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An Analysis of the Differences in Health Outcomes and Socioeconomic Factors Between Veteran Smokers and Non-Smokers in Tobacco-Growing States

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An Analysis of the Differences in Health Outcomes and Socioeconomic Factors Between Veteran Smokers and Non-Smokers in Tobacco-Growing States

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ABSTRACT

Tobacco usage still remains the single most preventable cause of disease, disability, and death in the United States. Service members and veterans, especially those residing in tobacco-growing states, face higher levels of societal pressure to take up the habit compared to their civilian counterparts. This research investigates why this is the case, the differences in health outcomes, and the differences in socioeconomic factors between the veteran smoking and non-smoking populations before making policy recommendations to policymakers and stakeholders to address this problem.

KEYWORDS: service members and veterans, tobacco-growing states

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Introduction

As tobacco rates continue to fall across the country, there are still several states which maintain steady rates of tobacco use. This problem is especially devastating for service members and veterans (SMVs) who reside in tobacco-growing states, such as Kentucky, Tennessee, Virginia, and North Carolina, as they face an unusually high societal pressure to continue their smoking addiction following the conclusion of their military service. The three major factors that foster this environment are the tobacco industry's targeted marketing approach towards the military, SMVs consuming tobacco products to cope with the stressors related to the lifestyle, and the culturally storied relationship between tobacco and the states that produce it. This research aims to explore the depth of these relationships, discuss the impact of this habit on health outcomes, and make recommendations to stakeholders and policy makers on how to combat this issue.

Literature Review

SMV Tobacco Use Risk Factors

Corporations will take whatever steps necessary to create as many consumers as possible at the youngest age possible to ensure their future profits and growth potential. This is especially true regarding the tobacco industry and their multi-faceted efforts to target the military population, a population they themselves have described as "plums here to be picked" (Smith, 2009). Efforts that include sending tobacco branded care packages to deployed troops, flooding military base commissaries and off base shops with cheap tobacco products, and sponsoring 1,400 military events between 1980 and 1997. In fact, the Department of Defense (DoD) banned this type of sponsorship in 1986, yet they continued to occur for another eleven years due to the pervasive, parasitic relationship between the tobacco industry and the military, who the industry candidly described as "less educated, part of the 'wrong' crowd, and having less desirable job opportunities" in leaked documents (MCCS, 2016). It took restrictions imposed by the Master Settlement Agreement (MSA) for these events to completely stop (Smith, 2009).

As of 2011, 24% of those (25% of men and 17.8% of women) in the military reported being smokers at that time (Truth, 2021). This high prevalence of usage only serves to line the pockets of the tobacco industry, degrade the readiness of the United States military, and reduce the health outcomes for SMVs who use tobacco. Out of that 24%, 38% reported to have begun smoking while serving in the military (Truth, 2021). Active-duty military smokers have reduced physical performance capacity, lower levels of visual perception in dim lighting, accelerated hearing loss, increased risk of injury, miss more working days, and face higher rates of hospitalization than non-smokers (30% for men and 25% for women) (Truth, 2021).

Although the tobacco industry has played a significant portion in creating the dependency problems that we see among SMVs, there are other influencing factors at play. The primary one being the increased number of stressors associated with military service. Being away from family for extended periods of time, the dangerous aspects related to the job, and the regimented routine the rigid lifestyle requires all serve to put the service member under a vast amount of pressure. Days full of hard work followed by long nights spent on watch create tense, fatigued individuals. These individuals yearn for release, usually in the form of a stimulant, so they're able to stay conscious throughout the night. Although a cup of coffee might wake them up, it does nothing to address the tightly bound knot in their gut. A cigarette or chewing tobacco on the other hand alleviates their stress, soothes their anxiety, hides their sleep deprivation, and affords them a sense of autonomy in an otherwise strict environment (Poston, 2008). Although SMVs know that tobacco usage is a detriment to their health, when compared to the dangers they face while on deployment these issues seem inconsequential and are vastly outweighed by the feeling of freedom the choice creates.

This issue is only further exacerbated when SMVs are on deployment. Where all the normal stressors are turned up to ten, in a hostile, foreign country, and decisions can have life or death consequences for the individual and those around them. When SMVs find themselves isolated from their loved ones under these conditions, tobacco is often one of the few solaces they have access to. In fact, a 2019 study found that one in every six Air Force members picked up smoking while on deployment (Talcott, 2015). Another study found that this relationship extends by up to three degrees of separation, i.e., it's not only an individual's friends but also their friends' friends and their friends' friends' friends that play a part (Christakis, 2013). Therefore, the more tobacco users in one's social network, whether they interact or not, the

higher the risk an individual faces in becoming a user. The consequences of this shared experience are especially pertinent, as the United States has been actively deploying troops to several countries located in the Middle East since September 2001.

It's estimated that between 1.9 to 3 million service members were deployed over those two decades (Watson, 2021). If we take existing smoking figures and extrapolate based on the 2019 study, we can estimate that between 317,000 to 500,000 SMVs picked up smoking while on deployment only. The lower smoking rates among members of the air force also are not accounted for, so when including the elevated smoking rates found in other branches these estimations are conservative. These figures also don't include those who picked up the habit prior to joining the service or those who picked up after their deployment, whose rates are also elevated. A 2011 DoD study found that, post-deployment, nonsmokers had a 60% chance of picking up the habit while former smokers had a 30% chance of resuming the habit (Truth, 2021), presumably due to the high psychological impact of the deployment.

One study estimated that SMVs who had deployed to Iraq or Afghanistan had a 36.9% prevalence for mental health diagnoses, a 21.8% prevalence for PTSD, and a 17.4% prevalence for depression (Seal, 2009). This is especially pertinent as a 2011 study found that individuals with a mental illness smoked at a rate of 36.1% while those without smoked at a rate of 21.4% (NIDA, 2021).

Smoking Rates by Service (Truth, 2021):

     1.   Marine Corps - 30.8%

     2.   Army - 26.7%

     3.   Navy - 24.4%

     4.   Air Force - 16.7%

Tobacco-Growing State Resident Risk Factors

Kentucky, like other states rife with tobacco's cultural influence, is an environment that isn't conducive for people to quit using tobacco. Tobacco farmers in Kentucky, Tennessee, North Carolina, and Virginia aim to have the tobacco stripped by Thanksgiving and sold by Christmas so they can pay their bills and have a little extra spending money for Christmas gifts (Ferrell, 2009). The 13-month long stages of the tobacco-growing and selling process are tied to culturally significant events and holidays throughout the year, which has created a bond between the population and the crop.

Although tobacco usage has fallen across the board, Kentucky, tied with West Virginia, still leads the country in usage at 24% (Elflein, 2020), is followed by both Tennessee at 20% and North Carolina at 19%, with Virginia trailing in the back at 14% (Office on Smoking and Health, 2021). The tobacco culture of these states only exacerbates this issue, with tobacco lobbyist Altria spending nearly $380,000 during the Kentucky 2018 General Assembly to prevent an increase in cigarette taxes. For comparison, this is more than twice the amount spent by any of the other 720 entities allowed to lobby in Kentucky (Loftus, 2018). Although the Master Settlement Agreement and other legislation have impacted the depth of this influence, according to the USDA, in 2017 North Carolina ranked 1st nationally in terms of market value of

agriculturally sold tobacco products and was followed closely by Kentucky at 2ⁿᵈ then Virginia at 3ʳᵈ and Tennessee at 4ᵗʰ (USDA, 2017). So, out of the 50 states, these four still produced the largest crop yields of tobacco in 2017. Domestically, this means that these states are largest remaining bastions for tobacco production.

If you are a veteran residing in the state of Kentucky, according to the American Lung Association, you are automatically in two of the top ten populations most disproportionately affected by cigarette and tobacco use: veterans and those living in traditional tobacco-growing states (Lung, 2021). Many SMVs residing in the state will also find themselves in more than just those two groups, some might even find themselves a member of all ten, depending on race/ethnicity, socioeconomic status, and other criteria. This issue is especially evident in the veteran population, who use tobacco at a rate of 29.2% according to one CDC study (Odani, 2018). When analyzing for different subgroups, the same study also found that veterans aged 18-25 used at a staggering rate of 56.8% and that, across all ages, veterans used at a higher rate than their civilian counter parts except for males over the age of 50.

Tobacco Impact on SMVs

The DoD, on average, spends more than $1.6 billion every year on tobacco related losses such as working days missed and hospitalizations. Additionally, service members who smoke require more resources than their non-smoking counterparts, costing the DoD an extrapolated $130 million per year in additional training expenses (Talcott, 2015). These high smoking rates don't end following the conclusion of service either, with the VA reporting that, in 2021, 55.5 percent of enrollees were classified as ever smokers and 12.9 percent were current smokers (Wang, 2021). These elevated smoking rates translate into higher levels of healthcare

expenditures. One 2014 study estimates that, out of the $40.2 billion the VHA received, 2.7 billion of it was spent on diseases directly attributable to smoking (Barnett, 2014).

It's also important to remember that not all veterans receive their care from the VHA, many of which utilize the same healthcare delivery system in the state as their civilian counterparts. For example, in 2009, the Kentucky healthcare system saw a total of $1.9 billion spent on smoking attributable expenditures and nationally it's estimated that $170 billion is spent annually treating smoking caused diseases (CDC, 2022). Over the past twenty years the Department of Veterans Health Administration (VHA) has spent $5 billion treating COPD alone (Talcott, 2015). Although we cannot determine whether each individual suffering from COPD was an active smoker, we do have CDC data stating that three in every four Americans who suffer from COPD have smoked before.

This same data states that lung irritants, such as secondhand smoke, are a huge contributor in those cases and that eight out of every ten COPD deaths is related to cigarette smoking (CDC, 2021). This information is not only significant for SMVS who smoke, as smoking reduces one's life expectancy by ten years, but also for those around them as the CDC estimates that approximately 41,000 deaths every year are due to lung cancer and heart disease caused by secondhand smoke (Office on Smoking and Health, 2020). Several of these health issues include, but are not limited to, elevated rates of cancer, COPD, coronary heart disease (CHD)/myocardial infarction (MI), stroke, arthritis, depression, and asthma.

Methods

The data source used for this study was obtained from the 2019 and 2020 Behavioral

Risk Factor Surveillance System (BRFSS) datasets (BRFSS, 2020). BRFSS is a phone health

survey created by the CDC and state health departments across the US. The purpose of the health

survey is to collect health related data in a methodical and standardized method. The data

includes information regarding US citizens' behaviors and preventive health practices that affect

their quality of health and has been used to inform policy makers and public health officials

when assessing how to improve the health of their citizens.

The strengths of BRFSS lies with its validity, quality, and reliability. The quality and

reliability of the data is ensuring that the results of the test are consistent. The validity of the

BRFSS questionnaires ensures that the questions asked, and the data collected were appropriate

to the understanding of the participants and were what the researchers intended on measuring.

We can be sure that data maintains high standards as the data from BRFSS has consistently been

tested by numerous studies.

The program Statistical Analysis Software v9.4 (SAS) was used for the statistical

analysis portion of this paper. The dataset includes responses from four tobacco-growing states:

Kentucky, Tennessee, North Carolina, and Virginia. These populations were first limited based

on yes response to the variable VETERAN3 to remove all civilians from the dataset. Then, the

calculated variable titled _RFSMOK3 was used to divide the population between current

smokers and those who either never smoked or were former smokers. This variable was used to

determine whether the population was actively using tobacco products. Tables of descriptive

statistics based on the variables _EDUCAG, SEXVAR, _RACEGR3, and INCOME2 were then

created for each state to determine the socioeconomic differences between smoking and non-

smoking veterans, compare smoking rates based on preexisting CDC data, and to build a better understanding of their unique sociodemographic profiles. All don't know/not sure, missing, and refused responses were excluded.

Following the creation of those descriptive statistics, seven variables were selected, based on preexisting literature linking them and tobacco use, and evaluated using bivariate analysis to determine any significant relationship between smoker status and the major ailment that the variable measured. These seven variables are _MICHD, CVDSTRK3, ADDEPEV3, HAVARTH4, CHCOCNCR, CHCCOPD2, and ASTHMA3. These variables were chosen due to their ability to encompass the major ailments related to tobacco consumption and a description of each SAS variable utilized can be found in the Appendix.

Results

Descriptive statistics for veterans in the state of Kentucky showed that approximately 19% were actively using tobacco products. Out of those who used tobacco products, approximately 84% were white, 10% were black, 6% were another race, 8% were female, and 92% were male. Descriptive statistics for veterans in the state of North Carolina showed that approximately 14% were actively using tobacco products. Out of those who used tobacco products, approximately 67% were white, 24% were black, 9% were another race, 13% were female, and 87% were male. Descriptive statistics for veterans in the state of Tennessee showed that approximately 19% were actively using tobacco products. Out of those who used tobacco products, 77% were white, 12% were black, 11% were another race, 13% were female, and 87% were male. Descriptive statistics for veterans in the state of Virginia showed that approximately 12% were actively using tobacco products. Out of those who used tobacco products, 70% were

white, 19% were black, 11% were of another race, 16% were female, and 84% were male. Descriptive Statistics can be seen in Tables 1A-1E in the appendix.

Chi-squared tests investigating the relationship between veteran tobacco users and veteran non-tobacco users revealed that there are statistically significant relationships between tobacco use and COPD, depression, stroke, CHD/MI, cancer other than skin cancer, arthritis, and asthma. These variables were all shown to have significance levels of $p \leq 0.05$. Therefore, we reject the null hypothesis for all variables.

The CHD/MI and stroke variables show a positive relationship between respondents reporting tobacco use and their prevalence. The proportion of respondents who reported using tobacco and responding yes to having CHD/MI is 20.2% compared to 18.2% for those who did not report tobacco use which resulted in a 2% favor in tobacco users out of 6,935 respondents. The proportion of respondents who reported using tobacco and having had a stroke was 9.5% versus 7% in those who did not report using tobacco which resulted in a 2.5% difference in favor of tobacco users out of 6,973 respondents. Figures, Wald chi-square values, and p-values can be found in Table 1F in the appendix.

The depression and arthritis variables show a positive relationship between respondents reporting tobacco use and their prevalence. The proportion of respondents who reported using tobacco and having depression was 41.5% versus 18.5% in those who did not report using tobacco which resulted in a 23% difference in favor of tobacco users out of 6,962 respondents. The proportion of respondents who reported using tobacco and having arthritis was 70.3% versus 67.7% in those who did not report using tobacco which resulted in a 2.6% difference in favor of tobacco users out of 6,949 respondents. Figures, Wald chi-square values, and p-values can be found in Table 5F in the appendix.

The COPD and asthma variables show a positive relationship between respondents reporting tobacco use and their prevalence. The proportion of respondents who reported using tobacco and having COPD was 32.4% versus 10.5% in those who did not report using tobacco which results in a 21.9% difference in favor of tobacco users out of 6,963 respondents. The proportion of respondents who reported using tobacco and having asthma was 13.4% versus 10.4% in those who did not report using tobacco which resulted in a 3% difference in favor of tobacco users out of 6,974 respondents. Figures, Wald chi-square values, and p-values can be found in Table 6F in the appendix.

The cancer other than skin cancer variable shows a negative relationship between respondents reporting tobacco use and the prevalence of cancer other than skin cancer. The proportion of respondents who reported using tobacco and having cancer other than skin cancer was 12.3% versus 15.9% in those who did not report using tobacco which resulted in a 3.6% difference in favor of nontobacco users out of 6,971 respondents. Figures, Wald chi-square values, and p-values can be found in Table 2F in the appendix.

Discussion

The purpose of this research is to investigate the differences between veteran smokers and nonsmokers, their tobacco utilization rates, health outcomes related to tobacco use, socioeconomic factors, and to compare the BRFSS data to preexisting demographic data in four tobacco-growing states: Kentucky, Tennessee, Virginia, and North Carolina. This research then aims to utilize the data uncovered to evaluate whether veterans who reside in these states face higher levels of tobacco usage versus their civilian peers, whether the health outcomes amongst the veteran population are worse depending on current tobacco usage, and if there is a difference in socioeconomic factors before utilizing the information uncovered to propose potential policy

recommendations. As discussed, the veteran population and those who reside in tobacco-growing states are the ones who suffer most disproportionately from the tobacco consumption epidemic.

Due to the extensive steps tobacco companies take while marketing to active-duty military, the tobacco friendly culture found in these states, and the influence tobacco lobbyists have in maintaining their ability to continue domestic production and consumption in these states, veterans face a higher societal pressure to use tobacco products than their civilian peers. According to the American Lung Association, the propensity to use tobacco can be further exacerbated based on their sexual orientation, whether they live in a rural area, their insurance coverage, income levels, and mental health status (Lung, 2021). This issue only further widens preexisting health disparities veterans face, which when combined with the harsh consequences of the profession, leads to earlier development of chronic diseases, increased prevalence of psychological trauma, and a higher frequency of debilitating physical impairments. The elevated rates of these issues can be seen in the Results section with tobacco using veterans facing higher proportions of six of the seven variables analyzed, with some of the negative health outcomes being 23% more likely among the tobacco using veterans.

Disparities related to education and income levels also exist between the two subgroups of the veteran population. As previously discussed, individuals who lack insurance coverage and have lower levels of income are among the populations more at risk to be tobacco users and, according to the Bureau of Labor and Statistics, the higher one's level of education the less likely an individual is to be unemployed (Torpey, 2018). Therefore, we can assume that veterans who smoke will also have lower education and income levels than veterans who do not smoke. This assumption is supported by the descriptive statistics found in the descriptive statistics section of the Appendix. On average, 74% of veterans residing in the four specified states who do not

smoke have at least some college education whereas only 61% of veterans who do smoke in the same states have at least some college education. Similar figures can be found in the income portions of the descriptive statistics, with 86% of veterans who do not use tobacco making over $25,000 whereas only 72% of veterans who do smoke make over $25,000.

When comparing the Census Bureau's demographics for state populations to the BRFSS results, the descriptive statistics also revealed some racial and gender disparities among the smoking population. Blacks used at a 2% and 3% higher rate than their demographic proportion would imply in the states of KY and NC, respectively. Other races used at a 5% and 1% higher rate than their demographic proportion would imply in the states of TN and KY, respectively. Whites used at a 2% higher rate than their demographic proportion would imply in VA. According to the Department of Labor, females make up approximately 10% of the veteran population (US Department of Labor, 2019). However, in the states of North Carolina and Tennessee 13% of the veteran tobacco using population is female while 16% of the veteran tobacco using population in Virginia is female. Because of these disparities, it is important for veterans, as a vulnerable population containing several other vulnerable subgroups, to be adequately represented in surveys such as the BRFSS in the hopes that the issues of these marginalized populations will be accounted for in future policy planning.

However, it is important to note that, when compared to the current CDC figures, none of the smoking veteran populations in any of the four states have a higher smoking rate than the whole state. Based on the 2019 and 2020 BRFSS data, veterans in the state of Kentucky smoke at a 5% lower rate, veterans in the state of North Carolina smoke at a 6% lower rate, veterans in Tennessee smoke at the same rate, and veterans in the state of Virginia smoke at a 2% lower rate. Although these figures are surprising, especially knowing that veterans make up approximately

7% of the population yet represent 14% of these survey responses, it is important to remember the limitations associated with the BRFSS dataset.

Limitations

A limitation of this study is the usage of unweighted data. This means that the inclusion of racial and ethnic minority groups might not be adequately represented in the findings. Therefore, no conclusive statement can be made when applying the findings of our data to these groups. Weighting also helps eliminate additional bias that may still exist through the wording of the questions in the survey. Thus, usage of unweighted data may also skew our data in various directions.

Another limitation of this study is the use of the variable _RFSMOK3 which groups former smokers with those who have never smoked against current smokers. There is no way to distinguish how recently some of the former smokers quit, how many years they smoked prior to quitting, or the frequency at which they smoked. Because of this, there is a chance that portions of the respondents who fall into the former category still suffer from chronic issues that stem from their time spent as a smoker. Depending on the prevalence of respondents with these issues, the nonsmoker population data regarding the chronic condition variables could skew higher than if the variable had a third category for former smokers.

A third limitation comes from utilizing data from self-reported surveys. A degree of uncertainty is always introduced due to the likelihood of bias from self-reporting. Respondents could either underreport the reality of their situation, simply misremember something, not know the correct information, overreport their details for unknown reasons, or face a communication issue which results in the wrong information being delivered. Another bias is introduced by the

optionality of the sampling, or the fact that some individuals choose to respond to the survey while others do not which creates two populations, one responding and the other not, rather than capturing the whole.

Finally, the Covid-19 pandemic and all the issues it created must be mentioned as a limitation. The psychological, social, and logistical impact the pandemic has had on the United States' population, workforce, and economy all represent huge shifts in perception between the 2019 and 2020 data gathered. Individuals across the country have faced unprecedented shifts in lifestyle which may have caused a drastic change in their behaviors and therefore the way they would typically respond. Because of this, any recommendations based on the datasets utilized during the pandemic should also factor in potential bias due to the widespread impacts caused by the virus.

Implications

Based on the findings of the literature review and results of the statistical analysis, five policy recommendations have been created for this survey. These recommendations either aim to address issues at the macro level to increase the amount of responsibility larger entities have in the health of SMVS, or hope to intervene at a critical time in a transitioning servicemember's life so action can be taken before chronic diseases have the time to take effect. They are as follows:

1. Create more interventions targeting younger SMVs as they exit the service.

    a. Current intervention efforts at the healthcare provider level aren't as effective at alleviating chronic diseases as, due to the nature of consuming more healthcare resources as you age, they target older SMVs who have already spent most of their lives using tobacco and therefore already have developed chronic issues.

b. By investing in efforts focused on younger SMVs, there will be a greater impact on addressing the prevalence of chronic issues associated with tobacco use. Targeting younger demographics will reduce total years spent using, the amount of healthcare expenditures required by the individual, and the pressure they unknowingly place on those in their social circles.

2. Encourage more legislative action and service branch restrictions towards either inhibiting the ability of tobacco companies to target SMVs for the sake of growing their customer base or make it more difficult for SMVs to indulge in the habit.

   a. The reaching of the Master settlement Agreement represented a huge turning point in the United States' struggle with tobacco addiction. More legislation designed to simultaneously reduce the ability of tobacco companies to create more users while also forcing them to pay more fees to address the epidemic they perpetuate is a step in the right direction.

   b. As seen in the lower smoking rates of the US Air Force, rules established at the service branch level are successful in reducing the frequency of tobacco use. Other branches, or even the DoD, need to follow in the footsteps of the Air Force and take more drastic steps to reduce the ability of service members to both pick up or continue their habit.

3. Increase collaboration between the VA, local health departments (LHD), and military bases to encourage resource and information sharing so beneficial partnerships can be created.

   a. LHDs who serve a large SMV population need to establish relationships with the local VA and military facilities to gain a better understanding of the population

they serve so resources can be more appropriately allocated to meet their complex needs.

b. LHDs need to provide guidance on evidence-based practices for addressing the tobacco problems the military faces. Mentioning an increase in military readiness through improved physical fitness and fewer days spent sick should serve as the platform for the approach.

4. Strengthen partnerships between the military branches, tobacco cessation specialists, and entities that helps SMVs transition out of the service.

a. Each branch has a specific and mandated course for each active-duty service member to complete before they're allowed to discharge from the military.

b. National veteran support organizations, such as The Mission Continues and Team Red, White, and Blue, need to be brought to the table and their input incorporated into the design of the mandated courses.

c. Tobacco cessation specialists' input should also be incorporated into the design of these mandated courses and, if possible, they should be present during their portion of the course so they can field questions from discharging service members.

5. Creation and administration of a questionnaire designed to identify discharging service members who are at high risk to continue or begin a smoking habit upon their pre-discharge physical.

a. Physicians who conduct their final physical could provide counseling and information to those who flag based on the questionnaire.

b. Criteria should be established based on respondent demographic information, such as if they belong to one of the 10 susceptible populations defined by the American Lung Association, current smoker status, or other indicators for high risk.

The purpose of this research was to investigate the differences between veteran smokers and nonsmokers, their tobacco utilization rates, health outcomes related to tobacco use, and differences in socioeconomic factors. This project found that racial and gender disparities, as well as socioeconomic gaps related to income and education do exist between veteran smokers and non-smokers. Utilizing these findings, policy recommendations were created with the hopes of both bringing more stakeholders interested in improving SMV health outcomes to the table and increasing the amount of intervention efforts made during the only time where interaction between a healthcare professional and a servicemember is guaranteed before they discharge and rejoin the civilian world. It is this author's hope that the relevant parties will see these recommendations and act accordingly to implement them as best they can with the resources their position allots.

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Appendix

Kentucky Descriptive Statistics

Table 1A Veteran's Income Level by Smoker Status (313 refused and don't know responses omitted)

	Less than $10,000	Less than $15,000	Less than $20,000	Less than $25,000	Less than $35,000	Less than $50,000	Less than $75,000	$75,000 or more	Total
Veteran Non-Smoker	18	31	40	47	89	120	170	301	816
Veteran Smoker	9	13	21	20	30	35	37	42	207

Table 2A Veteran's Educational Level by Smoker Status (2 refused responses omitted)

	Did not graduate high school	Highschool graduate	Attended college or technical school	College or technical school graduate	Total
Veteran Non-Smoker	50	283	363	379	1,075
Veteran Smoker	16	99	94	50	259

Table 3A Veteran's Race by Smoker Status (24 refused responses omitted)

	White, Non-Hispanic	Black, Non-Hispanic	Multiracial, Non-Hispanic	Hispanic	Other race, Non-Hispanic	Total
Veteran Non-Smoker	934	71	15	16	22	1,058
Veteran Smoker	214	26	7	3	4	254

Table 4A Veteran's Sex by Smoker Status

	Male	Female	Total
Veteran Non-Smoker	965	112	1,077
Veteran Smoker	237	22	259

North Carolina Descriptive Statistics

Table 1B Veteran's Income Level by Smoker Status (213 refused and don't know responses

omitted)

	Less than $10,000	Less than $15,000	Less than $20,000	Less than $25,000	Less than $35,000	Less than $50,000	Less than $75,000	$75,000 or more	Total
Veteran Non-Smoker	12	18	36	72	108	165	168	370	949
Veteran Smoker	2	4	18	20	28	29	31	32	164

Table 2B Veteran's Educational Level by Smoker Status (2 refused responses omitted)

	Did not graduate high school	Highschool graduate	Attended college or technical school	College or technical school graduate	Total
Veteran Non-Smoker	29	275	379	450	1,133
Veteran Smoker	6	68	78	39	191

Table 3B Veteran's Race by Smoker Status (25 refused responses omitted)

	White, Non-Hispanic	Black, Non-Hispanic	Multiracial, Non-Hispanic	Hispanic	Other race, Non-Hispanic	Total
Veteran Non-Smoker	785	209	24	56	40	1,114
Veteran Smoker	126	44	2	6	9	187

Table 4B Veteran's Sex by Smoker Status

	Male	Female	Total
Veteran Non-Smoker	990	145	1,135
Veteran Smoker	167	24	191

Tennessee Descriptive Statistics

Table 1C Veteran's Income Level by Smoker Status (217 refused and don't know responses omitted)

	Less than $10,000	Less than $15,000	Less than $20,000	Less than $25,000	Less than $35,000	Less than $50,000	Less than $75,000	$75,000 or more	Total
Veteran Non-Smoker	13	31	48	71	92	167	191	313	926
Veteran Smoker	9	17	25	32	25	28	38	42	216

Table 2C Veteran's Educational Level by Smoker Status (5 refused responses omitted)

	Did not graduate high school	Highschool graduate	Attended college or technical school	College or technical school graduate	Total
Veteran Non-Smoker	39	296	342	425	1,102
Veteran Smoker	18	94	87	53	252

Table 3C Veteran's Race by Smoker Status (35 refused responses omitted)

	White, Non-Hispanic	Black, Non-Hispanic	Multiracial, Non-Hispanic	Hispanic	Other race, Non-Hispanic	Total
Veteran Non-Smoker	915	88	19	15	40	1,077
Veteran Smoker	192	29	10	10	6	247

Table 4C Veteran's Sex by Smoker Status

	Male	Female	Total
Veteran Non-Smoker	994	113	1,107
Veteran Smoker	220	32	252

Virginia Descriptive Statistics

Table 1D Veteran's Income Level by Smoker Status (388 refused and don't know responses

omitted)

	Less than $10,000	Less than $15,000	Less than $20,000	Less than $25,000	Less than $35,000	Less than $50,000	Less than $75,000	$75,000 or more	Total
Veteran Non-Smoker	16	33	78	126	156	286	384	1,199	2,278
Veteran Smoker	2	11	14	37	44	46	55	100	309

Table 2D Veteran's Educational Level by Smoker Status (5 refused responses omitted)

	Did not graduate high school	Highschool graduate	Attended college or technical school	College or technical school graduate	Total
Veteran Non-Smoker	62	516	717	1,334	2,629
Veteran Smoker	17	87	153	84	341

Table 3D Veteran's Race by Smoker Status (61 refused responses omitted)

	White, Non-Hispanic	Black, Non-Hispanic	Multiracial, Non-Hispanic	Hispanic	Other race, Non-Hispanic	Total
Veteran Non-Smoker	1,960	381	77	99	60	2,577
Veteran Smoker	237	63	11	14	12	337

Table 4D Veteran's Sex by Smoker Status

	Male	Female	Total
Veteran Non-Smoker	2,251	382	2,633
Veteran Smoker	287	55	342

Table 1E Demographic Breakdown of Kentucky, North Carolina, Tennessee, and Virginia (US Census Bureau, 2022)

	Kentucky	North Carolina	Tennessee	Virginia
White	86.95%	68.68%	77.58%	67.63%
Black	8.07%	21.44%	16.76%	19.18%
Other Race	4.98%	9.88%	5.66%	13.19%
Male	49.2%	48.6%	48.7%	49.2%
Female	50.8%	51.4%	51.3%	50.8%

Chi-Square Results

Table 1F Coronary Heart Disease and Myocardial Infarction Prevalence by Tobacco Use Status (61 missing responses omitted)

	Yes	No	Chi-Square Results
No Tobacco Use	908 (83.3%)	4,995 (84.2%)	Chi-Square Value = 20.69
Tobacco Use	174 (16.7%)	858 (15.8%)	Chi-Square P Value = <.0001
Total	1,082	5,853	

Table 2F Cancer Other Than Skin Cancer Prevalence by Tobacco Use Status Prevalence by

Tobacco Use Status (25 missing responses omitted)

	Yes	No	Chi-Square Results
No Tobacco Use	815 (87.7%)	5,118 (83.6%)	Chi-Square Value = 17.75
Tobacco Use	114 (12.3%)	924 (16.4%)	Chi-Square P Value = <.0001
Total	929	6,042	

Table 3F Stroke Prevalence by Tobacco Use Status (23 missing responses omitted)

	Yes	No	Chi-Square Results
No Tobacco Use	392 (80.9%)	5,540 (84.2%	Chi-Square Value = 5.6
Tobacco Use	91 (19.1%)	950 (15.8%)	Chi-Square P Value = .0180
Total	483	6,490	

Table 4F Asthma Prevalence by Tobacco Use Status (22 missing responses omitted)

	Yes	No	Chi-Square Results
No Tobacco Use	559 (81.8%)	5,373 (84.2%)	Chi-Square Value = 4.44
Tobacco Use	123 (18.2%)	919 (15.8%)	Chi-Square P Value = .0351
Total	682	6,292	

Table 5F Depression Prevalence by Tobacco Use Status (34 missing responses omitted)

	Yes	No	Chi-Square Results
No Tobacco Use	927 (75.4%)	4,999 (86.2%)	Chi-Square Value = 5.11
Tobacco Use	304 (24.6%)	732 (13.8%)	Chi-Square P Value = .0238
Total	1,231	5,731	

Table 6F COPD Prevalence by Tobacco Use Status (33 missing responses omitted)

	Yes	No	Chi-Square Results
No Tobacco Use	563 (65.1%)	5,358 (86.0%)	Chi-Square Value = 8.47
Tobacco Use	255 (34.9%)	787 (14.0%)	Chi-Square P Value = .0036
Total	818	6,145	

Table 7F Arthritis Prevalence by Tobacco Use Status (47 missing responses omitted)

	Yes	No	Chi-Square Results
No Tobacco Use	2,387 (82.6%)	3,523 (84.8%)	Chi-Square Value = 17.23
Tobacco Use	429 (17.4%)	610 (15.2%)	Chi-Square P Value = <.0001
Total	2,816	4,133	

BRFSS SAS Variables Utilized		
SAS Variable Name	**Question**	**Potential Responses**
VETERAN3	Have you ever served on active duty in the United States Armed Forces, either in the regular military or in a National Guard or military reserve unit?	Calculated Value • Yes • No • Don't know/Not sure
_RFSMOK3	Calculated variable for adults who are current smokers	Calculated Value • Former smoker/never smoked • Current smoker
_RACEGR3	Calculated variable for race	Calculated Value • White, Non-Hispanic • Black, Non-Hispanic • Hispanic • Multiracial, Non-Hispanic • Other race, Non-Hispanic
_EDUCAG	Calculated variable for level of education completed	Calculated Value • Did not graduate high school • High school graduate • Attended college or technical school • College or technical school graduate
SEXVAR	Sex of respondent	Calculated Value • Male • Female
INCOME2	Is your annual household income from all sources:	Calculated Value • Less than $10,000 • Less than $15,000 • Less than $20,000 • Less than $25,000 • Less than $35,000

		• Less than $50,000
		• Less than $75,000
		• $75,000 or more
		• Don't know/Not sure
		• Refused
CHCOCNCR	Ever told you had any other types of cancer?	Calculated Value • Yes • No • Don't know/Not sure
CHCCOPD2	Ever told you had chronic obstructive pulmonary disease, C.O.P.D., emphysema or chronic bronchitis?	Calculated Value • Yes • No • Don't know/Not sure
CVDSTRK3	Ever told you had a stroke?	Calculated Value • Yes • No
ASTHMA3	Ever told you have asthma?	Calculated Value • Yes • No • Don't know/Not sure
_MICHD	Calculated variable for adults who have ever reported having coronary heart disease (CHD) or myocardial infarction (MI)	Calculated Value • Have MI or CHD • Do not have MI or CHD
ADDEPEV3	Ever told you that you had a depressive disorder, including depression, major depression, dysthymia, or minor depression	Calculated Value • Yes • No
HAVARTH4	Ever told you had some form of arthritis, rheumatoid arthritis, gout, lupus, or fibromyalgia	Calculated Value • Yes • No