Risk of Premature Birth due to Mom Smoking
at any Point during a Pregnancy: 2018 Births

Introduction

Smoking was noted as a risk factor for premature births more than 60 years ago.[1] A premature birth, an infant born less than 37 completed weeks of gestation, has been identified as the leading cause of infant death in Cuyahoga County for at least the last 25 years.[2] This data brief reports on analyses conducted to assess the risk women having a premature birth based on if women smoke at any point during her pregnancy. The birth data analyzed were women living in Cuyahoga County at the time of delivery in 2018.[3]

Results

In 2018, 8.0% of pregnant women reported smoking during their pregnancy. Cuyahoga County pregnant women who reported smoking were more likely to have a preterm birth or very preterm birth. **Table 1** shows that women who reported smoking during pregnancy were 70% more likely to have a preterm birth (19.20%) than women who did not report smoking during pregnancy (11.29%). Women who reported smoking during pregnancy were more than twice as likely to have a very preterm birth, birth less than 32 completed weeks of gestation, compared to those who did not report smoking during pregnancy (**Table 2**).

Table 1.

Risk of a preterm birth based on mothers smoking status during pregnancy (n =13,842).

	Preterm Births	Full term Births	Preterm Birth Percentage by Smoking Status	Relative Risk Ratio	95% Confidence Interval	Significance Level
Smoking	212	892	19.20%	1.70	(1.49 , 1.94)	p < 0.0001
No Smoking	1,438	11,300	11.29%			

Table 2.

Risk of a very preterm birth based on mothers smoking status during pregnancy (n = 12,518).

	Very Preterm Births	Full term Births	Very Preterm Birth Percentage by Smoking Status	Relative Risk Ratio	95% Confidence Interval	Significance Level
Smoking	49	892	5.21%	2.18	(1.62 , 2.93)	p < 0.0001
No Smoking	277	11,300	2.39%			

Due to the large disparity in women's smoking status and the rate of very preterm births, further analyses were done to see if ethnicity or racial differences exist and if smoking was a risk factor for very preterm births among all ethnic and racial groups (**Tables 3-5**). Black non-Hispanic and white non-Hispanic pregnant women whom reported smoking during the pregnancy were more than twice as likely to have a very preterm birth compared to those who did not report smoking during their pregnancy. Hispanic mothers who reported smoking were 57% more likely to have a very preterm birth; however this data was not statistically significant.

Table 3.

Risk of a very preterm birth among black non-Hispanic mothers based on smoking status during pregnancy.

	Very Preterm Births	Full term Births	Very Preterm Birth Percentage by Smoking Status	Relative Risk Ratio	95% Confidence Interval	Significance Level
Smoking	28	323	7.98%	2.16	(1.47 , 3.18)	p = 0.0001
No Smoking	158	4,115	3.70%			

Table 4.

Risk of a very preterm birth among white non-Hispanic mothers based on smoking status during pregnancy.

	Very Preterm Births	Full term Births	Very Preterm Birth Percentage by Smoking Status	Relative Risk Ratio	95% Confidence Interval	Significance Level
Smoking	19	516	3.55%	2.37	(1.45 , 3.86)	p = 0.0005
No Smoking	87	5,719	1.50%			

Table 5.

Risk of a very preterm birth among Hispanic mothers based on smoking status during pregnancy.

	Very Preterm Births	Full term Births	Very Preterm Birth Percentage by Smoking Status	Relative Risk Ratio	95% Confidence Interval	Significance Level
Smoking	2	48	4.00%	1.57	(0.38 , 6.50)	p = 0.53
No Smoking	22	843	2.54%			

There is a historical black-white inequity of preterm births. In 2018, the black non-Hispanic very preterm birth rate for women *whom did not report smoking* was higher than the white non-Hispanic very preterm birth rate for women *whom did report smoking*. While smoking is a major risk factor for prematurity, the impact of racism appears to play a larger role.[4,5]

Discussion

Cuyahoga County 2018 birth data strongly suggest that women whom report smoking during their pregnancy are much more likely to have a premature birth, regardless of ethnicity or race. All groups, except Hispanic ethnicity, were statistically significantly more likely to have a very premature birth if mom reported smoking during the pregnancy. Public health and healthcare practitioners should provide resources necessary to help women stop smoking, especially during the pregnancy to decrease preterm births.

There are a few limitations to discuss about this data brief. Smoking during pregnancy is a self-reported data point, research suggests that mothers under-report smoking.[6] The results reported in this data brief are likely an underestimate of the true risk of smoking during pregnancy and having a premature birth. Second, the use of ethnicity and/or race for public health surveillance has long been scrutinized.[7] The classifying categorizations applied are imperfect, but are the best available and consistent with public health surveillance data used for these data. Lastly, any gestational age calculation is an estimate. While the obstetric estimate method has improved the validity of the data, the data should be used with caution.

References *(in order of appearance)*

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