

**PREVALENCE IN MICHIGAN OF CIGARETTE SMOKING, COPD AND ASTHMA BY OCCUPATION AND INDUSTRY**

The Michigan Behavioral Risk Factor Surveillance System (MiBRFSS) is an annual, state-level telephone survey of Michigan residents, aged 18 years and older funded by the CDC. All 50 states have similar surveys. This survey provides state-specific, population-based estimates of the prevalence of various behaviors, medical conditions, and preventive health care practices among Michigan adults ([http://www.michigan.gov/mdhhs/0,5885,7-339-71550\\_5104\\_5279\\_39424---00.html](http://www.michigan.gov/mdhhs/0,5885,7-339-71550_5104_5279_39424---00.html)). Estimates based on an iterative proportional fitting methodology are weighted to adjust for the probabilities of selection and a raking adjustment factor to adjust for the distribution of the Michigan adult population by telephone source (landline or cell phone), detailed race/ethnicity, education level, marital status, age by gender, gender by race/ethnicity, age by race/ethnicity, and renter/owner status. The results of the sample are presented as weighted percentages with 95% confidence limits. Limitations of this data are that they are self-reported responses; there is no review of medical records to check the validity of the responses; and whether the results are representative for the whole population, given a 50% response rate. Despite these limitations the data is widely used to measure the prevalence of different diseases and behaviors.

**New NIH Award to Investigate the Etiology of Hypersensitivity Pneumonitis**

As clinicians know, Hypersensitivity Pneumonitis (HP) can be difficult to diagnose, particularly since there are limited ways to identify the causal antigen. Consequently, medical management is often difficult since effective treatment requires removing the patient from exposure. Commercially available HP precipitating antibody panels have limited utility due to their lack of sensitivity and specificity. Melissa Millerick-May, PhD, an environmental exposure scientist at MSU, recently received a major NIH award to investigate a novel approach to identify causal antigens for patients with HP. With this award, Dr. Millerick-May and her team will conduct comprehensive exposure assessments and collect potentially relevant environmental samples at the homes and workplaces of HP patients in Michigan. Immunoassays will be performed to determine whether the environmental samples collected contain antigens to which the patient has an immunogenic response. For patients with HP who consent to participate in this research study, 15 mL of blood will be collected for use in initial immunoassays.

*SEE page 3 for additional details on this project.*

Table 1. Industry Category* for Current Cigarette Smokers	Weighted %	95% Conf. Limit
Agriculture, Forestry, Fishing & Hunting, & Mining	19.9	(13.7-27.9)
Construction	36.3	(31.8-41.1)
Manufacturing	25.6	(23.3-28.1)
Wholesale Trade	21.3	(15.2-29.0)
Retail Trade	24.5	(21.5-27.9)
Transportation and Warehousing, & Utilities	23.9	(19.9-28.4)
Information	14.0	(9.8-19.6)
Finance & Insurance & Real Estate & Rental & Leasing	18.3	(15.1-22.1)
Prof., Scientific & Mgmt. & Admin. & Waste Mgmt. Svcs.	19.8	(16.8-23.2)
Educ. Services & Health Care and Social Assist.	13.5	(12.2-15.0)
Arts, Entertainment & Rec. & Accom. & Food Svcs.	32.1	(28.4-36.2)
Other Services (except Public Administration)	23.2	(19.2-27.8)
Public Administration	14.2	(10.6-18.8)

\*Insufficient number of respondents in Active Duty Military with smoking status to generate percent.

For 2013, 2014 and 2015, respondents in Michigan reported current occupation and industry. Ninety-four to 97% of the respondents completed the occupation/industry section. In this newsletter we examine current cigarette smoking prevalence, ever told had COPD and current asthma by industry and occupation. The prevalence of cigarette smoking by industry varied from 13.5% to 36.3% (Table 1) and 11.6 to 35.2% by occupation (Table 2), with the highest prevalence in construction. The increased prevalence of smoking in construction workers unexpectedly does not correspond to an increased prevalence of ever told COPD among those in the construction industry or occupation. Construction had the lowest prevalence of COPD and the Arts, Entertainment, Recreation, Accommodations & Food Services industry and the Services occupation had the highest prevalence of COPD (Tables 3 and 4). Analyses that were conducted controlling for race, body mass index, cigarettes, education level, income, exercise, binge drinking and having health insurance showed an increased risk of COPD in: the Arts, Entertainment, Recreation, Accommodations & Food Services; Educational Services, and Health Care and Social Assistance; Other Services (except Public Administration); and Retail Trade industries. The highest prevalence of current asthma, like COPD, was

in the Arts, Entertainment, Recreation, Accommodations & Food Services industry and the Services occupation (Tables 3 and 4). Also like COPD, analyses controlling for race, body mass index, cigarettes, education level, income, exercise, binge drinking and having health insurance showed an increased risk of current asthma in: the Arts, Entertainment, Recreation, Accommodations & Food Services; and Educational Services, and Health Care industries.

Possible explanations for a decreased prevalence of COPD and asthma in construction despite the highest prevalence of cigarette smokers are that construction work is sufficiently strenuous, and that those with COPD or asthma cannot continue to work in construction and therefore self-select out of this industry. Or, there could be some factors associated with the industries and occupations identified that increased the prevalence of COPD and/or asthma (services, retail trade and manufacturing for COPD and services and information for asthma). At minimum, the above analyses can help focus primary preventive activity (e.g. smoking cessation) or secondary prevention action (e.g. targeting education on asthma treatment). Better understanding of why certain industries/occupations have an increased prevalence of respiratory disease despite controlling for known risk factors such as cigarette smoking may allow for the identification of other modifiable risk factors. The fact that there was overlap in industries with increased risk for asthma and COPD raises additional questions about the difficulties in distinguishing asthma from COPD and/or risk factors in certain industries for both conditions.

Occupation Category	Weighted %	95% Conf. Limit
Mgt, Professional, & Related	11.6	(10.5-12.8)
Service	30.5	(27.9-33.1)
Sales & Office	21.1	(19.1-23.2)
Const., Extraction, Maint., Repair	35.2	(31.4-39.2)
Prod., Transp., & Material Moving	31.9	(29.0-35.0)
*Insufficient number of respondents in these occupations who smoke cigarettes to generate a percent: Farming, Fishing, Forestry; and Military.		

**Do you have thoughts about interpreting the data, suggestions for further analyses or using the data for public health? Contact Kenneth Rosenman MD at 1-800 446-7805 or via email at Rosenman@msu.edu**

Occupation Category	Ever Told they had COPD		with Current Asthma	
	Weighted %	95% Conf. Limit	Weighted %	95% Conf. Limit
Management, Professional, & Related	2.7	(2.2-3.2)	8.8	(8.0-9.7)
Service	6.8	(5.5-8.4)	11.9	(10.2-13.8)
Sales & Office	4.8	(4.0-5.8)	10.0	(8.7-11.4)
Construction, Extraction, Maintenance, & Repair	3.0	(2.1-4.2)	5.9	(4.2-8.1)
Production, Transportation & Material Moving	6.3	(5.0-7.9)	6.6	(5.3-8.3)
*Insufficient number of respondents in these occupations with COPD or Asthma to generate a percent: Farming, Fishing, Forestry; and Military.				

Table 4. Industry Category for those —	Ever Told they had COPD*		with Current Asthma**	
	Weighted %	95% Conf. Limit	Weighted %	95% Conf. Limit
Construction	2.6	(1.8-3.9)	5.4	(3.7-8.0)
Manufacturing	4.6	(3.6-5.7)	6.4	(5.3-7.8)
Wholesale Trade	—		8.1	(4.9-13.1)
Retail Trade	4.8	(3.5-6.5)	8.7	(7.0-10.7)
Transportation, Warehousing & Utilities	3.8	(2.4-5.8)	6.7	(4.6-9.7)
Information	—		10.6	(7.1-15.5)
Finance, Ins., Real Estate, Rental & Leasing	3.5	(2.3-5.3)	9.0	(6.8-11.8)
Prof., Sci., & Mgmt., Admin. & Waste Mgt.	4.0	(2.6-6.1)	9.1	(6.9-11.8)
Educ. Svcs., Health Care & Social Assist.	4.0	(3.3-4.8)	11.4	(10.3-12.7)
Arts, Ent., Recreation, Accom. & Food Svcs.	6.8	(5.0-9.2)	12.4	(10.0-15.2)
Other Services (except Public Admin.)	5.8	(4.1-8.1)	8.7	(6.1-12.2)
Public Administration	3.7	(2.4-5.6)	8.2	(6.0-11.0)

\*Insufficient number of respondents in these industries with COPD to generate a percent: Active Duty Military; Agriculture, Forestry, Fishing, Hunting, & Mining; Information; and Wholesale Trade  
\*\*Insufficient number of respondents in these industries with Asthma to generate a percent: Active Duty Military; Agriculture, Forestry, Fishing, Hunting, and Mining

**Continued from Page 1... NEWNIH Award to Investigate the Etiology of Hypersensitivity Pneumonitis**

If there is a positive reaction in the patient’s serum to the environmental sample, discrete antigens will be isolated from each positive environmental sample and identified using standard microbiological techniques and 16S sequencing. To better determine the clinical significance of any positive IgG antibody response to antigen collected in the patient’s environment, the patient will then be asked to provide 250 ml of blood. This sample will be used for flow cytometry to assess cytokine production and lymphocyte proliferation in response to discrete antigens found in the patient’s home and/or workplace. An asymptomatic disease-free family member and/or co-worker will be recruited as controls and their serum and blood similarly tested. For those patients who have positive reactions on the immunoassays, an exposure avoidance plan tailored to each patient will be developed to minimize/eliminate exposures. All test results and the exposure avoidance plans will be shared with both the patient and the referring physician. We will subsequently contact the referring physician to determine the clinical status of the patient and to evaluate if the testing and plan to reduce/eliminate exposures proved useful in managing the patient.

Diagnostic Criteria for Possible Study Participants with HP

Study subjects will need to fulfill at least 3 of the following 6 criteria, with other lung diseases with similar clinical findings considered less likely. We will request that referring physicians provide their impression of the suspected causative antigen based on clinical findings (particularly the exposure history).

- 1) *Recurrent symptoms of dyspnea, cough or chest tightness beginning 4-8 hours after suspected exposure.*
- 2) *Suspected exposure at home or workplace based on history and/or detection of IgG antibody to an antigen on a standard HP panel in serum.*
- 3) *Ground-glass opacities, poorly defined centrilobular nodules, mosaic attenuation and/or gas trapping on expiratory images on chest HRCT.*
- 4) *If bronchoalveolar lavage (BAL) is performed, then BAL lymphocytosis (>30% in non-smokers, >20% in smokers).*
- 5) *If a lung biopsy is performed, then if acute or subacute HP, the pathology shows interstitial lymphocytic and bronchiolocentric pneumonitis, with non-necrotizing granulomas; or if chronic HP, the pathology has a UIP or NSIP pattern, which maybe indistinguishable from idiopathic fibrosis.*
- 6) *Positive natural or laboratory challenge (reproduction of symptoms and laboratory abnormalities after exposure).*

**For additional information about our criteria for patient recruitment/enrollment and/or details pertaining to the sampling and laboratory methods used, please contact Melissa Millerick-May, PhD. If you have diagnostic or management questions about a possible HP patient, please contact Kenneth Rosenman, MD. Both can be reached at 1-800-446-7805.**

\*Project

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# News

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**In this issue:** v28n2 Prevalence in Michigan of Cigarette Smoking, COPD and Asthma by Occupation and Industry

\*Project  
S Remember to report all cases of occupational disease!

Printed on recycled paper.

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the Reporting of  
Known or Suspected  
Occupational Diseases**

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Reporting forms can be obtained by  
calling 1-800-446-7805