Obstetrical care and birth outcomes: What’s race/ethnicity got to do with them?

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Department of Obstetrics and Gynecology, Massachusetts General Hospital
North Carolina Preterm Birth Prevention Symposium
Disclosures

• No financial disclosures
A-ha moment

Infant mortality of blacks on rise

By Stephen Smith

Black babies born to Boston parents in 2000 died at a rate more than four times higher than white infants — a stark reversal after years of progress in the effort to bridge the black-white health care divide.

Although overall infant mortality in Massachusetts has reached a new low, figures released yesterday by public health officials show that black infants in the city died at a rate of 18.6 per 1,000 births, higher than any year since 1993.

White babies, by comparison, had a mortality rate of 2.8 per 1,000 births. Statewide figures show a similar gap.

Health authorities yesterday were so alarmed that they vowed to examine every infant death in detail, hunting for causes and solutions.

"I'm deeply troubled," said Barbara Ferrer, deputy director of the Boston Public Health Commission. "Even with the decline in infant mortality overall, for us..."
Racial/ethnic disparities in health and health care

- Disparity (Webster’s definition)
  - The condition or fact of being unequal, as in age, rank, or degree; difference

- Disparities in health vs. health care
Life expectancy

Figure 1. Life expectancy, by race: United States, 1970–2010


NCHS, 2013
Overweight and obesity: Women

NHANES, 2009-2010
Health care disparities

- Black patients less likely to undergo surgical treatment of colorectal cancer, stage for stage (Cook et al, 2005)
- Black and Hispanic patients less likely to remain on evidence-based preventive medications at 12 months after discharge for MI (Lauffenburger et al, 2005)
Contributors to health and health care disparities

**Health system factors**
- Health services organization, financing, delivery
- Health care organizational culture, QI

**Patient-level factors**
- Beliefs and preferences
- Race/ethnicity, culture, family
- Education and resources
- Biology

**Clinical encounter**
- Provider communication
- Cultural competence

**Provider factors**
- Knowledge and attitudes
- Competing demands
- Implicit/explicit biases

**Structural factors**
- Poverty/wealth
- Unemployment
- Stability of housing
- Food security
- Racism

Adapted from Kilbourne et al, AJPH 2006
# ACOG: Racial/ethnic disparities in Ob/Gyn

<table>
<thead>
<tr>
<th>Disparities in health outcomes</th>
<th>AI/AN</th>
<th>Asian</th>
<th>Black</th>
<th>Hispanic</th>
<th>White</th>
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<tbody>
<tr>
<td>Infertility in last 12 months (% of women)</td>
<td>--</td>
<td>10</td>
<td>12</td>
<td>9</td>
<td>7</td>
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<tr>
<td>Unintended pregnancy (% of pregnancies)</td>
<td>--</td>
<td>--</td>
<td>69</td>
<td>56</td>
<td>42</td>
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<tr>
<td>Preterm birth (% of live births)</td>
<td>14</td>
<td>10</td>
<td>17</td>
<td>12</td>
<td>11</td>
</tr>
<tr>
<td>Maternal death (/100,000 live births)</td>
<td>--</td>
<td>10</td>
<td>33</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td>Gonorrhea (/100,000 population)</td>
<td>96</td>
<td>18</td>
<td>570</td>
<td>--</td>
<td>24</td>
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<tr>
<td>Cervical cancer (/100,000 population)</td>
<td>7</td>
<td>7</td>
<td>10</td>
<td>11</td>
<td>7</td>
</tr>
<tr>
<td>Breast cancer deaths (/100,000 population)</td>
<td>16</td>
<td>12</td>
<td>31</td>
<td>15</td>
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ACOG: Racial/ethnic disparities in Ob/Gyn

<table>
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<tr>
<th>Disparities in health care access and services</th>
<th>AI/AN</th>
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<th>Black</th>
<th>Hispanic</th>
<th>White</th>
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<tbody>
<tr>
<td>Provision of birth control in past year (% women aged 15-44)</td>
<td>--</td>
<td>--</td>
<td>29</td>
<td>29</td>
<td>37</td>
</tr>
<tr>
<td>Pap testing within 3 years (% women aged 21-65)</td>
<td>--</td>
<td>--</td>
<td>66</td>
<td>53</td>
<td>62</td>
</tr>
<tr>
<td>Mammography within 2 years (% women aged 50-75)</td>
<td>73</td>
<td>73</td>
<td>64</td>
<td>69</td>
<td>70</td>
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<tr>
<td>Ever received infertility treatment (% women)</td>
<td>--</td>
<td>--</td>
<td>11</td>
<td>12</td>
<td>16</td>
</tr>
<tr>
<td>Prenatal care in first trimester (% births)</td>
<td>70</td>
<td>86</td>
<td>76</td>
<td>78</td>
<td>85</td>
</tr>
<tr>
<td>Cesarean delivery (% of births)</td>
<td>28</td>
<td>33</td>
<td>36</td>
<td>32</td>
<td>32</td>
</tr>
</tbody>
</table>

ACOG CO #649
Determinants of health/
How do we care for those we see?

• Role of implicit bias
  – Extensive examples of role of race in MD willingness to recommend for CV evaluation

• Implicit (but not explicit) bias against African Americans a significant negative predictor of likelihood to recommend thrombolysis for black patients (Green 2007)

• www.implicit.harvard.edu
Disparities in infant mortality: U.S., 2009

Infant Mortality Rate (per 1,000 LB)

- Total U.S.: 2.2
- Black, Non-Hispanic: 4.2
- American Indian: 4.1
- Puerto Rican: 2.4
- Cuban: 2.1
- White, Non-Hispanic: 3.6
- Mexican: 3.4
- Central/South American: 1.3

Healthy People 2020 Goal (6.0/1,000LB)

NCHS, 2013
Infant mortality

- Major contributors to Infant Mortality
  - Congenital Anomalies/Chromosomal Disorders
  - Preterm Birth/Low Birth Weight
  - Sudden Infant Death Syndrome
  - Maternal Complications of Pregnancy

National Center for Health Statistics 2004
Infant mortality

- Major contributors to Infant Mortality
  - Congenital Anomalies/Chromosomal Disorders
  - Preterm Birth/Low Birth Weight
  - Sudden Infant Death Syndrome
  - Maternal Complications of Pregnancy

National Center for Health Statistics 2004
Preterm birth

March of Dimes Peristats 2011-2013
Impact of preterm birth

% of infant deaths related to prematurity

- Total: 36%
- Puerto Rican: 43%
- Asian/Pl: 42%
- Central/S. American: 37%
- Mexican: 34%
- White, non-Hispanic: 33%
- Am. Indian/Alaska Native: 31%
- 24%

NCHS 2010
Risk factors for preterm birth

Biology/Genetics
- Chronic disease
- Inflammation
- Infection
- Multiple gestation

Behavior
- Unintended pregnancy
- Short interpregnancy interval
- Alcohol/tobacco/drug use

Environment
- Hazardous exposures
- Stressors
- Poor nutrition
- Racism

Health Care
- Poor interconception health/health care
- No prenatal care

Prior preterm birth
\[(RR = 5-6)\]
<table>
<thead>
<tr>
<th>Gestational age at first birth</th>
<th>% preterm birth at second birth</th>
<th>Adjusted RR of preterm birth at second birth</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥37 weeks</td>
<td>6%</td>
<td>ref</td>
</tr>
<tr>
<td>32-37 weeks</td>
<td>29%</td>
<td>4.8</td>
</tr>
<tr>
<td>28-32 weeks</td>
<td>38%</td>
<td>6.0</td>
</tr>
<tr>
<td>24-28 weeks</td>
<td>40%</td>
<td>6.4</td>
</tr>
<tr>
<td>20-24 weeks</td>
<td>28%</td>
<td>4.9</td>
</tr>
</tbody>
</table>

Loughon et al. AJOG 2014
Progesterone to prevent recurrent preterm birth: the evidence

• PROGESTational STEROidal ketONE

• Normally produced by corpus luteum, then placenta by 9 weeks

• Maintains uterine quiescence in the latter half of pregnancy

• Johnson et al, 1975, NEJM: small randomized trial of 17α-hydroxyprogesterone caproate (17P) vs. placebo
  – Significant benefit with respect to latency to delivery, birth weight, perinatal mortality

• Subsequent, less convincing studies followed

• Keirse et al, 1990, BJOG: meta-analysis of trials to date
  – Significant benefit with respect to preterm labor, preterm birth, and low birth weight
2003: The year of the progestins

- Meis et al, 2003, NEJM: MFMU trial randomized 459 women with prior sPTB to weekly IM 17P starting at 16-20 weeks, through 36 weeks gestation
### TABLE 3
Current Society for Maternal-Fetal Medicine recommendations regarding use of progestogens for prevention of preterm birth

<table>
<thead>
<tr>
<th>Population</th>
<th>Recommendation regarding use of progestogens</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asymptomatic</td>
<td>No evidence of effectiveness</td>
</tr>
<tr>
<td>Singletons without prior SPTB and unknown or normal TVU CL</td>
<td>17P 250 mg IM weekly from 16-20 wk until 36 wk</td>
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<tr>
<td>Singletons with prior SPTB</td>
<td>Vaginal progesterone 90-mg gel or 200-mg suppository daily from 20-24 weeks</td>
</tr>
<tr>
<td>Singletons without prior SPTB but CL ≤20 mm at ≤24 wk</td>
<td>No evidence of effectiveness</td>
</tr>
<tr>
<td>Multiple gestations</td>
<td>Vaginal progesterone 90-mg gel or 200-mg suppository daily from 20-24 weeks</td>
</tr>
<tr>
<td>Symptomatic</td>
<td>No evidence of effectiveness</td>
</tr>
<tr>
<td>PTL</td>
<td></td>
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<tr>
<td>PPROM</td>
<td></td>
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</table>
Current prevalence of appropriate 17P use?
What do we know?

- Henderson et al., 2009: survey of 469 ACOG Research Network members
  - 26% reported no use of progesterone in practice
Louisiana experience: inequity

Figure. Comparison of preterm birth rates (A; updated August 25, 2014) and percentages of women at risk for recurrent preterm birth in those with Medicaid coverage who received 17α-hydroxyprogesterone caproate (17P) (B; updated October 14, 2014), by parish (county) (Louisiana, 2011-2014). Reproduced with permission from Medicaid Quality Management, Statistics and Reporting, 2014.
Barriers to receipt of 17OHP/C
Sources of care disparities

Health system factors
- Health services organization, financing, delivery
- Health care organizational culture, QI

Patient-level factors
- Beliefs and preferences
- Race/ethnicity, culture, family
- Education and resources
- Biology

Clinical encounter
- Provider communication
- Cultural competence

Provider factors
- Knowledge and attitudes
- Competing demands
- Implicit/explicit biases

Structural factors
- Poverty/wealth
- Unemployment
- Stability of housing
- Food security
- Racism

Adapted from Kilbourne et al, AJPH 2006
What is the health care experience of a woman with a prior preterm birth?
Health Belief Model

- Perceived susceptibility to the problem
- Perceived consequences of the problem
- Perceived benefits of the action
- Perceived barriers to action

Perceived threat

Outcome expectations

Self efficacy

SMFM 2016
First pregnancy affected by prematurity

Recognition of preterm birth as concern and a risk to future obstetrical outcomes

- Lack of knowledge that preterm birth has occurred
- Preexisting knowledge/attitudes/social norms about recurrence of preterm birth
- Preexisting knowledge/attitudes/social norms about preterm birth consequences
- Inadequate provider knowledge
- Inadequate institutional recording [birth certificate, hospital record]

Knowledge of potential interventions to mitigate preterm birth risk

- Inadequate patient knowledge
- Inadequate provider knowledge

SMFM 2016
Next pregnancy, at risk

- Lack of early awareness of pregnancy
- Ambivalence toward/unwanted pregnancy delaying prenatal care enrollment
- Underutilization of providers in other fields as sources of referrals/expediting care (e.g. PCP, ED)
- Lack of population health focus to identify and bring eligible women into care before they may present on their own

Early pregnancy recognition

Recall of concerns for risks discussed after last pregnancy outcome

- Poor recall of obstetrical events and counseling
- Changes to a priori risk by changes in health status

THREATS to success

Registration for care early enough to enact specific interventions

- Real or perception of uninsurance or underinsurance
- Failure to appreciate need for early interaction with health care system
- Confusion about spontaneous vs. medically-induced PTB resulting in delay

SMFM 2016
Next pregnancy, at risk

17-OHPC is offered

- Provider lack of understanding of need for 17-OHPC
- Practice "mismatch" wherein provider and practice not aware of or able to offer appropriate interventions
- Difficulties identifying or getting access to MFM provider, in case of more complex deciphering of candidacy for 17-OHPC

17-OHPC is accepted

- Evidence for recommendation presented in a way not easily understood by patient/family
- Patient/family issues of mistrust/disbelief/concerns about injections, medication, cost/copay

THREATS to success

SMFM 2016
Next pregnancy, at risk

THREATS to success

- Errors or delay in prescriptions
- No available pharmacy to fill and distribute 17-OHPC in a timely fashion
- No clear safe and secure patient location to which med can be shipped
- No capacity to stock in outpatient offices and make available

17-OHPC is prescribed early enough to allow preparation, distribution, injection by 16 weeks

• Insurance/payment barriers

• Insurance coverage

- Women unable to identify someone in family or community to administer
- Practice unable to accommodate weekly injections
- No visiting nurse/community health worker to administer and/or bill for administration
- Weekly injection schedule too onerous
- Transportation, child care or other tangible social support barriers

17-OHPC is administered weekly
How to intervene?:
North Carolina 17P Project

• Patient-level interventions
• Provider-level interventions
• Health-systems interventions
• Understanding of social determinants of health
## Risk factors for preterm birth

### Biology/Genetics
- Chronic disease
- Inflammation
- Infection
- Multiple gestation

### Environment
- Hazardous exposures
- Stressors
- Poor nutrition
- Racism

### Behavior
- Unintended pregnancy
- Short interpregnancy interval
- Alcohol/tobacco/drug use

### Health Care
- Poor interconception health/health care
- No prenatal care
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<td>health/health care</td>
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</tbody>
</table>
Unintended pregnancy and birth spacing among low-income women

- Focus group study of low-income, recently postpartum women
- 7 groups conducted (N=47)
- Themes related to pregnancy planning, birth experience, interconception care, birth spacing explored, using semi-structured discussion guide
Pregnancy Planning: Meaning of “Planning” and “Control”

• “I think we can have all the plans in the world and life never goes the way it's planned... It’s not your plan anyway.”

• “... as far as that baby coming to this world, I don't think that's ever planned. You really don't know when you get pregnant. It just happens sometimes.”

• “Things happen, even if you’re on birth control sometimes you get pregnant, so why bother [planning]?”
Innovative tools

- Qualitative study of low-income, largely A-A women at family planning clinic:
  - “Patient participants were very receptive to this online contraceptive support tool, describing it as trustworthy, accessible and empowering. “
  - “In contrast, clinic providers and staff had concerns regarding the website's legitimacy, accessibility, ability to empower patients and applicability, which limited their willingness to recommend its use to patients.”

Gressel et al. Contraception 2014
Interpregnancy interval: Definition

Preconception care

Preconception Period

Prenatal care

Pregnancy 1

Interpregnancy Interval

Prenatal care

Pregnancy 2

Interconception care
Short interpregnancy interval: exemplar
Short interpregnancy interval: exemplar

Birth of Sean Preston
9/14/05 (a)

12 months (b-a)

Birth of Jayden James
9/12/06 (b)

Interpregnancy Interval = 3 months
((b-a) - c)

Gestational age = 9 months (c)
Interpregnancy interval and perinatal outcomes

Zhu et al, NEJM 1999
Interpregnancy intervals and perinatal outcomes

Preterm birth

Low birth weight

Small for GA

Fetal death

Early neonatal death

Conde-Agudelo et al, JAMA 2006
Interpregnancy intervals among women in CA

- Aim: To describe rates, predictors and outcomes of short interpregnancy intervals among women in California

- Methods: Retrospective cohort study of all women in CA with first birth in 1999-2000, second birth before 2005, using existing, linked administrative data

- N = 366,415
Results

Mean interpregnancy interval ± SD: 23.7 ± 13.1m

Risk of short IPI:

<table>
<thead>
<tr>
<th>Interval</th>
<th>All women</th>
<th>Low-income women</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 3 months</td>
<td>0.9%</td>
<td>2.6%</td>
</tr>
<tr>
<td>&lt; 6 months</td>
<td>3.3%</td>
<td>8.5%</td>
</tr>
<tr>
<td>&lt; 12 months</td>
<td>10.9%</td>
<td>23.4%</td>
</tr>
<tr>
<td>&lt; 18 months</td>
<td>19.9%</td>
<td>39.3%</td>
</tr>
</tbody>
</table>
Adjusted odds of short IPI by race/ethnicity
Are short IPIs worse for some?

Adjusted ORs for delivery at < 37 weeks, second birth

- **White, > 6 m o < 6 m o**: AOR = 1.0
- **SE Asian, > 6 m o < 6 m o**: AOR = 1.3, *p < 0.05*
- **Black, > 6 m o < 6 m o**: AOR = 1.6, *p < 0.05*

- **White, < 6 m o**: AOR = 1.0
- **SE Asian, > 6 m o**: AOR = 2.1
- **Black, > 6 m o**: AOR = 2.1
Birth spacing: Health

• “I did research to see what the safest time is to do it soonest ...[to] get this baby part over with as soon as possible. But it’s not safe before a year... So, after a year, your stores are back and you can, you know, easily healthily maintain a pregnancy.”

• “I think medically, you’re supposed to wait – I don’t know, I think only three or four months maybe.”

*Lesson learned: There are knowledge gaps related to adequate birth spacing
Birth Spacing: Sibling issues

• “So, it’s like, they’ll both have somebody to play with so they won’t be working my nerves… Like… he can’t go to school next year… So, at least they have a brother or somebody to play with… they wouldn’t get into so much… I don’t regret having my kids so close together.”

• “I want my kids to enjoy each other’s company as long as possible.”

*Lesson learned: Short birth intervals may be desirable for some women
Role of partners

• “Because in our country, the men have a bit of chauvinism in their heads... they just want children and children as if you were a baby-making machine... It’s good to give time to children.”

• “In my case.. he’s my second partner and he’s never had babies, so he says ‘I want to have a child with you’ and well, he convinced me, but I didn’t want any more.”

• Moderator: “When thinking about having babies, what are some reasons that women would have babies close together?”

Participant: “So they can catch the same man... They won’t have to deal with this man, this jerk, that Tom, that Harry. You know your one Sam and one Sam only.”
Role of family norms

• “My sister had kids a year after each other and it was kind of easy like that because they're all young still and they're all growing up together. So I kind of wish I had my babies a year apart, too.”

• “My mom had 7 kids in 7 years. She was fine.”
Birth spacing: Provider messages

• Moderator: “Have any of the doctors talked about the best time to wait between pregnancies?”

Participant: “They said don’t have sex for six weeks.”

Moderator: “Other than that?”

Participant: “Nothing.”

• “Well they tell you about the forty days, right? And after that... Before forty days, they tell you that you can’t. That’s the only thing, because they are not going to tell you, ‘you know what, wait.’ It depends on if you have an illness, then they tell you, ‘you can have children at a set time,’ but if you don’t have anything, they can’t tell you.”
Population Reports

Birth Spacing
Three to Five Saves Lives

Couples who space their births 3 to 5 years apart increase their children’s chances of survival, and mothers are more likely to survive, too, according to new research. Many women want to space births longer than they currently do. Programs can do more to help them achieve the birth intervals they want.

SPACING BIRTHS, SAVING LIVES

Ways to Turn the Latest Birth Spacing Recommendation into Results

By Dawn Epstein, Ph.D., M.E.H.S., Reproductive Health and HIV/AIDS Specialist
Healthy Babies are Worth the Wait®

Really important things happen to a baby in the last few weeks of pregnancy. Babies need at least 39 weeks in the womb to fully grow and develop.

Here's what at least 39 weeks can do:

**brain:**
In the last 6 weeks of pregnancy, the size of a baby's brain almost doubles. This helps with things like balance, learning and behavior as he gets older.

**mouth:**
A baby has time to learn to suck and swallow so he can eat after he's born.

**liver:**
The liver and other organs grow and develop.

**eyes and ears:**
Babies born at 39 weeks or later are less likely to have vision and hearing problems than babies born early.

**lungs:**
Babies born at 39 weeks or later are less likely to have breathing problems than babies born early.

More and more births are being scheduled a little early for non-medical reasons. This can cause problems for both mom and baby. If your pregnancy is healthy, it's best to stay pregnant until labor begins on its own.

For more information about a baby's growth and development, go to: marchofdimes.com/39weeks

March of Dimes is a registered trademark. All rights reserved.
Potential interventions

- Nurse visitation/care coordination in interconception period
  - In an RCT (Olds et al), home visits through 2 years of life associated with
    - Fewer pregnancies and births
    - Longer latency between 1\textsuperscript{st} and 2\textsuperscript{nd} births
    - Fewer months on AFDC or food stamps, arrests, days in jail, number of child abuse cases
- Education of women/ partners/ families
  - Reproductive life plans
  - Targeted education for those at highest risk
- Education of providers
- Improved access to interconception care, family planning
Boston Public Health Commission: Decline in Black Infant Mortality
Progress attributed to citywide partnerships to improve black women’s health
Friday, October 10, 2014

Good news out of Boston. The city’s black infant mortality rate sees a significant drop.
Boston: decline in Black IMR

**Infant Mortality Rates**

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<tbody>
<tr>
<td>Asian</td>
<td>3.4</td>
<td>3.5</td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td>13.1</td>
<td>12.0</td>
<td></td>
</tr>
<tr>
<td>Latino</td>
<td>6.3</td>
<td>5.3</td>
<td>5.4</td>
</tr>
<tr>
<td>White</td>
<td>3.5</td>
<td>3.6</td>
<td>3.6</td>
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</table>

_DATA SOURCE:_ Massachusetts Resident Birth and Death files, Massachusetts Department of Public Health
_DATA ANALYSIS:_ Boston Public Health Commission Research and Evaluation Office
Boston: decline in Black IMR

**Preterm Births**


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<thead>
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<tbody>
<tr>
<td>Asian</td>
<td>6.8</td>
<td>7.3</td>
<td>8.0</td>
</tr>
<tr>
<td>Black</td>
<td>13.4</td>
<td>13.7</td>
<td>11.2</td>
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**DATA SOURCE:** Massachusetts Resident Birth and Death files, Massachusetts Department of Public Health
**DATA ANALYSIS:** Boston Public Health Commission Research and Evaluation Office
What changed?

- Decrease in births to teen mothers
- Increase in births to foreign-born mothers
- “What is new in the current period, and most sharply since 2008, has been an explicit focus first, on the impact of poverty, racism and associated stress on health, and second, on the need for a broad, collaborative effort to support women facing these stresses on a daily basis.”
  - Changed case management to include interconception period
  - Peer support via “women’s circles” and group prenatal care
  - Recognition and addressing social determinants of health (food, housing, family medical concerns, finances)
    - Partnership with housing authority to prioritize pregnant women at risk of homelessness
    - Home visiting program
Equality vs. Equity
Equality vs. Equity vs. Liberation