

# MATERNAL MORTALITY DATA

Big Data  
Spring 2024  
Tega Oyibo



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# ASSUMPTIONS & HYPOTHESIS



## ASSUMPTION(S)



Maternal mortality and diversity, equity and inclusion have been hot topics in the medical field as of late. With maternal mortality, we see that the groups that suffer the most from maternal mortality tend to be the least underrepresented.

## HYPOTHESIS



The groups disproportionately affected from high mmr would benefit the most from receiving care from health providers with the same ethnicity.



# FACTORS TO CONSIDER

# FACTORS TO CONSIDER



## WHAT CONSTITUTES AS MATERNAL MORTALITY?

The CDC's Pregnancy Mortality Surveillance System defines maternal mortality as **pregnancy-related death occurring during pregnancy or within a year of the end of pregnancy from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes.**

## SO WHAT DOES THAT MEAN?

- I must account for the race and ethnicity for health providers outside of a standard pregnancy team.
- Mental health can also be aggravated by the pregnancy, therefore suicide is considered a maternal death. So professionals that deal with mental health must be also looked at.



# DATA AND SOURCES



## WHAT KIND OF DATA WAS USED? AND WHERE DID IT COME FROM?

- **NIH.GOV & IHME.ORG:** Maternal mortality count and rate for the years 1999-2021 (race and ethnicity included) (US)
- **CDC.GOV:** US Maternal mortality count (2019-2023)
- **HRSA.GOV:** Race and Ethnicity of providers for the years (2017-2021)
- **CDC.GOV:** If the death was considered preventable or not (2017-2019)\*
- **CDC.GOV:** Timing of pregnancy related death (2017-2019)\*
- **AAMC.ORG:** Number of black practicing Obstetricians and Gynecologists & Other Specialties (2021)

## HOW WAS THIS DATA CLEANED? AND WHY?

- Removed unwanted data from the datasets
  - EX: When cleaning the race and ethnicity provider data set, I removed irrelevant occupations such as dentist and dental hygienist.
- Fixed formatting issues.
  - Got rid of any formatting that would cause errors once importing information into **Tableau**.
    - Used **MySQL** and **Excel** to clean!



when_death_occurred	n_count	percentage
During pregnancy	216	21.6
Day of delivery	132	12.2
1-6 days postpartum	120	12.0
7-42 days postpartum	233	23.3
43-365 days postpartum	301	30.0

specialty	total_active_physicians	black_number	black_percentage
Cardiovascular Disease	18,378	767	4.2
Obstetrics and Gynecology	38,649	4,133	10.7
Pulmonary Disease	3,499	112	3.2
Vascular Surgery	3,769	151	4

measure_id	measure_name	location_name	race_group	year_id	val
25	Maternal mortality ratio	Alabama	Hispanic and any race	1999	7.05494969
25	Maternal mortality ratio	Alabama	Hispanic and any race	2000	6.85480223
25	Maternal mortality ratio	Alabama	Hispanic and any race	2001	7.07138678
25	Maternal mortality ratio	Alabama	Hispanic and any race	2002	7.66504429
25	Maternal mortality ratio	Alabama	Hispanic and any race	2003	7.97492984
25	Maternal mortality ratio	Alabama	Hispanic and any race	2004	7.71891577
25	Maternal mortality ratio	Alabama	Hispanic and any race	2005	6.98943265
25	Maternal mortality ratio	Alabama	Hispanic and any race	2006	6.32337556
25	Maternal mortality ratio	Alabama	Hispanic and any race	2007	6.06148005
25	Maternal mortality ratio	Alabama	Hispanic and any race	2008	6.29316367
25	Maternal mortality ratio	Alabama	Hispanic and any race	2009	6.73120634
25	Maternal mortality ratio	Alabama	Hispanic and any race	2010	7.09268231
25	Maternal mortality ratio	Alabama	Hispanic and any race	2011	7.25516414
25	Maternal mortality ratio	Alabama	Hispanic and any race	2012	8.2321371
25	Maternal mortality ratio	Alabama	Hispanic and any race	2013	10.4710376
25	Maternal mortality ratio	Alabama	Hispanic and any race	2014	13.6222788
25	Maternal mortality ratio	Alabama	Hispanic and any race	2015	15.2033755
25	Maternal mortality ratio	Alabama	Hispanic and any race	2016	15.2696137
25	Maternal mortality ratio	Alabama	Hispanic and any race	2017	15.337781
25	Maternal mortality ratio	Alabama	Hispanic and any race	2018	16.3038594
25	Maternal mortality ratio	Alabama	Hispanic and any race	2019	16.137543
25	Maternal mortality ratio	Alabama	Non-Hispanic American Indian and Alaska Native	1999	2.00499294
25	Maternal mortality ratio	Alabama	Non-Hispanic American Indian and Alaska Native	2000	1.28877669
25	Maternal mortality ratio	Alabama	Non-Hispanic American Indian and Alaska Native	2001	1.34808840
25	Maternal mortality ratio	Alabama	Non-Hispanic American Indian and Alaska Native	2002	1.890465
25	Maternal mortality ratio	Alabama	Non-Hispanic American Indian and Alaska Native	2003	2.39791442
25	Maternal mortality ratio	Alabama	Non-Hispanic American Indian and Alaska Native	2004	2.54919226
25	Maternal mortality ratio	Alabama	Non-Hispanic American Indian and Alaska Native	2005	2.44274935
25	Maternal mortality ratio	Alabama	Non-Hispanic American Indian and Alaska Native	2006	2.51039097
25	Maternal mortality ratio	Alabama	Non-Hispanic American Indian and Alaska Native	2007	2.91313918
25	Maternal mortality ratio	Alabama	Non-Hispanic American Indian and Alaska Native	2008	3.63078505
25	Maternal mortality ratio	Alabama	Non-Hispanic American Indian and Alaska Native	2009	4.09159237
25	Maternal mortality ratio	Alabama	Non-Hispanic American Indian and Alaska Native	2010	4.09431534
25	Maternal mortality ratio	Alabama	Non-Hispanic American Indian and Alaska Native	2011	3.76145618

[illegible]

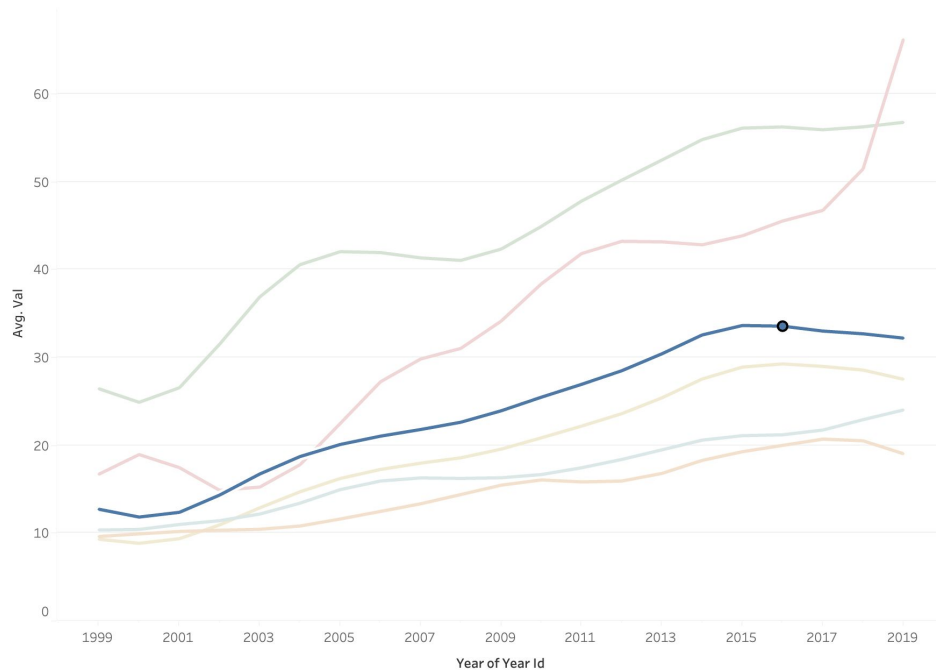
# 05.

## RESULTS

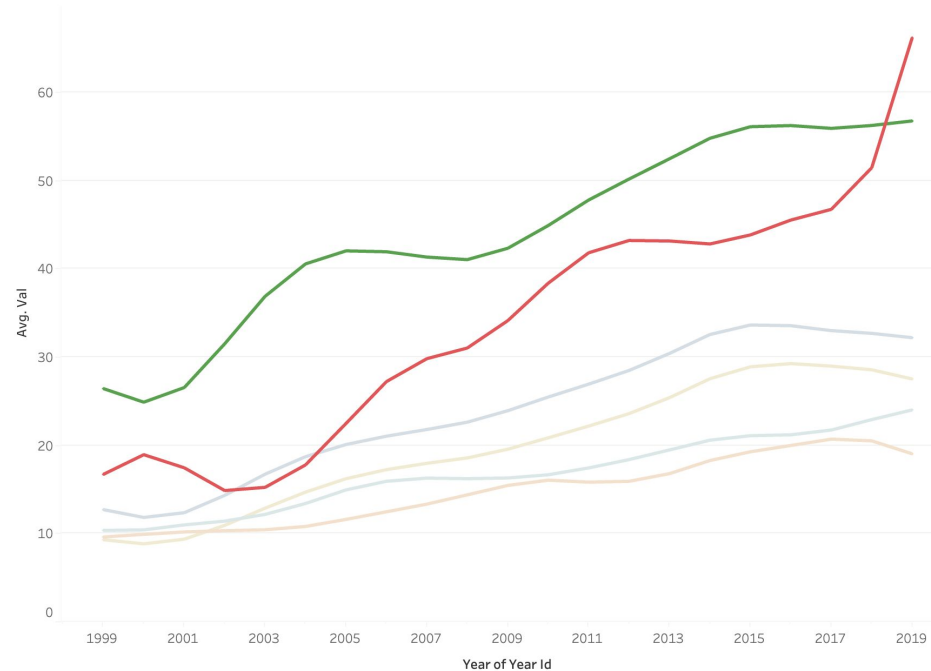


# RESULTS

All Races and Ethnicities MMR 1999-2019



All Races and Ethnicities MMR 1999-2019



# OUR GRAPHS

(4th) 2nd Lowest:



Time:

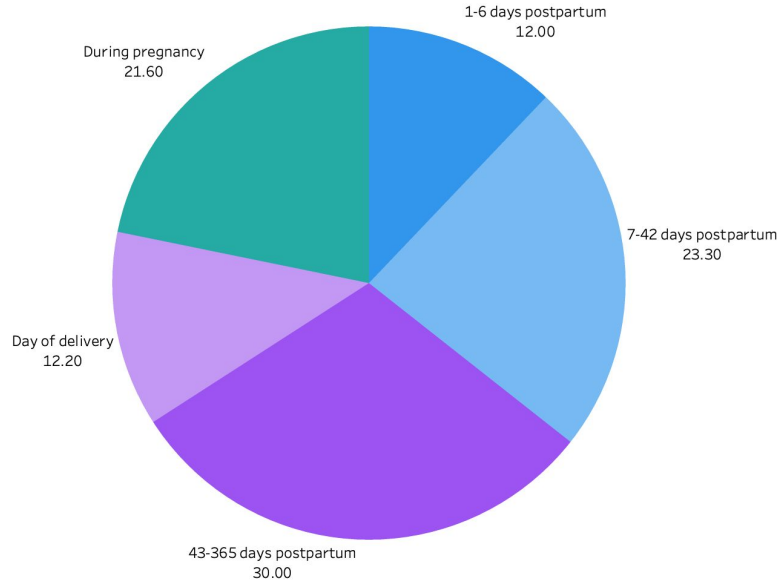
During Pregnancy  
**21.60%**



(4th) 2nd Lowest:

Day of Delivery  
**12.20%**

What I thought would  
be the highest!



(5th) Lowest:

1-6 day postpartum  
**12%**

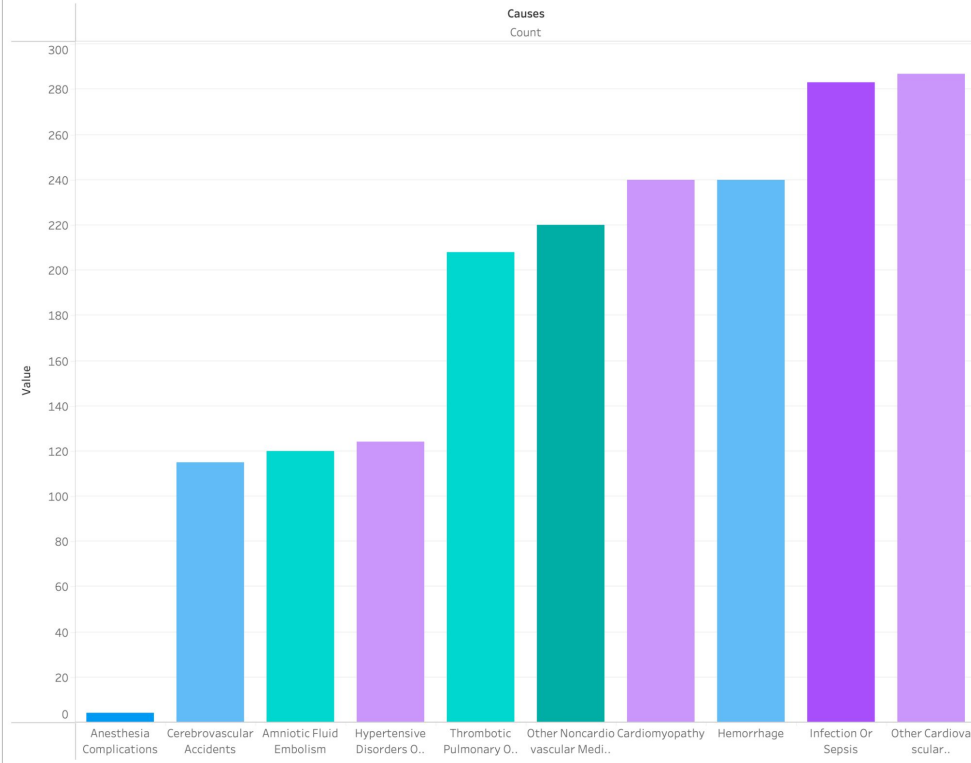
(1st) Highest:

43-365 day  
postpartum **30.30%**

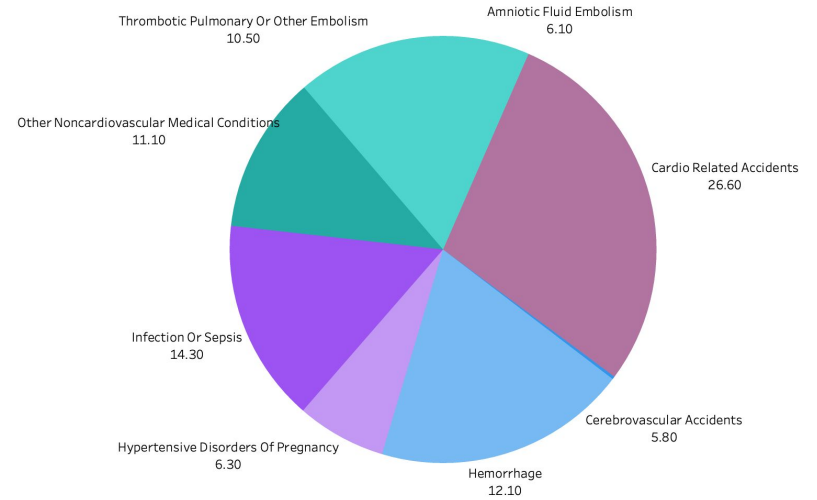
7-42 day postpartum  
**23.30%**

# GRAPHS: CAUSES

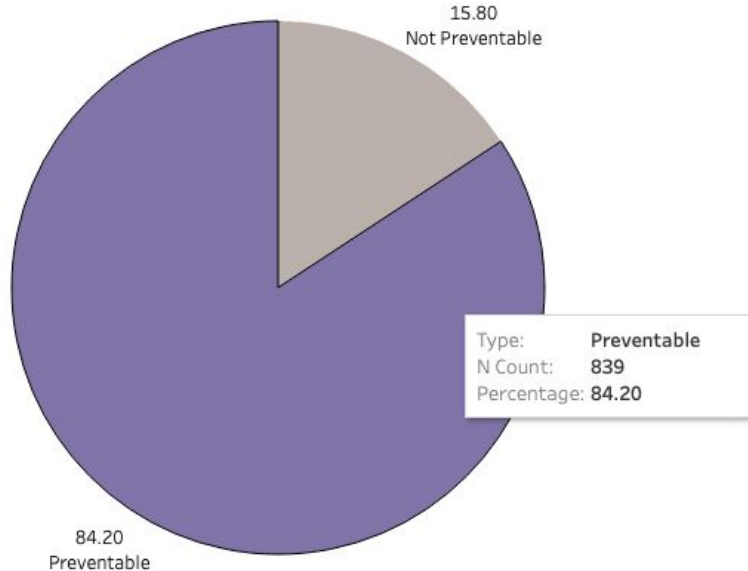
Causes of Maternal Mortality Bar Chart



Causes of Maternal Mortality Pie Chart



# PREVENTABLE DEATHS VS NOT PREVENTABLE



A whopping **84.20%** of maternal deaths were considered preventable in a CDC study!

# RESULTS

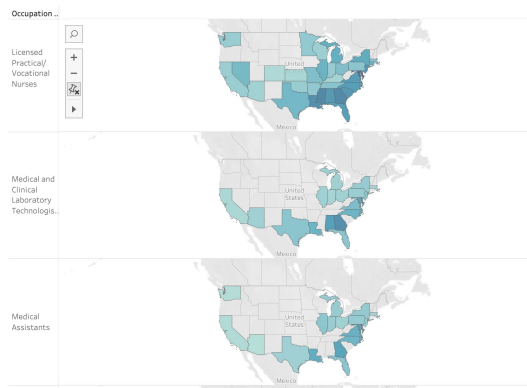
## Provider Diversity Black (Top 3)

Country	Occupation Name	State	Count	Black Percen..	American Or ..
United States	Advanced Practice Registered Nurses (excl. Clinical Nurse Specialists)	Georgia	8,672	18	0
		Texas	20,917	14	0
	Counselors	Georgia	10,391	47	0
		Maryland	8,246	38	0
		Texas	23,059	16	0
	Diagnostic Related Technologists & Technicians	Georgia	13,792	27	0
		Maryland	8,419	23	0
		Texas	35,772	11	0
	Dietitians and Nutritionists	Texas	9,163	15	0
		Georgia	9,115	14	0
	Emergency Medical Technicians and Paramedics	Maryland	3,144	15	0
		Texas	17,323	7	0
	Health Practitioner Support Technologists and Technicians	Georgia	21,664	33	0
		Maryland	13,829	34	0
		Texas	62,651	13	0
	Licensed Practical/Vocational Nurses	Georgia	22,167	51	0
		Maryland	11,613	63	0
		Texas	69,057	27	0
	Medical and Clinical Laboratory Technologists & Technicians	Georgia	11,826	48	0
		Maryland	6,488	38	0
		Texas	25,844	19	0
	Medical Assistants	Georgia	17,290	37	0
		Maryland	10,841	38	0
		Texas	50,635	12	0
	Medical Records & Health Information T...	Texas	13,279	14	0
	Occupational Therapists	Texas	8,257	7	0

## MMR by race and state for years (2017-2019) (GA, MD, TX)

Country (M..	Race ..	Location Na..	Year Id		
			2017	2018	2019
United States	Hispanic and any race	Georgia	21.08	20.61	21.97
		Maryland	19.08	18.40	16.90
		Texas	27.99	26.13	21.91
	Non-Hispanic Black	Georgia	95.22	95.35	100.90
		Maryland	52.50	55.74	60.65
		Texas	85.79	72.46	54.37

## Provider Diversity Black by State Map



I compared mmr data to the states that had the highest black professionals percentage, Ga, MD, TX.

# RESULTS

MMR by race and state for years (2017-2019) (GA, MD, TX)

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Compared to the states with the highest

Black Pop (Acc. to Census):

GA- 33%

MD- 31.7%

TX- **13.4%**

MMR by race and state for years (2017-2019) (CO,KY, WI)

Country (M..	Race ..	Location Na..	Year Id		
			2017	2018	2019
United States	Hispanic and any race	Colorado	20.43	24.98	30.29
		Kentucky	12.79	12.31	11.27
		Wisconsin	18.91	16.08	8.05
	Non-Hispanic Black	Colorado	77.09	59.17	29.43
		Kentucky	73.72	75.25	75.03
		Wisconsin	37.03	40.85	39.79



# HYPOTHESIS: IS IT RIGHT?



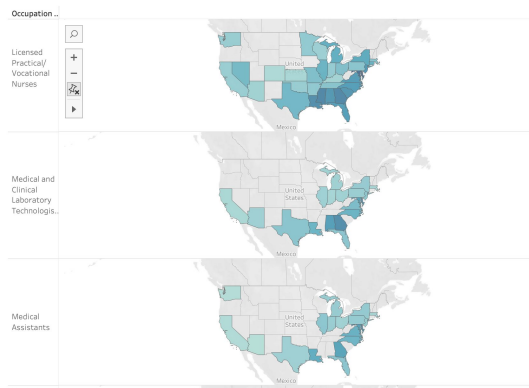
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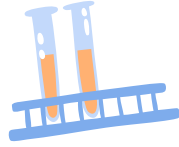
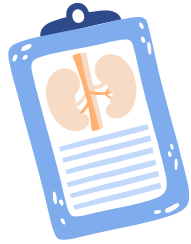
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Provider Diversity Black by State Map



Yes and No! While we see that underrepresented groups, like black women, do in fact suffer from high maternal mortality rate. We can not yet confirm that if they were represented their mmr would improve and here's why...

# 05. INSIGHTS AND CONCL.

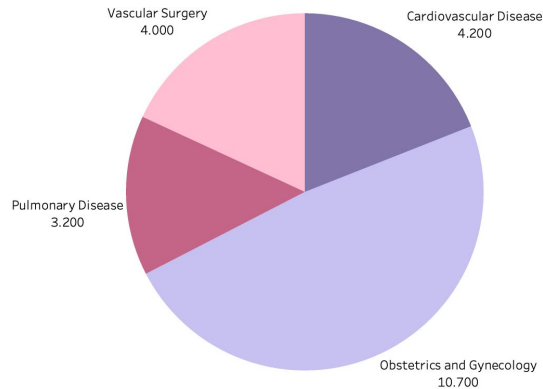




## WHAT NOW?

While, my hypothesis could not be directly proven or disproven. I can say that the data does show that there's a need for higher percentages of black providers to see a change.

Black Physicians Specialties 2021



## WHAT NOW?

These are the active physicians (as of 2021) in specialties that directly deal with the issues that cause mm. Obstetricians and Gynecologists are ranked #1 as the specialty with the highest percentage of black people... with **10%**

# DEDICATED PAGE FOR SOURCES



- **NIH.GOV & IHME.ORG**: Maternal mortality count and rate for the years 1999-2021 (race and ethnicity included) (US)
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# THANKS!

GOT ANY QUESTIONS?  
ASK NOW!



Thank you for listening!

