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## Patient-Provider Discussions About Strategies to Limit Air Pollution Exposures

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### Abstract

**Introduction:** Exposure to air pollution negatively affects respiratory and cardiovascular health. The objective of this study was to describe the extent to which health professionals report talking about how to limit exposure to air pollution during periods of poor air quality with their at-risk patients.

**Methods:** In 2015, a total of 1,751 health professionals completed an online survey and reported whether they talk with their patients about limiting their exposure to air pollution. In 2017, these data were analyzed to assess the frequency that health professionals in primary care, pediatrics, obstetrics/gynecology, and nursing reported talking about limiting air pollution exposure with patients who have respiratory or cardiovascular diseases, were aged 18 years, were aged 65 years, or were pregnant women. Frequencies of positive responses were assessed across categories of provider- and practice-level characteristics.

**Results:** Overall, 714 (41%) respondents reported ever talking with their patients about limiting their exposure to air pollution. Thirty-four percent and 16% of providers specifically reported talking with their patients with respiratory or cardiovascular disease diagnoses, respectively. Percentages of health professionals who reported talking with their patients about limiting air pollution exposure were highest among respondents in pediatrics (56%) and lowest among respondents in obstetrics/gynecology (0%).

**Conclusions:** Despite the well-described health effects of exposure to air pollution, the majority of respondents did not report talking with their patients about limiting their exposure to air pollution. These findings reveal clear opportunities to improve awareness about strategies to limit air pollution exposure among sensitive groups of patients and their health care providers.

### INTRODUCTION

Effects of exposure to air pollution on respiratory and cardiovascular health are well described.<sup>1–5</sup> However, people at risk of adverse health effects during periods of poor air quality are largely unaware of advisories issued to inform the public about air quality and its

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associated health risks.<sup>6–8</sup> Using data from a sample of U.S. adults, it was recently reported that just 3% of adults had discussed with a health professional strategies to reduce their exposure to air pollution and that percentages were higher among individuals with asthma (12%) and heart disease (5%).<sup>9</sup> In a companion survey, health professionals were asked whether they discuss strategies to limit exposure to air pollution with their patients. The present analysis describes the characteristics of health professionals and the extent to which they report discussing strategies to limit exposure to air pollution with their patients.

## METHODS

In 2017, data were analyzed from the 2015 DocStyles survey, conducted by the public relations firm Porter Novelli Public Services. The DocStyles survey contained 131 questions, some with multiple parts, and was designed to collect information about healthcare providers' attitudes and counseling behaviors about a variety of health issues, including exposure to air pollution, and to assess providers' use and trust of available health information sources.

From June 4 to June 23, 2015, a total of 2,281 health professionals were invited to complete the Internet-based Doc- Styles questionnaire. Health professionals in four specialties (primary care, pediatrics, obstetrics/gynecology, and nursing) were selected from the SERMO Global Medical Panel. SERMO is a global market research company that maintains a social medical network<sup>10</sup> and conducts polling of healthcare professionals.<sup>11</sup> At the time the DocStyles survey was conducted, the SERMO network had >330,000 medical professional users in the U.S. Potential respondents were recruited until the a priori targets of 1,000 primary care physicians, 250 pediatricians, 250 obstetrician/gynecologists, and 250 nurse practitioners were reached. Potential respondents were limited to those who, at the time of the survey, practiced in the U.S.; actively saw patients; worked in an individual, group, or hospital practice; and had been practicing for >3 years. Overall, 1,751 health professionals completed the survey for a response rate of 77%. The response rates ranged from 52% among nurse practitioners to 89% among primary care physicians.

Healthcare providers who discussed exposure to air pollution with their patients were identified using responses to two questionnaire items. First, respondents were asked, *Have you ever talked to your patients about how to limit their exposure to air pollution?* Respondents with positive responses were then asked, *What groups or types of patients do you typically talk to about limiting air pollution exposure?* The response options were *patients with asthma or other respiratory conditions* (hereafter referred to as respiratory disease), *patients with cardiovascular disease*, *patients 18 years of age*, *patients 65 years of age*, and *pregnant women*.

These data were analyzed to assess the frequency with which health professionals in selected specialties discussed with their at-risk patients how to limit their exposure to air pollution. All analyses were conducted using SAS, version 9.3. Analysis of DocStyles data is exempt from IRB review at the Centers for Disease Control and Prevention.

## RESULTS

Demographic and work-related characteristics of the respondents and percentages who reported talking with patients about limiting their exposure to air pollution are shown in Table 1. Overall, 714 (41%) health professionals reported ever talking with their patients about limiting their exposure to air pollution. Ever talking with patients about limiting their exposure to air pollution was least common among health professionals in the lowest categories of age (providers aged 26–34 years was 34%) and years in practice (3–9 years was 36%). Percentages were highest among pediatricians (56%) and family medicine physicians (51%; Table 2). By contrast, the percentage was lowest among physicians in obstetrics and gynecology (0%), though 226 other respondents reported talking with pregnant women about limiting their exposure to air pollution (Table 2). Overall, 34% reported having such discussions with their patients with respiratory disease. Percentages were lower when healthcare providers were asked about patients with cardiovascular disease, patients aged 18 years, and patients aged 65 years.

## DISCUSSION

This brief report presents novel information about the extent to which health professionals reported talking with their patients about how to limit their exposure to air pollution. Overall, more than 40% of providers reported such discussions. Given the well-described effects of air pollution on respiratory and cardiovascular health,<sup>1–5</sup> it is unsurprising that the respondents reported most commonly having these discussions with patients with respiratory and cardiovascular diseases. More striking, however, are the high percentages of providers whose patients likely include individuals in known at-risk populations who did not report talking with their patients about limiting their air pollution exposure.

In 2016, a member of the present research team conducted qualitative, in-depth interviews with clinicians on this same topic and found similar results; that is, that clinicians were not having comprehensive discussions with at-risk patients about air quality and that clinicians might not fully appreciate the risk poor air quality poses to their patients (SAD, unpublished observations, 2016). Concurrent focus groups with at-risk patients and parents of at-risk children echoed this finding (SAD, unpublished observations, 2016). Together with results of the DocStyles analysis, these findings reveal clear opportunities to improve awareness about strategies to limit air pollution exposure among sensitive groups of patients and among their healthcare providers. Indeed, outcomes associated with such discussions have not been systematically evaluated and thus these findings suggest that additional information about their benefits is needed.

In this survey, the majority of health professionals reported often or regularly keeping up-to-date with medical news via government health agencies (59%); medical websites (77%); and medical journals (86%; data not shown). Resources for health professionals to learn more about the health effects of air pollution and strategies to limit air pollution exposure are readily available via these and other communication channels (Table 3). Up-to-date information about local air quality and air quality alerts are widely available in North America,<sup>15,16</sup> Europe,<sup>17</sup> and elsewhere.<sup>18</sup> Because these results show that talking with

patients about limiting their exposure to air pollution was the least common among the youngest healthcare providers and those with the fewest years in practice, these resources might be effectively incorporated into curricula at schools educating health professionals.

## CONCLUSIONS

Despite the well-described health effects of air pollution exposure, the majority of health professionals did not report talking with their patients about limiting their exposure to air pollution. Because the survey question analyzed in the present analysis did not differentiate between indoor and outdoor air pollution, these findings do not specifically address indoor or outdoor air. Improving the scope of knowledge available about whether patients benefit from such discussions would provide additional information for advising patients about activities in poor indoor and outdoor air quality conditions.

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**Table 1.**

Characteristics of Healthcare Providers and Percentages Who Reported Talking With Patients About Limiting Their Exposure to Air Pollution

Characteristics	Total sample, <i>n</i> (%) <sup><i>a</i></sup>	Ever talk to patients about limiting air pollution exposure, <i>n</i> (%) <sup><i>b</i></sup>
Total	1,751 (100)	714 (40.8)
Age, years		
26–34	193 (11.0)	66 (34.2)
35–44	636 (36.3)	257 (40.4)
45–54	473 (27.0)	185 (39.1)
55–85	449 (25.6)	206 (45.9)
Sex		
Female	682 (38.9)	255 (37.4)
Male	1,069 (61.1)	459 (42.9)
Region		
Northeast	439 (25.1)	175 (39.9)
Midwest	386 (22.0)	150 (38.9)
South	580 (33.1)	241 (41.6)
West	346 (19.8)	148 (42.8)
Work/practice setting		
Individual outpatient	332 (19.0)	142 (42.8)
Group outpatient	1,161 (66.3)	473 (40.7)
Inpatient	258 (14.7)	99 (38.4)
Years in practice		
3–9	482 (27.5)	171 (35.5)
10–15	495 (28.3)	216 (43.6)
16–22	338 (19.3)	142 (42.0)
23–45	436 (24.9)	185 (42.4)

<sup>*a*</sup>Column percentages.

<sup>*b*</sup>Row percentages.

**Table 2.**

Healthcare Providers' Specialties and Percentages Who Reported Talking With At-risk Patient Groups About Limiting Their Exposure to Air Pollution

Characteristics	Total sample, <i>n</i> (%) <sup>a</sup>	Ever talk to Patients about limiting air pollution exposure, <i>n</i> (%) <sup>b</sup>	At-risk patient groups that health professionals reported talking to about limiting air pollution exposure				Pregnantwomen, <i>n</i> (%) <sup>b</sup>
			Patients with respiratory disease, <i>n</i> (%) <sup>b</sup>	Patients with cardiovascular disease, <i>n</i> (%) <sup>b</sup>	Patients aged 18 years, <i>n</i> (%) <sup>b</sup>	Patients aged 65 years, <i>n</i> (%) <sup>b</sup>	
Total	1,751 (100)	714 (40.8)	603 (34.4)	279 (15.9)	200 (11.4)	215 (12.3)	226 (12.9)
Specialty							
Family medicine	465 (26.6)	235 (50.5)	199 (42.8)	107 (23.0)	54 (11.6)	89 (19.1)	95 (20.4)
Internal medicine	535 (30.6)	233 (43.6)	192 (35.9)	100 (18.7)	44 (8.2)	82 (15.3)	75 (14.0)
Pediatrics	250 (14.3)	139 (55.6)	132 (52.8)	36 (14.4)	76 (30.4)	10 (4.0)	30 (12.0)
Obstetrics/gynecology	250 (14.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nurse practitioner	251 (14.3)	107 (42.6)	80 (31.9)	36 (14.3)	26 (10.4)	34 (13.5)	26 (10.4)

<sup>a</sup>Column percentages.

<sup>b</sup>Row percentages.

**Table 3.**

## Resources for Health Professionals to Learn More About the Health Effects of Air Pollution

Resource	Description
U.S. Environmental Protection Agency <sup>12</sup>	Particle Pollution and Your Patients' Health: An online course by the Environmental Protection Agency with continuing education credit offered by the Centers for Disease Control and Prevention
Brook et al. <sup>2</sup>	Review of air pollution and cardiovascular disease published by the American Heart Association
Committee of the Environmental and Occupational Health Assembly of the American Thoracic Society <sup>4</sup>	Review of health effects of outdoor air pollution published by the American Thoracic Society
Kunzli et al. <sup>13</sup>	Review of air quality and health published by the European Respiratory Society
Expert Panel Report 3 (EPR-3) <sup>14</sup>	National Asthma Education and Prevention Program guidelines for the diagnosis and management of asthma

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