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Rise in Maternal Mortality in Women of Color—Research Update and Future Directions

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Disclosures

- Reviewer, California Maternal Mortality Review Committee
- Health services researcher with funding
 - AHRQ (Maternal Quality of Care Indicators; Levels of Risk Appropriate Care)
 - California State MCAH (Trends in Maternal Morbidity)
- Not likely to tell you anything new, that you haven't heard before
 - Everything I am likely to say, you learned in kindergarten, or Introduction to Epi or MCH course
 - Adverse birth outcomes
 - Health disparities research
 - Life course, Social determinants, Individual level risk factors and theoretical interactions

Disclosures (cont'd)

- CA PAMR Report findings, summary recommendations, and review and integration of literature from multiple perspectives
- The opinions expressed are my own
 - Quality improvement perspective
 - Primary provider/educator within an academic tertiary care community hospital
 - Recent experience with healthcare system as a “client” in “caretaker” role
 - African American female, mother (sister, friend)
- No off label use of medications



Overview

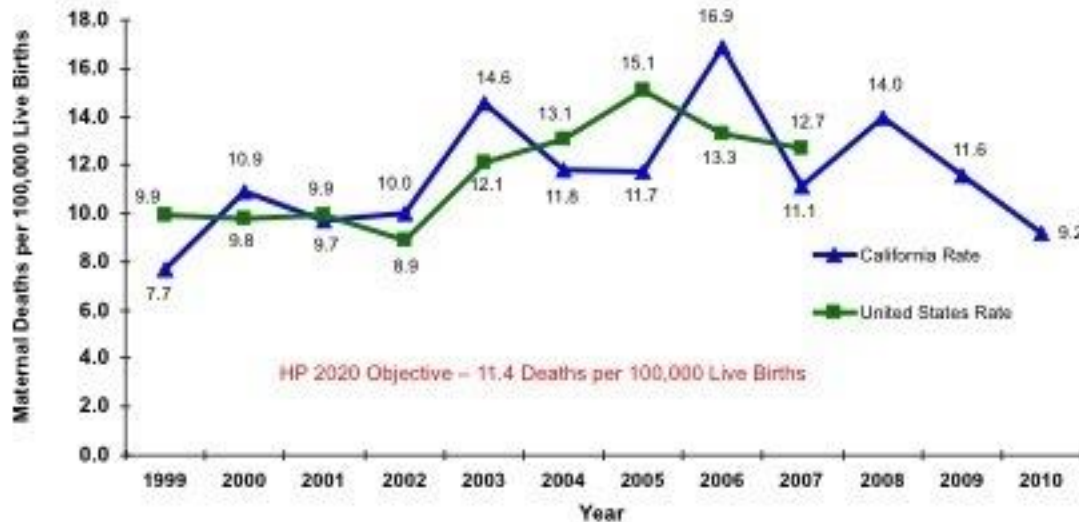
- Using CA-PAMR as a spring board...
 - What do we know about maternal mortality?
 - What do we know about reproductive health disparity?
 - Given what we know, what can we do about it?



What do we know about maternal mortality?



Maternal Mortality Rate, California and United States; 1999-2010



- Maternal mortality is on the rise
- California & US
- California 35/51 states;
 - 500,000 births/yr
 - 1/8 US births
- US is 50/59 developed countries
- US rate going up
- Global MMR rate going down
- US competitive, reflects poorly
- Especially given \$ US healthcare

SOURCE: State of California, Department of Public Health, California Birth and Death Statistical Master Files, 1999-2010. Maternal mortality for California (deaths \leq 42 days postpartum) was calculated using ICD-10 cause of death classification (codes A34, O00-O95, O98-O99) for 1999-2010. United States data and HP2020 Objective were calculated using the same methods. U.S. maternal mortality data is published through 2007 only. Produced by California Department of Public Health, Center for Family Health, Maternal, Child and Adolescent Health Division, December, 2012.

© CDPH MCAH California Pregnancy-Associated Mortality Review Project, April, 2012

cmqcc.org/maternalmortality, accessed 9/3/2013

KD Gregory 9/2013

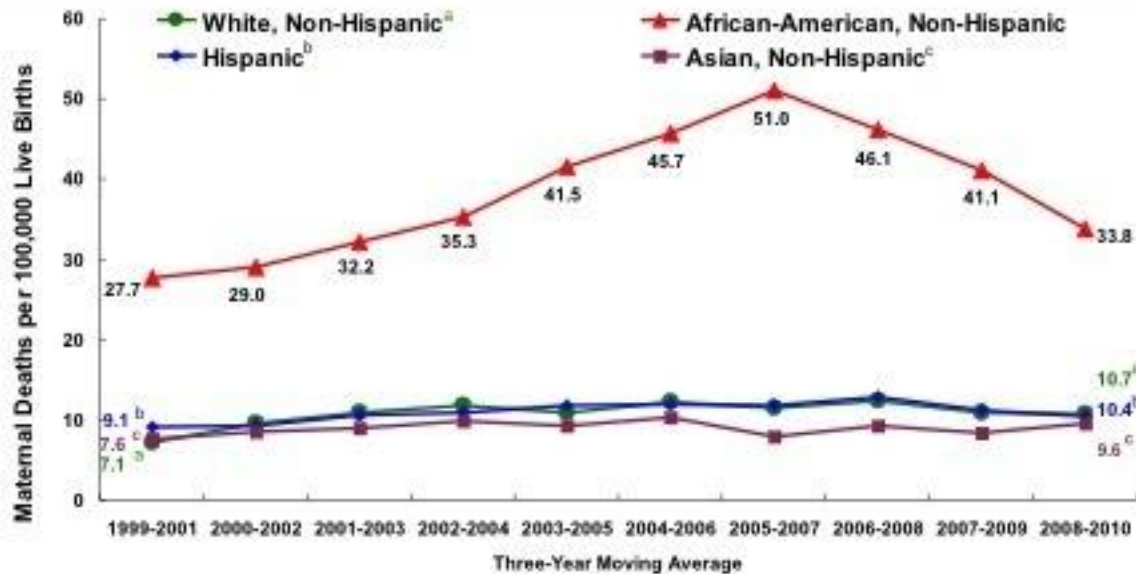


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What do we know about disparities in maternal mortality?



Maternal Mortality Rates by Race/Ethnicity, California Residents; 1999-2010



- AA 4x increased risk of death
- Hispanics comparable to White
- Asians have lowest MMR
- **HP 2020 11.4/100,000**
- Poor international rank related to health disparities

SOURCE: State of California, Department of Public Health, California Birth and Death Statistical Master Files, 1999-2010. Maternal mortality rates for California (deaths ≤ 42 days postpartum) were calculated using the ICD-10 codes for 1999 to 2010. Produced by California Department of Public Health, Center for Family Health, Maternal, Child and Adolescent Health Division, December, 2012.

cmqcc.org/maternalmortality, accessed 9/3/2013

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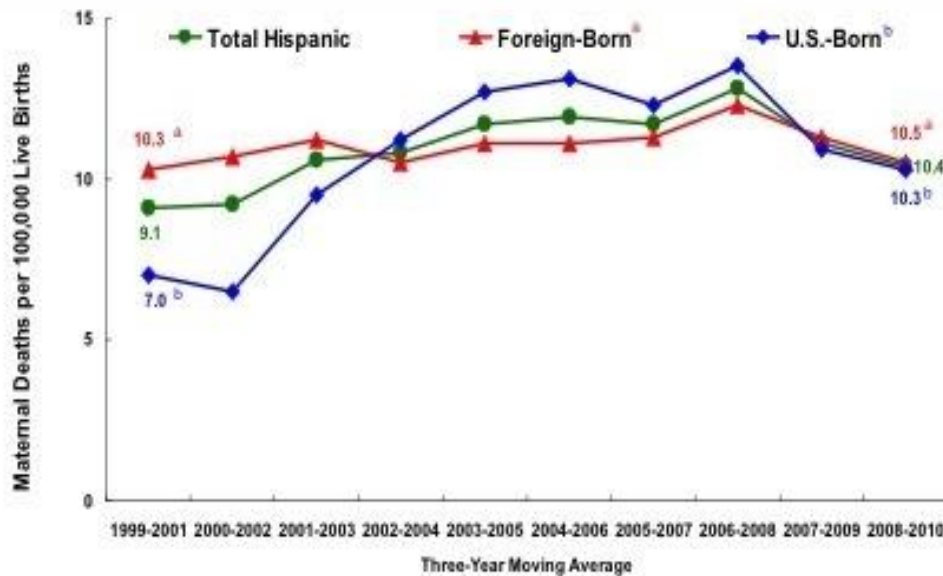


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What do we know about disparities in maternal mortality?



Maternal Mortality Rates for U.S.- and Foreign-born Hispanic California Residents; 1999-2010



- Hispanics comparable to White
- Rate actually increasing
 - Caution:
 - US born until recently at increased risk

SOURCE: State of California, Department of Public Health, California Birth and Death Statistical Master Files, 1999-2010. Maternal mortality rates for California (deaths ≤ 42 days postpartum) were calculated using the ICD-10 codes for 1999 to 2010. Produced by California Department of Public Health, Center for Family Health, Maternal, Child and Adolescent Health Division, December, 2012.

cmqcc.org/maternalmortality, accessed 9/3/2013

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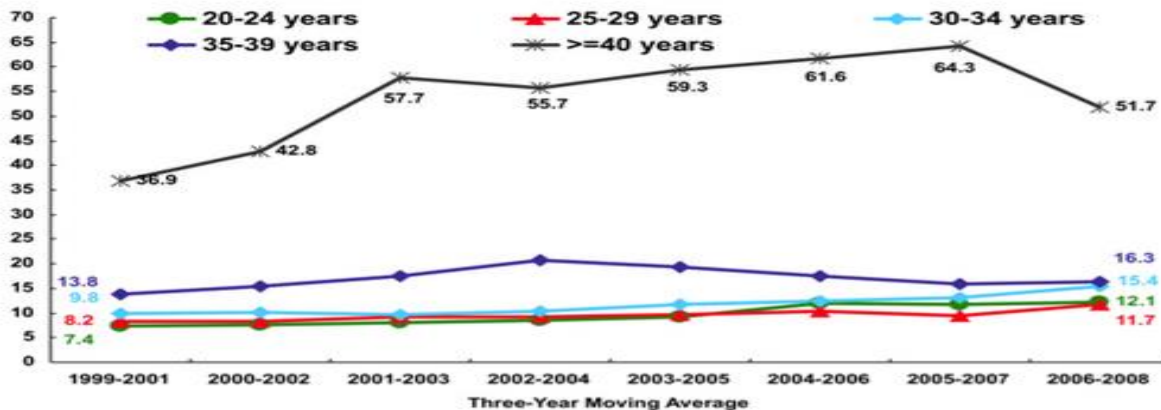


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Why is maternal mortality increasing? How does this relate to disparities?

- Increased case ascertainment—expanded case definition to include 1 yr; added variable on death certificate; looked at linked files—active case finding
- Delayed childbearing (older women at increased risk)
 - Average age of women giving birth is gradually increasing

Maternal Mortality Rates by Age Group, California Residents; 1999-2008



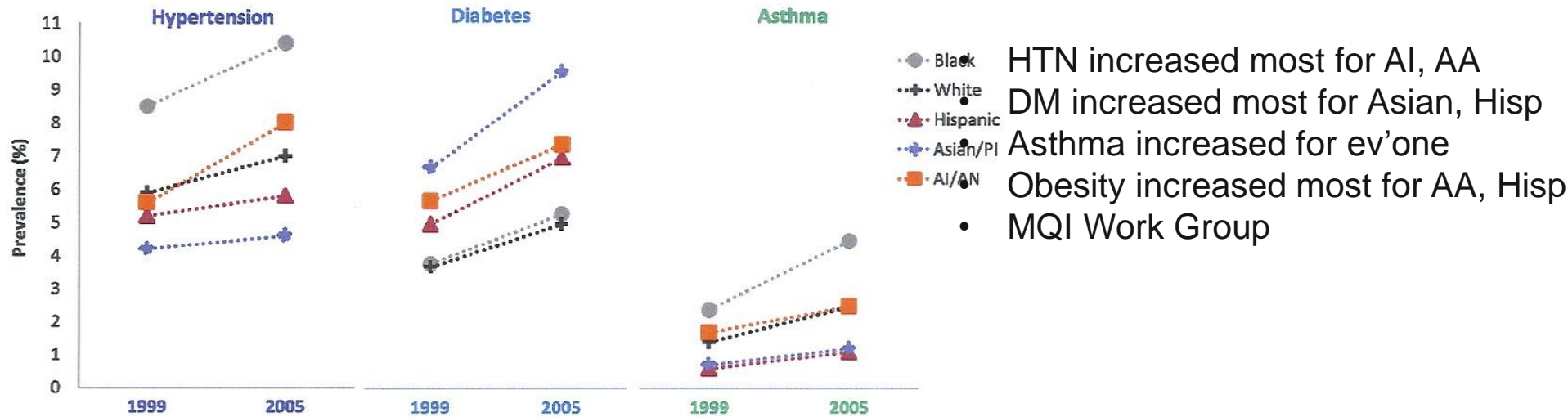
SOURCE: State of California, Department of Public Health, California Birth and Death Statistical Master Files, 1999-2008. Beginning in 1999, maternal mortality for California (deaths \leq 42 days postpartum) was calculated using ICD-10 cause of death codes A34, O00-O95, O98-O99. Produced by California Department of Public Health; Maternal, Child and Adolescent Health Division, December, 2010.

cmqcc.org/maternalmortality, accessed 9/3/2013

Why is maternal mortality increasing? How does this relate to disparities?

- Increased prevalence of chronic conditions (also related to age)
 - Hypertensive disorders, diabetes, obesity, cesarean delivery/prior cesareans

Figure 2. The Rise in Selected Maternal Morbidities by Racial-Ethnic Group, California 1999 - 2005



- HTN increased most for AI, AA
- DM increased most for Asian, Hisp
- Asthma increased for ev'one
- Obesity increased most for AA, Hisp
- MQI Work Group

Source: Office of Statewide Health Planning and Development (OSHPD) Linked Birth Certificate and Patient Discharge Data
Data are from 1999 and 2005. The dotted lines illustrate the increase between the two points, but do not indicate a linear trend for the intervening period.

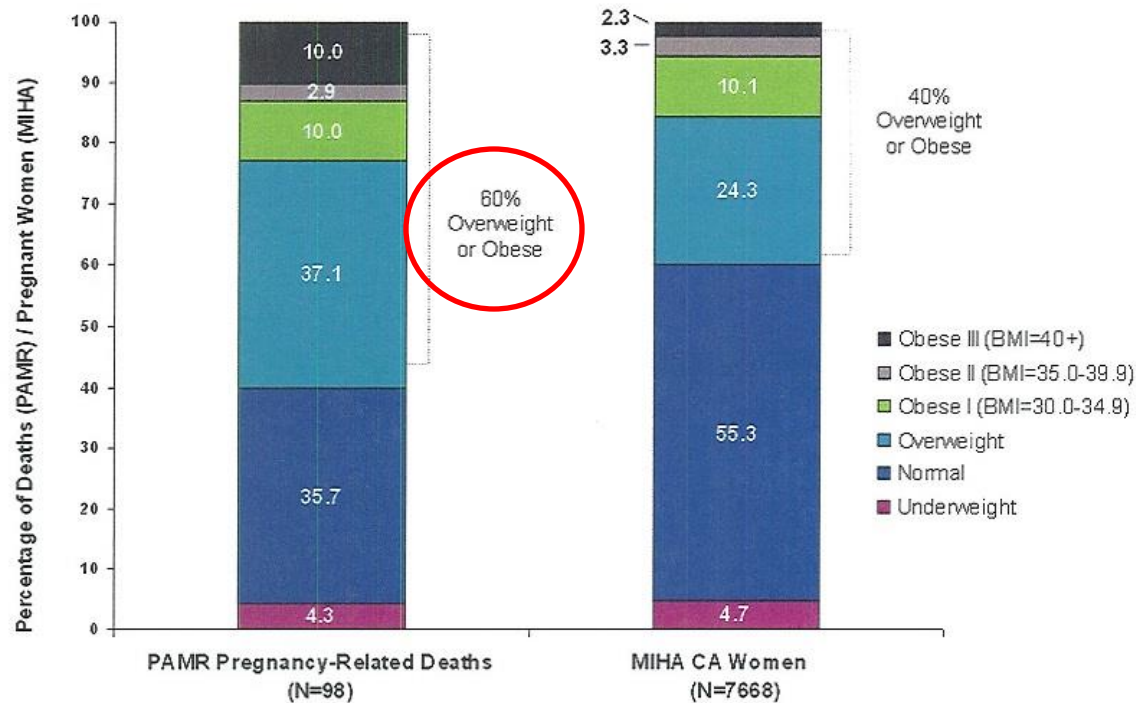
<http://www.cdph.ca.gov/programs/mcah/Documents/MO-MCAH-Bulletin-MQI-MaternalMorbidity-7-12-2012.pdf>



Why is maternal mortality increasing? How does this relate to disparities?

- Obesity was significant risk factor for maternal mortality

Figure 10. Pre-pregnancy BMI Status of CA-PAMR Pregnancy-Related Deaths and all Women with Live Births, California; 2002-2003



cmqcc.org/maternalmortality, accessed 9/3/2013

Why is maternal mortality increasing? How does this relate to disparities?

- Social factors such as low levels of social support, low SES, chronic exposure to environmental hazards/stress (allostatic load) including racism and difficulty accessing care
 - Tendency to focus on individual level risk factors;
 - Need to expand to social determinants of health
 - Characteristics of communities can mitigate (good or bad) health
 - Some segregated communities promote good behaviors, provide social support and coping mechanisms
 - (esp Hispanic communities; some not all AA communities—requires cooperating “kinsmen” or multigenerational neighbors)
 - Roberts 1997, AJPH; Stack, 1974; Culhane & Elo 2005, AJOG



Why is maternal mortality increasing? How does this relate to disparities?

- Factors related to health care systems and access to quality care (inpatient and outpatient) including disparate overuse (inductions/cesareans) and underuse (tocolytics, pain medicine)
- 30-50% of deaths presumed to be preventable and/or attributable to provider or health system limitations
 - Delays or inadequate diagnosis/treatment
 - Use of ineffective treatment
 - Misdiagnosis of condition
 - Lack of resources/delayed transfer/access to prior records/visits
- Clark 2012 Sem Perinat
- Berg et al 2005 Obstet Gynecol
- CA-PAMR



What are the leading causes of maternal mortality? Does it vary by race/ethnicity?

Worldwide ¹	United States ²	California ^{3a}	California ^{3b}
Postpartum hemorrhage	Hemorrhage	HTN disorders	Cardiovascular disease ^{3c} Including cardiomyopathy
Infection	HTN disorders	Hemorrhage	HTN disorders ^{3d}
HTN disorders	Thromboembolic disorders	Amniotic fluid embolism	Amniotic fluid embolism
Unsafe abortions	Amniotic fluid embolism	Sepsis	Hemorrhage
	Infection	Thromboembolic	Sepsis
	Other conditions	Other complications	

Traumatic Injury (MVA, homicide, suicide)

cmqcc.org/maternalmortality, accessed 9/3/2013

1. <http://www.who.int/mediacentre/factsheets/fs348/en/index.html>
2. <http://www.cdc.gov/mmwr/preview/mmwrhtml/ss5201a1.htm>; 1991-97
3. CA-PAMR; a before review; b after review; c leading cz AA; d leading cz Hisp



Leading causes

- Time dependent
- Location dependent
- CA findings 2002-2003 comparable to UK, Florida, different from US, NY
- Better definitions of race/ethnicity may change ranking



What are the leading causes of maternal mortality? Does it vary by race/ethnicity?

- Is disparity due to differences in prevalence of disease or difference in case-fatality?
- Several studies suggest not consistently due to increased prevalence of disease;
- Even among low risk or no risk, mortality rates are higher



Increased Prevalence or Increased Case-Fatality?

TABLE 1—Prevalence and Case-Fatality Rates and Black-White Rate Ratios (With 95% Confidence Intervals [CIs]) for 5 Selected Pregnancy Complications, By Race: United States, 1988–1999

	Prevalence Rate ^a		Black-White Ratio (95% CI)	Case-Fatality Rate ^b		Black-White Ratio (95% CI)
	Black	White		Black	White	
Preeclampsia	3176	2554	1.2 (0.8, 1.7)	73.5	27.4	2.7 (1.8, 3.6)
Eclampsia	131	83	1.6 (0.9, 2.3)	1536.3	626.2	2.5 (1.4, 3.5)
Abruption	970	895	1.1 (0.7, 1.5)	58.4	21.3	2.8 (1.8, 3.7)
Placenta previa	454	433	1.1 (0.7, 1.4)	40.7	17.3	2.4 (1.5, 3.2)
Postpartum hemorrhage	1428	1890	0.8 (0.5, 1.0)	68.3	21.0	3.3 (2.1, 4.4)



Note. NHDS = National Hospital Discharge Survey.

^aPrevalence rates were calculated as the number of pregnant women with the condition (obtained from the NHDS) per 100 000 live births (obtained from National Center for Health Statistics natality files).

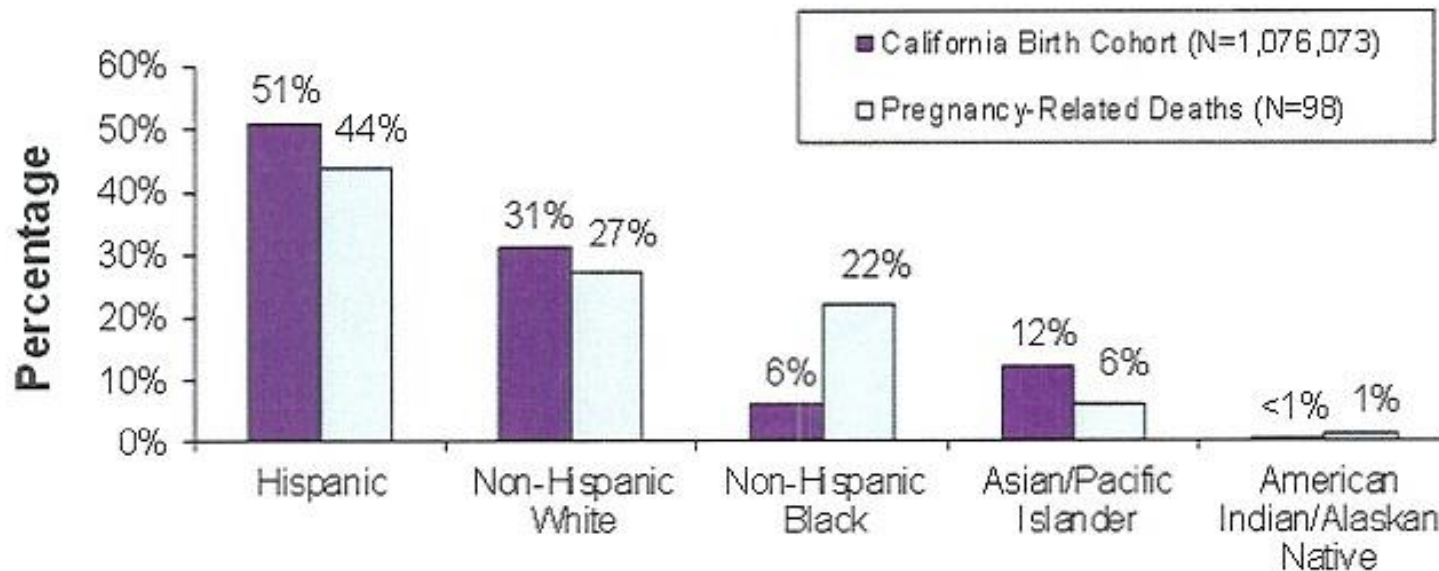
^bCase-fatality rates were calculated as the number of deaths attributable to that condition (obtained from the Pregnancy Mortality Surveillance System) per 100 000 women with that condition (obtained from the NHDS).

Tucker et al, AJPH 2007



Mortality Rate & Birth Rate Impact Overall Disparity

Figure 11. Race/Ethnicity of Pregnancy-Related Deaths and all California Births, 2002-2003



cmqcc.org/maternalmortality, accessed 9/3/2013

What do we know about health system contribution to health disparities?

- IOM. Unequal treatment: Confronting Racial and Ethnic Disparities in Health Care, 2002
- Sociocultural differences between patients and providers influence communication and clinical decision making
- Physicians tend to associate AA and pts of low SES as being less intelligent, more likely to engage in risky behaviors, and less likely to adhere to medical regimens, even when controlling for pts true SES, personality attributes and degree of illness



What do we know about health system contribution to health disparities?

- IOM. Unequal treatment: Confronting Racial and Ethnic Disparities in Health Care, 2002
- Compared to whites, minorities receive fewer cardiac dx/tx procedures
- less analgesia for pain control in ED
- less surgical tx for operable lung cancer
- fewer referrals for transplant
- poorer quality of care when admitted for pneumonia, CHF
- lower use of covered services (immunizations, mammograms) ETC
- even controlling for insurance status, income, age, comorbid conditions, and symptom expression



What do we know about health system contribution to health disparities?

- Not me! Doctors, Decisions, and Disparities in Health Care
 - Providers susceptibility to stereotyping, leads to disparate clinical decision making
 - Social cognitive theory: Bias, stereotyping, prejudice and clinical uncertain contribute to disparities (unequal treatment, referral, access)
 - We activate stereotypes when stressed, multitasking (eg seeing pts)
 - Betancourt, Cardio Rev Report, 2004
- Question: Does this unconscious, “systematic bias” contribute to preventable medical or health system errors associated with increased case-fatality rates?



Given what we know, what can we do about it?

- CA-PAMR QI Opportunity Themes based on 93/95 cases 2002-2003
 1. Timely dx and standardized EBM for specific conditions (hemorrhage, HTN, cardiomyopathy, AFE)
 2. Recognition and response to clinical triggers (pain, HR, O2sat, RR)
 - Optimal and EARLY resuscitation
 3. Clinical coordination of care with multiple comorbidities/consultants/transfers
 - Access to care/consultants
 4. Improved maternal health before, during pregnancy and postpartum
 - Optimize health and weight prior to pregnancy; lifelong nutrition, exercise



Given what we know, what can we do about it?

- CA-PAMR QI Opportunity Themes based on 93/95 cases 2002-2003
- 5. People who died were NOT low risk; had identifiable risk factors and publicly insured...societal costs are high
 - Provide education and services to optimize women's health along the continuum of lifecourse
 - Target specific subgroups, and address needs of AA and Hispanics (50% of deaths)
- 6. Support and replicate local projects that work (eg PPH toolkit)
- 7. Improve ability of hospitals to respond to OB Emergency, triage care by risk



Given what we know what can we do about it?

- Acknowledge that women of color are different
- Black women are different (individually and as a group)
- They are different and they are treated different
- How that difference is measured, characterized, yet to be determined...genetic, metabolic, proteonomic, social....
 - Globally across the world maternal mortality risk for women of African ancestry is greater
 - Africa; all countries where they migrate (UK, Netherlands, Caribbean, US)
 - Disparity not adequately defined by SES, segregation (eg. Hispanics in US, Turks & Moroccans in Netherlands, Asians anywhere)
 - Zwart et al 2010, Europ J Pub Health

Given what we know...what does evidence suggests?

- **Best practices. Learn from places where MMR is improving**
- Approach the national maternal mortality “gap” by treating/conceptualizing care for AA women as though they are receiving care in a “developing country”
- Developing countries making great strides towards the Millenium Goal 5
 1. Needs to be an ongoing political will to address the problem
 2. Skilled (INTERESTED) birth attendant
 - Provider attitude, communication
 - Providers that look like them
 - Continuity of providers and/or accountability between inpatient and outpatient
 - Seamless communication across providers/sites/visits especially if seen more than once, at same or different site
 - Likely need more mid-level clinicians (time); lay persons/educators
 3. Contraception—prevent pregnancy; address “wantedness”; avoid unintended or mistimed pregnancy
 4. Address education, economic empowerment early (teens, young adults)



Given what I know, what potential tests of change can we consider?

- Acknowledge that women of color are different.
- **Why don't we treat them different...in a good way**
- Develop a research program to isolate best practices for standardized treatment of black women comparable to the goals of emerging guidelines for tx of “HTN, DM, obesity”
- Being Black or AA is significant risk factor for all those conditions, and in most instances is a more prevalent condition.
- AA could or should be a “trigger” for enhanced scrutiny, care, sticking to the protocol



Given what I know, what potential tests of change can we consider?

- Acknowledge that women of color are different.
- **Why don't we treat them different...in a good way**
 - Theoretical examples of real life case scenarios:
 - What to do with the isolated elevated BP you don't believe? Repeat left lateral? Repeat tomorrow? Send to L&D for PIH evaluation?
 - What to do with HA unresponsive to tylenol?
 - Peripartum women with a cough—lower threshold for evaluation re: cardiomyopathy
 - postpartum home visits (70% single, head of household)
 - ½ pericardial myopathies and a lot of traumatic deaths occur 42 days+



Given what I know, what potential tests of change can we consider?

- Acknowledge that women of color are different.
- Why don't we treat them different...in a good way
 - Theoretical examples (cont'd):
 - Pt in ED or returns with same complaint, clinician should ask “what am I missing”
 - Made arrangements to get there, got care for kids, anticipating a long wait, and being ignored, poorly treated, or talked down to, and STILL came
- Diverse healthcare team—someone on the team needs to look like them to facilitate effective two way communication and shared decision making
 - “cultural competency” may not be enough



Given what I know

- **Personal reflections...food for thought**
- Hypertension disorders.
 - Be aggressive about BP control for chronic and gestational hypertension; medical literature consistently shows adult minorities undertreated
 - What about research on baby ASA for all AA to prevent preeclampsia
 - What about Magnesium sulfate for all AA women, or study criteria to be more inclusive (now variation by doctor, hospital policy re: mild vs severe vs ?).
 - Given rate/fatality in Hisp---standardized protocols may need to be considered for different race/ethnicities
- Stress/inflammation/allostatic load—when faced with an acute event, women of color may have less resources to recruit/combine/overcome; less resilient.
 - What interventions can be brought to bear to decrease/ameliorate these changes?



Given what I know

- **Personal reflections...food for thought (cont'd)**
- Levels of care; risk appropriate care:
 - Ambulance system in cities where there are options of where to a pt—take pregnant pt to risk appropriate site even if farther (e.g trauma, stroke)
- Communication/shared decision making tools that are standardized with regard to content, but specialized with regard to culture
- Continued surveillance, include “near miss” or maybe all adverse birth events for AA women specifically looking for patient level, provider level, and health system level biases, errors, qi opportunities



Best way to avoid maternal mortality...Primary Prevention!



SEE WHAT KISSING
CAN LEAD TO?

