Introduction

Understanding patterns of tobacco use behaviors can facilitate the development of interventions to prevent disease and promote health. Tobacco use remains the single leading preventable cause of death in the United States, with cigarette smoking and exposure to secondhand smoke causing approximately 480,000 deaths each year. A substantial proportion of those deaths are among African Americans (AAs). Mortality rates for coronary heart disease and cerebrovascular disease are higher among AAs than among whites. The 2013 mortality rate for malignant neoplasms of the trachea, bronchus, and lung was 22% higher among AA males than among white males and 8% higher among white females than among AA females. Racial differences in tobacco use, obesity, hypertension, diabetes, and survival contribute to racial differences in cardiovascular mortality. Historical patterns of tobacco use and exposure to tobacco carcinogens primarily explain the different rates of lung cancer, although differential exposure to environmental and workplace toxins, differential accumulation of carcinogens in melanin-containing tissues, racial differences in the rate of detoxifying carcinogens, a higher rate of menthol cigarette use, and greater tobacco smoke intake per cigarette...
might also contribute to the different rates of lung cancer mortality in AA and white adults.

This special issue of Nicotine & Tobacco Research has been commissioned by the Office on Smoking and Health of the US Centers for Disease Control and Prevention to improve our understanding of the unique patterns of smoking behaviors among AAs, relative to whites. Seven original investigations,12–20 two brief reports,21,22 one review article,23 and two commentaries24,25 provide useful information and perspectives on a wide range of topics that advance the science base in important ways. Here, we highlight some of the many advances made by the articles in this supplement, followed by elucidation of important research needs and of significant opportunities for disease prevention and health promotion among AAs.

Cigarette Smoking Prevalence Among AA and White Adolescents

Population-based estimates of tobacco use are generally described in terms of prevalence of use, employing representative estimates of the overall population and subgroups using serial cross-sectional analyses to show trends over time. Figure 1 depicts the prevalence of lifetime (ever) cigarette smoking by AA and white high school seniors in the Monitoring the Future (MTF) surveys from 1977 to 2014. It depicts a fairly steady decline of ever smoking among both whites and AAs, with the rate of ever smoking being lower among AAs than whites. A somewhat different pattern is seen for current use (Figure 2), with sharply divergent trends for AAs and whites during 1977–1992.24 Both groups experienced a marked increase in prevalence in the 1990s (likely influenced by pro-tobacco marketing) followed by a sharp decline among whites from 1998 (41.7%) to 2003 (29.4%) (likely explained by the policies implemented after the Master Settlement Agreement and excise tax increases at the federal, state, and local levels) followed by a slow but steady decline from 2003 until 2014 (17.5%). Among AAs, there was a decrease from 1999 (14.9%) until 2003 (10.0%), followed by very little progress through 2014 (9.0%). In fact, in 1992, 8.7% of AA high school seniors smoked cigarettes, which is essentially the same as in 2014.

Figure 3 helps us understand the differences in the ever use and current use trends. It presents the percentage of ever smokers who are current smokers for AA and white high school seniors. The shapes of the lines in Figure 3 roughly reflect the patterns seen for prevalence of current use through 2003 (Figure 2). Subsequently, however, the percentage of AA ever smokers who continued to smoke increased from 25.4% in 2004 to 40.1% in 2014.

More sophisticated analyses, such as those by Holford, Levy and Meza45 combine surveys from multiple years and conduct birth cohort analyses to assess patterns of initiation, current use, quitting, and smoking intensity in the 20th and early 21st centuries. Such analyses have the ability to indicate patterns of use that predate the existence of the cross-sectional surveys. Such analyses find patterns that are consistent with the results of serial cross-sectional surveys. In Holford’s work, for example, initiation rates are generally lower for AAs, but particularly so in birth cohorts since the 1960s.16 Similarly, reconstructed prevalence among youth and young adults is lower in young AAs than whites, particularly in the more recent birth cohorts, consistent with prevalence estimates from youth surveys.20–23

The trends in current cigarette smoking prevalence observed during the 1970s and 1980s (Figure 2) were likely not due to differential dropout status,2,9,10 or differential misclassification bias,2,30,31 differential use of other drugs,2,30 or background or lifestyle factors including socioeconomic status,2,30,32,33 Garrett and her colleagues21 and others20,21 describe protective factors for AA youth.

So why was prevalence of current cigarette smoking among AA adolescents the same in 2014 (9.0%) as it was in 1992 (8.7%); Figure 2)? And why did the conversion rate from ever smoking to current smoking among AA youth nearly double from 20.4% in 1992 to 40.1% in 2014 (Figure 3)? These findings seem counterintuitive, since the real price of cigarettes essentially doubled from 1992 ($2.93/pack) to 2014 ($5.76/pack)35,36 and AA youth are more price sensitive than white youth.37 Targeted tobacco marketing32,33,39 and use of menthol cigarettes17,19 might have counteracted the overall price increases. For example, menthol cigarettes are marketed more
heavily in AA neighborhoods and the price of menthol cigarettes is lower in communities with proportionately more AA residents.\textsuperscript{38,41} Marketing strategies promote the uptake of tobacco products.\textsuperscript{42} Ideally we would have better surveillance of the type, distribution, and intensity of advertising and promotional strategies, including direct mail, and of product placements in television, movies, video games and social media that were seen by children and adolescents over time.\textsuperscript{43} In addition, we should know more about the product formulations of relevant cigarette brands (eg, Marlboro, Camel, Newport, Kool, Salem) and how they might have changed over time.\textsuperscript{44,45}

Cigarette Smoking Prevalence Among AA and White Adults

Figure 4 presents gender specific estimates of the prevalence of adult cigarette smoking during 1978–1980 and 2011–2013 for non-Hispanic whites and non-Hispanic AAs, using data from National Health Interview Surveys.\textsuperscript{3} Cigarette smoking prevalence declined by 22.3 percentage points among AA males and by 15.2 percentage points among white males, representing a 46.7\% faster rate of decline among AA males. Prevalence also declined faster (by 32.8\%) among AA females than among white females, based on a 16.2 percentage point decline in AA females and a 12.2 percentage point decline among white females. The decline among AA males could be due to increased incarceration over time,\textsuperscript{46} which likely resulted in proportionately fewer AA male smokers being within the sample frame of the National Health Interview Survey over time.\textsuperscript{22} The declines among young adult AA males and females who were high school students in the late 1970s and 1980s also likely contributed to the faster decline in cigarette smoking prevalence among AA males and females as they matured into young adulthood (Figures 5–7).\textsuperscript{39} So, for example, although the prevalence of cigarette smoking was slightly higher among 25- to 29-year-old AAs than among 25- to 29-year-old whites in the 1980s, AA prevalence dropped well below that of whites in this age group in the 1990s (Figure 6). It is also possible that AA adults who smoke were more likely over time than white adults who smoke to conceal their smoking. Although the article in this issue by Caraballo and his colleagues suggests a role for misclassification bias in comparing AA and white prevalence estimates in recent years,\textsuperscript{13} their methods in the current article are not directly comparable to methods used in previous work, which covered 1988–1991.\textsuperscript{37}

It is worth noting that these prevalence estimates are also influenced by a later age of initiation among AAs.\textsuperscript{2,48} Data from the 1994–1995 National Household Surveys on Drug Abuse indicated that among US adults aged 30–39 years who had ever smoked daily, the average ages for first trial and first daily smoking were approximately 1 year higher for AA males compared to white males and 2 years higher for AA females compared to white females.\textsuperscript{3} These relatively small differences in age of initiation do not fully explain the differences in adult prevalence. Indeed, data from the Add Health cohort study demonstrate that even though the prevalence of

![Figure 4](https://example.com/figure4.png)


<table>
<thead>
<tr>
<th>Year</th>
<th>White Males</th>
<th>AA Males</th>
<th>White Females</th>
<th>AA Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>1978-1980</td>
<td>36.8</td>
<td>21.6</td>
<td>30.5</td>
<td>15.2</td>
</tr>
<tr>
<td>2011-2013</td>
<td>45.0</td>
<td>22.7</td>
<td>18.3</td>
<td>13.1</td>
</tr>
</tbody>
</table>
cigarette smoking as the cohort matured increased among AAs after age 18 and decreased among whites, the prevalence among 29-year-old AAs (30.7%) was still substantially lower than the prevalence among 29-year-old whites (40.2%). Eventually, as Holford and his colleagues demonstrate, cigarette smoking prevalence among AAs generally overtook that of whites, because of lower cessation probabilities for AAs as they age. This well-documented phenomenon has been referred to as the age-crossover effect.

Impoverished environments contribute to higher rates of smoking. In two multivariable analyses of national data sets, cigarette smoking prevalence was higher for AAs prior to controlling for indicators of socioeconomic status. After statistical control was made for socioeconomic status, the differences in prevalence were either eliminated or reversed.

### Use of Other Tobacco Products and Marijuana

While cigarette smoking is declining in the United States, snuff and cigars are increasing. Recently, Creamer and her colleagues studied trends from 1999 to 2013 of high school students’ use of cigarettes, cigars and smokeless tobacco. A slight increase in the use of smokeless tobacco over time among AA youths relative to whites was detected. An analysis by Kennedy and her colleagues observes that AA young adults were more likely than whites to use marijuana before tobacco and that over time, both groups were increasingly likely to use marijuana before tobacco. In another analysis, the prevalence differences between AA and white youth and young adults were lessened when the use of cigars and marijuana were included in a measure of any combustible tobacco/marijuana use.

In 2014, AA high school students were less likely than whites to report use electronic cigarettes (5.6% among AAs vs. 15.3% among whites), hookah (5.6% vs. 9.4%), smokeless tobacco (1.1% vs. 7.8%), and snus (0.6% vs. 2.4%); the prevalence of cigar smoking was statistically similar (8.8% vs. 8.3%). Prevalence of any tobacco use (17.2% vs. 26.5%) and current use of at least two tobacco products (5.4% vs. 15.1%) were lower among AA high school students, compared to whites. Among current tobacco users, 31% of AAs and 57% of whites reported using at least two tobacco products.

Among US adults in 2012/2013, AAs were less likely than whites to report use electronic cigarettes (0.8% vs. 2.1%) and smokeless tobacco (1.0% vs. 3.0%) and more likely to report use of cigars (3.7% vs. 1.6%). A measure of hookah use that included rare use indicated that AA adults were less likely than whites to use hookah (2.0% vs. 3.6%). Although the use of any tobacco product was statistically similar among AAs (22.5%) and whites (20.7%), AA adults were more likely than white adults to use any combustible tobacco product (21.6% vs. 18.2%).

### Knowledge Gaps

Although the papers in this supplement expand the science base of tobacco use among AA youth, young adults and adults, knowledge gaps remain to be addressed by future research.

- Studies are needed on how to increase rates of cessation among AA adults. Kulak and her colleagues review the relevant literature, which suggests important strategies for increasing support for quitting.
- Research to clarify how racial discrimination might influence tobacco use initiation and cessation could also improve interventions.
- Although the contribution in this issue by Caraballo and his colleagues suggests a role for misclassification bias in estimating tobacco use, it does not assess whether rates of misclassification have changed over time. Updates of previous work, using identical methods, would be informative.
- The Population Assessment of Tobacco and Health (PATH) study is a large cohort study that measures the use of multiple tobacco products among adolescents and adults in the United States. Race-specific assessments of progression (or not) to regular tobacco use among those who have experimented with multiple tobacco products are needed.

### Public Health Opportunities

Reducing the marketing of menthol cigarettes and cigars to AAs would likely reduce initiation and promote cessation. The banning of menthol as a characterizing flavor in cigarettes and the extension of the FDA ban on other flavors in cigarettes to cigars and smokeless tobacco would also promote health by reducing use of these products.

Supportive and empowering environments are health promoting. Increasing opportunities for exercise, socialization, and learning/advancement, coupled with improved access to healthy foods, could contribute to health promoting changes that would likely lead to reductions in tobacco use. Finally, we hope that any end game strategies that might someday be implemented have consistently positive effects across population strata and not increase disparities.

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### Declaration of Interests

None declared.

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### Disclaimer

The findings and conclusions are the author’s, not necessarily the CDC’s.

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References


