SMOKING TRENDS IN CANCER SURVIVORS

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Introduction

Tobacco use is one of the most avoidable and wide spread causes of cancer. Smoking rates for US adults have dropped since the 1964 Surgeon General's report from 42% in 1965 to 18.2% in 2008. The current US Healthy People goal for smoking in adults is 12%.

Smoking is:
- Responsible for 30% of all cancer deaths
- Associated with increased risk of at least 15 types of cancer
- Associated with cardiovascular and pulmonary diseases.

Cancer survivors:
- Represent almost 4% of the US population
- Are at increased risk for developing other cancers
- Many second cancers are realted to tobacco use
- Continued smoking is associated with increased morbidity and mortality

Purpose

To explore the role that existing types of cancer have on current smoking rates among survivors

Methods

Participants: There were a total of 19629 respondents to 2003, 2005, and 2007 Health Information National Trends Survey (HINTS); 2632 or 13.4% self-reported a diagnosis of cancer. The final sample consisted of the respondents who self-reported a diagnosis of cancer (CaSurvivors) after eliminating cases that reported only a nonmelanoma skin cancer (n=541) or had problematic responses (n=31). The final sample size was 2,060 respondents, of which most (n=2027, 98.4%) responded to the questions about smoking.

Measures: HINTS, developed by the National Cancer Institute (NCI), is a biannual national probability population survey to examine cancer communication trends over time. Survey questions addressed health communication, health services, behaviors and risk factors, cancer, health status and demographics. The 2003, 2005, and 2007 random digit dial telephone surveys were collected in English and Spanish. The survey instruments and final reports of each survey can be found at http://hints.cancer.gov. National probability sampling was done based on the most Current Population Survey with oversampling of Blacks and Hispanics in 2003 and 2007. The overall response rates (the product of the screening and extended interview rates) were 33% in 2003, 24.1% in 2005, and 24.2% in 2007.

Analytic Methods: Once the data were examined for consistency of responses to related questions, univariate statistics were conducted on demographic and health variables as well as smoking questions by survey year; the surveys were then combined. Trends across the three surveys were calculated comparing CaSurvivors to NoCancer HINTS respondents. Estimates of the prevalence of smoking by type of cancer were calculated using sample weights.

For each type of cancer, the likelihood of being a current smoker among it's survivors was compared to the likelihood among all of the survivors. The likelihood was adjusted by variables that were found to influence smoking rates included: age, education, race/ethnicity, marital status, health access, and gender. Gender was excluded from analyses for gender specific cancers (breast, cervical, uterus, ovarian, and prostate). The survey year was included since the independent surveys were pooled. For each cancer, a logistic regression estimated the likelihood of being a current smoker as a function of being a survivor of that cancer and other predictive factors. Estimates were obtained using SUDAAN (v.10.0, Research Triangle Institute, 2009).

Whether the likelihood of current smoking for the survivors of a type of cancer differed from that of other cancers was assessed by a likelihood ratio test. This is reported as significantly greater if the probability of the likelihood ratio test is < .05 and the estimate of the adjusted odds ratio is >2.0. Results are reported as percentiles (weighted).

Missing Data

Missing Data: Smoking status was not recorded for 33 (1.6%) of the 2060 cancer survivors, and missing data levels were less than 4% for all predictors except marital status (7.6%). Sensitivity analyses were performed by including the missing data for each predictor as a category. Estimates for the relative likelihood of smoking differed little between analyses of respondents with complete data and analyses where missing data was included.

Results

Participant Characteristics: Table 1 presents the demographic data for the total sample and for cervical cancer survivors. The average respondent for the total sample was married, Causacian, female, 60s, at least some college education, and 12 years post cancer diagnosis.

### Table 1. Cancer Survivors Smoking Behavior and Personal Characteristics[+]

	All (n=2060)	Cervical (n=228)
Smoking		
Current	18.68	48.32
Former	36.75	19.02
Never	42.74	31.53
Missing	1.83	1.13
Education		
Less than HS	16.86	14.91
HS graduate	32.19	41.69
Some college	26.05	28.49
College grad	21.89	13.10
Missing	3.01	1.81
Age		
18-34	6.51	24.34
35-49	16.95	45.26
50-64	31.92	19.30
66-74	21.57	6.52
75+	22.58	4.41
Missing	0.46	0.17
Marital Status		
Married	63.52	59.00
Divorced	11.45	15.59
Widowed	11.84	5.45
Separated	3.31	6.02
Single NM	3.77	6.52
Missing	6.11	7.42
Health Access[+]		
Yes	80.71	66.72
Partial/None	17.51	31.89
Missing	1.78	1.40
Race/Ethnicity		
Hispanic	5.46	8.69
Black/AA	7.78	9.52
Other	4.55	7.91
White	77.93	72.15
Missing	4.28	1.73
Gender		
Female	60.82	100.00
Male	39.18	0.00
Missing	0.00	0.00
Time since Diagnosis		
≤1 year	14.31	5.92
2-5 years	25.00	12.91
6-10 years	19.5	16.92
11 or more	40.01	62.68
Missing	1.44	1.57

[+] 2003, 2005, 2007 HINTS Surveys (weighted %).
[++] Partial = has a provider OR insurance but not both

Smoking Trends

Smoking Trends: Current, former and never smoking status was calculated for CaSurvivors and compared to the NoCancer HINTS respondents. Cancer survivors have a significantly lower proportion of current smokers (17.7% vs. 21.9% respectively), a higher proportion of former smokers (37.2% vs. 24.6%), and a correspondingly lower proportion that never smoked (43.5% vs. 53.1%). Cancer survivors smoking rates consistently dropped over the five year time period while smoking rates varied little in NoCancer HINTS respondents (figure 1). Similarly, the number of former smokers increased from 36.3% to 42.9% in the CaSurvivors but not in the NoCancer respondents (24.9% to 24.4%) over the same time period.

Figure 1. Current Smoking Rates (%)

Overall smoking rate for CaSurvivors = 17.7% and 21.9% for NoCancer.
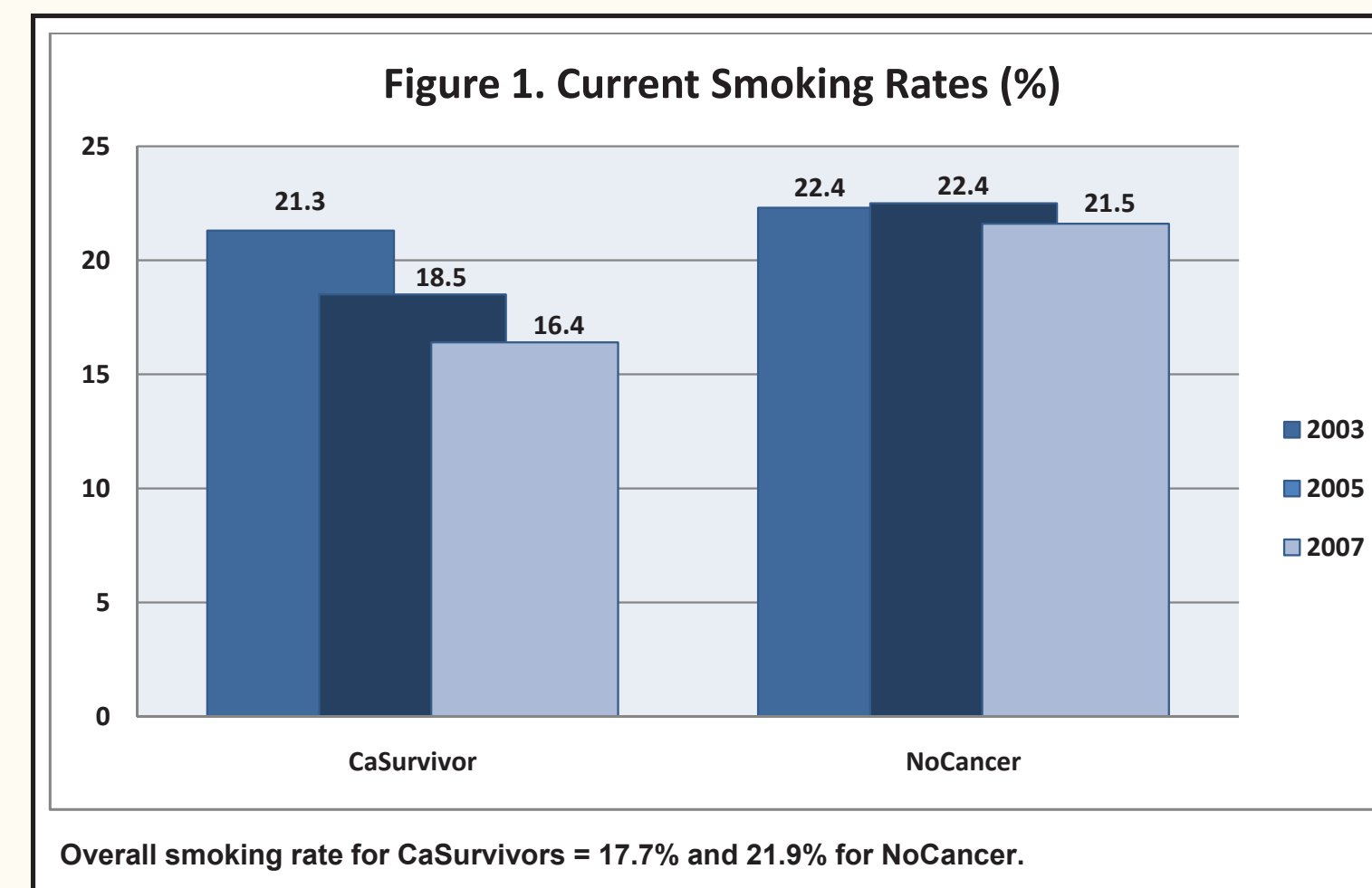
Smoking Rates by Survivors: Smoking rates by cancer type varied and ranged from a low of 7.4% to 48.3% (figure 2). Among the cancers survivors that are not gender specific, women had a significantly lower likelihood of being current smokers (likelihood ratio Chi-square with 1 df = 3.91, p< .05). Education (less than college), age (younger), marital status (widowed or divorced), and health care access (none or partial) were significant personal variables associated with smoking. The odds for being a current smoker was significantly higher for cervical cancer survivors [OR 2.88, CI 1.66-4.73, p <.001] when compared to all other CaSurvivors controlling for these specific variables.

Figure 2. Current Smoking by Type of Cancer (%) (n=2027)
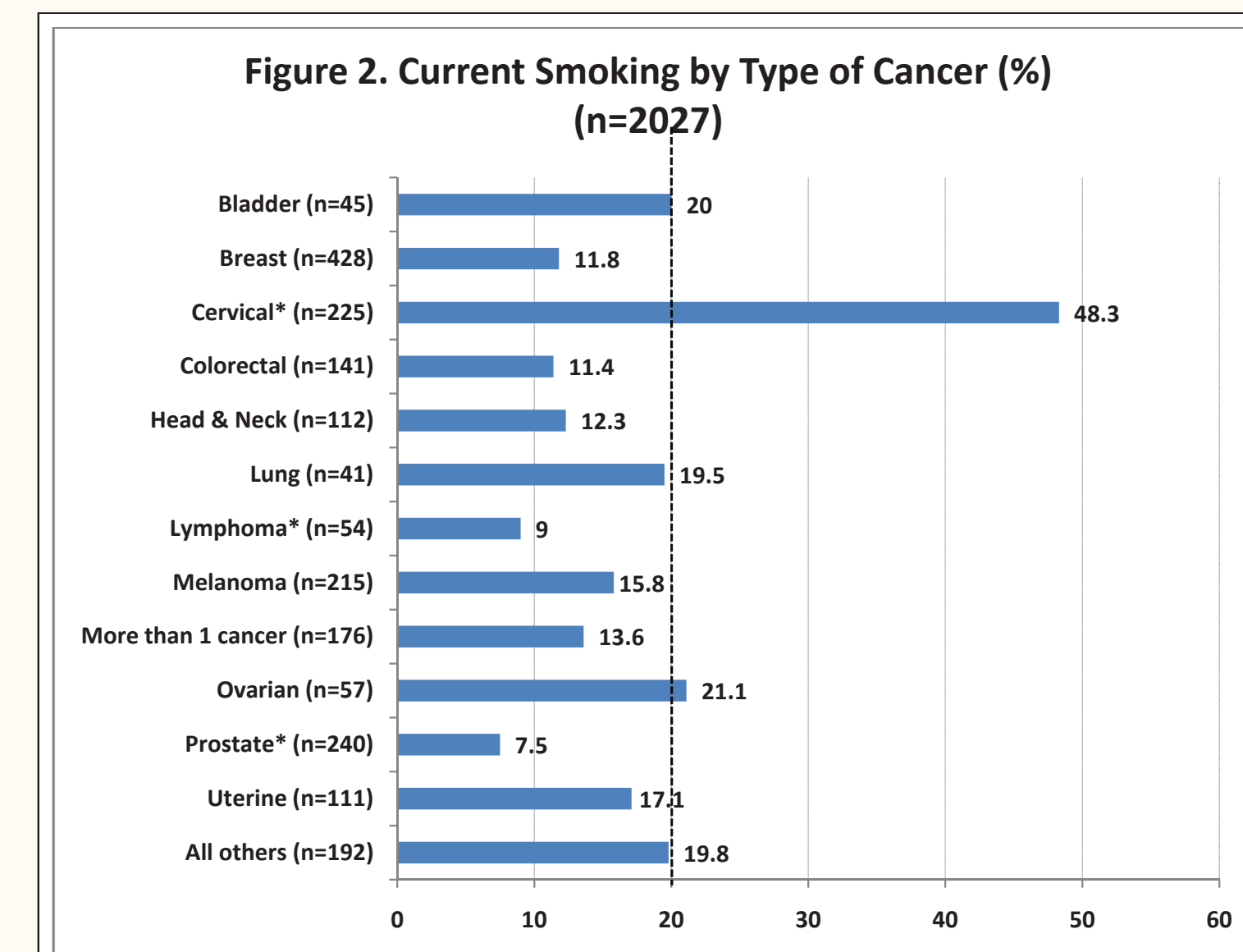
BRFSS US Smoking rates (dotted line) = 21.8% (2003), 20.5% (2005) and 19.7% (2007)
* Significant differences in smoking rate when compared to all other cancers

Limitations

Limitations: This study is based on survey respondent accuracy in reporting their cancer diagnosis and was not validated. There have been a number of studies on the accuracy of self-report for cancer screening; no similar studies were found comparing self-report with medical confirmation of a cancer diagnosis. In addition, the original HINTS were designed to sample the general population and not cancer survivors. Cancer survivors constituted 13.4% of the HINTS sample while the prevalence of survivors in the US population is approximately 4%.

Conclusion

Smoking rates of cancer survivors are declining at a greater rate than the general population. Being diagnosed with cancer has been thought of as a 'teachable moment' where survivors might be more receptive to health promotion and behavior change. Although we were not able to ascertain whether smoking cessation occurred before or after the diagnosis, it is possible that having cancer may have increased the rate of smoking cessation. However, the current smoking rates vary by gender, education, health care access and type of cancer. Women with cervical cancer had the highest rate of smoking compared to other cancer survivors and the general population. Reasons for this disturbing finding need to be explored further. Tobacco cessation programs should be offered to all cancer survivors who currently smoke.

Tobacco Cessation Resources

www.smokefree.gov

1-800-QUIT-NOW

AHRQ Treating Tobacco Use and Dependence (www.ahrq.gov)

HHS Tobacco Cessation - You Can Quit Smoking Now! (www.surgeongeneral.gov)