



**Florida Pregnancy-Associated Mortality Review  
Pregnancy-Related Deaths  
2012 Data Update**

**Prepared by:**

**Leticia Hernandez, PhD, MS**  
Training and Research Consultant

**Cheryl Clark, DrPH, RHIA**  
Sr. MCH Epidemiologist, Training and Research Manager

**Division of Community Health Promotion  
Florida Department of Health**

## **Florida Pregnancy-Associated Mortality Review: Pregnancy-Related Deaths, 2012 Data Update**

The Florida Pregnancy-Associated Mortality Review (PAMR) is an ongoing surveillance process that involves data collection and examination of maternal death information to promote evidence-based actions for individual behavioral changes and health care system improvements, and prevention of pregnancy-related deaths (PRDs). [For additional details about the PAMR team and process, please refer to Appendix 2]

The 2012 data update report provides overviews and comparisons of PRD data and trends for Florida between the years 2007 and 2012. Distributions of PRDs and, when applicable, PRD mortality ratios are shown by factors that are associated with maternal mortality: race/ethnicity, age, weight, timing of death, pregnancy outcome, and type of delivery. These data breakouts assist the PAMR Committee in developing specific prevention and intervention recommendations that are relevant to Florida's diverse populations of women.

Following the PRD data overviews, the 2012 update report also presents summaries of the recommendations made by the PAMR Committee based on reviews of Year 2012 cases. The recommendations provide guidance to the development of protocols and provision of care for pregnant women to assist in improving the health of women during pregnancy and reduce risks of PRD.

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*At a Glance: Pregnancy-Related Deaths: Florida, 2007-2012*

	Year 2012	Years 2007-2011	Years 2007-2012
<b>Number of Pregnancy-Related Deaths (PRDs)</b>	39	210	249
<b>Pregnancy-Related Mortality Ratios (PRMRs)</b>	18.3 PRDs per 100,000 live births	18.8 PRDs per 100,000 live births	18.7 PRDs per 100,000 live births
<b>PRMRs (PRDs per 100,000 Live Births) and PRD Distributions (Percent**) by Maternal Characteristics</b>			
<b>Race/Ethnicity*</b>	<b>Year 2012</b>	<b>Years 2007-2011</b>	<b>Years 2007-2012</b>
Black Non-Hispanic	60.7 (74.4%)	39.5 (46.2%)	42.9 (50.6%)
White Non-Hispanic	8.4 (20.5%)	13.2 (31.4%)	12.5 (29.7%)
Hispanic	1.7 (2.6%)	12.3 (18.6%)	10.7 (16.1%)
<b>Age</b>			
19 yrs. and younger	0.0 (0.0%)	8.2 (4.3%)	7.2 (3.6%)
20-24 yrs.	11.7 (15.4%)	14.8 (20.0%)	14.3 (19.3%)
25-29 yrs.	9.8 (17.9%)	17.4 (25.7%)	16.4 (24.5%)
30-34 yrs.	26.8 (33.3%)	16.8 (20.0%)	18.5 (22.1%)
35 yrs. and older	40.0 (33.3%)	38.2 (30.0%)	38.5 (30.5%)
<b>Pre-pregnancy Body Mass Index (BMI)</b>			
Underweight	20.6 (5.1%)	19.1 (5.0%)	19.4 (5.0%)
Normal	11.3 (25.6%)	10.0 (26.1%)	10.1 (26.1%)
Overweight	27.6 (35.9%)	19.6 (25.6%)	20.7 (27.3%)
Obese (I, II, & III)	29.6 (33.3%)	39.4 (43.2%)	37.7 (41.6%)
<b>PRD Distribution by Timing of Death (Percent)</b>			
	<b>Year 2012</b>	<b>Years 2007-2011</b>	<b>Years 2007-2012</b>
Prenatal	23.1%	21.4%	21.7%
Labor & Delivery	7.7%	3.3%	4.0%
Post-Partum, No Hospital Discharge	33.3%	41.9%	40.6%
Post-Partum, After Hospital Discharge	35.9%	33.3%	33.7%
<b>PRD Distribution by Pregnancy Outcome (Percent**)</b>			
	<b>Year 2012</b>	<b>Years 2007-2011</b>	<b>Years 2007-2012</b>
Abortion (spontaneous & elective)	10.3%	4.8%	5.6%
Ectopic	0.0%	7.6%	6.4%
Emergency Delivery	5.1%	5.7%	5.6%
Live Birth	56.4%	64.3%	63.1%
Molar	0.0%	0.5%	0.4%
Stillbirth	7.7%	6.2%	6.4%
Undelivered	20.5%	11.0%	12.4%
<b>PRD Distribution by Delivery Type (Percent**)</b>			
	<b>Year 2012</b>	<b>Years 2007-2011</b>	<b>Years 2007-2012</b>
Cesarean Section	72.4%	71.3%	71.4%
- <i>Planned</i>	27.6%	20.0%	21.2%
- <i>Unplanned</i>	44.8%	51.3%	50.3%
Vaginal	27.6%	28.8%	28.6%

\*Non-Hispanic Other Race not included

\*\*Note: Percent column totals may not add to 100.0% due to rounding

Pregnancy-Related Deaths

Pregnancy-Associated and Related Deaths, 2007-2012

A pregnancy-associated death is a death from any cause that occurs to a woman while pregnant or within one year of the end of pregnancy. A pregnancy-related is a death of a woman directly attributed to pregnancy and/or childbirth. PRDs are subsets of pregnancy-associated deaths. The number of pregnancy-associated deaths and pregnancy-related deaths in Florida between 2007 and 2012 are shown in Figure 1.

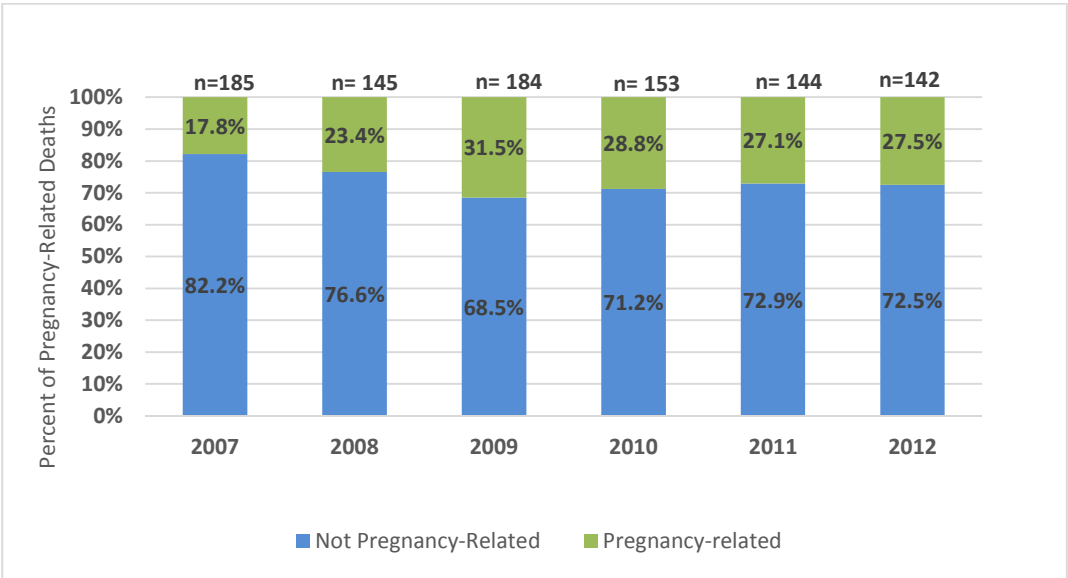


Figure 1. Pregnancy-Associated Deaths: Pregnancy-related and Not Pregnancy-Related, Florida 2007-2012

- The total number of pregnancy-associated deaths in Florida ranged from 142 to 185 deaths per year between 2007 and 2012. The number of pregnancy-associated deaths in 2012 was 142.
- The proportion of pregnancy-associated deaths that are PRD ranged from 17.8% to 31.5% between 2007 and 2012. In 2012, 27.5% (39) of 142 pregnancy-associated deaths were determined to be pregnancy-related by the Florida PAMR Committee.

## Florida Pregnancy-Associated Mortality Review: Pregnancy-Related Deaths, 2012 Data Update

### Pregnancy-Related Mortality Ratios

A measure of pregnancy-related deaths (PRD) is the pregnancy-related mortality ratio (PRMR). The PRMR is the number of PRDs per 100,000 live births. In assessing mortality, it is customary to view mortality measures over an extended period of time to identify increasing or decreasing trends. For this purpose, Figure 2 displays PRMRs for Florida between 1999 and 2012 by race and Hispanic ethnicity.

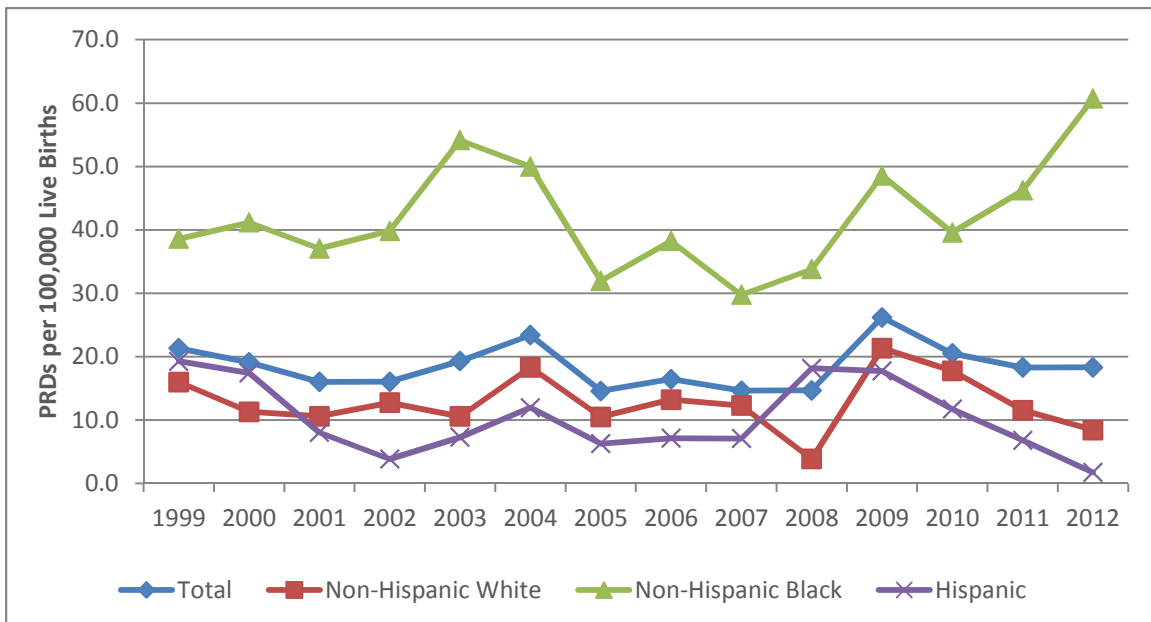


Figure 2. Pregnancy-Related Mortality Ratios (PRMRs) by Race/Ethnicity: Florida, 1999-2012

- During the period 1999 - 2012, the overall Florida PRMR fluctuated between 14.6 and 26.2. The 2009 Florida PRMR of 26.2 was the highest value in this 14-year period primarily due to an increase in PRDs due to ectopic pregnancy and the H1N1 Influenza epidemic that adversely affected pregnant women. The 2011 and 2012 PRMRs were 18.3.
- As evidenced in Figure 2, racial disparities are present and consistent with PRMR in Florida. Between 2007 and 2012, annual PRMRs among non-Hispanic black women have been at least two times higher than the PRMRs for non-Hispanic white and Hispanic women. In 2012, the PRMR for non-Hispanic black women reached a 14-year

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high (1999-2012) at 60.7 compared to a PRMR of 8.4 for non-Hispanic white women and the lowest ever PRMR of 1.7 for Hispanic women.

*Causes of Pregnancy-Related Deaths*

For each PRD case reviewed by the PAMR Committee, a primary cause of the PRD is determined.

- For the overall 2007-2012 period, the leading cause of PRD was hemorrhage at 17.7%. The second leading cause of PRD during this period was infection at 15.7%.
- In 2012, hemorrhage, hypertensive disorders and “other remaining causes” tied for the leading cause of PRDs with each accounting for 15.4% of total PRDs and collectively represented 46.2% of Year 2012 PRD cases. In 2012, cardiomyopathy, thrombotic embolism, and infection tied for the second leading cause of PRDs, each at 12.8% and collectively represented 38.4% of Year 2012 PRD cases.

Counts of PRDs by cause of death between 2007 and 2012 are provided in Table 1. The PRD causes and distribution for the 2007-2012 period are shown in Figure 3.

*Table 1. Causes of Pregnancy-related deaths (counts): Florida, 2007-2012*

<b>Causes of Death</b>	<b>2012</b>	<b>2007-2012</b>
<b>Hemorrhage</b>	<b>6</b>	<b>44</b>
<b>Infection</b>	<b>5</b>	<b>39</b>
<b>Hypertensive disorders</b>	<b>6</b>	<b>37</b>
<b>Other remaining causes</b>	<b>6</b>	<b>31</b>
<b>Cardiomyopathy</b>	<b>5</b>	<b>25</b>
<b>Cardiovascular</b>	<b>2</b>	<b>22</b>
<b>Thrombotic Embolism</b>	<b>5</b>	<b>21</b>
<b>Amniotic Fluid Embolism</b>	<b>3</b>	<b>10</b>
<b>Cerebrovascular accident</b>	<b>1</b>	<b>7</b>
<b>Anesthesia</b>	<b>0</b>	<b>3</b>
<b>Total</b>	<b>39</b>	<b>249</b>



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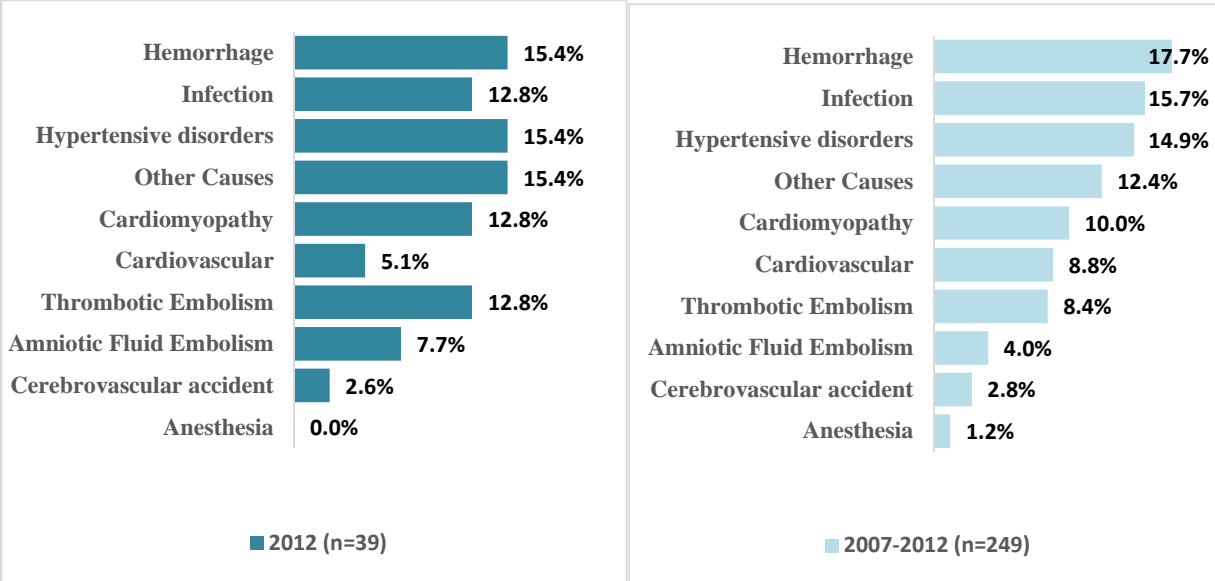


Figure 3. Distribution of Pregnancy-Related Causes of Death: Florida, 2012 and 2007-2012

*Pregnancy-Related Deaths by Age*

Examinations of age at death can point towards the presence and types of PRD protective or risk factors among age groups, such as biological effects of the aging process. PRD distribution and PRMRs by age group are shown in Figures 4a and 4b.

- Between 2007 and 2012, the majority (66.3%) of the PRDs occurred in women who were 20-34 years old. However, approximately one-third of the PRD cases occurred in women who were 35 and older. (Figure 4a)

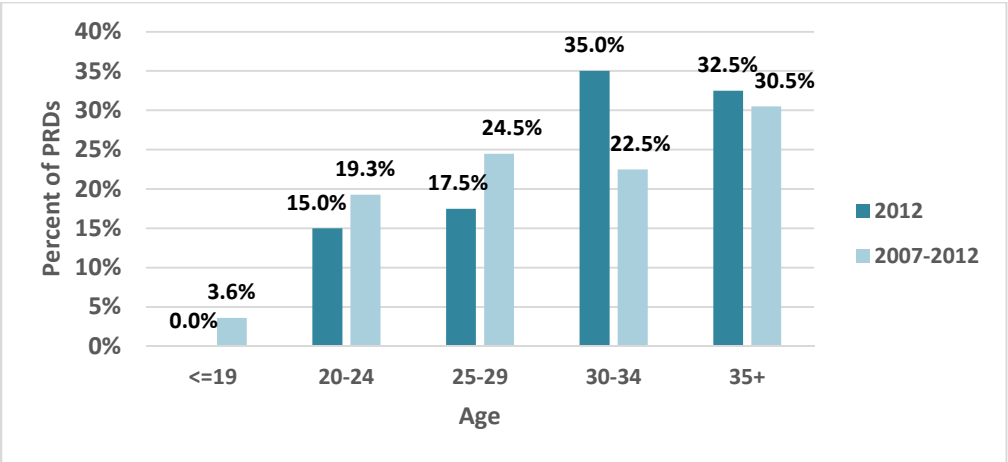


Figure 4a. Distribution of Pregnancy-Related Deaths by Age: Florida, 2007-2012

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- For PRDs that occurred between 2007 and 2012, risk for PRDs increased at each age group increment. Women aged 19 or younger had the lowest PRMRs at 7.2 and women aged 35 or older had the highest PRMRs at 38.5. (Figure 4b)

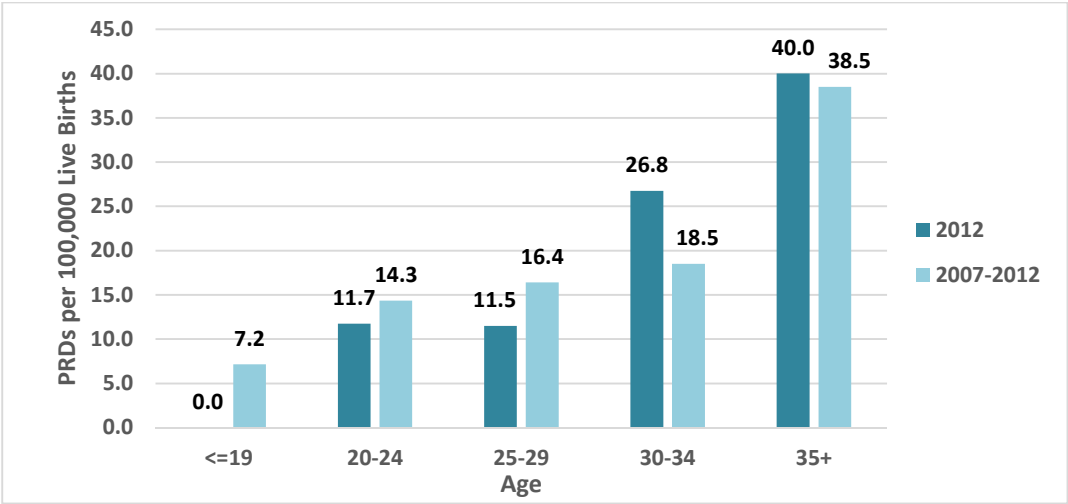


Figure 4b. Pregnancy-Related Mortality Ratios by Age: Florida, 2007-2012

*Pregnancy-Related Deaths by Pre-pregnancy Body Mass Index*

Body Mass Index (BMI) is a calculated measure of the relative percentage of body fat based on height and weight. PAMR uses the following BMI categories to examine associations between weight before pregnancy and PRD: underweight, normal weight, overweight, obese (Class I, Class II, Class III). [See Appendix 1 for detailed definitions on BMI calculation and BMI categories.] Distributions of PRDs and PRMRs by BMI category are shown in Figures 5a & 5b, respectively.

- Between 2007 and 2012, 68.8% of PRD cases had an overweight or obese pre-pregnancy BMI. Comparably during the same time period, a lesser percentage of all Florida women who had a live birth had an overweight/obese pre-pregnancy BMI at approximately 43% (not shown in figures) [1].

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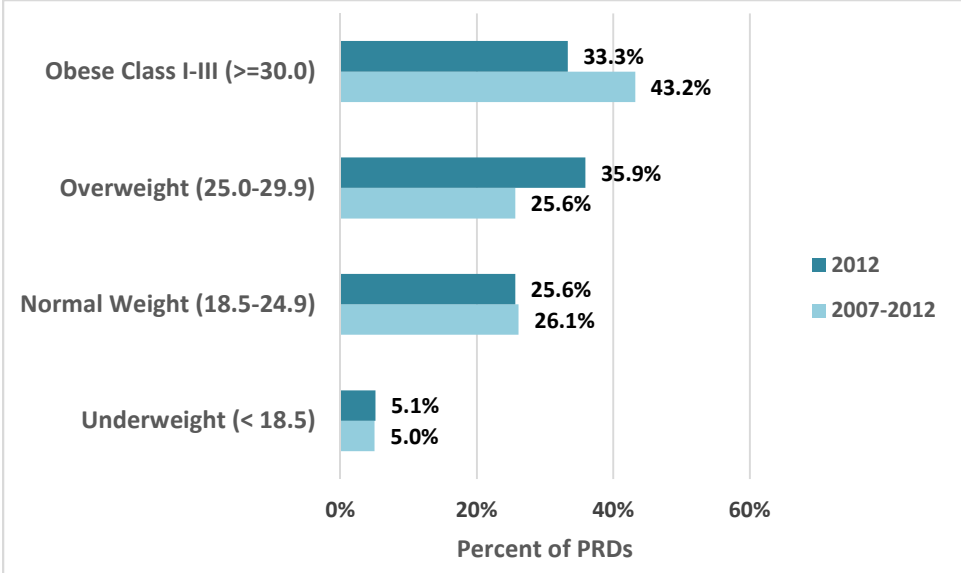


Figure 5a. Distribution of Pregnancy-Related Deaths by Pre-Pregnancy BMI: Florida, 2007-2012

- As presented in Figure 5b, PRD cases with higher pre-pregnancy BMIs had higher PRMRs. Between 2007 and 2012, the PRMR was 10.1 for PRD cases with normal weight pre-pregnancy BMIs versus 20.9 and 37.7 for PRD cases with overweight and obese (Classes I, II, & III) pre-pregnancy BMIs, respectively.

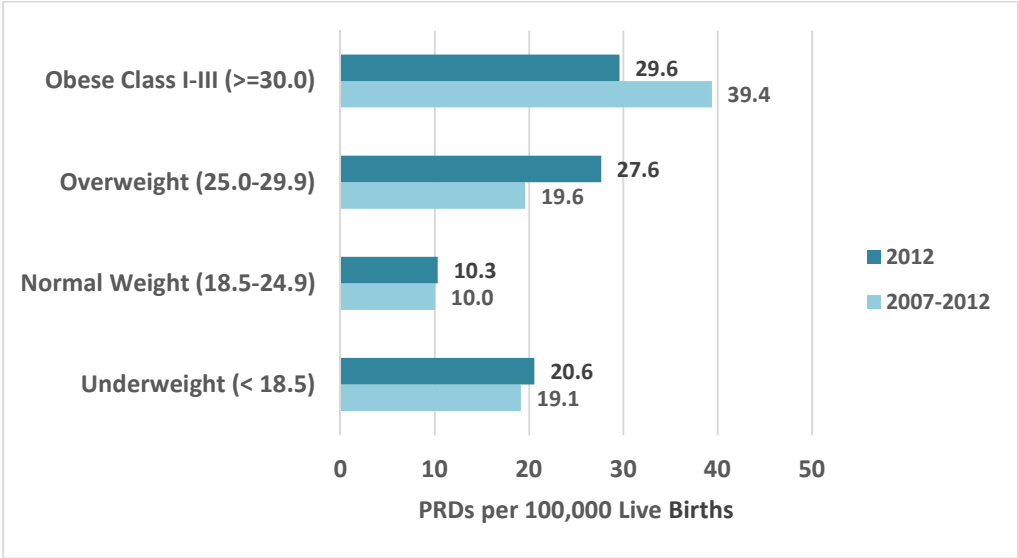


Figure 5b. Pregnancy-Related Mortality Ratios by Pre-Pregnancy BMI: Florida, 2007-2012

*Pregnancy-Related Deaths by Timing of Death*

The PAMR process classifies timing of death for PRDs into categories defined by the three perinatal periods in which PRDs can occur: prenatal; labor and delivery; and postpartum. The postpartum period is divided into two subcategories: Postpartum–Not Discharged from the Hospital and Postpartum–Discharged from Hospital. [See Appendix 1 for detailed definitions.]

PRDs by timing of death between 2007 and 2012 are shown in Figure 6.

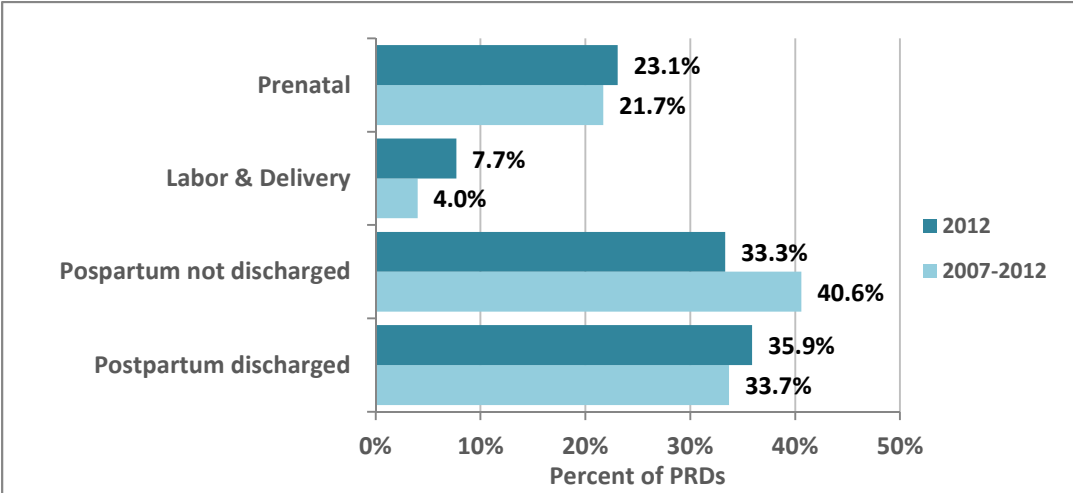


Figure 6. Distribution of Pregnancy-Related Deaths by Timing of Death: Florida, 2007-2012

- Between 2007 and 2012, a majority of PRDs (74.3%) occurred in the postpartum period. There are differences between the causes of death in the postpartum period for cases that were and were not discharged from hospitals.
  - Of the postpartum PRD cases who were not discharged from the hospital, the PRD causes were hemorrhage, hypertensive disorders, thrombotic embolism, amniotic fluid embolism, and other remaining causes.
  - Of the women who died after hospital discharge, more than half died during the first six-weeks postpartum. The causes of death for women who died within the first six weeks postpartum differed from women who died after the sixth postpartum week. The PRD that occurred during the first six-weeks postpartum were due to cardiomyopathy, cerebrovascular accident and other remaining causes. Of women who died after six-weeks postpartum

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and were discharged from the hospital, the leading causes of death were cardiomyopathy, infection, and thrombotic embolism.

*Pregnancy-Related Deaths by Pregnancy Outcome*

In the PAMR process, pregnancy outcomes are classified as: undelivered, molar, abortion (therapeutic or elective), emergency delivery, ectopic, stillbirth, or live birth. [See Appendix 1 for detailed pregnancy outcome definitions.] Figure 7 shows PRDs by outcome of pregnancy for the 2007-2012 period.

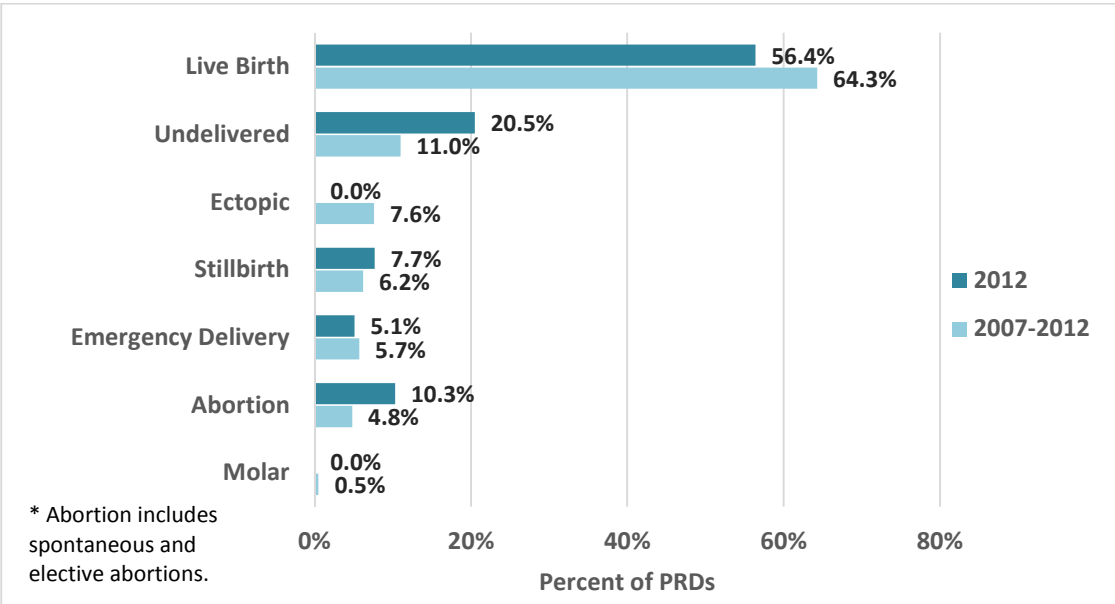


Figure 7. Distribution of Pregnancy-Related Deaths by Pregnancy Outcome: Florida, 2007-2012

- Between 2007 and 2012, the majority of pregnancy outcomes were classified as live births at 64.3%. This finding is expected because the majority of PRDs occurred during the postpartum period (see the Pregnancy-Related Deaths by Timing of Death section). In the 2007-2012 period, the “undelivered” pregnancy outcome ranked as the distant second pregnancy outcome at 11.0%.

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*Pregnancy-Related Deaths by Type of Delivery*

Type of delivery is classified by PAMR as vaginal or cesarean-section (C-section). C-section deliveries are further defined as planned and unplanned. [See Appendix 1 for type of delivery definitions.] Figure 8 illustrates the PRD distribution by type of delivery for the women who died during the labor/delivery and postpartum periods.

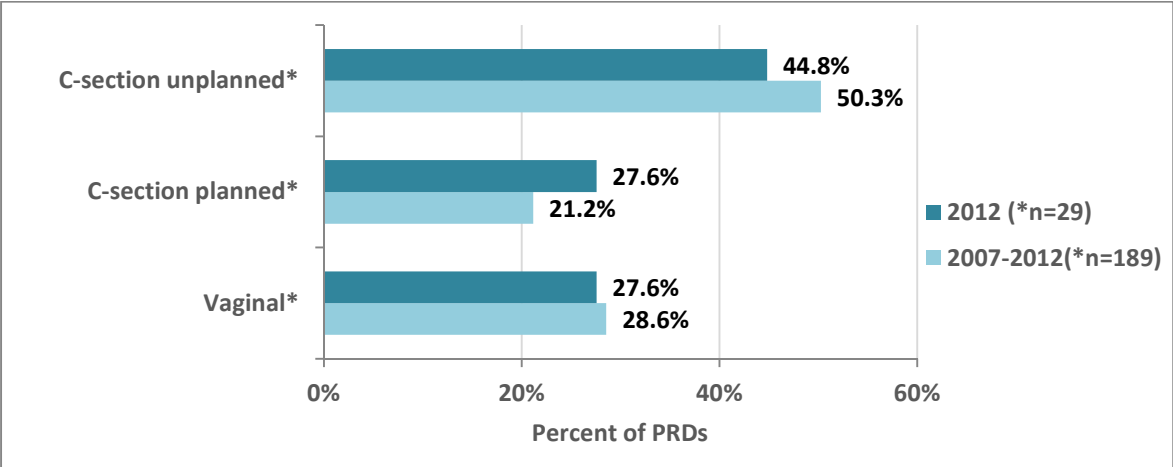


Figure 8. Distribution of Pregnancy-Related Deaths by Delivery Type\*: Florida, 2007-2012 (\*labor/delivery or postpartum PRDs only)

- Between 2007 and 2012, 71.5% of PRDs among cases that occurred during the labor/delivery and postpartum periods, the primary type of delivery was by C-section. In comparison, 37.8% of all live births in Florida were C-section deliveries in the 2007-2012 period (not shown in figures) [1].
- Nearly half of the C-sections among the PRD cases that occurred between 2007 and 2012 were unplanned.

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### *PAMR Identified Issues and Recommendations for PRDs, 2012*

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After reviewing PRD cases, the PAMR Committee identifies relevant issues related to the death and makes recommendations to promote system improvements. The PAMR Committee's identified issues and recommendations are placed into four prevention categories: Clinical Factors, System Factors, Individual and Community Factors, and Death Review Factors. The following narrative outlines issues and recommendations of the PAMR Committee for the reviewed Year 2012 PRD cases listed by the four prevention categories. 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 health care providers enable women to make informed decisions. Community factors encompass non-medical issues that have an underlying causal role in the death, such as reasons which hindered a woman or her family from recognizing a health problem or seeking care once a problem was recognized. Also, the PAMR process relies on information from death certificates and autopsy reports for the identification and evaluation of pregnancy-related deaths.

#### **CLINICAL FACTORS (HEALTH CARE SERVICES, PRACTICE, PROTOCOLS, AND CARE COORDINATION)**

##### *Issues*

1. Incomplete patient assessments
2. Inadequate documentation in the medical chart
3. Lack of coordination and follow-up, particularly of high-risk women

##### *Clinical Recommendations*

- Providers should plan for the appropriate level of care and care coordination for delivery of high-risk pregnancy at a tertiary facility.
- Providers should consider care coordination to ascertain access to prescription medications in high-risk women.

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- Hospitals should provide cesarean/hysterectomy patient education and counseling in patients with risk factors.
- Providers should stress the importance of assessment of vital signs including oxygen saturation in labor and delivery.
- Providers should consider development of obesity protocols for surgery support which include assessment of what technical and personnel support will be needed due to the increase in surgical complications.
- Providers should educate postpartum discharge patients to return if they present with fever.

### SYSTEM FACTORS (HEALTH CARE MANAGEMENT, REIMBURSEMENT AND ACCESS)

#### *Issues*

1. Barriers to accessing care: lack of insurance, provider shortage, transportation
  - Lack of child care for high-risk pregnant women who are hospitalized
  - Lack of insurance may affect ability to pay for medications
2. Lack of standardized policies and procedures
  - Lack of care coordination for medically complex cases
  - Lack of transfusion protocols
  - Medicaid fees bundled for prenatal, delivery, and postpartum visits are inadequate for extensive postpartum follow up for patients with chronic illness

#### *System Recommendations*

- Providers should promote the use and significance of the universal prenatal screening results as a predictor of outcome to the obstetrical providers and medical residents.
- Health care systems should promote preconception care for women without financial resources for management of chronic disease.
- Standard levels of care for birthing facilities should be designated in Florida to enable providers to identify the appropriate facility for care of high-risk pregnant women.
- Health care systems should consider patient-centered care or pregnancy medical home model to provide continuity of care for high-risk women with chronic disease.
- Health care systems should improve access to family planning services postpartum for women with risk factors or chronic diseases, such as obesity, hypertension, and cardiac disease.
- Influenza vaccine should be given in the prenatal period and be reimbursed by Medicaid in the obstetrical provider's office.



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### INDIVIDUAL AND COMMUNITY FACTORS (PERSONAL BEHAVIORS; SOCIAL DETERMINANTS OF HEALTH; HEALTH LITERACY & KNOWLEDGE; COMMUNITY RESOURCES AND BARRIERS)

#### *Issues*

1. Women presenting in pregnancy with pre-existing medical conditions, such as hypertension, obesity, diabetes, and asthma
2. Women and their partners may not be fully aware of the implications of symptoms signifying a complication

#### *Individual/Community Recommendations*

- It is recommended to conduct prenatal discussions with patients for risk associated with the refusal of blood products.
- It is important to educate women to keep weight gain during pregnancy within the Institute of Medicine guidelines.
- It is important to assess patients for underlying reasons for non-compliance and signing out against medical advice.
- Patients with chronic diseases should receive education to understand the severity of their health status and associated risks.
- Women with chronic health problems should receive family planning recommendations advising about serious complications of pregnancy.
- Providers should stress the importance of postpartum visits to assess health status and reinforce the patient to seek medical assistance for shortness of breath and headache.

### DEATH REVIEW FACTORS (DATA INFORMATION DOCUMENTATION, COMPLETENESS, ACCURACY, RELIABILITY)

#### *Issue*

1. Lack of autopsy for sudden, unexplained, or inconclusive cause of death

#### *Death Review Recommendations*

- Review team should standardize PAMR recommendations which are recurring.
- Medical Examiner review and autopsies should reflect time period after labor and delivery and before hospital discharge.
- PAMR abstractors should include more details on autopsy notes especially gross description of heart and heart weight, include vital signs and nurse notes during terminal events and disseminated intravascular coagulation lab work on the case summary.

*PAMR Committee Recommendations Related to Causes of Death,  
2012*

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Also outlined are PAMR Committee-identified and recommendations related to the six leading causes of PRD for the Year 2012 PRD cases: hemorrhage, infection, amniotic fluid embolism, thrombotic embolism, hypertensive disorders, and cardiomyopathy.

## **HEMORRHAGE**

### *Clinical Recommendations*

- Providers should plan for stages of hemorrhage management including algorithm for patients who refuse blood products.
- Providers should have a delivery care plan for high-risk women with the potential for cesarean, hysterectomy, and hemorrhage due to factors such as extensive fibroids and prior uterine rupture.
- Providers should rule out accreta with placenta previa with previous cesarean.

### *System Recommendations*

- Hospitals should develop massive transfusion protocols requiring management with a rapid response team approach which includes a systematic approach for high-risk cesareans.
- Facilities should assess hemorrhage risk and place patient at higher level of care or assign high-risk status.

### *Individual/Community Recommendations*

- Providers should communicate the risk for possible obstetric hemorrhage and make a plan with patients who refuse blood products during the prenatal period.

## **HYPERTENSIVE DISORDERS**

### *Clinical Recommendations*

- Providers should consider low dose of Aspirin (ASA) 81 mg a day for pregnant women with high-risk of developing preeclampsia.
- Providers should give more aggressive treatment for elevated blood/hypertension during the prenatal and postpartum period.

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### INFECTION

#### *Clinical Recommendations*

- Providers should keep index of suspicion of flu in respiratory illness despite negative swabs in pregnant women.

### THROMBOTIC EMBOLISM

#### *Clinical Recommendations*

- Providers should consider exploring standard treatment for antepartum deep vein thrombosis (DVT) and consider chemical prophylaxis for DVT prevention when patient is discharged with risk factors for DVT.
- Providers should provide and document DVT prophylaxis for all pre-op patients.

### CARDIOMYOPATHY

#### *Clinical Recommendations*

- Providers should consider early delivery for women who have severe cardiac risk.
- Providers should consider more thorough workup in obese patients with cardiac issues.

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## Appendix 1 - Definitions

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- *Body Mass Index (BMI)* - is a calculated measure of the relative percentage of body fat based on height and weight
  - *Formula for BMI calculation:*  $BMI = (\text{weight (pounds)}/\text{height (inches)}^2) \times 703$
  - *BMI Classifications and Value Ranges for Adults (ages 20 or older)*
    - Underweight: BMI <18.5
    - Normal Weight: BMI 18.5 - 24.9
    - Overweight: BMI 25.0 - 29.9
    - Obese Class I: BMI 30.0 - 34.9
    - Obese Class II: BMI 35.0 - 39.9
    - Obese Class III: BMI 40.0 or more
- *Pregnancy-associated death* - a death from any cause that occurs to a woman while pregnant or within one year of the end of pregnancy
- *Pregnancy-associated mortality ratio (PRMR)* - number of pregnancy-related deaths per 100,000 live births; a measure of maternal mortality
- *Pregnancy-related death* - a death of a woman that is directly attributed to pregnancy and/or childbirth
- *Pregnancy outcome*
  - *Abortion* - A procedure to end a pregnancy. Medicinal and surgical methods are used to remove an embryo or fetus and placenta from the uterus [2].
  - *Ectopic* – Occurs when the fertilized egg grows in an abnormal place outside the uterus, usually in the fallopian tubes [2].
  - *Emergency delivery* – An emergency cesarean delivery (C-section) that is conducted shortly after a maternal death or during the maternal death process. The outcome could be a live birth or fetal death/stillbirth [3].
  - *Live birth* – The complete expulsion or extraction from the mother of a product of human conception that shows evidence of life after expulsion/extraction [3].
  - *Molar* – (also known as hydatidiform mole) A noncancerous (benign) tumor that develops in the uterus. A molar pregnancy starts when an egg is fertilized, but instead of continuing to the stages of a viable pregnancy, the placenta develops into an abnormal mass of cysts [4].
  - *Stillbirth* – Death of a fetus before the complete expulsion or extraction from the mother irrespective of the duration of pregnancy; the death is indicated by the fact that after expulsion or extraction, the fetus does not show any evidence of life [3].

- *Undelivered* – A women that dies before delivering or the extraction of her fetus [3].
- *Timing of death* - perinatal period in which PRDs occur; three main classifications
  - *Prenatal PRD* – occurs between conception and birth
  - *Labor and Delivery PRD* – occurs between the start of the delivery process and ends when the mother leaves the delivery room
  - *Postpartum PRD* – occurs during the period after labor and delivery and up to one year after delivery or termination of pregnancy. The Postpartum PRD classification has two sub classifications:
    - *Postpartum – Not discharged from the Hospital/Health Facility PRD* – occurs in the postpartum period after delivery or termination of pregnancy and before discharge from the hospital/birth facility.
    - *Postpartum – Discharged from Hospital/Health Facility PRD* – occurs in the postpartum period after delivery/termination of pregnancy and after discharge from a hospital or health facility up to one year after the delivery/termination event.
- *Type of Delivery*
  - *Cesarean* – An assisted delivery procedure where an infant or fetus is delivered through surgical incisions made in the abdomen and the uterus [5].
  - *Vaginal* – Delivery of an infant or fetus through the vaginal canal.

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## *Appendix 2 – PAMR Case Selection Process for Team Review*

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The PAMR process begins with collecting data for all Florida resident deaths that are associated with pregnancy. A pregnancy-associated death is defined as a death to a woman during pregnancy or up to one year after the pregnancy ends, regardless of the cause of death. The Florida Department of Health (DOH) has implemented a process of data linkages to maximize the identification of pregnancy-associated deaths. This enhanced surveillance system fosters improved case identification when compared with a more limited process utilized by the Bureau of Vital Statistics.

Cases are included in the listing of pregnancy-associated deaths if any of the following four criteria are met:

- 1) The response on the death certificate is “yes” to the question: “If female, was she pregnant in the past year?”
- 2) The cause of death diagnosis code International Classification of Diseases (ICD) code indicates a death classified as being due to “Pregnancy, Childbirth, and the Puerperium”.
- 3) There is a matching birth or fetal death record within 365 days prior to the woman’s death.
- 4) There is a matching Florida universal prenatal screening tool, which is used to identify and assess pregnant women at risk for adverse birth outcomes within 365 days prior to the woman’s death.

A pregnancy-related death (PRD) is a pregnancy-associated death which resulted 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. A possible PRD is a pregnancy-associated death where determination of the death could not be conclusively classified as either related or not related to the pregnancy. Pregnancy-associated deaths due to a cause deemed unrelated to pregnancy are classified as not pregnancy-related.

Quarterly, the PAMR case selection committee composed of PAMR team members (an obstetrician, a nurse, PAMR data manager, and an epidemiologist) reviews ascertained pregnancy-associated cases by cause and time of death to categorize the cases as pregnancy-related, possibly pregnancy-related, or not pregnancy-related. The pregnancy-associated cases determined to be either pregnancy-related or possibly pregnancy-related are submitted for record abstraction and subsequent review by the full PAMR Committee. Abstraction and review preference is given to case deaths categorized as pregnancy-related. If there are fewer than 15 pregnancy-related deaths in a given quarter to review, case abstraction and review of “possibly pregnancy-related” and “not pregnancy-related” cases may occur.

*For additional details of the PAMR case ascertainment process, see the following:*

*Burch D, Noell D, Hill WC, Delke I. Pregnancy-associated mortality review: the Florida experience. *Semin Perinatol.* 2012; 36: 31-6.*

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## *Appendix 3 – Florida Pregnancy Associated Mortality Review Members, 2012*

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### *PAMR Committee Co-Chairs*

- **Kris-Tena Albers, ARNP, CNM** – Chief, Bureau of Family Health Services, DOH
- **Anthony Gregg, MD** - Professor & Chief, Division of Maternal-Fetal Medicine/Department of Obstetrics and Gynecology/University of Florida

### *PAMR Coordinator*

**Rhonda Brown, RN, BSN** - Program Administrator, Maternal & Child Health Section, DOH

### *PAMR Lead Abstractor*

**Dani Noell, ARNP, NNP, BC, MSN** - PAMR Facilitator & Abstractor, DOH

### *PAMR Committee Review Team*

**Marie Bailey, MA, MSW** - Public Health Statistics Manager, DOH

**Estrellita “Lo” Berry, MA, LTFP** – President, REACHUP Inc.

**Deborah Burch, RN, MSN, CPCE** - PAMR Abstractor, DOH

**Ed Carney, MD** - Emeritus

**Anthony Clark, MD** - Medical Examiner, KWB Pathology Associates; Medical Examiner's Commission

**Cheryl Clark, DrPH, RHIA** - Sr. MCH Epidemiologist/Training & Research Manager, Community Health Practice & Analysis Unit, DOH

**Mary Kaye Collins, CNM, MN, JD, FACNM** - Assistant Professor, Nursing, Indian River State College; American College of Nurse-Midwives

**Isaac Delke, MD** - Professor and Medical Director, University of Florida College of Medicine; ACOG

**Karen Harris, MD, MPH** - Vice Chair, Florida District XII/ACOG; President, North Florida Women's Physicians, PA

**Nancy Hardt, MD** - Professor, Obstetrics and Gynecology; Pathology/University of Florida

**Leticia Hernandez, PhD, MS** - Training & Research Consultant; Community Health Practice & Analysis Unit, DOH

**Norma Hill, RN, BSN** - Nursing Consultant; Maternal & Child Health Section, DOH

**Washington Hill, MD** - Emeritus

**Joan Hulett, RNC** Retired, Florida Chapter Association of Women's Health, Obstetric and Neonatal Nurses

**Jane Murphy, MPA** - Executive Director, Healthy Start Coalition of Hillsborough County

**William Sappenfield, MD, MPH** - Professor & Chair, College of Public Health, Chair Lawton and Rhea Chiles Center/University of South Florida

**Robert Yelverton, MD** – Chair, Florida District XII/ACOG

ACOG = American Congress of Obstetricians and Gynecologists; DOH = Florida Department of Health



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