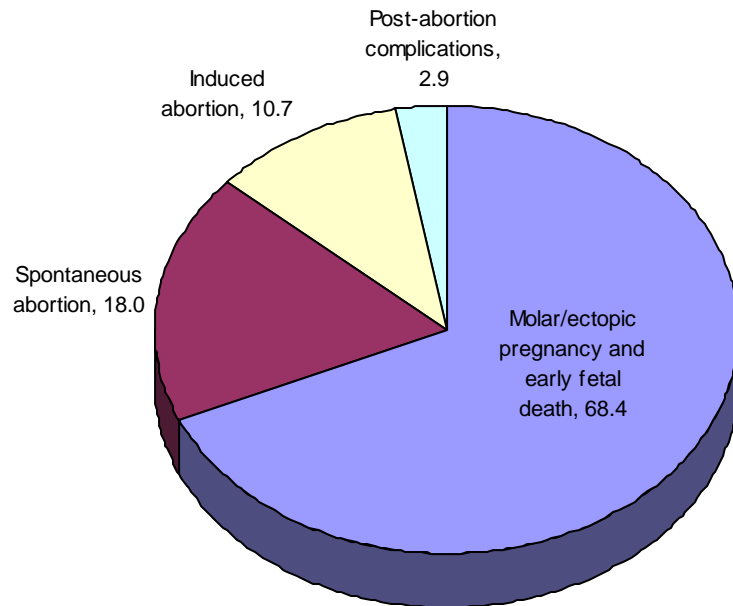
Approximately 10 percent of obstetric stays resulted from antepartum and postpartum care, and the remaining 1.5 percent involved pregnancy loss.

Source: Delaware Health Statistics Center

Antepartum stays are hospitalizations of pregnant women prior to and not including delivery. The most common reason for antepartum care was early or threatened labor, which accounted for 1 in 3 stays. Infections of the genitourinary tract, excessive vomiting, hypertension, and hemorrhage (bleeding) accounted for another 25 percent of all antepartum stays.

One-quarter of postpartum hospitalizations, in which care is received after delivery, were for hypertension. Infections, complications of obstetrical surgical wound, and hemorrhage accounted for another 40 percent of postpartum stays.

Figure 12. Distribution of Hospitalizations Related to Pregnancy Loss, Delaware Hospitals, 2007



Over half of hospitalizations related to pregnancy loss were due to molar and ectopic pregnancies and early fetal death; another 18 percent were due to spontaneous abortion or stillbirth/miscarriage.

Source: Delaware Health Statistics Center

References:

1. Elixhauser, A. and Jiang, H. J. *Hospitalizations for Women with Circulatory Disease, 2003*. HCUP Statistical Brief #5. May 2006. Agency for Healthcare Research and Quality, Rockville, MD. <http://www.hcup-us.ahrq.gov/reports/statbriefs/sb5.pdf>.
2. Owens P, Myers M, Elixhauser A, Brach C. *Care of Adults with Mental Health and Substance Abuse Disorders in U.S. Community Hospitals, 2004*. Agency for Healthcare Research and Quality, 2007. HCUP Fact Book No.10. AHRQ Publication No. 07-0008. ISBN 1-58763-229-2.
3. Merrill C, Elixhauser A. *Procedures in U.S. Hospitals, 2003*. Rockville, MD: Agency for Healthcare Research and Quality; 2005. HCUP Fact Book No. 7. AHRQ Publication No. 06-0039. ISBN 1-58763-185-7.
4. Jiang HJ, Elixhauser A, Nicholas J, et al. *Care of Women in U.S. Hospitals, 2000*. Rockville (MD): Agency for Healthcare Research and Quality; 2002. HCUP Fact Book No. 3; AHRQ Publication No. 02-0044.
5. Johnson RL, Thomas KE, Sarmiento K. *State Injury Indicators: Instructions for Preparing 2005 Data*. Atlanta (GA): Centers for Disease Control and Prevention, National Center for Injury Prevention and Control; 2007.
6. Chu SY, Bachman DJ, Callaghan WM et al. *Association between obesity during pregnancy and increased use of healthcare*. N Engl J Med. 2008;**358**:1444–53.
7. Mahmood T. *Obesity and pregnancy: an obstetrician's view*. Br J Diabetes Vasc Dis. 2009;**9**:19-22.
8. Olshansky SJ, Passaro DJ, et al. *A Potential Decline in Life Expectancy in the United States in the 21st Century*. N Engl J Med. 2005;**352**:1138–45.
9. Ogden CL, Carroll MD, McDowell MA, Flegal KM. *Obesity among adults in the United States— no change since 2003–2004*. NCHS data brief no 1. Hyattsville, MD: National Center for Health Statistics. 2007.



DELAWARE HEALTH AND SOCIAL SERVICES

Division of Public Health

If you have comments, suggestions, and/or questions, please contact the Delaware Health Statistics Center at (302) 744-4541.