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**Maternal Mortality and Failure to Rescue:
Implications for Women's Health
Practitioners**



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Headlines are confusing...

2017

- **NBC News**

“Texas Has the Highest Maternal Mortality Rate in the Developed World. Why?”

- **Governing – The States and Localities**

“Why Texas Is the Most Dangerous U.S. State to Have a Baby”

2018

- **The Washington Post**

“Texas’s maternal mortality rate was unbelievably high. Now we know why.”

- How do we define maternal mortality?

- **Texas Medical Association**

“Does Texas Still Have a Maternal Health Crisis? You Bet It Does.”



MacDorman Report, August 2016

United States Average Maternal Mortality Only states with standard pregnancy question (Data exclude California and Texas)

Year	Maternal Mortality Rate
2000	18.8
2001	19.2
2002	19.5
2003	19.9
2004	20.3
2005	20.6
2006	21.0
2007	21.3
2008	21.7
2009	22.0
2010	22.4
2011	22.8
2012	23.1
2013	23.5
2014	23.8

Rates back-estimated from reported 2014 rate for states with the standard pregnancy question using a weighted average of the slopes from groups 1–4; see “Materials and Methods.”



The Story of Two States: Texas and California

Texas adjusted maternal mortality (2006)
Maternal deaths up to 1 year after birth

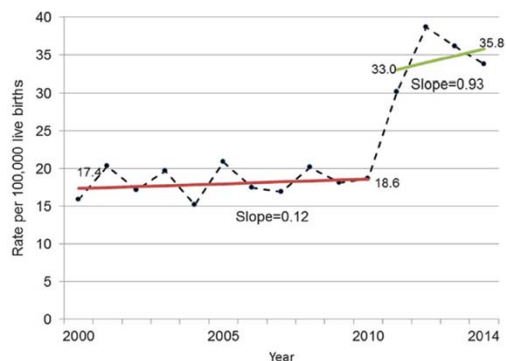


Fig. 4. Adjusted maternal mortality rates, Texas, 2000–2014. Texas revised to the U.S. standard pregnancy question in 2006. The unrevised question asked about pregnancies within the past 12 months.

MacDorman. *U.S. Maternal Mortality Trends. Obstet Gynecol* 2016.

California adjusted maternal mortality (2003)
Maternal deaths up to 1 year after birth

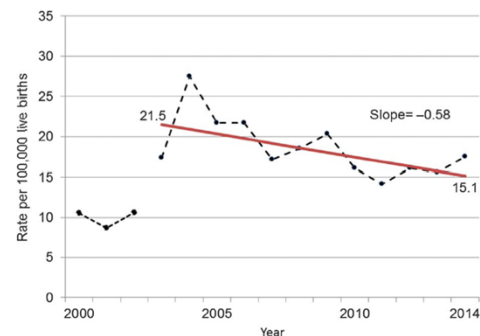
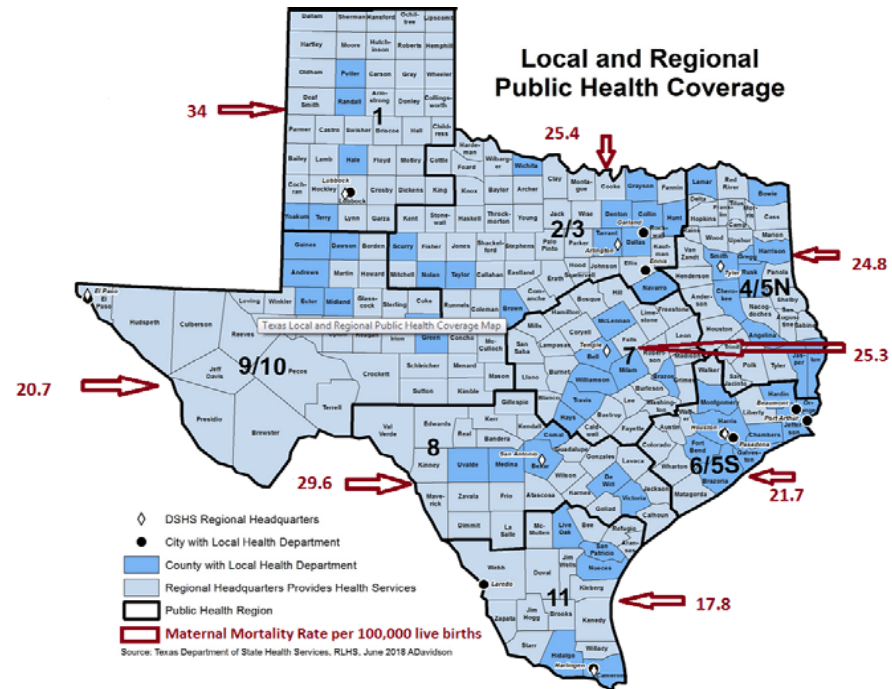


Fig. 5. Unadjusted combined maternal and late maternal mortality rates, California, 2000–2014. Includes pregnancy-related deaths occurring within 1 year of pregnancy. California revised their death certificate in 2003 to a non-standard question that asks about deaths within 1 year of pregnancy. Before 2003, California did not have a pregnancy question on their death certificate.

MacDorman. *U.S. Maternal Mortality Trends. Obstet Gynecol* 2016.



Maternal Mortality Rate per 100,000 Live Births by Texas Public Health Region in 2015



Criteria for Defining Maternal Mortality

Death Certificate “Pregnancy Check Box”

- Pregnant at death
- Pregnant within the 42 days before death
- Pregnant within 43-364 days before death (late maternal mortality)
- Some cases included regardless of cause of deaths
 - Not only deaths from obstetrical causes



Texas Maternal Morbidity and Mortality Task Force Analysis

- Excluded women who were pregnant within 43-364 days before death (late maternal mortality)
 - Some causes of death (e.g., opioid overdose, homicide) excluded
- “Enhanced method”
 - Determined “mistakes” in death certificates
 - No evidence of pregnancy
 - Mistakes occur in both directions
 - Pregnancy not indicated when woman has been pregnant



Dallas Morning News: “Texas is more concerned with counting maternal mortality than saving lives.”

“I am concerned the state of Texas is spending an inordinate amount of resources looking backward rather than focusing on preventing future maternal deaths. Members of the Texas Maternal Mortality and Morbidity Task Force published a new study in [Obstetrics & Gynecology](#) challenging the unbelievably high maternal mortality ratio in Texas, concluding human error is to blame.”

“The Texas Department of State Health Services **spent significant resources refining the way maternal deaths are identified and mortality ratios calculated.** The report used an enhanced method to examine deaths in 2012. Researchers found the new count slashed the state's maternal mortality ratio to 14.6 from 38.4, and maternal deaths dropped to 56 from 147.”

James Lozada, MD, Northwestern University
Feinberg School of Medicine



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Failure to Rescue

- Failure to Rescue (FTR) was developed by Silber et al. who suggested the term as an indicator of quality of care, with a focus on surgical patients in the inpatient setting (Silber, Williams, Krakauer, & Schwartz, 1992).
- FTR was originally conceptualized as **management of complications or prevention of death after a complication** and was operationalized to mean the number of patients that health care providers failed to save after developing surgical complications that were life-threatening.
- We expanded the concept to examine FTR in a maternal population in Texas.



Maternal Failure to Rescue

- Maternal mortality from pregnancy onset to 42 days after pregnancy termination AND 43 to 364 days after pregnancy termination
- Increased cause of deaths from:
 - Drug overdose
 - Suicide
 - Homicide
- Screening tools available for pregnancy/birth:
 - U.S. Preventative Services Task Force and ACOG
 - Recommend screening for depression, family violence, drug and alcohol use
 - If screening guidelines were implemented, high-risk cases would be identified
 - Failure to Rescue occurs when screening does not occur or is inaccurate



Population and Analysis

- We examined births and maternal deaths in Texas for the years 2013, 2014, and 2015.
- We identified 713 mortalities from 1,218,205 births in Texas.
 - Met definition of maternal mortality for births occurring in 2013, 2014, and 2015
- Of these deaths, 475 noted underlying obstetrical risk factors for maternal mortality, leaving 238 deaths from other causes.
- Forty of these 238 mothers died from suicide, opioid overdose, or homicide.



Failure to Rescue Calculation

Calculation based upon identified population:

- **We counted all of the preventable deaths from five complications (not including deaths from motor vehicle accidents or cancer)**
- **But, we also included homicide, suicide, and opioid overdose.**
- **We combined diabetes (gestational and prepregnancy) and hypertension (chronic and gestational)**
- **One might assume that deaths from those five complications would occur within 42 days after birth but the results are mixed.**



Maternal Death among Black Women Cause and Timing of Death Texas - 2012-2015

CAUSE OF DEATH	TIMING OF DEATH					TOTAL
	While Pregnant	0-7 Days Postpartum	8-42 Days Postpartum	43-60 Days Postpartum	61+ Days Postpartum	
Other Causes	2	1	0	0	11	14
Cardiac Event	0	2	4	1	6	13
Homicide	2	0	3	1	4	10
Hypertension Eclampsia	0	2	2	0	5	9
Drug Overdose	0	0	2	1	4	7
Cerebrovascular Event	0	0	3	0	2	5
Infection/Sepsis	0	0	4	0	1	5
Amniotic Embolism	3	1	0	0	0	4
Pulmonary Embolism	2	0	1	0	1	4
Hemorrhage	0	1	1	0	1	3
Suicide	0	0	0	0	3	3
Substance Use Sequelae (e.g. cirrhosis)	0	0	0	0	0	0



Numeric Calculation

$D_c + D_{uc} / (B_c + B_{uc}) D_c$ = Deaths from a subset of complications documented on the birth record:

D_c = Deaths from a subset of complications documented on the birth record

D_{uc} = Deaths with undocumented complications, from the death record

B_c = Births with a subset of complications documented on the birth record

B_{uc} = Births with undocumented complications on the birth record



Births with a subset of complications documented on the birth record (B_c)

B_c includes only the following:

- Data documenting five specific complications (maternal morbidities)
- These complications include the following conditions:
 1. Hemorrhage
 2. Hypertension (both chronic and gestational)
 3. Diabetes (both prepregnancy and gestational)
 4. Eclampsia
 5. Cesarean delivery



Results

- The unrefined FTR rate was 96 maternal deaths/100,000 births.
- The FTR rate (using the expanded concept) was 104 deaths/100,000 births, an increase of 8 deaths/100,000 births.
- **The revised FTR calculation demonstrated an 8% increase.**



Summary

- Changing the definition of maternal mortality changes the rate of maternal mortality.
 - Cannot compare states using two different definitions of maternal mortality
- Is the purpose of population analysis to identify problems we can fix or to obscure problems that exist?



Precision Public Health – Preventive Public Health

If precision health focuses on an individual, precision public health is about populations.

It is essentially about delivering
“the right intervention at the right time,
every time to the right population.”



Implications for Nurse Practitioners Who Care for Women

- The current focus on common maternal physiological complications restricts thinking to hospital-based remedies
- When planning population-level interventions, consideration of only those complications amenable to hospital-based services would fail to recognize the full range of services needed to reduce FTR and maternal mortality, furthering promotion of maternal health



References

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Questions?



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Thank You!



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