

PREGNANCY-RELATED DEATHS DUE TO HEMORRHAGE IN FLORIDA 1999-2012

Pregnancy-Associated Mortality Review (PAMR)

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To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts.



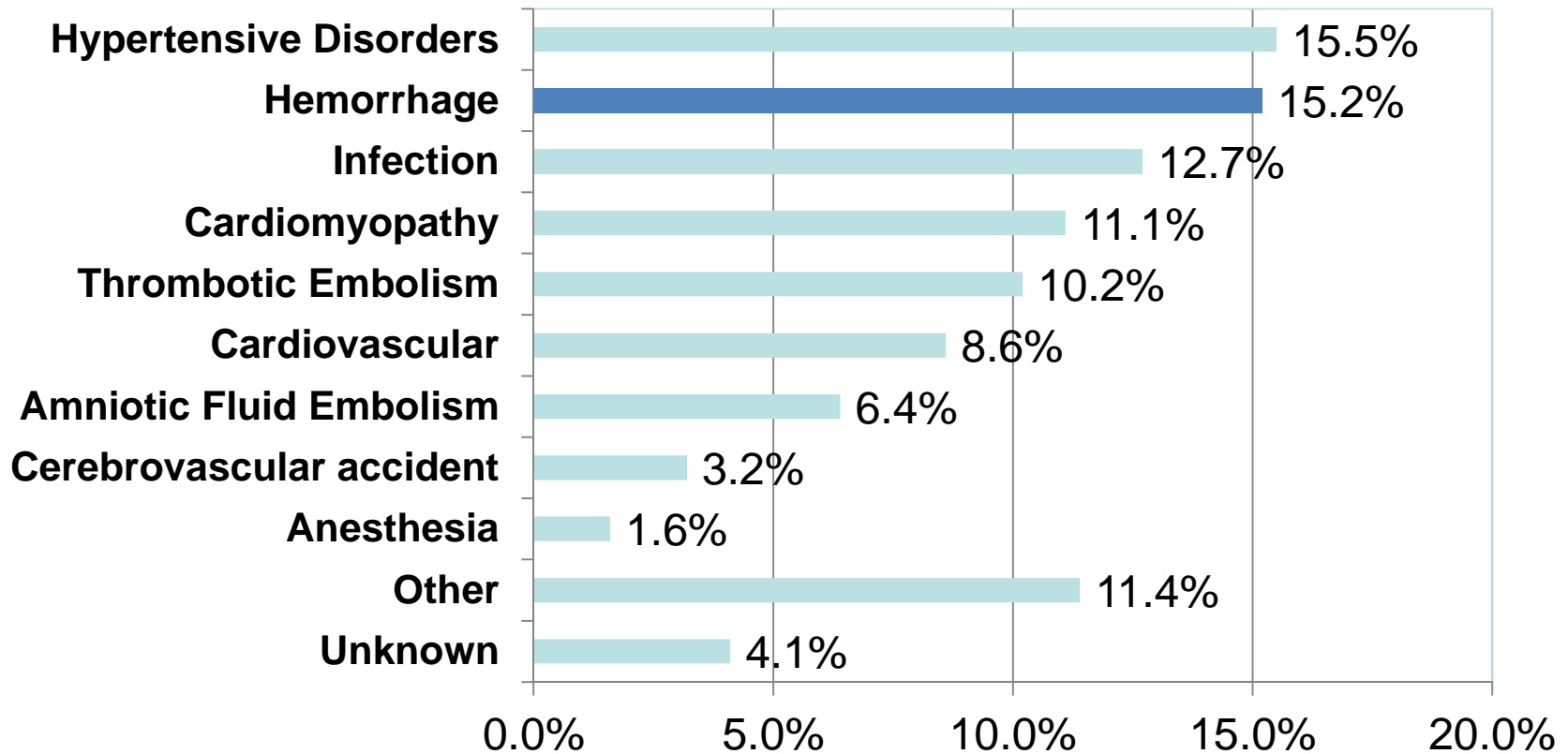
Background

- ❖ The Florida Department of Health, Pregnancy-Associated Mortality Review (PAMR) is an ongoing system of surveillance that collects and analyzes information related to maternal deaths
 - ❖ to promote care and system improvement through evidence-based actions
 - ❖ to reduce risk of pregnancy-related deaths
- ❖ During the period 1999-2012, the PAMR review team classified 560 cases as pregnancy-related deaths (PRDs).

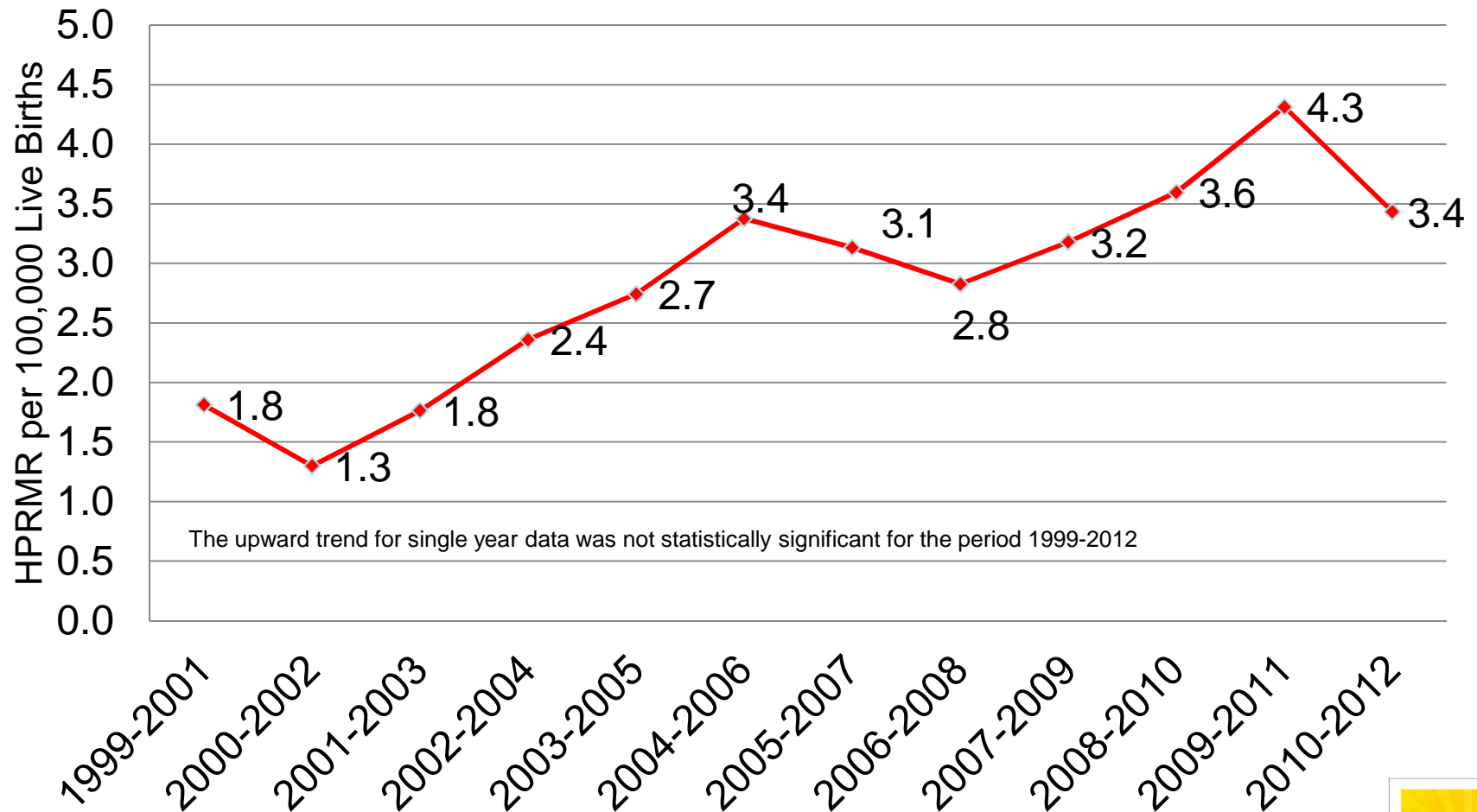
Background

- ❖ Worldwide and in the United States, hemorrhage is a leading cause of pregnancy-related deaths (PRDs) before, during, or after delivery.
- ❖ Reports from North Carolina and California state that maternal deaths due to hemorrhage had significant prevention opportunities. (Berg, C. et al., 2005 & California, 2011)

Distribution of Pregnancy-Related Causes of Deaths, Florida, 1999-2012



Pregnancy-Related Mortality Ratios due to Hemorrhage (HPRMR), Three Years Rolling Average, Florida 1999-2012



Pregnancy-Related Mortality Ratios due to Hemorrhage (per 100,000 Live Births) and URR Florida, 1999-2012

Characteristics	Deaths	HPRMR	URR** (95%CI)
Age			
<25	13	1.2	Ref.
25-34	37	2.5	2.1* (1.1-3.9)
35 +	35	7.9	6.7* (3.5-12.6)
Race			
Non-Hispanic White	20	1.4	Ref.
Non-Hispanic Black	46	6.9	5.0* (2.9-8.4)
Hispanic and Other	19	2.0	1.5 (0.8-2.7)
Marital Status			
Married	50	2.9	Ref.
Not married	35	2.7	0.9 (0.6-1.4)

** URR: Unadjusted relative ratio, * (p<0.05)



Pregnancy-Related Mortality Ratios due to Hemorrhage (per 100,000 Live Births) and URR, Florida, 1999-2012. Cont.

Characteristics	Deaths	HPRMR	URR** (95%CI)
Mode of Delivery			
Vaginal	17	0.8	Ref.
Cesarean ¹	31	3.0	3.6* (2.0-6.5)
Prenatal Care Initiation ²			
First Trimester	17	0.7	Ref.
Second-Third or None	22	4.0	5.4* (2.9-10.2)
Body Mass Index Categories ³			
Underweight (BMI <20)	4	4.2	2.0 (0.7-5.7)
Normal (BMI 20-24.9)	20	2.2	Ref.
Overweight (BMI 25-29.9)	15	3.3	1.5 (0.8-3.0)
Obese (BMI ≥ 30)	18	4.8	2.2* (1.2-4.2)

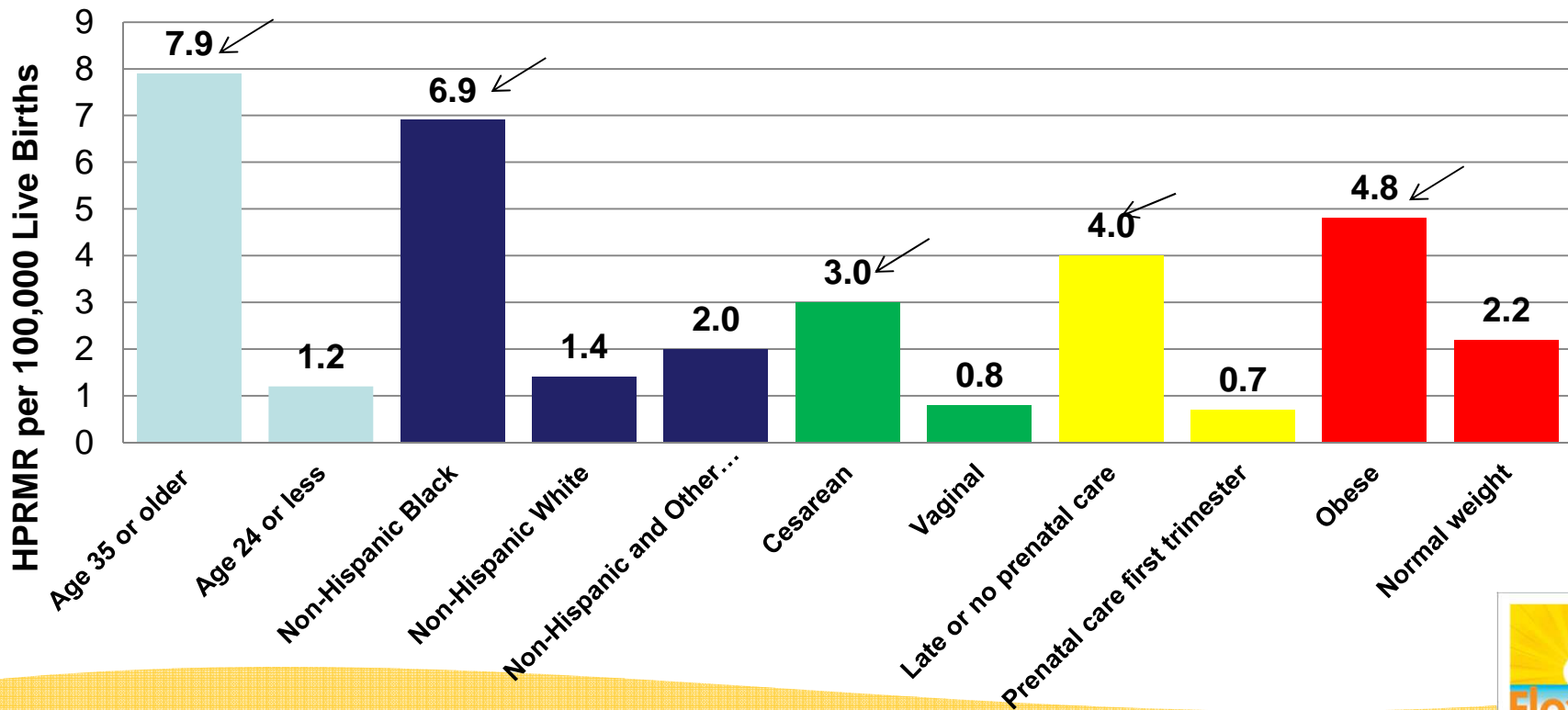
** URR: Unadjusted relative ratio, 1/ Excluded two emergency cesarean sections, 2/ Excluded women who died during 1st or 2nd trimester, 3/ Included year 2004-2012,

* (p<0.05)



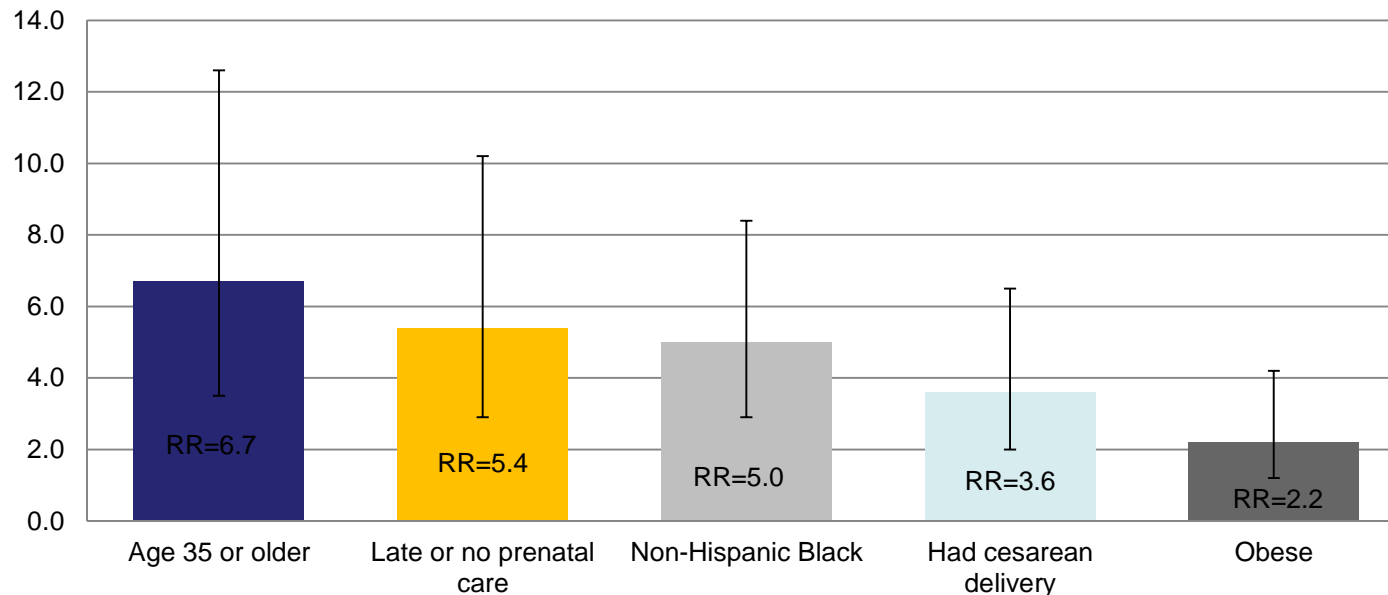
Results

- ❖ There were 560 pregnancy-related deaths from 1999-2012 and 85 (15.2%) were due to hemorrhage.
- ❖ The HPRMR per 100,000 live births was higher for:



Results

- ❖ Women at increased risk of death due to hemorrhage were:
 - ❖ Non-Hispanic Black (Reference: Non-Hispanic White)
 - ❖ 35-years or older (Reference: Age 24 or less)
 - ❖ Had cesarean delivery (Reference: Vaginal delivery)
 - ❖ Late or no prenatal care (Reference: Prenatal care first trimester)
 - ❖ Obese (BMI \geq 30) (Reference: Normal weight BMI 20-24.9)



Pregnancy-Related Deaths Due to Hemorrhage by Causes, Florida 1999-2012 (n=85)

Causes	Vaginal	Cesarean Delivery	N/D*	Total Deaths # (%)
Intrauterine gestations \geq 20 weeks	17	33	3	53 (100%)
Uterine atony/Postpartum hemorrhage ¹	6	6		12 (23%)
Placenta previa	0	3		3 (6%)
Placenta accreta, increta, percreta ²	1	6	1	8 (15%)
Abruption placenta ^{1,2}	1	3	1	5 (9%)
Retained Placenta/POC ³	4	1		5 (9%)
Other (uterine artery lac, intra abdominal & other sites of hemorrhage)	2	5		7 (13%)
Coagulopathies (include DIC)	0	1		1 (2%)
Uterine bleeding, NOS	1	5		6 (11%)
Uterine laceration/rupture spont, forceps or TAB ^{2,4}	2	2	1	5 (9%)
Unknown	0	1		1 (2%)
Total Deaths Due to Hemorrhage	23	33	3	85

1/Three cases related to religious belief, 2/ Two cases undelivered diagnosis by autopsy, 3/
Two cases of home birth, 4/ Termination abortion. *N/D not delivered

Pregnancy-Related Deaths Due to Hemorrhage by Causes, Florida 1999-2012 (n=85). Cont.

Causes	Vaginal	Cesarean Delivery	N/D*	Total Deaths # (%)
Intrauterine gestations <20 weeks	6	N/A		6 (100%)
Spontaneous abortion/hemorrhage	2			2 (33%)
D&E/bleeding from uterine perforation/laceration of uterine vessels	4			4 (67%)
Rupture ectopic pregnancy	N/A	N/A		26 (100%)
Total Deaths Due to Hemorrhage	23	33	3	85

*N/D not delivered

Results

- ❖ Uterine atony (22.6%)
- ❖ Uterine laceration (22.6%)
- ❖ Placenta previa/accreta/increta/percreta (20.8%)
Accounted for two-thirds of deaths in women with an intrauterine pregnancy at 20 weeks or more.
- ❖ Ectopic pregnancy accounted for 30.6% of all deaths due to hemorrhage.

Conclusions

- ❖ Hemorrhage was the second leading cause of pregnancy-related death in Florida.
- ❖ Non-Hispanic Black women had five times the risk of hemorrhage death than white women had.
- ❖ The risk of pregnancy-related death due to hemorrhage increased with age.
- ❖ Women who delivered by cesarean had higher risk of hemorrhage than women who delivered vaginally.
- ❖ Women with late or no prenatal care were more likely to die from hemorrhage than women with early prenatal care.
- ❖ Obese women had higher risk of death from hemorrhage than normal weight women.

Recommendations

Clinical

- ❖ Clinicians should develop comprehensive hemorrhage protocol including a hemorrhage cart with key equipment and a massive transfusion protocol in every birthing facility
- ❖ Medical personnel should practice hemorrhage drills on labor and delivery and promote team approach
- ❖ It is important to provide specialized counseling to patients and family members with religious views against blood transfusions.

Recommendations

System

- ❖ Clinicians should establish protocols for women presenting to the emergency room with abdominal pain and anemia to be evaluated for ectopic pregnancy.

Recommendations

Individual and Community Factors

- ❖ Providers should raise community awareness about the need to seek prompt medical attention in women of reproductive age experiencing abdominal pain.

What is Florida doing?

- ❖ The Florida Obstetric Hemorrhage Initiative (OHI)
 - ❖ Florida Perinatal Quality Collaborative (FPQC)
 - ❖ American Congress of Obstetricians and Gynecologists (ACOG District XII)
 - ❖ The OHI advisory group
 - ❖ Florida Department of Health
- Developed a tool box for hospital implementation (2-year multi-hospital collaborative) (2012-2014)

References

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5. Florida Perinatal Quality Collaborative (2013). Florida Obstetric Hemorrhage Initiative Toolkit: A Quality Improvement Initiative For Obstetric Hemorrhage Management.



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Thank You!

