

# Reducing Infant Mortality: a Perinatal Periods of Risk Analysis of Fetal-Infant Mortality in King County, WA



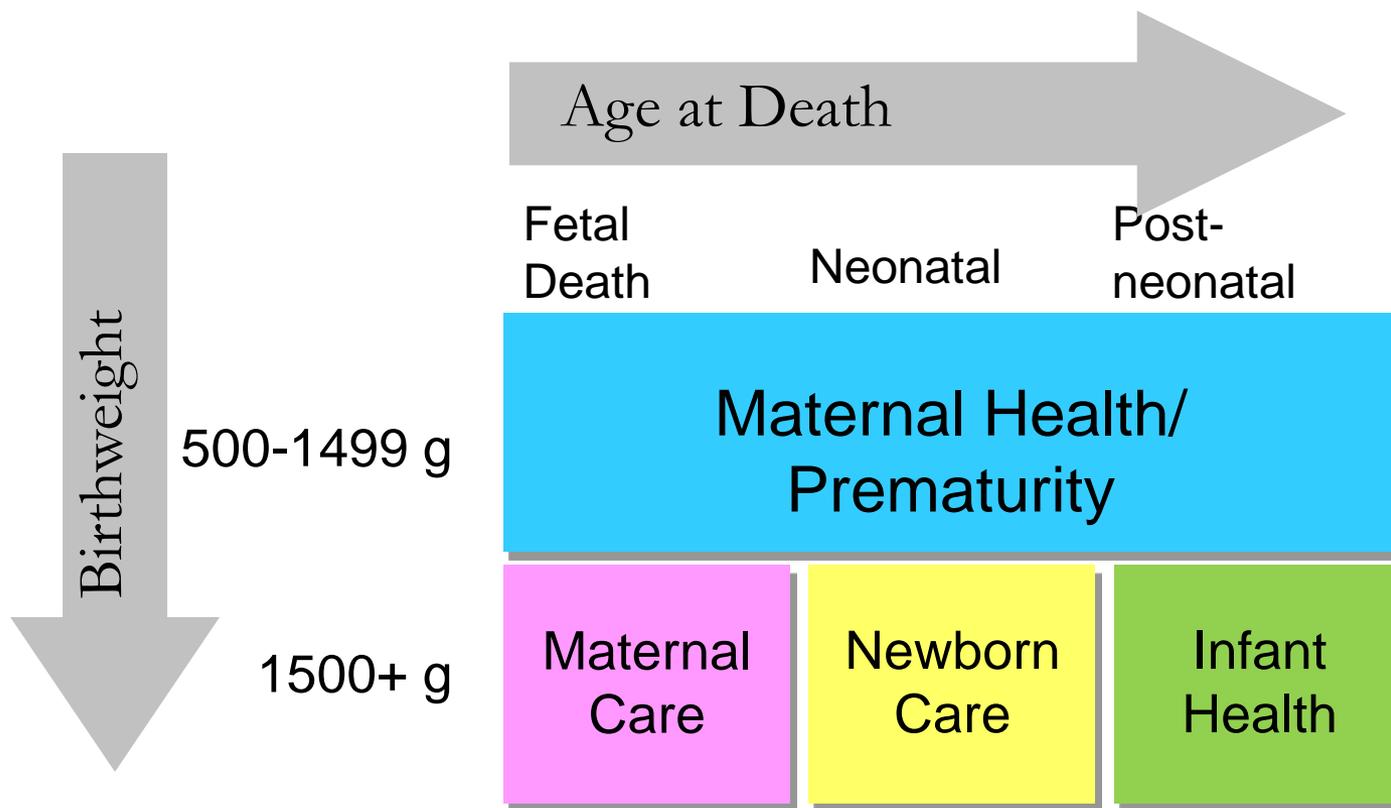
Adverse Birth Outcomes Advisory Committee  
Governor's Interagency Council on Health Disparities  
February 26, 2015

# Perinatal Periods Of Risk (PPOR) Approach – Why?

- A *simple approach* that can be used by communities nationwide.
- An approach that can *identify preventable deaths* in the community.
- An approach that can *target resources* for prevention activities.
- An approach that can *mobilize the community* to action.

# PPOR "MAP"

The cells in the PPOR MAP help indicate the actions needed



These four groups are given labels that suggest the primary preventive strategy for preventing the deaths in that group.

# Maternal Health/Prematurity

## Issues

- Preconceptional Health
- Health Behaviors
- Perinatal Care

## Interventions

- Perinatal outreach and education to promote early entry to high quality prenatal care and provide support
- Pre- and post-conception genetic counseling
- Promote access to health care, substance abuse treatment

# Maternal Care

## Issues

- Access to high quality, continuous prenatal care
- High-risk referral as needed
- Management of medical conditions

## Interventions

- Perinatal outreach to promote early entry to high quality, continuous prenatal care
- System of care for high risk pregnancies, with uniform transport policies, accessible to all

# Newborn Care

## Issues

- Access to neonatal intensive care
- Early and continuous neonatal care
- Pediatric surgery

## Interventions

- Early post-birth visits
- Outreach to promote ongoing pediatric care
- Advanced neonatal care
- System of care for high risk infants, with uniform transport policies, accessible to all

# Infant Health

## Issues

- Sudden Unexplained Infant Death (SUID), Sleep position
- Breast-feeding
- Accidents/injury
- Child abuse/neglect
- Infection

## Interventions

- Safe to Sleep campaigns
- Car seat safety
- Breastfeeding
- Ongoing family support
- Access to a medical home
- Reduce substance use

# Definitions and Data Sources

- Fetal death (Fetal Death Certificates)
  - 24+ weeks gestation, 500+g birthweight
- Infant death (Linked Birth-Infant Death File data)
  - Neonatal (0-27 days)
  - Postneonatal (28 days - 1 year)
- Live births: remainder of live birth cohort (Birth Certificate data)

# Included in the Analysis

- Fetal Deaths
  - 24+ weeks gestation
  - 500 grams or more
- Infants
  - 500 grams or more
- Excludes spontaneous and induced abortions



# Study Population



- Births to King County residents
- Comparison to Washington State
- Analysis Groups
  - White non-Hispanic
  - African American non-Hispanic
  - American Indian/Alaskan Native
  - Hispanic
  - Asian and Pacific Islander

# AIAN in Washington State

- 29 Federally Recognized Tribes
- 3 Tribes with Pending Federal Recognition
- 2 Urban Indian Health Organizations: Spokane & Seattle
  
- Population: 198,998
- Non reservation Population: Approx. 83% (2010 Census)
- $\frac{3}{4}$  live in urban areas; 1 in 5 live in King County

Population Data Source: US Census Bureau, 2010 Census; 2009-2011 American Community Survey

# Black/African Americans in Washington State

- Population: 325,004
- Almost half live in King County
- 1 in 5 speak a language other than English at home (1 in 3 in King County)
- About 1 in 4 live in poverty

Population Data Source: US Census Bureau, 2010 Census; 2009-2013 American Community Survey

# Steps for PPOR Analysis

1. Identify reference group

King County, white non-Hispanic; age 20+ years; 13+ years education

2. Calculate birthweight proportionate mortality rates (BWPMR) in each cell for both groups

$$BWPMR = \frac{\# \text{ deaths in cell}}{\# \text{ births (still+live) in matrix}} \times 1,000$$

3. Calculate excess mortality: BWPMR for group of interest minus BWPMR for standard.

$$BWPMR_{(group \text{ of interest})} - BWPMR_{(reference)}$$

# Perinatal Periods Of Risk (PPOR) Use

- Examine the four “Periods of Risk”
- Identify the groups and periods of risk with the most deaths and the highest rates.
- Use a comparison group to estimate “excess or preventable deaths” for these groups and periods of risk.
- Comparison group: white non-Hispanic;  $\geq 20$  years of age;  $\geq 13$  years of education

# King County Excess FIMR (Deaths/1000 Births) 2008-2012

White NH (0.2)



African-Am NH  
(5.6)



AI/AN NH\* (8.4)



\*Washington analysis

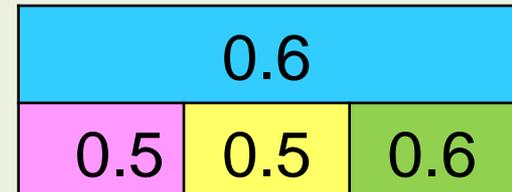
API (1.1)



Hispanic (2.4)



King County (2.1)



# Perinatal Periods of Risk Identifies Number of Preventable Deaths King County, WA 2008-2012

	King	White NH	African Am. NH	AIAN*	API	Hispanic
Mat. Health/ Prematurity	71	21	18	19	9	13
Maternal Care	66	6	15	16	4	14
Newborn Care	57	25	13	5	7	7
Infant Health	70	-40	16	31	8	10
<b>Total</b>	<b>265</b>	<b>12</b>	<b>62</b>	<b>71*</b>	<b>28</b>	<b>43</b>

\*Washington State data shown/ King County preventable deaths ~ 9 overall.

Numbers do not add to total due to missing information for some deaths.

NH=non-Hispanic, AIAN=American Indian/Alaska Native NH, API=Asian/Pacific Islander NH.

# Perinatal Periods of Risk Identifies Number of Preventable Deaths Washington State 2008-2012

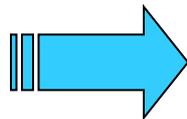
	WA State	White NH	African Am. NH	AIAN	API	Hispanic
Mat. Health/ Prematurity	316	153	49	19	23	48
Maternal Care	310	105	36	16	31	47
Newborn Care	136	78	6	5	1	31
Infant Health	381	229	32	31	19	54
<b>Total</b>	<b>1,143</b>	<b>565</b>	<b>123</b>	<b>71</b>	<b>74</b>	<b>180</b>

Numbers do not add to total due to missing information for some deaths.

NH=non-Hispanic, AIAN=American Indian/Alaska Native NH, API=Asian/Pacific Islander NH.

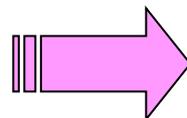
# Perinatal Periods of Risk Identifies Preventive Action Opportunities

Maternal Health/  
Prematurity



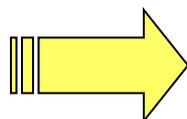
Preconception Health  
Health Behaviors  
Perinatal Care  
+ EXPAND STRATEGIES to address social factors giving rise to disparities

Maternal Care



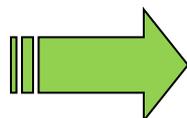
Prenatal Care  
High Risk Referral Obstetric Care

Newborn Care



Perinatal Management  
Neonatal Care  
Pediatric Surgery

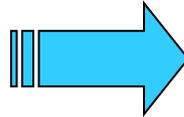
Infant Health



Safe Sleep  
Breast Feeding  
Substance Use  
Injury Prevention

# Perinatal Periods of Risk Identifies Preventive Action Opportunities

Maternal Health/  
Prematurity



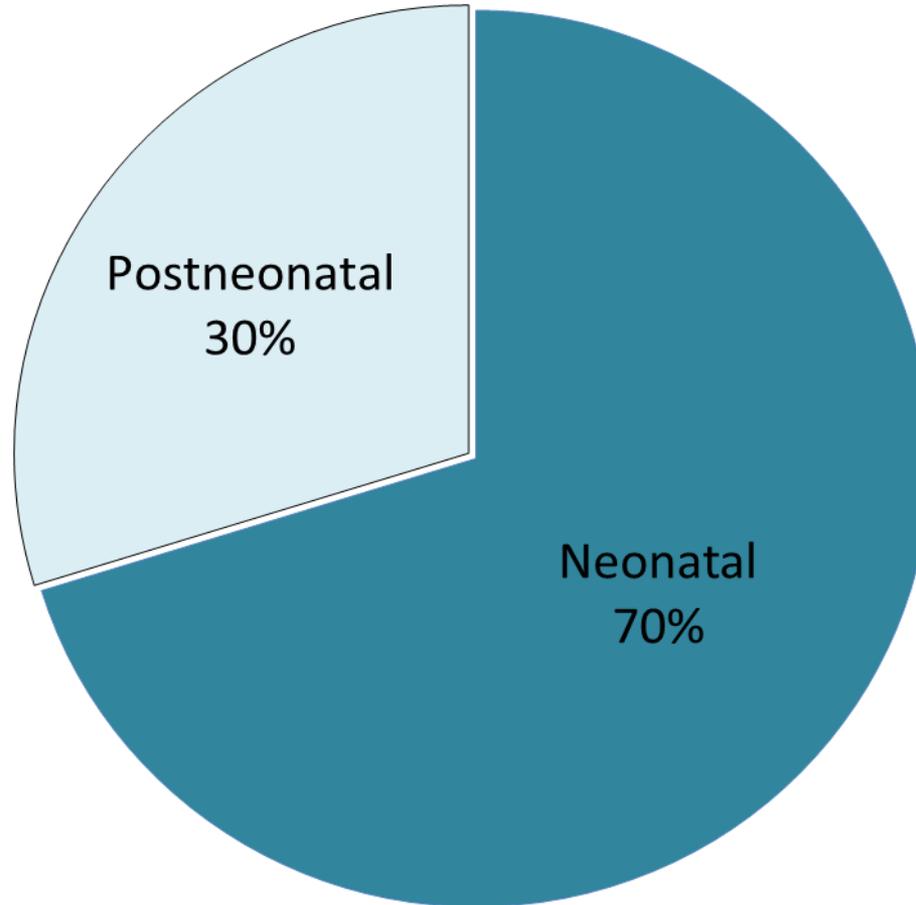
Preconception Health  
Health Behaviors  
Perinatal Care  
  
+ EXPAND STRATEGIES to address social factors giving rise to disparities

Diving deeper,

Birth weight distribution accounts for 54% of the statewide African American excess mortality rate compared to an average statewide of 28%. This suggests that the excess deaths are due to a higher frequency of prematurity/very low birth weight.

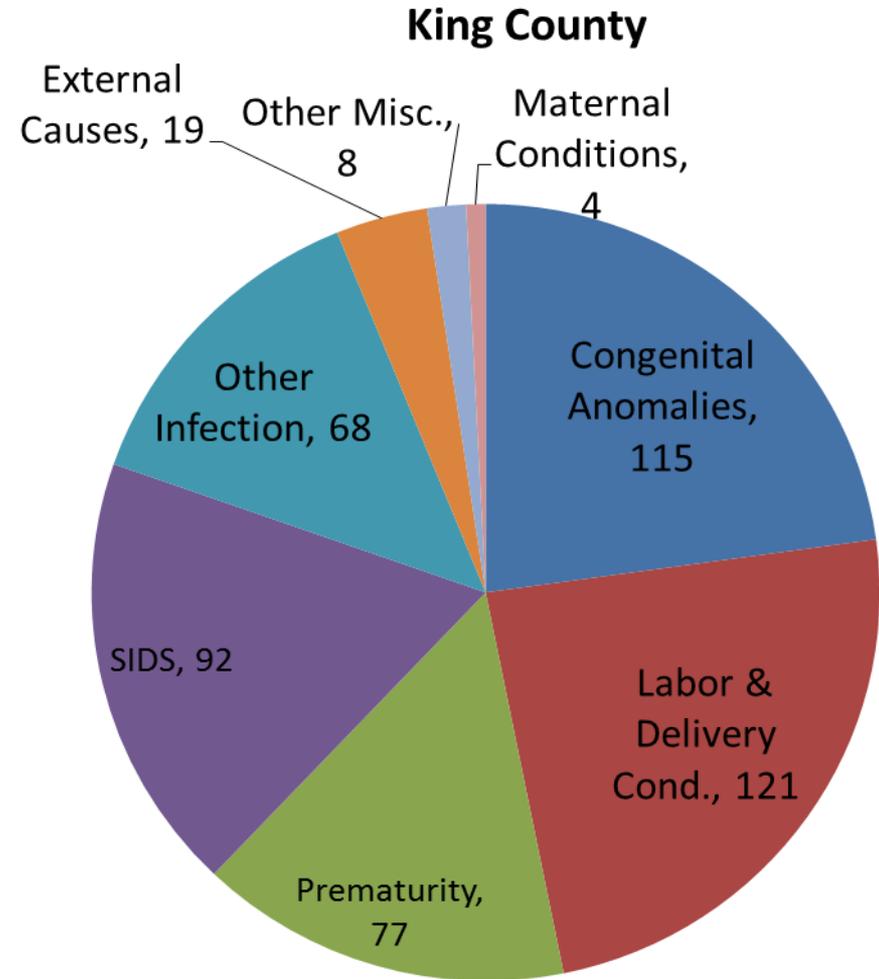
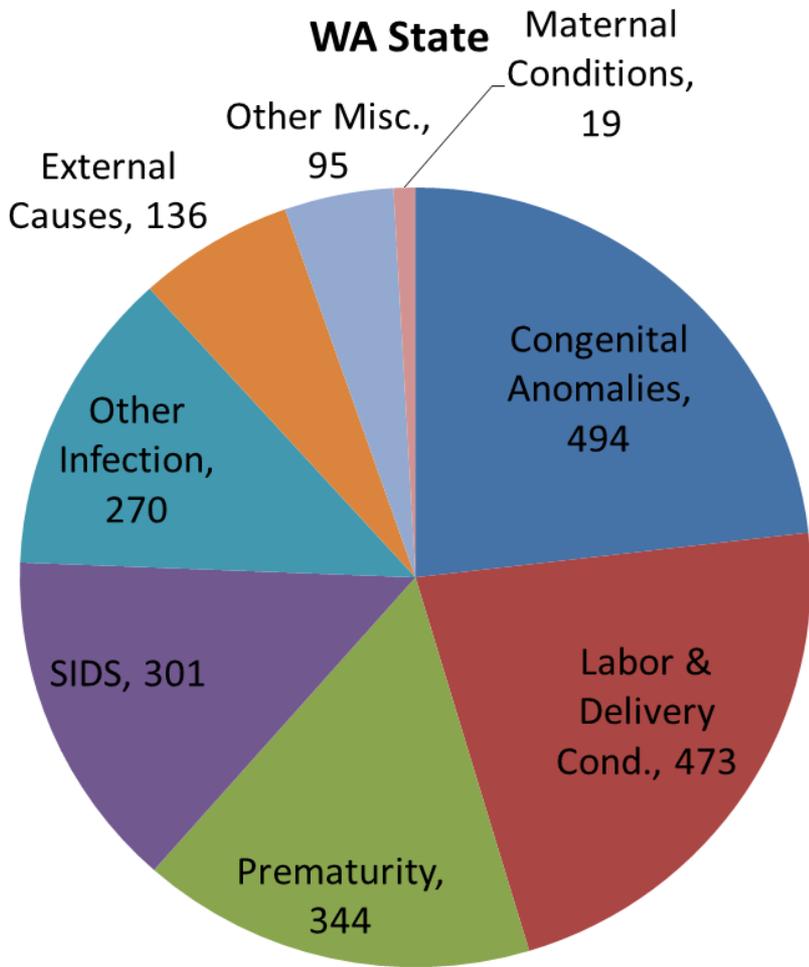
AIAN excess deaths due to higher mortality rates among very low birth weight babies.

# Most infant deaths occur in the neonatal period

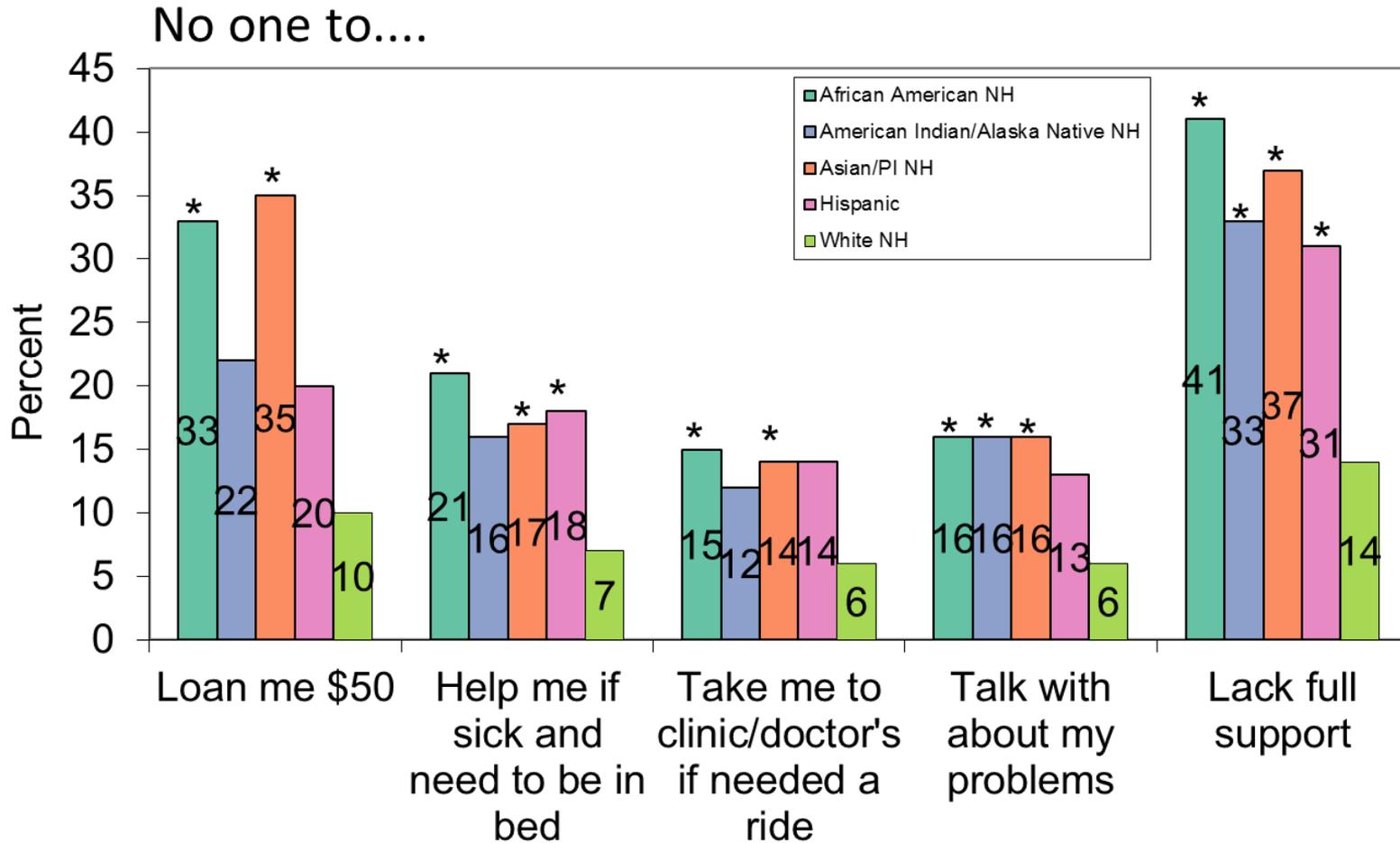


King County, 2008-2012

# Causes of Infant Mortality

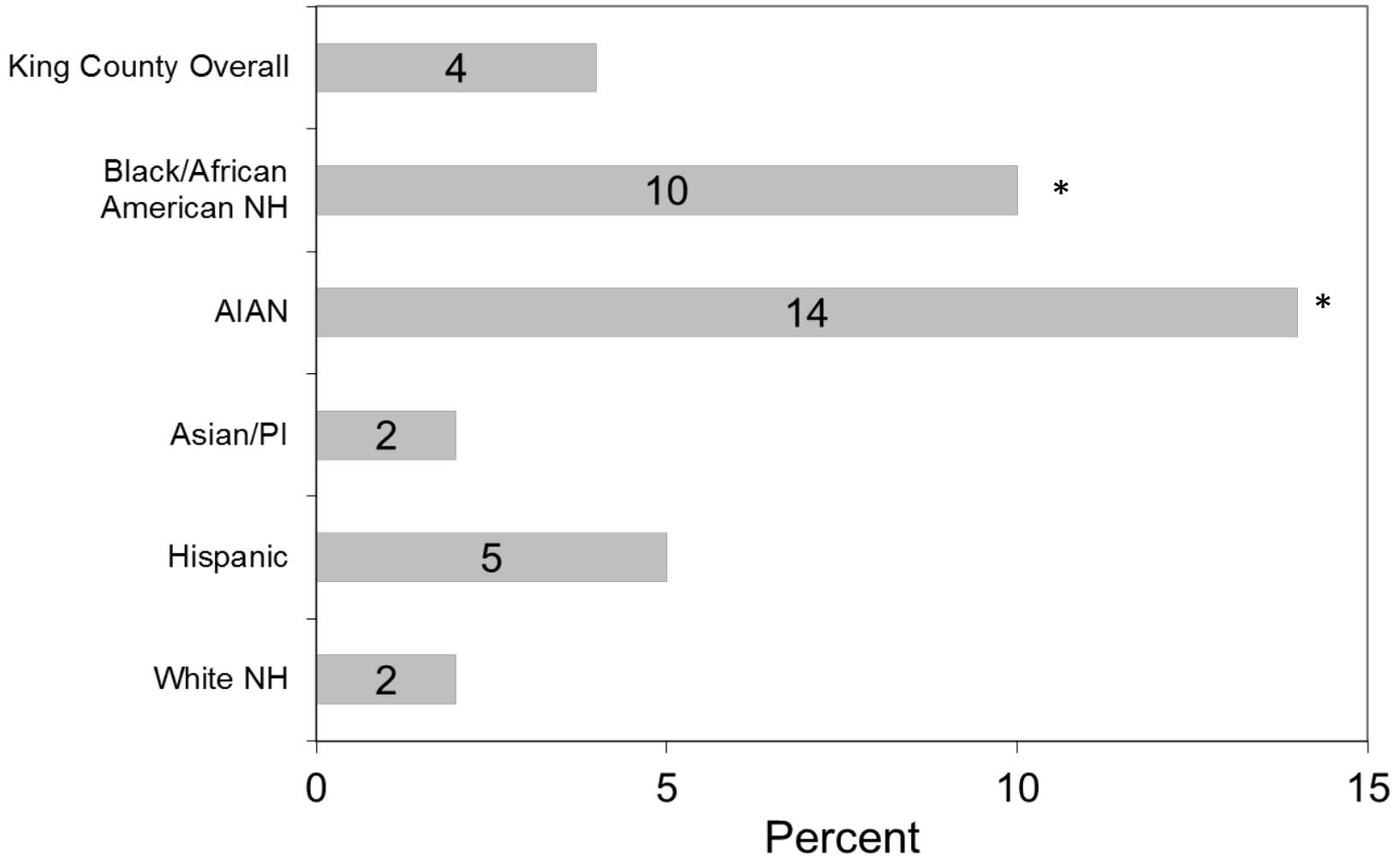


# Lack of Social Support During Pregnancy, by Race/Ethnicity, King County, 2007-2011



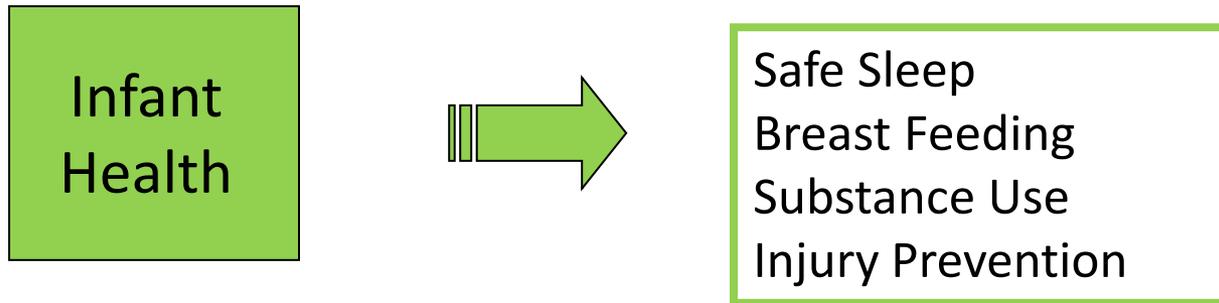
Source: Pregnancy Risk Assessment Monitoring System

# High Level of Stressful Life Events (6+) in the year before birth, by Race/Ethnicity, King County, 2007-2011



Source: Pregnancy Risk Assessment Monitoring System

# Perinatal Periods of Risk Identifies Preventive Action Opportunities

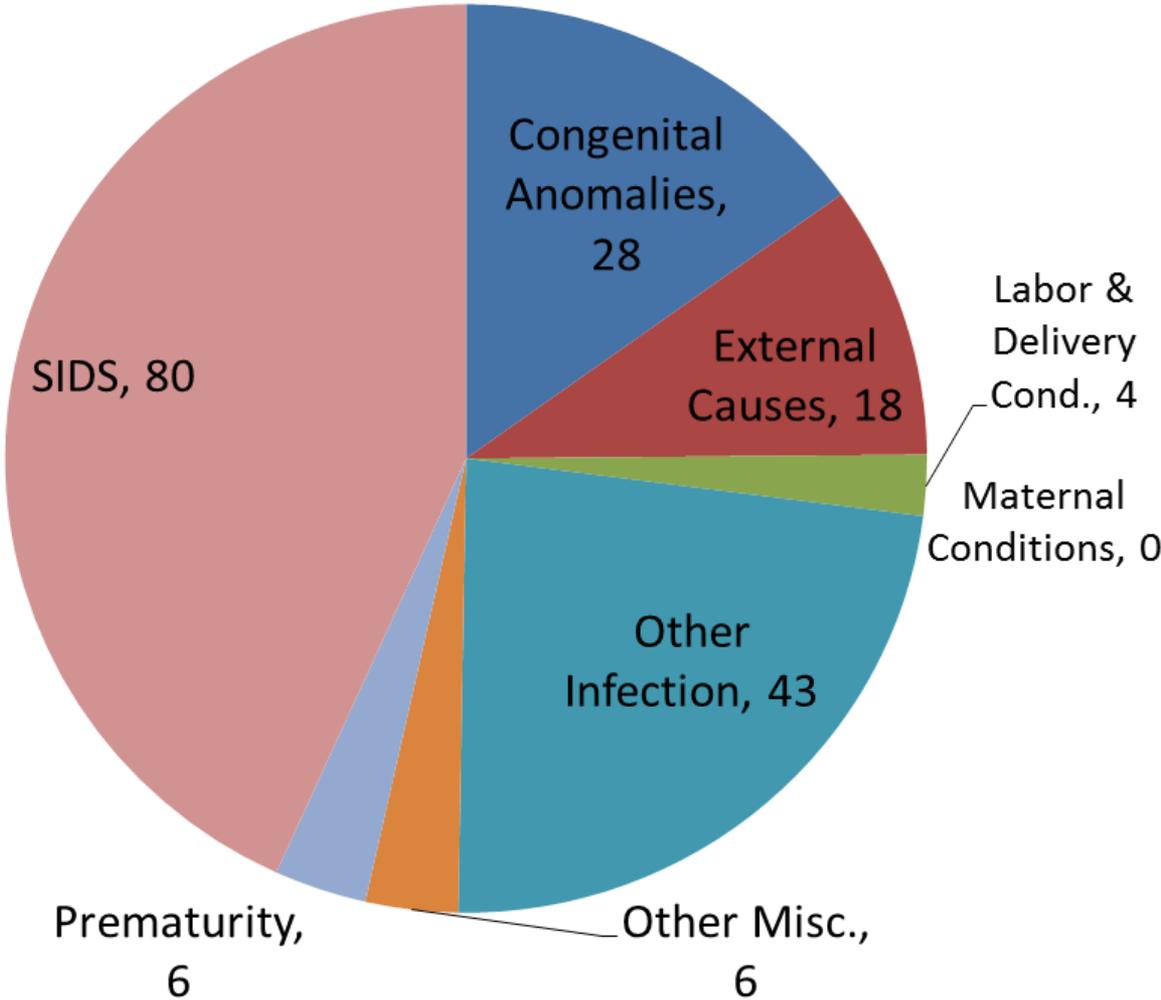


Diving deeper:

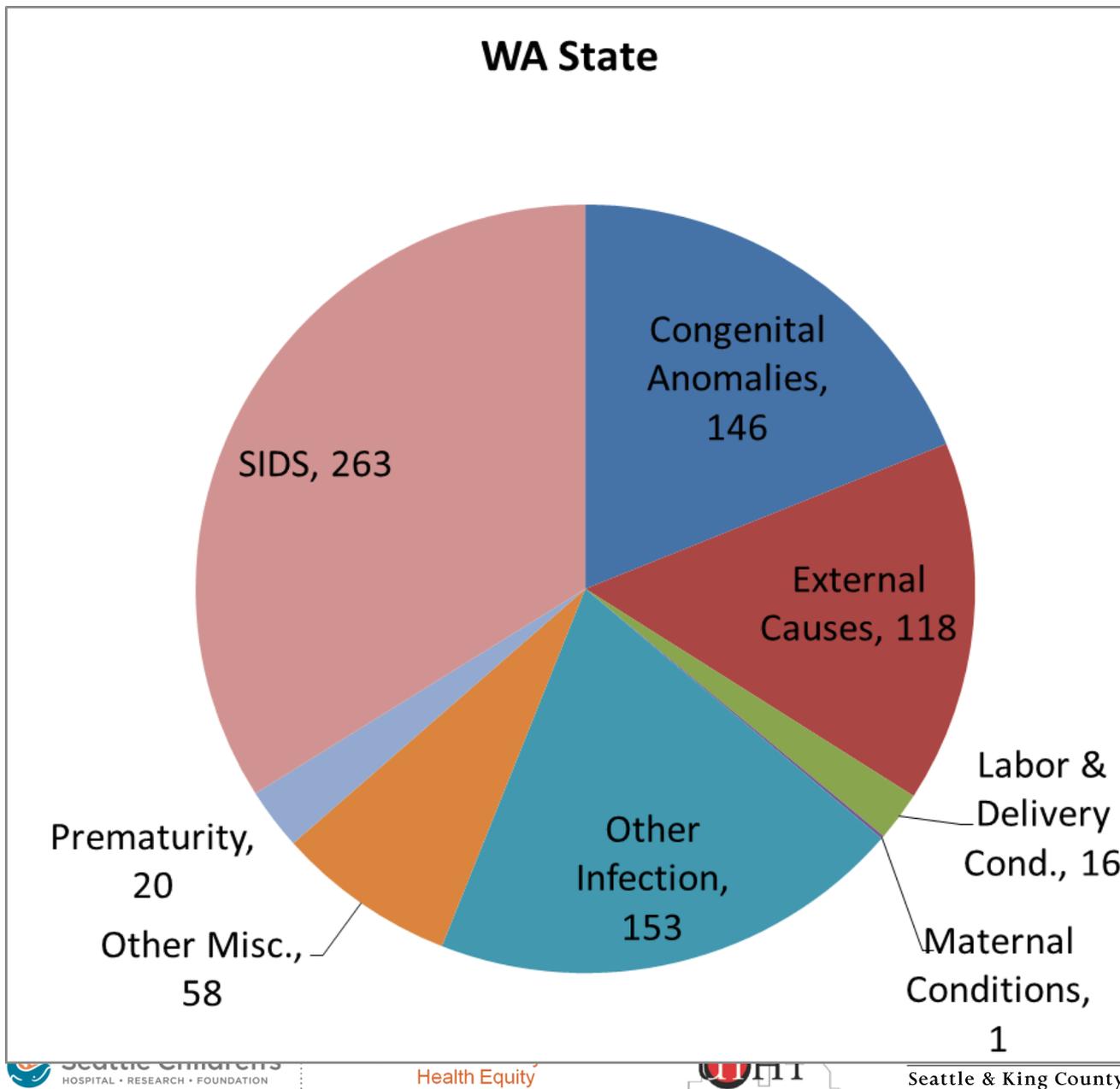
What causes of death are contributing to excess mortality in this box?

# Leading Causes of Postneonatal Mortality

## King County

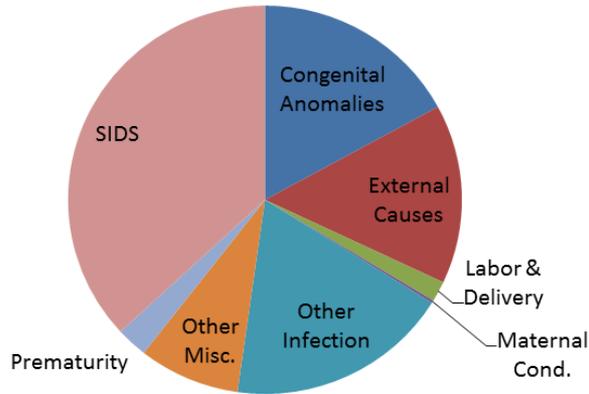


# Leading Causes of Postneonatal Mortality, 2008-2012

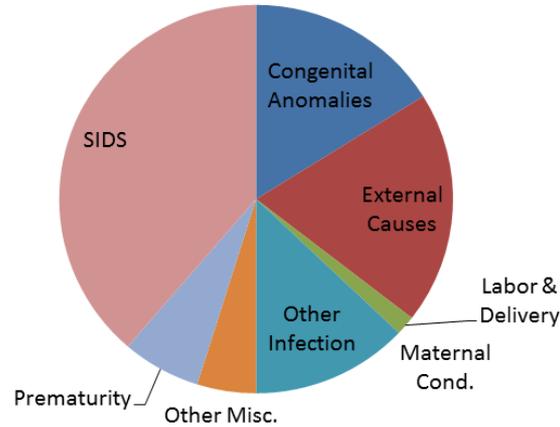


# Postneonatal Mortality Causes, WA State

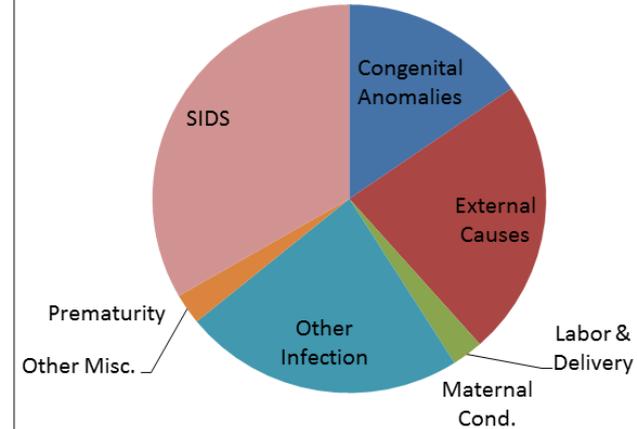
**White NH**



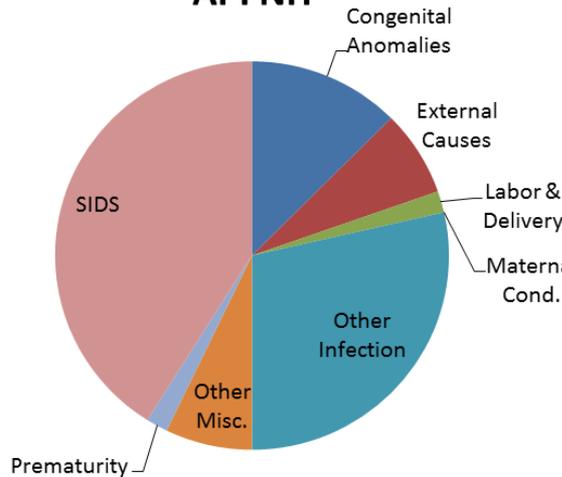
**African American NH**



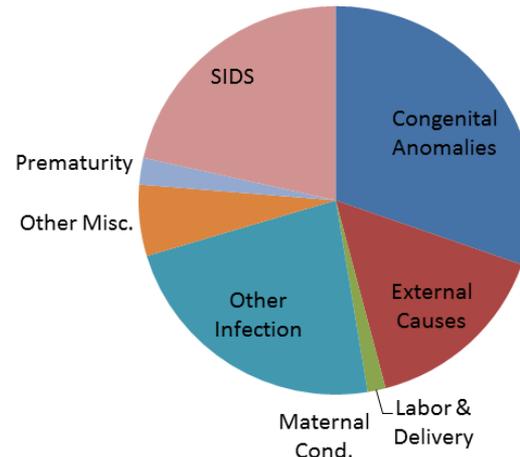
**AIAN NH**



**API NH**



**Hispanic**



# INSTITUTIONALIZED RACISM/

## Historical Trauma

### Discrimination

- Health Care
- Housing
- Legal System
- Employment
- Refused care over IHS status

### Poverty

- Affordable Housing
- Moving frequently
- Adequate Education
- Employment
- Access to Health Care
- Perceived as wealthy

### Abuse

- Institutional
- Interpersonal
- Cycles
- Substance

### Internalized Racism

- Hopelessness
- Self-hatred and blame
- Inability to see family/ community as support
- Ancestry seen as hindrance to life's goals

## STRESS

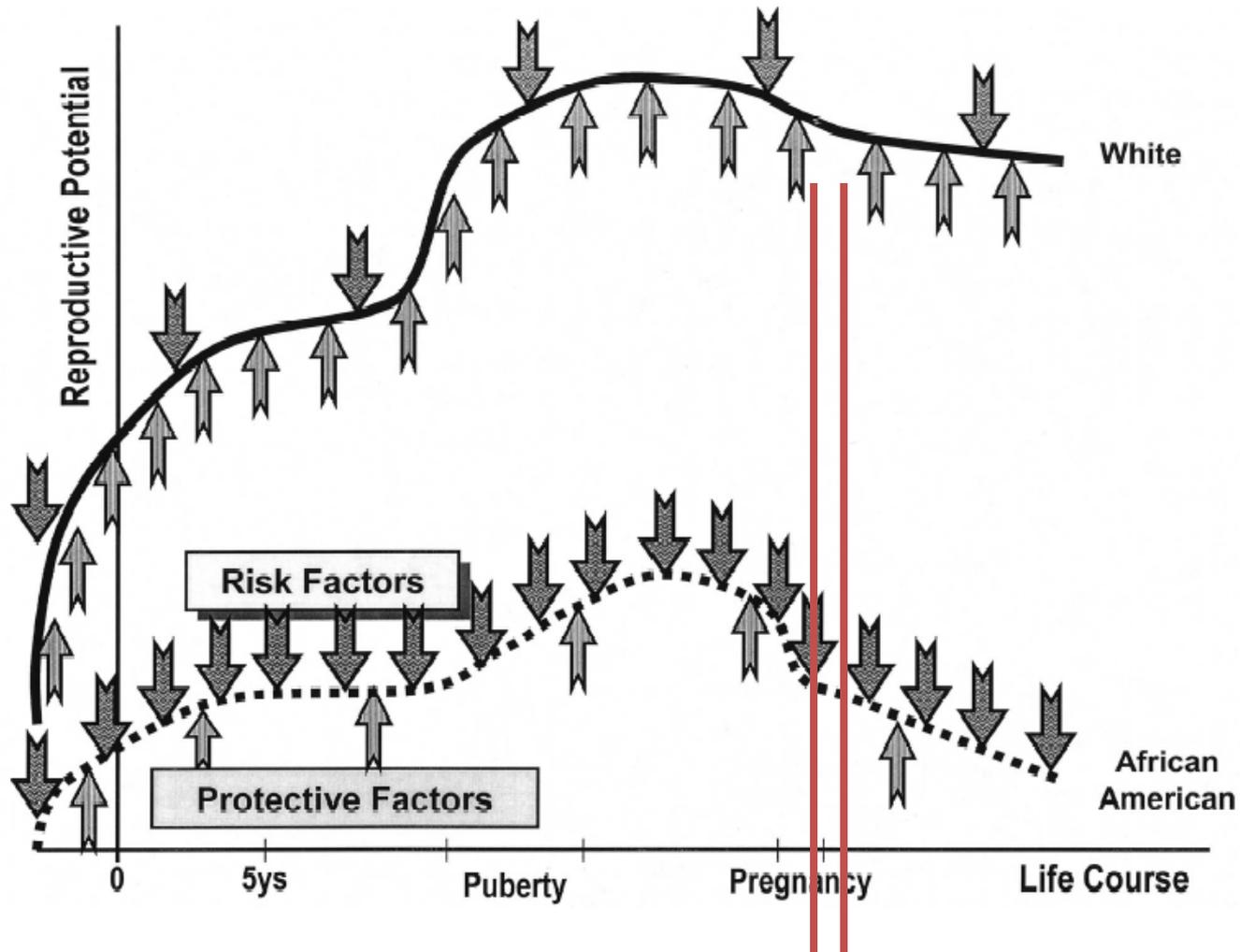
Direct Effects: Endocrine System Response - Increased cortisol levels, decreased immune function, increased vulnerability to infection, trigger onset of labor

Indirect Effects: Maternal Behaviors – Smoking, alcohol, substance use, poor nutrition, survival supersedes wellness

## DISPARITIES IN BIRTH OUTCOME

Adapted from M. Dalila,  
IntraAfrikan Konnections

# Life Course Perspective



Lu MC, Halfon N. Racial and ethnic disparities in birth outcomes: a life-course perspective. *Matern Child Health J.* 2003;7:13-30.



# What More Needs to be Done:

- Use PPOR data to **target prevention** efforts and support the work of the community
- Support women
  - Recognize the impact of adverse childhood experiences across the life span
  - Prevention focus on **pre-conception** health, health behaviors, and specialized perinatal care services
  - Sustain programs that provide for early and continuous **prenatal** care services, referral of high-risk pregnancies and good medical management of medical problems
- Support **infants**
  - Support SIDS risk reduction, access to a medical home, injury prevention, early childhood development
- Support **families**
  - Invest in early childhood development, wrap-around support of families to address multiple needs
- Support communities
  - Foster community and individual **resilience** and **social support**

# Thank you!

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