



## Patient–provider discussions about lung cancer screening: Results from the 2012/2013 Kansas Adult Tobacco Survey

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### ABSTRACT

**Objective.** Prior to the 2013 US Preventive Services Task Force (USPSTF) guidelines for lung cancer screening, the American Cancer Society released interim guidance recommending physicians discuss lung cancer screening with high risk patients. We included a question on patient–provider discussions about lung cancer screening on a statewide population-based survey to establish baseline prevalence for surveillance and to identify subpopulation disparities.

**Methods.** We analyzed the 2012/2013 Kansas Adult Tobacco Survey to assess patient–provider discussions about lung cancer screening. Weighted prevalence estimates and adjusted odds ratios were calculated to examine characteristics associated with discussing screening.

**Results.** The prevalence of patient–provider discussions about lung cancer screening among current and former smokers aged 55 to 74 years was 31.0% (95% CI 27.0–35.0). The adjusted prevalence odds of having these discussions was higher among males, adults aged 65 to 74 years, adults living with a disability, as well as those who saw a health professional in the past year and had their smoking status assessed or were advised to quit.

**Conclusions.** The current study is unique as it is the first to assess patient–provider discussions about lung cancer screening using a statewide survey. These results may inform strategies to increase patient–provider discussions about lung cancer screening among high risk Kansans.

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### Introduction

Lung cancer is the leading cause of cancer death in Kansas (U.S. Cancer Statistics Working Group, 2013). Early detection is key for improving survival. Currently, 5-year relative survival is 54% when diagnosed in localized stage, but nearly half of lung cancer cases are diagnosed in distant stage, where 5-year relative survival is only 4% (Surveillance, Epidemiology, and End Results Program, 2014). Prior to 2013, there were no lung cancer screening recommendations from the US Preventive Services Task Force (USPSTF) (Moyer, 2013). Despite the absence of these guidelines prior to 2013, low dose computed tomography (LDCT) and chest x-rays have been used for lung cancer screening. In a 2006/2007 national survey of primary care physicians, 55% reported they had ordered chest x-rays, and 22% had ordered LDCT for lung cancer screening (Klabunde et al., 2012). Further, in the 2010 National Health Interview Survey, 2.5% of Americans 40 years and older without a prior diagnosis of lung cancer reported chest x-

ray for lung cancer screening, while 1.3% reported LDCT for lung cancer screening (Doria-Rose et al., 2012).

In 2011, the National Lung Screening Trial (NLST) found that screening with LDCT can reduce lung cancer mortality among high risk groups by 20% when compared to screening with chest x-ray (National Lung Screening Trial Research Team et al., 2011). Following these results, the American Cancer Society (ACS) released interim guidance on lung cancer screening, which recommended that adults who meet NLST eligibility criteria should discuss lung cancer screening using LDCT with their health care provider (HCP) and make a shared decision as to whether or not to be screened. These guidelines also stressed that screening is not an alternative to smoking cessation (Fontham, 2011). Based on these recommendations, the Kansas Comprehensive Cancer Prevention and Control Program included a question on the 2012/2013 Kansas Adult Tobacco Survey (ATS) to assess the prevalence of current and former smokers who have discussed with their HCP whether or not to be screened for lung cancer.

We anticipate that results from the NLST and the growing number of organizations recommending the use of LDCT for lung cancer screening will increase screening rates among high risk populations. To our knowledge, this study is the first to estimate the prevalence of patient–provider

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discussions about lung cancer screening and to identify disparities among subpopulations in Kansas.

## Methods

The 2012/2013 Kansas ATS is a point-in-time, random-digit-dial-survey of non-institutionalized adults 18 years and older living in a private residence in Kansas with landline and/or cell phone service. An overlapping frame sampling methodology was implemented and the sample was stratified by county population density subgroups. Data were weighted using iterative proportional fitting, or “raking,” across several margins including: age, gender, race/ethnicity, education, home ownership, and region. Additional information on the 2012/2013 Kansas ATS weighting methodology has been previously published (Christensen et al., 2014).

Current smokers and former smokers (who had their last cigarette in the past 15 years) aged 55 to 74 years with no history of cancer were asked the question “Have you discussed with your health care provider whether or not to be screened for lung cancer?” Other relevant data collected include socio-demographic characteristics, visits with a HCP, provider assessment of tobacco use and provider advice to quit. Respondents were considered to be living with a disability if they indicated they were limited in activities because of physical, mental, or emotional problems or if they had a health problem that required the use of special equipment. Provider assessment of tobacco use was determined by the question “In the past 12 months, did any doctor, dentist, nurse, or other health professional ask if you smoke cigarettes or use any other tobacco products?” Provider advice to quit was determined by the question “In the past 12 months, did any doctor, dentist, nurse, or other health professional advise you to quit smoking cigarettes or using any other tobacco products?”

Weighted prevalence estimates and 95% confidence limits were computed taking into account complex survey methodology. Logistic regression models were developed to examine characteristics associated with discussing screening while adjusting for potential confounding variables. Models were assessed for confounding, interaction, and collinearity in a forward selection process. All statistical analyses were conducted using SAS 9.3 software.

## Results

The Kansas ATS was completed by 9656 Kansas adults, 733 of whom were identified as current or former smokers aged 55 to 74 years with no history of cancer. In 2012 to 2013, 31.0% (95% CI: 27.0%–35.0%) of current and former smokers aged 55 to 74 years in Kansas had discussed whether or not to be screened for lung cancer with a HCP. The prevalence odds of discussing screening was higher among males than females (adjusted OR = 1.57, 95% CI 1.07–2.52), higher among adults aged 65 to 74 years than adults aged 55 to 64 years (adjusted OR = 1.57, 95% CI 1.12–2.52), and higher among adults living with a disability than those not living with a disability (adjusted OR = 1.70, 95% CI 1.15–2.92) [Table 1].

We further explored data among respondents who had seen a HCP within the past year while adjusting for age, gender and disability status. We found that the prevalence odds of discussing lung cancer screening was higher among those who had their smoking status assessed by their HCP than those who did not (adjusted OR = 2.50, 95% CI 1.54–4.07) and higher among those who were advised to quit by their HCP than those who were not advised to quit (adjusted OR = 1.78, 95% CI 1.02–3.09).

## Discussion

In 2012/2013, nearly one-third of current and former smokers aged 55 to 74 years in Kansas had ever discussed lung cancer screening with their HCP. Differences in the prevalence odds of patient–provider

**Table 1**

Prevalence odds of patient–provider discussions about lung cancer screening among current and former smokers aged 55 to 74 years, Kansas ATS 2012/2013 (n = 733).

	Crude OR	95% CI	Adjusted OR	95% CI
<i>Gender</i>				
Female	1.00	–	1.00	–
Male	1.53	(1.05–2.23)	1.57 <sup>a</sup>	(1.07–2.52)
<i>Age</i>				
55–64	1.00	–	1.00	–
65–74	1.68	(1.15–2.46)	1.57 <sup>a</sup>	(1.12–2.52)
<i>Disability status</i>				
Not living with a disability	1.00	–	1.00	–
Living with a disability	1.53	(1.04–2.24)	1.70 <sup>a</sup>	(1.15–2.92)
<i>Insurance coverage</i>				
Has insurance	1.00	–		
Does not have insurance	0.92	(0.49–1.73)		
<i>Income</i>				
<\$25,000	1.00	–		
\$25,000–\$49,999	1.03	(0.62–1.71)		
≥\$50,000	0.77	(0.48–1.25)		
<i>Saw health professional in past year</i>				
Yes	1.00	–		
No	1.41	(0.79–2.51)		
<i>Saw a health care professional in past year and had tobacco use status assessed</i>				
No	1.00	–	1.00	–
Yes	2.44	(1.51–3.93)	2.50 <sup>†</sup>	(1.54–4.07)
<i>Saw a health care professional in past year and were advised to stop using tobacco</i>				
No	1.00	–	1.00	–
Yes	1.79	(1.04–3.08)	1.78 <sup>†</sup>	(1.02–3.09)

<sup>a</sup> Final model includes gender, age and disability status.

<sup>†</sup> Odds ratios adjusted for gender, age, and disability status.

discussions by age and gender could be due to differences in the perceived risk of lung cancer linked to historical smoking disparities in this age cohort by gender (U.S. Department of Health and Human Services, 2014). Differences by disability status could be related to disparities in health care access affecting individuals with disability (Kansas Behavioral Risk Factor Surveillance System, 2014).

Our findings that a health care professional's assessment of smoking status and providing advice to quit is associated with discussing screening may provide opportunities for intervention. These differences could be due to physician knowledge and attitudes regarding lung cancer risk and screening. Screening is not a replacement for smoking cessation intervention, but both should be discussed between high risk smokers and their HCP. The role of provider knowledge and attitudes may be better understood through further investigation and should be considered when developing interventions to increase lung cancer screening discussions.

This study is not without limitations. The survey did not ascertain pack-year smoking history; not all current and former smokers in this study will meet screening guidelines. Although pack-year smoking history was unmeasured, we anticipate a large proportion of our study population meeting the pack-year requirement. When asked about the age at which they had their first cigarette, 92.5% of our study population reported initiating smoking before the age of 25. Nonetheless, some in our sample may be misclassified as high risk despite a smoking history of less than 30 pack-years.

In addition, the question used to assess patient–provider discussions of lung cancer screening does not differentiate between screening modalities and thus does not necessarily measure discussing screening according to guidelines recommending LDCT. Despite this limitation, we expect that this indicator provides adequate information to identify subpopulation disparities and trends over time, and provide useful information for developing targeted interventions. We were unable to stratify data by race and ethnicity due to the small sample size of non-

white respondents. In addition, self-report of having a discussion about lung cancer screening may be affected by recall bias.

The current study is unique in that, to our knowledge, it is the first to assess patient–provider discussions about lung cancer screening at the population level using a statewide health survey. Results from this study can be used to inform strategies to increase patient–provider discussions about lung cancer screening among high risk individuals, as well as strategies to increase provider awareness around this issue.

#### Conflict of interest statement

The authors declare that there are no conflicts of interests.

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