



Approximately 9 million American adults use two or more tobacco

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**METHODS** Alaska Native adults reporting daily smoking and identified with high

prevalence of dual use combinations were identified through a survey of Alaska Native

**RESULTS** Participants (n=299) were 48.5% female and identified as Yup'ik (31.1%),

with 18.7% reporting dual use combinations. The most prevalent dual use combinations were

**CONCLUSIONS** Young men identifying as Yup'ik were more likely to use dual

use combinations than other Alaska Native groups. The prevalence of dual use combinations

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**INTRODUCTION**

Regular use of two or more tobacco products (e.g. cigarettes, cigars, smokeless tobacco, e-cigarettes), termed dual or poly use<sup>1</sup>, is common<sup>2</sup>. Approximately 9 million adults in the US use two tobacco products or more<sup>2</sup>, with the most prevalent dual use combinations of cigarettes/e-cigarettes (30.1%) and cigarettes/

cigars (29.2%)<sup>3</sup>. Recent data indicate that dual tobacco use may be on the rise<sup>3,4</sup>, may be associated with lower quit rates<sup>5</sup>, and may result in greater exposure to tobacco toxins<sup>1</sup>.

Although smoking in the US has significantly declined over the last several decades, disparities exist. Compared to all other major racial/ethnic

groups, American Indian/Alaska Native people have the highest prevalence of any tobacco use (32.3% vs 21.9% or less)<sup>2</sup>, and specifically cigarette smoking (22.6% vs 15.0% or less)<sup>2</sup> and smokeless tobacco use (8.4% vs 4.5% or less)<sup>6</sup>. Among American Indian/Alaska Native people, 4.9% report dual tobacco product use compared to 4.1% or less for other major racial/ethnic groups<sup>6</sup>.

Specifically, in Alaska, 35.1% of Alaska Native people smoke cigarettes compared to 20.7% or less for other major racial/ethnic groups<sup>7</sup>. The higher smoking prevalence is due in part to low quit rates among Alaska Native adults who smoke<sup>8</sup>. Regional differences in tobacco product use also are apparent. State surveillance data indicate that cigarette smoking

*Demographic characteristics*

Participants reported their age, gender, level of education, annual household income, and subjective social status. Age was categorized as 19–35, 36–50, 51 years old. Education level attained was analyzed as some high school or less, high school graduate, or some college or more. Annual household income was categorized as 10000, 11000–25000, 26000–50000 and 51000 US . Subjective social status in one's community was reported on a scale from 1 (lowest) to 10 (highest)<sup>20</sup>.

*Alaska Native cultural characteristics*

Participants reported their Alaska Native tribal group (Aleut, Athabascan, Inupiat, Yup'ik, other) and whether they spoke their tribal language (no/yes). Due to low numbers of Aleut and Athabascan participants, analyses compared Inupiat only, Yup'ik only, and other. Participants who identified with more than one tribal group (n=18) were classified as other. Participants also reported their level of identification with their Alaska Native heritage with response options dichotomized for analyses as not at all/very little and somewhat/very much.

*Smoking characteristics*

Smoking characteristics included the average number of cigarettes smoked per day in the past week, smoking of menthol cigarettes (analyzed as non-menthol only vs menthol-only or both), the age of smoking initiation, time to first cigarette upon waking (analyzed as within or after 30 minutes), and home smoking rules (analyzed as no smoking allowed indoors or other). Lifetime 24-h quit smoking attempts were analyzed as none or one or more. Stage of change for quitting smoking was categorized as in precontemplation (not intending to quit in the next 6 months), contemplation (intending to quit in the next 6 months), or preparation stage of change

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Characteristics	Overall (n = 299)	No dual use (n = 269)	Dual use (n = 30)
All participants, %	100	90.0	10.0
<b>DEMOGRAPHIC</b>			
Age (years), %			
19–35	27.8	25.7 <sup>a</sup>	46.7 <sup>b</sup>
36–50	29.1	27.1 <sup>a</sup>	46.7 <sup>b</sup>
51	43.1	47.2 <sup>a</sup>	6.7 <sup>b</sup>
Gender, %			
Female	48.5	51.3 <sup>a</sup>	23.3 <sup>b</sup>
Education level, %			
Some high school or less	20.5	19.4	30.0
High school graduate	59.7	60.4	53.3
Some college or more	19.8	20.1	16.7
Annual household income (US\$), %			
10000	29.4	29.2	31.0
11000–25000	21.3	21.3	20.7
26000–50000	20.6	21.0	17.2
51000	9.5	10.5	0
Don't know/refused	19.3	18.0	31.0
Community subjective social status, mean (SD)	5.3 (2.1)	5.3 (2.1)	5.2 (1.8)
<b>CULTURAL</b>			
Alaska Native tribal group, %			
Inupiat	60.5	63.2 <sup>a</sup>	36.7 <sup>b</sup>
Yup'ik	31.1	29.4	46.7
Other	8.4	7.4	16.7
Identification with Alaska Native heritage, %			
Not at all/very little	14.4	12.3 <sup>a</sup>	33.3 <sup>b</sup>
Very much/somewhat	85.3	87.7 <sup>a</sup>	66.7 <sup>b</sup>
Speaks Alaska Native tribal language, %	61.1	60.4	66.7
<b>SMOKING</b>			
Cigarettes smoked per day, mean (SD)	12.4 (10.0)	12.6 (10.4)	11.3 (6.5)
Smokes ≥ 10 cigarettes per day, %	63.5	64.2	60.0
Age at smoking initiation, mean (SD)	16.8 (5.6)	17.0 (5.7)	15.1 (4.3)
Smokes within 30 minutes of waking, %	65.3	64.2	75.9
Home indoor smoking ban, %	13.8	12.6	23.3
Reported 24-h lifetime quit attempt, %	80.3	84.0	83.3
Stage of change for smoking cessation, %			
Precontemplation	32.8	33.8	30.0
Contemplation	45.8	46.4	50.0
Preparation	19.4	19.8	20.0

a,b Denote significant group differences for the characteristic of interest (rows) by dual tobacco (columns) per chi-squared and t-test analyses. A family-wise Bonferroni correction was applied for three conceptual variable groups: 1) demographic (5 items, p<0.010); 2) Alaska Native cultural (3 items, p<0.017); and 3) smoking behaviors (6 items, p<0.008) characteristics. SD: standard deviation.



control policy and treatment efforts. Findings highlight the relevance of cultural factors to dual tobacco use. Given that tobacco use is not native to the region, efforts that build connection to and identification with one's Alaska Native culture may bring the added benefit of dissuading tobacco use and supporting tobacco cessation. Given the differences observed here by tribe in the prevalence of dual tobacco product use, attention to regional and tribal differences is warranted.

#### Strengths and limitations

Study strengths include the inclusion of multiple cultural factors and a detailed assessment of tobacco-related product use and related behaviors. Data were collected in only one Northern Alaska region. Findings may differ for Alaska Native people in other regions where the use of other types of tobacco (e.g. Iq'mik) may be more prevalent. Participants were all adult daily smokers with at least one cardiovascular disease risk factor; hence, findings may have limited generalizability. Data for the current study were cross sectional, and therefore, it is not possible to draw any casual connections. Future research should examine changes over time in dual product use in the context of demographic, Alaska Native cultural, and tobacco-related behaviors.

## CONCLUSIONS

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