

Is the Behavioral Risk Factor Surveillance System a good source of estimates of behaviors during pregnancy?

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Background

- Maternal smoking is linked to preterm birth, low birthweight, miscarriage, ectopic pregnancy, and increased risk of sudden unexpected infant death.
- Population data is collected on birth certificates (CDC Wonder natality file) and CDC's Pregnancy Risk Assessment Monitoring Program (PRAMS) samples mothers, but neither have smoking data for all states.
- Objective: to determine if smoking during pregnancy estimates from BRFSS are similar to estimates from the natality file and PRAMS.

Methods

- US and state estimates of smoking prevalence during pregnancy were calculated from:
 - 2015 natality records (NVSS) - mothers aged 18-44, suppressed if missing responses >15%
 - 2015 PRAMS - women with recent live birth, suppressed if response rate was <55%
 - 2012-2015 BRFSS - pregnant women aged 18-44, suppressed if sample size was <50 or relative standard error >30%
- Two-sample t-tests were used to evaluate differences in the estimates between sources.

Results

- The 2015 national estimates differed by 1% and the 2012-2015 BRFSS estimate was 0.8% and 1.8% higher at 9.6% of pregnant women.

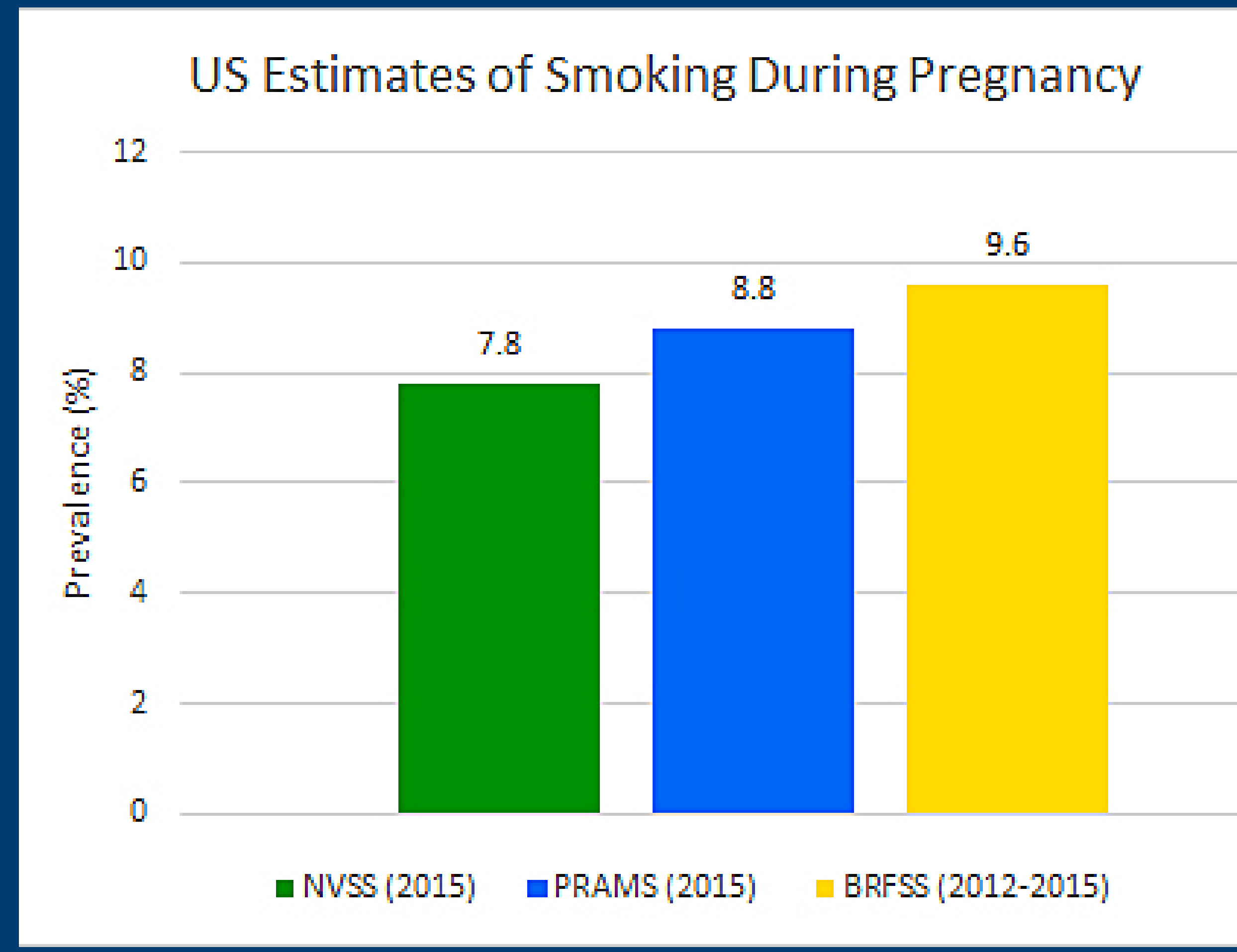


Figure 1 (left): National estimates of smoking during pregnancy by data source

Figure 2 (right): Estimates of smoking during pregnancy by state and source

*=suppressed
NA=Not available

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

- Estimates were available for 27 states from 2012-2015 BRFSS, most states with the exception of Connecticut and New Jersey (not reported) and Hawaii (suppressed) from the natality file, and 32 states, including Connecticut, Hawaii and New Jersey from PRAMS.
- The 2012-2015 BRFSS state estimates significantly differed from both the natality and PRAMS estimates (t-tests, p=0.0001).
- State natality and PRAMS estimates were not statistically different
- Compared with natality records, BRFSS estimates:
 - Differed by 1% or less in 6 states
 - Were more than 1% higher in 18 states; and more than 5% higher in Arkansas, Colorado, Mississippi, Ohio, Pennsylvania, South Carolina, and South Dakota
 - Were more than 2% less in 3 states: Kentucky, Montana, and West Virginia

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
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	*

Conclusions

- BRFSS estimates were only available for 27 states and they differed from the natality and PRAMS estimates
- Including 2012-2014 data along with 2015 from BRFSS may have increased the estimated values as smoking prevalence decreased between 2012-2015.
- 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. BRFSS respondents are pregnant at the time of the questionnaire, whereas natality data is asked of all mothers in the hospital around the time of delivery, and PRAMS is retrospective and samples respondents 2-4 months after a live birth.
- Due to the differences in estimates between BRFSS and NVSS and PRAMS, as well as the low number of pregnant women sampled and the number of years needed to get a sufficient sample size, BRFSS is not a strong source for calculating smoking prevalence estimates during pregnancy for all states.