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Nicotine and Alcohol Use during Pregnancy: Preliminary Results from the Missouri Family Study (MOFAM)

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Abstract

We explored substance use during pregnancy among mothers of offspring with and without excessive drinking fathers. Data from 472 mothers of 1099 offspring were collected in the Missouri Family Study, a population-based family study selected on paternal excessive drinking. Families were stratified by race (African American or Majority), oversampling for African Americans, and designated high risk (HR) if fathers had excessive drinking history and low risk (LR) if no such history. The highest risk group included families of men with ≥ 2 drunk driving citations (RDD). Rates of maternal substance use during pregnancy are reported, examining interactions of family risk type and race. Maj. and A.A. HR and RDD women had higher rates of lifetime smoking, nicotine dependence and any smoking in pregnancy compared with LR women. Among lifetime smokers only, however, group differences on use in pregnancy washed out. Compared to alcohol, there was only a moderate decline in cigarette use in all groups by the 2nd trimester. Maj. HR and RDD and Af. Am HR women also had higher rates of lifetime alcohol dependence. Higher rates of drinking during pregnancy was found in Maj. women compared with Af. Am. Sharp declines in alcohol use were seen by the 2nd trimester, except in Af. Am. HR and RDD women. Our results suggest having a partner with history of excessive drinking is associated in both A.A. and Maj. women with higher prevalence of nicotine and/or alcohol use during pregnancy and higher rates of lifetime nicotine and alcohol dependence. Among lifetime smokers, a significant minority smoked throughout pregnancy.

Sample

Families with 2 or more children (ages 13-30) were ascertained from the community through Missouri birth records (High and Low Risk families) and driving records (Recurrent Drunk Driving families). 472 mothers with 1099 offspring have been interviewed to date, with an oversampling of African Americans.



Family Risk: Paternal Excessive Drinking

- ♦ **Low Risk (LR) Family:** Mothers report no history of paternal excessive drinking
- ♦ **High Risk (HR) Family:** Mothers report a history of paternal excessive drinking: *“Has ‘father’ ever been an excessive drinker, that is someone who drinks too much?”*
- ♦ **Recurrent Drunk Driving (RDD) Family:** Fathers with 2 or more drunk driving citations

Demographics: 472 mothers

CHARACTERISTICS	LOW RISK	HIGH RISK	RECURRENT DRUNK DRIVING	P VALUE
MAJORITY	N=66	N=57	N=94	
AGE (SD)	45.0(4.6)	43.9 (5.1)	40.7(4.6)	<.0001
CURRENTLY MARRIED	84.9%	71.9%	57.4%	<.001
MEAN HOUSEHOLD INCOME x100 (SD)	77.5 (39.1)	63.0 (37.1)	44.0 (31.4)	<.0001
% COMPLETED HIGHSCHOOL/GED	98.5%	94.7%	88.3%	0.04
AFRICAN AMERICAN	N=126	N=86	N=43	
AGE (SD)	42.4 (6.1)	42.4 (5.4)	43.6 (5.2)	NS
CURRENTLY MARRIED	42.1%	31.4%	44.2%	NS
MEAN HOUSEHOLD INCOME x100 (SD)	43.0 (38.3)	31.9 (26.3)	30.9 (23.7)	0.02
% COMPLETED HIGHSCHOOL/GED	88.1%	87.1%	81.4%	NS

Mother Lifetime Smoking History

	LOW RISK	HIGH RISK	RECURRENT DRUNK DRIVING	P VALUE
MAJORITY	N=66	N=57	N=94	
NO LIFETIME SMOKING (<100 cigarettes in lifetime)	75.8%	31.6%	33.0%	
SMOKER, NO DEPENDENCE	12.1%	26.3%	16.0%	
DSM-IV LIFETIME NICOTINE DEPENDENCE	12.1%	42.1%	51.1%	<.0001
AFRICAN AMERICAN	N=126	N=86	N=43	
NO LIFETIME SMOKING (<100 cigarettes in lifetime)	58.7%	51.2%	39.5%	
SMOKER, NO DEPENDENCE	20.6%	22.1%	26.7%	
DSM-IV LIFETIME NICOTINE DEPENDENCE	20.6%	26.7%	34.9%	NS

Higher rates of lifetime smoking and nicotine dependence in Maj. RDD and HR women. Trend toward difference b/t Af. Am. RDD and LR women ($p < .10$)

1099 Offspring Reported

	LOW RISK	HIGH RISK	RECURRENT DRUNK DRIVING	TOTAL
MAJORITY	N=158	N=136	N=209	N=503
AFRICAN AMERICAN	N=310	N=187	N=97	N=594
TOTAL	N=468	N=323	N=306	N=1099

Smoking in Any Pregnancy

	LOW RISK	HIGH RISK	RECURRENT DRUNK DRIVING	P VALUE
MAJORITY	N=158	N=136	N=209	
NO SMOKING	85.4%	62.5%	50.7%	
ANY SMOKING	14.6%	37.5%	49.3%	<.0001
AFRICAN AMERICAN	N=310	N=187	N=97	
NO SMOKING	76.7%	70.0%	58.8%	
ANY SMOKING	23.2%	30.0%	41.2%	<.01

Higher rates of any smoking during pregnancy in HR and RDD women—mirroring lifetime smoking rates

Smoking in Pregnancy among Lifetime Smokers

	LOW RISK	HIGH RISK	RECURRENT DRUNK DRIVING	P VALUE
MAJORITY	N=38	N=95	N=137	
NO SMOKING IN PREGNANCY	39.5%	46.3%	24.8%	
SMOKING IN 1 ST TRIMESTER ONLY	13.2%	17.9%	24.1%	
SMOKING BEYOND 1 ST TRIMESTER	47.4%	35.8%	51.1%	0.01
AFRICAN AMERICAN	N=125	N=90	N=61	
NO SMOKING IN PREGNANCY	42.4%	37.8%	31.2%	
SMOKING IN 1 ST TRIMESTER ONLY	20.0%	18.9%	31.2%	
SMOKING BEYOND 1 ST TRIMESTER	37.6%	43.3%	37.7%	NS

Differences wash out when looking at lifetime smokers only—particularly for Af. Am women. However, note that between 36-51% of pregnancies to lifetime smokers are exposed to nicotine beyond the 1st trimester.

Typical Daily Smoking among Smokers in 1st Trimester

	LOW RISK	HIGH RISK	RECURRENT DRUNK DRIVING	P VALUE
MAJORITY	N=23	N=50	N=103	
LESS THAN ½ PPD	39.1%	42.0%	25.2%	
BETWEEN ½ PPD AND 1 PPD	39.1%	36.0%	48.5%	
MORE THAN 1 PPD	21.7%	22.0%	26.2%	NS
AFRICAN AMERICAN	N=69	N=55	N=39	
LESS THAN ½ PPD	85.5%	74.6%	61.5%	
MORE THAN ½ PPD	14.5%	25.4%	38.4%	0.02

Af. Am women are smoking fewer cigarettes in pregnancy than Majority.
 Af. Am RDD are smoking greater numbers than Af. Am. LR women.

Typical Daily Smoking among Smokers in 2nd Trimester

	LOW RISK	HIGH RISK	RECURRENT DRUNK DRIVING	P VALUE
MAJORITY (% of 1 st trimester smokers)	N=18 (78%)	N=34 (68%)	N=67 (65%)	
LESS THAN ½ PPD	44.4%	41.2%	32.8%	
BETWEEN ½ PPD AND 1 PPD	27.8%	35.3%	40.3%	
MORE THAN 1 PPD	27.8%	23.5%	26.9%	NS
AFRICAN AMERICAN (% of 1 st trimester smokers)	N=45 (65%)	N=37 (67%)	N=21 (54%)	
LESS THAN ½ PPD	82.2%	75.7%	47.6%	
MORE THAN ½ PPD	17.8%	24.3%	52.4%	0.01

Around 2/3 of those smoking in the 1st trimester continue smoking in the 2nd trimester. Af. Am. RDD women are smoking greater number of cigarettes than HR or LR.

Typical Daily Smoking among Smokers in 3rd Trimester

	LOW RISK	HIGH RISK	RECURRENT DRUNK DRIVING	P VALUE
MAJORITY	N=18	N=33	N=65	
LESS THAN ½ PPD	44.4%	39.4%	30.8%	
BETWEEN ½ PPD AND 1 PPD	27.8%	36.4%	41.5%	
MORE THAN 1 PPD	27.8%	24.2%	27.7%	NS
AFRICAN AMERICAN	N=41	N=36	N=19	
LESS THAN ½ PPD	80.5%	75.0%	42.1%	
MORE THAN ½ PPD	19.5%	25.0%	57.9%	<.01

There is very little change in number of smokers or daily cigarettes between the 2nd and 3rd trimester.

Mother Lifetime Drinking Patterns

	LOW RISK	HIGH RISK	RECURRENT DRUNK DRIVING	P VALUE
MAJORITY	N=66	N=57	N=94	
NO LIFETIME DRINKING	4.6%	0.0%	3.2%	
DRINKER, NO DEPENDENCE	90.9%	80.7%	78.7%	
DSM-IV LIFETIME ALCOHOL DEPENDENCE	4.6%	19.3%	18.1%	0.05
AFRICAN AMERICAN	N=126	N=86	N=43	
NO LIFETIME DRINKING	15.8%	11.8%	13.1%	
DRINKER, NO DEPENDENCE	76.4%	73.8%	77.8%	
DSM-IV LIFETIME ALCOHOL DEPENDENCE	7.7%	14.4%	9.1%	NS

Higher rates of Dependence in Maj. RDD and HR and Af. Am. HR women.

Drinking in Pregnancy Redefined

Because any drinking during pregnancy was so prevalent in all three Majority family risk groups, we limited our definition of “drinking in pregnancy” to include all women who reported drinking:

> 2 drinks on any occasion

or drinking > 2 times during 1st trimester

or any drinking in 2nd or 3rd trimester

A Closer Look at Our Definition of Drinking in Pregnancy

	LOW RISK	HIGH RISK	RECURRENT DRUNK DRIVING	P VALUE
MAJORITY (N=ANY DRINKING IN PREGNANCY)	N=67	N=58	N=58	
DRINKING <3 DRINKS/OCCASION ON <3 OCCASIONS AND NO DRINKING IN 2 ND OR 3 RD TRIMESTER	61.2%	43.1%	36.2%	
DRINKING ABOVE THRESHOLD	38.8%	56.9%	63.8%	0.01
AFRICAN AMERICAN	N=52	N=38	N=21	
DRINKING <3 DRINKS/OCCASION ON <3 OCCASIONS AND NO DRINKING IN 2 ND OR 3 RD TRIMESTER	61.5%	29.0%	14.3%	
DRINKING ABOVE THRESHOLD	38.5%	71.0%	85.7%	<.001

The majority of LR women drinking in pregnancy are drinking fewer than 4 total drinks over 2 occasions during the 1st trimester only. Meeting this low threshold was considered exclusion criteria for “drinking in pregnancy.”

Drinking in Pregnancy among Lifetime Drinkers

	LOW RISK	HIGH RISK	RECURRENT DRUNK DRIVING	P VALUE
MAJORITY	N=151	N=136	N=202	
NO DRINKING IN PREGNANCY (Includes no drinking and very low threshold drinking as defined in previous slide)	81.5%	75.7%	81.7%	
DRINKING DURING 1ST TRIMESTER ONLY	7.3%	16.2%	11.9%	
DRINKING BEYOND 1ST TRIMESTER	11.3%	11.9%	6.4%	NS
AFRICAN AMERICAN	N=261	N=165	N=86	
NO DRINKING IN PREGNANCY	92.3%	83.6%	79.1%	
DRINKING DURING 1ST TRIMESTER ONLY	4.6%	3.0%	9.3%	
DRINKING BEYOND 1ST TRIMESTER	3.1%	13.3%	11.6%	<.001

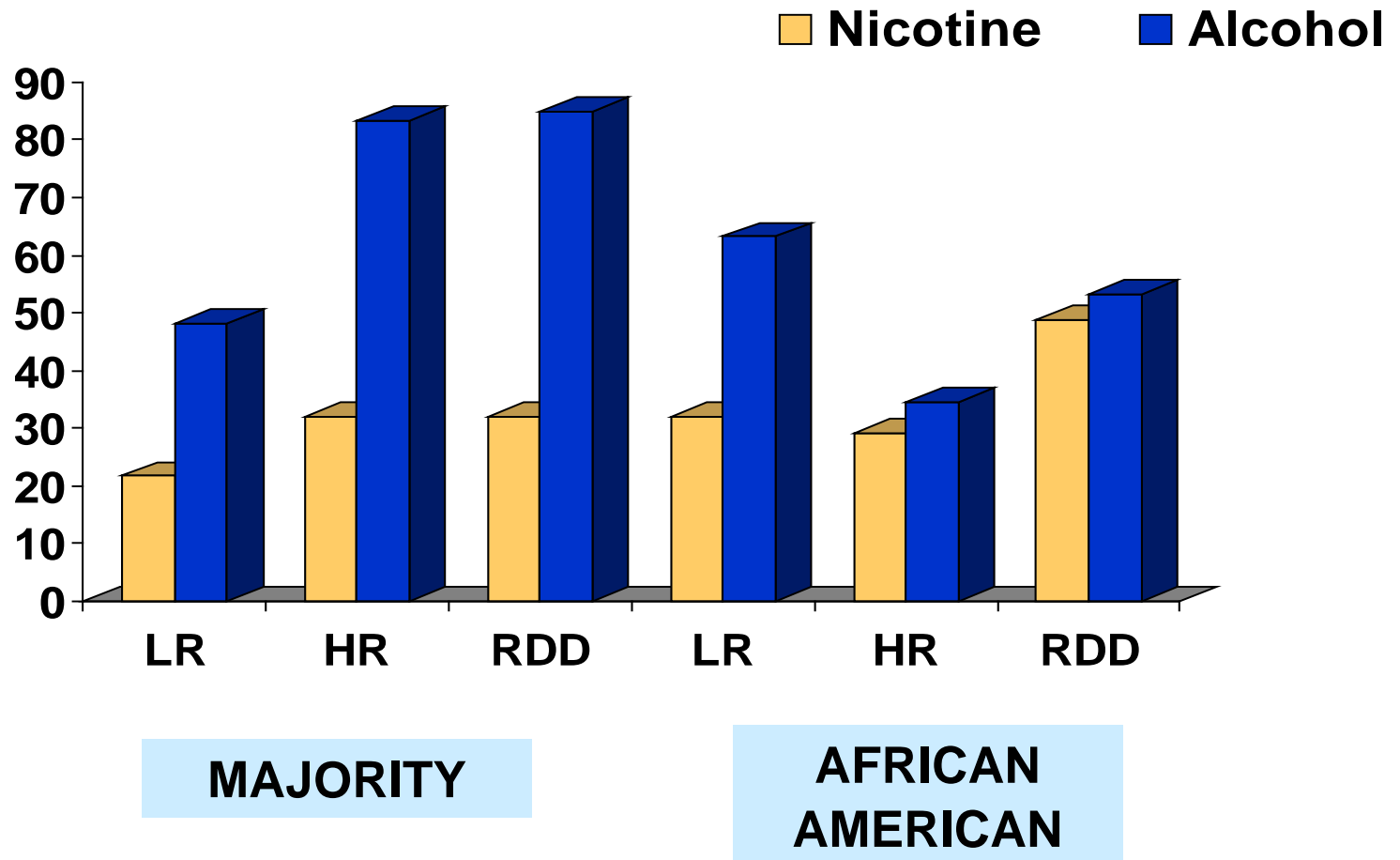
Much lower rates of drinking during pregnancy among lifetime drinkers are seen compared with smoking during pregnancy among lifetime smokers.

Quantity/Frequency of Drinking in Drinkers during 1st Trimester

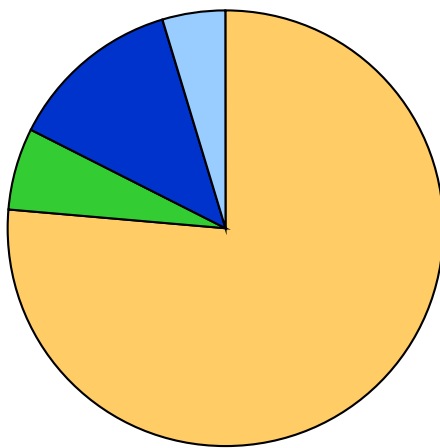
	LOW RISK	HIGH RISK	RECURRENT DRUNK DRIVING	P VALUE
MAJORITY	N=27	N=30	N=33	
LESS THAN 3 DRINKS/OCCASION AND LESS THAN 9 OCCASIONS	29.6%	36.7%	21.2%	
MORE THAN 3 DRINKS/OCCASION OR THAN 9 OCCASIONS	70.4%	63.3%	78.8%	NS
AFRICAN AMERICAN	N=19	N=26	N=15	
LESS THAN 3 DRINKS/OCCASION AND LESS THAN 9 OCCASIONS	26.3%	50.0%	40.0%	
MORE THAN 3 DRINKS/OCCASION OR THAN 9 OCCASIONS	73.7%	50.0%	60.0%	NS

Among those drinking during pregnancy, the majority are drinking at high amounts: either >2 drinks/occasion or drinking more than 8 occasions during the 1st trimester. Rates of drinking decline sharply after 1st trimester.

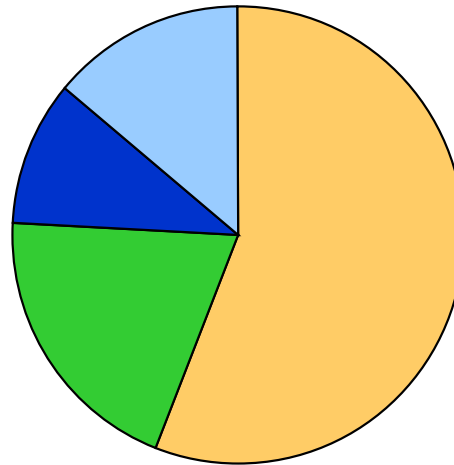
Rates of Quitting Substance Use by the 2nd Trimester Compared



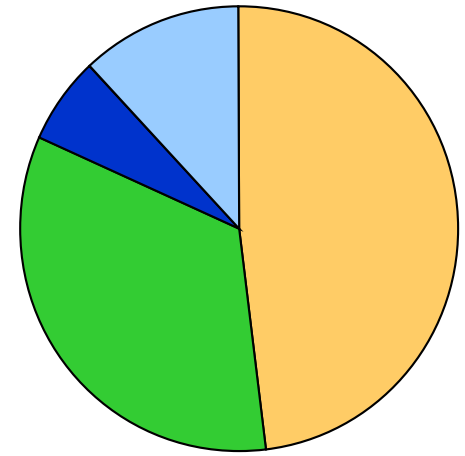
Snapshot at Exposure in Pregnancy: Majority



LOW RISK



HIGH RISK

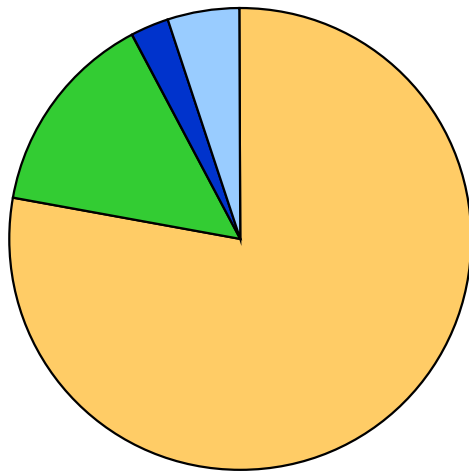


**RECURRENT
DRUNK DRIVING**

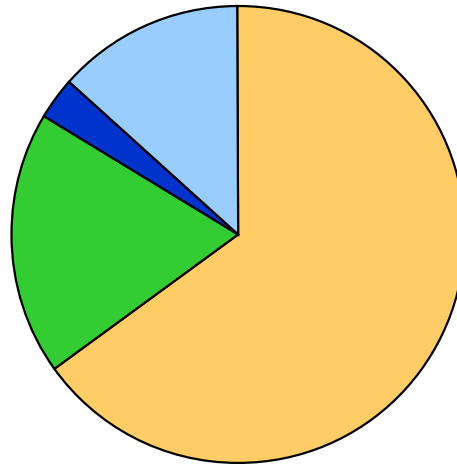


$p < .0001$

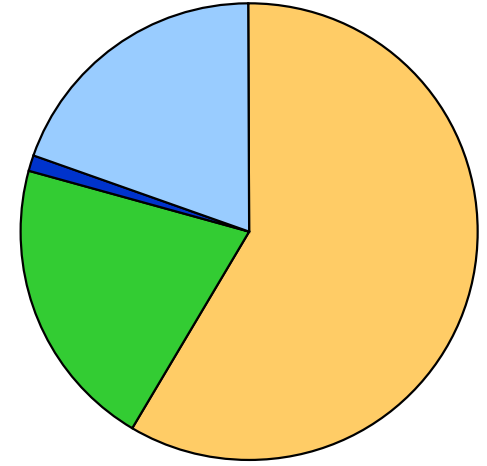
Snapshot at Exposure in Pregnancy: African American



LOW RISK



HIGH RISK



RECURRENT DRUNK DRIVING



$p < .001$

Findings

Having a partner with excessive drinking was associated with:

1. higher rates of lifetime nicotine and alcohol dependence in Majority women
2. higher prevalence of nicotine and/or alcohol use in pregnancy

African American smokers consumed fewer cigarettes in pregnancy than Majority smokers

Rates of quitting smoking by the second trimester were lower than quitting alcohol

Limitations

- ◆ Recall bias: pregnancy data is based on retrospective reporting
- ◆ Group “Recurrent Drunk Driving” may not be clinically distinct from “High Risk” families, particularly for African Americans
- ◆ Error in family risk group designation: based on a one-question screening measure
- ◆ Reporting bias by substance: affected by stigma of use in pregnancy
- ◆ Lower level statistics applied