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PREVENTION OPPORTUNITIES UNDER THE BIG SKY

Exposure to Secondhand Smoke: Montana youth are at risk of exposure

Exposure to secondhand smoke (SHS) causes disease and premature death among nonsmoking adults and children. In the United States, exposure to SHS decreased approximately 70% from the late 1980s through 2002.[1] This decrease is largely due to laws which prohibit smoking in indoor work places and public places enacted by many states and municipalities, including the Montana Clean Indoor Air Act. Additionally, the decrease in SHS exposure can be attributed to the decreased prevalence of cigarette smoking and the increased percentage of households with no-smoking rules during this same time period.[1]

However, this decrease in exposure to SHS is not uniform throughout our population. Children are still exposed to SHS in private homes and vehicles.[1] Children are particularly vulnerable to tobacco smoke because their lungs continue to develop throughout childhood. According to the 2006 Surgeon General's report on involuntary exposure to tobacco smoke, children exposed to SHS are at an increased risk for Sudden Infant Death Syndrome (SIDS), acute respiratory infections, ear problems, and more severe asthma.[2] In addition, smoking by parents causes respiratory symptoms (cough, phlegm, wheeze, and breathlessness) and slows lung growth for children.[2] Finally, exposure to smoking and SHS may increase the likelihood of a child later becoming a smoker.[3]

This report examines trends in exposure to SHS in a room and in vehicles among Montana students using data from the 2004 and 2008 Prevention Needs Assessment Survey.[4]

The Prevention Needs Assessment Survey (PNA) is conducted in Montana schools every other year by the Montana Department of Public Health and Human Services. This report presents analysis of 17,553 students who completed form A of the PNA survey in 2004 and 2008, combined.[4] Students were considered current smokers if they reported smoking on any of the 30 days before the survey. The survey asked students, "During the past 30 days, have you been with somebody who was smoking?" Students that reported, "Yes, I was in the same room" or "Yes, I was in a car", were considered exposed to SHS.

Table. Reported exposure to secondhand smoke in a room or in a vehicle in the past 30 days by students, Prevention Needs Assessment (2004 and 2008, combined).

Characteristic	*Room* *% Exposed(95% CI)*	*Vehicle* *% Exposed (95% CI)*
Total	46 (45- 47)	33 (33- 34)
Year		
2004	48 (47- 50) [a]	34 (33- 35)
2008	43 (42- 45)	33 (32- 34)
Gender		
Boys	45 (44- 46)	31 (30- 32) [a]
Girls	47 (46- 48)	35 (34- 36)
Race		
White	45 (45- 45)	32 (32- 33)
American Indian	55 (53- 58) [b]	44 (41- 46) [b]
Other	47 (44- 50)	35 (32- 38)
Smoking Status		
Current smoker	78 (77- 80) [a]	64 (62- 66) [a]
Non-smoker	40 (39- 40)	27 (27- 28)
Live with		
Smoker(s)	71 (69- 72) [a]	54 (53- 56) [a]
Non-smoker(s)	34 (34- 35)	24 (23- 24)

[a] Indicates significant difference ($p < 0.05$) within category
[b] Indicates significant difference ($p < 0.05$) compared to White

Exposure to Secondhand Smoke in a Room and in Vehicles. Exposure to SHS in a room decreased significantly from 49% in 2004 to 43% in 2008. Meanwhile, the percentage of students who reported exposure to SHS in vehicles did not significantly change during this period. Using the combined 2004 and 2008 data, students who ***were smokers or lived with smokers*** reported being exposed to SHS in a room and in vehicles more than those students who did not have these characteristics (Table).

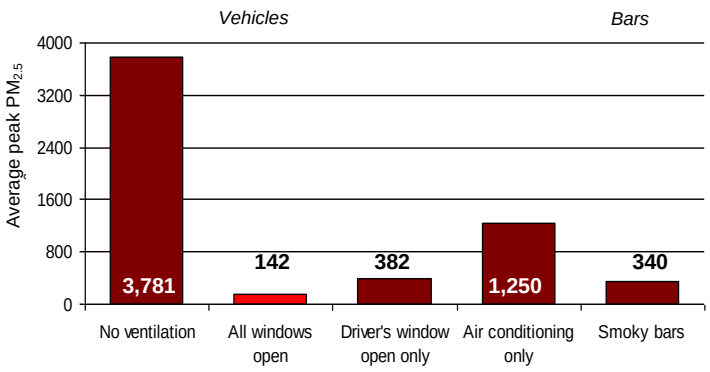
American Indians reported a higher prevalence of exposure to SHS in a room or in a vehicle than did whites. However, both race and gender were significantly correlated ($p < 0.01$) with students' smoking status and the smoking status of persons with whom they lived. Therefore, neither of these characteristics alone should be interpreted as a predictor of SHS exposure.

Tobacco Smoke Pollution in Vehicles. Tobacco smoke pollution is measured as particulate matter ($PM_{2.5}$), which are particles in the air measuring 2.5 micrometers or less in diameter. These particles are readily inhaled

into the lungs. The National Ambient Air Quality standards, established by the Environmental Protection Agency to protect the public's health, limits $PM_{2.5}$ exposure to an average 15 µg/m^3 over the course of a year and to 35 µg/m^3 in any 24 hour period.[5]

One study of tobacco smoke pollution in vehicles documented levels of pollution from tobacco smoke from 3,781 µg/m^3 to 142 µg/m^3 under a variety of ventilation conditions in vehicles.[6] These values are markedly above the EPA's 24-hour exposure limit (Figure). Also, nearly all $PM_{2.5}$ levels in vehicles were higher than the average $PM_{2.5}$ of bars which allow smoking (Figure).[6]

Figure. Average levels of particulate matter ($PM_{2.5}$) in vehicles while smoking occurred under four ventilation conditions and the average $PM_{2.5}$ level of bars which allow smoking.[6]



Recommendations to eliminate exposure to tobacco smoke among youth

The Montana Clean Indoor Air Act may increase the number of Montana smokers who quit. This law may also: (a) reduce youth SHS exposure in public places and may reduce their exposure at home or in vehicles and (b) reduce youth initiation of tobacco use.

Health care providers and advocates for children should strongly encourage parents and guardians of minors (under 18 years of age) to adopt no-smoking rules at home and in their vehicles.

For more information about the Montana Tobacco Use Prevention Program, contact Laura L. Biazzo, MPH, Epidemiologist/ Program Evaluator at (406) 444-0064 or lbiazzo@mt.gov or visit http://tobaccofree.mt.gov

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