

Smokeless Tobacco Use Among Adults in Kentucky: 1994

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We assessed the 1994 prevalence of smokeless tobacco use among Kentucky adults \geq 18 years of age. 649 adults, contacted through a statewide random digit dialing procedure, completed an 18-minute telephone survey which included questions on current and former use of chewing tobacco and snuff. Overall, 4.5% of the sample (95% confidence interval [CI] = 2.95%–6.15%) claimed to currently use smokeless tobacco. Among males, 9.9% (95% CI = 6.1%–13.3%) claimed to currently use smokeless tobacco. Use of chewing tobacco exceeded snuff use by 2 to 1. No women were current users of either chewing tobacco or snuff. A typical current user was male, was over 45 years of age, did not graduate from high school, and lived in a rural or Appalachian county of Kentucky. Former users comprised 17.3% of the sample; all but one of these were male. By the year 2000, the overall prevalence of smokeless tobacco must be reduced by half if Kentucky is to meet its public health objective that no more than 2% of Kentuckians use smokeless tobacco.

The use of smokeless tobacco is a significant public health problem in the United States. Smokeless tobacco, which is sold as snuff and chewing tobacco,¹ increases the risk of gingival recession,^{2,3} oral mucosal lesions,^{3,4} leukoplakia,^{1,2,4} and oral cancers.^{1,3,5}

Despite the 11.7% reduction nationally in cigarette use among adults from 1970 to 1991, smokeless tobacco use showed little decline except among women, a group in which use of smokeless tobacco is generally uncommon. Among males, however, the prevalence of smokeless tobacco use increased during those years from 5.2% to 5.6%. The age group with the greatest increase consisted of males ages 18-24, where the rate increased from 2.2% in 1970 to 8.4% in 1991. Within this age group, snuff use increased from 0.7% to 6.2%, while chewing tobacco use rose

from 1.8% to 4.1%. Yet, for all age groups, chewing tobacco use declined slightly from 1970 to 1991 (3.9% to 3.1%), while snuff use doubled (1.5% to 3.3%). The greatest rise in snuff use was among men ages 25 to 34, showing almost a tenfold increase.⁶

Epidemiologic data reported for current users is often supplemented with data about former users and a third category of "ever" users, composed of both "current" and "former" users. For example, 5.3 million (2.9%) of US adults were current users of smokeless tobacco in 1991, while 4.4% reported being former users; 7.3% were ever users.⁷

For Kentucky and other states, the prevalence of smokeless tobacco use is derived from several surveys relying on self-report, including the National Health Interview Survey (NHIS),⁷ the Current Population Survey,⁸ and the Centers for Disease Control and Prevention (CDC) Behavioral Risk Factor Surveillance System (BRFSS).⁶ Compared with persons who do not use smokeless tobacco, current users are more likely to be male,^{7,9} have fewer years of schooling,^{7,10} have lower household incomes,^{7,10} be unemployed,¹⁰ reside in the southern United States,^{7,9,10} and live in rural areas.^{7,9}

Prevalence estimates from these national surveys provide benchmarks to plan and evaluate tobacco control programs. CDC calls for a nationwide reduction in the prevalence of smokeless tobacco use in males ages 12 to 24 to no higher than 4% by the year 2000 — down from recent estimates that range from 6.6% to 8.9%.¹¹

Kentucky has established a state-specific goal for the year 2000: "to reduce smokeless tobacco use to a prevalence of no more than 2% among Kentuckians."¹² In 1988, 6.1% of adult Kentuckians used smokeless tobacco, with use by men (11.9%) far exceeding use by women (0.9%). The overall adult prevalence in 1988 represented an increase of one third from 1987's prevalence of 4.6%.⁶ While data to monitor smokeless tobacco

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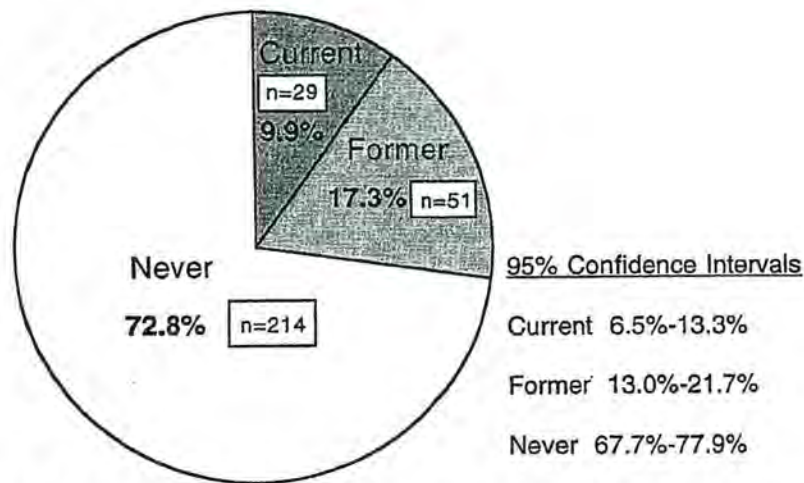


Fig 1 — Prevalence of smokeless tobacco use among males age 18 years and older, Kentucky, 1994 (n = 294).

goals have been collected in at least 24 states since 1988,⁶ similar data for Kentucky is scant or remains unpublished. This data gap hampers the evaluation of efforts to meet Kentucky's Year 2000 goal. Since 1988, only one study on smokeless tobacco use in Kentucky has been published, and it was limited to adolescents in grades 7 through 12 in two Kentucky counties.¹³

Unpublished data from the CDC's Office on Smoking and Health (written communication, January 23, 1995), based on the US Census Bureau's Current Population Survey, estimated that Kentucky's overall prevalence of current smokeless tobacco use was 4.3% in early 1993, down from the same survey's 1985 estimate of 13.6%.⁹ The prevalence among men, 8.5%, remained substantially higher than that of women, 0.5%. However, no information was available on users' age, household income, or other sociodemographic characteristics. Furthermore, these unpublished data do not differentiate between the types of tobacco products used (ie, chewing tobacco or snuff).

In an attempt to bridge the data gap on use of smokeless tobacco, we added four questions about smokeless tobacco use to an annual statewide survey. Our purpose was to estimate the prevalence of current and former users of smokeless tobacco among Kentucky adults and to compare the sociodemographic characteristics of these users with those of persons who claim never to have used smokeless tobacco.

Methods

The Kentucky Health Survey (KHS), an annual household telephone survey of Kentucky residents sponsored by the University of Kentucky Medical Center, provided data for this study. The survey contains questions on health status, health behavior, health insurance, medical services, and sociodemographic characteristics. In 1994, four questions about smokeless tobacco were added, taken verbatim from the National Health Interview Survey (NHIS): "Have you used chewing tobacco at least 20 times in your entire life?" and "Do you use chewing tobacco now?" These two questions were repeated, substituting "snuff" for "chewing tobacco."¹⁴

In June and July 1994, trained interviewers at the University of Kentucky Survey Research Center telephoned households statewide via random digit dialing.¹⁵ One adult (age 18 or older) in each household was asked to complete the questionnaire if he or she spoke English, was capable of hearing and speaking effectively on the phone, and was judged by the interviewer to be competent to participate in the survey. After an eligible respondent's consent was obtained, the interview began and lasted approximately 18 minutes. Responses to all questions were entered immediately into a computer-assisted telephone interview system (CATI).¹⁶ Afterwards, data were analyzed by a mainframe computer using SAS software.¹⁷

Initially, we calculated the percentage of respondents who fell into each of four classifications based on NHIS categories of smokeless tobacco use: (1) *current* users claimed to have used snuff or chewing tobacco at least 20 times and reported using it at the time of the interview; (2) *former* users reported having used snuff or chewing tobacco at least 20 times in their lives but were not using either at the time of the interview; (3) *never* users had used smokeless tobacco fewer than 20 times in their lifetimes; and (4) *ever* users included all current and former users. We then stratified each category according to sociodemographic variables such as age group, marital status, and gender.

Results

Interviewers contacted 1183 eligible adults; of these, 649 persons completed the survey, for a response rate of 54.9%. All respondents, who lived in 89 of the Commonwealth's 120 counties, an-

Table 1. Prevalence of smokeless tobacco use among Kentucky males by sociodemographic characteristics

Characteristic	Current (n = 29)		Former (n = 51)		Ever*Users (n = 80)		Never Users (n = 214)		Total (n = 294)	
	n	%	n	%	n	%	n	%	n	%
Age group (years)										
18-24	2	6.9	5	9.8	7	8.8	10	4.7	17	5.8
25-34	6	20.7	14	27.4	20	25.0	38	17.8	58	19.7
35-44	7	24.1	13	25.5	20	25.0	60	28.0	80	27.2
45-54	7	24.1	6	11.8	13	16.2	44	20.5	57	19.4
55-64	2	6.9	7	13.7	9	11.2	32	15.0	41	13.9
≥65	5	17.2	6	11.8	11	13.8	30	14.0	41	13.9
Married?										
Yes	23	79.3	39	76.5	62	77.5	150	70.1	212	72.1
No	6	20.7	12	23.5	18	22.5	64	29.9	82	27.9
Education (years)										
<12	7	24.1	10	19.6	17	21.2	30	14.0	47	16.0
≥12	22	75.9	41	80.4	63	78.8	184	86.0	247	84.0
County of Residence										
Metropolitan	5	17.2	13	25.5	18	22.5	104	48.6	122	41.5
Nonmetropolitan	24	82.8	38	74.5	62	77.5	110	51.4	172	58.5
Region of State										
Appalachian	12	41.4	13	25.5	25	31.2	54	25.2	79	26.9
Non-Appalachian	17	58.6	38	74.5	55	68.8	160	74.8	215	73.1
Employed?										
Yes	23	79.3	37	72.5	60	75.0	160	74.8	220	74.8
No	6	20.7	14	27.5	20	25.0	54	25.2	74	25.2
Has personal physician?										
Yes	27	93.1	45	88.2	72	90.0	178	83.2	250	85.0
No	2	6.9	6	11.8	8	10.0	36	16.8	44	15.0
Has health insurance?										
Yes	28	96.6	43	84.3	71	88.8	190	88.8	261	88.8
No	1	3.4	8	15.7	9	11.3	24	11.2	33	11.2
Household income/year**										
<\$12,500	1	3.7	6	12.7	7	9.5	25	11.4	32	11.6
\$12,500-\$24,999	5	18.5	9	19.2	14	18.9	51	25.4	65	23.6
\$25,000-\$39,999	10	37.0	13	27.7	23	31.0	42	20.9	65	23.6
≥\$40,000	11	40.8	19	40.4	30	40.6	83	41.3	113	41.1

Some columns may not sum to 100% due to rounding.

* Ever = current + former.

** 19 respondents did not answer income question.

answered the four questions about smokeless tobacco.

Characteristics of the sample

Women comprised 54.7% of those interviewed and men 45.3%. The median age of women (47 years) slightly exceeded that of men (43 years). To determine whether the sample was representative of Kentucky's population, we compared it with the state's 1990 US Census.¹⁸ The KHS sample was within $\pm 3\%$ of the census figures for gender, race, marital status, employment, and annual household income. However, the percentage of adults ≥ 25 years of age who were high school graduates was 80.5% for the survey sample, as compared to 64.6% recorded by the census. Ex-

cept for this last comparison, the sample was indeed representative of Kentucky's population.

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The overall prevalence of smokeless tobacco use was 4.5% (95% confidence interval = 2.9%, 6.1%). All current users were male, and with one exception, all former users were male. The remainder of the analysis, therefore, was restricted to men. Slightly over one fourth of the men were ever users of smokeless tobacco (Fig 1).

Table 1 displays nine sociodemographic characteristics of the men surveyed. The table presents characteristics of former and current users separately, and also combines these two groups to compare men who have ever used

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smokeless tobacco to men who have never used it.

Current users — Compared with both former and never users, current users of smokeless tobacco were more likely to be over 45, married and employed. They were also more likely to be residents of a non-metropolitan county and to live in the Appalachian region. Current users were more likely to have health insurance, a personal physician, and annual household incomes greater than \$25,000. Current users were less likely to have finished high school than either former or never users.

Former users — When compared with both current and never users, former users were more likely to be younger, clustering in the age groups between 18 and 34 years. Compared with current users, former users were more likely to be high school graduates, to reside in a metropolitan county, and to have annual household incomes less than \$25,000. However, former users were less likely than never users to show these last three characteristics. Former users did not differ from never users in the proportion that were currently employed or the proportion that resided in Kentucky's Appalachian region.

Never versus ever users — Ever users, defined as the pooled group of current and former users, were compared with those who had never used smokeless tobacco. The never users had a higher household income than the ever users and were more likely to be over 35 years old. They were also more likely to be high school graduates and residents of a metropolitan county. Ever users were more likely than never users to be married and to reside in the Appalachian region. Ever users did not differ from the never users in the likelihood of being employed or having health insurance.

Education and Residence

Two diverse sociodemographic groups, based on education and county of residence, were identified and contrasted by user type. Among men without a high school diploma, living in nonmetropolitan Appalachian counties, 25.0% were current users of smokeless tobacco. In contrast, only 3.9% of men with a high school diploma, living in metropolitan counties outside Appalachia, were current users — a ratio of 6.4 to 1.

Age

The proportion of never, former, and current users

of smokeless tobacco varied within the six age groupings. The age group 55-64 had the lowest proportion of current users (4.9%). The proportion of former users declined steadily from age group 18-24 (29.4%) to age group 45-54 (10.5%). The proportion of never users increased with age from 58.8% among 18- to 24-year-olds to 78.1% in the 55-64 age group.

Use of chewing tobacco versus snuff

Among the 29 current users, 20.7% used both forms of smokeless tobacco, while 58.6% used chewing tobacco only and 20.7% used snuff only. A similar proportion of the 51 former users said they had used chewing tobacco only (56.9%), while a smaller proportion (11.8%) had used snuff only, and 31.4% had used both forms. Among both current and former users, there were overall about twice as many chewing tobacco users as snuff users.

The type of smokeless tobacco currently used differed with the respondent's age. Older persons were more likely to be current users of chewing tobacco than of snuff: 21.7% of current users of chewing tobacco were age 65 years or older, while only 8.3% of current users of snuff were of this age group. The median age of current snuff users was 40, while the median age of current chewing tobacco users was 44.

Smokeless tobacco and cigarettes

Among the 29 current users of smokeless tobacco, 24.1% were current cigarette smokers, while 13.8% were former smokers. Of all 294 Kentucky men sampled, less than 1% currently used chewing tobacco and snuff and cigarettes.

Discussion

This study provides the first published results in several years on the use of smokeless tobacco among Kentucky adults. Furthermore, these findings from 1994 can help evaluate progress in reducing smokeless tobacco use in Kentucky. If the Commonwealth is to meet its Year 2000 prevalence goal of 2.0%, the use of smokeless tobacco we report (4.5%) must be reduced by more than half. Based on Kentucky's 1990 population,¹⁸ about 67,400 persons aged 18 years and over must cease smokeless tobacco use by the year 2000.

The overall adult prevalence of smokeless tobacco in Kentucky in 1994 (4.5%) almost matches the yet unpublished 1993 prevalence of

4.3% (CDC Office on Smoking and Health, written communication, January 23, 1995). However, when compared with the 1988 prevalence of 6.1%,⁶ the 1994 prevalence suggests a 25% decline in current smokeless tobacco use over six years.

Among Kentucky women, current use of smokeless tobacco remains extremely low, consistent with 1988 (0.9%) and 1993 (0.5%) state findings. Among Kentucky men, current use of smokeless tobacco (9.9%) remains high, over twice the national prevalence of 4.0% (CDC Office on Smoking and Health, written communication, January 23, 1995). Yet the prevalence of smokeless tobacco use we report (9.9%) is less than the state's 1988 prevalence of 11.9%. While this suggests that use of smokeless tobacco among Kentucky males has dropped by one sixth since 1988, the combination of a low proportion of current users and a relatively small sample size limits the statistical power needed to identify a true decline. A similar issue of measurement error might account for the 1994 prevalence being slightly higher than the 1993 prevalence (8.5%).

The ratio of current chewing tobacco users to current snuff users in this study (2:1) is consistent with ratios reported for the South,⁹ though the national ratio is about 1:1.⁶ Our results are consistent with national data on current smokeless tobacco use in two other ways: (1) snuff users tend to be younger than chewing tobacco users,^{6,7,9} and (2) about 1 in 4 current smokeless tobacco users is also a current cigarette smoker.⁷

When the sociodemographic characteristics of smokeless tobacco users in Kentucky are compared with those in national studies, both similarities and differences are detected. For example, current users in our study, when compared with never users, tended to have lower levels of education^{7,10} and reside in a non-metropolitan county,⁷ findings seen nationwide. However, our findings differed from national studies which reported that current users had lower incomes than never users^{7,10} and were less likely to be employed.¹⁰

Since about 9 out of 10 current smokeless tobacco users reported having a personal physician, several implications for primary care are evident. Among the most important for physicians is patient counseling and education on cessation of smokeless tobacco use. One recent cessation program conducted in a dental office increased the proportion of users who quit by about one half.¹⁹ The *Guide to Clinical Preventive Services* recommends that tobacco cessation counseling be offered on a regular basis to all patients who

use tobacco products, including smokeless tobacco. Furthermore, adolescents and young adults who do not currently use tobacco products should be advised not to start.²⁰

The results of this cross-sectional study must be tempered against several limitations, including the variability of the overall and gender-specific prevalences, sampling biases of telephone surveys, and validity of data obtained from self-report. The confidence intervals shown in Fig 1 reveal the variability of the prevalences, given the sample size and low proportion of users in the sample. In addition, telephone surveys cannot reach persons without telephones, who are more likely than those with telephones to have a lower income, to live in a rural nonfarm area, and to have less education.¹⁶ Since these same factors are also associated with current use of smokeless tobacco, the prevalence of current users might have been higher if persons without telephones had been surveyed. This might also explain the higher education level in the sample compared with the 1990 census. Lastly, data obtained from self-report regarding behavioral risk factors, such as alcohol and seat belt use, may not be predictive of actual behavior.²¹ Since the use of smokeless tobacco is often seen as socially undesirable, some current users might have denied being users.

Researchers may wish to replicate this study using a larger sample size. Our decision to add questions to an existing fixed-sample survey, though highly cost-effective, limited statistical power needed to detect statistical significance, particularly for changes in smokeless tobacco use since 1988. One solution to the problem of low sample size would be for the Kentucky Department of Health Services to add questions on smokeless tobacco use to future versions of the BRFSS survey, which annually samples about 2000 persons statewide. Furthermore, questions could be added regarding patterns of smokeless tobacco use, such as cumulative years of use, frequency of use, attempts to quit, involvement in tobacco production, and age of first use.

In summary, persons most likely to use smokeless tobacco in Kentucky are those who have not completed high school, who reside in non-metropolitan counties, and who live in Appalachia. Given the increasing popularity of smokeless tobacco nationwide, particularly among young males, prevention efforts must be escalated in order to reach Kentucky's Year 2000 goal of a prevalence of no more than 2%.

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