

Population-level Risks for Preterm Birth in the U.S. and Alabama

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Assumptions About Preterm Birth Rate Comparisons: Health Insurance, Health Care, Individual Choices

- News comments on the March of Dimes report cards:
 - CBS News: "States like Louisiana have a lot of challenges. I don't have the exact answers, but some issues that can be targeted may be access to care, making sure that women have insurance and have care before they become pregnant."

Assumptions About Preterm Birth Rate Comparisons: Health Insurance, Health Care, Individual Choices

- US News and World Report "Everyone has a role to play in preventing premature births.. Health officials need to assure that services are available; women should plan their pregnancies and wait at least 18 months between the birth of their baby and the next conception."

Assumptions About Preterm Birth Rate Comparisons: Health Insurance, Health Care, Social Support

- News comment on the National Center for Health Statistics report on international preterm birth rate comparisons:
 - New York Times: " Dr. Alan R. Fleischman, medical director for the March of Dimes, said the new report was "an indictment of the U.S. health care system" and the poor job it had done in taking care of women and children.

Assumptions About Preterm Birth Rate Comparisons: Health Insurance, Health Care, Social Support

- The report, Dr. Fleischman added, "puts together two very important issues, both of which we knew about but hadn't linked tightly."....
- The high levels of prematurity in the United States have various causes. Dr. Fleischman said the smallest, earliest and most fragile babies were often born to poor and minority women...

Assumptions About Preterm Birth Rate Comparisons: Health Insurance, Health Care, Social Support

who lacked health care and social support. The highest rates of infant mortality occur in non-Hispanic black, American Indian, Alaska Native and Puerto Rican women..”

What Does Early Prenatal Care Do?

- Enables early screening for medical complications such as hypertension and diabetes, which can be managed
- Establishes linkages with care providers, opportunity for education and support
- **GENERALLY DOES NOT PREVENT PRETERM DELIVERY** - Some at risk women may benefit from P-17 treatment and/or cerclage, but PNC care does not shift population-level PTB rates

If Not Prenatal Care, Then What?

- For individual women, there are multiple physiological pathways to preterm delivery – spontaneous labor (2/3 of cases), interventional delivery (1/3 of cases).
- At the population level, numerous inter-related correlates of higher PTB rates:

If Not Prenatal Care, Then What?

- Prior preterm birth; multiple gestation; assisted reproduction; short intrapartum interval;
- Younger or older maternal age; unintendedness of pregnancy; underweight; tobacco, alcohol, cocaine use;
- Health issues, particularly cardiovascular; poverty, race/ethnicity

Population-level Risks for Preterm Birth

- Which population-level exposures and protective factors distinguish the U.S. from other nations with lower PTB rates?
- Which population-level exposures and protective factors distinguish Alabama from other states with lower PTB rates?

Risks To Be Considered:

- Individual Level
 - Pregnancy Characteristics
 - Multiple gestation
 - Maternal age
 - Health behaviors
 - Health status

Risks To Be Considered:

- **Family Level**
 - Intendedness
 - Use of assisted reproduction technology
- **Community Level**
 - Race/ethnicity
 - Poverty

Risks To Be Considered:

- **Policy Level**
 - Reproductive health policies
 - Social welfare policies

Individual Level Risks: Pregnancy Characteristics – Multiple Gestation

- Multiple gestation pregnancies are more likely to end preterm than singleton pregnancies
 - The U.S. has similar rates of twins but higher rates of triplets and higher order multiples than England, France or Canada (Blondel et al 1997)

Individual Level Risks: Pregnancy Characteristics – Multiple Gestation

- Alabama has a higher rate of multiple births than U.S. overall (AL and National Vital Statistics 2015)

	% Twins	% Triplets	% Higher order multiples
U.S.	3.3	0.10	0.01
Alabama	3.7	0.15	0.02

U.S. and Alabama Comparisons - Maternal Age Specific Birth Rates (Births per 1,000)

2015	Ages 15-19	Ages 35-39	Ages 40-44	Ages 45-49
United States	22.3	51.8	11.0	0.8
Alabama	30.1	34.6	5.9	0.3

National Vital Statistics 2015

Conclusions

- Childbearing women are younger in the U.S. than in comparison countries
- Childbearing women are younger in Alabama than in the U.S.
- Higher preterm birth rates are NOT explained by maternal age-related risks

Individual Level Risks: Maternal Health Behaviors

- Smoking while pregnant is a risk factor for low birth weight and preterm birth
 - Tobacco exposure causes vasoconstriction, which reduces oxygen flow to the fetus

Individual Level Risks: Maternal Health Behaviors

- Heavy alcohol use is a threat to fetal development
 - There is some evidence that first trimester alcohol use may be associated with preterm birth, but no consensus

Individual Level Risks: Maternal Health Behaviors

- Illicit drug use during pregnancy is a concern, but only cocaine use has been associated with higher risk of preterm birth

U.S. and Alabama Comparison - Health Behaviors

	% Adults currently smokers	% Adults any alcohol last 30 days	% Young adults any cocaine use past year
United States	18	54	5.0
Alabama	22	41	3.2

Tobacco and alcohol use from CDC BRFSS survey, 2015. Cocaine use in 2014-2015 from Hughes et al, 2016.

Conclusions

- U.S. DOES NOT have higher rates of health behavior risks than comparison countries
- Alabama DOES have higher rates of tobacco use than the U.S. as a whole

Individual Level Risk – Maternal Health Status

- Obesity is a risk factor for preterm birth, primarily because it is a risk factor for pregnancy complications, particularly preeclampsia, hypertension and diabetes, which can trigger surgical interventions to deliver babies before term

Individual Level Risk – Maternal Health Status

- Heart disease, particularly hypertension, is associated with preterm labor and interventional deliveries
- Maternal mortality is an indicator of health complications, and has been used as a measure of maternity care quality

U.S. and Alabama Comparison - Maternal Health Status

	Adult Women Obese, 2014	Deaths from Heart disease per 100,000 2014	Maternal mortality rate 2003-2007
United States	27.2	192.7	13.3
Alabama	31.1	256.4	11.7

Obesity and Maternal mortality rates from March of Dimes Peristats. Heart disease mortality rates from Alabama Vital Statistics 2015.

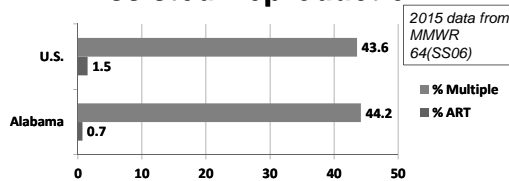
Conclusions

- U.S. women have WORSE health status than women in comparison countries
- Alabama has higher rates of obesity and heart disease than U.S. women in general

Family Level Risks – Assisted Reproduction

- Pregnancies that result from use of assisted reproduction are more likely to end before term, partly because they are more often multiple births, and partly because of fecundity challenges (for example, implantation abnormalities)

U.S. and Alabama Comparison - Assisted Reproduction



- Conclusion
- The U.S. has fewer ART births than Europe, but more of these are multiples, at higher PTB risk.
 - Alabama has fewer ART births than the U.S., with slightly more multiples.
 - ART choices may contribute to higher PTB rates

Family Level Risks: Unintended Pregnancies

- Women who report their pregnancies as having been unwanted or mistimed are more likely to have delivered before term.
 - Short intrapartum intervals are associated with preterm delivery – hypothesis that maternal health status is depleted when interval is less than 18 months.

Family Level Risks: Unintended Pregnancies

- Exposure to stress, coupled with minimal social support, is associated with higher risk of preterm birth.
- Some studies suggest that unintendedness is a risk in the context of other factors, such as poverty or advanced age.

U.S. and Alabama Comparison of Unintended Pregnancies

	% Pregnancies unintended	% Unintended pregnancies ending in birth	% Unintended pregnancies ending in abortion	% Unintended pregnancies ending in miscarriage
United States	54	52	36	13
Alabama	55	63	23	14

Estimated from Finer and Kost 2011

- Conclusion
- The U.S. has more unintended pregnancies ending in births than in comparison countries BOTH because of less pregnancy planning AND because of lower abortion rates.
 - Alabama has more unintended pregnancies ending in births than the U.S. overall NOT because of less pregnancy planning, BUT because of lower abortion rates.

Community Level Risks – Race / Ethnicity

- Women who are racial or ethnic minorities in their countries have higher preterm birth rates
- Higher rates are not due to genetic heritage: Black women who were born outside the U.S. are less likely to have a preterm birth than Black women who grew up in the U.S.

Community Level Risks – Race / Ethnicity

- Women born in Mexico had generally lower preterm birth rates than U.S. born women, but PTB rates increase the longer women of Mexican origin have lived in the U.S.

Community Level Risks – Race / Ethnicity

- In Europe, immigrant women of non-European origin have higher preterm birth rates than native-born women. In Canada, native American women have higher preterm birth rates than Canadians of European ancestry.

Community Level Risks - Poverty

- Women living in poverty are more likely to have preterm deliveries than women who do not live in poverty. This has been observed in European countries, in the U.S., and elsewhere in the world.

Income Level	% Preterm Births, U.S.	% Preterm Births, Canada
Lowest third	8.4	5.6
Middle third	8.1	4.7
Upper third	6.4	4.7

data from
Garn et al
2015

International and State Comparisons of Race / Ethnicity and Poverty

Conclusions

- The population of the U.S. includes **more** racial and ethnic minorities than the populations of comparison countries.
- Taking income transfers (welfare payments) into account, a **larger portion** of the U.S. population is below 50% of the nation's median income.
- States with "F" grades on the March of Dimes Preterm Birth Report Card have **more race/ethnic minorities and more adults under the federal poverty level** in their populations.

Policy-Level Risks - Reproductive Health

- Reproductive health policies have an impact on the family-level risks for preterm birth identified here.

– Assisted Reproduction

- Many European countries provide financing for ART and set and enforce guidelines restricting the number of embryos that can be implanted

Policy-Level Risks - Reproductive Health

- The U.S. does not have financing or policies restricting multiple embryo implantation. Practices vary

– Unintended births

- Rates of contraceptive use are higher in European countries compared to the U.S. but abortion rates are about the same

Policy-Level Risks - Reproductive Health

- More contraceptive use lowers the % of unintended births
- Rates of contraceptive use are about the same in Alabama as the U.S. as a whole, but abortion rates are lower
- Higher abortion rates lower the % of unintended births

Policy-Level Risks – Social welfare policies

- Government welfare benefits can modify the impact of poverty on household resource availability
 - Poverty
 - European countries have a similar portion of adults in poverty, but a larger portion of adults receiving government support

Policy-Level Risks – Social welfare policies

- States receiving “A” on the March of Dimes report card have a larger portion of families in poverty receiving cash welfare benefits than states receiving “F”

Conclusion

- Many factors combine to place the U.S. at the bottom of international rankings for preterm birth rates, and place Alabama at the bottom of national rankings

Conclusion

- Interventions that could improve Alabama’s preterm birth rate include:
 - Improving the health status and reducing obesity and tobacco use rates among women of child-bearing age
 - Improving social welfare policies to modify the impact of poverty

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