

FLORIDA DEPARTMENT OF HEALTH

Florida's Maternal Mortality Review Committee 2020



Florida
HEALTH

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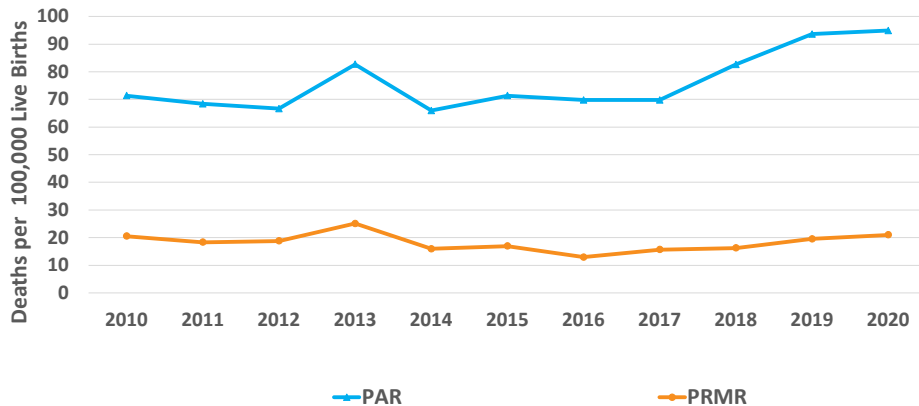
DEFINITIONS

Pregnancy-associated death (PAD)- A death of a woman from any cause, while she is pregnant or within one year of being pregnant, regardless of the duration and site of the pregnancy.

Pregnancy-related death (PRD)- A pregnancy-associated death directly attributed to pregnancy and/or childbirth.

Florida's Maternal Mortality Review Committee (FLMMRC)- An ongoing surveillance process that involves data collection and examination of maternal deaths to promote evidence-based actions for individual behavior changes, health care system improvements, and prevention of pregnancy-related deaths (PRDs).

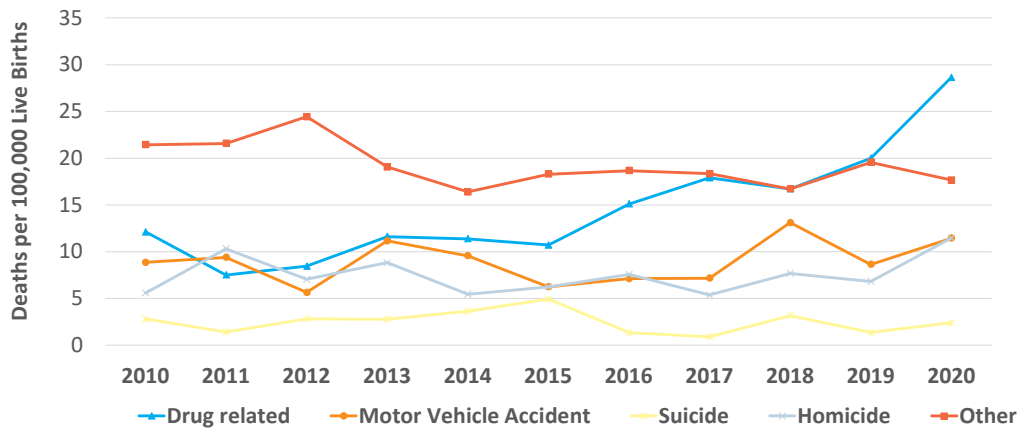
PREGNANCY-ASSOCIATED MORTALITY RATIOS (PAR) AND PREGNANCY-RELATED MORTALITY RATIOS (PRMR), FLORIDA, 2010-2020



This slide presents the Pregnancy-Associated Mortality Ratios (PAR) and the Pregnancy-Related Mortality Ratios (PRMR) for the period 2010–2020. The Pregnancy-Related Mortality Ratio (PRMR) is the number of pregnancy-related deaths per 100,000 live births.

- The data linkage process identified 199 Florida resident pregnancy-associated deaths (PADs) from 2020.
- The Florida Maternal Mortality Review case selection committee selected 59 cases to review, starting with those most likely to be pregnancy-related, followed by those possibly related and some not pregnancy-related. Upon full team review of the 59 PADs, Florida’s Maternal Mortality Review Committee (FL MMRC) found that 44 (75%) were pregnancy-related.
- The Healthy People 2030 goal is to reduce the ratio of pregnancy related deaths to 15.7 PRDs per 100, 000 live births. However, the average PRMR from 2010-2020 was 18.3 in Florida.

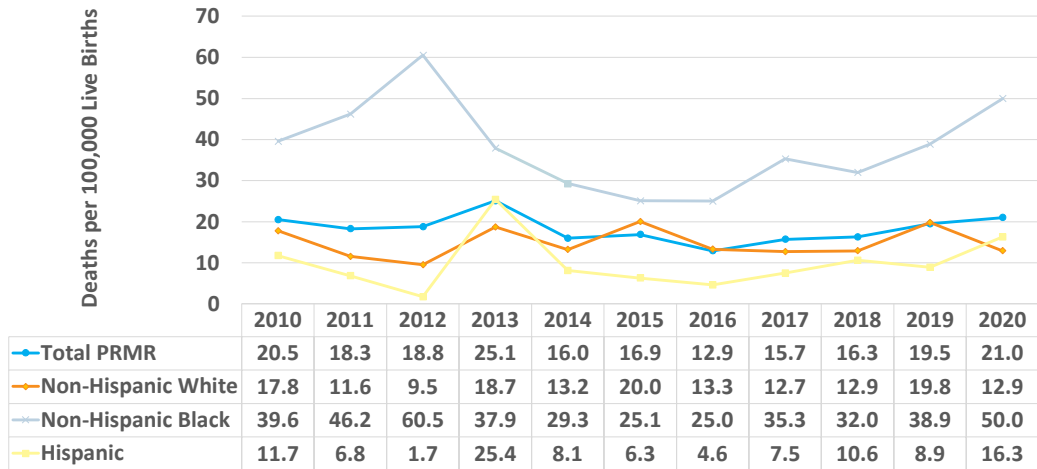
PREGNANCY-ASSOCIATED DEATH RATIOS BASED ON THE FORM OF NON-SELECTED CASES PRESENTED EVERY QUARTER, BY CAUSE OF DEATH, FLORIDA, 2010-2020



This slide presents the not-pregnancy-related death ratios based on the form “Florida MMRC Quarterly Demographic Data on Non-Selected Cases” presented every quarter, by cause of death for the period 2010–2020.

- Not-Pregnancy-Related Deaths (NPRD) are a subset of PAD.
- The causes of maternal death in the NPRD ratios for 2010–2020 are based on the “Florida MMRC Quarterly Demographic Data on Non-Selected Cases” form.
- These maternal deaths were identified through the case identification process.
- In 2020, the NPRD ratio due to drug related causes was 28.6 per 100,000 live births, followed by other causes with a ratio of 17.6, motor vehicle accidents (MVA) with a ratio of 11.4, homicides with a ratio of 11.4, and suicides 2.4 per 100,000 live births, respectively.

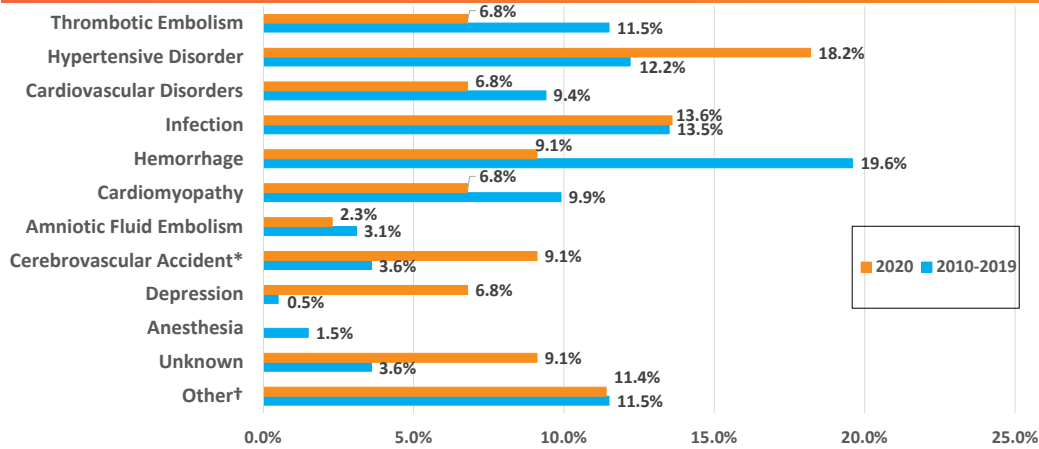
PREGNANCY-RELATED MORTALITY RATIOS (PRMRS) BY RACE/ETHNICITY, FLORIDA, 2010–2020



This slide presents the pregnancy-related mortality ratio by race/ethnicity during the period 2010–2020.

- The overall Florida total pregnancy-related mortality ratio (PRMR) fluctuated from a high of 25.1 in 2013 and a low of 12.9 in 2016.
- The PRMR in 2020 was 21.0 deaths per 100,000 live births.
- Florida PRMRs exhibited consistent racial differences. The gap between non-Hispanic Black women and non-Hispanic White women decreased from 6.4 in 2012 to 2.0 in 2019. The gap is found by dividing the higher rate by the lower rate (ex. $60.5/9.5=6.4$). However, this gap increased from 2.0 in 2019 to 3.9 in 2020. In other words, non-Hispanic Black women were almost four times as likely to have a pregnancy-related death compared to non-Hispanic White women in 2020.
- During 2012, the PRMR for non-Hispanic Black women was 60.5, an all-time high.
- In 2020, the PRMR per 100,000 live births was 50.0 for non-Hispanic Black women, 12.9 for non-Hispanic White women, and 16.3 for Hispanic women.

DISTRIBUTION OF PREGNANCY-RELATED CAUSES OF DEATH, FLORIDA, 2010-2019 (N= 393) AND 2020 (N= 44)



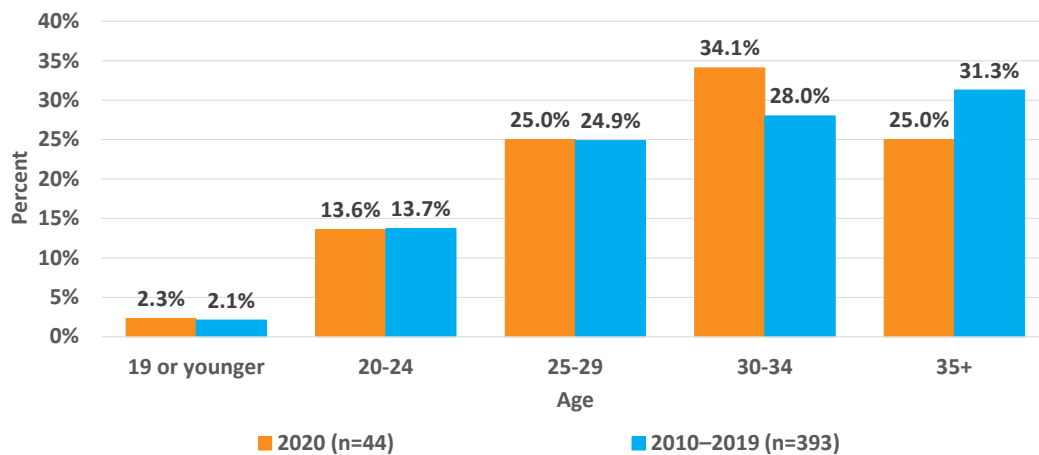
*Cerebrovascular accident no known hypertensive disorders.

†Other is comprised of various causes of deaths not easily captured with enough numbers in a homogeneous category.

This slide presents the distribution of pregnancy-related causes of death in Florida comparing the periods 2010–2019 and 2020.

- In 2020, the leading underlying causes of PRDs were hypertensive disorder (18.2%), infection (13.6%), other (11.4%), hemorrhage (9.1%), and cerebrovascular accident (9.1%) .
- The percentage of deaths for hypertensive disorder, cerebrovascular accident, depression, and unknown underlying causes were higher in 2020 compared to 2010-2019.
- There were decreases in the percentage of deaths in 2020 compared to 2010-2019 due to thrombotic embolism (6.8% vs. 11.5%), cardiovascular disorders (6.8% vs. 9.4%), hemorrhage (9.1% vs. 19.6%), cardiomyopathy (6.8% vs. 9.9%), and amniotic fluid embolism (2.3% vs. 3.1%).

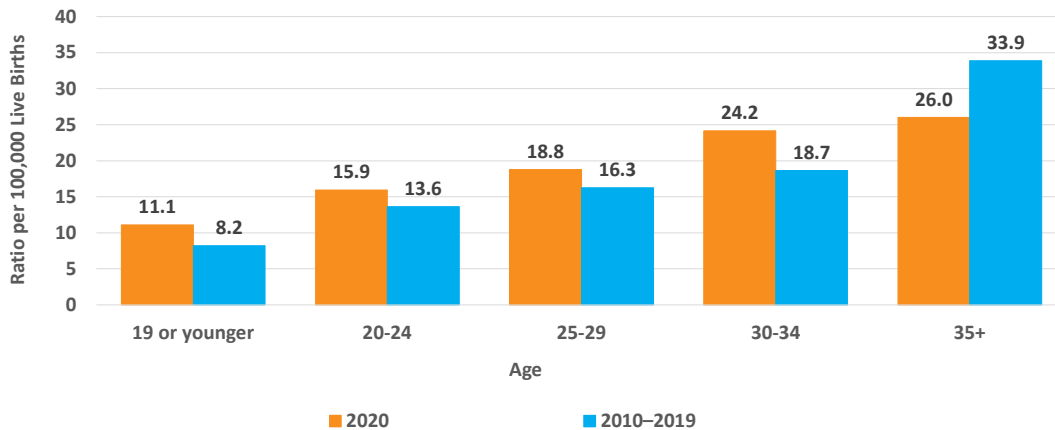
DISTRIBUTION OF PREGNANCY RELATED DEATHS BY AGE, FLORIDA, 2010-2020 (N=393) AND 2020 (N=44)



This slide presents the distribution of pregnancy-related deaths by age in Florida comparing the periods 2010–2019 and 2020.

- In 2020, the pregnancy-related deaths for mothers aged 19 or younger, 20-24, and 25-29 did not differ much from deaths for 2010-2019.
- In 2020, the highest percentage of pregnancy related deaths occurred in women 30-34 years old (34.1%).
- The rates of PRD in women aged 35+ **decreased** by an actual 6.3% in 2020 in comparison to previous years (2010–2019).
- However, the rates of PRD in women aged 30-34 years **increased** by an actual 6.1% as compared to previous years (2010-2019).

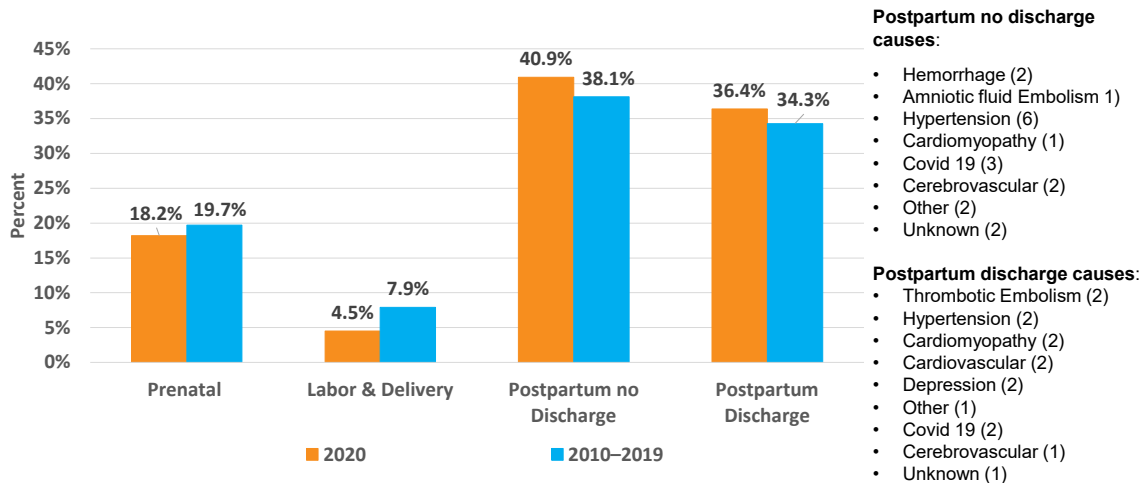
PREGNANCY-RELATED MORTALITY RATIOS (PRMRS) BY AGE, FLORIDA, 2010-2019 (N=393) AND 2020 (N=44)



This slide presents the pregnancy-related mortality ratios by age in Florida comparing the periods 2010-2019 and 2020. This figure differs from the previous slide as it shows the pregnancy-related mortality ratio stratified by age instead of the percentage of pregnancy related deaths stratified by age. As a reminder, the pregnancy related mortality ratio is the number of pregnancy-related deaths per 100,000 live births.

In 2020, mothers aged 35 or more had the highest PRMR, followed by the 30-34 age group. In the 2010-2019 period, there was a large gap (1.8 times) between the PRMR of mothers ages 35 or more and the PRMR of mothers 30-34 years old. In comparison, the gap between these two age groups decreased in 2020 (1.1 times).

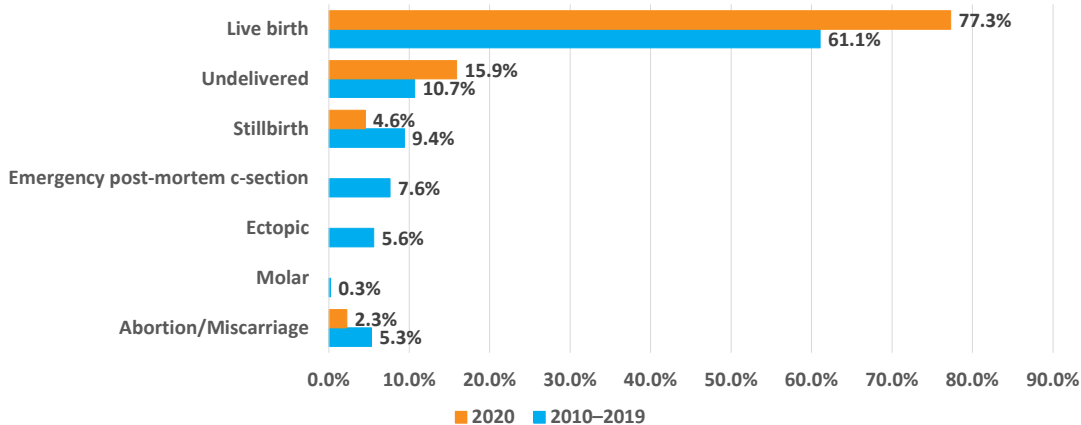
DISTRIBUTION OF PREGNANCY-RELATED DEATHS BY TIMING OF DEATH, FLORIDA, 2020 (N=44) AND 2010-2019 (N= 393)



This slide shows the distribution of pregnancy-related deaths (PRD) by timing of death in Florida comparing the periods of 2010-2019 and 2020.

- During 2010-2019, one postpartum discharge case was not applicable, and one case had no source data for timing.
- In 2020, most PRDs (77.3%) occurred during the postpartum period.
- In 2020, the percentage of pregnancy related deaths in the post-partum period, both before and after discharge, increased as compared to previous years.
- There were differences in the causes of death in the postpartum period by hospital discharge status.

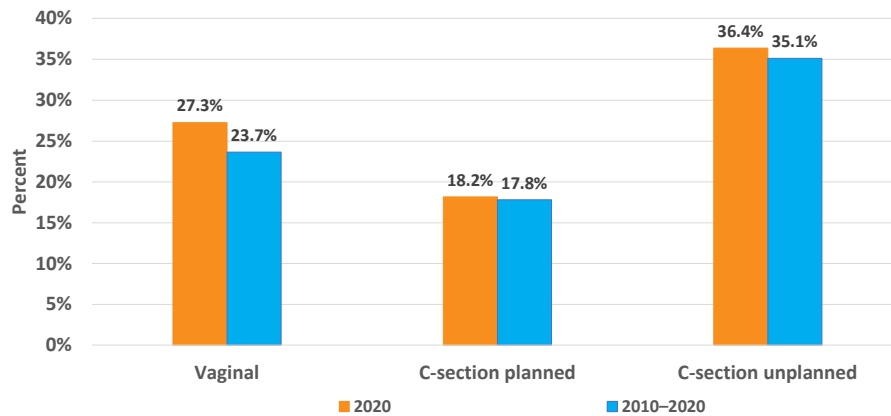
DISTRIBUTION OF PREGNANCY-RELATED DEATHS BY PREGNANCY OUTCOME, FLORIDA, 2010-2019 (N=393) AND 2020 (N=44)



This slide shows the distribution of pregnancy-related deaths by pregnancy outcome during the periods 2010-2019 and 2020 in Florida.

- In 2020, the majority (77.3%) of PRDs occurred after a live birth. In comparison, the 61.1% of PRDs occurred after a live birth in the 2010-2019 time period.
- In 2020, 15.9% of PRDs were undelivered and 10.7% of PRDs were undelivered in 2010-2019.
- In 2020, 4.6% PRDs occurred after a stillbirth. In comparison, 9.4% of PRDs occurred after a stillbirth in the 2010-2019 time period.
- In 2020, 2.3% of PRDs occurred after abortion or miscarriage. In comparison, 5.3% of PRDs occurred after abortion or miscarriage in the 2010-2019 time period.
- No PRDs occurred after emergency post-mortem c-sections, ectopic pregnancies, or molar pregnancies in 2020. In 2010-2019, 7.6% of PRDs occurred after emergency post-mortem c-section, 5.6% of PRDs occurred after ectopic pregnancies, and 0.3% of PRDs occurred after molar pregnancies.

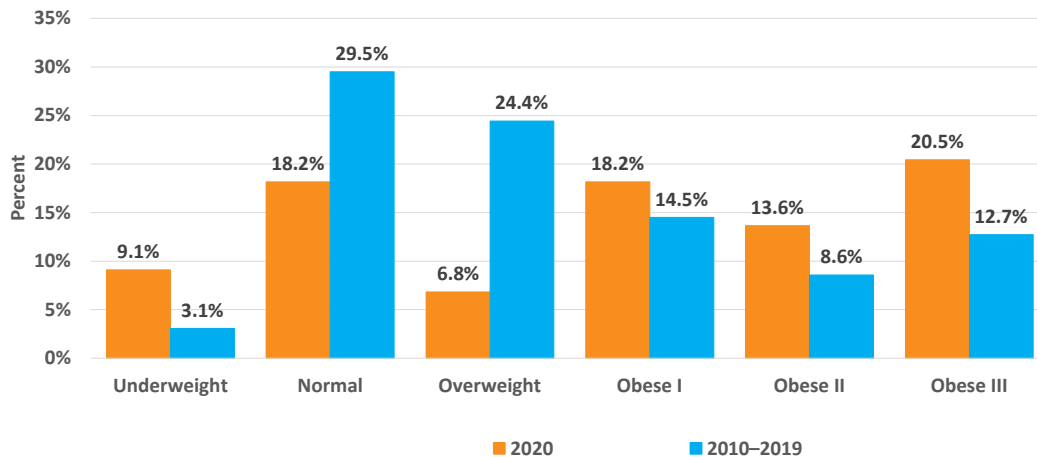
DISTRIBUTION OF PREGNANCY-RELATED DEATHS BY TYPE OF DELIVERY, FLORIDA, 2010-2019 (N=393), 2020 (N=44)



This slide shows the distribution of pregnancy-related deaths by type of delivery comparing the periods 2010-2019 and 2020.

- In 2020, 54.6% of PRD cases that occurred during the labor and delivery and post-partum periods were by c-section.
- In comparison, 35.9% of all live births in Florida were c-section deliveries in 2020 (not shown in Figure 8).
- In 2020, 16 (36.4%) of c-section deliveries were unplanned.
- During 2010-20, 23.4% of maternal deaths had missing or not applicable delivery information. In 2020, 18.2% of deaths had missing or not applicable delivery information.

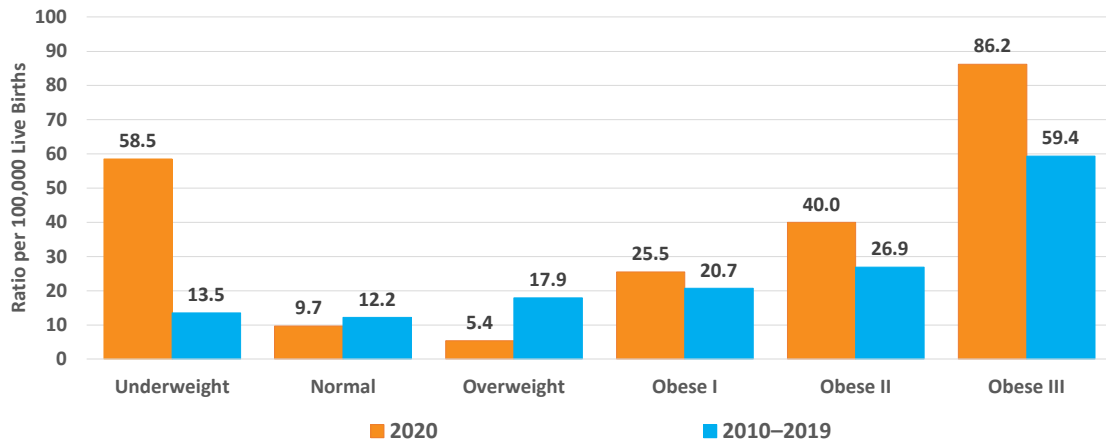
DISTRIBUTION OF PREGNANCY-RELATED DEATHS BY PRE-PREGNANCY BMI, FLORIDA, 2010-2019 (N=393), 2020 (N=44)



This slide shows the distribution of pregnancy-related deaths (PRD) by pregnancy body mass index for the periods 2010-2019 and 2020.

- For 2010-2019, 7.1% had unknown/missing BMI and for 2020, 13.6% of PRDs had unknown/missing BMI data.
- In 2020, 59.1% of women who experienced a PRD had overweight/obese pre-pregnancy BMIs. During 2010-2019, 60.2% of women who experienced a PRD had overweight/obese pregnancy BMIs.
- Similarly, during 2020, 55.7% of all Florida women who had a live birth were in the overweight/obese pre-pregnancy category (not shown on the slide).

PREGNANCY RELATED MORTALITY RATIO BY PRE-PREGNANCY BMI, FLORIDA, 2010-2019 (N=393), 2020 (N=44)



This slide shows the pregnancy-related mortality ratios (PRMR) for the periods 2010-2019 and 2020.

- In 2020, there were 58.5 maternal deaths per 100,000 live births at the underweight category.
- The PRMR per 100,000 live births was 9.7 with normal pre-pregnancy BMIs, 5.4 with overweight, and 25.5, 40.0, and 86.2 with obese Class I, Class II, and Class III pre-pregnancy BMIs, respectively.

DISTRIBUTION OF PREVENTABILITY AMONG PREGNANCY-RELATED DEATHS AND CAUSE, FLORIDA, 2020 (N=44)

Cause of PRDs	PRDs with Chance to Alter Outcome				Total	Percent Preventable
	Good	Some	Unable to Determine	None		
Thrombotic embolism	1	1	0	1	3	66.7%
Hypertensive disorder	4	4	0	0	8	100.0%
Cardiovascular disorders	1	1	0	1	3	66.7%
Infection	0	3	0	3	6	50.0%
Hemorrhage	2	1	0	1	4	75.0%
Cardiomyopathy	0	2	0	1	3	50.0%
Amniotic fluid embolism	0	1	0	0	1	100.0%
Cerebrovascular accident	1	0	0	3	4	25.0%
Depression	2	1	0	0	3	100.0%
Other remaining causes*	2	2	0	1	5	80.0%
Unknown**	0	0	1	0	1	100.0%
Total	13	16	1	11	44	68.2%

*Other remaining causes is comprised of various causes of deaths not easily captured with enough numbers in a homogeneous category. Percent preventable is (good + some + unable to determine/Total) **There were 3 cases in the unknown category that had missing committee determination of preventability and were only included in the total column.

This slide shows the distribution of preventability among pregnancy-related deaths and cause in Florida in 2020.

The “Chance to Alter Outcome” question is only answered for deaths the committee decided were preventable. In this table, 30 out of 44 (68.2%) of PRD’s were preventable, 11 out of 44 (25%) were not preventable, and 3 (6.8%) were missing. Out of the total 44 PRD’s, there were 3 cases in the unknown category for “Cause of PRDs” that had missing committee determination of preventability and were only included in the total column.

The category “other remaining causes” is comprised of various causes of death not easily captured with enough numbers in a homogeneous category. The percent preventable for each cause of death is calculated by adding the good, some, and unable to determine responses from the chance to alter outcome variable and then dividing by the total for each cause of death.

In 2020,

- Three causes of death (hypertensive disorder, amniotic fluid embolism, and depression) were deemed to be 100% preventable.
- They were followed by other remaining causes (80.0%), hemorrhage (75.0%), cardiovascular disorders (66.7%), thrombotic embolism (66.7%), cardiomyopathy (50.0%), infection (50.0%), and cardiovascular problems (40.0%).

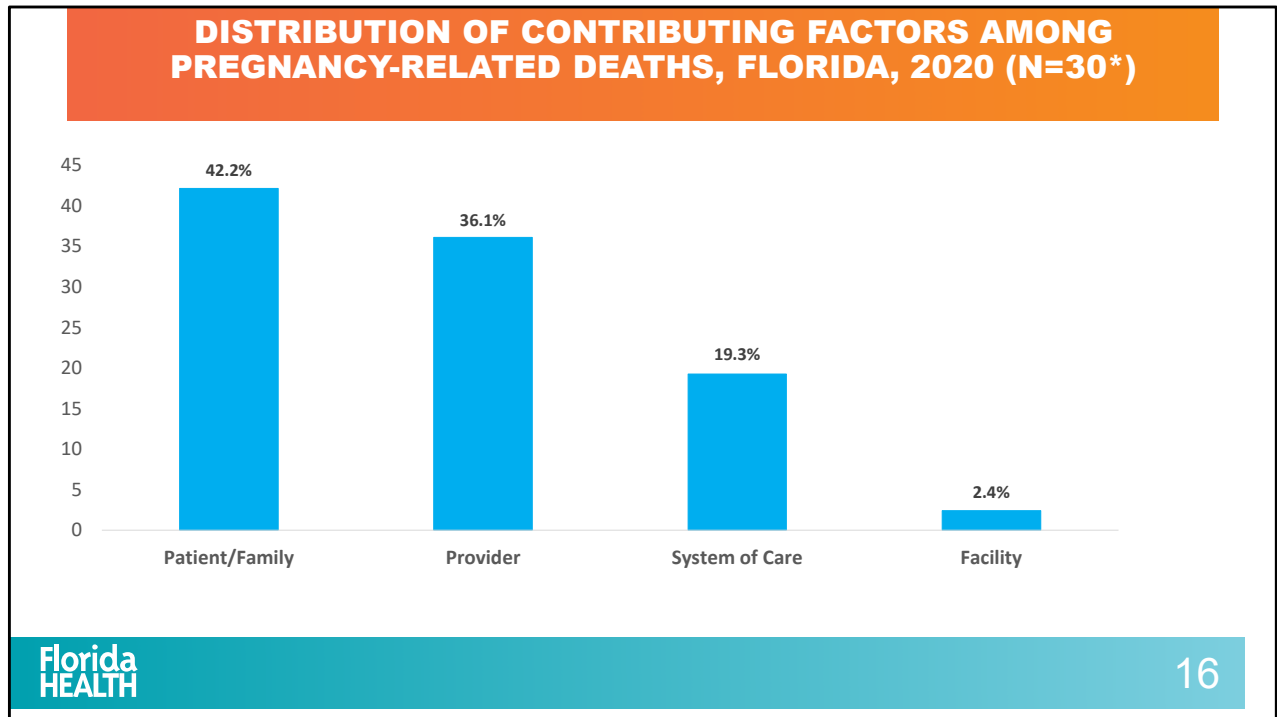
DISTRIBUTION OF PREVENTABILITY AMONG PREGNANCY-RELATED DEATHS BY TIMING IN RELATION TO PREGNANCY, FLORIDA, 2020 (N=44)

Timing	Total	Percent Preventable	PRDs with Chance to Alter Outcome			
			Good	Some	Unable to Determine	None
While pregnant	4	100.0%	3	1	0	0
Within 42 days	28	71.4%	6	13	1	8
43 days to 1 year	2	50.0%	0	1	0	1
Unknown	7	71.4%	4	1	0	2
Total	44	68.2%	13	16	1	11

Note: The total column is 41 but it adds up to 44 after accounting for three missing values for the Chance to Alter Outcome variable. The missing values are only calculated in the total column. The Percent Preventable column excludes the missing values (Good (13) + Some (16) + Unable to determine (1) /41).

This slide shows the distribution of preventability among pregnancy-related deaths by timing.

- Women who died during pregnancy were determined to have 100% preventability.
- Women who died during the first 6 weeks postpartum or within 42 days of delivery had 71.4% chance of preventability.
- Women who died 43 days to 1 year after delivery had 50.0% chance of preventability and women with unknown timing of death had 71.4% chance of preventability.
- Overall, the total column is 41, but it adds up to 44 after accounting for three missing values for the Chance to Alter Outcome variable: with one missing in the “While Pregnant” Timing category and two missing in the Unknown Timing category. The missing values are only calculated in the total column and the % Preventable for Total column does not include the missing values (Good (13) + Some (16) + Unable to determine (1)/41).



This slide shows the distribution of levels of factors that contributed to the death. They were:

- Patient/family 42.2%
- Provider 36.1%
- System of care 19.3% and
- Facility 2.4%

These factors form the basis for the committee recommendations.

Contributing factors (83) were included from the 30 PRDs (out of the total 44 PRDs) that were determined to be preventable by the committee. It is possible to have several contributing factors listed for PRDs.

Note: This figure displays the 79 out of 83 total recommendations that had reported Level of Impact for the 30 preventable cases.

CAUSE OF DEATH BY CONTRIBUTING FACTOR CATEGORY, FLORIDA, 2020 (N=30*)

Cause of Death	Contributing Factors						Preventable Related Deaths
	Patient or Family	Facility	Provider	Systems of Care	Community	Total Factors	
Thrombotic Embolism	3	1	2	0	0	6	2
Hypertensive Disorder	10	1	6	4	0	21	8
Cardiovascular Disorders	4	0	1	1	0	6	2
Amniotic Fluid Embolism	0	0	1	1	0	2	1
Cerebrovascular Accident	1	0	0	1	0	2	1
Depression	4	0	7	5	0	16	3
Other remaining causes*	5	0	5	1	0	11	4
Unknown	2	0	2	0	0	4	1
Anesthesia	0	0	0	0	0	0	0
Infection	2	0	3	0	0	5	3
Hemorrhage	1	0	3	2	0	6	3
Cardiomyopathy	4	0	0	0	0	4	2
Total	36	2	30	15	0	83	30

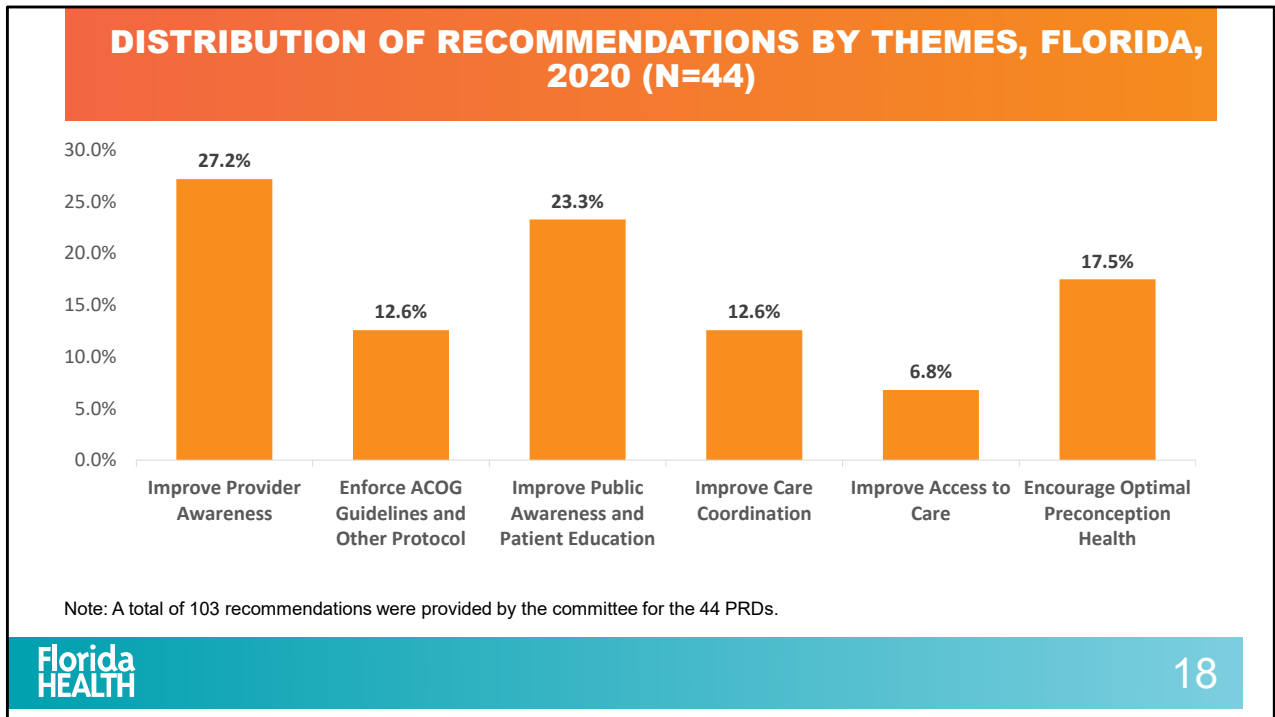
*Other remaining causes is comprised of various causes of deaths not easily captured with enough numbers in a homogeneous category.

In 2020, 83 contributing factors were identified among the 30 preventable PRDs, out of the total 44 PRDs.

*Contributing factors are only available for deaths considered preventable. In this table, 30 out of the total 44 (68.2%) PRDs were considered preventable.

**Other remaining causes is comprised of various causes of deaths not easily captured with enough numbers in a homogenous category.

- The categories and numbers of contributing factors vary by cause of PRD.
- The causes of death with the most contributing factors per death were: hypertensive disorder, depression, other remaining causes, thrombotic embolism, cardiovascular disorders, and hemorrhage.
- On average, 2.8 contributing factors were identified for each PRD.

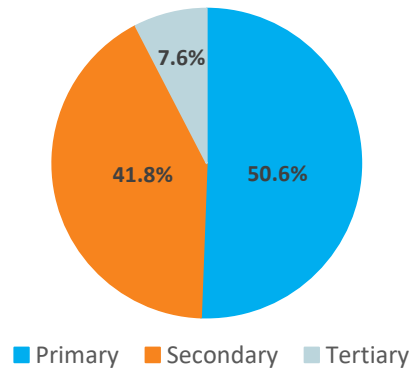


This slide presents the themes used to classify the recommendations. The recommendations were categorized by the following themes: Improve Provider Awareness, Improve Public Awareness/Patient Education, Encourage Optimal Preconception Health, Enforce ACOG Guidelines/Protocol, Improve Care Coordination, and Improve Access to Care.

This slide shows the most frequent recommendation themes for 2020. The most frequent recommendation theme was Improve Provider Awareness (27.2%), followed by Public Awareness and Patient Education (23.3%), then Optimal Preconception Health (17.5%), and Care Coordination (12.6%).

Note: A total of 103 recommendations were provided by the committee for the 44 pregnancy related deaths and were all included in the analyses for this figure.

LEVEL OF PREVENTION FOR RECOMMENDATIONS, FLORIDA, 2020 (N=30)

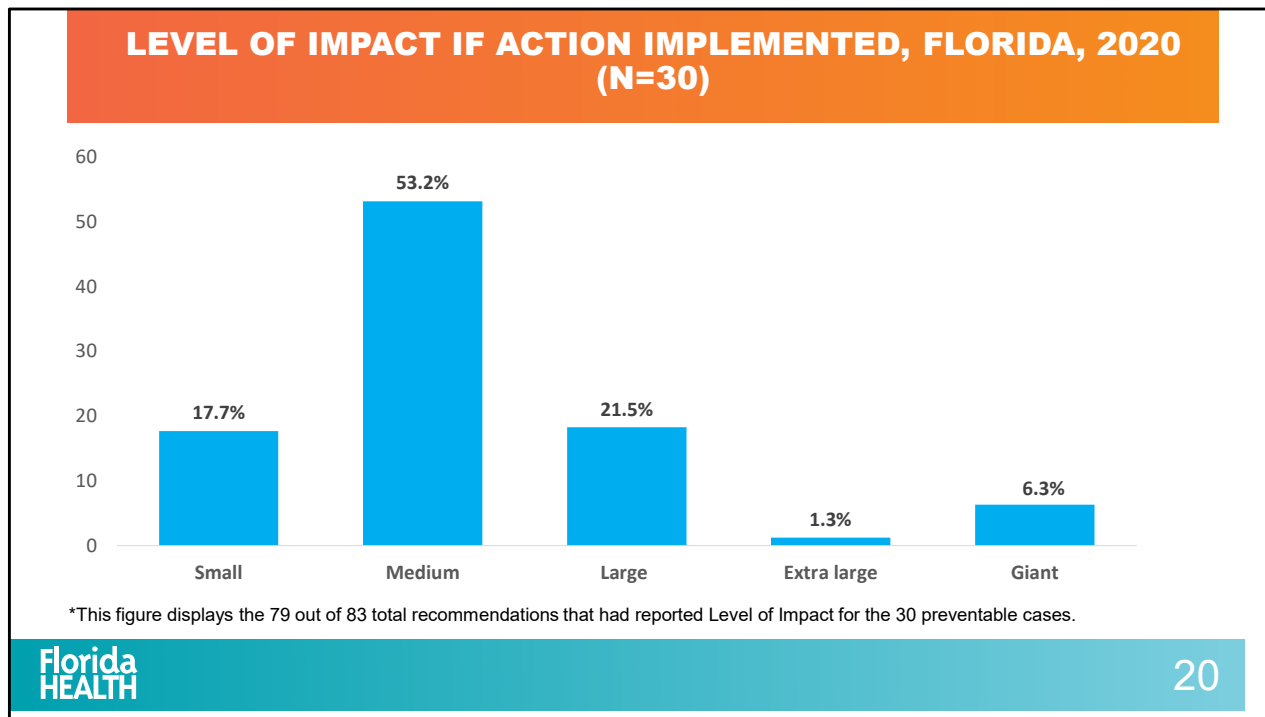


Note: The level of prevention for recommendations are only for the 30 pregnancy related deaths that were decided to be preventable. There were 79 responses related to the level of prevention for the 83 recommendations for the preventable PRDs.

This slide shows the level of prevention for 2020 recommendations in Florida. The committee determines whether, if implemented, the actions would result as:

- Primary prevention (actions that prevent the contributing factor before it occurs)
- Secondary prevention (actions that reduce the impact of a contributing factor once it has occurred), or
- Tertiary prevention (actions that reduce the impact or progression of what has become an ongoing contributing factor).

There were 79 responses related to the level of prevention for the 83 reported recommendations. A slight majority of the recommendations were identified as primary prevention (50.6%), 41.8% were identified as secondary prevention and 7.6% were identified as tertiary prevention.



This slide shows the level of impact if the recommendations are implemented.

- To each specific committee recommendation an expected level of impact is assigned if the recommendation is implemented, with the categories none, small, medium, large, extra-large and giant.
- The level of impact was estimated to be small in 17.7% of the recommendations.
- Medium in 53.2% of the recommendations.
- Large in 21.5% of the recommendations.
- Extra large in 1.3% recommendations.
- Giant in 6.3% recommendations

*This figure displays the 79 out of 83 total recommendations that had reported Level of Impact for the 30 preventable cases.

CONCLUSIONS

- Florida has been actively conducting ongoing surveillance of maternal mortality cases since 1996.
- To date, the Florida MMRC has reviewed almost 3,500 pregnancy associated deaths.
- Non-Hispanic Black women were almost four times as likely to have a PRD compared with Non-Hispanic White women.
- In 2020 as compared to 2010-2019, fewer women died from thrombotic embolism, cardiovascular disorders, hemorrhage, cardiomyopathy, and amniotic fluid embolism.
- The most common recommendation mentioned is “Women should be at an optimal weight and be in optimal health prior to becoming pregnant.”

