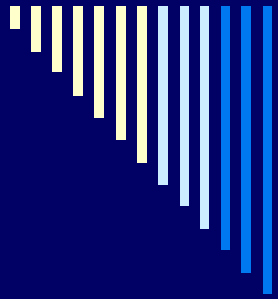


# From Infant mortality to women's health

Violanda Grigorescu MD, MSPH  
Cassandre Larrieux, MPH

One Day Conference  
October 25, 2007

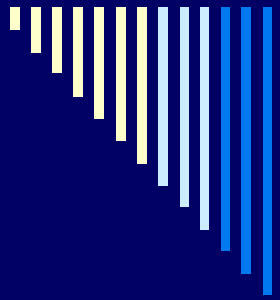
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# Basic Health Indicators

**Infant Mortality Rate (IMR):** number of infant deaths per 1,000 live births

**Maternal Mortality Ratio (MMR):** number of maternal deaths per 100,000 live births



# Infant Mortality

**Infant mortality rate (IMR):** indicator of general health, economic and social well-being status in a population.

Healthy People 2010 goal:  $IMR = 4.5$

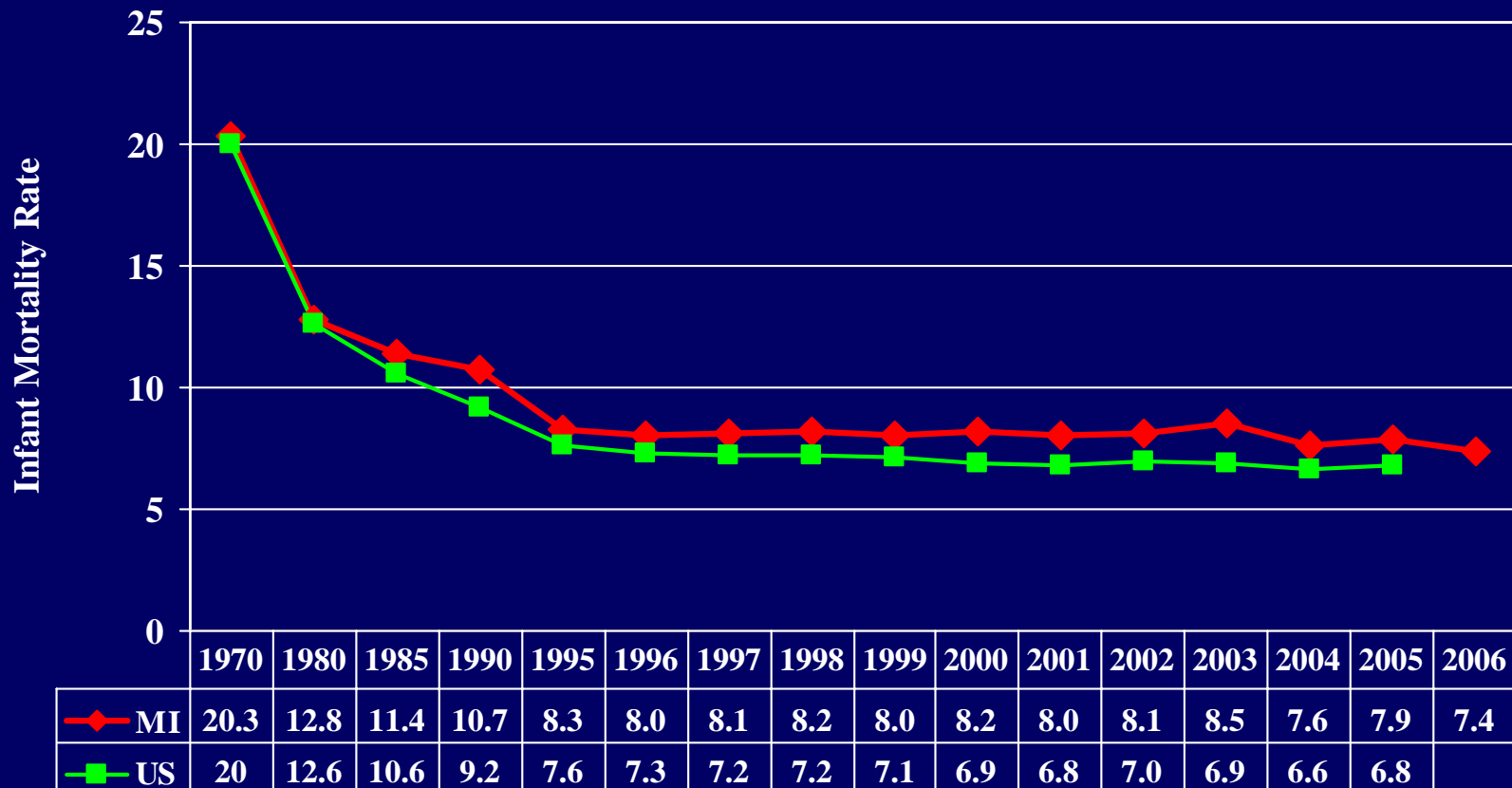


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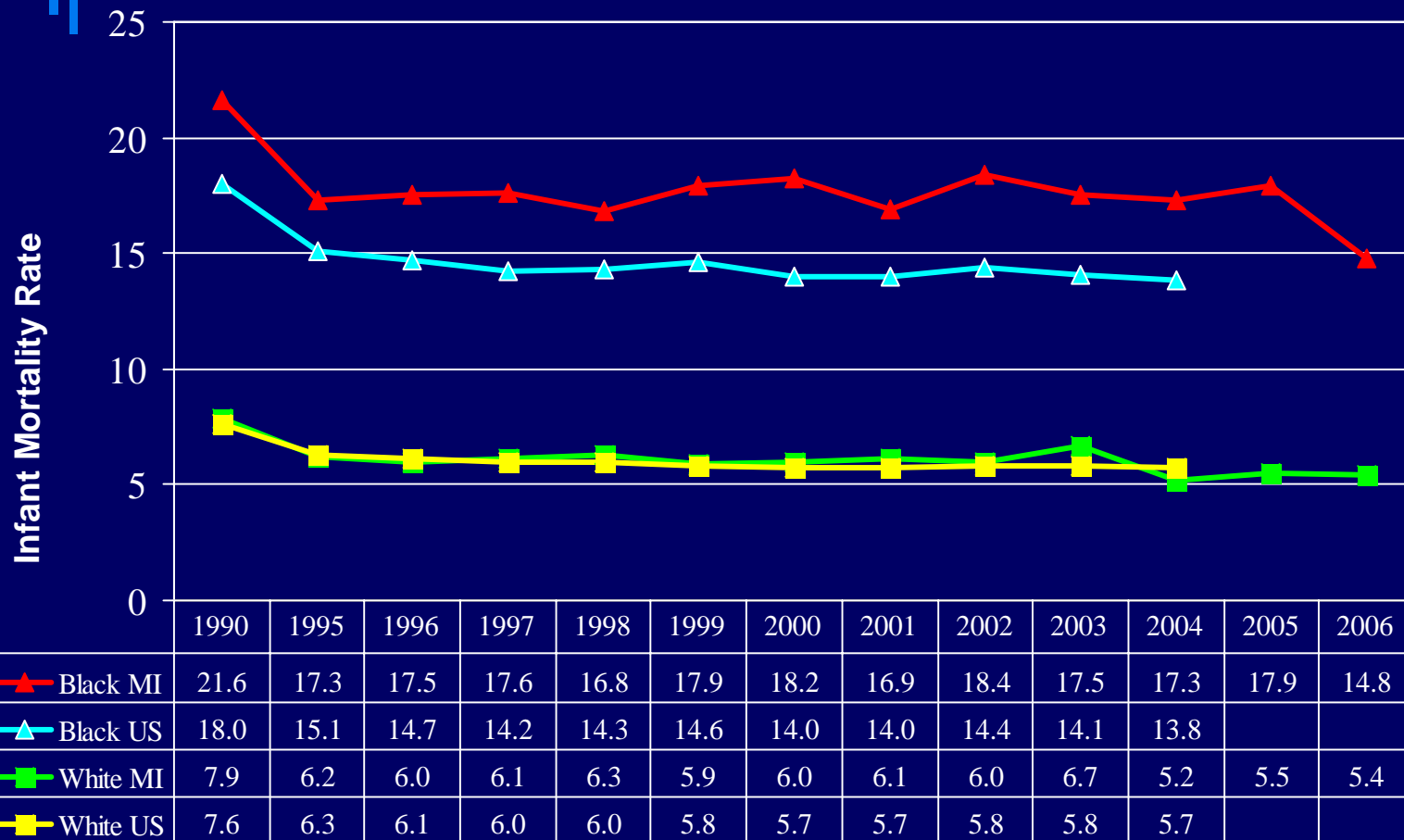
## Infant Mortality in Michigan

- **Persistently higher than U.S. average**
  - **Larger racial disparities compared to U.S.**
-

# Infant Mortality Rate (IMR): Michigan compared to United States



# Infant Mortality Rate by Race: Michigan compared to United States



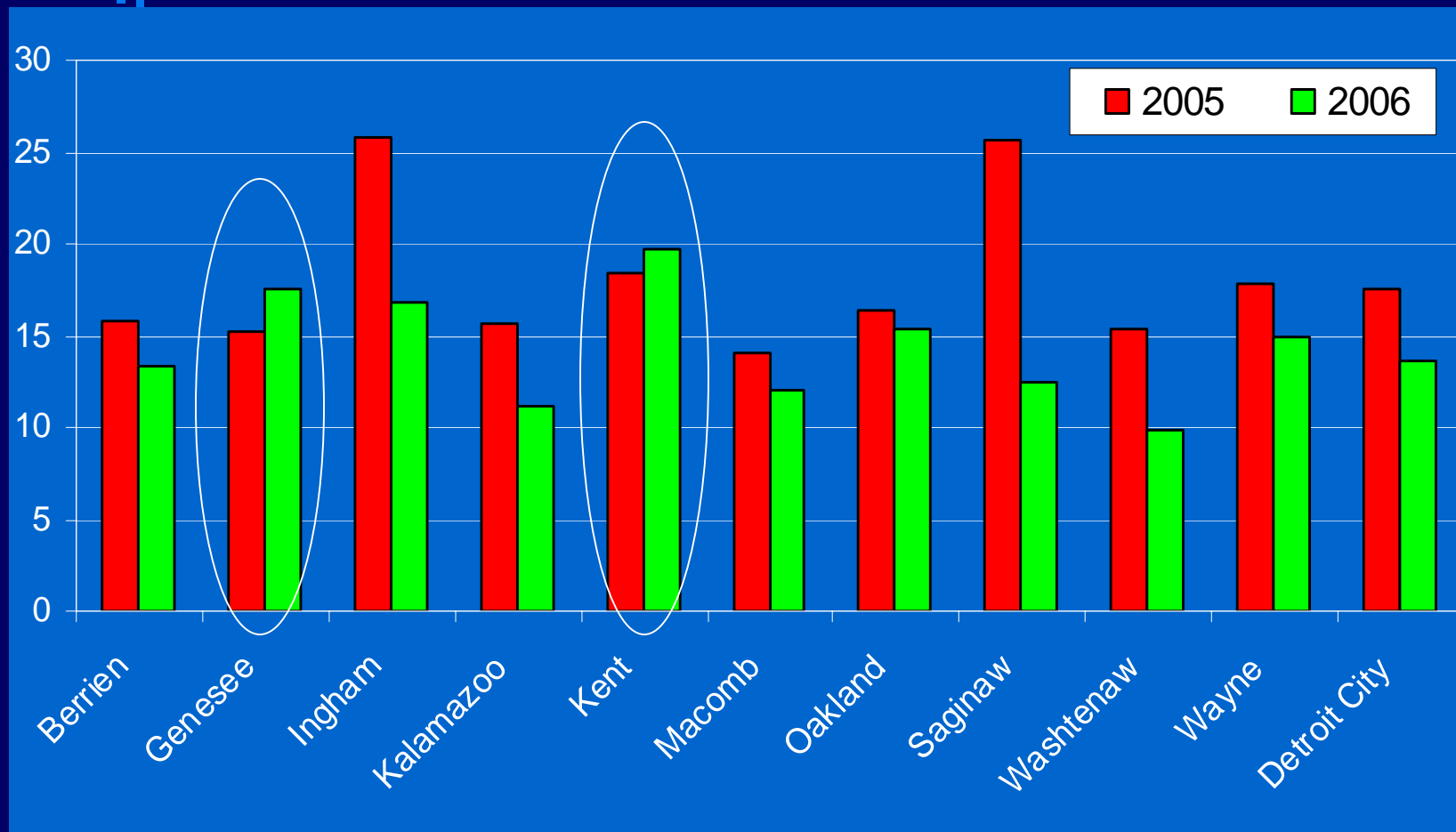


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## Infant Mortality in Michigan

- ❑ Persistently higher than U.S. average
  - ❑ Larger racial disparities compared to U.S.
  - ❑ **Geographic analysis identifies communities with highest infant mortality**
-

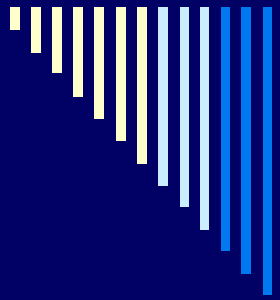
## Eleven communities with high Black IMR



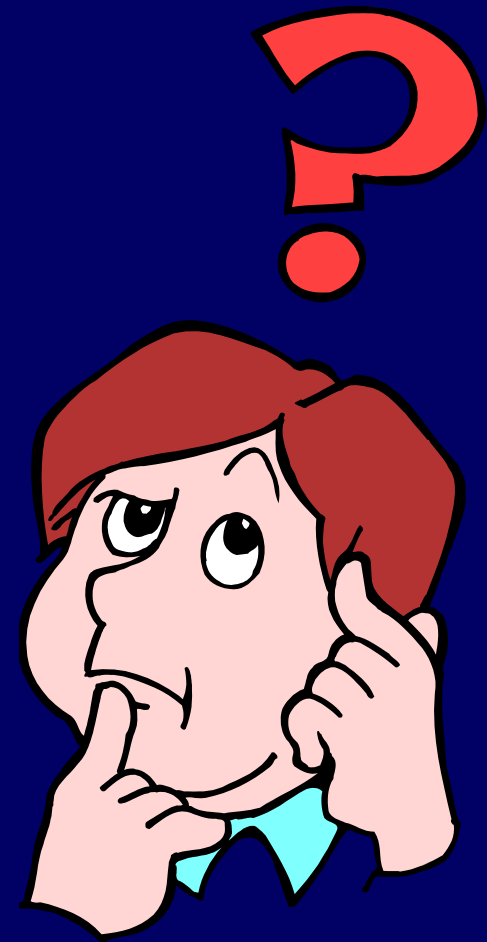


# Infant Mortality in Michigan

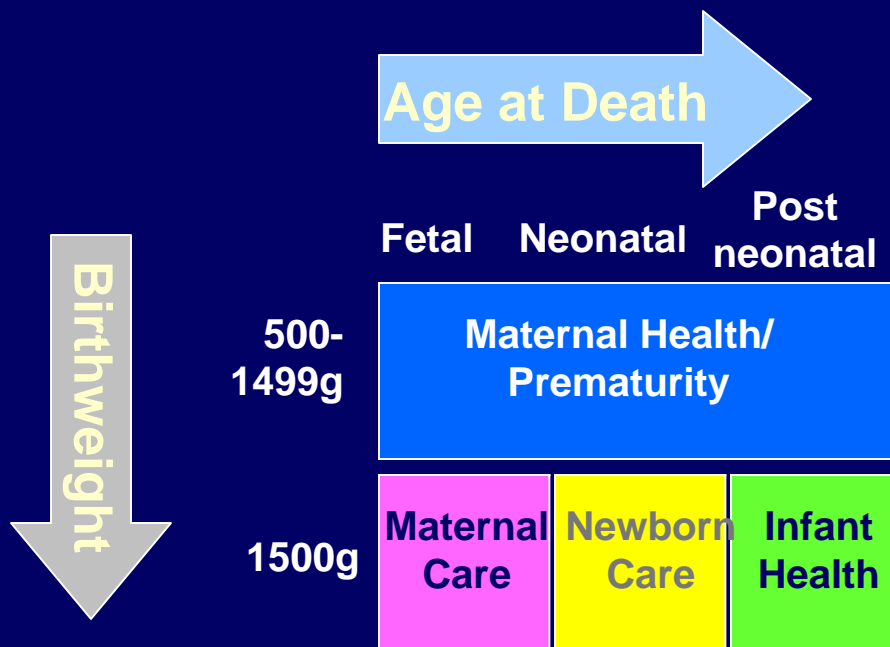
- ❑ Persistently higher than U.S. average
- ❑ Larger racial disparities compared to U.S.
- ❑ Geographic analysis identifies 16 communities with highest infant mortality
- ❑ **PPOR analysis points to Maternal Health/Prematurity as main target for intervention**



What is PPOR?

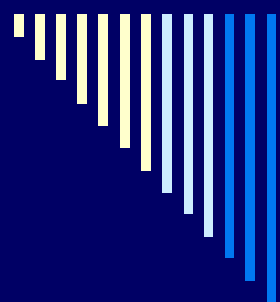


# Perinatal Periods Of Risk: New Approach to Infant Mortality



## 6 KEY STEPS FOR PPOR

1. Engage community partners
2. Map feto-infant mortality
3. Focus on overall rate
4. Examine potential opportunity gaps
5. Target further efforts
6. Mobilize for sustainable systems change



## PPOR : **Excess** Feto-Infant Mortality to Blacks in Michigan

2005

2006

**Maternal Health/Prematurity**  
7.5

**Maternal Health/Prematurity**  
5.4

**Maternal Care**  
2.2

**Newborn Care**  
1.7

**Infant Health**  
2.1

**Maternal Care**  
1.3

**Newborn Care**  
0.8

**Infant Health**  
2.5

392 Total Feto-Infant Deaths

Total feto-infant mortality rate: 17.6

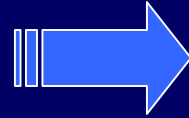
348 Total Feto-Infant Deaths

Total feto-infant mortality rate: 15.2

Reminder: PPOR counts only 500 grams and over

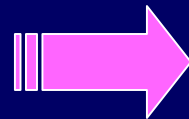
# Map Connections to Action

**Maternal  
Health/  
Prematurity**



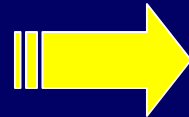
Preconceptional Health  
Health Behaviors  
Perinatal Care

**Maternal  
Care**



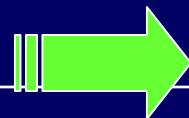
Prenatal Care  
High Risk Referral  
Obstetric Care

**Newborn  
Care**



Perinatal Management  
Neonatal Care  
Pediatric Surgery

**Infant  
Health**



Sleep Position    Breast  
Feeding    Injury  
Prevention



# Maternal Health/Prematurity

## Birthweight Distribution (VLBW Births)

- Smoking
- Prenatal care
- Race
- Maternal age
- Parity
- Multiple Pregnancy
- STD/Bacterial Vag.
- Previous preterm births
- Unintended pregnancy
- Alcohol/drug use
- Maternal health conditions

## Birthweight- Specific Mortality Rates

- Gestational age
- Referral system
- Mother transfer
- Infant transfer
- Perinatal care
- Neonatal conditions
- Pay source
- Maternal complications



## Infant Mortality in Michigan

- ❑ Persistently higher than U.S. average
- ❑ Larger racial disparities compared to U.S.
- ❑ Geographic analysis identifies 16 communities with highest infant mortality
- ❑ PPOR analysis points to Maternal Health/Prematurity as main target for intervention
- ❑ **Leading causes: Low Birth Weight (LBW)/Prematurity and Congenital anomalies**



## Infant Deaths by Age at Death and Underlying Cause of Death

Cause of Death	Age at Death					
	Total <1 Year	<1 Day	1-6 Days	7-27 Days	1-5 Months	6-11 Months
Disorders relating to short gestation and unspecified low birthweight	201	178	10	8	5	0
Congenital anomalies	185	86	27	30	27	15
Unintentional injuries	71	0	1	7	51	12
Respiratory distress newborn	36	11	15	8	2	0
Sudden infant death syndrome	51	0	0	4	42	5
Other respiratory conditions of newborn	28	6	3	10	7	2
Homicide	9	0	0	0	4	5
All other causes	359	136	55	65	81	22
Total	940	417	111	132	219	61

Source 2006 Michigan Resident Death File, Vital Records and Health Data Development Section, MDCH



## Infant Mortality in Michigan

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- ❑ PPOR analysis points to Maternal Health/Prematurity as main target for intervention
- ❑ Leading causes: Low Birth Weight (LBW) and Congenital anomalies
- ❑ **Literature points to comprehensive intervention for both, mother and baby**



# PPOR-Driven Interventions: from *Knowing to Doing*

- Identify critical information and evidence-based approaches in key areas
  - Assure participating communities understand the data/information
  - Assess current intervention strategies and compare to *evidence-based* strategies
  - Revise or develop new plan based on community assessment, intervention strategy assessment or other information
-



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# Comprehensive interventions

- Community initiatives (i.e., Fetal and Infant Mortality Review, Infant Mortality Coalitions, etc.)
  - Understanding the Perinatal system of care: Perinatal Survey
  - **Maternal Mortality Surveillance**
-



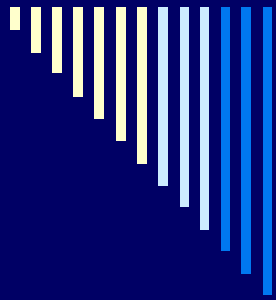
# Michigan Maternal Mortality Background

Michigan Maternal Mortality Study (MMMS) Initiated in 1950 as a collaborative effort among:

- Michigan Department of Community Health,
- Committee on Maternal and Perinatal Health of the Michigan State Medical Society and
- Chairs of the Departments of Obstetrics and Gynecology of the Medical Schools in Michigan

Currently: Michigan Maternal Mortality Surveillance (MMMS) is:

- Michigan Department of Community Health (MDCH)'s program
  - Bureau of Epidemiology and Bureau of Family, Maternal and Child Health share the responsibilities
  - Committee on Maternal and Perinatal Health of the Michigan State Medical Society - committed and strong partner
-



## Maternal Deaths by Race

	1999	2000	2001	2002	2003	2004	2005
<b>White</b>							
Number of cases	50	34	41	35	37	41	52
MMR	47.7	32.3	38.9	34.0	36.3	40.7	52.5
<b>Black</b>							
Number of Cases	21	25	28	28	23	41	37
MMR	88.1	103.9	119.2	125.9	102.8	182.5	165.4
<b>Black/White Ratio</b>	<b>1.8</b>	<b>3.2</b>	<b>3.1</b>	<b>3.7</b>	<b>2.8</b>	<b>4.5</b>	<b>3.2</b>

Maternal deaths to other races: 3 in 1999, 2 in 2000, 3 in 2002; 4 in 2003; 11 in 2005

Maternal death with unknown race: 1 in 2001 and 5 in 2003



# Maternal morbidity

- ❑ Maternal mortality represents the definitive consequence of severe maternal morbidity
- ❑ For every woman who dies, many suffer serious life-threatening complications of pregnancy

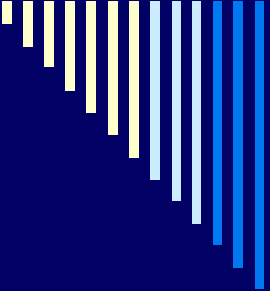
## Maternal morbidity:

- ❑ a public health problem that affect nearly 1,7 million women annually (AJPH, 2003)
  - ❑ related to a pre-existing medical condition that affects or is exacerbated by pregnancy, or a pregnancy-related medical condition
  - ❑ not very well understood, less frequently measured and more difficult to track at the population level than maternal mortality
-



# Health beyond pregnancy

- ❑ Health conditions that women may experience before or during pregnancy have a great impact on pregnancy outcomes
  - ❑ Pregnancy outcome is shaped by social, psychological, behavioral, environmental, and biological forces: “multiple determinants” model
  - ❑ Preconception and interconception health as important as prenatal health
  - ❑ Further prevention strategies should be focused on improving women’s health not just during but beyond pregnancy
  - ❑ Develop partnership and collaboration among organizations, programs, public health professionals and providers, etc.
-



# Epidemiological analyses/studies

Presented at the state and national meetings

- Racial disparities in maternal mortality
- Trends in maternal mortality
- Maternal morbidity: an emerging issue
- Pregnancy outcomes in Medicaid population
- WIC studies:

1/ VLBW and birth outcomes among WIC and non-WIC  
Medicaid participants for residents of Detroit

2/ Postneonatal infant mortality among WIC and non-WIC  
Medicaid participants for residents of Detroit

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# What is WIC

- The Special Supplemental Nutrition Program for Women, Infants, and Children (better known as the WIC Program) seeks to safeguard the health of low-income nutritionally at-risk women, infants, & children under the age of five years old
  - WIC is administered by the Department of Agriculture, unlike other MCH programs
  - WIC is a federal grant program not an entitlement program
    - Congress authorizes a specific amount of funds each year for the program.
  - WIC Legislative Requirements are contained in Section 17 of the Child Nutrition Act of 1966.



# Michigan WIC

- ❑ There are 48 WIC agencies with approximately 248 clinics that work with clients, in Michigan.
  - ❑ Approximately half babies born in Michigan receives WIC benefits.
  - ❑ For every dollar spent by this program, more than three dollars in subsequent health care costs are saved.
  - ❑ Local communities are supported with more than \$120 million yearly when WIC foods are purchased at grocery stores and pharmacies.
-



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# Michigan WIC Mission

The mission of the Michigan WIC program is to improve the health outcome and quality of life for eligible women, infants, and children by providing nutritious food, nutrition education, breastfeeding promotion, and support and referrals to health and other services.

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## WIC Mission (*continue*)

To this end, Michigan WIC seeks to:

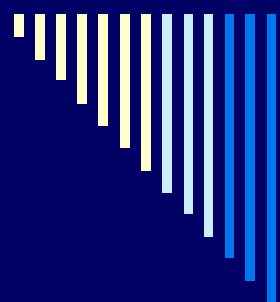
- deliver services and supports in a caring, respectful, efficient, cost effective confidential, and culturally competent manner
  - Assure the broadest possible access to services, supports, and food
-



# WIC Eligibility

There are four eligibility criteria that must be met to participate in Michigan WIC:

- be a pregnant or postpartum woman, infant, or child (under the age of five years old);
  - be a resident of Michigan;
  - be at or below 185% of the Poverty Income Guideline or participate in another state administered program that utilizes the same income criteria; and
  - be classified by a health professional as “nutritionally at risk.”
-



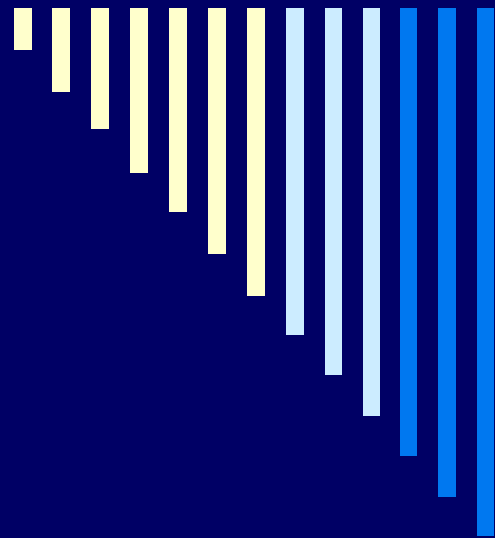
## WIC data

- Data from Michigan's WIC program can be obtained via two methods:
    - Accessing Michigan's data warehouse
    - Obtaining Michigan PedNSS/PNSS data from the CDC
  
  - Both sets of information are derived from the same source: information from the local agency.
  - The type of information provided is slightly different depending on the method used to access the data
-



# PNSS & PedNSS

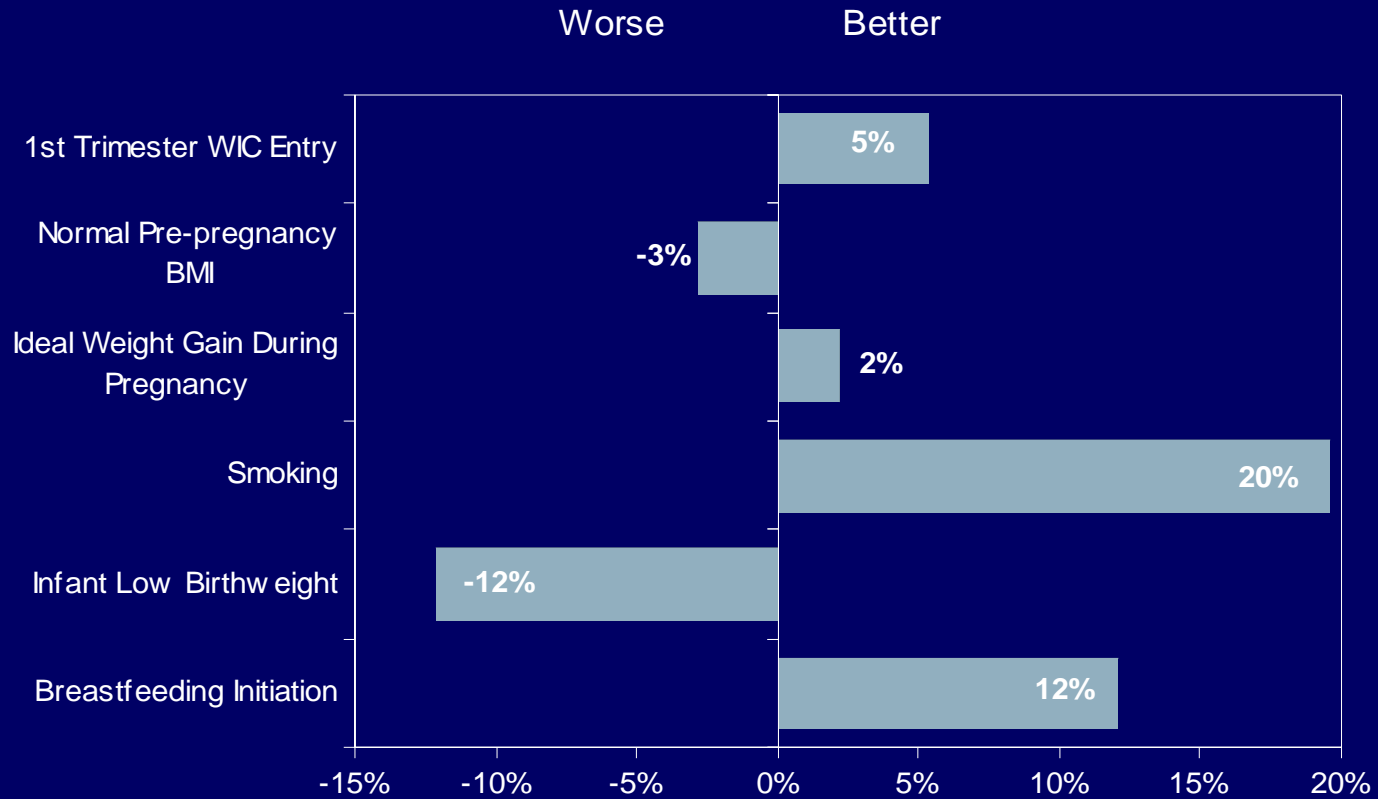
- **The Pregnancy Nutrition Surveillance System (PNSS)** is a program-based public health nutritional surveillance system that monitors the health outcome of low-income women who participate in federally funded maternal and child health programs.
    - Nationally PNSS data represent approximately 750,000 pregnant and postpartum women.
  - **Pediatric Nutrition Surveillance System (PedNSS)** is the national child-based surveillance system used by public health professionals to monitor the nutritional status of children participating in the federally-funded maternal and child health programs.
    - Nationally PedNSS data represent more than 7 million children from birth to 5 years old.
-



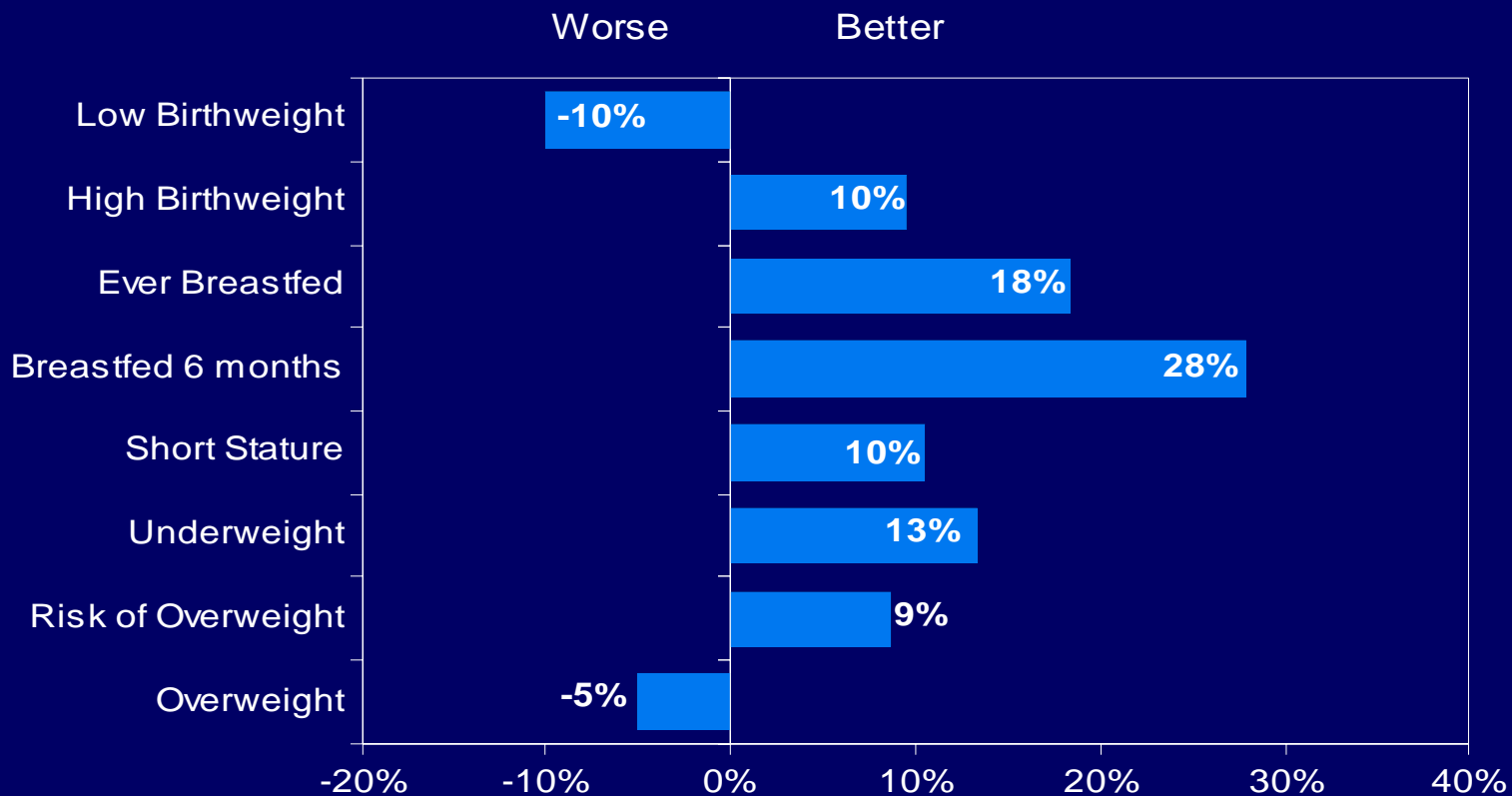
**So how are our participants  
doing?**

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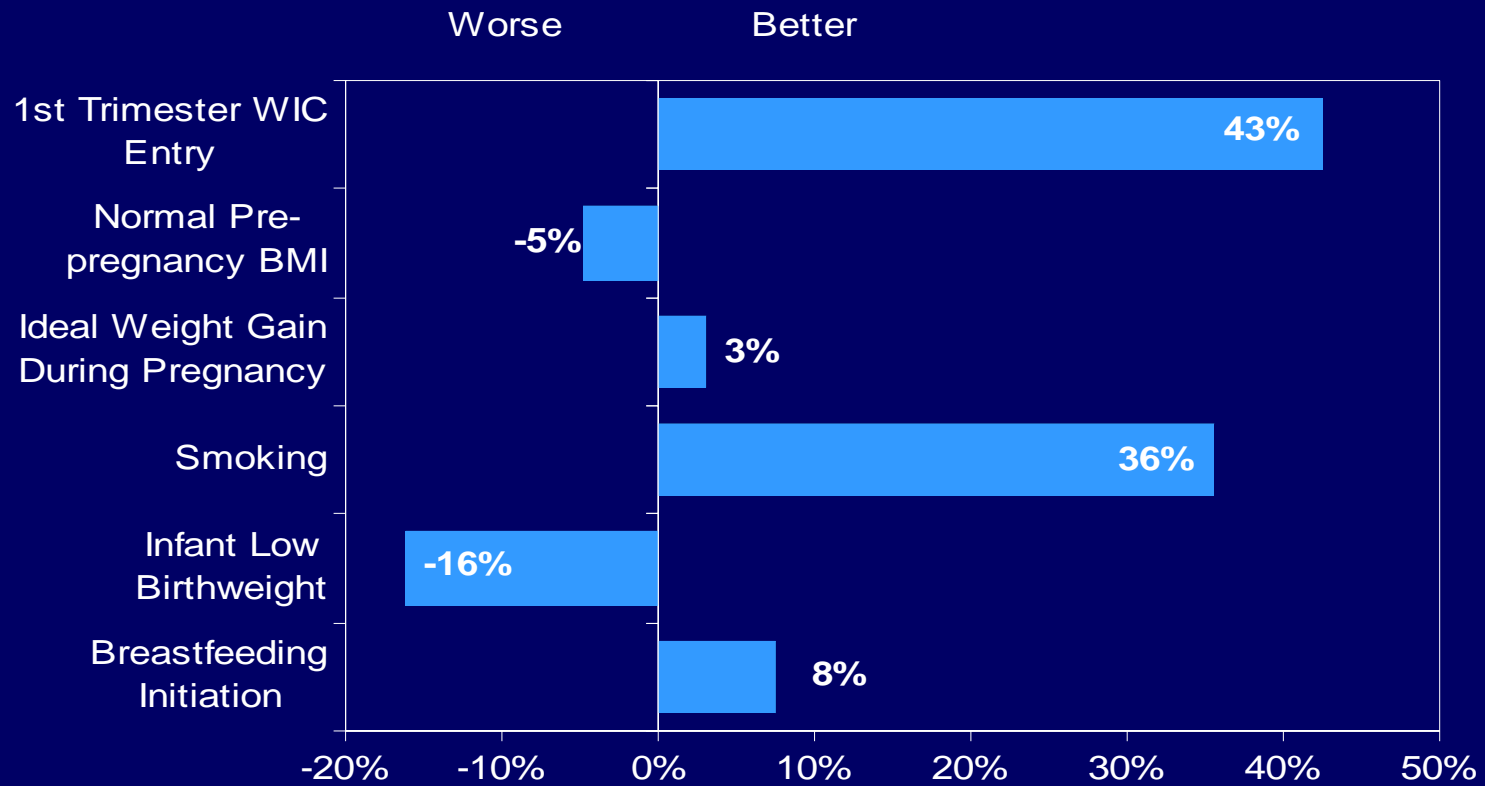
# PNSS Health Progress: Michigan

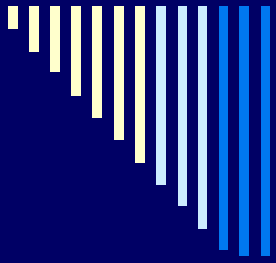


# PedNSS Health Progress: Michigan

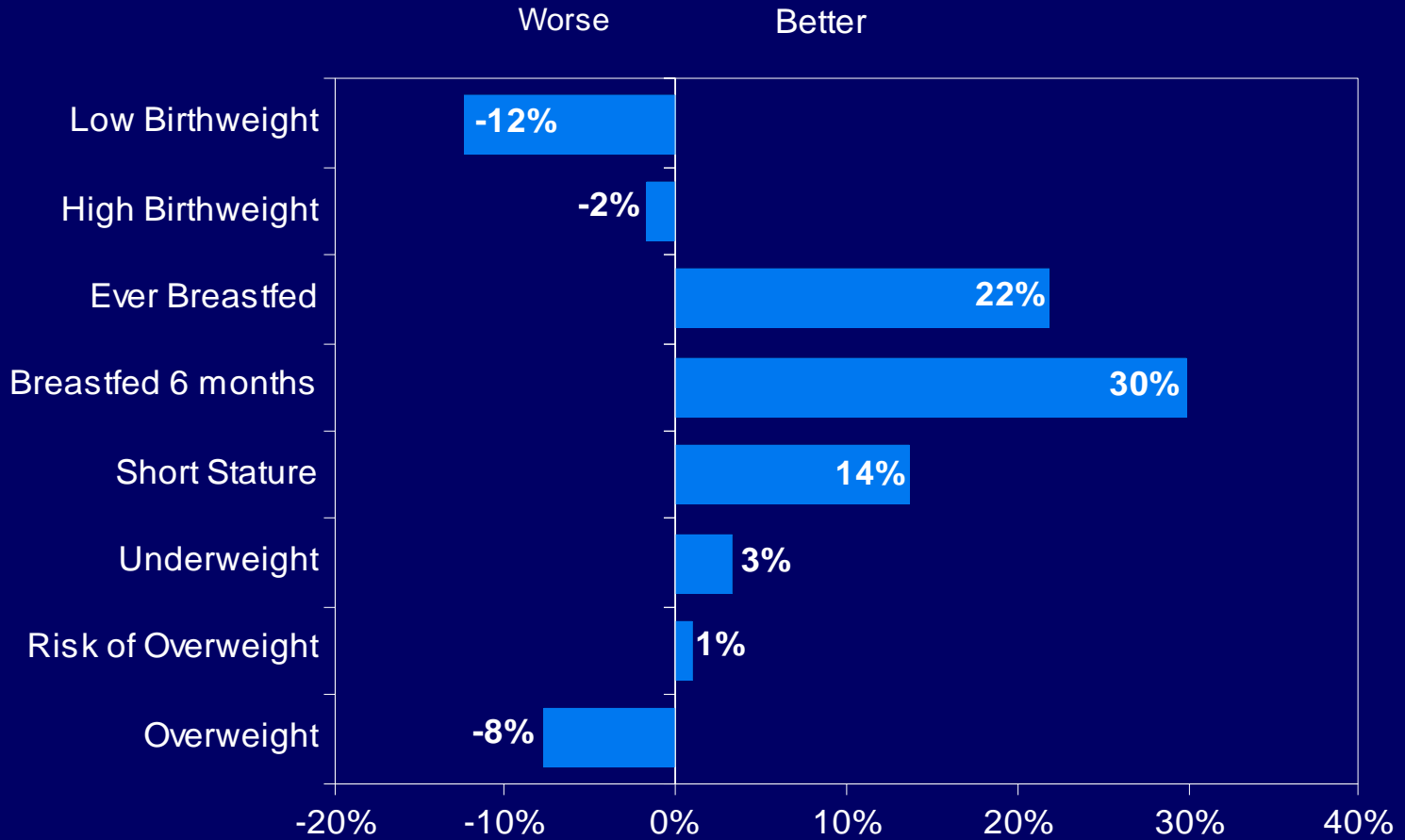


# PNSS Health Progress: Detroit DHWP

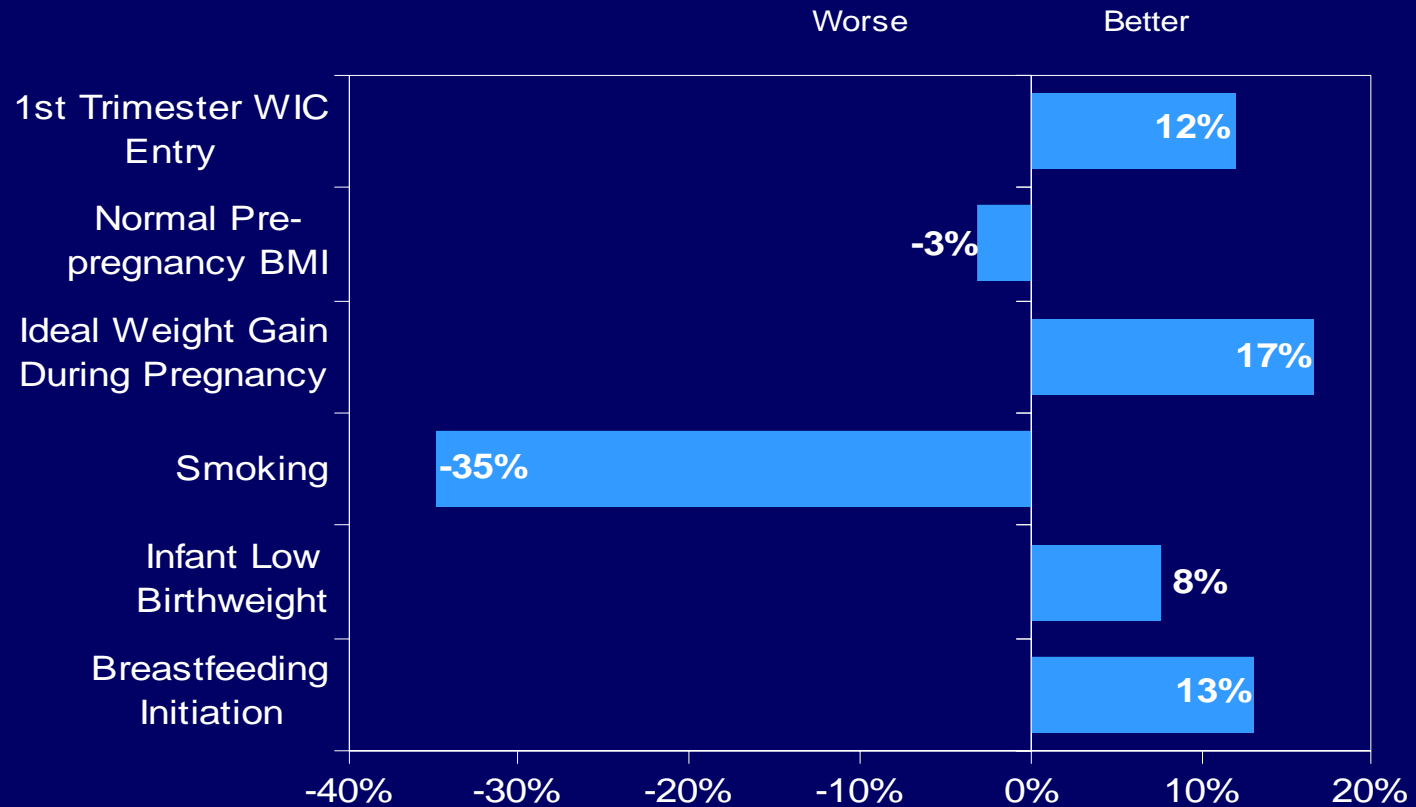


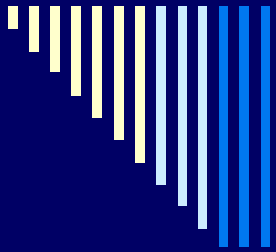


# PedNSS Health Progress: Detroit DHWP

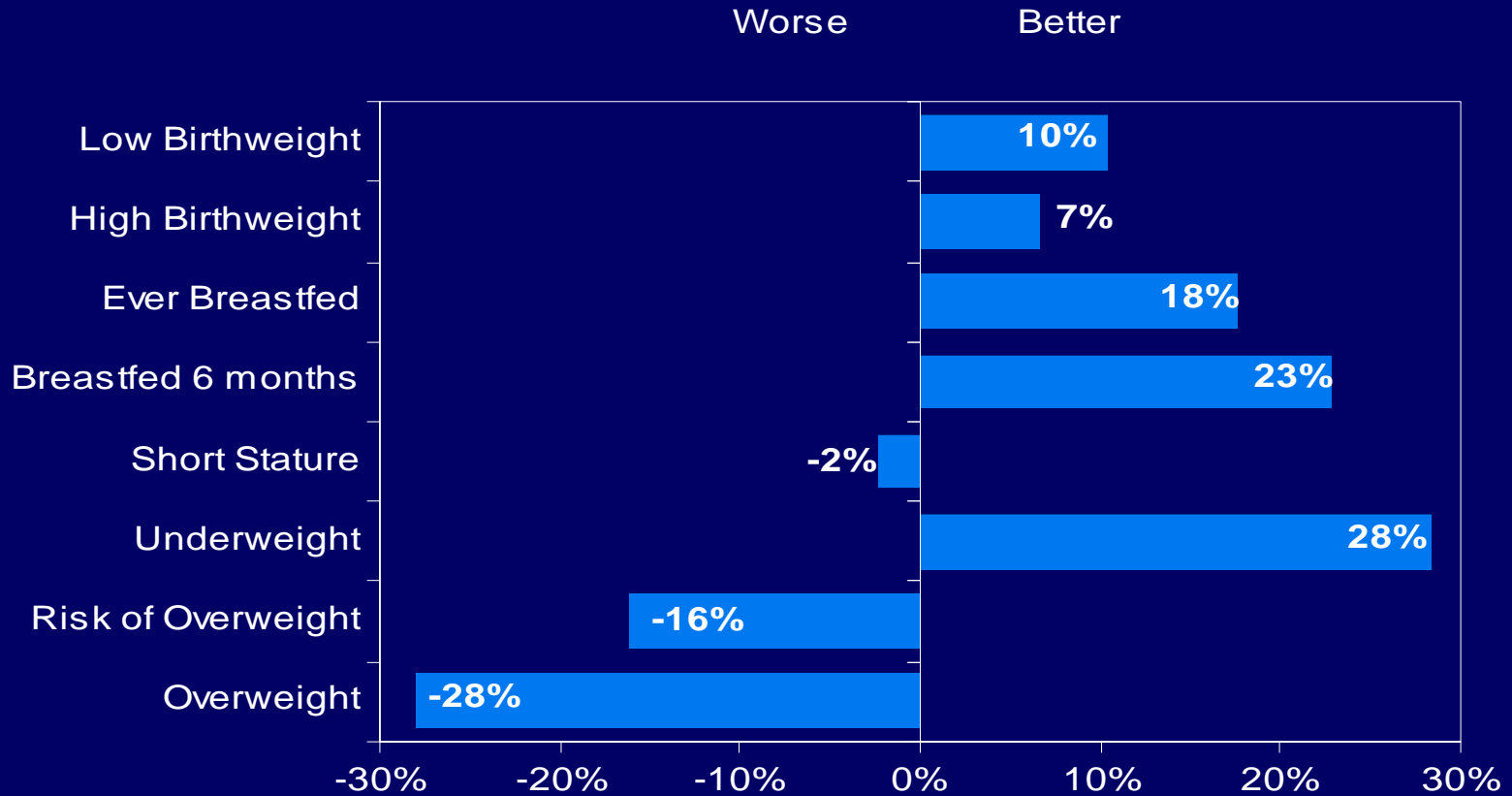


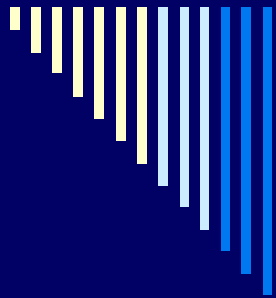
# PNSS Health Progress: Kent CHD





# PedNSS Health Progress: Kent CHD





# Thank you for your attention

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