Smoking cessation patterns by socioeconomic status in Alaska

Barbara Pizacani[a], Kathryn Pickle[a], Julie Maher[a], Kristen Rohde[a,*], Andrea Fenaughty[b]

[a] Program Design and Evaluation Services, Multnomah County Health Department and Oregon Public Health Division, 800 NE Oregon Street, Suite 260, Portland, OR 97232, United States
[b] Alaska Department of Health and Social Services, Division of Public Health, 3601 C Street, Suite 722, Anchorage, AK 99503, United States

ARTICLE INFO

ABSTRACT

The ongoing disparity in smoking prevalence across levels of socioeconomic status (SES) is a significant concern in the tobacco control field, and surveillance of cessation-related activity is key to understanding progress. Historically, lower SES smokers have had much lower quit ratios but this measure can be insensitive to recent quit-related behavior. It is therefore important to examine recent quit-related behavior to assess progress toward addressing this disparity, especially in states with tobacco control programs that focus on this priority population.

We compared recent quit attempts and successes among non-Native lower SES Alaska smokers to those of higher SES using data from the 2012–2013 Alaska Behavioral Risk Factor Surveillance System (BRFSS). We assessed quit ratios, one-year and five-year quit rates, and six-month abstinence between the two groups.

Cessation-related measures restricted to those who smoked in the previous one year did not significantly vary by SES. However, five year quit rates were significantly lower for persons of lower SES vs. higher SES (14% vs. 32% respectively, $p < .001$). Results were consistent after adjustment for age, sex, and other factors.

Results showed that in the previous year, smokers of lower SES in Alaska were trying to quit and succeeding at similar rates as their higher SES counterparts. However, the equivalent pattern of quit success was not reflected in the five-year time frame. Tobacco control programs should monitor cessation trends using both recent and longer-term time frames for this population. More research is needed on reasons for fewer long-term quits among lower SES smokers.

1. Introduction

The disparity in tobacco use between people of lower and higher socioeconomic status (SES) has been well-documented nationally (Centers for Disease Control and Prevention, 2011a). Smoking prevalence is approximately 50% higher among the low SES population (Centers for Disease Control and Prevention, 2011a), initiation rates are higher (Hanson and Chen, 2007), and quit ratios (the proportion of former smokers among ever smokers) are much lower (Flint and Novotny, 1997). The picture is similar in Alaska, and so the Alaska State Department of Health and Social Services Tobacco Prevention and Control Program has included persons of lower SES as a priority population. However, though smoking prevalence has decreased among Alaska adults of higher SES since the program start (23% to 13% from 1996 to 2012, $p > .001$) prevalence has remained high among those of lower SES (39% to 34% during the same years) (Alaska Department of Health and Social Services, Division of Public Health, 2014). Similarly, quit ratios increased from 1996 to 2012 among the higher SES group

(57% to 69%, $p < .01$) but have not changed significantly in the lower SES group (33% to 39%).

Successful surveillance of the population prevalence of adult smoking relies on the ability to precisely measure the extent to which smokers are quitting. To measure such progress, standard practice among state tobacco prevention programs (Centers for Disease Control and Prevention, 2012) has been to assess the quit ratio and the number of quit attempts in the prior year among current smokers. These indicators, however, may be insufficient. For example, the quit ratio includes the large quantity of former smokers who have quit many years before, and thus is insensitive to recent changes. Also, defining quit attempts in the past year as those attempts that resulted in failure alone can be misleading because past year attempts that resulted in success are obscured as they are included in the overall category of former smokers.

It is therefore valuable to also include measures that address recent cessation-related behavior in a basic set of surveillance indicators, especially when evaluating population-based tobacco control programs

---

* Corresponding author at: Program Design and Evaluation Services, 800 NE Oregon Street, Suite 260, Portland, OR 97232, United States.
E-mail address: kristen.rohde@state.or.us (K. Rohde).

(U.S. Department of Health and Human Services, Public Health Service, National Institutes of Health, National Cancer Institute, 2000). In addition, it is worthwhile for programs to assess both components of smoking cessation – recent quit attempts, both successful and unsuccessful – in order to understand the need for motivating smokers to attempt to quit or for helping smokers sustain quits. Although there are surveillance reports that document past year quit attempts by socioeconomic status (Centers for Disease Control and Prevention, 2011b), no U.S. study, to our knowledge, has examined these cessation measures within the environment of a state comprehensive tobacco program in order to assess progress in reducing disparities by SES. The objective of our study was to describe patterns in recent quit rates by SES in the context of such a program.

2. Methods

We used population-based statewide surveillance data from the Alaska Behavioral Risk Factor Surveillance System (BRFSS). The Alaska BRFSS is a random-digit-dialed, cross-sectional household survey stratified on geographic region (Alaska's Behavioral Risk Factor Surveillance System, 2012). Eligible participants are aged 18 years or over, and living in households with a landline or cell telephone. We used data from BRFSS for 2012–2013; the total number of participants during this time was 8602. Response rates for BRFSS were calculated using standards set by the American Association of Public Opinion Research (AAPOR) Response Rate Formula #4 (The American Association for Public Opinion Research, 2016). Annual response rates for the data used in this study ranged from 60%–64%.

The inclusion criteria for the study were as follows: current or former smoker, age 25–64, not of Alaska Native race, and non-missing information on education, income and current or former smoking. These criteria yielded 2265 adults (838 current and 1427 former smokers). The criteria related to age, race, education and income derive from the definition we used for socioeconomic status. We included only adults aged 25 to 64 because a measure of SES based on income and education might not be appropriate for younger adults who may still be completing their education and for older adults who are more likely to be retired. In addition, only non-Native Alaska adults were included because there are well-documented cultural and geographic differences between Alaska Native and non-Native people that should be considered when designing programmatic interventions and analyses (Alaska Department of Health and Social Services, Division of Public Health, 2007). Furthermore, a comprehensive report on the burden of tobacco among Alaska Native people was published by the Alaska Department of Health and Social Services (Alaska Department of Health and Social Services, Division of Public Health, 2007) and included analyses of the association between SES and tobacco use.

2.1. Measures

Below, we briefly describe the measures used. The specific wording of all questions can be found at the website for the Alaska BRFSS (Alaska's Behavioral Risk Factor Surveillance System, 2012). BRFSS information about income, household size, and education was used to develop a marker of SES.

Low SES respondents had either a household income at or below 185% of the Alaska-adjusted poverty guidelines (the Medicaid eligibility guideline in Alaska), or an educational attainment that was less than a high school diploma or GED (General Education Diploma). Higher SES adults had a household income above the 185% poverty guideline and had achieved at least a high school diploma or GED.

We used BRFSS questions to create other demographic measures for gender, age, employment status, any children in the home, marital status, and race/ethnicity. Urbanicity and geographic region were determined based on the zip code or borough of residence.

We created several smoking and quit-related measures. Respondents

were asked whether they had smoked 100 cigarettes in their lives. If they responded "no," they were categorized as never smokers. If they responded "yes," they were asked if they currently smoked every day, some days, or not at all. Those answering "every day" or "some days" were categorized as current smokers; those answering "not at all" were categorized as former smokers. Current and former smokers together were considered "ever smokers."

We determined the period of abstinence from regular smoking by asking former smokers "About how long has it been since you last smoked regularly?" Response options were, "Five years or more, more than a year ago but less than five years, about a year, at least six months but less than a year, at least three months but less than six months, at least 30 days but less than three months, at least seven days but less than 30 days, at least 24 h but less than seven days, or within the last 24 h." Using this information, we categorized former smokers as having quit sometime within the past year, one to five years ago, or more than five years ago.

We then created a quit measure for respondents who smoked during the past year (i.e., those who were either current smokers or who were former smokers and had quit within the past year). Specifically, we grouped them into three categories: did not have a quit attempt in the past year, had an unsuccessful quit attempt in the past year, and successfully quit. We considered a respondent to have successfully quit if they were not currently a smoker, but we did not require that they be quit for any particular length of time. We determined if current smokers had an unsuccessful quit attempt in the past year using the question, "During the past 12 months, have you stopped smoking for one day or longer because you were trying to quit smoking?"

We examined the quit ratio and the one-year and five-year quit rates by socioeconomic status. The traditional quit ratio, which represents cumulative quit success, is defined as the proportion of former smokers among ever smokers. We then restricted the quit ratio to the most recent one-year and five-year time periods – a measure that is equivalent to the cumulative incidence rate for each of the two time periods (Rothman, 1986). The one-year quit rate was defined as the proportion of former smokers who had been quit for any length of time among those who had smoked in the past year. Within this group we further defined a six month abstinence rate as the proportion of former smokers who had been quit at least six months among those had smoked in the past year. The five-year quit rate was defined as the proportion of former smokers among those who had smoked in the past five years.

2.2. Statistical analyses

All analyses were conducted using Stata/IC v. 13.1 and procedures that took the study design into account. We weighted the data to adjust for differential sampling rates within each telephone bank and for the number of telephones and adults in the household, and to ensure that the distribution of participants matched that for Alaska adults not living in institutional settings, based on the Alaska Department of Labor and Workforce Development, Research and Analysis population estimates (Population Estimates, 2010). In addition to weighting for sampling design factors, data were weighted using iterative proportional fitting, or "raking," a procedure used for BRFSS. This method allows for adjustment by multiple demographic factors, including education level, marital status, and renter/owner status, as well as region, gender, age, and race/ethnicity.

We used chi-square tests to compare low SES and higher SES participants with respect to demographic and cessation measures. We also used binary and multinomial logistic regression modeling to assess the effect of age, gender, marital status or presence of children in the home on the observed association between each cessation measure and SES. Statistical significance was based on a p value $< .05$.