

Florida's Pregnancy-Associated Mortality Review 2007 Update



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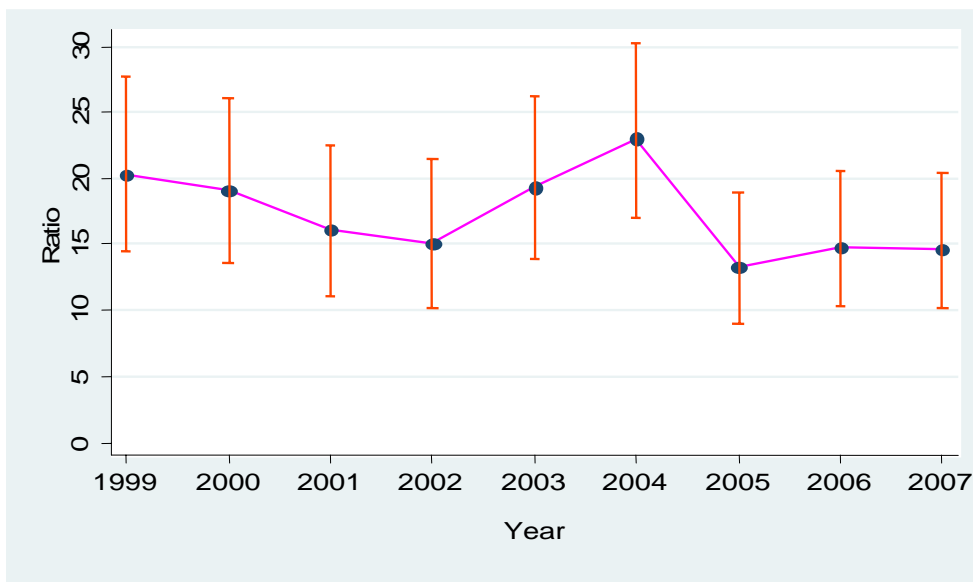
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Pregnancy-Related Mortality Findings, Florida 2007

In 2008, the Pregnancy Associated Mortality Review (PAMR) committee reviewed 59 pregnancy-associated deaths and identified 36 (61%) deaths as pregnancy related. Between 1999 to 2007, the pregnancy-related mortality ratio fluctuated from 20.3 deaths per one hundred thousand live births to a high of 23.0 in 2004, and a low of 13.3 in 2005. In 2006 and 2007, the ratios were 14.8 and 15.1 respectively (Figure 1). The slight downward trend from 1999 to 2007 is not statistically significant.

Figure 1. Pregnancy-Related Mortality Ratios and 95% C.I., Florida 1999-2007

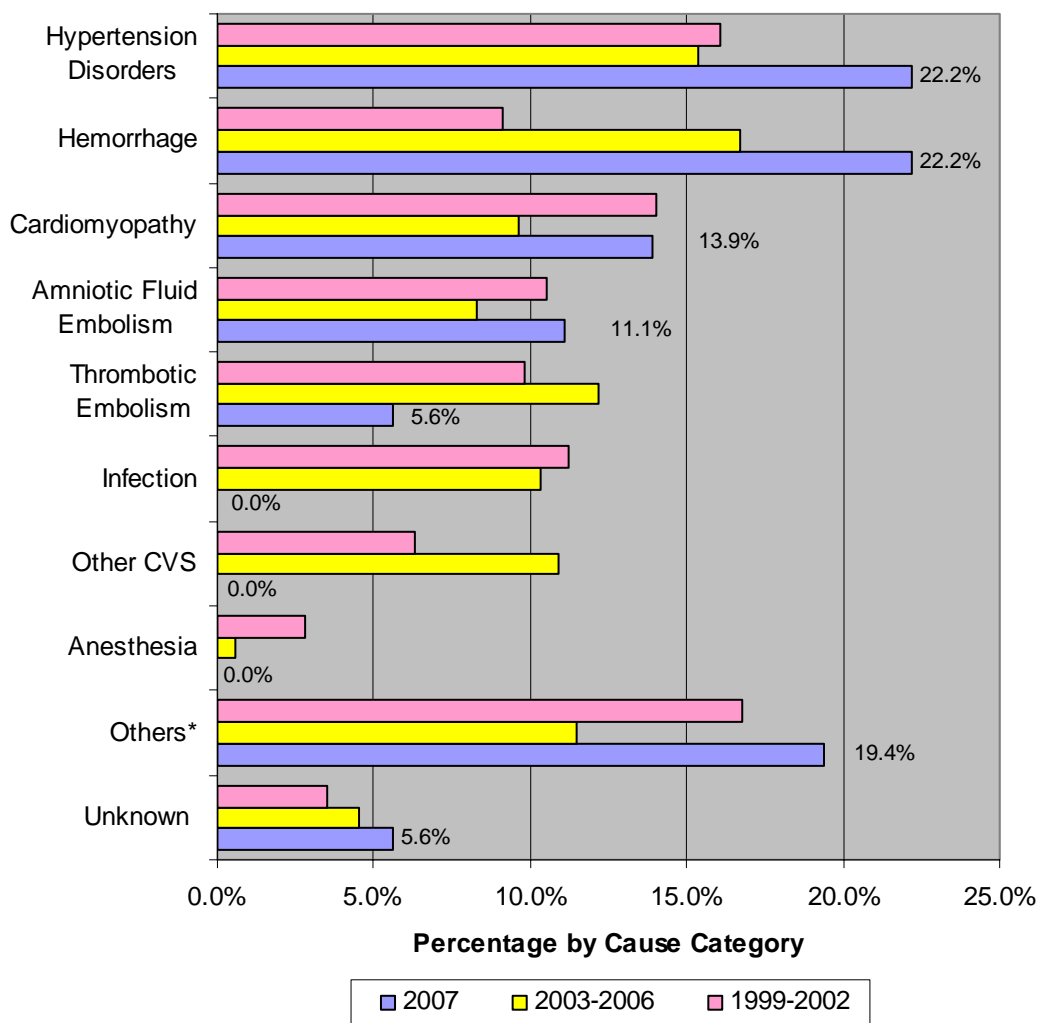


Cause of Death

The leading causes of pregnancy-related death in 2007 were hypertension (22%), hemorrhage (22%) and cardiomyopathy (14%) (Figure 2). Other remaining causes ranked third among the categories accounting for 19% of deaths. These other causes include: hematopoietic (3%), metabolic (3%), injury (3%), pulmonary problems (3%), multiple organ system failure (3%), and intracerebral hemorrhage (4%). Figure 2 shows how the percentages of deaths for hypertension disorders, hemorrhage and other causes are higher in 2007 than in other earlier time periods,

2003-2006 and 1999-2002. Limited statistical testing has been performed in this interim PAMR report because this is only one year of data with a relatively small number of deaths. Differences highlighted in this report may not be statistically significant.

Figure 2. Distribution of Pregnancy-Related Causes of Deaths, Florida 1999-2002 (n=143) 2003-2006 (n=156) 2007 (n=36)



**Table 1: Distribution of Causes of Pregnancy-Related Death, Florida
1999-2002, 2003-2006, & 2007**

Causes	1999-2002 N (%)	2003-2006 N (%)	2007 N (%)	Total N (%)
Hypertensive disorders	23(16.1)	24(15.4)	8(22.2)	55(16.4)
Hemorrhage	13(9.1)	26(16.7)	8(22.2)	47 (14.0)
Cardiomyopathy	20(14.0)	15(9.6)	5(13.9)	40 (11.9)
Amniotic fluid embolism	15(10.5)	13(8.3)	4(11.1)	32 (9.6)
Thrombotic embolism	14(9.8)	19(12.2)	2(5.6)	35 (10.4)
Infection	16(11.2)	16(10.3)	0(0.0)	32 (9.6)
Other CVS	9(6.3)	17(10.9)	0(0.0)	26 (7.8)
Anesthesia	4(2.8)	1(0.6)	0(0.0)	5 (1.5)
Others*	24(16.8)	18(11.5)	7(19.4)	49 (14.6)
Unknown**	5(3.5)*	7(4.5)*	2(5.6)*	14 (4.2)
Total	143	156	36	335

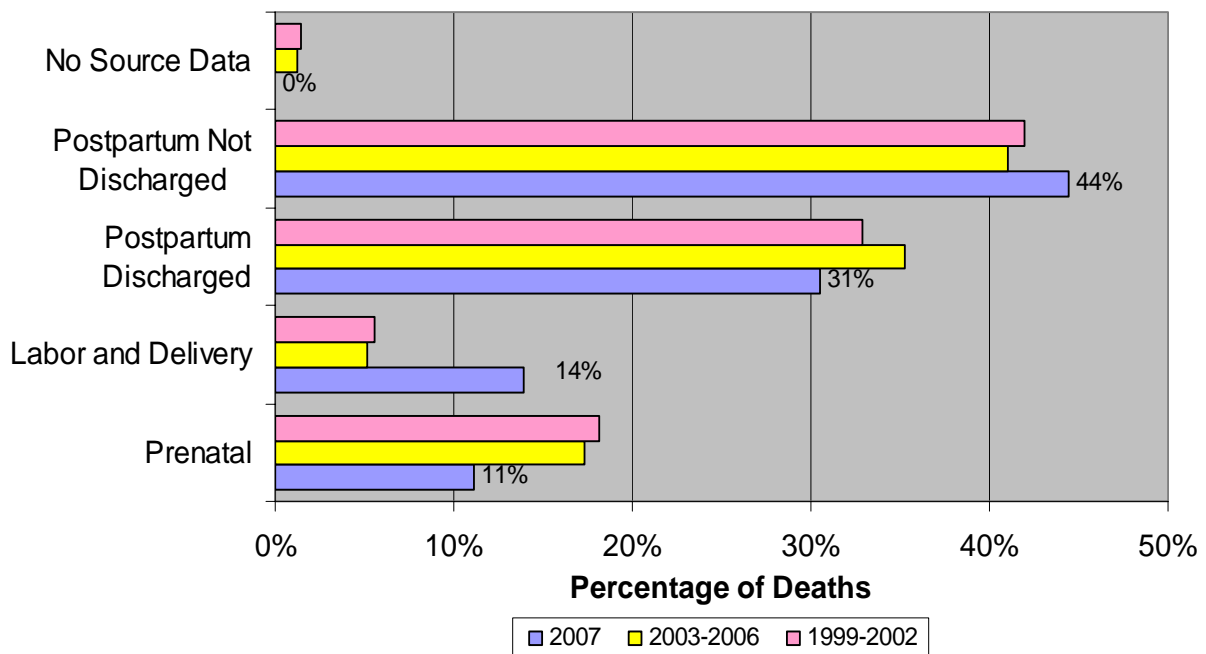
*Others (list): 8 (Hematopoietic (sickle cell, thalassemia, ITP), 3(Collagen vascular diseases), 1 (Metabolic pregnancy related), 3 (Metabolic other pregnancy related), 1 (Immune deficiency problems), 1(Injury), 4 (Cancer), 4 (Pulmonary problems), 1 (Multiple organ/system failure, NOS), 12 (Intracerebral hemorrhage (not associated with PIH), 6 (Gastrointestinal disorders), 5 (Other conditions not specified above).

Timing of Death

Figure 3 presents pregnancy-related death by timing of death: prenatal, labor and delivery, or postpartum. In 2007, 75% of the deaths occurred during the postpartum period (the period following birth up to one year). Forty-four percent of all deaths occurred postpartum prior to discharge from the delivery hospital and 31% occurred postpartum after hospital discharge. Figure 3 also presents the data from two other time periods for comparison, 2003-2006 and 1999-2002.

The most common causes of death occurring during the first six weeks among women who were discharged from the hospital after delivery, were cardiomyopathy (50%), intracerebral hemorrhage (25%), hypertension (13%) and pulmonary problems (13%). For those women who were not discharged, the most common causes of death were hemorrhage (39%), hypertension (38%), and amniotic fluid embolism (23%).

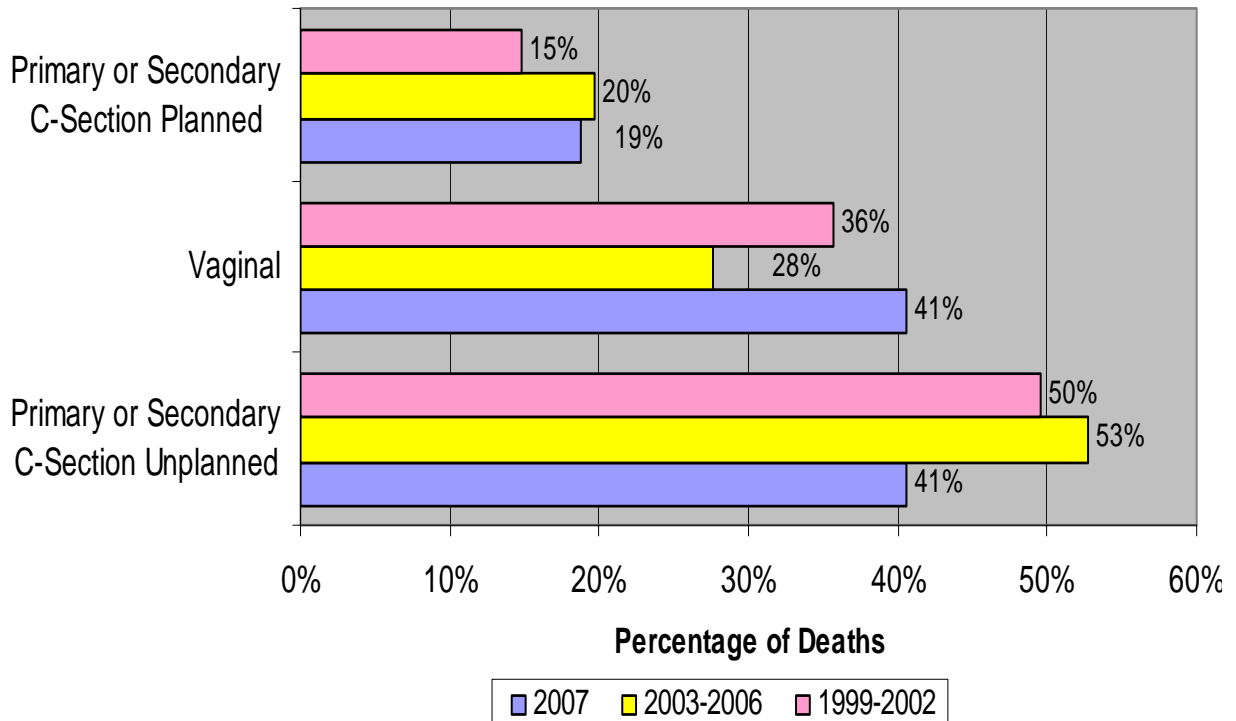
Figure 3. Percent Pregnancy-Related Mortality by Timing of Death, Florida, 1999-2002 (n=143), 2003-2006 (n=156), 2007 (n=36)



Type of Delivery

Figure 4 shows for 2007 the percent of women who died during labor and delivery or postpartum by type of delivery. The majority (60%) were cesarean deliveries. Of them 19% were planned and 41% were unplanned. The percentage of women who died after a vaginal delivery increased to 41%. Figure 4 presents data from two other time periods for comparison, 2003-2006 and 1999-2002.

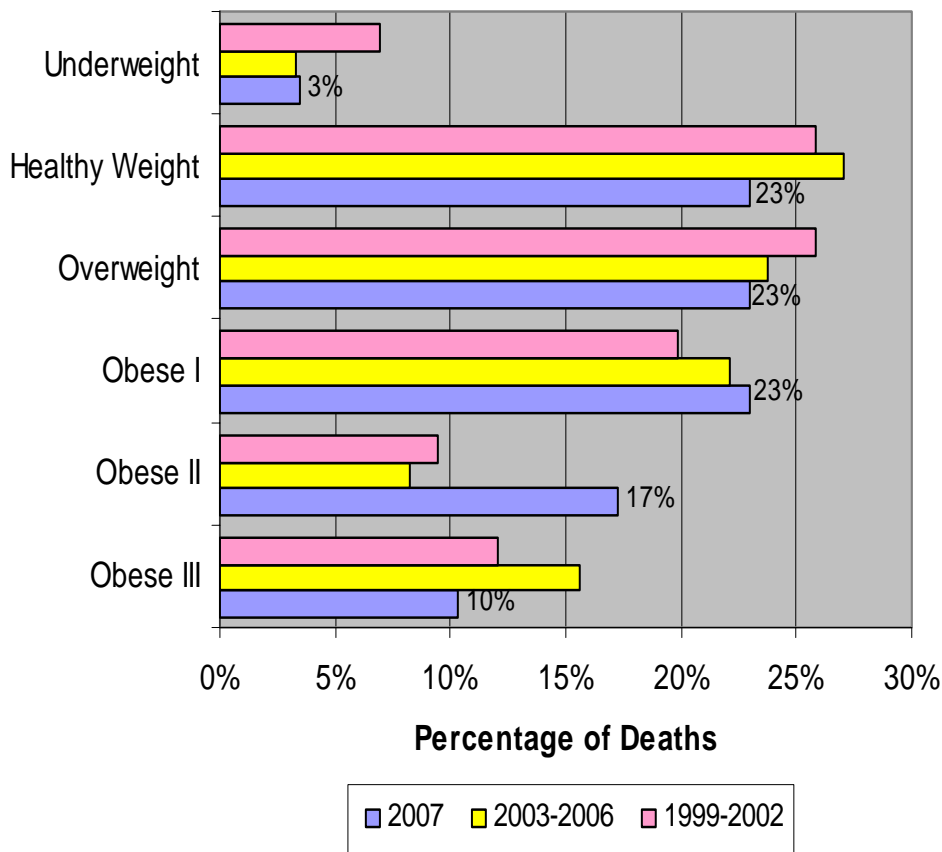
Figure 4. Percent Pregnancy-Related Mortality by Type of Delivery, Florida, 1999-2002 (n=115), 2003-2006 (n=127), 2007 (n=32)



Weight

In 2007, the majority (73%) of women experiencing a pregnancy-related death fell into the overweight and obese I, II, or III categories (Figure 5). Half (50%) were obese. This compares to 20% of all women having a live births being obese. Figure 5 presents data from two other time periods for comparison.

Figure 5. Percent of Pregnancy-Related Mortality by BMI, Florida, 1999-2002 (n= 116), 2003-2006 (n=122), 2007 (n=30)



FL PAMR Recommendations for the 36 Pregnancy-Related Deaths in 2007

After reviewing pregnancy-related deaths, the PAMR committee identifies relevant issues related to the death and makes recommendations in an effort to prevent such future deaths. Below summarizes these issues and recommendations into four prevention categories:

CLINICAL FACTORS: Relates to services provided by the entire health care system

ISSUES: A lack of services evidenced by:

1. Incomplete assessment
2. Inadequate documentation
3. Lack of coordination and follow-up particularly of high-risk women
4. Deficient communication between staff and patients
5. Lack of association between a change in mental status and deteriorating medical condition

RECOMMENDATIONS:

1. High risk women may require longer postpartum stay
2. Use protocols for emergent hypertension
3. Obtain cardiac evaluation for increased swelling and shortness of breath (SOB)
4. Refer patients for smoking cessation
5. Include SOB with postpartum discharge education
6. Inform patients to notify provider if patient has SOB
7. Patient education-preconception counseling of risks for women who are of advanced maternal age and/or morbidly obese
8. Provide nutrition counseling for obese patients
9. Increase care coordination for women with chronic illness prenatally and postpartum
10. Thoroughly assess women at high risk for hemorrhage
11. Incorporate a team approach in the management of postpartum hemorrhage
12. Link high risk patients to care coordination with primary care and/or specialist
13. Screen pregnant women for psychosocial issues and provide referral and follow-up for identified risks
14. Women presenting to ER with abdominal pain and anemia should be suspect for ectopic until proven otherwise

15. Post op monitoring should reflect the level of acuity.

SYSTEM FACTORS: A lack of policies and procedures may lend itself to deficient quality of care, which potentially can affect a woman's health outcome

ISSUES:

1. Lack of standard treatment policy for prevention of thrombotic embolism particularly for pregnant and postpartum women who are obese and /or have Cesarean deliveries
2. Postpartum education was not inclusive for signs of thrombosis and cardiovascular events
3. Decreased number of available beds due to limited staffing

RECOMMENDATIONS:

1. Guidelines and procedures for care of a patient presenting with elevated blood pressure and pre-eclampsia
2. Need proactive protocol for early intervention and appropriate management of preeclampsia, abruption and hemorrhage
3. All birth facilities should have standard protocols on effective management of postpartum hemorrhage including prompt identification of hemorrhage

DEATH REVIEW FACTORS: The PAMR process relies on information from death certificates and autopsy reports for the identification and evaluation of pregnancy-related deaths

ISSUES:

1. Lack of autopsy on unexplained or inconclusive deaths
2. Death certificates not completed accurately
3. Missing prenatal record impeded review

RECOMMENDATIONS:

1. Autopsy final records need to be available on medical records
2. Increase awareness on importance of autopsy for unexplained maternal death
3. Develop standard criteria for Medical Examiner to use when deciding to accept a case

4. Medical providers need to refer cases of maternal death to the medical examiner

INDIVIDUAL/COMMUNITY FACTORS: It has been established that a woman's health prior to her pregnancy can greatly affect the birth outcome as well as the woman's health status after birth. Some deaths may be associated with a woman's personal decision regarding her health and her care. It is important that healthcare providers enable women to make informed decisions.

ISSUES:

1. Women presenting in pregnancy with pre-existing medical conditions such as hypertension, obesity, diabetes and asthma
2. Lack of documentation of patient education and counseling regarding a woman's risk factors

RECOMMENDATIONS:

1. Educate communities on the risk of professionally unattended home birth
2. Increase patient knowledge of chronic illness and potential impact on pregnancy
3. Include spouse on preconception counseling
4. Patients need to be educated on risk of pregnancy with advanced maternal age, obesity, and multiple gestation
5. Raise awareness that stressors and life circumstances affect individuals decisions regarding their health and accessing care
6. Teach patients about shortness of breath and severe headaches as warning signs of complications
7. Guidelines for follow up-needs of children left behind
8. Guidelines for exercise with morbid obese patient
9. Protocols for pregnant women regarding when and where and how to seek care if experiencing abdominal pain

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