

## RESEARCH PAPER

# Healthcare provider smoking cessation advice among US worker groups

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**Objective:** Among workers in dusty occupations, tobacco use is particularly detrimental to health because of the potential synergistic effects of occupational exposures (for example, asbestos) in causing disease. This study explored the prevalence of smoking and the reported smoking cessation discussion with a primary healthcare provider (HCP) among a representative sample of currently employed US worker groups.

**Methods:** Pooled data from the 1997–2003 National Health Interview Survey (NHIS) were used to estimate occupation specific smoking rates (n = 135 412). The 2000 NHIS Cancer Control Module was used to determine (among employed smokers with HCP visits) the prevalence of being advised to quit smoking by occupation (n = 3454).

**Results:** The average annual prevalence of current smoking was 25% in all workers. In 2000, 84% of smokers reported visiting an HCP during the past 12 months; 53% reported being advised by their physician to quit smoking (range 42%–66% among 30 occupations). However, an estimated 10.5 million smokers were not advised to quit smoking by their HCP. Workers with potentially increased occupational exposure to dusty work environments (including asbestos, silica, particulates, etc), at high risk for occupational lung disease and with high smoking prevalence, had relatively low reported discussions with an HCP about smoking cessation, including farm workers (30% overall smoking prevalence; 42% told to quit), construction and extractive trades (39%; 46%), and machine operators/tenderers (34%; 44%).

**Conclusion:** The relatively low reported prevalence of HCP initiated smoking cessation discussion, particularly among currently employed workers with potentially synergistic occupational exposures and high current smoking prevalence, needs to be addressed through educational campaigns targeting physicians and other HCPs.

It has been over 40 years since the publication of the first Surgeon General Report linking smoking to cancer and other adverse health outcomes,<sup>1</sup> yet tobacco use remains the leading cause of preventable mortality in the United States.<sup>2</sup> Among workers in dusty occupations (for example, construction, farming), tobacco use is particularly hazardous because of the potential synergistic effects of occupational exposures in causing lung disease.<sup>3–7</sup>

One of the most obvious and low cost forms of smoking prevention is for healthcare providers (HCPs) to recommend smoking cessation to their patients.<sup>8</sup> Despite calls from the public health and medical care communities for greater participation of HCPs in encouraging smoking cessation,<sup>9</sup> and the availability of evidence based treatment guidelines and smoking cessation products,<sup>10–11</sup> HCP participation in such activities is relatively low.<sup>12</sup>

It is currently unknown if HCP smoking cessation advice varies for patients from different occupational groups. This study explored the prevalence of smoking and the reported prevalence of smoking cessation discussion with an HCP across 41 occupational categories in a nationally representative sample of US worker groups.

## METHODS

The National Health Interview Survey (NHIS) is a household survey of the US civilian non-institutionalised population conducted yearly since 1957 by the National Center for Health Statistics (NCHS).<sup>13</sup> Annual response rates have ranged from 70% to 80%.<sup>14–21</sup> Forty-one standardised occupational codes derived from more detailed US census occupational codes were provided in the NHIS database.<sup>22</sup> Participants who

reported smoking at least 100 cigarettes in their lifetime were asked if they now smoked every day, some days, or not at all. Those responding that they smoked every day or some days were considered current smokers.

The 2000 NHIS Cancer Control Module was used to determine if smokers were advised to quit smoking by a physician or other HCPs (for example, primary care physicians, specialists, nurse practitioners, etc). The number of smokers with at least one HCP contact in the previous 12 months who reported receiving advice to quit smoking was divided by the total number of smokers with at least one HCP contact in the previous 12 months.

A subset analysis examined participants who reported only HCP contacts with primary care physicians and/or obstetrics/gynaecologists to examine the hypothesis that these particular primary HCPs would be more likely to provide smoking cessation advice than the broader array of HCPs who, in some cases, would have limited repeat patient encounters (for example, specialists).<sup>23</sup>

All analyses were completed with adjustments for the complex sample survey design and the pooling of annual smoking prevalence estimates.<sup>24–25</sup> Logistic regression analysis was used to determine if the occupation specific prevalence of receipt of smoking cessation advice differed from the prevalence for all workers after adjustment for education

**Abbreviations:** BRFSS, Behavioral Risk Factor Surveillance System; HCP, healthcare provider; JCAHO, Joint Commission on Accreditation of Healthcare Organizations; NCHS, National Center for Health Statistics; NCQA, National Committee for Quality Assurance; NHIS, National Health Interview Survey

(classified as less than high school, high school graduate, and more than high school). This study was approved by the University of Miami human subjects committee.

## RESULTS

The study population represented an estimated 126.4 million US workers annually between 1997–2003. The average annual prevalence of current smoking was 25% in all workers over years 1997–2003 (table 1). Smoking rates ranged from 39% in forestry and fishing occupations to 5% in health diagnosing workers.

Among all US workers in the 2000 NHIS, 84% reported visiting an HCP during the past 12 months with substantial variability across occupations (for example, 68% in workers employed in the constructive and extractive trades to 95% in those employed in the health assessment/treating occupations). Among workers who were current smokers at the time of the 2000 NHIS interview, 53% were told by their HCP to stop smoking (range 42%–66% across occupations). This translates to an estimated 10.5 million US workers who smoked cigarettes

and saw an HCP in 2000, but did not report being advised to quit during any provider contact in the previous 12 months.

Worker groups with an expected increased occupational exposure to dusty work environments (including asbestos, silica, bio-aerosols, etc),<sup>7</sup> and high reported smoking prevalence often reported below average rates of smoking cessation discussions with their HCPs. Examples included farm workers (30% overall smoking prevalence; 42% told to quit), construction and extractive trades (39%; 46%), and machine operators/tenderers (34%; 44%). In fact, of the 41 occupations listed in table 1, 13 are known to have a higher risk of occupational dust exposures and subsequent lung disease.<sup>7</sup> Notably, all but one of these high risk occupations (that is, farmer operators and managers) were among the top 13 occupations with the highest reported smoking rates.

Workers with more than a high school education were significantly more likely to report receiving smoking cessation advice relative to workers with less education (odds ratio = 1.30; (95% confidence interval 1.03 to 1.62)); there were no differences in workers with a high school education

**Table 1** 1997–2003 pooled current smoking rates, the percentage of smokers advised to quit, and the estimated number not advised to quit by their healthcare provider (HCP) in year 2000: the National Health Interview Survey

Occupation	Current smoker* (%)	Advised to quit by HCP† (%)	Estimated number of smokers in year 2000 not advised to quit by HCP‡
Forestry and fishing occupations¶	39.2	–§	12 274
Construction and extractive trades¶	39.2	46.1	650 063
Food service	39.0	43.1	766 002
Construction labourers¶	36.8	–	88 164
Material moving equipment operators¶	34.8	64.9	90 119
Machine operators/tenderers, except precision¶	34.3	43.5	672 487
Motor vehicle operators¶	34.2	53.3	496 559
Freight, stock, material handlers¶	32.7	55.4	313 366
Fabricators, assemblers, inspectors, samplers¶	32.2	54.9	235 965
Precision production occupations¶	32.1	54.2	431 003
Mechanics and repairers¶	31.8	44.7	535 942
Cleaning and building service¶	30.4	46.3	359 838
Farm workers and other agricultural workers¶	29.8	41.5	225 797
Health service	29.2	65.6	237 076
Other protective service occupations	28.9	49.9	96 357
Other transportation, except motor vehicles	28.7	–	5385
Other sales	27.2	51.0	532 033
Supervisors and proprietors	25.7	55.1	247 119
Mail and message distributing	23.7	–	67 649
Other administrative support	23.1	60.9	839 587
Health technologists/technicians	22.7	49.3	192 915
Managers administrators, except public administration	22.4	56.5	990 730
Financial records processing occupations	22.4	57.6	180 400
Personal service	20.9	47.3	223 407
Sales representatives, commodities and finance	20.5	51.0	279 278
Secretaries, stenographers and typists	19.8	64.3	161 947
Technologists, technicians except health	19.5	58.0	132 771
Private household occupations	19.4	–	42 911
Computer equipment operators	19.3	–	13 632
Police and fire fighters	19.3	–	82 381
Management related occupations	18.8	54.0	380 482
Writers, artists, entertainers, athletes	18.3	42.7	148 477
Farm operators and managers¶	15.3	–	36 213
Officials and administrators public administration	15.2	–	34 807
Natural mathematical/computer scientists	14.3	60.3	97 397
Health assessment/treating occupations	13.7	59.8	155 445
Engineers	12.9	47.7	105 653
Architects and surveyors	12.3	–	3797
Other professional specialty occupations	12.3	51.0	159 760
Teachers, librarians, counsellors	10.3	60.9	211 801
Health diagnosing occupations	5.3	–	7022
All workers	24.8	52.8	10 544 011

\*Based on pooled rates from the 1997–2003 NHIS (n = 135 412). †Based on the 2000 NHIS employed smokers who reported a healthcare visit in the previous 12 months (n = 3454). ‡Calculated by applying NHIS sampling weights to the number of smokers with healthcare encounters who reported not being told to quit by their healthcare provider(s).

¶Occupations with high risk of dust exposure and lung disease.<sup>7</sup> §Estimate not reported because of small sample size.<sup>26</sup>

versus less than a high school education. With education controlled for in the model, food service workers were significantly less likely to report receipt of quit smoking advice (0.68 (0.49 to 0.94)) relative to all other workers. Conversely, after control for education, health service workers and other administrative support workers were more likely to report receiving smoking cessation advice (1.78 (1.17 to 2.71); 1.42 (1.07 to 1.88)).

Fifty-three per cent of smokers reporting only primary care physician and/or obstetrics/gynaecologist contacts in the previous 12 months indicated that their physician had advised them to quit smoking (worker group range: 41%–66%) (data not shown).

## CONCLUSION/RECOMMENDATIONS

We found a relatively low reported prevalence of physician initiated smoking cessation discussion, particularly among currently employed workers with potentially synergistic occupational exposures and high current smoking prevalence. Workers with more than a high school education were more likely to report receipt of smoking cessation advice relative to high school graduates and those with less than a high school education. In our multivariable models, educational attainment greater than high school remained significantly associated with an increased likelihood of receiving smoking counselling, while occupational classification was generally not significant. Our multivariable results should be interpreted with caution given the correlation between occupation and education and sample size differences across the occupation groups. However, numerous studies have shown that the quality of doctor-patient communications is lower among less versus more educated patients.<sup>27</sup> Therefore, one possible explanation for the lower rates of smoking cessation discussion among many of the blue collar occupational groups may be because of the communication challenges posed by differences in educational attainment between patient and HCP.

A large percentage of primary care physicians practising in the US and in other industrialised countries believe that smoking cessation discussions with their patients are too time consuming (42%) and ineffective (38%).<sup>28</sup> Despite these beliefs, quit rates are approximately 2.3% higher in smokers who are advised by their physicians to stop smoking relative to smokers who do not receive this advice.<sup>10</sup> Based on table 1, this suggests that there could have been over 242 000 employed smokers who might have quit in the year 2000 if all US patient encounters during that year included a direct message from their HCP to stop smoking.

Unfortunately, the current analysis suggests that just over half of employed smokers with an HCP contact in the previous 12 months reported being advised to quit smoking. Furthermore, there was no increase in this prevalence when only the primary care physician and/or obstetrician/gynaecologist visits were examined, even though these are HCPs with specialised preventive medicine training. Similar results were recently obtained from participants of the 2000 Behavioral Risk Factor Surveillance System (BRFSS), which found that nearly 55% of smokers with an HCP encounter in the previous 12 months reported being advised to quit smoking.<sup>29</sup> It should be noted that smokers in the BRFSS and in the present analysis may tend to under-report advice to quit smoking. Nevertheless, counselling rates from the BRFSS and the present study are similar to those reported two decades earlier,<sup>8 30</sup> indicating that the increasing availability of anti-smoking educational materials and programmes have been insufficient to motivate more HCPs to communicate smoking cessation messages to their patients.

Tobacco use counselling in healthcare settings is currently monitored in the US by the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) and the National Committee for Quality Assurance (NCQA). Other national medical organisations are moving towards performance standards that include the monitoring and delivery of smoking cessation services.<sup>31</sup> Continued development and implementation of these standards, along with more favourable reimbursement policies for the provision of such services, established by the Centers for Medicaid and Medicare services in 2005,<sup>32</sup> should ultimately lead to improved delivery of smoking cessation services.

Online clinical practice guidelines on smoking cessation advice and treatment are available (<http://www.surgeongeneral.gov/tobacco/>) and include the brief clinical interventions such as the five A's: Ask (about smoking status), Advise (the patient to quit), Assess (determine willingness to quit), Assist (help the patient with a plan to quit), and Arrange (a follow-up contact).<sup>10 11</sup> While intensive clinical interventions are more efficacious, there is strong evidence that brief clinical interventions are cost effective.<sup>10</sup> All HCPs should, at minimum, know if their patients use tobacco and provide information to their smoking patients on the new national quitline launched in 2004 (1-800-QUITNOW; <http://www.smokefree.gov/>).<sup>12</sup> Telephone counselling is a proven, relatively low cost, and barrier free method for smoking cessation,<sup>33 34</sup> and referral mechanisms can be integrated into HCP office practices.<sup>35</sup> Pairing of telephone counselling with nicotine replacement therapy further enhances quit rates.<sup>36</sup>

The relatively low prevalence of smoking cessation discussion with their HCP reported by US workers, particularly among workers with potentially synergistic occupational exposures and high current smoking prevalence, may reflect a lack of knowledge of the occupational exposures and risks of their worker patients on the part of HCPs.<sup>37–39</sup> There are limited online resources available for HCPs who seek additional

### What this paper adds

Among workers in dusty occupations (for example, construction, mining, machine operators, farming), tobacco use is particularly hazardous because of the potential synergistic effects of occupational exposures in causing lung disease. Results from this nationally representative sample of US workers indicated that workers in these occupations report high rates of smoking, but often are not told by their healthcare provider (HCP) to quit smoking. Workers with less education were also less likely to report receiving advice from their HCP to quit smoking. In the year 2000, there were an estimated 10.5 million employed smokers with HCP contacts who were not advised to quit smoking. Previous research indicates quit rates are 2.3% higher in smokers receiving stop smoking advice from HCP. Therefore, an estimated 242 000 additional smokers would have quit in the year 2000 if they had received advice from their HCP to stop smoking. All HCPs must communicate this message to their smoking patients, and furthermore educate themselves about the potential occupational synergistic chemical and respiratory exposures which may place their patients at additional risk for smoking related disease. Obtaining information on occupational respiratory exposures can serve as a powerful tool for opening discussion of the hazards of smoking in high risk worker groups. HCPs also need to be aware of the challenges of encouraging a therapeutic dialogue with the many patients in these high risk groups who have educational levels that do not approach their own.

information on the unique occupational risks of their smoking patients.<sup>40-41</sup> Educational campaigns targeting HCPs, enhanced curricula for medical students, and user friendly internet and telephone based resources are needed so that physicians can quickly identify potentially hazardous exposures that may be affecting the health of their patients.<sup>37</sup> Knowledge of these risks represents an opportunity for HCPs to open discussions with their patients regarding the need to quit smoking. HCPs also need to be aware of the challenges of encouraging a therapeutic dialogue with the many patients in these high risk groups who have lower educational levels.<sup>27</sup>

Finally, the development of worksite based programmes is needed to reach smokers who do not routinely come in contact with the healthcare system.<sup>42-43</sup> Widespread adoption of these worksite based smoking cessation services will almost certainly require the support of the federal government—for example, through the provision of tax credits for employers who offer smoking cessation services to their employees.<sup>44</sup> Such approaches not only will serve to reduce tobacco related health disparities noted among worker groups in dusty occupations, but will also lower healthcare and productivity costs as employees quit smoking.<sup>5 44-46</sup>

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