A Comparison of Smoking During Pregnancy Prevalence from Natality Records, the Pregnancy Risk Assessment Monitoring Program, and the Behavioral Risk Factor Surveillance System

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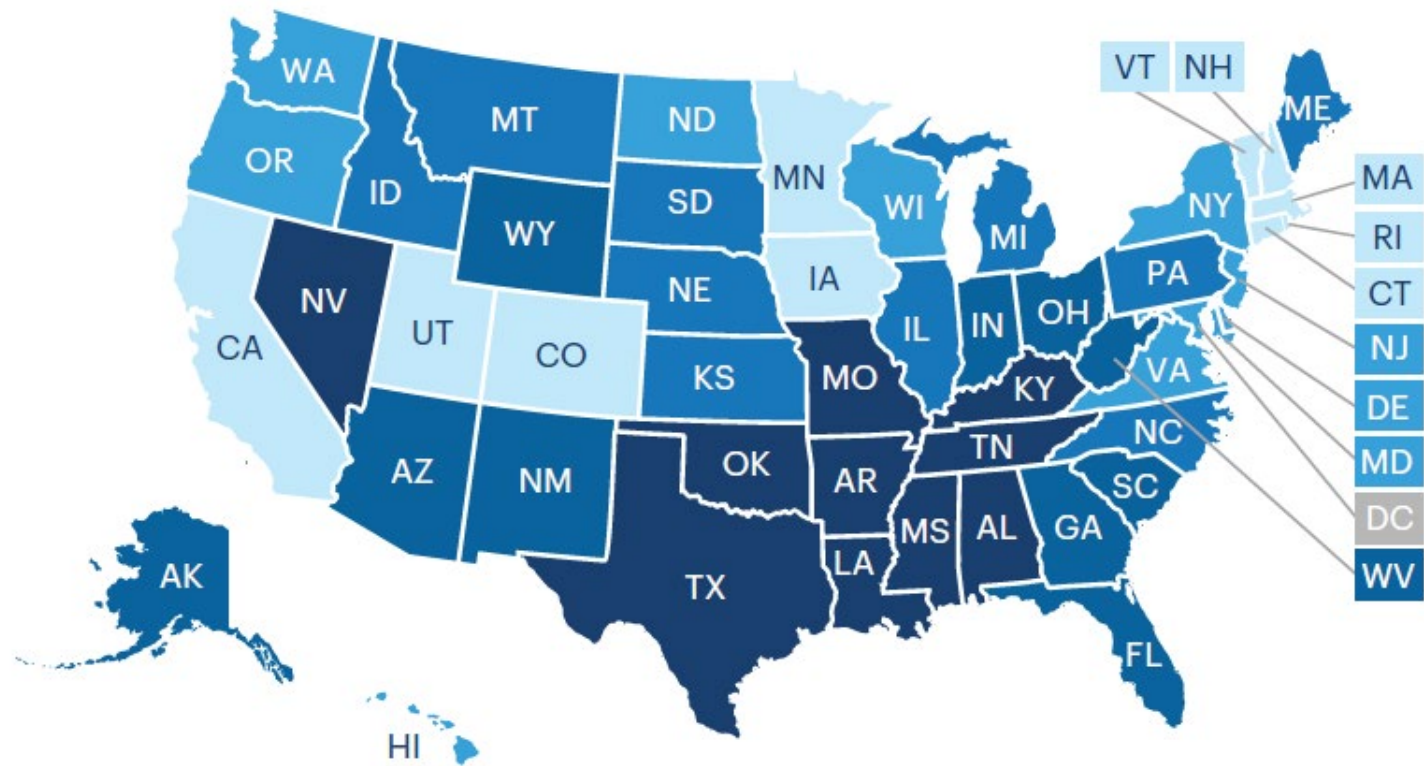
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Background

America's Health Rankings Health of Women and Children Report

2018 Health of Women and Children Report

Behaviors

Community & Environment

Policy

Clinical Care

= Health Outcomes

2018 Health of Women and Children State Rankings

RANK: 1 to 10 | 11 to 20 | 21 to 30 | 31 to 40 | 41 to 50 | Not Ranked

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How We Measure Infant Health

Behaviors

- Alcohol Consumption During Pregnancy
- Breastfed
- Sleep Position
- Tobacco Use During Pregnancy

Community & Environment

- Household Smoke
- Infant Child Care Cost

Policy

- Baby Friendly Facility
- mPINC

Clinical Care

- Low-Risk Cesarean Delivery
- Prenatal Care Before 3rd Trimester
- Well-Baby Check

Health Outcomes

- Infant Mortality
- Low Birthweight
- Neonatal Mortality
- Preterm Birth

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Smoking During Pregnancy

- Smoking during pregnancy is linked to poor natality outcomes including preterm birth, low birthweight, miscarriage, ectopic pregnancy and increased risk of sudden unexpected infant death

- Birth certificate data is often used to determine prevalence of smoking during pregnancy, but estimates are not available in all 50 states

Objective

The purpose of this study was to compare state-level smoking during pregnancy prevalence estimates from CDC Wonder natality records, Pregnancy Risk Assessment Monitoring Program (PRAMS), and Behavioral Risk Factor Surveillance System (BRFSS)

Methodology

Methodology

- Smoking during pregnancy prevalence estimates were calculated by state from the 3 data sources

- Two-sample t-tests were used to evaluate differences in the prevalence estimates between data sources

Birth Certificates

- 2015 natality records

- Restricted to mothers aged 18-44

- Estimates were suppressed if the percentage of missing responses exceeded 15%

- Estimates were available for the US, DC, and 47 states, but were not available for Connecticut, Hawaii, and New Jersey
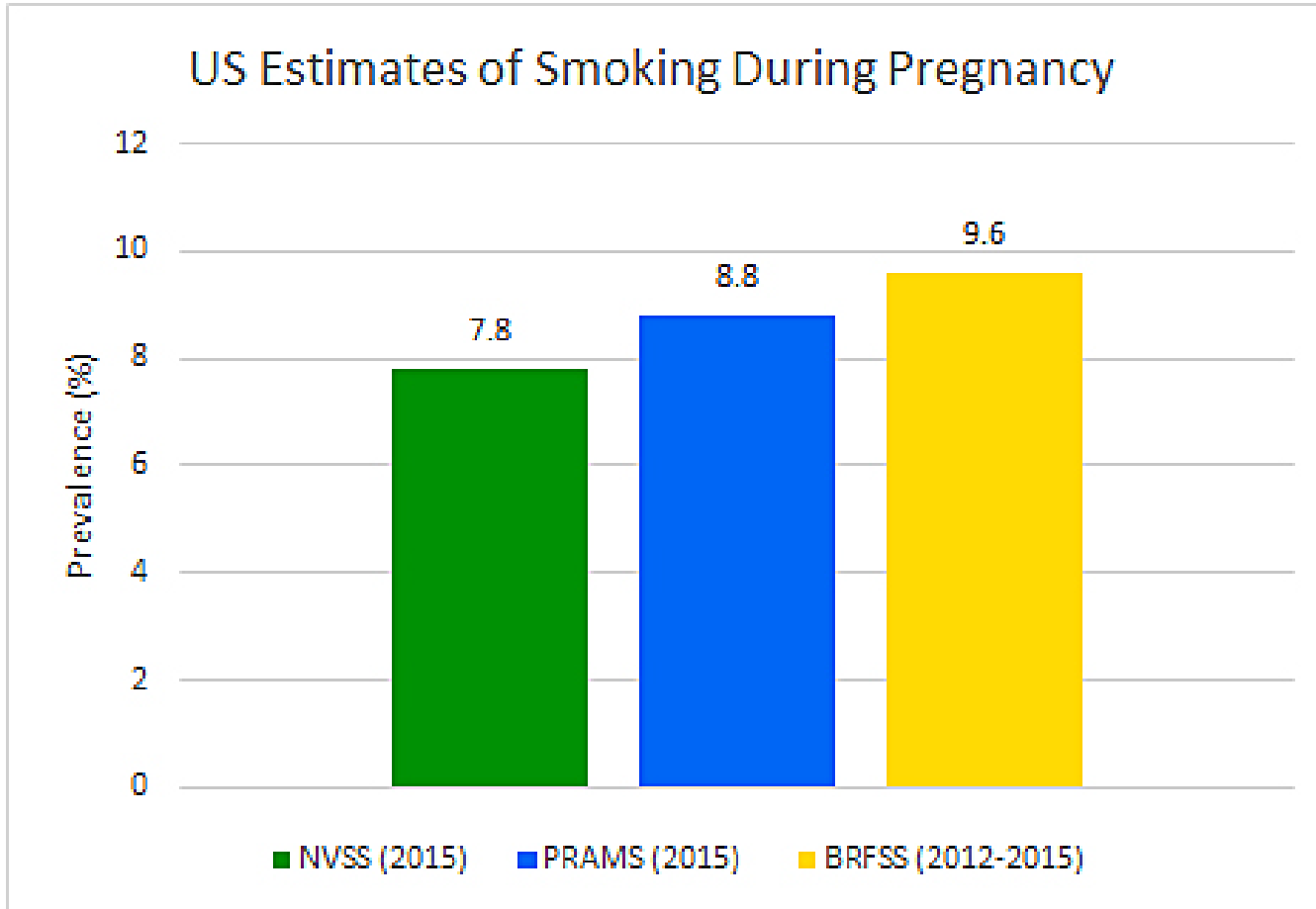
PRAMS

- Used 2015 survey data
- Surveys women with recent live birth
- Not all states participate in PRAMS
- PRAMS estimates were suppressed if the response rate was below 55%
- PRAMS estimates were available for 32 states, including Connecticut, Hawaii and New Jersey

BRFSS

- Used 2012-2015 data
  - Multiple years of BRFSS data were used to increase sample size
- Restricted to pregnant women aged 18-44
- Estimates suppressed if the sample size was below 50 or the relative standard error was greater than 30%
- Estimates were available for 27 states from 2012-2015 BRFSS

Results

National Prevalence Estimates

US Estimates of Smoking During Pregnancy

NVSS and PRAMS estimates differed by 1 percentage point

BRFSS estimate was 0.8 and 1.8 percentage points higher then PRAMS and NVSS estimates, respectively

State-level Prevalence Estimates

State	NVSS	PRAMS	BRFSS
AK	12.5	11.4	*
AL	10.4	11.0	15.2
AR	14.6	15.8	24.7
AZ	5.3	NA	*
CA	1.7	NA	*
CO	6.4	5.9	13.8
CT	NA	4.5	*
DE	10.0	9.0	*
FL	5.8	*	*
GA	5.7	*	*
HI	*	4.9	*
IA	13.7	14.2	*
ID	9.6	NA	13.7
IL	6.6	7.8	*
IN	14.3	NA	17.1
KS	11.0	NA	11.9
KY	19.5	NA	13.2
LA	6.9	11.6	*
MA	5.7	5.2	8.0
MD	6.5	5.9	*
ME	15.6	*	19.5
MI	12.3	13.3	15.6
MN	9.4	*	11.8
MO	15.9	15.1	15.9
MS	10.2	*	17.3

State	NVSS	PRAMS	BRFSS
MT	15.9	NA	13.5
NC	9.4	*	14.2
ND	14.4	NA	13.8
NE	10.1	10.3	9.8
NH	12.5	8.6	*
NJ	NA	4.4	*
NM	6.6	7.1	*
NV	4.8	NA	*
NY	5.0	6.8	*
OH	15.2	14.6	20.7
OK	12.2	13.7	12.0
OR	9.9	8.7	*
PA	12.5	10.8	20.4
RI	7.5	*	*
SC	9.8	*	16.3
SD	14.0	NA	19.2
TN	14.3	16.0	*
TX	3.6	5.1	*
UT	3.5	4.0	*
VA	6.8	6.2	6.5
VT	16.6	16.0	18.7
WA	7.2	7.0	10.2
WI	12.0	9.7	13.7
WV	25.2	25.2	18.9
WY	15.2	13.5	*

Legend:
- 1.7% ≤ 6.6%
- 6.7% ≤ 10.0%
- 10.1% ≤ 13.3%
- 13.4 ≤ 15.6%
- ≥ 15.7%

*Data was suppressed
NA=Not available

NVSS vs. PRAMS

- The state natality and PRAMS estimates were not statistically different

- Of the 28 states that had 2015 estimates from both sources, the difference in estimates ranged from no difference in West Virginia (25.2%) to a 4.7 percentage point difference in Louisiana (6.9% natality file vs. 11.6% PRAMS)

- Half of states differed by 1 percentage point or less

BRFSS Estimates Differed

The 2012-2015 BRFSS state estimates significantly differed from both the natality and PRAMS estimates (t-tests, p=0.0001)

Conclusion

Conclusion

- Smoking during pregnancy prevalence estimates are similar between 2015 natality files and PRAMS

- Connecticut, Hawaii, and New Jersey could use PRAMS estimates and states not participating in PRAMS or with low response rates could use natality estimates

- BRFSS may not be a reliable source for calculating smoking prevalence estimates during pregnancy

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Limitations

- Smoking during pregnancy prevalence estimates likely underestimate the true prevalence

- Different data sources ascertain smoking during pregnancy at different times from mother (during pregnancy, immediately after birth, and several months after birth)

- Timing of the questionnaire and reporting bias and sample bias may also play a large part in the differences between BRFSS and the other two data sources

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Questions?

Thank You.