



# Pregnancy-Related Deaths during the Postpartum Period, 1999-2004

## Pregnancy-Associated Mortality Review

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*In 1996, The Florida Department of Health initiated the Pregnancy-Associated Mortality Review (PAMR) to improve surveillance and analysis of pregnancy-related mortality. A pregnancy-related death is a death resulting from: 1) complications of the pregnancy itself, 2) the chain of events initiated by the pregnancy that led to death or 3) aggravation of an unrelated condition by the physiologic or pharmacologic effects of the pregnancy that subsequently caused death.<sup>1</sup>*

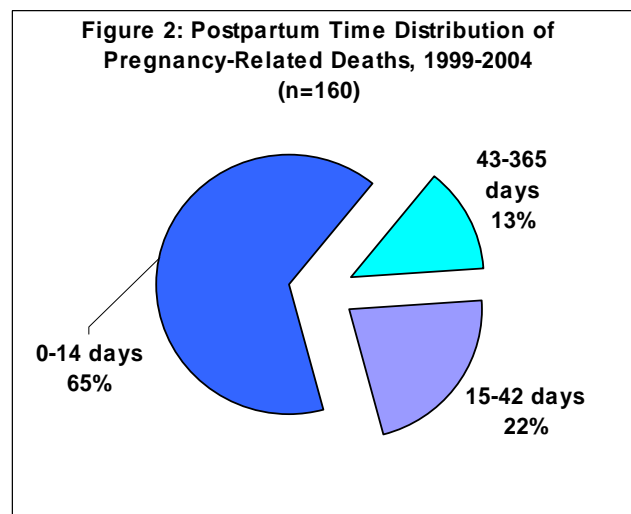
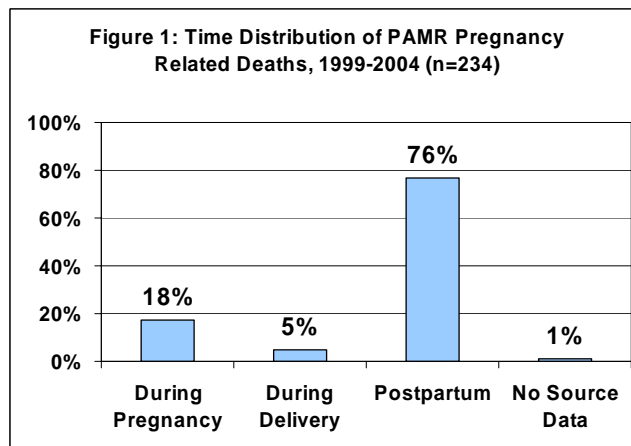
In Florida, the Pregnancy-Associated Mortality Review (PAMR) pregnancy-related mortality ratio has remained fairly consistent ranging from 20.3 in 1999 to 23.0 in 2004. The Healthy People 2010 goal is to reduce maternal mortality to 3.3 maternal deaths per 100,000 live births. During 1999-2004, the PAMR team classified 234 cases as pregnancy-related deaths. The majority of the deaths (179; 76%) occurred during the postpartum period. Figure 1 shows the time distribution for these 234 deaths.

Many complications can occur in 6 to 8 weeks or within 1 year following a pregnancy. The early postpartum period is critical to maternal survival. The American Academy of Pediatrics, American College of Obstetricians, and Gynecologists and the American College of Nurse Midwives, recommend that every postpartum woman should follow-up with her physician within 4 to 6 weeks after delivery or within 7-14 days after a cesarean delivery or complicated delivery.<sup>2</sup>

Of the 179 postpartum deaths, the number of days from date of live birth or fetal death was known for 160 cases. During this postpartum period, 139 (87%) were early postpartum deaths (0-42 days), and 21 (13%) were late postpartum deaths (43-365 days), see figure 2. The majority of these deaths occurred during the early postpartum period; within the recommended 4 to 6 week postpartum check-up. Sixty-five percent of the deaths occurred within 2 weeks of their live birth or fetal demise.

Of the 104 (65%) women dying during the first 2 weeks of their live birth or fetal demise, 30% were discharged and 70% were not discharged from the hospital. The leading causes of death were Hypertension and Embolism for those not discharged and Cardiomyopathy, Infection, and Embolism for those discharged from the hospital, see Table 1.

Table 2 shows, women who received no prenatal care, were approximately 8 times more likely to



**Table 1: PAMR Pregnancy-Related Postpartum Causes of Death Within Two-weeks of the Live Birth or Fetal Death, 1999-2004 (n=104)**

Cause of Death	Not Discharged		Discharged	
	Number	Percent	Number	Percent
Hypertension	19	26.03%	3	9.68%
Embolism	17	23.29%	5	16.13%
Hemorrhage	8	10.96%	1	3.23%
Cardiomyopathy	1	1.37%	7	22.58%
Infection	2	2.74%	5	16.13%
Anesthesia Complications	2	2.74%	0	0.00%
Other	22	30.14%	7	22.58%
Cerebrovascular Accident	2	2.74%	3	9.68%
<b>Total</b>	<b>73</b>	<b>100.00%</b>	<b>31</b>	<b>100.00%</b>

experience a postpartum pregnancy-related death. When compared to White women, Black women were 5 times more likely to experience a postpartum pregnancy-related death. Additionally, women aged 35 and older (RR=2.9), who completed high school (RR=1.6), were unmarried (RR=1.2), were classified as overweight (RR=2.4) or obese I, II, or III, (RR= 4.1, 3.0, 7.4, respectively) were more likely to experience a postpartum pregnancy-related death.

Women significantly most at risk for a postpartum pregnancy-related death, from highest to lowest risk: received no prenatal care (CI:3.48,16.40), were classified as obese III (CI:4.24,12.89), of Black race (CI:3.62,7.0), classified as obese I (CI:2.59,6.43), or obese II (CI:1.55,5.87), were aged 35 or older (CI:1.62,5.2), classified as overweight (CI:1.59,3.75), or had only a high school education (CI:1.13,2.18).

Table 2: Postpartum pregnancy-related mortality ratios and unadjusted risk ratios, 1999-2004					
	Total Deaths	Pregnancy-Related Mortality Ratios	Risk Ratio	Lower CI	Upper CI
<b>Race and Ethnicity</b>					
White	58	6.3	Referent		
Black*	89	31.8	5.04	3.62	7.01
Hispanic	25	8.3	1.31	0.82	2.09
<b>Age Groups</b>					
19 or Less	15	10.2	Referent		
20-24	38	12.0	1.17	0.64	2.13
25-34	73	12.1	1.18	0.68	2.06
35 or greater*	53	30.0	2.93	1.65	5.2
<b>Education</b>					
< High School	34	13.37	1.12	0.74	1.70
High School*	78	18.70	1.57	1.13	2.18
> High School	67	11.91	Referent		
<b>Marital Status</b>					
Married	100	13.26	Referent		
Unmarried	79	16.20	1.22	0.91	1.64
<b>Prenatal Care Initiation</b>					
1st Trimester	75	7.39	Referent		
2nd Trimester	15	9.87	1.33	0.77	2.32
3rd Trimester	3	10.60	1.43	0.45	4.54
None*	7	55.89	7.56	3.48	16.40
<b>Body Mass Index (BMI) Categories</b>					
Underweight	8	0.74	1.48	0.69	3.16
Healthy Weight	40	0.50	Referent		
Overweight*	44	1.22	2.45	1.59	3.75
Obese I*	35	2.04	4.08	2.59	6.43
Obese II*	11	1.51	3.01	1.55	5.87
Obese III*	18	3.70	7.39	4.24	12.89

\*statistically significant

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## Florida PAMR Committee Postpartum Recommendations:

**Self-Empowerment** – systems must be in place to assure the health needs of postpartum women are being met. Women and their families must know how to recognize the “danger signs,” where to access healthcare, and what services are available.

**Discharge Teaching** – must be thorough, specific, and education-level appropriate. Teaching should include information on the importance of seeking care for prolonged headache, shortness of breath, swelling, redness, warmth, or pain in lower extremities, chest pain, palpitations, and syncope. Teaching should also stress the importance of follow-up. Additionally, women with complex medical problems during delivery need to be carefully evaluated prior to discharge and may need longer hospital stays.

**Emergency Personnel Training** – to increase the awareness of potential cardio-respiratory complications in all postpartum women presenting to an emergency facility. Women presenting with cardio-respiratory symptoms require comprehensive evaluations.

**Interconception Counseling** – must be provided to all women concerning family planning, baby spacing, chronic illness, nutrition, exercise, and lifestyle habits.

Florida’s pregnancy-related deaths have remained continually high. The research presented here is consistent with national research from the Maternal and Child Health Bureau which indicates women of Black race, women aged 35 or older, and those who receive no prenatal care are at the highest risk for death from a pregnancy-related complication.<sup>3</sup>

Continued, ongoing monitoring of systems of care as well as further prevention research of cultural, health issues, and prevention programs are warranted.

### References:

1. Berg C, Danel I, Atrash H, Zane S, Barlett L. Strategies to reduce pregnancy-related deaths: from identification and review to action. Atlanta: Centers for Disease Control and Prevention; 2001.
2. Guidelines for Perinatal Care, Fifth Edition, 2002. American Academy of Pediatrics and the American College of Obstetricians and Gynecologists, page 159.
3. Women’s Health USA 2003: Maternal Mortality, Maternal and Child Health Bureau. Date accessed: 02/ 07/07. [http://www.mchb.hrsa.gov/pages/page\\_55.htm](http://www.mchb.hrsa.gov/pages/page_55.htm).