Distribution Agreement

In presenting this thesis or dissertation as a partial fulfillment of the requirements for an advanced degree from Emory University, I hereby grant to Emory University and its agents the non-exclusive license to archive, make accessible, and display my thesis or dissertation in whole or in part in all forms of media, now or hereafter known, including display on the world wide web. I understand that I may select some access restrictions as part of the online submission of this thesis or dissertation. I retain all ownership rights to the copyright of the thesis or dissertation. I also retain the right to use in future works (such as articles or books) all or part of this thesis or dissertation.

_____

Emily C. Talbert Date

AN ENVIRONMENTAL SCAN AND NEEDS ASSESSMENT OF TOBACCO CONTROL IN APPALACHIAN KENTUCKY USING SECONDARY DATA

BY

Emily C. Talbert
Degree to be awarded: M.P.H.
Career MPH

Grant T. Baldwin, PhD, MPH Committee Chair	Date
Tesfa N. Alexander, PhD Committee Member	Date
Melissa Alperin, MPH, MCHES Chair, CMPH Program	Date

AN ENVIRONMENTAL SCAN AND NEEDS ASSESSMENT OF TOBACCO CONTROL IN APPALACHIAN KENTUCKY USING SECONDARY DATA

BY

Emily C. Talbert
M.P.H., Emory University, 2013
B.A., University of Maryland-College Park, 2005

Thesis Committee Chair: Grant T. Baldwin, PhD, MPH

An abstract of
A thesis submitted to the Faculty of the
Rollins School of Public Health of Emory University
in partial fulfillment of the requirements for the degree of
Master of Public Health in the Career MPH program
2013

Abstract

AN ENVIRONMENTAL SCAN AND NEEDS ASSESSMENT OF TOBACCO CONTROL IN APPALACHIAN KENTUCKY USING SECONDARY DATA

BY
Emily C. Talbert

Although tobacco control efforts such as smoke-free laws, cigarette tax increases, tobacco advertising bans, limits on age of purchase, and mass media campaigns have helped curb tobacco use among Americans, cigarette smoking remains the leading cause of death and disease in the United States. However, the burden of tobacco use is not equally distributed across the nation. Due to a variety of individual, interpersonal, and environmental factors, people living in rural areas—especially those in rural Appalachian Kentucky—are far more likely to use tobacco and be disproportionally affected by its use. In fact, in some areas of rural Appalachian Kentucky, as many as 41% of adults currently smoke, and lung cancer rates can exceed the national average by as much as 89%. While tobacco use alone does not account for the disproportionately higher rates of morbidity and mortality in Appalachian Kentucky, tobacco use is a significant—if not leading—risk factor. Reducing the burden of tobacco use among this population requires evidence-based, culturally-tailored tobacco use interventions at all levels of influence, from the individual to the policy level.

Developing effective tobacco use interventions at multiple levels of influence requires understanding the full scope of current tobacco use and control trends in Appalachian Kentucky. To capture this scope, a broad environmental scan of secondary data sources was conducted to identify the primary factors driving tobacco use in this region. The primary goals of the tobacco control needs assessment included 1) understanding the unique challenges to reducing tobacco use in Appalachian Kentucky within the larger context of national tobacco control; and 2) recommending additional measures to prevent and reduce tobacco use in this region using a social ecological approach.

Given the range of tobacco use challenges at all levels of influence, recommendations for reducing tobacco use in Appalachian Kentucky are based on the World Health Organization's MPOWER framework with a few additional recommendations from the Centers for Disease Control. Where appropriate, recommendations are tailored to more specifically address the unique challenges facing Appalachian Kentucky to provide local tobacco control practitioners with a practical, comprehensive framework for reducing tobacco use in their communities.

AN ENVIRONMENTAL SCAN AND NEEDS ASSESSMENT OF TOBACCO CONTROL IN APPALACHIAN KENTUCKY USING SECONDARY DATA

BY

Emily C. Talbert
M.P.H., Emory University, 2013
B.A., University of Maryland-College Park, 2005

Thesis Committee Chair: Grant T. Baldwin, PhD, MPH

A Thesis submitted to the Faculty of the
Rollins School of Public Health of Emory University
in partial fulfillment of the requirements for the degree of
Master of Public Health in the Career MPH program
2013

ACKNOWLEDGEMENTS

I would like to thank my committee chair, Dr. Grant T. Baldwin, and my field advisor, Dr. Tesfa N. Alexander, for their time, assistance, and encouragement throughout this project, including before it officially started. I would also like to thank my supervisor, April Brubach, for her words of encouragement during my early writer's block moments, and for allowing me to take a few days off here and there to focus on writing. Additional thanks go to Melissa (Moose) Alperin and Melissa M. Krancer for their guidance navigating the administrative details of this process. Lastly, I would like to thank my husband, Rick Tavares, for his endless patience, support, and love during the past three (plus) years while I started and finished my MPH.

Table of Contents

Figures

Tables

EXECUTIVE SUMMARY

Although tobacco control efforts such as smoke-free laws, cigarette tax increases, tobacco advertising bans, limits on age of purchase, and mass media campaigns have helped curb tobacco use among Americans, cigarette smoking remains the leading cause of death and disease in the United States. However, the burden of tobacco use is not equally distributed across the nation. Due to a variety of individual, interpersonal, and environmental factors, people living in rural areas—especially those in rural Appalachian Kentucky—are far more likely to use tobacco and be disproportionally affected by its use.

Reducing the burden of tobacco use among this population requires evidence-based, culturally-tailored tobacco use interventions at all levels of influence, from the individual to the policy level. Developing effective tobacco use interventions at multiple levels of influence requires understanding the full scope of current tobacco use and control trends in Appalachian Kentucky. To capture this scope, a broad environmental scan of secondary data sources was conducted to identify the primary factors driving tobacco use in this region and recommend additional measures to prevent and reduce tobacco use in this region using a social ecological approach. Key findings from this tobacco control needs assessment include:

- **Highest adult smoking rates in the nation.** Kentucky has the highest adult smoking rate in the nation (29.0%) and Appalachian Kentucky has the highest adult smoking rates in the Appalachian region (33.6% among males, 29.4% among females).
- **High adult smoking during pregnancy rates.** Kentucky's rate of adult smoking during pregnancy (24.3%) is twice the national average and ranges from 23.5% to 56.1% its Appalachian counties.

- **High adult smokeless tobacco use rates.** The prevalence of smokeless tobacco use among Appalachian Kentucky adult males (4.5%) is actually lower than rates among males in other Appalachian states, but 6.8% of all Kentucky adults report current smokeless tobacco use.
- **Highest youth smoking rates.** Kentucky's high school smoking rate is the highest in the nation at 24.1% and exceeds 30.0% in several Appalachian counties. Additionally, more than 5,400 Kentucky youth become daily smokers every year, accounting for 60.8% of the nation's annual influx of youth daily smokers.
- **Increasing youth smokeless tobacco use rates.** Smokeless tobacco use among Kentucky youth has increased in recent years, and the percentage of youth reporting any type of tobacco use is 31.9%—the worst in the nation.
- **High exposure to secondhand smoke.** More than half of all Kentucky adults report exposure to secondhand smoke, and the percentage of Kentucky homes without smoke-free rules with children living in them is 34.0%.
- **No comprehensive smoke-free laws.** Kentucky is one of seven states without statewide smoke-free laws or restrictions. As a result, only about 30% of all Kentuckians are protected by comprehensive smoke-free regulations.
- **Poor coverage for cessation services.** Although Kentucky's past year quit attempts (56.7%) were slightly higher than the national average, Kentucky's Medicaid program does not provide complete coverage through Medicaid for tobacco dependence treatment, and only about 25% of Kentuckians surveyed were aware of the state's quitline services.

- **Weak tobacco control enforcement policies.** Kentucky is one of nine states that preempts local regulation of tobacco industry promotions, tobacco product sampling, and display of tobacco products in commercial establishments.
- **Low cigarette excise tax.** Kentucky's cigarette excise tax is just $0.60 per pack compared to the national median ($1.34). Due to the low excise tax, Kentucky smokers report paying an average of just $4.23 a pack.
- **Low tobacco control spending.** Kentucky ranks 36th in the nation for adequate state-funded anti-tobacco media campaigns. Additionally, Kentucky's total state funding for FY13 tobacco control programs was $4,030,828—a mere 7% of recommended amount.
- **High smoking-attributable health burden.** About 20% of all deaths in Kentucky—more than 7,800 adults—are a result of smoking. Cancer is the leading cause of death in Kentucky overall as well as in Appalachian Kentucky, where the rates for total cancer, lung cancer, and cervical cancer in Appalachian Kentucky exceed the rest of Appalachia by an estimated 36% and the rest of the nation by about 50%. Kentucky adults who died of a smoking-attributable illness lost 14.8 years of life on average, and 107,000 Kentucky youth under age 18 alive today will ultimately die prematurely from smoking.
- **High smoking-attributable costs.** With close to one million adult smokers in the state in 2010, smoking-attributable costs are also a primary health implication since they further strain limited healthcare resources. Currently, Kentucky spends $5.67 billion in excess personal medical care expenditures and productivity losses from smoking-related premature death and illnesses.
- **High prevalence of risk factors for tobacco use.** At least 24% of Appalachian Kentucky residents live below the poverty level, about 37% of Appalachian Kentucky

citizens lack a high school diploma, and more than 70% of all tobacco grown in the U.S. is grown in Kentucky and North Carolina, making cultural norms difficult to uproot.

Given the range of tobacco use challenges at all levels of influence, recommendations for reducing tobacco use in Appalachian Kentucky follow the World Health Organization's MPOWER framework with a few additional recommendations from the Centers for Disease Control. Where appropriate, recommendations are tailored to more specifically address the unique challenges facing Appalachian Kentucky to provide local tobacco control practitioners with a practical, comprehensive framework for reducing tobacco use in their communities. The top ten recommendations for local-level practitioners include:

1. Establish local tobacco surveillance programs (MONITOR).
2. Engage community members and residents to improve monitoring response rates and build engagement for future tobacco control efforts (MONITOR).
3. Establish local smoke-free policies for public places and worksites (PROTECT).
4. Enforce state and local smoking bans (PROTECT).
5. Engage community members to build local support for smoke-free laws (PROTECT).
6. Promote Kentucky's quitline and *Quit Now Kentucky* website (OFFER).
7. Establish evidence-based, culturally-competent cessation programs in all Appalachian counties (OFFER).
8. Extend state and federal campaigns in underserved areas of Appalachian Kentucky through localized media efforts (WARN).
9. Conduct local surveillance to ensure retailer compliance with excise tax and price policies (RAISE).
10. Increase annual tobacco prevention spending levels to meet CDC's recommendations.

"It is well recognized that Appalachians suffer disproportionately poor health and increased risks of adverse health outcomes compared with the rest of the nation… [most likely] due to 'highly localized' factors…The public health policy implications of such localized factors are potentially much different from those that apply to more systematic barriers to health" (Borak, Salipante-Zaidel, Slade, & Fields, 2012, p.146).

CHAPTER ONE: INTRODUCTION

Rationale for Needs Assessment

Despite decades of dedicated efforts to reduce the enormous public health burden of tobacco use, cigarette smoking remains the leading cause of preventable death and disease in the United States, claiming more than 443,000 American lives every year (CDC, 2008). Another 8.6 million Americans have chronic illnesses caused by smoking, as tobacco use is a risk factor for numerous health conditions, including heart disease, stroke, diabetes, chronic obstructive pulmonary disease (COPD), and more than 15 types of cancer (CDC, 2003; HHS, 2004). As a result, the United States spends more than $193 billion dollars a year in smoking-attributable direct medical costs and lost productivity due to premature death—and that's in 1993 dollars (CDC, 2008). Tobacco control efforts including public health education, mass media campaigns, tobacco advertising bans, limits on age of purchase, smoke-free laws, and tobacco tax increases have helped curb tobacco use among Americans, but more than 43.8 million Americans, or 19.0% of adults, continue to smoke (CDC, 2012a).[1] Worse, every day in the United States more than 900 youth under age 18 become daily cigarette smokers, facing greatly increased odds of continuing daily tobacco use for the rest of their lives (SAMHSA, 2011).

Among rural populations, this picture of tobacco use—and its devastating effects—is even more dire. Due to a variety of individual, interpersonal, and environmental factors, people living in rural areas are both more likely to use tobacco and more likely to be disproportionally affected by its use. Rural citizens report higher, heavier, younger, and longer rates of tobacco use than their urban counterparts (Denham et al., 2004; Hutcheson et al., 2008; Northridge et al., 2008; Smith et al., 2008; Weg et al., 2011; York et al., 2010). Additionally, they have greater

[1] Estimates from 2012 National Health Interview Study data released June 2013 reveal the prevalence of smoking among U.S. adults may have decreased to 18.0%, but final results are not yet available (CDC, 2013a).

ease of access to tobacco products and are more likely to be exposed to secondhand smoke and tobacco marketing, but are less likely to have access to medical care, including cessation services (Denham, Meyer, & Toborg, 2004; Hutcheson et al., 2008; Northridge et al., 2008; Smith et al., 2008; Weg et al., 2011; York et al., 2010). As a result, according to the Centers for Disease Control and Prevention's (CDC) 2006 National Health Interview Survey, about 25% of rural Americans currently smoke (CDC, 2007a).

Further, with up to 49% of the Unites States considered rural depending on the definition of rurality (Cromartie & Bucholtz, 2008), there are additional disparities among rural populations. For example, rural Appalachia far exceeds most other non-Appalachian rural areas in terms of low socioeconomic status, educational attainment, health literacy, and health access. These factors help explain the resulting health disparities including high disease burden, poor health outcomes, and high rates of tobacco use in rural Appalachia—especially in the central Appalachian regions of eastern Kentucky and West Virginia (Dube et al., 2010; Halverson, 2004; Halverson & Bischak, 2008; Wingo et al., 2008). In fact, in some areas of rural Appalachian Kentucky, as many as 41% of adults currently smoke, and lung cancer rates can exceed the national average by as much as 89% (Kentucky Institute of Medicine (KIOM), 2007).

While low socioeconomic status, low educational attainment, unemployment, rurality, and living in areas where tobacco is grown and manufactured are known tobacco use risk factors that might explain the higher prevalence of use in Appalachian Kentucky, these factors alone are not enough to explain the even more alarming county-level tobacco use figures, which range from 22% to 41% (Behavioral Risk Factor Surveillance Survey data, 2005-2011). Pro-tobacco cultural norms, lack of cessation services, low cigarette taxes, insufficient smoke-free policies

and enforcement, high exposure to tobacco advertising, and ease of access to tobacco products are just some of the additional factors behind the region's high tobacco use.

Understanding the interplay between the host of factors contributing to Appalachian Kentucky's tobacco use burden requires both an in-depth view and a broad understanding of the surrounding tobacco control landscape; reducing the burden of tobacco use among this population requires a social ecological approach that considers—and impacts—all levels of influence, from the individual to the policy level. As others have already recognized, a "one size fits all" approach cannot create measurable change in populations that have explicitly unique strengths and needs (American Legacy Foundation, 2009).

Purpose Statement

Through an in-depth environmental scan using secondary data sources, this tobacco control needs assessment seeks to 1) understand the unique challenges to reducing tobacco use in Appalachian Kentucky within the larger context of national tobacco control; and 2) recommend additional measures to prevent and reduce tobacco use in this region using a social ecological approach. Specific questions this needs assessment will answer include:

- What are the current tobacco use trends in Appalachian Kentucky?
    - How do these trends compare to state and national tobacco use trends?
    - How do these trends compare to *Healthy People 2020* benchmarks?
- What are the current tobacco control trends in Appalachian Kentucky?
    - How do these trends compare to state and national tobacco control trends?
    - How do these trends compare to national and global best practices for tobacco control?
- What are the primary health implications of these data?

- What obstacles must be overcome to prevent and reduce tobacco use in this region?
    - What are the driving sociodemographic and psychographic factors in tobacco use in this region, including perceptions, attitudes, and beliefs about tobacco use and tobacco control?
- What resources are currently available to reduce tobacco use in this region?
- What are the recommended strategies for preventing and reducing tobacco use in this region from a social ecological perspective?
    - How can these recommendations be leveraged at the local level?

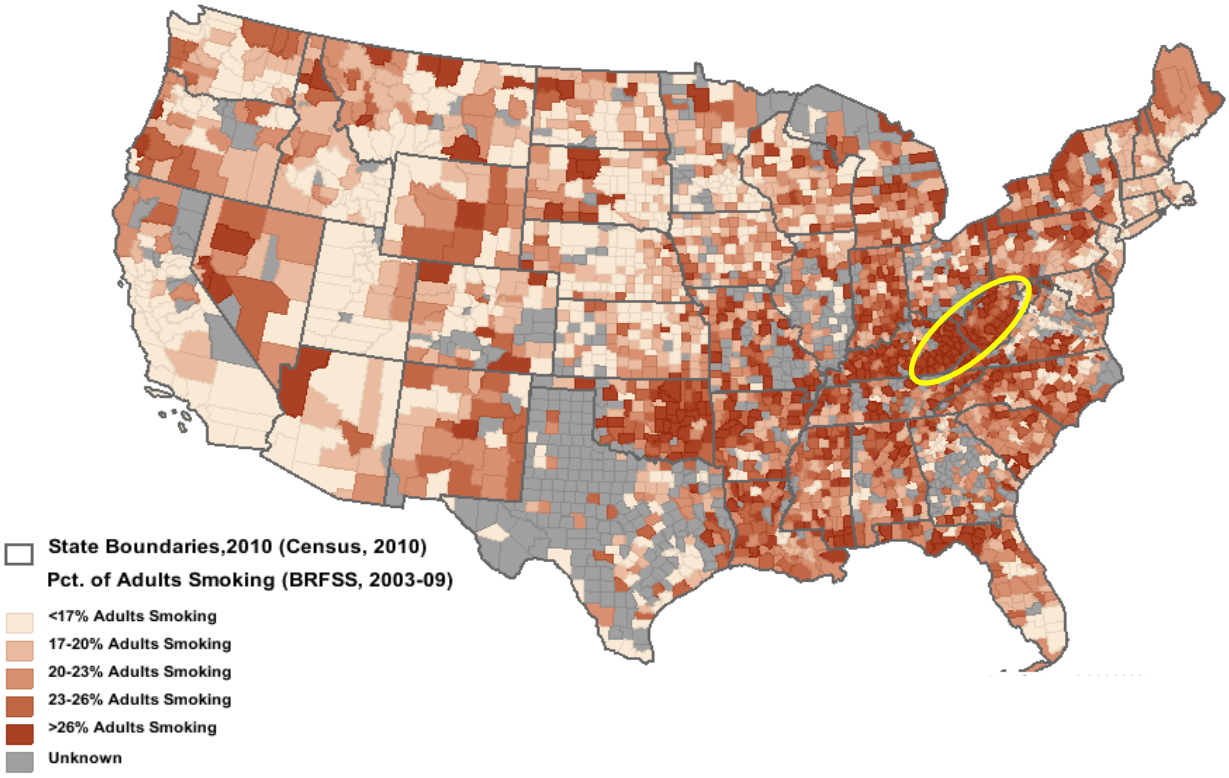
The primary goal of answering these questions is to provide tobacco control practitioners at all levels of influence with the full scope and context of current tobacco use trends and tobacco control efforts in Appalachian Kentucky to create a practical, comprehensive framework for reducing tobacco use in this region. It is important to note that although this needs assessment focuses on Appalachian Kentucky as much as possible, data specific to Appalachian Kentucky are not available for all categories; in some instances, data for Kentucky or larger sections of Appalachia are used as a proxy. As a result, many of these findings and recommendations may be applicable to the surrounding region.

Statement of Significance

Tobacco use is a significant public health problem in Appalachia at large, with the highest concentrations of burden and use in the central Appalachian regions of eastern Kentucky and West Virginia (see Figure 1.1). While tobacco use alone does not account for the disproportionately higher rates of total and premature mortality; heart disease and cardiac mortality; cancer incidence and mortality; stroke mortality; COPD; obesity; and diabetes in Appalachia, tobacco use is a significant—if not leading—risk factor. In Appalachian Kentucky

alone, mortality rates for total cancer, lung cancer, and cervical cancer exceed the rest of Appalachia by an estimated 36% and the rest of the nation by about 50% (Borak et al., 2012).

Figure 1.1: Map of U.S. Adult Smoking Prevalence, 2010*



*Based on 2010 Census population data and BRFSS adult smoking data from 2003-2009
Source: Community Commons, n.d.

Overall, about 20% of all deaths in Kentucky are attributable to smoking, and smoking costs Kentucky $5.6 billion in excess personal medical care expenditures and productivity losses from smoking-related premature death and illnesses every year (Peyton et al., 2012; Rumberger, Hollenbeak, & Kline, 2010). In 2010, there were about 1.1 million adult smokers in the state, which ranks 51st in the nation for tobacco use prevalence (CDC, 2013b; Peyton et al., 2012).

Additionally, Kentucky has an exceedingly high prevalence of women who smoke while pregnant—24.3%—twice the national average (Kentucky Office of Vital Statistics (KOVS), 2009). Appalachian county rates are even higher. In Lee County, 56.1% of women reportedly

smoked while pregnant in 2009 (KOVS, 2009; Peyton et al., 2012). Smoking during pregnancy has been linked to poor health outcomes for both the mother and infant, including miscarriage, premature birth, stillbirth, low birth weight, and sudden infant death syndrome (HHS, 2004).

Youth tobacco use is also concerning. Although youth smoking rates have declined since 2004, more than 24% of Kentucky high school students reported a current smoking status in 2011, and high school smoking rates at the county level can exceed 30%, especially in Appalachian areas (CDC, 2013a; KIOM, 2007). Additionally, smokeless tobacco use among youth has actually increased in recent years and youth who use smokeless tobacco are more likely to become daily smokers as adults (HHS, 2004). As close to 90% of current adult daily smokers smoked their first cigarette before age 18 (HHS, 2012), current trends in Kentucky highlight the impact of youth tobacco use on future adult health outcomes and demonstrate the need for stronger, uniquely-tailored tobacco control efforts.

Definition of Key Terms

Appalachian Kentucky

Appalachian Kentucky makes up the majority of the central Appalachian region. The 54 Kentucky counties in the Appalachian region include Adair, Bath, Bell, Boyd, Breathitt, Carter, Casey, Clark, Clay, Clinton, Cumberland, Edmonson, Elliott, Estill, Fleming, Floyd, Garrard, Green, Greenup, Harlan, Hart, Jackson, Johnson, Knott, Knox, Laurel, Lawrence, Lee, Leslie, Letcher, Lewis, Lincoln, McCreary, Madison, Magoffin, Martin, Menifee, Metcalfe, Monroe, Montgomery, Morgan, Nicholas, Owsley, Perry, Pike, Powell, Pulaski, Robertson, Rockcastle, Rowan, Russell, Wayne, Whitley, and Wolfe.

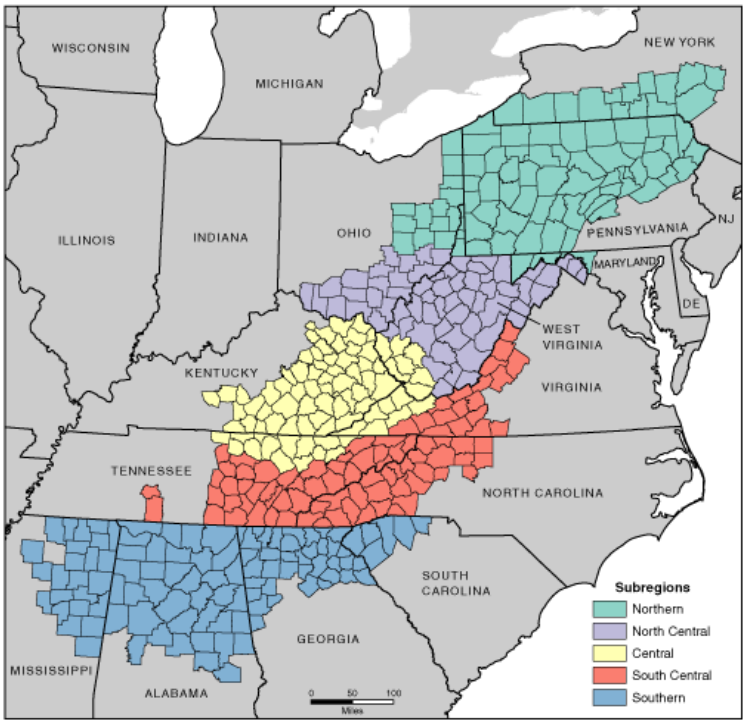
These counties represent some of the most economically distressed counties in the entire nation. With this status comes similarly distressing reports of low educational attainment, high

unemployment, high poverty, extreme health disparities, and the highest rates of all-cause mortality in the U.S. (Appalachian Regional Commission (ARC), 2013; Behringer & Friedell, 2006; Borak et al., 2012; Halverson & Bischak; 2008; Kruger et al., 2012; Wingo et al., 2008).

Appalachian Region

According to the ARC, the Appalachian region of the U.S. is a "205,000-square-mile region that follows the spine of the Appalachian Mountains from southern New York to northern Mississippi" (ARC, 2011a). It extends more than 1,000 miles and includes 420 counties from 13 states: Alabama, Georgia, Kentucky, Maryland, Mississippi, New York, North Carolina, Ohio, Pennsylvania, South Carolina, Tennessee, Virginia, and West Virginia. The Appalachian region is split into subregions: Northern, North Central, Central, South Central, and Southern (see Figure 1.2). Forty-two percent of the region's population is rural, and the region is home to more than 25 million people (ARC, 2011a).

Figure 1.2: Map of Appalachian Subregions, 2009



Source: ARC, 2009

Needs Assessment

A needs assessment is a systematic process for determining and addressing gaps between current conditions and desired conditions. The goal of a needs assessment is to identify and understand a problem in order to develop effective, feasible solutions. According to Kaufman, Rojas, and Mayer (1993), "needs assessments are only effective when they are ends-focused and provide concrete evidence that can be used to determine which of the possible means-to-the-ends are most effective and efficient for achieving the desired results" (p.4). A needs assessment is an effective problem-solving and planning process with a range of effective applications, including tobacco control.

Rural

The Legacy Foundation (2009) observes that while the word "rural" is "generally used to describe some unique social, economic, geographic, demographic, and cultural characteristics or conditions of people and places…there is no single, common or universal definition of the word" (p.6). The term takes on different meanings depending on whether its definition is based on population size of a region, population density of region, socioeconomic conditions, distance from a metropolitan area, geographic features of place, or some combination of these factors. As a result, the "share of the U.S. population considered rural ranges from 17% to 49% depending on the definition used" (Cromartie & Bucholtz, 2008; American Legacy Foundation, 2009, p.7).

Thus, a rural-urban continuum might be a better approach to determining rurality rather than a strictly rural v. urban paradigm. Alternatively, focusing on the aspects of rurality that matter for health might be the best approach for healthcare practitioners (Larson & Hart, 2003). Overall, recognizing that not all rural areas are the same, no matter the definition, is key to any successful efforts to impact health and behavior in rural areas. Thus, for the purposes of this

tobacco control needs assessment, the "rurality conditions that give rise to unique tobacco-related disparities" in Appalachian Kentucky will drive considerations of the "programmatic actions" needed to address those disparities (American Legacy Foundation, 2009, p.8).

However, because the term "rural" is often used in tobacco use prevalence and norms discussions, and data presented in this report may refer to "rural" areas, it can be assumed unless otherwise indicated that the term "rural" refers to the urban-rural definition set out by the U.S. Department of Health and Human Services (HHS), Substance Abuse and Mental Health Services Administration (SAMHSA), Office of Applied Studies. SAMHSA's "county type" classifications are based on Rural/Urban Continuum Codes developed by the U.S. Department of Agriculture (USDA) in 2003 (SAMHSA, 2006; see Box 1.1).

Box 1.1 Defining Rural

According to the Rural/Urban Continuum Codes developed by the USDA (2003) each county is in either a metropolitan statistical area (MSA) or outside of a MSA. Large metropolitan (large metro) areas have a population of 1 million or more. Small metropolitan (small metro) areas have a population of less than 1 million. Nonmetropolitan (nonmetro) areas are outside of MSAs and include urbanized countries with a population of 20,000 or more in urbanized areas, less urbanized counties with a population of at least 2,500 but fewer than 20,000 in urbanized areas, and completely rural counties are those with a population of fewer than 2,500 in urbanized areas (SAMHSA, 2006).

Social Ecological Approach

The social ecological framework developed by McLeroy, Bibeau, Stecklet, and Glanz (1988) recognizes the multiple levels of influence on health and human behavior. These levels include individual, interpersonal, organizational, community, and policy. Proponents of the social ecological approach recognize the complex interplay between factors that impact health within the various levels of influence that cannot be successfully addressed in isolation (Crosby & Noar, 2010; McMichael, 1999; Stokols, 1992).

Tobacco Control

For the purposes of this project, tobacco control will refer to "tobacco control provisions that reduce the demand for tobacco as well as others that reduce tobacco production, distribution, availability and supply" (World Health Organization (WHO), n.d.). These efforts include restricting tobacco advertising, marketing and distribution; limiting interactions between legislators and the tobacco industry; restricting the sale of tobacco products to minors; modifying tobacco labeling to include graphic health warnings; prohibiting deceptive labeling and modified risk claims; prohibiting certain flavors and additives; implementing and enforcing smoke-free laws in public places; regulating and disclosing tobacco product ingredients; implementing counter-measures to tobacco product smuggling; increasing taxes on tobacco products; increasing access to cessation services; and improving public awareness of the harms of tobacco use. WHO's MPOWER measures will be used as the basis for recommended best practices in tobacco control efforts from the global to the local level (see Box 1.2).

Box 1.2 MPOWER Measures

Monitor tobacco use and prevention policies

Protect people from tobacco smoke

Offer help to quit tobacco use

Warn about the dangers of tobacco

Enforce bans on tobacco advertising, promotion and sponsorship

Raise taxes on tobacco

"The federal government and state and local governments must take steps to ensure tobacco control efforts address and include people living in rural communities. School systems and health systems must take measures to promote smoke-free air and tobacco cessation services. Lastly, everyone must do their part to change our culture and ensure that future generations have a healthy, tobacco-free future"(Kimberly Horn, American Lung Association, 2012, p.1).

CHAPTER TWO: LITERATURE REVIEW

Introduction

Cigarette smoking causes 1 out of every 5 deaths in the United States—a staggering 443,000 deaths annually and more than 1,200 deaths each day (CDC, 2008; NCHS, 2012; Mackun & Wilson, 2011). In fact, smoking cigarettes kills more Americans than human immunodeficiency virus (HIV), illegal drug use, alcohol use, motor vehicle injuries, suicides, and murders combined, making cigarette smoking the leading cause of preventable death in the United States (CDC, 2008; Kochanek, et al., 2011; McGinnis & Foege, 1993). Smoking is also the leading cause of preventable disease, with 8.6 million people currently suffering from smoking-related illnesses (CDC, 2003). Despite this significant health burden, 19.0% of all adults aged 18 years or older in the United States—an estimated 43.8 million people—currently smoke cigarettes (CDC, 2012a). New smokers join these ranks every day, maintaining the significant tobacco burden decade after decade.

Yet the aggregate burden of tobacco use oversimplifies what is an extremely complex, multifaceted health issue that extends far beyond the serious health effects of tobacco use and the constant influx of new smokers to replace those lost to tobacco-related causes. Tobacco use occurs at the intersection of myriad risk and protective factors at all levels of influence, from the individual to surrounding social and political environments. As a result, the picture of tobacco use changes depending on the lens used to view it, with significant, disturbing disparities occurring in very distinct populations across the nation. Understanding these distinctions in the context of tobacco use trends in the U.S. is an integral first step in developing and implementing effective tobacco control strategies to reduce the public health burden of tobacco use.

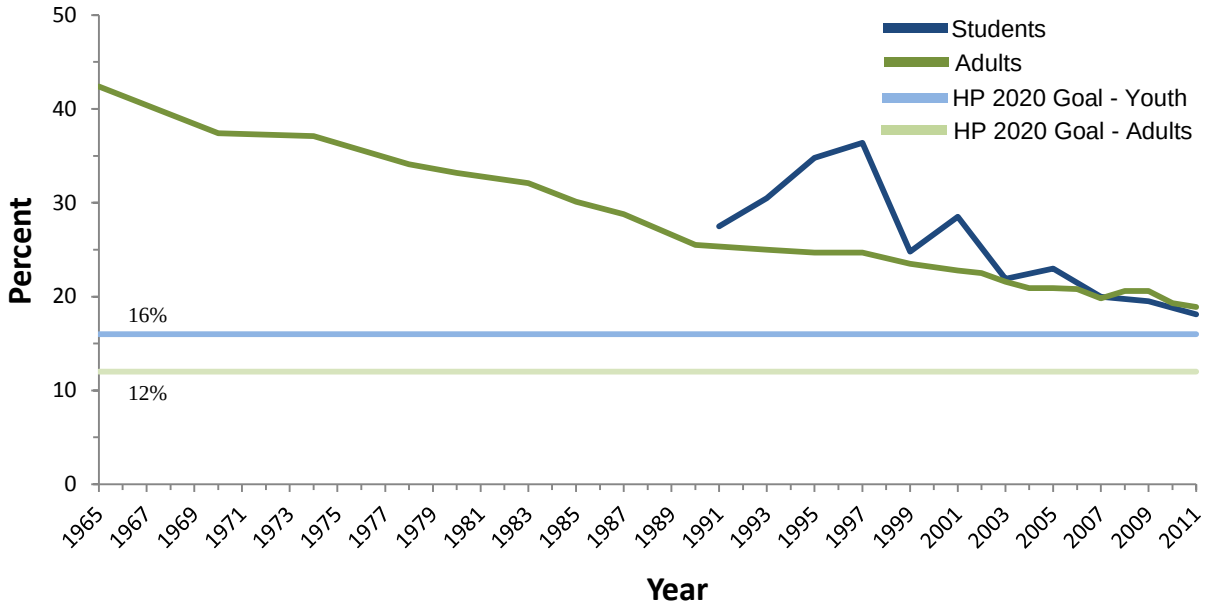
The following literature review provides a brief overview of 1) current tobacco use trends, including trends by age, gender, race/ethnicity, socioeconomic status, and geographic location; 2) tobacco-related mortality and morbidity; 3) risk and protective factors for tobacco use; 4) current best practices in tobacco control; and 5) current tobacco control efforts. These sections are not meant to be exhaustive reviews as other data sources provide in-depth analyses of these issues. Unless otherwise noted, all figures reflect United States data.

Current Tobacco Use Trends

General

Although the prevalence of cigarette smoking among youth and adults has declined over the past several decades (see Figure 2.1), that decline has slowed in recent years and remains above the goals set by *Healthy People 2020*—16.0% and 12.0% for youth and adults respectively (Garrett, Dube, Trosclair, Caraballo, & Pechacek, 2011; CDC, 2010a; CDC 2010b).

Figure 2.1: Trends in Current Smoking by High School Students* & Adults, 1965-2011**



*Percentage of high school students who smoked cigarettes on 1 or more of the 30 days prior (Youth Risk Behavior Survey, 1991-2011)
**Percentage of adults who are current cigarette smokers (National Health Interview Survey, 1965-2011)

Source: CDC, 2012

Additionally, disparities in smoking still persist among certain groups, including racial/ethnic minorities; persons with low socioeconomic status; persons with histories of mental health and substance abuse conditions; the lesbian, gay, bisexual, and transgender (LGBT) community; and persons living in the South and Midwest regions of the United States, especially in rural areas (Garrett et al., 2011).

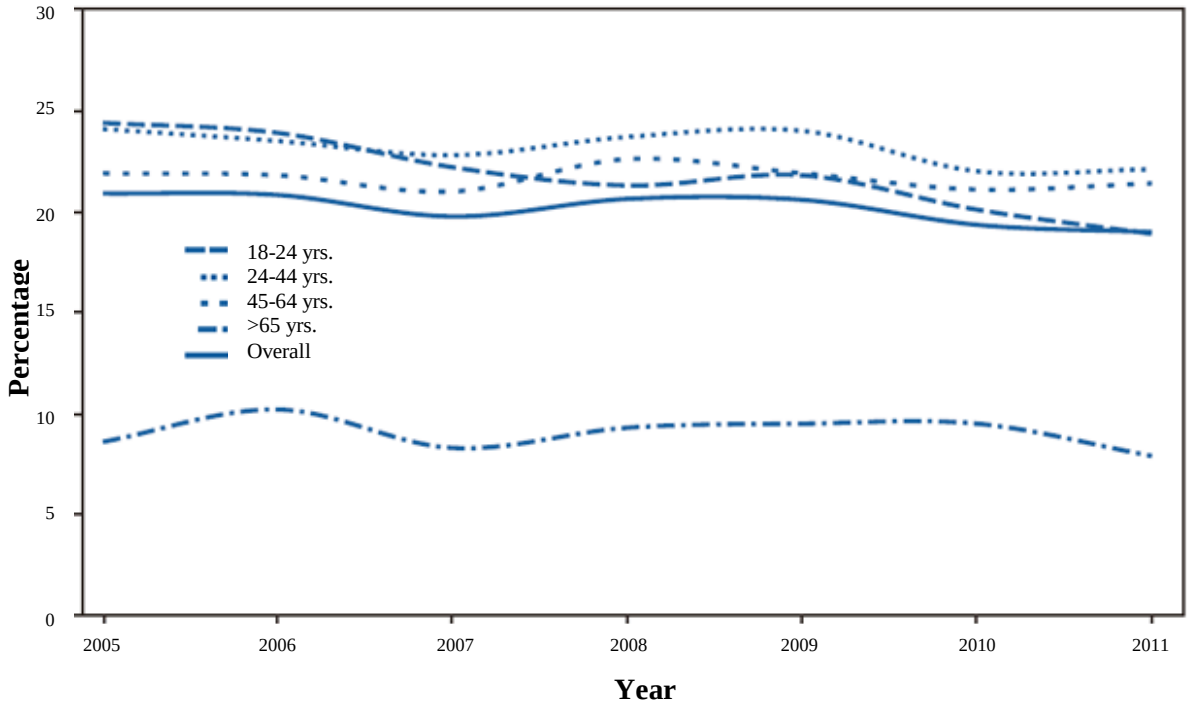
Smokeless tobacco use among adults and female youth has remained low over the past 20 years, showing little change from 1987 to 2000 (Nelson et al., 2006). Smokeless use among men has declined slowly, with the biggest declines among those ages 18 to 24, as well as among Black, non-Hispanic males (Black), males in Southern areas, and males living in rural areas (Nelson et al., 2006). Smokeless tobacco use has declined most sharply among adolescent boys. However, national trend analyses on smokeless use are not currently available for recent years, and national trend data may mask differences among demographic subgroups (Nelson et al., 2006). For instance, there are disparities in smokeless use, with higher rates of use among adult males, young adult males, men residing in rural areas and/or southern or western states, White, non-Hispanic men (White), American Indian/Alaskan Native (AI/AN) men, men with lower education, and male youth who are White, AI/AN, or residing in rural areas (CDC, 1993; Grunbaum et al., 2002; Howard-Pitney & Winkleby, 2002; HHS, 1994; Marchus, Crane, Shopland & Lynn, 1989; Nelson et al., 2006).

Adults

According to new estimates from 2012 National Health Interview Survey data released in June 2013, the prevalence of cigarette smoking among adults aged 18 and over may now be as low as 18.0%, down from 19.0% in 2012, although final estimates are not yet available (CDC,

2013a).[2] Cigarette smoking is still more common among men (20.4%) than women (15.8%) and highest among the age group 18-44 (20.3%) (CDC, 2013a). However, there has been a decline in smoking among young adults aged 18-24 since 2005, with prevalence rates dropping from 24.4% in 2005 to 18.9% in 2011 (see Figure 2.2) (CDC, 2012a). More than 75% of all current adult smokers report smoking daily, with more than 35% of these reporting smoking between 10 and 19 cigarettes per day (CDC, 2012a). Smokeless tobacco use remains low (2.3%), although men and adults between ages 25 and 44 report higher rates of use, 4.5% and 5.8%, respectively (Nelson et al., 2006).

Figure 2.2: Percentage of adults aged ≥18 years who were current smokers, by age group — National Health Interview Survey, United States, 2005–2011



Source: CDC, 2012

In terms of race/ethnicity,[3] AI/AN adults report the highest prevalence of current smoking (31.5%), followed by White adults (20.6%), Black adults (19.4%) Hispanic adults

[2] Current adult smokers are defined as those who had smoked more than 100 cigarettes in their lifetime and now smoke every day or some days.
[3] Since early data from the 2012 NHIS was not released for all racial/ethnic minority groups, data from the 2011 NHIS is used instead.

(12.9%) and Asian, non-Hispanic (Asian) adults (9.9%) (CDC, 2012a). Smokeless tobacco use by adults also varies by race, with the majority of use by Whites (5.5%), followed by Blacks (1.4%), and almost no use among Hispanics (0.8%) (Nelson et al., 2006).

However, although most racial/ethnic minorities report a lower prevalence of smoking than their White counterparts, prevalence estimates alone mask the severe tobacco-related disparities among racial/ethnic minority groups (Margerison-Zilko & Cubbin, 2012). Racial/ethnic minority groups are less likely to report long-term quitting, cessation attempts, and receiving advice on quitting from health professional (Trinidad, Perez-Stable, White, Emery, & Messer, 2011). Additionally, Hispanics initiate tobacco use earlier than all other groups (see Youth section) and Blacks have the highest exposure to secondhand smoke (Fagan et al., 2007). As a result, racial/ethnic minority groups face greater disparities in smoking-attributable morbidity and mortality, with the highest rates of lung cancer incidence and death among Black adults (Fagan et al., 2007).

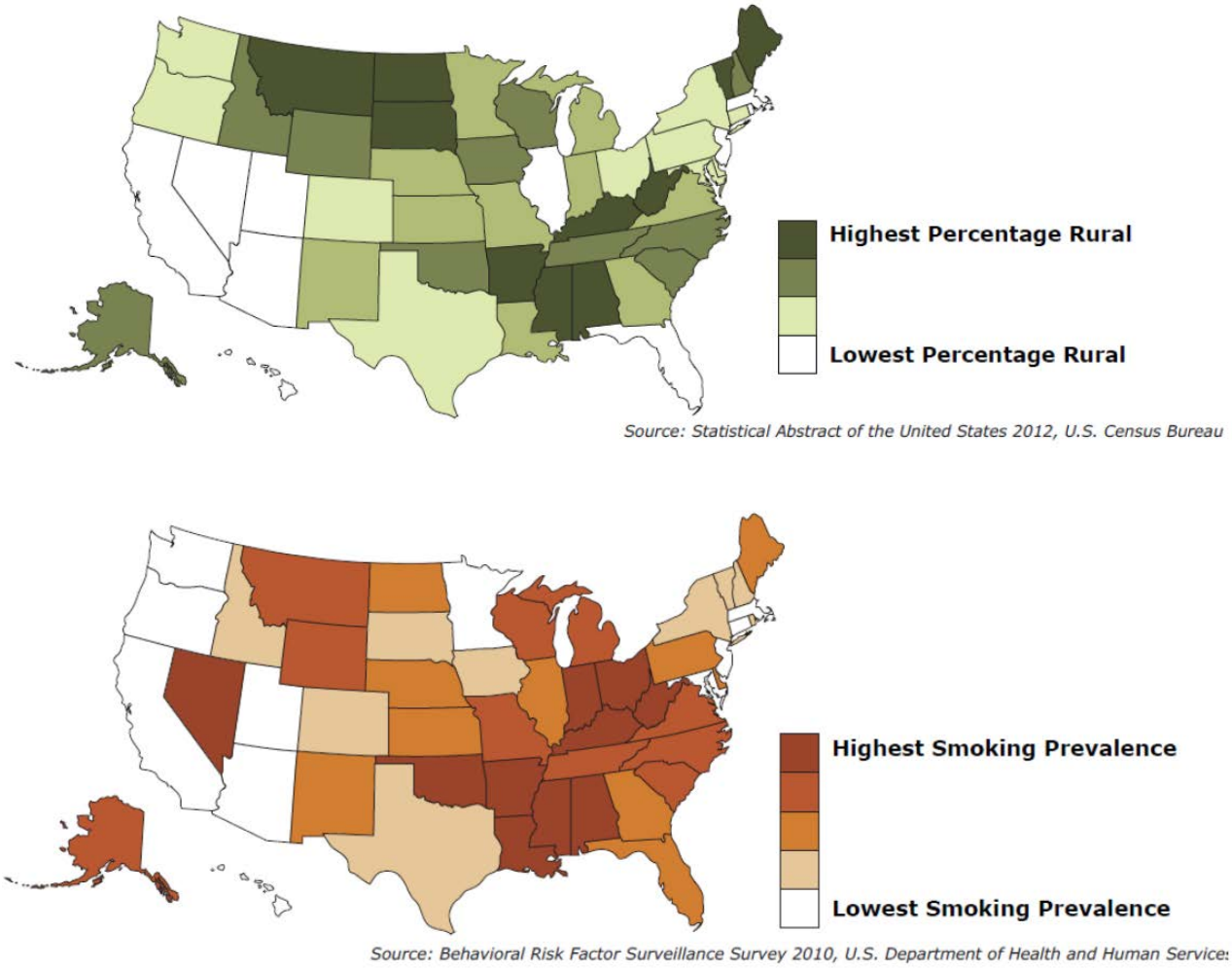
Tobacco use also remains correlated with educational attainment, poverty status, geographic location, and rurality, with higher rates of tobacco use among persons with a GED or lower, those living below the poverty level, and those living in the Midwest and Southern regions of the United States, especially in rural areas. However, the higher prevalence of tobacco use in rural areas may be a result of compounding tobacco use risk factors, as Whites and persons with lower levels of income and education are more likely to reside in rural areas (see Figure 2.3).

Additionally, significant disparities are seen among persons with any mental illness (AMI)[4] and persons who identify as LGBT. Of the near 20% of adults reporting AMI from 2009 to 2011, 36.1% were current smokers, and these adults smoked 30.9% of all cigarettes smoked

[4] Defined as having a mental, behavioral, or emotional disorder, excluding developmental & substance use disorders, in the past 12 months.

by adults during this time period (CDC, 2013c). Within the LGBT community, smoking prevalence among gay and bisexual men is anywhere from 27% to 71% higher than their heterosexual male counterparts; for lesbians and bisexual women, prevalence is anywhere from 70% to 350% higher (Burkhalter et al., 2009, ALA report).

Figure 2.3: Comparison of States with Highest Percentage of Citizens living in Rural Areas and Highest Smoking Prevalence, 2010



Source: American Lung Association, 2012

Youth

According to the 2011 National Youth Tobacco Survey, 15.8% of high school students, or 2.6 million youth, currently smoke cigarettes (CDC, 2012b).[5] Males report slightly higher smoking rates than females, 1.5 million vs. 1.1 million, respectively. Males also report significantly higher rates of smokeless tobacco use than females, 1.1 million vs. 130,000, with a total 7.3% of high schoolers reporting current smokeless tobacco use (CDC, 2012b). Increasingly, high school youth are starting to report higher rates of other combustible tobacco product use, including cigars (11.6%), pipes (4.0%), bidis (2.0%) and kreteks (1.7%).[6] The total combustible tobacco product use for high school students is 21.0%, and the total any tobacco use is 23.2% or 3.8 million high school youth (CDC, 2012b).

White and Hispanic youth report higher rates of tobacco use in comparison to their peers for all types of tobacco expect cigars, where Black youth exceed Hispanic youth rates. Asian youth report the lowest prevalence of tobacco use for all categories (CDC, 2012b). However, AI/AN youth were not included in this survey, and the AI/AN population typically reports the highest rates of tobacco use (CDC, 2011). Pooled data from six waves of Monitoring The Future surveys from 1996–2000 indicate that, among American Indians in grade 12, the current smoking rate is 46.1% (Wallace, Bachman, O'Malley, Johnston, Schulenberg, & Cooper, 2002).

Among middle schoolers, 7.1% report any tobacco use, with 4.3% reporting current cigarette smoking and 2.2% reporting smokeless tobacco use (CDC, 2012b). Males are more likely than females to report tobacco use. Hispanic middle school youth report higher rates of tobacco use in comparison to their peers for all types of tobacco; Asian middle schoolers report the lowest prevalence (CDC, 2012b). However, other national data sources suggest racial/ethnic

[5] The definition of current smoking for youth is having smoked a cigarette on at least 1 day during the past 30 days.
[6] A bidi is a small, thin, hand-rolled cigarette made of tobacco wrapped in a tendu or temburni leaf (plants native to Asia). A kretek, or clove cigarettes, is a cigarette containing a mixture of tobacco, cloves, and other additives. Bidis and kreteks are typically imported from Asia.

differences in smoking do not emerge until high school (see Table 2.1) (Arrazola, Dube, Kaufmann, Caraballo, & Pechacek, 2010; Eaton et al., 2012; Johnston, O'Malley, Bachman, & Schulenberg, 2012).

Table 2.1 Current Youth Smoking Prevalence by Race/Ethnicity, 2011

Age / Race/Ethnicity	Grades 6-8 NYTS 2011	Grade 8 MTF 2011	Age 12-17 YRBSS 2011	Grades 9-12 NYTS 2011	Grade 12 MTF 2011
White, non-Hispanic	3.8	7.2	9.8	17.6	22.2
Hispanic	6.7	6.9	8.0	15.8	14.3
Black, non-Hispanic	3.6	4.1	4.5	10.6	9.7
Asian, non-Hispanic	1.3	-	3.6	5.0	-

NYTS = National Youth Tobacco Survey | MTF = Monitoring The Future | YRBSS = Youth Risk Behavioral Surveillance System

In terms of initiation, each day more than 3,600 youth under age 18 smoke their first cigarette, and more than 900 become daily cigarette smokers (SAMHSA, 2011). Initiation rates for cigarette smoking do not differ by gender; however, three times as many male youth try smokeless tobacco for the first time every day compared to females, with more than 1,500 total youth trying smokeless every day (SAMHSA, 2011). Similar discrepancies by gender occur for first time cigar use as well, with more than 3,000 youth (1,800 males, 1,200 females) trying their first cigar every day (SAMHSA, 2011).

Understanding youth initiation trends is important in the context of reducing the total burden of tobacco use, as youth tobacco use is the leading risk factor for adult tobacco use. In fact, among adults who become daily cigarette smokers, nearly all first use of cigarettes occurs by 18 years of age (88%), with 99% of first use by 26 years of age (HHS, 2012). Youth and young adults who reach age 18 without ever starting to use cigarettes will most likely never become daily smokers. Among those youth that do become regular smokers before adulthood, about one-third will eventually die from smoking, and if current trends continue, more than five million kids under 18 who are alive today will die from tobacco-related causes (CDC, 2011).

Other factors influencing youth tobacco initiation are described later in this chapter (see section on Tobacco Use Risk and Protective Factors). However, national survey data suggest that youth smoking is also correlated with socioeconomic status, parental education level, plans to attend college, and parental smoking (Johnston et al., 2012).

Finally, understanding disparities in youth tobacco use is important. Age of initiation and progression to daily use differ by race/ethnicity, with Hispanic youth initiating tobacco use much younger than their peers and 59% of White youth describing themselves as daily smokers (Johnston et al., 2012). Similarly to adults, youth who identify as LGBT report higher, heavier, earlier rates of smoking, with current prevalence ranging from 38% to 59% (Ryan, Wortley, Easton, Pederson, & Greenwood, 2001). In 2011, the CDC analyzed data from the 2001-2009 Youth Risk Behavior Surveys in seven states and six urban school districts that asked high school students about sexual identity. According to the results of this analysis, bisexual youth currently face the highest tobacco use rates (39.6%), followed by gay or lesbian youth (35.4%), and heterosexual youth (13.6%). Additionally, gay or lesbian youth are also more likely to have smoked a whole cigarette by age 13 (25.7%) than bisexual (24%) or heterosexual (10%) youth (Kann et al., 2011). Youth who reside in rural areas also report higher rates of smoking (22.3% compared to 17.2% of their urban peers) and smokeless tobacco use, and regional differences found in adult tobacco use are mirrored in youth rates, with highest prevalence in Midwest and Southern regions (Johnston et al., 2012).

Smoking-Related Morbidity & Mortality[7]

Despite substantial declines in smoking over the past five decades, smoking-attributable mortality has mostly remained static due to the increasing and aging population (CDC, 2008). The CDC explains this phenomenon:

> "Even with declines in the rates of various smoking-related diseases (e.g., coronary heart disease), the absolute number of deaths is increasing as the total population increases. In addition, cohorts of smokers with the highest peak prevalence have now reached the ages with the highest incidence of smoking-attributable diseases" (CDC, 2008).

As a result, smoking is still responsible for about 20% of all deaths each year, most of them premature. In fact, on average, adults who smoke cigarettes die 14 years earlier than nonsmokers (CDC, 2002), and more than 25 million adults alive today will die prematurely from smoking-related illness including cancer, heart disease, stroke, and lung disease (CDC, 1997).

Cigarette smoking harms nearly every organ in the body. Compared with nonsmokers, smoking increases the risk of coronary heart disease by 2 to 4 times, stroke by 2 to 4 times, men developing lung cancer by 23 times, women developing lung cancer by 13 times, and dying from chronic obstructive lung diseases (such as chronic bronchitis and emphysema) by 12 to 13 times (HHS, 2004).

Cigarette smoking is the primary causal factor in at least 30% of all cancer deaths and 87% of all lung cancer deaths—the leading cause of cancer death in both men and women (HHS, 2004). Smoking is also linked with an increased risk of cancer of the larynx (voice box), oral cavity (mouth, tongue, and lips), nose and sinuses, pharynx (throat), esophagus, stomach,

[7] This review does not include an overview of secondhand smoke morbidity and mortality. However, secondhand smoke accounts for nearly 50,000 of the 443,000 smoking-attributable deaths per year.

pancreas, cervix, kidney, bladder, ovary, colon, rectum, and blood cells (acute myeloid leukemia).

Smoking contributes to other health problems such as pneumonia, asthma, gum disease, cataracts, bone thinning, hip fractures, peptic ulcers, circulation issues, and blindness. Smoking during pregnancy can cause infertility in women and increase the risks of miscarriage, premature birth, stillbirth, low birth-weight infants, and sudden infant death syndrome (HHS, 2004; HHS, 2001).

Although smokeless tobacco use does not carry the same level of risk as cigarette smoking, smokeless tobacco use can cause oral, esophageal and pancreatic cancer (WHO, 2007). Smokeless tobacco use also increases the risk of oral lesions and may cause heart disease and gum disease. According to the WHO, "the nicotine in smokeless tobacco may increase the risk for sudden death from a condition where the heart does not beat properly (ventricular arrhythmias), and, as a result, the heart pumps little or no blood to the body's organs" (WHO, 2007). There is no known safe level of tobacco use or tobacco smoke exposure.

Tobacco Use Risk and Protective Factors

Tobacco use is influenced by a range of risk and protective factors occurring at multiple levels of influence. The following summarizes key individual, interpersonal, and sociopolitical risk and protective factors for tobacco use.

Individual Factors

As evidenced by the disparities in tobacco use according to age, gender, race/ethnicity, socioeconomic status, educational attainment, mental health, sexual orientation, rurality, and region of the country described in Chapter Two, it is unsurprising that these characteristics comprise the primary demographic risk factors at the individual level. As previously noted,

perhaps the most significant individual risk factor for tobacco use is age of initiation, with earlier initiation predicting greater likelihood for continued use in adulthood (HHS, 2012). Age of initiation is also correlated with earlier dependence, difficulties quitting, and development of tobacco-related health problems (Breslau & Peterson, 1996; Lando, 1999). According to Monitoring The Future data, peak years for first trying a cigarette appear to be in the sixth and seventh grades (Johnston et al., 2012).

Individual risk factors extend beyond demographics to incorporate less tangible risk factors such as knowledge, attitudes, and beliefs about tobacco use. These attitudes and beliefs include beliefs about the risks and benefits of tobacco use, perceptions of peer tobacco use and social acceptability, and perceptions of the tobacco industry (Cowell, Farrelly, Chou, & Vallone, 2009; Farrelly, Davis, Duke, & Messeri, 2009; Farrelly et al., 2002; Goldman & Glantz, 1998; Gryczynski & Ward, 2011; Shen, 2010; Sly et al., 2005). Some studies suggest that perceptions of peer tobacco use may play a greater role in youth smoking than actual peer smoking (HHS, 2012; Ellickson, Bird, Orlando, Klein, & McCaffrey, 2003), and perceptions that tobacco use is not accepted in one's social network is a protective factor for youth smoking initiation (Johnston et al., 2012). However, beliefs about what constitutes smoking and self-perceptions of smoking status may be important, as a large proportion of both youth and adult smokers do not equate intermittent smoking (i.e., social smoking) with being a smoker (Berg et al., 2010; Choi, Choi, & Rifon, 2012; Levinson et al., 2007).

Other individual level risk factors include perceived and actual levels of stress (Bruijnzeel, 2012; O'Loughlin, Karp, Koulis, Paradis, & Difranza, 2009; Purnell et al., 2012) sensation-seeking, and risk-taking (Palmgreen, Donohew, Lorch, Hoyle, & Stephenson, 2001; Palmgreen et al., 2007; Slater, 2003; Stephenson, Hoyle, Palmgreen, & Slater, 2003; Vallone,

Allen, Clayton, & Xiao, 2007). Religiousness and perceived discrimination of tobacco users may be a protective factors (Borrell et al., 2010; Gryczynski & Ward, 2011; Johnston et al., 2012; Lorenzo-Blanco, Unger, Ritt-Olson, Soto, & Baezconde-Garbanati, 2011; Purnell et al., 2012; Todorova, Falcon, Lincoln, & Price, 2010; Wiehe, Aalsma, Liu, & Fortenberry, 2010; Yeung, Chan, & Lee, 2009)

Interpersonal Factors

Interpersonal factors for tobacco use are also significant. Youth and young adults who are exposed to smoking by close social contacts such as parents, older siblings and friends are more likely to initiate smoking compared to those who are not exposed to smoking (Bricker et al. 2012; Freedman, Nelson, & Feldman, 2012; HHS, 2012; Johnston et al., 2012; Pollard et al., 2010; Schaefer, Haas & Bishop, 2012). Some studies suggest that peer smoking may be the primary interpersonal risk factor for both youth tobacco initiation and continued smoking into adulthood—more influential than even parental smoking (HHS, 2012). This effect may be even stronger during middle school, especially for girls, with a recent study finding the greatest peer influence on youth tobacco initiation among girls in junior high school, with male peer influence effects increasing in high school (Liao, Huan, Huh, Pentz, & Chou, 2013).

Sociopolitical Factors

Cultural norms influence the tobacco use perceptions that often drive individual and interpersonal risk factors related to social acceptability and perceived discrimination. Cultural norms are also shaped by factors in the social environment such as tobacco marketing and countermarketing, as well as political factors such as smoke-free laws, age of purchase restrictions, and tobacco taxes.

The influence of tobacco marketing on tobacco use is well studied (Andrews & Franke, 1991; Chaloupka & Warner, 1999; Lovato, Linn, Stead, & Best, 2003), especially among vulnerable populations such as youth, persons with low socioeconomic status, and racial/ethnic minority groups (Henriksen, Schleicher, Dauphinee, & Fortmann 2011; Hyland et al., 2003; Ogneva-Himmelberger, Ross, Burdick, & Simpson, 2010; Peterson et al., 2011; Reid, Peterson, & Lowe, Hughey, 2005; Schneider et al., 2005; Siahpush, Jones, Singh, Timsina, & Martin, 2010; White, White, Freeman, Gilpin & Pierce., 2006; Yu, Peterson, Sheffer, Reid, & Schneider, 2010). These studies provide a strong evidence base for the recent tobacco marketing and advertising bans enacted by the 2009 Family Smoking Prevention and Tobacco Control act to reduce youth exposure to tobacco marketing.

From a protective standpoint, exposure to anti-tobacco marketing is correlated with reductions in youth and adult smoking prevalence (CDC, 2007b; Farrelly, Davis, et al., 2009; Farrelly, Nonnemaker, Davis, & Hussin, 2009; Farrelly et al., 2005; Hersey et al., 2005; HHS, 2012; NCI, 2008; Niederdeppe, Farrelly, & Haviland, 2004; Niederdeppe, Farrelly, Hersey, & Davis, 2008).

Finally, communities that have implemented and enforced strong, comprehensive tobacco control policies such as smoke-free laws in public places, state and local tobacco countermarketing, bans on tobacco marketing and advertising, access to cessation services, and increased state tobacco taxes, have much lower youth and adult tobacco use prevalence than those communities with weaker policies (Carpenter & Cook, 2007; Siegel, Albers, Cheng, Biener, & Rigotti, 2005; Siegel, Albers, Cheng, Hamilton, & Biener, 2008). Smoke-free laws and tobacco taxes are particularly effective—a 10% increase in the price of cigarettes is

associated with a 6-7% decline in youth smoking and a 3.5% decline in adult smoking (Carpenter & Cook, 2007; Chaloupka, Yurekli, & Fong, 2012).

Current Best Practices in Tobacco Control

As noted in Chapter One, the WHO framework for effective tobacco control includes implementing a range of measures, including monitoring tobacco use and prevention policies; protecting people from tobacco smoke; offering help to quit tobacco use; warning about the dangers of tobacco; enforcing bans on tobacco advertising, promotion and sponsorship; and raising taxes on tobacco. However, the United States has yet to ratify the WHO Framework Convention on Tobacco Control or implement these measures to the extent recommended at the national, state, or local levels (WHO, 2011). The 2009 Family Smoking Prevention and Tobacco Control act has helped lay the groundwork for more fully implementing some of these measures at the national level, including stricter bans on tobacco advertising, promotion and sponsorship, mass media campaigns educating about the dangers of tobacco, strong health warning labels on tobacco packaging (under litigation), and tobacco use monitoring. However, more needs to be done to meet CDC's *Healthy People 2020* objectives for reducing tobacco use:

- Tobacco Use Prevalence: Implementing policies to reduce tobacco use and initiation among youth and adults.
- Health System Changes: Adopting policies and strategies to increase access, affordability, and use of smoking cessation services and treatments.
- Social and Environmental Changes: Establishing policies to reduce exposure to secondhand smoke, increase the cost of tobacco, restrict tobacco advertising, and reduce illegal sales to minors.

According to the CDC, "evidence-based, statewide tobacco control programs that are comprehensive, sustained, and accountable have been shown to reduce smoking rates, tobacco related deaths, and diseases caused by smoking" (CDC, 2007b, p.7). CDC's *Best Practices for Comprehensive Tobacco Control Programs—2007* describes the primary components of an effective comprehensive statewide tobacco control program, including: state and community interventions; health communication interventions; cessation interventions; surveillance and evaluation; and administration and management (see Box 2.1) (CDC, 2007b). If all states implemented and sustained a comprehensive statewide program at the recommended level of investment—between $9.23 and $18.02 per capita—for at least 5 years, the CDC estimates there would be at least 5 million fewer smokers in the United States.

However, there are a range of barriers to tobacco prevention and control efforts in rural areas that may require even greater attention and spending. These include lack of transportation and access to medical services, lower rates of insurance coverage, low socioeconomic status, low health literacy, proximity to tobacco growers, inadequate enforcement of tobacco retailing laws, lack of effective compliance with smoke-free policies, limited research on how rural conditions lead to higher tobacco use, and pro-tobacco cultural norms (Gray & Chaloupka, 2003, Stevens, Colwell, & Hutchison, 2010; Hutcheson et al., 2008; Treiber, 2007; USDA; 2006).

Box 2.1 Components of Comprehensive Tobacco Control Programs

I. State and Community Interventions
State and community interventions include supporting and implementing programs and policies to influence societal organizations, systems, and networks that encourage and support individuals to make behavior choices consistent with tobacco-free norms. The social norm change model presumes that durable change occurs through shifts in the social environment, initially or ultimately, at the grassroots level across local communities. State and community interventions unite a range of integrated programmatic activities, including local and statewide policies and programs, chronic disease and tobacco-related disparity elimination initiatives, and interventions specifically aimed at influencing youth.

II. Health Communication Interventions
An effective state health communication intervention should deliver strategic, culturally appropriate, and high-impact messages in sustained and adequately funded campaigns integrated into the overall state tobacco program effort. Traditional health communication interventions and counter-marketing strategies employ a wide range of efforts, including paid television, radio, billboard, print, and web-based advertising at the state and local levels; media advocacy through public relations efforts, such as press releases, local events, media literacy, and health promotion activities; and efforts to reduce or replace tobacco industry sponsorship and promotions. Innovations in health communication interventions include more focused targeting of specific audiences as well as fostering message development and distribution by the target audience through appropriate channels.

III. Cessation Interventions
Interventions to increase cessation encompass a broad array of policy, system, and population-based measures. System-based initiatives should ensure that all patients seen in the health care system are screened for tobacco use, receive brief interventions to help them quit, and are offered more intensive counseling services and FDA-approved cessation medications. Cessation quitlines are effective and have the potential to reach large numbers of tobacco users. Quitlines also serve as a resource for busy health care providers, who provide the brief intervention and discuss medication options and then link tobacco users to quitline cessation services for more intensive counseling. Optimally, quitline counseling should be made available to all tobacco users willing to access the service.

IV. Surveillance and Evaluation
State surveillance is the process of monitoring tobacco-related attitudes, behaviors, and health outcomes at regular intervals. Statewide surveillance should monitor the achievement of overall program goals. Program evaluation is used to assess the implementation and outcomes of a program, increase efficiency and impact over time, and demonstrate accountability. A comprehensive state tobacco control plan—with well-defined goals; objectives; and short-term, intermediate, and long-term indicators—requires appropriate surveillance and evaluation data systems. Collecting baseline data related to each objective and performance indicator is critical to ensuring that program-related effects can be clearly measured. For this reason, surveillance and evaluation systems must have first priority in the planning process.

V. Administration and Management
Effective tobacco prevention and control programs require substantial funding to implement, thus making critical the need for sound fiscal management. Internal capacity within a state health department is essential for program sustainability, efficacy, and efficiency. Sufficient capacity enables programs to plan their strategic efforts, provide strong leadership, and foster collaboration between the state and local tobacco control communities. An adequate number of skilled staff is also necessary to provide or facilitate program oversight, technical assistance, and training.

Current Tobacco Control Efforts

The CDC's *Tobacco Control State Highlights 2012* report details a variety of tobacco control indicators for all 50 states and the District of Columbia, including:

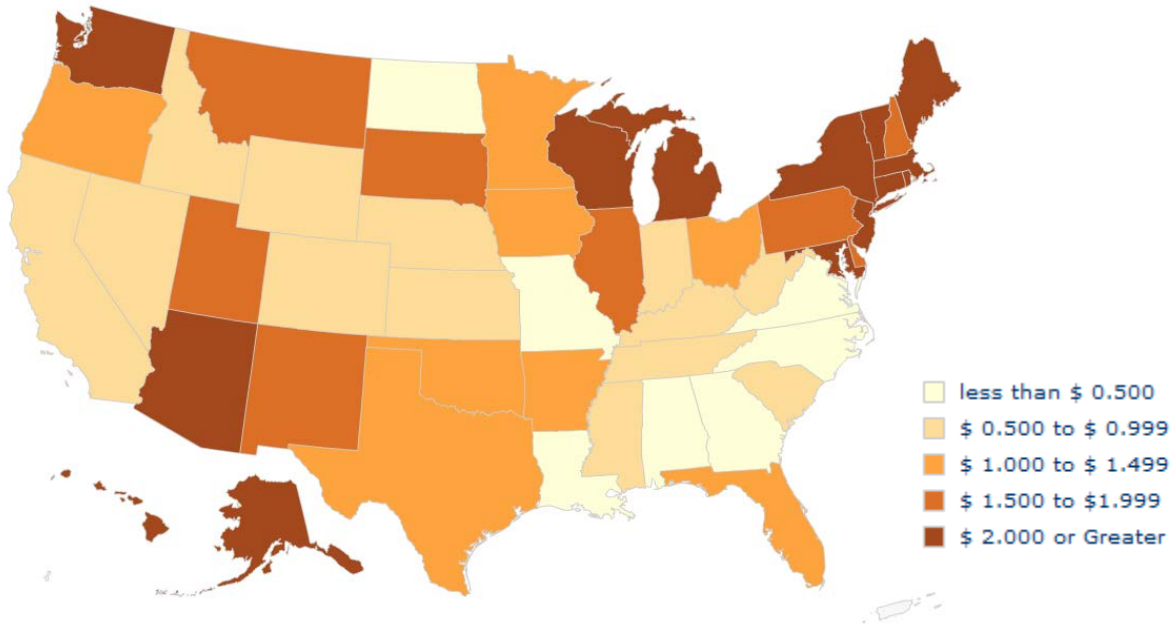
- Prevalence of tobacco use by demographic
- State anti-tobacco media campaign characteristics among adults and youth exposure
- Past year cigarette initiation
- Medicaid coverage for cessation
- Knowledge of the dangers of tobacco use counseling and medications
- Exposure to secondhand smoke
- State preemption of local advertising laws
- Statewide smoke-free policy
- State retail tobacco licensure policy
- Households with no-smoking rules
- Cigarette and smokeless excise tax
- Percentage of smokers attempting to quit
- Price paid for last cigarettes purchased

While some states such as Utah, Hawaii, and California are making strides in tobacco control and seeing lower tobacco use prevalence as a result, other states, like Kentucky, West Virginia, and Wyoming, are falling behind. In fact, the only six states left that lack statewide smoke-free policies are Kentucky, Mississippi, South Carolina, Texas, West Virginia and Wyoming. Eleven states also still allow local policies that preempt statewide smoke-free polices.

States also range greatly in terms of state cigarette taxes; as of June 2012, New York was charging $4.35 per pack while Missouri only charged $0.17 per pack (CDC, 2013b).[8] Overall, the national median for state excise taxes is too low, at just $1.34 per pack, and only 14 states have excise taxes that exceed $2.00 (see Figure 2.4). Given that each pack of cigarettes sold in the Unites States costs the economy $10.47 in direct medical costs and lost productivity (CDC, 2006), higher cigarette taxes are needed.

[8] State excise taxes exclude local and federal taxes.

Figure 2.4 Excise Tax Rates on Packs of Cigarettes



Source: CDC, 2013

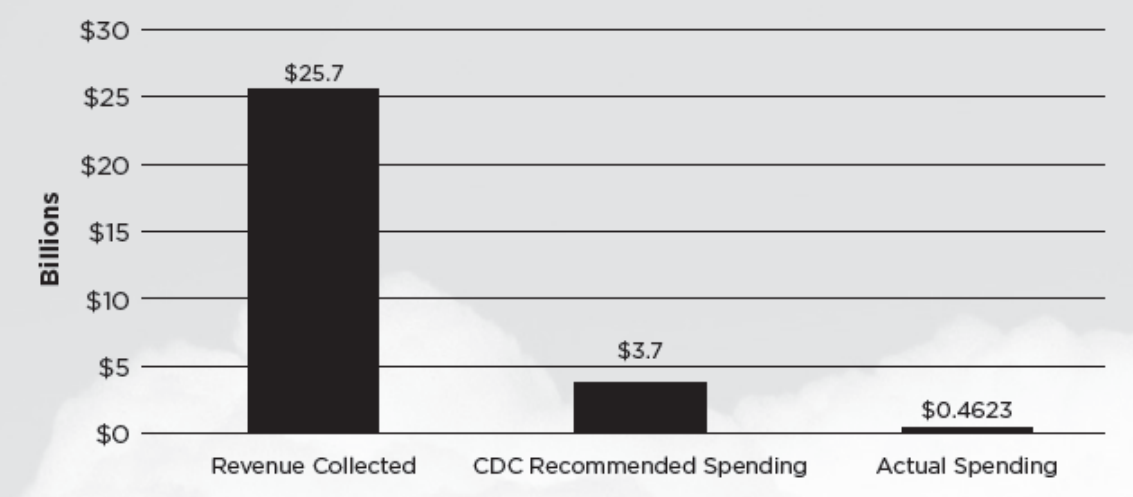
Overall, the states with the weakest tobacco control have the highest tobacco use. Kentucky ranks at the bottom of the list for adult smoking, youth smoking, youth smokeless use, youth tobacco use in general (CDC, 2013b).

The *American Lung Association State of Tobacco Control 2013* report also tracks progress on key tobacco control policies at the state and federal levels, and assigns grades based on tobacco control laws and regulations in effect. Overall, this report paints a similarly dismal picture of tobacco control efforts, especially in terms of federal and state tobacco control spending (see Figure 2.6), FDA tobacco regulation, cessation coverage, cigarette tax, and failure to ratify the WHO Framework Convention on Tobacco Control (American Lung Association,

REPORT CARD	
UNITED STATES	
SUBJECT:	GRADE:
Food and Drug Administration Regulation of Tobacco Products	F
Cessation Coverage	D
Cigarette Tax	D
Framework Convention on Tobacco Control	D

2013). The report also highlights the efforts of the tobacco industry to develop new and novel products and shift users to tobacco products currently not regulated by the FDA, including cigars, e-cigarettes, and dissolvables.

Figure 2.6 Tobacco –Related Revenue Collected by States, and Tobacco Control Recommended and Actual Spending



Source: American Lung Association, 2013

Overall, the findings of this literature review demonstrate that more must be done to reduce the health and economic burden of tobacco use in the United States, especially among populations facing severe disparities. Implementation of tobacco control measures must be culturally tailored to ensure intervention efforts successfully reach target populations and adequately address unique needs at the community level.

"Researchers and practitioners alike have called for increased attention to the complex issues that compromise the health of people living in marginalized communities; for more integration of research and practice; for greater community involvement and control, for example, through partnerships among academic, health practice, and community organizations; for increased sensitivity to and competence in working within diverse cultures; for expanded use of both qualitative and quantitative research methods; and for more focus on health and quality of life, including the social, economic, and political dimensions of health and well-being" (Israel, Schultz, Parker, & Becker, 1998, p.174).

CHAPTER THREE: METHODOLOGY

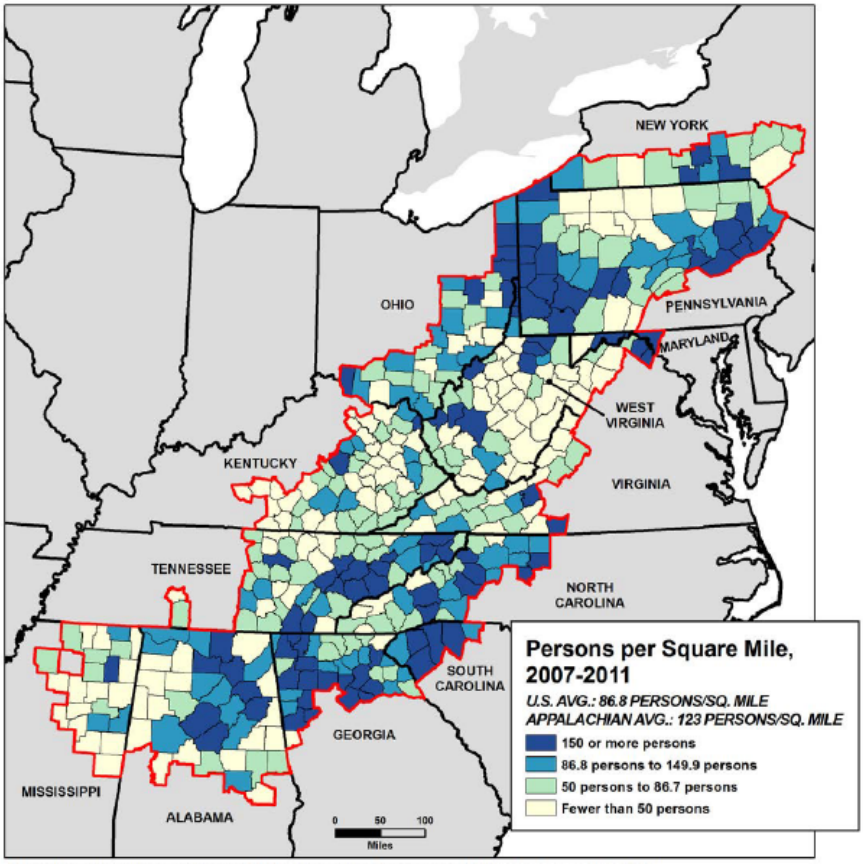
Introduction

The primary methodology for this tobacco control needs assessment is an in-depth environmental scan of peer-reviewed literature, grey literature (e.g., state and local health department reports), public data sets, and information from websites of respected health and tobacco organizations such as the American Lung Association (ALA), the Centers for Disease Control and Prevention (CDC), and the World Health Organization (WHO). Additionally, this environmental scan will include some secondary data analysis of public data sources to further inform findings and recommendations. The methodology is purposefully broad and wide-reaching to highlight issues specific to Appalachian Kentucky tobacco control within the context of a range of perspectives on effective tobacco control. The needs assessment is meant to be comprehensive but not prescriptive; recommendations will be framed more broadly, with specific areas for local tailoring noted where applicable.

Population and Sample

The total population in Kentucky from 2007-2011 was 4,316,040 people (U.S. Census Bureau, 2007-2011 American Community Survey). Of these, 1,184,118 lived in Appalachian Kentucky (Pollard & Jacobsen, 2013). The total land area of Kentucky is 39,486 square miles and Appalachian Kentucky is 18,231 square miles, making the population per square mile 109.3 and 65 respectively (Pollard & Jacobsen, 2013). In fact, only one Appalachian county has more than 150 persons per square mile (see Figure 3.1). Given the small sample sizes at the county level, state level data will be used for some data categories or the information may represent the entire Appalachian region where subregion data is not available.

Figure 3.1 Population per Square Mile of Land Area in the Appalachian Region, 2007-2011



Source: ARC, 2012

Research Design

The primary research design for this project is a comprehensive environmental scan involving a scientific literature review, grey literature review, and secondary data analysis of publicly available data.

Scientific Literature Review

A series of PubMed, EBSCOHost, and Google Scholar searches using combinations of the following search terms were conducted to obtain peer-reviewed articles related to tobacco use trends, risk and protective factors, rural tobacco use, tobacco-related disparities, Appalachian Kentucky tobacco use and other health factors, rural health, and best practices in tobacco control:

Tobacco, Tobacco Use, Youth Tobacco Use, Youth Smoking, Adult Smoking, Smoking, Pregnancy, Cigarette Smoking, Smokeless, Snus, Cigars, Dissolvables, E-cig, Electronic Cigarettes, Cigarillos, Tobacco Use Disorder, Tobacco Use Cessation, Cessation, Relapse, Tobacco Growing, Prevention, Tobacco Control, Intervention, Tobacco Program, Quitline, Smoke-free Policies, Tobacco Taxes, Tobacco Regulation, Tobacco Education, Mass Media Campaigns, Community Prevention, Best Practices, Tobacco Disparities, Health Disparities, Determinants of Tobacco Use, Tobacco Risk Factors, Smoking-attributable Morbidity, Smoking-attributable Mortality, Rural Tobacco, Rural Health, Rural Population, Kentucky, Appalachia, Rural Appalachia, Rural Kentucky, Appalachian Region, Appalachian Health

All results were limited to English-language articles published within the past ten years. Articles related to tobacco use in other countries were excluded, unless they were related to tobacco control practices.

Grey Literature Review

Google searches were also conducted using combinations of the same search terms to identify related grey literature and other data sources. An example set of key websites reviewed include:

- American Lung Association: http://www.lung.org/
- American Legacy Foundation: http://www.legacyforhealth.org/
- Appalachian Regional Commission: www.arc.gov
- Centers for Disease Control and Prevention – Smoking and Tobacco use: http://www.cdc.gov/tobacco/

    - Weekly Morbidity and Mortality Reports: http://www.cdc.gov/tobacco/data_statistics/mmwrs/index.htm
    - Surgeon General Reports: http://www.cdc.gov/tobacco/data_statistics/sgr/index.htm
    - State Tobacco Control: http://www.cdc.gov/tobacco/state_system/index.htm
- County Health Rankings and Roadmaps-Kentucky: http://www.countyhealthrankings.org/app/kentucky/2012/measure/factors/9/map
- Kentucky Cabinet for Health and Human Services, Department of Public Health: http://chfs.ky.gov/dph/mch/hp/tobacco.htm
- Kentucky Institute of Medicine: http://www.kyiom.org/assessment.html
- Kentucky Tobacco Free Schools: http://www.tobaccofreeschoolsky.org/index.html
- University of Kentucky, School of Nursing, Tobacco Policy Research Program: http://www.mc.uky.edu/tobaccopolicy/
- World Health Organization Tobacco Free Initiative: http://www.who.int/tobacco/en/

Secondary Data Analysis Sources

Secondary data analysis of data from the following sources and surveys was conducted: Behavioral Risk Factor Surveillance System (BRFSS), Kentucky Adult Tobacco Survey (KYATS), Kentucky Youth Tobacco Survey (KYTS), Monitoring the Future (MTF), National Health Information Survey (NHIS), National Survey on Drug Use and Health (NSDUH), National Youth Tobacco Survey (NYTS), Pregnancy Risk Assessment Monitoring Systems (PRAMS), Youth Risk Behavior Surveillance System (YRBSS), U.S. Census Bureau Data. Additionally, a Pubmed search for qualitative research conducted with Appalachian Kentucky tobacco users resulted in one article by Kruger et al. (2012) looking at perceptions of smoking

cessation programs in rural Appalachian Kentucky. These data were analyzed for relevant insights into tobacco-related knowledge, attitudes and beliefs to help inform recommendations for tobacco control measures in this region.

Limitations

Limitations of the data include a relatively low number of articles and data sources on Appalachian Kentucky and tobacco use in this region. Additionally, the low population density in Appalachian Kentucky counties raises questions of data quality at the county level. From a community opinions perspective, limitations include the inability to conduct primary data and the use of qualitative research conducted by other authors.

"A more complete understanding of the community - its history, cultures and demographics – is critical to provide appropriate tobacco prevention and control programs and services. This type of understanding can be achieved when data from many sources are collected, examined and interpreted through the lens of a large cross-section of the community" (Texas Department of State Health Services, 2008, p.II-1).

CHAPTER FOUR: FINDINGS

Introduction

To fully understand the unique challenges to tobacco control in Appalachian Kentucky and use these findings to develop additional recommendations to prevent and reduce tobacco use in this region, this chapter will attempt to answer the following questions:

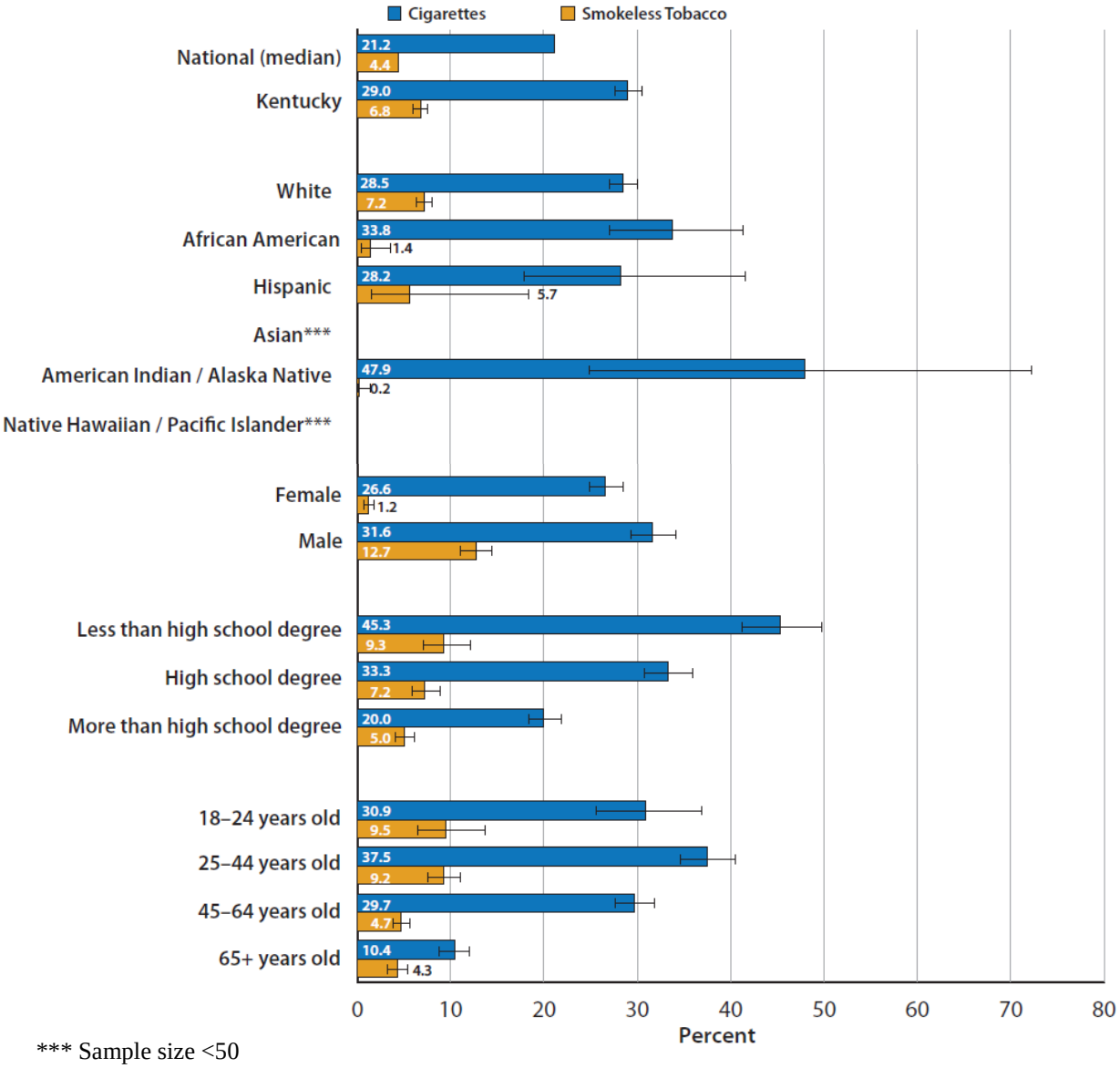
- What are the current tobacco use trends in Appalachian Kentucky?
    - How do these trends compare to state and national tobacco use trends?
    - How do these trends compare to *Healthy People 2020* benchmarks?
- What are the current tobacco control trends in Appalachian Kentucky?
    - How do these trends compare to state and national tobacco control trends?
    - How do these trends compare to national and global best practices for tobacco control?
- What are the primary health implications of these data?
- What obstacles must be overcome to prevent and reduce tobacco use in this region?
    - What are the driving sociodemographic and psychographic factors in tobacco use in this region, including perceptions, attitudes, and beliefs about tobacco use and tobacco control?
- What resources are currently available to reduce tobacco use in this region?

Again, it is important to note that although this needs assessment focuses on Appalachian Kentucky as much as possible, data specific to Appalachian Kentucky are not available for all categories; in some instances, statewide data for Kentucky are used as a proxy.

Current Tobacco Use Trends in Appalachian Kentucky

While demographic trends of adult tobacco use rates in Kentucky mirror national trends (see Figure 4.1), the state of Kentucky repeatedly ranks among the worst in the nation for adult smoking, adult smoking during pregnant, youth tobacco use (including cigarettes, smokeless, and any tobacco use), and secondhand smoke exposure. The majority of Kentucky's poor rankings are due to abnormally high tobacco use rates in its Appalachian region.

Figure 4.1 Tobacco Use among Kentucky Adults by Demographic Characteristics, 2011

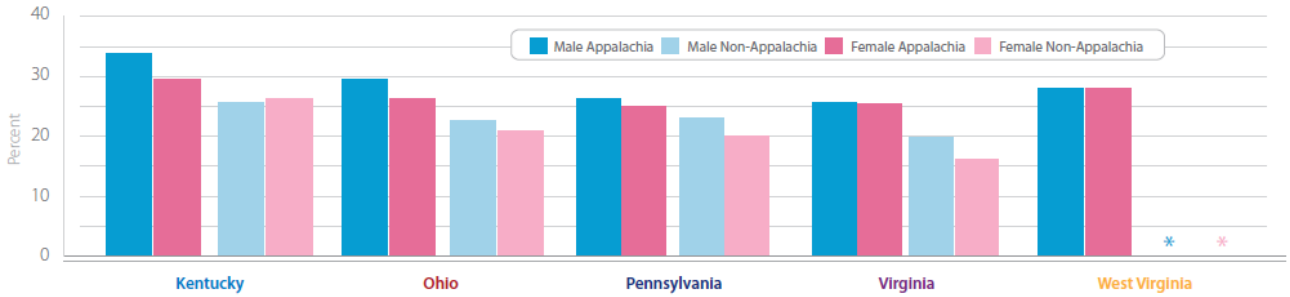


*** Sample size <50
Source: Behavioral Risk Factor Surveillance System, 2011

Adult Smoking

The prevalence of current cigarette smoking among Appalachian adults age 18 years and older is highest in Appalachian Kentucky (see Figure 4.2). In 2007, the proportion of Appalachian males reporting current cigarette smoking ranged from 25.9% (Virginia) to 33.6% (Kentucky), and the proportion of females reporting current cigarette smoking ranged from 25.9% (Virginia) to 29.4% (Kentucky) (Appalachian Community Cancer Network (ACCN), 2009).

Figure 4.2 Prevalence of Current Cigarette Smoking Among Adults 18 and Older, Appalachia compared to Non-Appalachia, 2007



*West Virginia is the only state that is entirely Appalachian
Source: ACCN, 2009

Of the total 54 counties in Appalachian Kentucky, 27 counties report adult smoking rates over 30.0% (see Table 4.1). Only 11 counties report prevalence rates lower than the adult smoking prevalence rate for the state (29.0%), which ranks 51st among the states and D.C. as it is well above both the current national rate of 19.0% and the *Healthy People 2020* benchmark of 12.0% or less (CDC, 2013b). Further, while the nation has a whole has seen dramatic declines in adult smoking prevalence from 42.4% in 1965 to 19.0% in 2013, smoking prevalence in Kentucky is higher now than it was at its lowest in 2008 (25.2%) (National Health Interview Survey data, 1965-2009).

Table 4.1 Appalachian Kentucky Adult Smoking Prevalence by County, 2011[9]

Appalachian County	Adult Population	Sample Size	% Adult Smokers
KENTUCKY	**3348401**	**55021**	**29.0**
Adair	14539	303	**33.3**
Bath	8841	559	**33.9**
Bell	22441	391	27.7
Boyd	38902	1115	24.8
Breathitt	10660	428	**30.9**
Carter	21247	674	**33.9**
Casey	12177	294	**32.6**
Clark	27315	*	*
Clay	16980	306	**35.5**
Clinton	7789	182	22.9
Cumberland	5299	*	*
Edmonson	9458	193	**34.9**
Elliott	6160	204	**34.5**
Estill	11394	*	*
Fleming	10979	803	29.8
Floyd	30420	900	29.8
Garrard	13057	*	*
Green	8711	207	28.5
Greenup	28723	917	24.8
Harlan	22443	459	**32.2**
Hart	13765	298	28.7
Jackson	10336	236	**32.5**
Johnson	18129	515	26.9
Knott	12837	488	**32.2**
Knox	24033	411	29.1
Laurel	45075	757	**30.1**
Lawrence	12341	403	**34.2**
Lee	6274	198	**40.7**
Leslie	8822	354	**39.2**
Letcher	19033	704	29.8
Lewis	10642	772	**34.4**
Lincoln	18666	*	*
McCreary	14211	286	**39.1**
Madison	66289	358	22.0
Magoffin	10113	255	**33.9**
Martin	10067	214	**33.3**

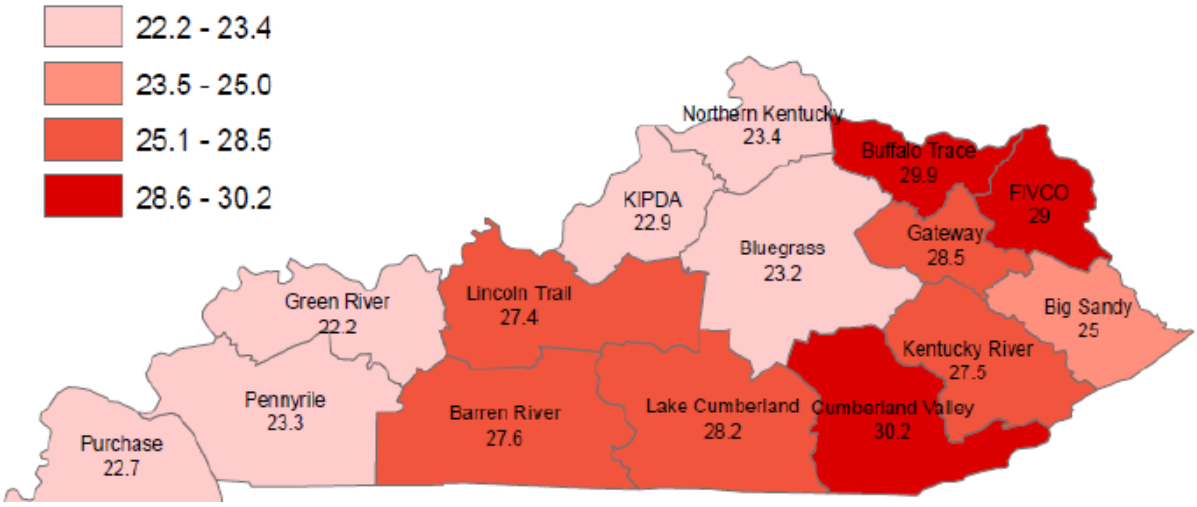
[9] The data breakdowns by county represent very small sample sizes so an average of BRFSS adult smoking prevalence data from 2005-2011 is reported here.

Appalachian County	Adult Population	Sample Size	% Adult Smokers
Menifee	4864	398	**34.9**
Metcalfe	7645	*	*
Monroe	8435	187	25.2
Montgomery	20239	979	27.5
Morgan	11140	702	**35.2**
Nicholas	5370	*	*
Owsley	3725	152	**38.7**
Perry	22475	806	**33.2**
Pike	50765	1466	**30.8**
Powell	9543	*	*
Pulaski	49250	1167	**30.5**
Robertson	1774	*	*
Rockcastle	13114	267	29.4
Rowan	19010	962	27.8
Russell	13719	383	29.0
Wayne	16290	342	29.1
Whitley	27384	482	**30.7**
Wolfe	5564	252	**36.3**

*Insufficient sample size to report data
Source: Behavioral Risk Factor Surveillance System, 2005-2011

While Table 4.1 provides a clear picture of smoking in Appalachian Kentucky, the disparities in smoking rates in the Appalachian region of Kentucky in comparison to the rest of the state are perhaps best illustrated by maps (see Figure 4.3).

Figure 4.3 Prevalence of Current Cigarette Smoking by Area Development District, 2010

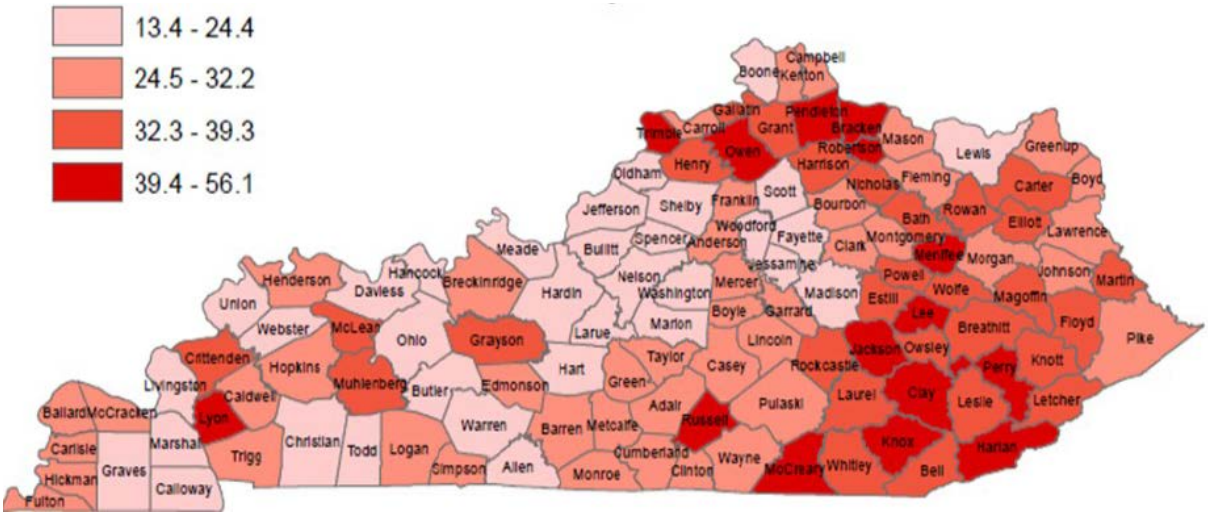


Source: Peyton et al., 2012

Adult Smoking During Pregnancy

In addition to high rates of general adult smoking, all 54 Appalachian Kentucky counties report high rates of smoking while pregnant, contributing to Kentucky's exceedingly high prevalence of adult women who smoke while pregnant—an astounding 24.3%, which is twice the national average (KOVS, 2009). In 2009, rates of smoking during pregnancy in Appalachian Kentucky ranged from 23.5% in Madison County to 56.1% in Lee County, with the majority exceeding 30.0% (see Figure 4.4) (KOVS, 2009; Peyton et al., 2012). Additionally, Kentucky has seen little improvement in this trend since 1990, when the prevalence was 28.5% (Vital Statistics data, 1990-2008).

Figure 4.4 Prevalence of Smoking Among Pregnant Women by County, 2009



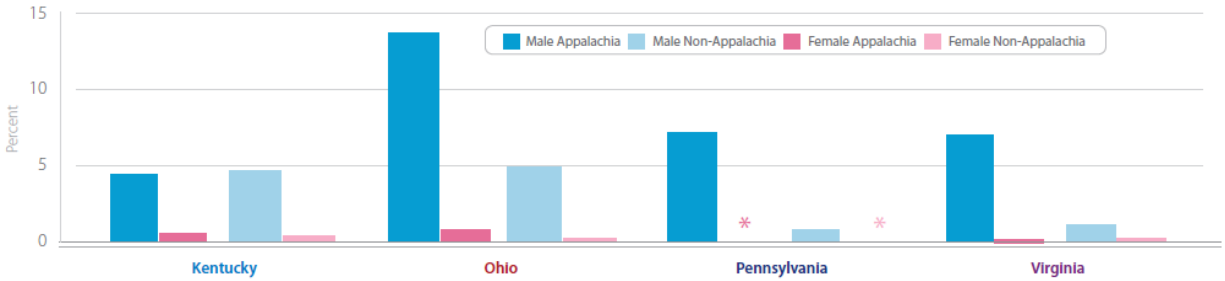
Source: Peyton et al., 2012

Adult Smokeless Use

Adult smokeless tobacco use rates in Kentucky are higher than the national average of 4.4% and the *Healthy People 2020* goal of 0.3%. In 2011, 6.8% of Kentucky adults reported current smokeless tobacco use, with Kentucky ranking 43rd out of 51 states and D.C. Nationally, the prevalence ranged from 1.4% to 9.8% (CDC, 2013b). However, despite the higher rates of

smokeless use generally, the prevalence of smokeless tobacco use among Appalachian Kentucky adult males is actually lower than rates in other Appalachian states (see Figure 4.5). In 2007, the proportion of Appalachian males reporting current smokeless tobacco use ranged from 4.5% (Kentucky) to 14.3% (Ohio), and the proportion of females reporting current smokeless tobacco use ranged from 0.1% (Virginia) to 0.9% (Ohio) (ACCN, 2009).

Figure 4.5 Prevalence of Current Use of Smokeless Tobacco Among Adults 18 and Older, Appalachia compared to Non-Appalachia, 2007



*Insufficient or missing data
Source: ACCN, 2009

Youth Smoking

Kentucky's high school smoking rate of 24.1% is concerning—far above the *Healthy People 2020* goal of 16.0%—and county level figures exceed 30.0%, especially in Appalachian areas (KIOM, 2007; KYTS, 2011). In fact, the range across 44 states for high school smoking prevalence was 5.9% to 24.1%—with Kentucky ranking 44th (CDC, 2013b). Further, despite declines in youth smoking since 2004, youth smoking in Kentucky does not appear to be slowing as more than 5,400 Kentucky youth become daily smokers every year, accounting for 60.8% of the nation's annual influx of youth daily smokers (SAMHSA, 2011).

Youth Smokeless Use

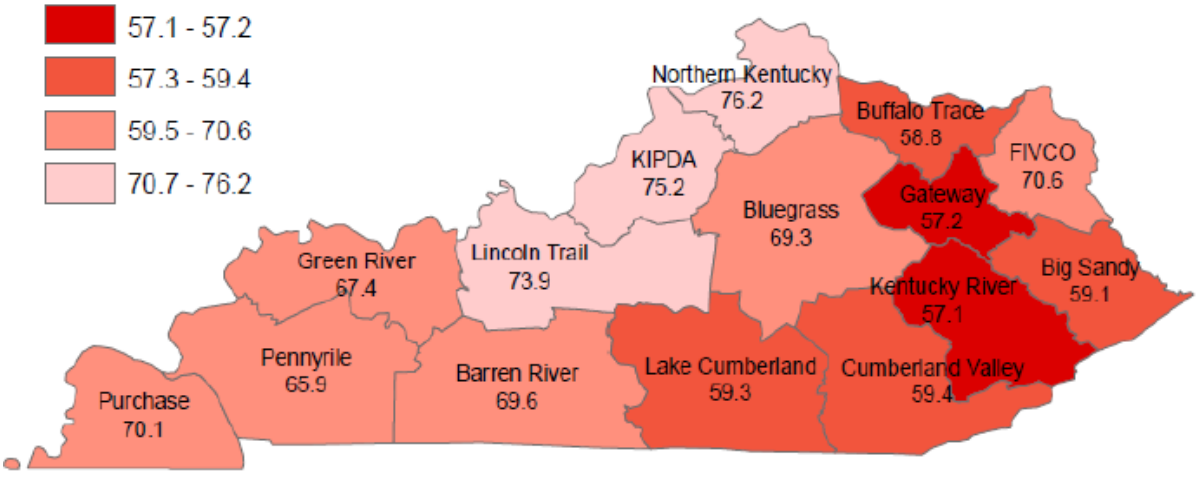
Smokeless tobacco use among Kentucky youth has increased in recent years, and youth who use smokeless tobacco are more likely to become daily smokers as adults (HHS, 2004). In 2011, the percentage of Kentucky youth reporting current smokeless tobacco use was 16.9%.

The range across 40 states was 3.5% to 16.9%—with Kentucky ranking 40th (CDC, 2013b). In terms of any type of tobacco use (e.g., cigarettes, smokeless tobacco, cigars), the percentage of youth reporting any type of tobacco use in 2011 was 31.9%. The range across 36 states was 7.8% to 31.9%—with Kentucky ranking 36th (CDC, 2013b).

Secondhand Smoke Exposure

Considering the current tobacco use trends in Appalachian Kentucky and the rest of the state, it is perhaps unsurprising that the population also has a high exposure to secondhand smoke. From 2009-2010, overall exposure to secondhand smoke in Kentucky was 51.4%, ranking 43rd among the states and D.C. (CDC, 2013b). Adults were slightly more likely to report being exposed to secondhand smoke in public places and workplaces, but only 67.5% of adults in Kentucky reported that their homes had smoke-free rules, ranking 51st among the states and D.C. (see Figure 4.6). Nationally, more than 80% of adults report homes with smoke-free rules. Further, the percentage of Kentucky homes without smoke-free rules with children living in them was 34.0%, ranking 32nd among the states (CDC, 2013b).

Figure 4.6 Percent of Smoke-free Homes in Kentucky by Area Development District, 2009



Source: Peyton et al., 2012

Current Tobacco Control Trends in Appalachian Kentucky

In addition it its high rates of tobacco use, Appalachian Kentucky also suffers weak tobacco control measures, from lacking smoke-free policies to a low tobacco excise tax. However, as most tobacco control efforts are enacted and evaluated at the state level, the following section will present an evaluation of the statewide efforts in Kentucky using the MPOWER framework. Implications for Appalachian areas will be noted where relevant.

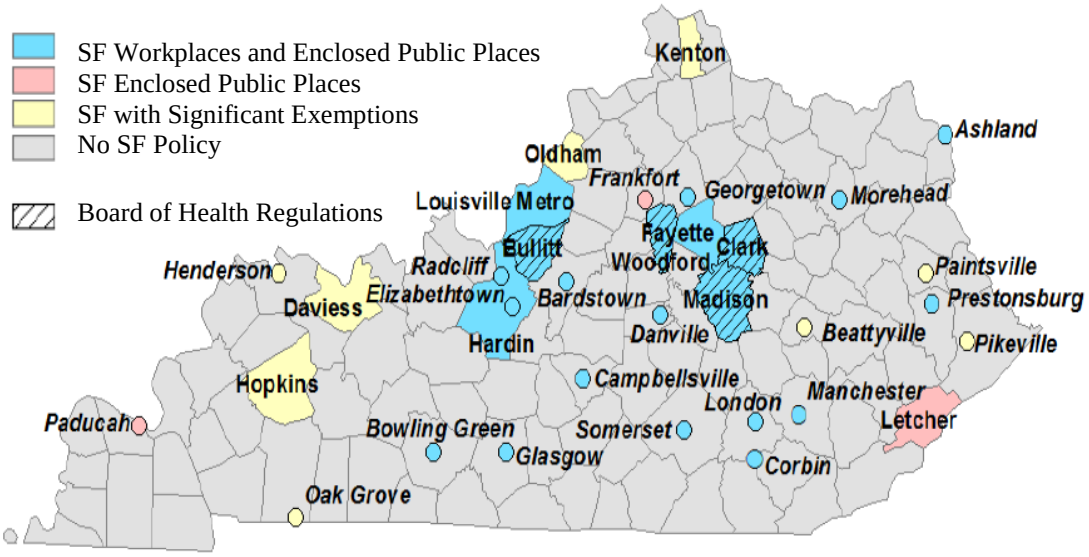
MONITOR. Monitoring tobacco use and prevention policies is a key part of effective tobacco control. With the CDC's assistance, the Kentucky Tobacco Prevention and Control Program has established several surveillance systems to measure and evaluate tobacco use and tobacco control programs in Kentucky. These statewide programs include the Kentucky Adult Tobacco Survey, the Kentucky Youth Tobacco Survey, the Behavioral Risk Factor Surveillance System, the Pregnancy Risk Assessment Monitoring System, Kentucky's Tobacco Quitline, and Kentucky Vital Statistics (Peyton et al., 2012). As a result of these monitoring programs, data are available on tobacco use trends by age, gender, race/ethnicity, socioeconomic status, educational attainment, rurality, and location. Additionally, data related to tobacco control measures and citizen knowledge, attitudes, and beliefs about tobacco use are collected. These data are essential to understanding and addressing Kentucky tobacco use to deliver improved tobacco control measures and interventions.

PROTECT. Both the WHO and the CDC agree that reducing exposure to tobacco smoke is critical to reducing smoking-attributable death and disease. In 2010, 47.7% of U.S. adults reported being exposed to secondhand smoke either at home, in vehicles, at work or in other public places, both indoor and outdoor (CDC, 2013b). The *Healthy People 2020* goal is to reduce secondhand smoke exposure among adults to 33.8% by encouraging all states to establish

comprehensive smoke-free policies for public places and worksites. As of June 30, 2012, only 26 states had comprehensive smoke-free laws for workplaces, restaurants, and bars, and 7 states lacked statewide laws for all 3 sites.

Kentucky is one of the seven states without statewide smoke-free laws or restrictions in any location, placing the onus on communities to enact local smoke-free laws (CDC, 2013b). As a result, only 34.1% of Kentucky's citizens are protected by comprehensive smoke-free workplace laws or regulations (see Figure 4.7), 54.1% of adults report secondhand smoke exposure, and only 67.0% of adults believe indoor smoking should be prohibited (CDC, 2013b; Peyton et al., 2012).

Figure 4.7 Strength of Smoke-free Laws and Regulations in Kentucky Communities, 2012



Source: Peyton et al., 2012

In the 2012, Kentucky attempted to pass a comprehensive smoke-free law prohibiting smoking in almost all indoor workplaces and public places and allowing local ordinances to enact stronger laws, but the legislative session ended before the bill could pass both houses (American Lung Association, 2013).

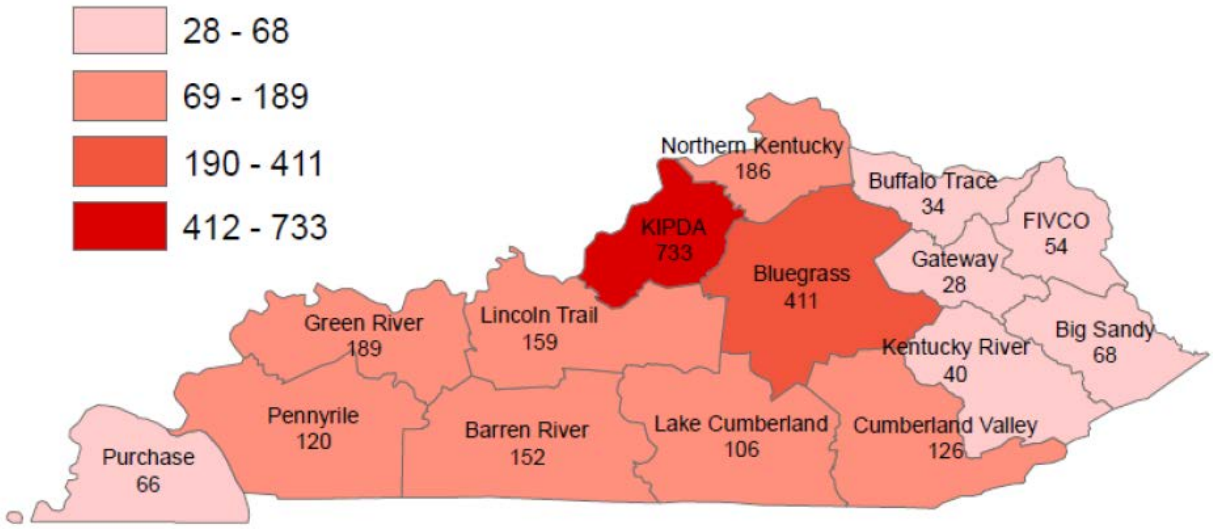
OFFER. Quitting tobacco use is exceedingly difficult, and current best practices recommend cessation services that incorporate both counseling and medication. Currently, 68.8% of adult smokers in the U.S. report wanting to quit but only 55.7% of adult smokers made a quit attempt from 2009–2010 (CDC, 2013b). The *Healthy People 2020* goal for adult cessation is to increase the number of quit attempts to 80.0%. To achieve this, the CDC also recommends increasing comprehensive Medicaid insurance coverage of evidence-based treatment for nicotine dependence and increasing tobacco screening and counseling.

Currently, only five states offer comprehensive Medicaid coverage for nicotine dependence treatment, although the Patient Protection and Affordable Care Act (Affordable Care Act) will precluded states from excluding tobacco cessation drugs from coverage for Medicaid enrollees starting in 2014. Kentucky's Medicaid program currently provides incomplete coverage through Medicaid for tobacco dependence treatment, but the state provides full coverage for some nicotine replacement therapies, full coverage for varenicline, full coverage for bupropion, and full coverage for counseling (individual and group).

The state has also operated an evidence-based quitline program since 2005. Kentucky's tobacco quitline provides individualized cessation counseling for all tobacco users, including specific protocols for pregnant women, English and Spanish language counselors, and a TDY number for individuals who are deaf or hard of hearing (Peyton et al., 2012). The quitline received 4,019 callers in 2010 but only 0.2% of tobacco users received telephone counseling services, cessation medications, or both, compared to 1.0% of tobacco users nationally (CDC, 2013b). This may be a result of low quitline awareness, with only about 25% of those surveyed reporting prior knowledge of the service (Peyton et al., 2012). Additionally, Appalachian tobacco

users are less likely to take advantage of the quitline (see Figure 4.8) and typically report poor access to health services, including cessation services.

Figure 4.8 Kentucky Quitline Callers by Area Development District, 2010



Source: Peyton et al., 2012

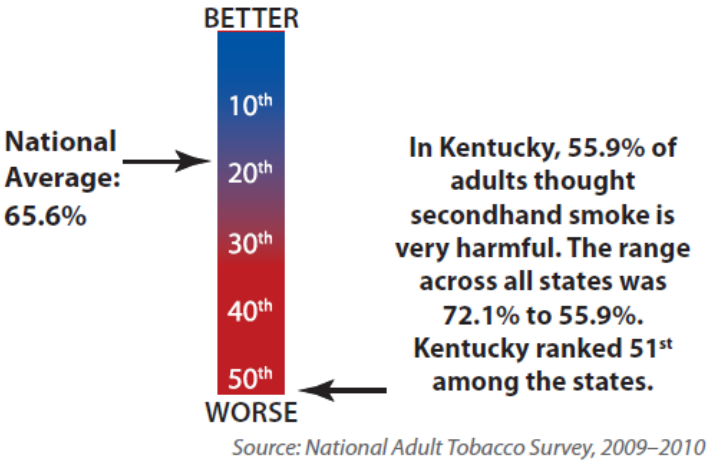
On a positive note, Kentucky reported higher past year quit attempts (56.7%) than the national average (55.7%) in 2010, ranking 16th among states and D.C. (CDC, 2013b), and nearly 60% of Kentuckians reported asking for advice on how to quit smoking from a health care professional (Peyton et al., 2012).

WARN. Consistent, frequent exposure to hard-hitting anti-tobacco messaging is associated with reduced tobacco use prevalence among youth and adults, making mass media countermarketing campaigns an effective way to reduce and prevent tobacco use (NCI, 2008). Additionally, Congress has repeatedly acknowledged the need for stronger, graphic health warnings on tobacco products to improve the public's knowledge and awareness of the dangers of tobacco use and secondhand smoke exposure, as evidenced by the Federal Cigarette Labeling and Advertising Act and the Family Smoking Prevention and Tobacco Control Act.

While federal actions to strengthen graphic health warnings on tobacco products are currently under litigation, efforts to warn the public about the dangers of tobacco use continue to be primarily media campaign based. However, mass media campaigns must achieve significant reach, frequency, and duration to be effective. According to CDC *Best Practices* for mass media campaigns, funding levels must be sufficient to achieve 1,200 general audience gross rating points (GRPs)[10] and 800 youth targeted rating points (TRPs)[11] per quarter (CDC, 2013b).

In 2010, the median quarterly GRP across states was 242.7, and the median quarterly TRP for youth was 39.7. By comparison, Kentucky's average quarterly GRPs and TRPs were 106.6 and 15, respectively, with Kentucky ranking 35th and 36th in the nation for adequate state-funded anti-tobacco media campaigns (CDC, 2013b).

Kentucky's low media weight for tobacco education campaigns might explain the state's low percentage of adults who believe breathing secondhand smoke is harmful—only 55.9%. The national average for adults with this protective belief is 65.6% (CDC, 2013b). Knowledge of the dangers of secondhand smoke is associated with lower secondhand exposure and improved cessation outcomes (CDC, 2005b; WHO, 2008). Beliefs about secondhand smoke in Kentucky may also be a result of, and a driving factor in, current attitudes and policies around smoke-free laws, suggesting a need for both better public



[10] GRPs are a measure of the total intensity of a general audience media campaign and represent total reach (the percentage of households exposed to an ad campaign) multiplied by frequency of exposure to the ads; 1,200 general audience GRPs equates to 80% of the audience reached with 15 exposures each (CDC, 2013b).
[11] TRPs measure the percent of the targeted population that is exposed to a media campaign (reach x frequency); 800 youth TRPs equates to 80% of the audience age 12-17 reached with 10 exposures each (CDC, 2013b).

education and stronger smoke-free laws. In terms of other smoking beliefs, 87.2% of Kentuckians think smoking is addictive, slightly exceeding the national average of 85.4% (CDC, 2013b).

ENFORCE. Just as anti-tobacco advertising can be effective in preventing and reducing tobacco use, tobacco advertising and promotion is extremely effective in gaining and sustaining tobacco users, especially among youth (CDC, 2007b; Evans, Farkas, Gilpin, Berry, & Pierce, 1995; Gilpin, White, Messer, & Pierce, 2007; HHS, 2012; Pollay et al., 1996). The success of tobacco advertising explains the billions of dollars spent every year by the tobacco industry—roughly $8.8 billion in 2011 ($271 million of which was spent in Kentucky) (FTC, 2011). Further, the industry appears unfazed by the increasing restrictions on tobacco advertising and promotions, as tactics shift toward the web, retail environments, and novel products outside current regulations (e.g., e-cigarettes), highlighting the need for stronger, more comprehensive advertising and promotion laws.

The Family Smoking Prevention and Tobacco Control Act (Tobacco Control Act) gives the Food and Drug Administration (FDA) the authority to regulate the manufacture, marketing, sale, and distribution of cigarettes, smokeless tobacco, and roll-your-own tobacco. Under this authority, FDA has increased marketing restrictions for these products. The Tobacco Control Act also grants state and local governments the authority to impose additional restrictions on tobacco marketing that exceed current federal regulations.

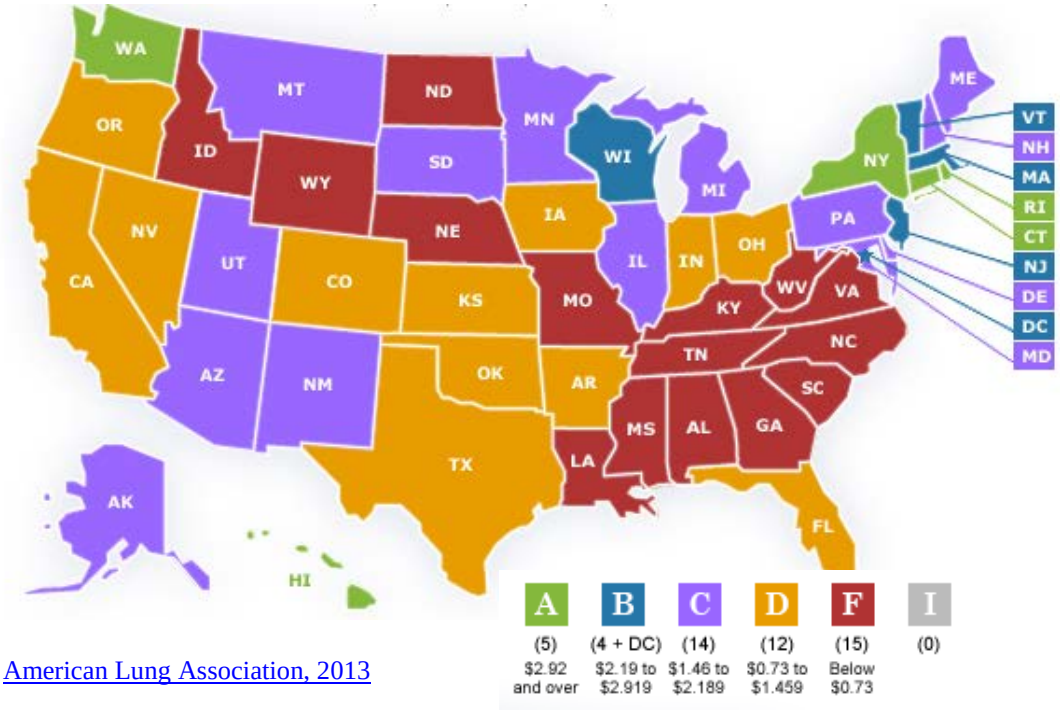
However, the states may also preempt local laws, to the detriment of effective tobacco control. A *Healthy People 2020* goal is to eliminate all state laws that preempt stronger local laws. As of June 30, 2012, Kentucky was one of nine states that preempted local regulation of tobacco industry promotions, tobacco product sampling, and display of tobacco products in

commercial establishments. Further, Kentucky does not require tobacco retailers to obtain a license to sell tobacco, resulting in a weak system for monitoring and enforcing legal tobacco sales and preventing illegal sales to minors (CDC, 2013b). Currently, 37 states have retailer license requirements that include a range of penalties for violations to improve compliance with federal, state, and local retailing laws.

RAISE. The tobacco control community agrees that increasing excise taxes on tobacco products is one of the most effective tobacco control policies because there is an inverse relationship between tobacco use and tobacco product price, especially among youth (CDC, 2007b; CDC, 2005b; HHS, 2012; WHO, 2008). Increasing the price of tobacco decreases initiation and general consumption of tobacco products and increases cessation. In fact, a 10% increase in the price of cigarettes is associated with a 6-7% decline in youth smoking and a 3.5% decline in adult smoking (Carpenter & Cook, 2007; Chaloupka, Yurekli, & Fong, 2012). As a result, two *Healthy People 2020* goals include increasing federal and state tobacco excise taxes.

As of June 30, 2012, the median state cigarette excise tax across the states was $1.34, ranging from $4.35 in New York to $0.17 in Missouri—in Kentucky, the excise tax on cigarettes is $0.60 per pack, ranking 40th among the states (CDC, 2013b) (see Figure 4.9). Due to the low excise tax, Kentucky smokers reported paying an average of just $4.23 a pack in 2010.

Figure 4.9 State Cigarette Excise Tax, 2012

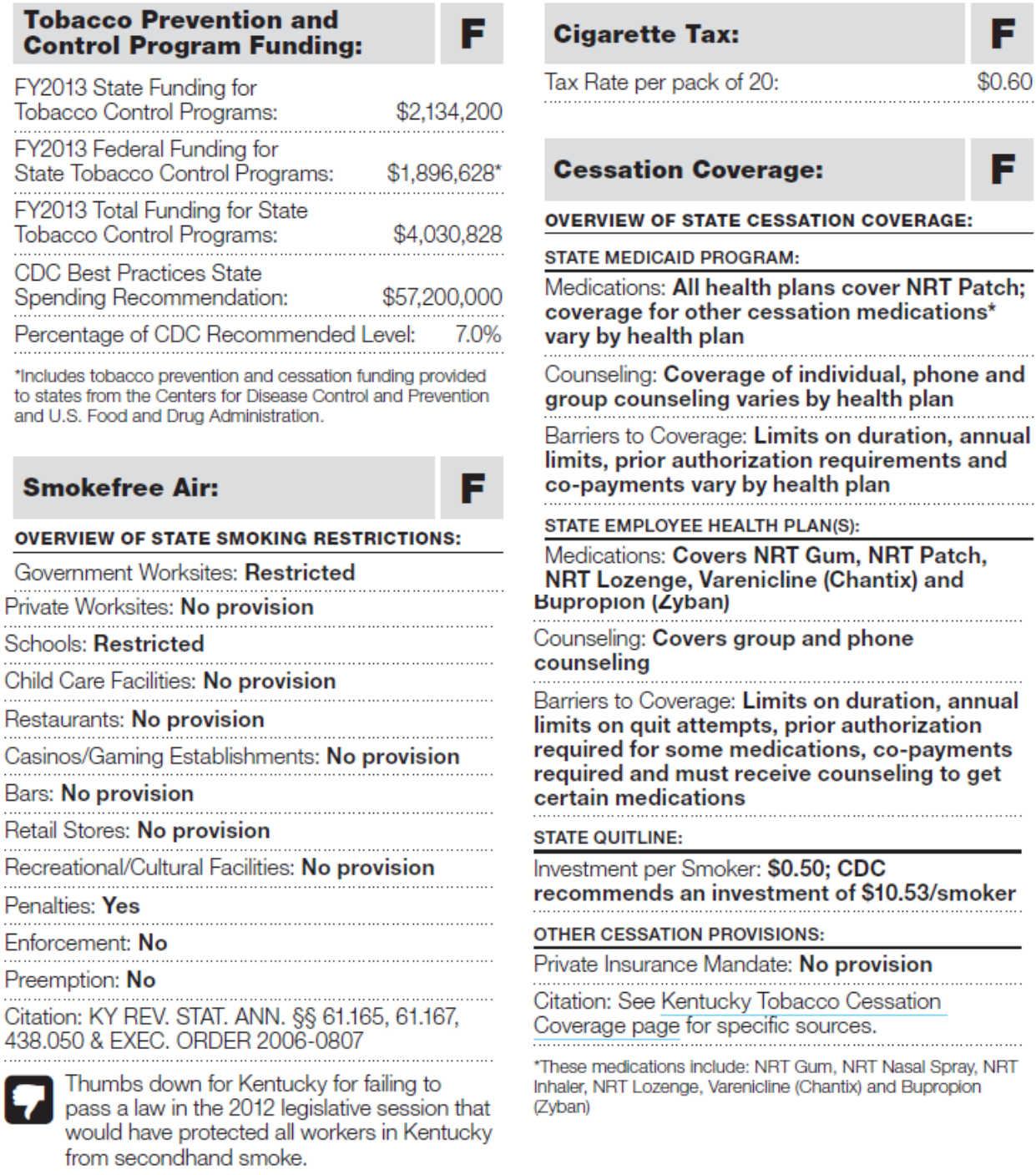


Source: [American Lung Association, 2013]

In addition to the MPOWER measures, CDC best practices also dictate overall spending levels for effective tobacco control. For FY13, CDC recommends states spend at least $57,200,000 on comprehensive tobacco control programs, but only two states currently spend 80% or more of the recommended funding amount, Alaska and North Dakota (American Lung Association, 2013). Kentucky's total state funding for FY13 tobacco control programs was $4,030,828—a mere 7% of recommended amount—with nearly half the budget coming from federal sources such as the CDC and FDA as opposed to state tobacco taxes or settlement funds. If Kentucky wanted to reach CDC's recommended spending level for tobacco control, the state would only have to spend 21% of the annual revenue generated from state excise taxes and settlement payments.

Overall, the American Lung Association gave Kentucky a grade of F for its tobacco control efforts (see Figure 4.10).

Figure 4.10 Kentucky Tobacco Control Report Card



Tobacco Prevention and Control Program Funding: F

FY2013 State Funding for Tobacco Control Programs:	$2,134,200
FY2013 Federal Funding for State Tobacco Control Programs:	$1,896,628*
FY2013 Total Funding for State Tobacco Control Programs:	$4,030,828
CDC Best Practices State Spending Recommendation:	$57,200,000
Percentage of CDC Recommended Level:	7.0%

*Includes tobacco prevention and cessation funding provided to states from the Centers for Disease Control and Prevention and U.S. Food and Drug Administration.

Smokefree Air: F

OVERVIEW OF STATE SMOKING RESTRICTIONS:

Government Worksites: **Restricted**
Private Worksites: **No provision**
Schools: **Restricted**
Child Care Facilities: **No provision**
Restaurants: **No provision**
Casinos/Gaming Establishments: **No provision**
Bars: **No provision**
Retail Stores: **No provision**
Recreational/Cultural Facilities: **No provision**
Penalties: **Yes**
Enforcement: **No**
Preemption: **No**
Citation: KY REV. STAT. ANN. §§ 61.165, 61.167, 438.050 & EXEC. ORDER 2006-0807

Thumbs down for Kentucky for failing to pass a law in the 2012 legislative session that would have protected all workers in Kentucky from secondhand smoke.

Cigarette Tax: F

Tax Rate per pack of 20:	$0.60

Cessation Coverage: F

OVERVIEW OF STATE CESSATION COVERAGE:

STATE MEDICAID PROGRAM:

Medications: **All health plans cover NRT Patch; coverage for other cessation medications* vary by health plan**
Counseling: **Coverage of individual, phone and group counseling varies by health plan**
Barriers to Coverage: **Limits on duration, annual limits, prior authorization requirements and co-payments vary by health plan**

STATE EMPLOYEE HEALTH PLAN(S):

Medications: **Covers NRT Gum, NRT Patch, NRT Lozenge, Varenicline (Chantix) and Bupropion (Zyban)**
Counseling: **Covers group and phone counseling**
Barriers to Coverage: **Limits on duration, annual limits on quit attempts, prior authorization required for some medications, co-payments required and must receive counseling to get certain medications**

STATE QUITLINE:

Investment per Smoker: **$0.50; CDC recommends an investment of $10.53/smoker**

OTHER CESSATION PROVISIONS:

Private Insurance Mandate: **No provision**
Citation: See Kentucky Tobacco Cessation Coverage page for specific sources.

*These medications include: NRT Gum, NRT Nasal Spray, NRT Inhaler, NRT Lozenge, Varenicline (Chantix) and Bupropion (Zyban)

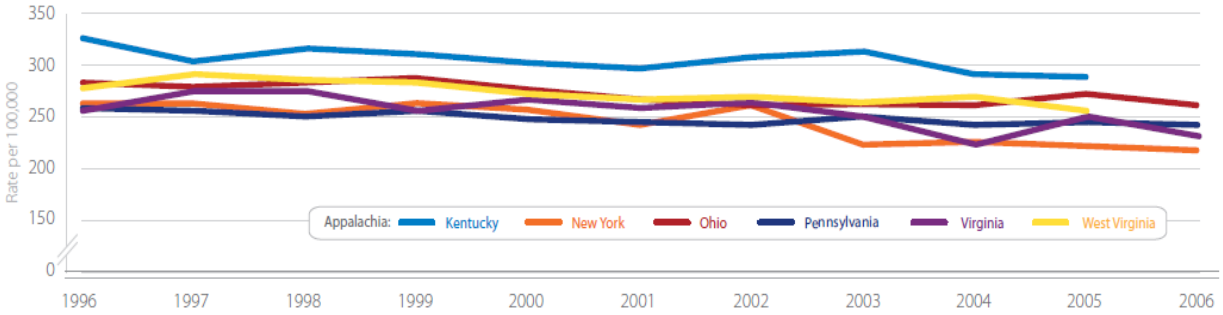
Source: American Lung Association, 2013

Primary Health Implications

As described in Chapter Two, tobacco use is the leading cause of preventable death and disease in the United States, killing more people than HIV, illegal drug use, alcohol use, motor vehicle injuries, suicides, and murders combined (CDC, 2008; Kochanek, et al., 2011; McGinnis & Foege, 1993). Smoking causes disease in nearly every organ of the body, but adult smoking-attributable mortality is largely the result of cancer, cardiovascular disease, and respiratory diseases (HHS, 2004). Additionally, smoking during pregnancy has been linked to poor health outcomes for both the mother and infant, including miscarriage, premature birth, stillbirth, low birth weight, and sudden infant death syndrome (HHS, 2004; HHS, 2001).

Given the impact of tobacco use on health, Kentucky's high tobacco use rates and lacking tobacco control measures have serious health implications, especially in the Appalachian region where rates for total cancer, lung cancer, and cervical cancer exceed the rest of Appalachia by an estimated 36% and the rest of the nation by about 50% (Borak et al., 2012) (see Figure 4.11). In fact, although Kentucky has the 9th highest death rate from heart disease—the leading cause of death in the U.S.—cancer is the leading cause of death in Kentucky, largely due to high tobacco use rates (American Heart Association, 2013; CDC, 2010).

Figure 4.11 Trends in Age-adjusted Mortality Rates for Males All Cancer Sites/Types Combined, Appalachia, 1996-2006



Average annual rate per 100,000, age-adjusted to the 2000 US standard population.
Source: ACCN, 2009

Unsurprisingly, the leading cause of cancer mortality in Kentucky is lung cancer, especially in Appalachian Kentucky, which has the highest rates of both lung cancer incidence and mortality in comparison to the rest of Appalachia. As described in Table 4.2, the average annual age-adjusted lung and bronchus cancer incidence rates in the Appalachian region ranged from 69.7 (Pennsylvania) to 108.8 (Kentucky) per 100,000 people in 2008. The average annual age-adjusted lung and bronchus cancer mortality rates in the Appalachian region ranged from 53.4 (Pennsylvania, New York) to 88.2 (Kentucky) per 100,000 people.

Table 4.2 Average Annual Age-adjusted Lung & Bronchus Cancer Incidence and Mortality by Gender, Appalachia Compared to Non-Appalachia, 2008

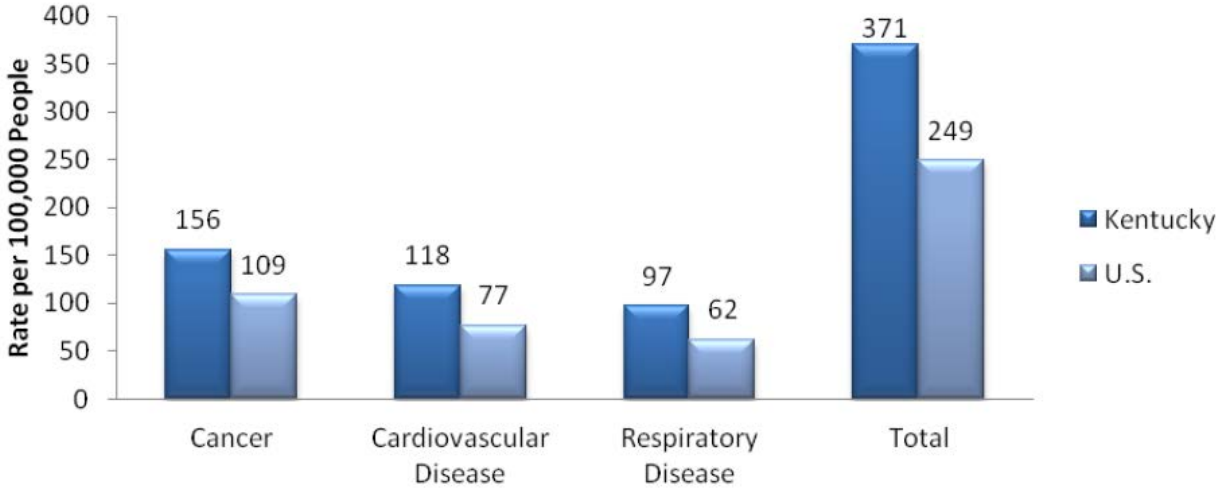
	Incidence						Mortality					
	Appalachia			Non-Appalachia			Appalachia			Non-Appalachia		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Kentucky	147.6	79.9	108.8	127.1	75.7	97.1	125.7	60.0	88.2	105.3	54.2	75.1
New York	93.5	64.3	76.5	78.5	53.5	63.7	68.9	43.9	54.3	58.8	36.7	45.7
Ohio	107.5	60.1	80.3	93.7	58.8	73.3	89.3	45.6	64.2	79.4	45.3	59.3
Pennsylvania	92.8	53.6	69.7	88.2	56.5	69.4	74.9	38.7	53.4	70.6	41.5	53.2
Virginia	106.2	57.1	77.9	86.9	53.5	67.5	90.4	43.8	63.6	72.7	41.7	54.7
West Virginia	116.2	63.5	89.1	*	*	*	95.7	51.2	69.8	*	*	*

Average annual rate per 100,000, age-adjusted to the 2000 US standard population.
Source: ACCN, 2009

Oral and pharyngeal cancer incidence and mortality rates were also highest in Appalachian Kentucky—11.8 and 2.8 per 10,000 people respectively (ACCN, 2009).

Looking at the state as a whole, about 20% of all deaths in Kentucky—more than 7,800 adults—are a result of smoking. In 2004, an average of 371 per 100,000 people died from smoking-attributable diseases in Kentucky, compared to 249 per 100,000 among the entire United States (see Figure 4.12) (Peyton et al., 2012). Further, 107,000 Kentucky youth under 18 alive today will ultimately die prematurely from smoking.

Figure 4.12 Average Age-Adjusted Smoking-Attributable Mortality Rates in Kentucky and the U.S., 2000-2004



Source: Peyton et al., 2012

The 7,848 deaths in Kentucky attributable to smoking-related diseases in 2004 can be broken down into those due to cancer (3,339), cardiovascular disease (2,506), and respiratory disease (2,003). Of the cancer deaths, 2715 were a result of cancer of the trachea, lung, or bronchus. Ultimately, Kentucky adults who died of a smoking-attributable illness lost 14.8 years of life on average, and the years of potential life are lost due to smoking-attributable premature death for adults age 35 and older and infants equates to 116,679 per year.

With close to one million adult smokers in the state in 2010 (CDC, 2013b; Peyton et al., 2012), smoking-attributable costs are also a primary health implication since they further strain limited healthcare resources. Currently, Kentucky spends $5.67 billion in excess personal medical care expenditures and productivity losses from smoking-related premature death and illnesses (see Table 4.3) (Peyton et al., 2012; Rumberger et al., 2010). The smoking-attributable medical expenditures alone cost each Kentucky household an extra $592 a year in federal and state tax burden.

Table 4.3 Kentucky Annual Direct Medical Expenditures and Productivity Losses Attributed to Smoking

Component	Total	Per Pack	Per Smoker
Direct Medical Expenditures	$1,777,694,030	$3.16	$1,960.55
Premature Death	$2,637,245,760	$4.69	$2,908.51
Workplace Productivity	$1,259,405,054	$2.24	$1,388.95
TOTAL	**$5,674,344,844**	**$10.08**	**$6,25802**

Source: Peyton et al., 2012

Current Obstacles to Reducing Tobacco Use in Appalachian Kentucky

Appalachian Kentucky currently faces a range of obstacles to reducing tobacco use among its citizens—from the sociopolitical to the individual—creating negative feedback loop. For example, the state of Kentucky at large currently lacks effective tobacco control policies necessary to help curb tobacco use in the state, resulting it its continual ranking among the worst in the nation for adult smoking prevalence, youth smoking, and smoking-related mortality (CDC, 2010; Kruger et al., 2012). However, Kentucky's poor scores for state tobacco use indicators are also largely driven by the high tobacco use rates in its Appalachian region where lacking tobacco control efforts are further exacerbated by a series of clustered factors.

These factors include 1) low socioeconomic status, high unemployment, and low educational attainment; 2) economic ties to tobacco growing and deep-seated cultural norms; 3) increased access to tobacco products, high exposure to tobacco advertising, and low exposure to countermarking; and 4) rurality and poor access to health services and information. Additionally, findings from Kruger et al.'s recent qualitative research with current and former Appalachian Kentucky smokers provide additional insight into the region's prevailing knowledge, attitudes and beliefs about tobacco use, which drive and are driven by these factors, adding to the complexity of reducing tobacco use in Appalachian Kentucky.

Low Socioeconomic Status, High Unemployment, and Low Educational Attainment

In the U.S. overall, about 12% of the population lives below the poverty line—in Appalachia at large, more than 15% of the population lives in poverty (ARC, 2011b). High rates of poverty are a significant risk factor for tobacco use as about 29% of all Americans living below the poverty level reportedly smoke (CDC, 2004; Kruger et al., 2012).

The economic distress in Appalachia is a result of declining industries such as mining, manufacturing, textiles and wood products, as well as population outmigration and an aging work force. These economic factors result in severe poverty and unemployment, which then contribute to severe health disparities, especially in central Appalachia (ARC, 2011b). In fact, in Appalachian Kentucky alone, at least 24% of residents live below the poverty level and more than half of the 82 Appalachian counties classified as "distressed" by the Appalachian Regional Commission (ARC) are found in Kentucky (ARC, 2006; Kruger et al., 2012).

Additionally, educational attainment plays into the cycle of high unemployment, poverty, and tobacco use as low educational attainment is associated with higher rates of unemployment, poverty and smoking. In fact, up to 34% of U.S. citizens without a high school diploma currently smoke (CDC, 2005a; Kruger et al., 2012). Nationally, about 20% of the population has less than a high school diploma; in Appalachian Kentucky, about 37% lack a high school diploma (ARC, 2006; Kruger et al., 2012).

Economic Ties to Tobacco Growing and Deep-Seated Cultural Norms

Although the number of U.S. tobacco farms has decreased from 500,000 in the 1950s to 10,000 in 2007, the U.S. is still the world's leading producer of tobacco leaves (USDA, 2007; Eriksen, Mackay, & Ross, 2012). Currently, 16 states grow tobacco, but more than 70% of all tobacco grown in the U.S. is grown in Kentucky and North Carolina alone (USDA, 2007). The

impact economic dependence on tobacco growing has on tobacco growing states' tobacco use prevalence, attitudes, and policy decisions is well established (Giovino, 2002; Glantz & Begay, 1994; Jamieson, 1998; Kluger, 1996; Kruger et al., 2012; Meyer, Toborg, Denham, & Mande, 2008; Noland et al., 1998; Saloojee & Dagli, 2000; Von Gernet, 2000; World Bank, 1999). According to Kruger et al. (2012), "long traditions of economic dependence on tobacco in resource-challenged economies traditionally have made communities more accepting of smoking" (p.374).

Community acceptance of smoking may be due to the fact that most citizens in tobacco growing communities have some relationship with tobacco, either themselves or through a close friend or relative, making them less accepting of policies or opinions that threaten a tobacco-dependent livelihood. This perspective may also explain resistance to tobacco control policies in tobacco growing communities and poor local enforcement of tobacco control laws. For example, only about 30% of all Kentuckians are protected by comprehensive smoke-free regulations (Peyton et al., 2012).

Fortunately, agricultural dependence on tobacco is continuing to decline, which may improve community acceptance of stronger tobacco control efforts in the long term (Capehart; 2004; Kentucky Department of Agriculture, 2002; Kruger, 2012). However, high rates of tobacco use prevalence in small communities will continue to reinforce longstanding cultural norms, as both perceived and actual tobacco use contributes to tobacco use rates at the individual and interpersonal levels. Additionally, centuries of hardship have made Kentucky's Appalachian region fiercely independent and resistant to outside interference, making health interventions especially challenging to implement.

Increased Access to Tobacco Products, High Exposure to Tobacco Advertising, and Low Exposure to Countermarking

Changing cultural tobacco norms in Appalachian Kentucky is also difficult due to the area's greater ease of access to tobacco products, high exposure to tobacco advertising, and low exposure to countermarketing. Greater ease of access to tobacco products is a result of lower cigarette prices, high proximity to stores that sell tobacco, poor enforcement of tobacco retailing and promotion laws, and increased acceptance of tobacco product use among community members. These factors can be further influenced by tobacco product advertising, as the role of tobacco marketing on increased initiation of smoking, greater cigarette consumption, decreased cessation, and increased relapse among former smokers is well established (DiFranza, et al., 2006; Hammond, Fong, Zanna, Thrasher, & Borland, 2006; Ling & Glantz, 2004; Kasza et al., 2011; MacFadyen, Hastings, & Mackintosh, 2001; Wakefield, Germain, & Henriksen, 2008; Warner, 1986). Additionally, although mass media exposure to anti-tobacco messaging has increased in rural areas over the past decade through improved technology access (Pew Internet and American Life Project, 2006), the lack of effective countermarketing messaging exposure due to technology gaps and low media campaign funding levels continues to exacerbate tobacco use (CDC, 2007; Duke et al., 2009; Farrelly et al., 2005; Flay & Burton, 1990).

Rurality and Poor Access to Health Services and Information

Rural communities typically report higher tobacco use prevalence than their urban counterparts, as rurality is a risk factor for tobacco use. In fact, about 25% of rural Americans currently smoke (CDC, 2007a). This phenomenon is largely due to the increased prevalence of other tobacco use risk factors more commonly found in rural areas such as low socioeconomic status, low educational attainment, high unemployment, decreased health literacy, high exposure

to tobacco advertising, pro-tobacco cultural norms, and poor access to health information. As a result, rural citizens report higher, heavier, younger, and longer rates of tobacco use than urban dwellers (Denham et al., 2004; Hutcheson et al., 2008; Northridge et al., 2008; Smith et al., 2008; Weg et al., 2011; York et al., 2010). Additionally, rural populations are less likely to have access to medical care, including cessation services, and suffer worse outcomes from tobacco use as a result (Denham, Meyer, & Toborg, 2004; Hutcheson et al., 2008; Northridge et al., 2008; Smith et al., 2008; Weg et al., 2011; York et al., 2010).

Prevailing Community Beliefs

Recognizing that successful tobacco cessation programs in Appalachian Kentucky require careful incorporation of local perspectives, Kruger et al. (2012) conducted qualitative research with local residents in Appalachian Kentucky. According to the authors, the prevailing question guiding the research was "'What characteristics of smoking cessation programs do rural Appalachian Kentucky residents consider appealing?'" (p.374). To help answer this question, Kruger et al. conducted 12 focus groups (6 with current smokers [n=36] and 5 with former smokers [n=27]) and 23 key informant interviews with local stakeholders living in Appalachian communities. The focus group participants were predominately White and Black females with a median age of 50 who had earned a high school diploma or less and had an annual income under $30,000. These participants were asked about their smoking history; perceptions of smoking and smoking cessation, including perceived benefits from smoking and challenges to quitting; experiences with quitting smoking and smoking treatment programs; and recommendations for improving local tobacco treatment programs. Key informants were asked primarily about current tobacco treatment programs and recommendations for improving them.

Overall, key findings from Kruger et al.'s research included the following (see Box 4.1 for salient quotes from participants):

Perspectives on Quitting

- Current and former smokers reported that the benefits of smoking (e.g., alone time, calming effect, appetite suppression, boredom relief) and physiological addiction made quitting difficult.
- Family members, friends, and co-workers who smoked encouraged smoking behavior; health concerns and family members or friends expressing disproval of smoking encouraged quitting.
- Current smokers felt increasingly marginalized due to smoking bans.

Program Characteristics

- Individual commitment to smoking is the most important factor in quitting smoking.
- Immediate access to smoking cessation treatment is important for those who decide to quit; being waitlisted results in less successful quit attempts.
- Programs need to be on-going, all year long and offer constant open enrollment and a range of times.
- Physical accessibility is paramount in geographically isolated areas.
- Program costs should be low—but not free.

Box 4.1 Community Opinions

"Nowadays you're just [pathetic] if you smoke. Before it was normal."

"Me and my daughter wanted to quit once, but when we called the Health Department they told me there was a big long list in front of us, and we never did call back."

"I believe that sometimes something becomes more valuable if you have to pay into it."

"Be more caring about smokers."

"I think that smokers have turned into outcasts. You can't smoke in restaurants or in so many feet of buildings. It is all understandable, but
I feel ashamed in some situations because I feel like I'm the only smoker there. You feel embarrassed, but at the same time you have to smoke because you can't help it."

- Programs should be run by culturally sensitive, knowledgeable, supportive leaders who model healthy behavior.

Program Components

- Programs should provide transportation and child care, where possible.
- Social support outside of classroom sessions would be particularly helpful for vulnerable moments.
- Incorporate the use of incentives like free nicotine replacement therapy or even money.

Participants also felt that a multifaceted approach to tobacco treatment that incorporated community-based, provider-based, and policy-based programs would be the most beneficial in the long term, although responses were mixed on policy-based interventions that infringed on personal rights (e.g., smoking bans). Generally, participants were supportive of cessation programs, but still resented being treated as "outcasts" by the non-smoking community (p.381). These findings demonstrate a late but emerging shift in cultural norms around smoking in a longstanding pro-tobacco region of the country. However, these findings also show that the resource strained area continues to underserve its citizens in terms of tobacco treatment as fewer than 40 out of 10,000 adult smokers in the region participate in tobacco treatment programs due to lack of access, highlighting the need for greater efforts at the community and policy levels.

Current Resources to Reduce Tobacco Use in Appalachian Kentucky

Despite the many obstacles and areas where Kentucky falls short of providing effective tobacco control programs, Kentucky does have a number of resources that can be leveraged to reduce tobacco use in Appalachian Kentucky.

The Kentucky Cabinet for Health and Family Services within Kentucky's Department for Public Health runs the Kentucky Tobacco Prevention and Cessation Program (KTPC).

According to their website (http://chfs.ky.gov/dph/mch/hp/tobacco.htm), KTPC's mission is "to reduce preventable and premature deaths attributed to tobacco use by implementing programs to decrease tobacco use and exposure to secondhand tobacco smoke" (KTPC, n.d.). The program has designed its efforts around the CDC's primary goals for reducing tobacco use, including:

- Preventing the initiation of tobacco use among young people.
- Promoting cessation among young people and adults.
- Eliminating non-smokers exposure to environmental tobacco smoke.
- Identifying and eliminating the disparities related to tobacco and its effects on different population groups.

In support of these goals, KTPC's *2008-2013 Strategic Plan* includes a range of specific objectives for reducing tobacco use in the state among youth and adults through strategies such as implementing evidence-based tobacco use prevention programs in schools, increasing the unit price for tobacco products, enforcing tobacco retailing laws designed to protect youth, reducing out of pocket costs for cessation support, expanding the state quitline, providing culturally competent tobacco interventions for underserved populations, increasing community support for smoke-free laws, increasing statewide funding for tobacco prevention, and improving the state and local tobacco control infrastructure (see Table 4.4).

Table 4.4 KTPC's Strategic Plan Goals & Objectives

Goals	Objectives
Goal 1: Reduce Youth Initiation of Tobacco Use	OBJECTIVE 1.1: By 2013, decrease the percentage of middle school students (grades 6 to 8) who report smoking cigarettes on one or more of the previous 30 days to 10% or less. [2006 baseline is 12.1%] OBJECTIVE 1.2: By 2013, decrease the percentage of high school students (grades 9 to 12) who report smoking cigarettes on one or more of the previous 30 days to 20% or less. [2006 baseline is 24.5%] OBJECTIVE 1.3: By 2013, decrease the percentage of middle school students who have used smokeless tobacco on one or more of the past 30 days from 8.1% to 7.3%. [10% reduction from 2006 baseline]

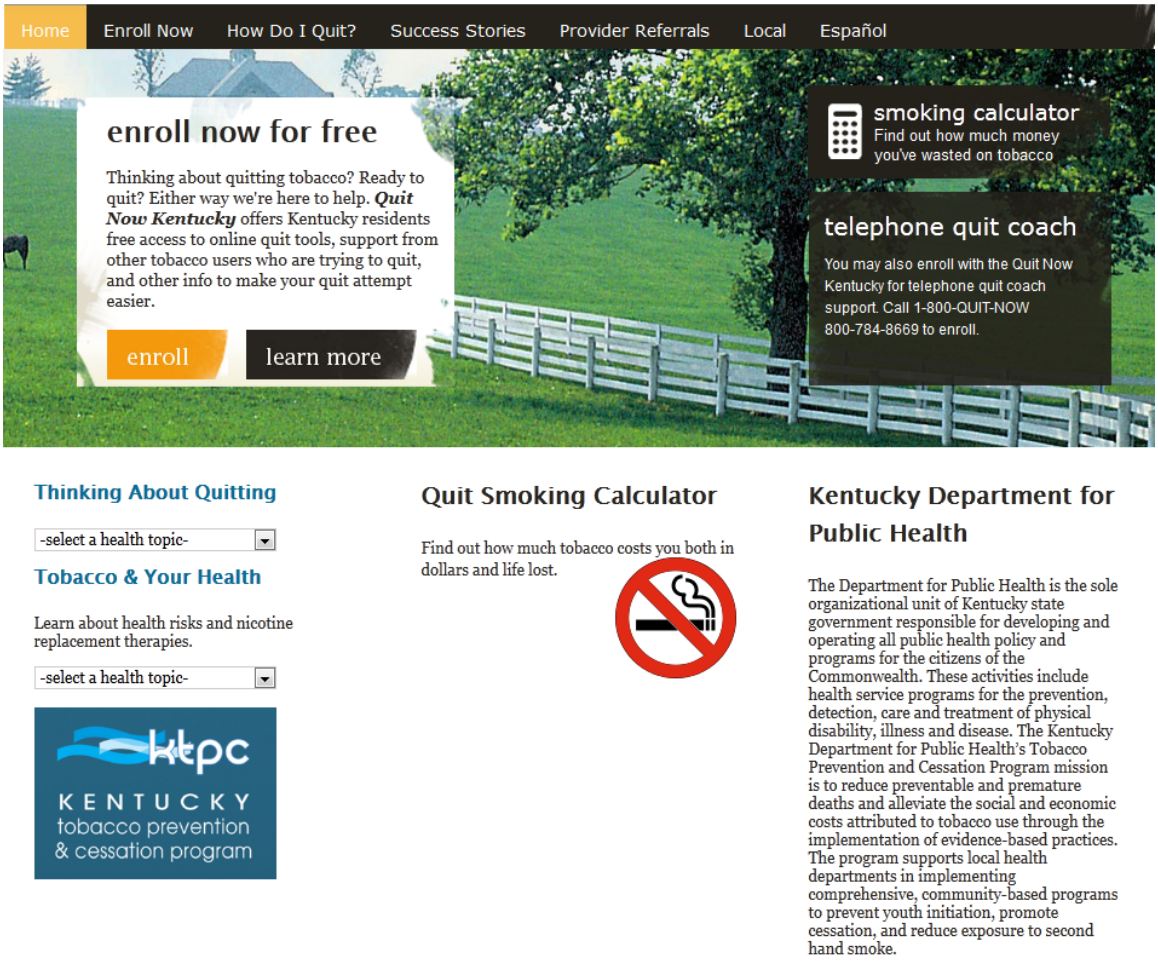
Goals	Objectives
	OBJECTIVE 1.4: By 2013, decrease the percentage of high school students who have used smokeless tobacco on one or more of the past 30 days from 13.5% to 12.2%. [10% reduction from 2006 baseline]
Goal 2: Promote Youth and Adult Cessation	OBJECTIVE 1.5: Reduce the proportion of adults age 18 and older who smoke from 28.2% to 25%, and the proportion of those who use smokeless tobacco from 5% to 4.5%. [2007 baseline]
	OBJECTIVE 1.6: By 2013, decrease the percentage of current smoking among low-income adult (defined as 2008 federal property guidelines) to 32%.
	OBJECTIVE 1.7: By 2013, decrease the percentage of current smoking among African-American adults to 24%. [2007 baseline is 31.5%]
	OBJECTIVE 1.8: By 2013, decrease the percentage of current smoking among Hispanic/ Latino adults to 10%. [2004 baseline is 11.8%]
	OBJECTIVE 1.9: Reduce smoking among pregnant women to 20% by 2013. [2005 baseline is 26.1%]
Goal 3: Reduce Exposure to Secondhand Smoke	OBJECTIVE 1.10: By 2013, Kentucky will have enacted a comprehensive smoke-free law according to Fundamentals of Smoke-Free Workplace Law recommendations.
	OBJECTIVE 1.11: By 2013, all state buildings will be smoke-free.
Goal 4: Increase Funding	Objective 1.12: By 2013, increase direct funding for statewide comprehensive tobacco prevention and control services to $13.59 (the lower CDC-recommended level for Kentucky). [2007 baseline is $0.85 per capita]
Goal 4: Improve Infrastructure	OBJECTIVE 1.13: By 2013, create a sustainable infrastructure to increase coordination and collaboration of tobacco control efforts on local, regional and state levels.

KTPC's website also has a number of resources and tools for both citizens and local tobacco control practitioners including factsheets, presentations, data reports, information about the state quitline, links to cessation class schedules, contact information for local tobacco coordinators, information for healthcare practitioners, and relevant links to other resources.

Kentucky's quitline—Quit Now Kentucky—offers both web-based and telephone-based cessation services. The telephone quitline (1-800-QUIT-NOW) is available 7 days a week from 8:00AM – 1:00AM EST and provides free telephone counseling delivered by trained tobacco cessation coaches offering encouragement for quit attempts, materials to assist tobacco users who are ready to quit, and referrals to local cessation services. The quitline offers services in both English and Spanish.

The quitline's website, www.quitnowkentucky.org (see Figure 4.13) offers a comprehensive web-based program with the latest information and research-based tools to help tobacco users quit. Quit Now Kentucky is available 24 hours a day, 7 days a week and provides access to tailored motivational messages, step-by-step guides to cutting down and quitting tobacco, quit coaches, and online support from other quitters.

Figure 4.13 Quit Now Kentucky Homepage



Source: www.quitnowkentucky.org

Resources at the local level are sparser, especially in Appalachian Kentucky. Only five Appalachian Kentucky counties currently offer cessation treatment classes (see Table 4.5), whereas the Louisville Metro area alone has more than 30 different sessions at multiple locations throughout the course of the year. Cessation classes follow the Cooper Clayton model, which

provides 13 weekly, one-hour sessions that include education, skills training, group support, and nicotine replacement therapy (NRT). Participants use NRT (e.g., Nicoderm CQ patches, Nicorette Gum or Nicorette Lozenges) for 10 weeks; all 10 weeks are provided at no charge, due to grant funding provided by the Kentucky Department for Public Health. NRT is dispensed on a week to-week basis by the class facilitator. The classes require advance registration, and once a 13-week course has begun, no new applicants are accepted.

Table 4.5 Cooper Clayton Class Schedule

Appalachian County	Time	Location	Phone	Notes
Adair	--			
Bath	--		606-674-6396	
Bell	--		606-337-7046	
Boyd	Tuesdays, 7:30AM; Wednesdays 12:00PM	KDMC Health Education Center, 2201 Lexington Ave. Ashland	606-408-4000	Participants have access to YMCA while enrolled in the program
Breathitt	Tuesdays, 3:00PM	Breathitt Co Health Dept 955 Highway 30 West Jackson, 41339	606-272-0732	
Carter	--		606-474-4115	
Casey	--			
Clark	--			
Clay	--			
Clinton	--			
Cumberland	--			
Edmonson	--		270-597-2194	See www.smokefreesoky.org
Elliott	--			
Estill	Mondays, 6:00PM	Estill Co Health Dept 365 River Drive PO Box 115 Irvine, 40336	606-723-5181	
Fleming	--		606-845-6511	
Floyd	Mondays, 10:30AM	Martin Clinic facility Saint Joseph – Martin 11203 Main St. Martin, KY 41649	606-285- 6692	Provide NRT (name-brand only) to all first time participants. Participants pay a weekly fee of $5.00 which is returned to them upon competition of the program.
Garrard	--			
Green	--		800-928-4416	
Greenup	--	CareLine	606-573-3700	

Appalachian County	Time	Location	Phone	Notes
		606-833-CARE (2273)		
Harlan	--			
Hart	--		270-524-2511	See www.smokefreesoky.org
Jackson	--		606-287-8421	
Johnson	Ongoing 1-1 counseling	Johnson County Health Department	606-789-2590	NRT provided
Knott	--		606-785-3144	
Knox	--		606-546-3486	
Laurel	--		606-864-5187	
Lawrence	--		606-638-4389	
Lee	--		606-464-2492	
Leslie	--		606-672-2393	
Letcher	--		606-633-2945	
Lewis	--		606-796-2632	
Lincoln	TBD	Lincoln Co Health Dept 44 Health Way PO Box 165 Stanford, KY 40484	606-365-3106	
McCreary	--		606-376-2412	
Madison	--		859-228-2043	
Magoffin	--		606-349-6212	
Martin	--		606-298-7752	
Menifee	--		606-674-6390	
Metcalfe	--		270-432-3214	See www.smokefreesoky.org
Monroe	--		270-487-6782	
Montgomery	--		859-497-2438	
Morgan	--		606-674-6396	
Nicholas	--		859-588-8517	
Owsley	--		606-593-5181	
Perry	--		606-672-2393	
Pike	--		606-509-5505	
Powell	--		606-663-4360	
Pulaski	--		606-679-4416	
Robertson	--		606-724-5222	
Rockcastle	--		606-256-2242	
Rowan	--		606-674-3696	
Russell	--		270-343-2181	
Wayne	--		606-348-9349	
Whitley	--			
Wolfe	--		606-672-2392	

Source: Cooper Clayton Class Schedule

Most counties do provide contact information for local tobacco coordinators. Tobacco coordinators are located in all health districts and departments throughout Kentucky to provide information about health hazards and risks associated with smoking and exposure to secondhand smoke, as well as assistance with quitting.

Additionally, Kentucky's Medicare program provides coverage for smoking and other tobacco use counseling for participants who meet one of the following criteria:

- use tobacco and have a disease or an adverse health effect that has been found by the U.S. Surgeon General to be linked to tobacco use; or
- are taking a therapeutic agent whose metabolism or dosing is affected by tobacco use as based on Food and Drug Administration-approved information.

Medicare covers two cessation attempts per year. Each attempt may include a maximum of four counseling sessions. The total annual benefit covers up to eight smoking and tobacco use cessation counseling sessions in a 12-month period. Medicare's prescription drug benefit also covers smoking and tobacco use cessation agents prescribed by a physician. For additional information about this benefit, visit the Medicare website or call 1-800-MEDICARE (1-800-633-4227).

"Individuals have a choice to use tobacco, but we can create an environment to encourage safe, healthy choices" (Peyton et al., 2012).

CHAPTER FIVE: DISCUSSION

Introduction

As described in Chapter Four, Kentucky repeatedly ranks among the worst in the nation for adult smoking, adult smoking during pregnancy, youth tobacco use, and secondhand smoke exposure—largely due to the high tobacco use rates in its Appalachian region. Reducing tobacco use in Appalachian Kentucky is difficult due to a range of unique tobacco control challenges that exacerbate the region's high tobacco use rates and poor tobacco-related health outcomes. Overcoming these challenges requires continued understanding of the current scope and context of tobacco use in Appalachian Kentucky in order to develop and implement effective, culturally-tailored tobacco use interventions.

To highlight the importance of understanding the full context of tobacco use in Appalachian Kentucky, the following chapter first summarizes the key findings from Chapter Four before recommending strategies for preventing and reducing tobacco use in the Appalachian region from a social ecological perspective. Although the primary focus of these recommendations will be at the policy level, recommendations for leveraging strategies at the local level are included where relevant to provide tobacco control practitioners at different levels of influence with a practical, comprehensive framework for reducing tobacco use in this region.

Summary of Major Findings

Chapter Four provides an overview of current tobacco use and control trends in Appalachian Kentucky, the public health implications of these trends, and the current challenges to and resources for reducing tobacco use in the region. Key findings include:

- **Highest adult smoking rates in the nation.** Kentucky has the highest prevalence of adult cigarette smoking (29.0%) in the United States (CDC, 2013b), and Appalachian

Kentucky has the highest prevalence of adult cigarette smoking (33.6% among males, 29.4% among females) of all the Appalachian states (ACCN, 2009).

- **High adult smoking during pregnancy rates.** Kentucky's prevalence of adult women who smoke while pregnant (24.3%) is twice the national average, and rates of smoking during pregnancy in Appalachian Kentucky range from 23.5% in Madison County to 56.1% in Lee County, with the majority exceeding 30.0% (KOVS, 2009; Peyton et al., 2012).
- **High adult smokeless tobacco use rates.** Although the prevalence of smokeless tobacco use among Appalachian Kentucky adult males (4.5%) is actually lower than rates among males in other Appalachian states (ACCN, 2009), 6.8% of all Kentucky adults report current smokeless tobacco use, well above the national average of 4.4% (CDC, 2013b).
- **Highest youth tobacco use rates.** Kentucky's high school smoking rate (24.1%) is the highest in the nation (CDC, 2013b) and exceeds 30.0% in several Appalachian counties (KIOM, 2007; KYTS, 2011). In fact, more than 5,400 Kentucky youth become daily smokers every year, accounting for 60.8% of the nation's annual influx of youth daily smokers (SAMHSA, 2011). Further, smokeless tobacco use among Kentucky youth has increased in recent years, and the percentage of youth reporting any type of tobacco use is 31.9%—again, the worst in the nation (CDC, 2013b).
- **High exposure to secondhand smoke.** 51.4% of Kentucky adults report exposure to secondhand smoke, and only 67.5% of Kentucky adults report homes with smoke-free rules (CDC, 2013b). Further, the percentage of Kentucky homes without smoke-free rules with children living in them is 34.0% (CDC, 2013b).

- **No comprehensive smoke-free laws.** Kentucky is one of seven states without statewide smoke-free laws or restrictions, placing the onus on communities to enact local smoke-free laws (CDC, 2013b). As a result, only about 30% of all Kentuckians are protected by comprehensive smoke-free regulations (Peyton et al., 2012), and only 67.0% of adults believe indoor smoking should be prohibited (CDC, 2013b; Peyton et al., 2012).
- **Poor coverage for cessation services.** Although Kentucky reports higher past year quit attempts (56.7%) than the national average (55.7%) (CDC, 2013b), Kentucky's Medicaid program does not provide complete coverage through Medicaid for tobacco dependence treatment, and only about 25% of Kentuckians surveyed were aware of the state's quitline services. Further, in Appalachian Kentucky, fewer than 40 out of 10,000 adult smokers in the region participate in tobacco treatment programs due to lack of access—only 5 Appalachian Kentucky counties currently offer cessation treatment classes (Kruger et al., 2012; Peyton et al., 2012).
- **Weak tobacco control enforcement policies.** Kentucky is one of nine states that preempts local regulation of tobacco industry promotions, tobacco product sampling, and display of tobacco products in commercial establishments. Further, Kentucky does not require tobacco retailers to obtain a license to sell tobacco, resulting in a weak system for monitoring and enforcing legal tobacco sales and preventing illegal sales to minors (CDC, 2013b).
- **Low cigarette excise tax.** Kentucky's cigarette excise tax is just $0.60 per pack compared to the national median ($1.34) (CDC, 2013b). Due to the low excise tax, Kentucky smokers report paying an average of just $4.23 a pack.

- **Low tobacco control spending.** Kentucky ranks 36th in the nation for adequate state-funded anti-tobacco media campaigns (CDC, 2013b). Additionally, Kentucky's total state funding for FY13 tobacco control programs was $4,030,828—a mere 7% of recommended amount.
- **High smoking-attributable health burden.** About 20% of all deaths in Kentucky—more than 7,800 adults—are a result of smoking. Cancer is the leading cause of death in Kentucky overall as well as in Appalachian Kentucky (CDC, 2010). In fact, the rates for total cancer, lung cancer, and cervical cancer in Appalachian Kentucky exceed the rest of Appalachia by an estimated 36% and the rest of the nation by about 50% (Borak et al., 2012). Unsurprisingly, lung cancer is the most problematic. In 2008, the average annual age-adjusted lung and bronchus cancer incidence rates in Appalachian Kentucky were 108.8 per 100,000 people, and the average annual age-adjusted lung and bronchus cancer mortality rates were 88.2 per 100,000 people (ACCN, 2009). Oral and pharyngeal cancer incidence and mortality rates were also highest in Appalachian Kentucky—11.8 and 2.8 per 10,000 people respectively. Ultimately, Kentucky adults who died of a smoking-attributable illness lost 14.8 years of life on average, and 107,000 Kentucky youth under age 18 alive today will ultimately die prematurely from smoking.
- **High smoking-attributable costs.** With close to one million adult smokers in the state in 2010 (CDC, 2013b; Peyton et al., 2012), smoking-attributable costs are also a primary health implication since they further strain limited healthcare resources. Currently, Kentucky spends $5.67 billion in excess personal medical care expenditures and productivity losses from smoking-related premature death and illnesses (Peyton et al.,

2012; Rumberger et al., 2010). The smoking-attributable medical expenditures alone cost each Kentucky household an extra $592 a year in federal and state tax burden.

- **High prevalence of risk factors for tobacco use.** At least 24% of Appalachian Kentucky residents live below the poverty level and more than half of the 82 Appalachian counties classified as "distressed" by the Appalachian Regional Commission (ARC) are found in Kentucky (ARC, 2006; Kruger et al., 2012). Additionally, about 37% of Appalachian Kentucky citizens lack a high school diploma (ARC, 2006; Kruger et al., 2012). Despite a decline in the number of tobacco farms, more than 70% of all tobacco grown in the U.S. is grown in Kentucky and North Carolina (USDA, 2007), making tobacco use cultural norms difficult to uproot.

Recommendations

Given the range of tobacco use challenges at all levels of influence, reducing tobacco use in Appalachian Kentucky requires a social ecological perspective. Currently, best practices in tobacco control described by the Centers for Disease Control (CDC) and the World Health Organization (WHO) focus primarily at the sociopolitical level; however, this is because individual tobacco-related knowledge, attitudes, beliefs, and behaviors are driven by sociopolitical factors and are nearly impossible to change without comprehensive tobacco control efforts. As such, recommendations for reducing tobacco use in Appalachian Kentucky follow the WHO's MPOWER framework, with a few additional recommendations from CDC's 2007 *Best Practices for Comprehensive Tobacco Control Programs Report*. Where appropriate, recommendations are tailored to more specifically address the unique challenges facing Appalachian Kentucky.

MONITOR

"A comprehensive tobacco control program has a system of surveillance and evaluation that can monitor and document short-, intermediate-, and long-term intervention outcomes in the population to inform program and policy directions and to ensure accountability to those with fiscal oversight. ***Best Practices recommends investing approximately 10% of a program's total annual intervention or programmatic budget in surveillance and evaluation efforts"*** (CDC, 2013b, p.7).

Monitor tobacco use and prevention policies

Although Kentucky has adequate state-level tobacco use monitoring programs in place, conducting an in-depth tobacco control needs assessment of Appalachian Kentucky is currently difficult to do due to lacking information at the local level in the Appalachian region. This lack of information is understandable given the difficulty of accurately monitoring tobacco use in the region with existing tobacco surveillance mechanisms due to sample size concerns as well as other factors such as rurality and poor existing infrastructure. As such, improving surveillance in Appalachian Kentucky requires grassroots efforts at the community level.

State-level recommendations:

1. Evaluate whether current state and national surveillance efforts are adequately reaching and reflecting Appalachian Kentucky tobacco use trends.
2. Assess current tobacco control spending for monitoring programs and increase spending to meet CDC's recommended levels.
3. Provide Appalachian-specific surveillance data to local practitioners.

Local-level recommendations:

1. Establish local tobacco surveillance programs.
2. Investigate innovative measures for assessing tobacco use trends and needs that will allow for better tobacco intervention tailoring and improved cultural competence. For example, practitioners might take advantage of Appalachian cultural factors such as

close-knit, religious communities to establish more personalized local level monitoring programs.

3. Engage prominent community members and interact directly with residents to improve monitoring response rates and build engagement for future tobacco control efforts.

PROTECT

"Creating smoke-free policies in workplaces and other public places not only protects nonsmokers from involuntary exposure to the toxins in tobacco smoke but also may have the added benefit of reducing tobacco consumption by smokers, increasing the number of smokers who quit, and preventing relapse among those who have already quit" (CDC, 2013b, p.7).

Protect people from tobacco smoke

Kentucky residents currently report high exposure to second-hand smoke as Kentucky lacks comprehensive smoke-free policies. Further, Kentucky residents report limited awareness of the dangers of secondhand smoke exposure.

State-level recommendations:

1. Establish comprehensive, state-wide smoke-free policies for public places and worksites that do not preempt stronger local level laws.
2. Work with local practitioners to enforce smoking bans.
3. Provide resources to local practitioners for the development of secondhand smoke education materials and programs.

Local-level recommendations:

1. Establish local smoke-free policies for public places and worksites, including schools.
2. Enforce state and local smoking bans.
3. Develop and implement local campaigns to educate Appalachian Kentucky residents about the dangers of secondhand smoke to encourage smoke-free home practices.

4. Develop evidence-based campaign materials based on recognized behavioral theories that target individual-level knowledge and attitudes, such as the Health Belief Model, Stages of Change Theory, and the Theory of Planned Behavior.
5. Engage community members to build local support for smoke-free laws.

FFER

"Cessation of tobacco use can reduce the risk for tobacco-related disease, even among those who have used tobacco for decades. Offering access to cessation programs to help those who want to quit is one effective tobacco control strategy to promote quitting. These include telephone counseling (quitlines) and reducing patient out-of-pocket costs for effective cessation treatment" (CDC, 2013b, p.7).

Offer help to quit tobacco use

Although Kentucky has exceedingly high rates of tobacco use, the state also has a significant number of users who report wanting to quit—56.7%, just above the national average of 55.7% (CDC, 2013b). In fact, nearly 60% of Kentuckians reported asking for advice on how to quit smoking from a health care professional in 2010 (Peyton et al., 2012). However, the state provides incomplete coverage through Medicaid for tobacco dependence treatment, only 25% of those surveyed reported quitline awareness, and access to cessation treatment is severely lacking in the Appalachian region (Peyton et al., 2012).

State-level recommendations:

1. Increase comprehensive Medicaid insurance coverage of evidence-based treatment for nicotine dependence.
2. Encourage and incentivize private employers and insurers to offer complete tobacco cessation services.
3. Promote Kentucky's quitline and *Quit Now Kentucky* website.
4. Increase cessation program funding to recommended levels.

Local-level recommendations:

1. Engage health care providers to encourage increased tobacco screening and counseling.
2. Promote Kentucky's quitline and *Quit Now Kentucky* website.
3. Evaluate cultural competence of current programs and services.
4. Establish evidence-based cessation programs in all Appalachian counties.
5. Conduct community needs assessments to determine key factors in successful cessation programs.
6. Consider Appalachian community-level findings from Kruger et al. (2012) including:
    a. Provide on-going, year-long programs with continual open enrollment.
    b. Offer multiple classes with different times.
    c. Improve accessibility by providing transportation and childcare when possible.
    d. Offer nicotine replacement therapy and/or other incentives.
    e. Keep program costs low, but not free.

ARN

"Comprehensive efforts to educate and warn about the dangers of tobacco use are critical to changing social norms, preventing initiation, and promoting cessation. Effective messages that are targeted appropriately can increase public support for tobacco control interventions and create a supportive environment for policy and programmatic community efforts. The Task Force on Community Preventive Services' Guide to Community Preventive Services strongly recommends sustained media campaigns combined with other interventions as an effective strategy to decrease the likelihood of tobacco initiation and promote smoking cessation" (CDC, 2013b, p.8).

Warn about the dangers of tobacco

Although Congress mandated stronger graphic health warnings on all tobacco products as part of the Family Smoking Prevention and Tobacco Control Act (Tobacco Control Act), current labeling efforts by the FDA are under litigation. In the absence of stronger warning labels, the

CDC recommends the use of sustained, evidence-based mass media campaigns as the most effective way to warn citizens about tobacco-related dangers. Unfortunately, Kentucky currently lacks adequate state-funded anti-tobacco media campaigns that educate residents about the harms of tobacco use and secondhand smoke exposure (CDC, 2013b). Stronger public education efforts are needed to combat the state's current pro-tobacco knowledge, attitudes, beliefs, and behaviors. Additionally, improved education and awareness of the dangers of secondhand smoke may improve state and local support for stronger smoke-free laws and reduce indoor smoking at home.

State-level recommendations:

1. Develop and implement evidence-based public education campaigns with hard-hitting, emotional messages. Incorporate the following best practices:
    a. Conduct formative research to identify messages, themes, and tactics.
    b. Test messages with members of the target audience.
    c. Use factual messages with hard-hitting emotional themes; avoid humor.
    d. Incorporate the use of relevant behavior theories with individual-level impact.
    e. Minimize the use of smoking-related imagery unless these images are paired with strong, graphic images highlighting negative health consequences.
    f. Assess messages for unintended consequences.
    g. Engage experts in tobacco-control campaign development and evaluation.
    h. Evaluate the impact of campaigns over time.
2. Sustain evidence-based mass media campaigns with sufficient funding to achieve CDC's recommended exposure levels of 1,200 general audience gross rating points (GRPs) and 800 youth targeted rating points (TRPs) per quarter (CDC, 2013b).

3. Optimize campaign content for use across multiple media channels beyond traditional broadcast media to include mobile, web, and print applications.
4. Work with local practitioners to extend campaign media reach to underserved areas in Appalachian Kentucky.

Local-level recommendations:

1. Extend state and federal campaigns in underserved areas of Appalachian Kentucky through localized media efforts.
2. Develop additional culturally-sensitive campaign messages that consider the region's economic ties to tobacco growing
3. Hold promotional events to increase campaign awareness.
4. Evaluate campaign awareness and effectiveness in local communities; tailor messages where possible to improve salience.
5. Collaborate with other state and local partners to bolster campaign engagement.

ENFORCE

"With the enactment of the [Tobacco Control Act] on June 22, 2009, FDA was given authority to regulate the manufacturing, marketing, and distribution of tobacco products. This legislation also grants authority to states and local communities to impose restrictions that are in addition to or more stringent than FDA requirements, such as specific bans or restrictions on the time, place, and manner of tobacco advertising. It will be important to measure and monitor the establishment of, compliance with, and impact of federal, state, and local regulations and restrictions to assess the impact they have on reducing morbidity and mortality from tobacco use" (CDC, 2013b, p.8).

Enforce bans on tobacco advertising, promotion, and sponsorship

The Tobacco Control Act grants state and local governments the authority to impose additional restrictions on tobacco marketing that exceed current federal regulations. However, the states may also preempt local laws, to the detriment of effective tobacco control. Kentucky is one of nine states that preempts local regulation of tobacco industry promotions,

tobacco product sampling, and display of tobacco products in commercial establishments. Further, Kentucky does not require tobacco retailers to obtain a license to sell tobacco, resulting in a weak system for monitoring and enforcing legal tobacco sales and preventing illegal sales to minors (CDC, 2013b).

State-level recommendations:

1. Enforce federal tobacco advertising, marketing, and distribution laws (see FDA's website for full list of regulations).
2. Implement strong tobacco retailing laws that exceed federal regulations.
3. Do not preempt stronger local tobacco retailing laws.
4. In collaboration with FDA, develop and promote education programs for retailers to inform them of federal and state laws (see FDA's website for current retailer training programs).
5. Establish a system for monitoring tobacco retailers and illegal tobacco sales across the state; share information with local and federal tobacco control partners.
6. Require all tobacco retailers to obtain a license to sell tobacco.
7. Enforce penalties for failure to comply with retailing regulations.

Local-level recommendations:

1. Enforce current federal and state tobacco retailing laws.
2. Encourage state-level practitioners to develop stronger tobacco retailing laws and to stop preempting stronger local level laws.
3. If state policies allow, develop stronger advertising, marketing, and distribution laws.
4. Develop and promote retailer education programs to improve compliance with existing regulations.

5. If no state-level system exists, establish a system for monitoring tobacco retailers and illegal tobacco sale to minors; share information with state and federal partners.

RAISE

"Increasing the price of tobacco products reduces tobacco consumption and prevalence, especially among the most price-sensitive populations (e.g., young people). Increasing cigarette taxes is an effective method of increasing the real price of cigarettes, but maintaining high prices requires continued tax adjustments to offset the effects of inflation and industry practices designed to control retail product prices" (CDC, 2013b, p.8).

Raise taxes on tobacco

Kentucky's current excise tax on cigarettes is $0.60 per pack, ranking 40th among the states (CDC, 2013b). Due to this low excise tax, Kentucky smokers reported paying an average of just $4.23 a pack in 2010, contributing to the state's high tobacco use prevalence. Increasing the state's excise tax on tobacco products is a key step in effective tobacco control given the inverse relationship between tobacco use and tobacco product price, especially among youth (CDC, 2007b; CDC, 2005b; HHS, 2012; WHO, 2008). Additionally, prohibiting tobacco industry price discounts to retailers will help ensure effective price control policies.

State-level recommendations:

1. Meet CDC's *Healthy People 2020* objective by increasing state tobacco excise tax by at least $1.50 per pack.
2. Increase the price of cigarettes by at least 10%.
3. Prohibit price discounts to retailers.

Local-level recommendations:

1. Conduct local surveillance to ensure retailer compliance with excise tax and price policies.

Other Recommendations

Other recommendations for improving tobacco control in Kentucky include:

1. Improve strategic planning
    a. Evaluate current progress on meeting objectives set forth by the *Kentucky Tobacco Prevention and Control 2008-2013 Strategic Plan*.
    b. Identify additional measures to improve strategic plan performance.
    c. Develop a new five year strategic plan for improving tobacco control in the state.
    d. Include objectives and strategies specific to reducing tobacco use in Appalachian Kentucky.
2. Establish a clear process for evaluating current and future tobacco control efforts in Appalachian Kentucky.
3. Establish a network of state and local tobacco control practitioners to share relevant data and lessons learned as well as improve collaboration; hold quarterly meetings.
4. Collaborate with federal agencies such as FDA and CDC to extend national efforts in local communities.
5. Conduct comprehensive tobacco control needs assessments at the community-level.
    a. Engage community members to improve cultural competence and engagement.
6. Increase annual tobacco prevention spending levels to meet CDC's recommendations (see Figure 5.1).

Figure 5.1 CDC's Recommended Kentucky Tobacco Program Intervention Budget, 2007

Deaths in Kentucky Caused by Smoking	
Annual average smoking-attributable deaths	7,700
Youth ages 0-17 projected to die from smoking	107,000
Annual Costs Incurred in Kentucky from Smoking	
Total medical	$1,500 million
Medicaid medical	$487 million
Lost productivity from premature death	$2,138 million
State Revenue from Tobacco Excise Taxes and Settlement	
FY 2006 tobacco tax revenue	$165.2 million
FY 2006 tobacco settlement payment	$102.7 million
Total state revenue from tobacco excise taxes and settlement	$267.9 million
Percent tobacco revenue to fund at CDC recommended level	**21%**

		Per Capita Recommendation
I.	**State and Community Interventions** Multiple societal resources working together have the greatest long-term population impact.	**$5.50**
II.	**Health Communication Interventions** Media interventions prevent tobacco use initiation, promote cessation, and shape social norms.	**$1.65**
III.	**Cessation Interventions** Tobacco use treatment is highly cost-effective.	**$4.67**
IV.	**Surveillance and Evaluation** Publicly financed programs should be accountable and demonstrate effectiveness.	**$1.18**
V.	**Administration and Management** Complex, integrated programs require experienced staff to provide fiscal management, accountability, and coordination.	**$0.59**
	Total	**$13.59**

Source: CDC, 2007b

Conclusion

Appalachian Kentucky will continue to face significant public health disparities unless current tobacco use and control trends are significantly disrupted. Arguably, reducing tobacco use in the region is difficult due to myriad factors including long-standing pro-tobacco cultural norms, poverty, unemployment, low educational attainment, rurality, and weak tobacco control measures. However, this tobacco control needs assessment provides a range of practical, evidence-based strategies that can be implemented at both the state and local level to reduce tobacco use in Appalachian Kentucky and improve tobacco-related health outcomes. These recommendations are proven best practices for tobacco control but require a comprehensive approach that considers a full social ecological perspective. Tobacco control practitioners should review the full scope and context of tobacco trends presented to assess the best process for implementing a combination of tobacco control strategies that will ultimately improve the health and well-being of Appalachian Kentucky communities.

REFERENCES

American Heart Association. (2013). Heart Disease and Stroke Statistics, 2013. Update: A Report from the American Heart Association.

American Legacy Foundation. (2009). Tobacco Control in Rural America. Washington, DC. Retrieved June 10, from http://www.legacyforhealth.org/content/download/595/7129/version/1/file/Tobacco_Control_in_Rural_America.pdf

American Lung Association. (2013). State of Tobacco Control 2013. Washington, DC. Retrieved June 26, 2013 from http://www.stateoftobaccocontrol.org/sotc-2013-report.pdf

American Lung Association. (2012). Cutting Tobacco's Rural Roots: Tobacco Use in Rural Communities. Washington, DC. Retrieved June 13, from http://www.lung.org/lung-disease/disparities-reports/cutting-tobaccos-rural-roots/

Andrews, R.L., & Franke, G.R. (1991). The Determinants of Cigarette Consumption: A Meta-Analysis. *Journal of Public Policy & Marketing*, *10*(1):81–100.

Appalachian Community Cancer Network. (2009). The Cancer Burden in Appalachia. Retrieved June 11, 2013 from http://www.accnweb.com/docs/2009/CancerBurdenAppalachia2009.pdf

Appalachian Regional Commission (ARC). (2013). County Economic Distressed Status and Distressed Areas in Appalachia. Washington, DC. Retrieved June 1, 2013 from http://www.arc.gov/appalachian_region/CountyEconomicStatusandDistressedAreasinAppalachia.asp

Appalachian Regional Commission (ARC). (2011a). The Appalachian Region. Washington, DC. Retrieved June 1, 2013 from http://www.arc.gov/appalachian_region/TheAppalachianRegion.asp

Appalachian Regional Commission (ARC). (2011b). Economic Overview of Appalachia-2011. Washington, DC. Retrieved June 1, 2013 from http://www.arc.gov/resesearch

Appalachian Regional Commission (ARC). (2009). Subregions in Appalachia. Washington, DC. Retrieved June 1, 2013 from http://www.arc.gov/research/MapsofAppalachia.asp?MAP_ID=31

Appalachian Regional Commission (ARC). (2006). Demographic and Health Information. Retrieved June 11, 2013 from http://www.arc.gov

Arrazola, R.A., Dube, S.R., Kaufmann, R.B., Caraballo, R.S., & Pechacek, T. (2010). Tobacco Use Among Middle and High School Students—United States, 2000–2009. *Morbidity and Mortality Weekly Report, 59*(33), 1063–1068.

Behringer, B., & Friedell, G.H. (2006). Appalachia: Where Place Matters in Health. *Preventing Chronic Disease, 3*:A113.

Berg, C.J., Parelkar, P.P., Lessard, L., Escoffery, C., Kegler, M. C., Sterling, K.L., & Ahluwalia, J. S. (2010). Defining "Smoker": College Student Attitudes and Related Smoking Characteristics. *Nicotine & Tobacco Research, 12*(9):963–969.

Borak, J., Salipante-Zaidel, C., Slade, M.D., & Fields, C.A. (2012). Mortality Disparities in Appalachia: Reassessment of Major Risk Factors. *Journal of Occupational & Environmental Medicine, 54*(2):146-56.

Borrell, L.N., Diez Roux, A.V., Jacobs, D.R., Jr., Shea, S., Jackson, S.A., Shrager, S., & Blumenthal, R.S. (2010). Perceived Racial/Ethnic Discrimination, Smoking and Alcohol

Consumption in the Multi-Ethnic Study of Atherosclerosis (MESA). *Preventive Medicine, 51*(3–4):307–312.

Breslau, N., & Peterson, E.L. (1996). Smoking Cessation in Young Adults: Age at Initiation of Cigarette Smoking and Other Suspected Influences. *American Journal of Public Health, 86*(2): 214-20.

Bricker, J.B., Peterson, A.V., Andersen, R.M., Leroux, B.G., Bharat Rajan K., & Sarason, I.G. (2006). Close Friends', Parents', and Older Siblings' Smoking: Reevaluating their Influence in Children's Smoking. *Nicotine & Tobacco Research, 8*(2):217–226.

Bruijnzeel, A.W. (2012). Tobacco Addiction and the Dysregulation of Brain Stress Systems. *Neuroscience & Biobehavioral Reviews, 36*(5):1418–1441.

Burkhalter J, et al. Intention to quit smoking among lesbian, gay, bisexual, and transgender smokers. *Nicotine & Tobacco* Research, 2009; 11(11):1312-1320. From American Lung Association report.

Capehart, T. (2004). Trends in U.S. Tobacco Farming: Electronic Outlook Report form the Economic Research Service: United States Department of Agriculture.

Carpenter, C., & Cook, P.J. (2007). Cigarette Taxes and Youth Smoking: New Evidence From National, State, & Local Youth Risk Behavior Surveys. NBER Working Paper No. 13046: The National Bureau of Economic Research.

Caudill, H.M. (1963). Night Comes to the Cumberlands: A Biography of a Depressed Area. Boston: Little, Brown and Co.

Centers for Disease Control and Prevention (CDC). (2013a). Early Release of Selected Estimates based on 2012 National Health Interview Survey Data: Current Smoking. Hyattsville, MD: US Department of Health and Human Services, CDC, National Center for Health

Statistics; 2013. Retrieved June 19, 2013 from http://www.cdc.gov/nchs/data/nhis/earlyrelease/earlyrelease201306.pdf

Centers for Disease Control and Prevention (CDC). (2013b). Centers for Disease Control and Prevention. Tobacco Control State Highlights 2012. Atlanta: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2013. Retrieved June 26, 2013 from http://www.cdc.gov/tobacco/data_statistics/state_data/state_highlights/2012/sections/index.htm

Centers for Disease Control and Prevention (CDC). (2013c). Vital Signs: Current Cigarette Smoking Among Adults Aged ≥18 Years with Mental Illness-United States, 2009–2011. *Morbidity and Mortality Weekly Report, 62*(05):81-87. Retrieved June 19, 2013 from http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6205a2.htm?s_cid=mm6205a2_w

Centers for Disease Control and Prevention (CDC). (2012a). Current Cigarette Smoking Among Adults - United States, 2011. *Morbidity and Mortality Weekly Report, 61*: 890-4. Retrieved June 18, 2013 from http://www.cdc.gov/mmwr/pdf/wk/mm6144.pdf

Centers for Disease Control and Prevention (CDC). (2012b). Current Tobacco Use Among Middle and High School Students - United States, 2011. *Morbidity and Mortality Weekly Report, 61*: 581-5. Retrieved June 18, 2013 from http://www.cdc.gov/mmwr/pdf/wk/mm6131.pdf

Centers for Disease Control and Prevention (CDC). (2011). Cigarette Smoking — United States, 1965–2008. *Morbidity and Mortality Weekly Report, 60*(01): 109-113. Retrieved June 19,

2013 from http://www.cdc.gov/mmwr/preview/mmwrhtml/su6001a24.htm?s_cid=su6001a24_w

Centers for Disease Control and Prevention (CDC). (2010a). Cigarette Use Among High School Students --- United States, 1991—2009. *Morbidity and Mortality Weekly Report, 59*(26):797-801. Retrieved June 18, 2013 from http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5926a1.htm

Centers for Disease Control and Prevention (CDC). (2010b). Early Release of Selected Estimates Based on Data from the 2009 National Health Interview Survey: Current Smoking. Hyattsville, MD: US Department of Health and Human Services, CDC, National Center for Health Statistics; 2010. Retrieved June 18, 2013 from http://www.cdc.gov/nchs/data/nhis/earlyrelease/201006_08.pdf

Centers for Disease Control and Prevention (CDC). (2008). Cigarette smoking among adults—United States, 2007. *Morbidity and Mortality Weekly Report*, *57*(45):1221-1226 Retrieved June 18, 2013 from http://www.cdc.gov/mmwr/PDF/wk/mm5745.pdf

Centers for Disease Control and Prevention (CDC). (2007a). Summary Health Statistics for U.S. Adults: National Health Interview Survey 2006. *Vital Health Statistics, 10*(235).

Centers for Disease Control and Prevention (CDC). (2007b). Best Practices for Comprehensive Tobacco Control Programs—2007. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health. Retrieved June 24, 2013 from http://www.cdc.gov/tobacco/stateandcommunity/best_practices/pdfs/2007/BestPractices_Complete.pdf

Centers for Disease Control and Prevention (CDC). (2006). Sustaining State Programs for Tobacco Control: Data Highlights, *2006*. Retrieved June 26, from http://www.cdc.gov/tobacco/data_statistics/state_data/data_highlights/2006/index.htm.

Centers for Disease Control and Prevention (CDC). (2005a). Cigarette Smoking Among Adults-United States, 2004. *Morbidity and Mortality Weekly Report*, *54*:1121-1124.

Centers for Disease Control and Prevention (CDC). (2005b). Key Outcome Indicators for Evaluating Comprehensive Tobacco Control Programs. Atlanta (GA): U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2005.

Centers for Disease Control and Prevention (CDC). (2004). Tobacco Related Mortality Fact Sheet. National Center for Chronic Disease Prevention and Health Promotion, February 2004. Retrieved June 18, 2013 from www.cdc.gov/tobacco/factsheets/Tobacco_Related_Mortality_factsheet.htm

Centers for Disease Control and Prevention (CDC). (2003). Cigarette Smoking-Attributable Morbidity—United States, 2000. *Morbidity and Mortality Weekly Report,* 52;842-4. Retrieved June 18, 2013 from http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5235a4.htm

Centers for Disease Control and Prevention (CDC). (2002). Annual Smoking-Attributable Mortality, Years of Potential Life Lost, and Economic Costs—United States, 1995–1999. *Morbidity and Mortality Weekly Report, 51*(14):300–3. Retrieved June 19, 2013 from http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5114a2.htm

Centers for Disease Control and Prevention (CDC). (1997). Perspectives in Disease Prevention and Health Promotion, Smoking-Attributable Mortality and Years of Potential Life Lost—United States, 1984. *Morbidity and Mortality Weekly Report, 46*(20):444–51. Retrieved June 19, 2013 from http://www.cdc.gov/mmwr/preview/mmwrhtml/00047690.htm

Centers for Disease Control and Prevention (CDC). (1993). Use of Smokeless Tobacco Among Adults—United States, 1991 [published correction appears in *Morbidity and Mortality Weekly Report*, *42*:382]. *Morbidity and Mortality Weekly Report*, *42*:263–266. [PubMed]

Chaloupka, F.J., & Warner, K.E. (1999). The Economics of Smoking. In J. Newhouse & A. Culyer (Eds.), *The Handbook of Health Economics*. Amsterdam: Elsevier.

Chaloupka, F.J., Yurekli, A., & Fong, G.T. (2012). Tobacco Taxes As A Tobacco Control Strategy. [Review]. *Tobacco Control*, *21*(2):172–180.

Choi, Y., Choi, S.M., & Rifon, N. (2011). "I smoke but I am not a smoker": Phantom Smokers and the Discrepancy Between Self-Identity and Behavior. *Journal of American College Health*, *59*(2):117–125.

Cowell, A.J., Farrelly, M.C., Chou, R., & Vallone, D.M. (2009). Assessing the impact of the National 'truth' Antismoking Campaign on Beliefs, Attitudes, and Intent to Smoke by Race/Ethnicity. *Ethnicity & Health*, *14*(1), 75–91.

Cromartie, J. & Bucholtz, S. (2008). Defining the "Rural" in Rural America. *Amber Waves*, *6*(3):28-35. Retrieved June 23, 2013 from http://webarchives.cdlib.org/wayback.public/UERS_ag_1/20120224164626/http://www.ers.usda.gov/AmberWaves/June08/PDF/RuralAmerica.pdf

Crosby, R., & Noar, S.M. (2010). Theory Development in Health Promotion: Are We There Yet? *Journal of Behavioral Medicine, 33*(4):259-63.

Denham, S., Meyer, M., & Toborg, M. (2004). Tobacco Cessation in Adolescent Females in Appalachian Communities. *Family Community Health, 27*(2):170-181.

DiFranza. J.R., Wellman, R.J., Sargent, J.D., Weitzman, M., Hipple, B.J., Winickoff, & J.P. (2006). Tobacco promotion and the initiation of tobacco use: Assessing the evidence for causality. *Pediatrics,117*:1237–1248.

Dube, S.R., McClave, A., James, C., Caraballo, R., Kaufmann, R., Pechacek, T. (2010). Vital Signs: Current Cigarette Smoking Among Adults aged > or = 18 Years of Age. *Morbidity and Mortality Weekly Report, 59*(35);1135-1140. Retrieved June 28, 2013 from http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5935a3.htm

Duke, J.C., Vallone, D.M., Allen, J.A., Cullen, J., Mowery, P.D., Xiao, H., Dorrle, N., Asche, E.T., & Healton, C. (2009). Increasing Youths' Exposure to a Tobacco Prevention Media Campaign in Rural and Low-Population-Density Communities. *American Journal of Public Health, 99*(12): 2210–2216.

Eaton, D.K., Kann, L., Kinchen, S., Shanklin, S., Flint, K. H., Hawkins, J., …Wechsler, H. (2012). Youth risk behavior surveillance—United States, 2011. *Morbidity and Mortality Weekly Report, Surveillance Summaries, 61*(4), 1–162.

Ellickson, P.L., Bird, C.E., Orlando, M., Klein, D.J., & McCaffrey, D.F. (2003). Social Context and Adolescent Health Behavior: Does School-level Smoking Prevalence Affect Students' Subsequent Smoking Behavior? *Journal of Health & Social Behavior, 44*(4): 525–535.

Eriksen, M., Mackay, J., & Ross, H. (2012). The Tobacco Atlas, 4th ed. Atlanta, GA: American Cancer Society; New York, NY: World Lung Foundation.

Evans, N., Farkas, A., Gilpin, E., Berry, C., & Pierce, J.P. (1995). Influence of Tobacco Marketing and Exposure to Smokers on Adolescent Susceptibility to Smoking. *Journal of the National Cancer Institute, 87*(20):1538-45.

Fagan, P., Moolchan, E. T., Lawrence, D., Fernander, A., & Ponder, P. K. (2007). Identifying Health Disparities Across the Tobacco Continuum. *Addiction, 102:*5–29.

Farrelly, M.C., Davis, K.C., Duke, J., & Messeri, P. (2009). Sustaining 'Truth': Changes in Youth Tobacco Attitudes and Smoking Intentions After 3 Years of a National Antismoking Campaign. *Health Education Research, 24*(1):42–48.

Farrelly, M.C., Nonnemaker, J., Davis, K.C., & Hussin, A. (2009). The Influence of the National truth campaign on smoking initiation. *American Journal of Preventive Medicine, 36*(5):379–384.

Farrelly, M.C., Davis, K.C., Haviland, M.L., Messeri, P., & Healton, C.G. (2005). Evidence of a dose–response relationship between "truth" antismoking ads and youth smoking. *American Journal of Public Health, 95*:425–431.

Farrelly, M.C., Healton, C.G., Davis, K.C., Messeri, P., Hersey, J.C., & Haviland, M.L. (2002). Getting to the Truth: Evaluating National Tobacco Countermarketing Campaigns. *American Journal of Public Health, 92*(6):901–907.

Federal Trade Commission (FTC). (2011). Cigarette Report for 2011; Smokeless Tobacco Report for 2011. Washington: Federal Trade Commission. Retrieved September 3, 2013 from http://www.ftc.gov/os/2013/05/130521cigarettereport.pdf and http://www.ftc.gov/os/2013/05/130521smokelesstobaccoreport.pdf

Fiore, M.C., Jaen, C.R., Baker, T.B., et al. (2008). Treating tobacco use and dependence: 2008 update. Clinical practice guideline. Rockville, MD: US Department of Health and Human Services, Public Health Service; 2008. Retrieved June 18, 2013 from http://www.surgeongeneral.gov/tobacco/treating_tobacco_use08.pdf

Flay, B.R. & Burton, D. (1990). Effective mass media communication strategies or health campaigns. Atkin, C. & Wallack, L. (edss). Mass Communication and Public Health: Complexities and Conflicts. Newbury Park, CA: Sage; 1990:129–146.

Freedman. K.S., Nelson, N.M., Feldman, L.L. (2007). Smoking Initiation Among Young Adults In The United States And Canada, 1998-2010: A Systematic Review. *Preventing Chronic Disease, 9*(E05).

Garrett, B.E., Dube, S.R., Trosclair, A., Caraballo, R.S., & Pechacek, T.F. (2011). Cigarette Smoking — United States, 1965–2008. National Center for Chronic Disease Prevention and Health. Centers for Disease Control and Prevention. *Morbidity and Mortality Weekly Report, 60*(01): 109-113. Retrieved June 19, 2013 from http://www.cdc.gov/mmwr/preview/mmwrhtml/su6001a24.htm?s_cid=su6001a24_w

Gilpin. E.A., White, M.M., Messer, K., & Pierce, J.P. (2007). Receptivity to tobacco advertising and promotions among young adolescents as a predictor of established smoking in young adulthood. *American Journal of Public Health, 97*(8):1489–95.

Giovino, G.A. (2002). Epidemiology of tobacco use in the United States. *Oncogene, 21:*7326-7340.

Glantz, S.A. & Begay, M.E. (1994). Tobacco Industry Campaign Contributions Are Affecting Tobacco Control Policymaking in California. *Journal of the American Medical Association, 272*:1176-1182.

Goldman, L.K., & Glantz, S.A. (1998). Evaluation of Antismoking Advertising Campaigns. *Journal of the American Medical Association, 279*(10):772–777.

Gray, B. & Chaloupka, F.J. (2003). Do State Policies Affect Tobacco Sales to Minors? *Policy Forum, 16*(3).

Grunbaum. J.A., Kann, L., Kinchen, S., et al. (2002). Youth Risk Behavior Surveillance—United States 2001. *Morbidity and Mortality Weekly, Surveillance Summaries, 51*(SS-4):1–64. Retrieved June 19, 2033 from http://www.cdc.gov/mmwr/preview/mmwrhtml/ss5104a1.htm.

Gryczynski, J., & Ward, B. W. (2011). Social Norms and the Relationship Between Cigarette Use and Religiosity Among Adolescents in the United States. *Health Education & Behavior, 38*(1):39–48.

Halverson, J.A. (2004). An Analysis of Disparities in Health Status and Access to Health Care in the Appalachian Region. Washington, DC: Appalachian Regional Commission, 2004.

Halverson, J.A. & Bischak, G. (2008). Underlying Socioeconomic Factors Influencing Health Disparities in the Appalachian Region. Washington, DC: Appalachian Regional Commission, 2008.

Hammond, D., Fong, G.T., Zanna, M.P., Thrasher, J.F., & Borland, R. (2006). Tobacco Denormalization and Industry Beliefs Among Smokers From Four Countries. *American Journal of Preventive Medicine, 31*:225–232.

Henriksen, L., Schleicher, N.C., Dauphinee, A.L., & Fortmann, S.P. (2011). Targeted Advertising, Promotion, and Price for Menthol Cigarettes in California High School Neighborhoods. *Nicotine & Tobacco Research*.

Hersey, J.C., Niederdeppe, J., Ng, S.W., Mowery, P., Farrelly, M., & Messeri, P. (2005). How State Counter-Industry Campaigns Help Prime Perceptions of Tobacco Industry Practices to Promote Reductions in Youth Smoking. *Tobacco Control, 14*(6):377–383.

Howard-Pitney, B. & Winkleby, M.A. (2002). Chewing Tobacco: Who Uses And Who Quits? Findings from the NHANES III, 1988–1994. National Health and Nutrition Examination Survey III. *Am J Public Health, 92:*250–256. [PMC free article] [PubMed]

Hutcheson, T., Greiner, K., Ellerbeck, E., Jeffries, S., Mussulman, L., & Casey, G. (2008). Understanding Smoking Cessation in Rural Communities. *The Journal of Rural Health, 24*(2):116-124.

Hyland, A., Travers, M.J., Cummings, K.M., Bauer, J., Alford, T., & Wieczorek, W.F. (2003). Tobacco Outlet Density and Demographics In Erie County, New York. *American Journal of Public Health, 93*(7):1075–1076.

Israel, B.A., Schulz, A.J., Parker, E.A., & Becker, A.B. (1998). Review of Community-Based Research: Assessing Partnership Approaches to Improve Public Health. *Annual Review of Public Health, 19*:173–202.

Jamieson, K.H. (1998). 'Tax and spend' vs. 'little kids': advocacy and accuracy in the tobacco settlement ads of 1997-1998. Philadelphia, Pennsylvania: Annenberg Public Policy Center of the University of Pennsylvania.

Johnston, L.D., O'Malley, P.M., Bachman, J.G., & Schulenberg, J.E. (2012). Monitoring the Future national survey results on drug use, 1975–2011: Volume I, Secondary School Students. Ann Arbor, MI: Institute for Social Research, The University of Michigan.

Kann, L., et al. (2011). Sexual Identity, Sex of Sexual Contacts, and Health-Risk Behaviors Among Students in Grades 9–12 — Youth Risk Behavior Surveillance, Selected Sites,

United States, 2001–2009. *Morbidity and Mortality Weekly Report*, *60*(SS07):1-133. Retrieved June 28, 2013 from http://www.cdc.gov/mmwr/preview/mmwrhtml/ss6007a1.htm

Kasza, K.A., Hyland, A.J., Brown, A., Siahpush, M., Yong, H., McNeill, A.D., Li, L., & Cummings, K.M. (2011). The Effectiveness of Tobacco Marketing Regulations on Reducing Smokers' Exposure to Advertising and Promotion: Findings from the International Tobacco Control (ITC) Four Country Survey. *International Journal of Environmental Research and Public Health, 8*(2):321-340.

Kaufman, R., Rojas, A.M, & Mayer, H. (1993). Needs Assessment: A User's Guide. Englewood Cliffs, New Jersey: Educational Technology Publications, Inc.

Kentucky Center for Smoke-Free Policy (KCSP). (2011). Tobacco Use and Policy: County Factsheets. University of Kentucky: Lexington, KY. Retrieved June 1, 2013 from http://www.kcsp.uky.edu

Kentucky Department of Agriculture. (2002). Kentucky Agricultural Statistics 2000-2001. Frankfort, KY: U.S. Department of Agriculture.

Kentucky Institute of Medicine (KIOM). (2007). The Health of Kentucky: A County Assessment. Lexington, KY. Retrieved June 1, 2013 from http://www.kyiom.org/healthky2007a.pdf

Kentucky Office of Vital Statistics (KOVS). (2009). Department for Public Health. Kentucky Cabinet for Health and Family Services. Retrieved June 1, 2013 from http://chfs.ky.gov/dph/vital

Kentucky Tobacco Prevention and Cessation Program (KTPC). (n.d.). About. Retrieved July 25, 3013 from http://chfs.ky.gov/dph/mch/hp/tobacco.htm

Kentucky Youth Tobacco Survey (KYTS). (2011). 2010 Factsheet. Retrieved June 1, from http://chfs.ky.gov/NR/rdonlyres/AC64E39A-4403-4717-B481-091AF78C39F7/0/2010KentuckyYouthTobaccoSurveyHighSchoolFactSheet.pdf

Kluger, R. (1996). Ashes to Ashes. America's Hundred-Year Cigarette War, the Public Health, and the Unabashed Triumph Of Philip Morris. New York, NY: Alfred A. Knopf.

Kochanek M.A., Xu, J., Murphy, S.L., et al. (2011). Deaths: Final Data for 2009. National vital statistics reports; 60(3). Hyattsville, MD: National Center for Health Statistics. http://www.cdc.gov/nchs/data/nvsr/nvsr60/nvsr60_03.pdf

Kruger, T.M., Howell, B.M., Haney, A., Davis, R.E., Fields, N., & Schoenberg, N.E. (2012). Perceptions of Smoking Cessation Programs in Rural Appalachia. *American Journal of Health Behavior, 36*(3):373-384.

Lando, H.A., Thai D.T., Murray, D.M., Robinson, L.A., Jeffery, R.W., Sherwood, N.E & Hennrikus, D.J. (1999). Age of Initiation, Smoking Patterns, and Risk in a Population of Working Adults. *Preventive Medicine, 29*(6 Pt 1):590-98. [Pubmed]

Larson, E.H. & Hart, G. L. (2003). Rural Health Workforce Methods and Analysis. In Larson et al., (Eds.) *State of the Health Workforce in Rural America: State Profiles and Comparison.* Seattle, WA: WWAMI Rural Health Research Center, University of Washington, 2003.

Levinson, A.H., Campo, S., Gascoigne, J., Jolly, O., Zakharyan, A., & Tran, Z. V. (2007). Smoking, but Not Smokers: Identity Among College Students Who Smoke Cigarettes. *Nicotine & Tobacco Research, 9*(8):845–852.

Liao, Y., Huang, Z., Huh, J., Pentz, M.A., Chou, C-P. (2013). Changes in Friends' and Parental Influences on Cigarette Smoking From Early Through Late Adolescence. Journal of Adolescent Health, 53(1):132-138.

Ling. P.M., & Glantz, S.A. (2004). Tobacco Industry Research on Smoking Cessation. Recapturing Young Adults and Other Recent Quitters. *Journal of General Internal Medicine,19*:419–426.

Lorenzo-Blanco, E.I., Unger, J.B., Ritt-Olson, A., Soto, D., & Baezconde-Garbanati, L. (2011). Acculturation, Gender, Depression, And Cigarette Smoking Among U.S. Hispanic Youth: The Mediating Role of Perceived Discrimination. *Journal of Youth and Adolescence, 40*(11): 1519–1533.

Lovato, C., Linn, G., Stead, L.F., & Best, A. (2003). Impact of Tobacco Advertising and Promotion on Increasing Adolescent Smoking Behaviours. *Cochrane Database of Systematic Reviews, 4*, CD003439.

McGinnis, J., Foege, W.H. (1993). Actual Causes of Death in the United States. *Journal of American Medical Association, 270*:2207–12.

McLeroy, K. R., Bibeau, D., Stecklet, A., & Glanz, K. (1988). An ecological perspective on health promotion programs. *Health Education Quarterly, 149*(10), 887-897.

McMichael, A. J. (1999). Prisoners of the proximate: loosening the constraints on epidemiology in an age of change. American Journal of Epidemiology, 149(10), 887-897.

MacFadyen, L., Hastings, G., MacKintosh, A.M. (2001). Cross sectional study of young people's awareness of and involvement with tobacco marketing. *British Medical Journal,322*:513–517.

Mackun, P & Wilson, S. *Population Distribution and Change: 2000 to 2010*. 2010 Census Briefs, Washington, D.C.: U.S. Census Bureau, 2011. Retrieved June 18, 2013 from http://www.census.gov/prod/cen2010/briefs/c2010br-01.pdf.

Marcus, A.C., Crane, L.A., Shopland, D.R., & Lynn, W.R. (1989). Use Of Smokeless Tobacco In The United States: Recent Estimates From The Current Population Survey. NCI Monograph. 1989;8:17–23. [PubMed]

Margerison-Zilko, C., & Cubbin, C. (2012). Socioeconomic Disparities in Tobacco-Related Health Outcomes Across Race/Ethnic Groups in the United States: National Health Interview Survey 2010. *Nicotine & Tobacco Research 2012.* 1-5.

Meyer, M.G., Toborg, M.A., Denham, S.A., & Mande, M.J. (2008). Cultural Perspectives Concerning Adolescent Use of Tobacco and Alcohol in the Appalachian Mountain Region. *Journal of Rural Health, 24*:67-74.

National Cancer Institute (NCI). (2008). The Role of the Media in Promoting and Reducing Tobacco Use. Tobacco Control Monograph No. 19. (NIH Pub. No. 07–6242). Bethesda, MD: U.S. Department of Health and Human Services, National Institutes of Health, National Cancer Institute.

National Center for Health Statistics (NCHS). (2012). Table 24: Age-adjusted death rates for selected causes of death, by sex, race, and Hispanic origin: United States, selected years 1950-2010. Hyattsville, MD. 2012. Retrieved June 18, 2013 from http://www.cdc.gov/nchs/hus/contents2011.htm#024

Nelson, D.E., Mowery, P., Tomar, S., Marcus, S., Giovion, G., & Zhao, L. (2006). Trends in Smokeless Tobacco Use Among Adults and Adolescents in the United States.

American Journal of Public Health, 96(5):897-905. Retrieved June 19, 2013 from http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1470594/#r15

Niederdeppe, J., Farrelly, M.C., & Haviland, M.L. (2004). Confirming "Truth": More Evidence of a Successful Tobacco Countermarketing Campaign in Florida. *American Journal of Public Health, 94*(2):255–257.

Niederdeppe, J., Farrelly, M.C., Hersey, J.C., & Davis, K.C. (2008). Consequences of Dramatic Reductions in State Tobacco Control Funds: Florida, 1998–2000. *Tobacco Control, 17*(3):205–210.

Noland, M.P., Kryscio, R.J., Hinkle, J., Riggs, R.S., Linville, L.H., Ford, V.Y. & Tucker, T.C. (1998). The effectiveness of a tobacco prevention program with adolescents living in a tobacco-producing region. *American Journal of Public Health, 88*(12): 1862–1865.

Northridge, M., Vallone, D., Xiao, H., Green, M., Blackwood, J., Kemper, S.,…et al. (2008). The Importance of Location for Tobacco Cessation: Rural-urban Disparities in Quit Success in Underserved West Virginia Counties. *Journal of Rural Health, 24*(2):105-115.

O'Loughlin, J., Karp, I., Koulis, T., Paradis, G., & Difranza, J. (2009). Determinants of First Puff and Daily Cigarette Smoking in Adolescents. *American Journal of Epidemiology, 170*(5):585–597.

Ogneva-Himmelberger, Y., Ross, L., Burdick, W., & Simpson, S.A. (2010). Using Geographic Information Systems to Compare the Density of Stores Selling Tobacco and Alcohol: Youth Making an Argument for Increased Regulation of the Tobacco Permitting Process in Worcester, Massachusetts, USA. *Tobacco Control, 19*(6):475-480.

Palmgreen, P., Donohew, L., Lorch, E.P., Hoyle, R.H., & Stephenson, M.T. (2001). Television Campaigns and Adolescent Marijuana Use: Tests of Sensation Seeking Targeting. *American Journal of Public Health, 91*(2), 292–296.

Palmgreen, P., Lorch, E.P., Stephenson, M.T., Hoyle, R.H., & Donohew, L. (2007). Effects of the Office of National Drug Control Policy's marijuana initiative campaign on high sensation-seeking adolescents. *American Journal of Public Health, 97*(9):1644–1649.

Peterson, N.A., Yu, D., Morton, C.M., Reid, R.J., Sheffer, M.A., & Schneider, J.E. (2011). Tobacco Outlet Density and Demographics at the Tract Level of Analysis in New Jersey: A Statewide Analysis. *Drugs: Education, Prevention and Policy, 18*(1):47–52.

Pew Internet and American Life Project. (2006). Rural Broadband Use. Retrieved August 29, 2013 from http://www.pewinternet.org/reports/2006/home-broadband-adoptions-in-rural-america.aspx

Peyton, D., Centers, I., Gray, B., Sizemore, M., Beauchamp, J., & Anderson-Hoagland, E. (2012). Tobacco Use in Kentucky 2012. Kentucky Tobacco Prevention & Cessation Program. Department for Public Health. Kentucky Cabinet for Health and Family Services. Retrieved June 1, 2013 from http://chfs.ky.gov/ktpc

Pollard, K. & Jacobsen, L.A. (2013). The Appalachian Region: A Data Overview from the 2007-2011 American Community Survey. Appalachian Regional Commission. Population Reference Bureau. Retrieved June 28, 2013 from http://www.arc.gov/research/researchreportdetails.asp?REPORT_ID=103

Pollay, R., Siddarth, S., Siegel, M., Haddix, A., Merritt, R.K., Giovino, G.A., & Eriksen, M.P. (1996). The Last Straw? Cigarette Advertising and Realized Market Shares Among Youths and Adults. *Journal of Marketing 60*(2):1-16.

Purnell, J.Q., Peppone, L.J., Alcaraz, K., McQueen, A., Guido, J.J., Carroll, J.K., … Morrow, G.R. (2012). Perceived Discrimination, Psychological Distress, and Current Smoking Status: Results From The Behavioral Risk Factor Surveillance System Reactions to Race Module, 2004–2008. *American Journal of Public Health, 102*(5):844–851.

Reid, R.J., Peterson, N.A., Lowe, J.B., & Hughey, J. (2005). Tobacco Outlet Density and Smoking Prevalence: Does Racial Concentration Matter? *Drugs: Education, Prevention and Policy, 12*(3):233–238.

Rumberger, J.S., Hollenbeak, C.S., & Kline, D. (2010). Potential Costs and Benefits of Smoking Cessation in Kentucky. Retrieved June 28, 2013 from http://www.lungusa.org/stop-smoking/tobacco-control-advocacy/reports-resources.

Ryan, H., Wortley, P. M., Easton, A., Pederson, L., & Greenwood, G. (2001). Smoking among lesbians, gays, and bisexuals: A review of the literature. *American Journal of Preventive Medicine, 21*(2), 142–149.

Saloojee, Y. & Dagli, E. (2000). Tobacco industry tactics for resisting public policy on health. *Bulletin of the World Health Organization, 78*(7): 902–910.

Schaefer, D.R., Haas, S.A., & Bishop, N.J. (2012). A Dynamic Model of US Adolescents' Smoking and Friendship Networks. *American Journal of Public Health, 102*(6):e12–18.

Schneider, J.E., Reid, R.J., Peterson, N.A., Lowe, J.B., & Hughey, J. (2005). Tobacco Outlet Density and Demographics at the Tract Level of Analysis in Iowa: Implications For Environmentally Based Prevention Initiatives. *Preventive Science, 6*(4):319–325.

Shen, L. (2010). The Effect of Message Frame in Anti-Smoking Public Service Announcements on Cognitive Response and Attitude Toward Smoking. *Health Communication,* 25(1):11–21.

Siahpush, M., Jones, P.R., Singh, G.K., Timsina, L.R., & Martin, J. (2010). The Association of Tobacco Marketing With Median Income and Racial/Ethnic Characteristics of Neighbourhoods in Omaha, Nebraska. *Tobacco Control, 19*(3):256–258.

Siegel, M., Albers, A.B., Cheng, D.M., Biener, L., & Rigotti, N.A. (2005). Effect of Local Restaurant Smoking Regulations on Progression to Established Smoking Among Youths. *Tobacco Control, 14*(5):300–306.

Siegel, M., Albers, A.B., Cheng, D.M., Hamilton, W.L., & Biener, L. (2008). Local Restaurant Smoking Regulations and the Adolescent Smoking Initiation Process: Results of a Multilevel Contextual Analysis Among Massachusetts Youth. *Archives of Pediatric and Adolescent Medicine, 162*(5):477–483.

Slater, M.D. (2003). Sensation-Seeking as a Moderator of the Effects of Peer Influences, Consistency with Personal Aspirations, and Perceived Harm on Marijuana and Cigarette Use Among Younger Adolescents. *Substance Use and Misuse, 38*(7):865–880.

Sly, D.F., Arheart, K., Dietz, N., Trapido, E. J., Nelson, D., Rodriguez, R., …Lee, D. (2005). The Outcome Consequences of Defunding the Minnesota Youth Tobacco-Use Prevention Program. *Preventive Medicine, 41*(2):503–510.

Smith, K., Siebel, C., Pham, L., Cho, J., Singer, R., Chaloupka, F.,…et al. (2008). News on Tobacco and Public Attitudes Towards Smokefree Air Policies in the United States. *Health Policy, 69*(10):398-402.

Stephenson, M.T., Hoyle, R.H., Palmgreen, P., & Slater, M.D. (2003). Brief Measures of Sensation Seeking for Screening and Large-Scale Surveys. *Drug and Alcohol Dependence, 72*(3):279–286.

Stevens, S., Colwell, B., & Hutchison, L.L. (2010). Tobacco Use in Rural Areas. In Gamm et al. (Eds). *Rural Healthy People 2010: A Companion Document to Healthy People 2010.* Volume 1. College Station, TX: School of Rural Public Health, Southwest Research Health Center, The Texas A&M University System Health Science Center, 2003.

Stokols, D. (1992). Establishing and maintaining healthy environments. Toward a social ecology of health promotion. American Psychologist, 47(1), 6-22.

Substance Abuse and Mental Health Services Administration (SAMHSA). (2011). *Results from the 2011 National Survey on Drug Use and Health, NSDUH: Table 4.10A Past Year Initiation of Substance Use among Persons Aged 12 or Older Who Initiated Use Prior to the Age of 18, by Gender: Numbers in Thousands, 2010 and 2011*. Rockville (MD): U.S. Department of Health and Human Services, Substance Abuse and Mental Health Services Administration, Center for Behavioral Health Statistics and Quality, 2011. Retrieved June 18, 2013 from http://www.samhsa.gov/data/NSDUH/2011SummNatFindDetTables/NSDUH-DetTabsPDFWHTML2011/2k11DetailedTabs/Web/PDFW/NSDUH-DetTabsSect4peTabs10to11-2011.pdf.

Substance Abuse and Mental Health Services Administration (SAMHSA). (2006). National Survey on Drug Use and Health: National Results, Appendix C: Key Definitions, 2006. Rockville (MD): U.S. Department of Health and Human Services, Substance Abuse and Mental Health Services Administration, Center for Behavioral Health Statistics and Quality.

Texas Department of State Health Services. (2008). Community Tobacco Prevention & Control Toolkit: Assessment. *Companion Guide to the* CADCA *Assessment Primer: Analyzing*

the Community, Identifying Problems and Setting Goals 2006. *http://www.coalitioninstitute.org/SPF_Elements/Assessment/AssessmentHome.asp*. Retrieved June 18, 2013 from http://www.uttobacco.org/files/Module%202alt%20-%20Assessment%208-25-08.pdf

Todorova, I.L., Falcon, L.M., Lincoln, A.K., & Price, L.L. (2010). Perceived Discrimination, Psychological Distress and Health. *Sociology of Health and Illness, 32*(6):843–861.

Treiber, J. (2007). Tobacco Control Evaluation with Rural Populations. Davis, CA: US Davis, Tobacco Control Evaluation Center.

Trinidad, D.R., Perez-Stable, E.J., White, M.M., Emery, S.L., & Messer, K. (2011). A Nationwide Analysis of U.S. racial/ethnic disparities in smoking behaviors, smoking cessation, and cessation-related factors. *American Journal of Public Health, 101*(4):699-706. http://www.ncbi.nlm.nih.gov/pubmed/21330593

U.S. Department of Agriculture (USDA). (2006). Rural America at a Glance. Washington, DC: USDA, Economic Research Service.

U.S. Department of Agriculture (USDA). (2007). Census of Agriculture—State Data: Table 45: Farms by North American Industry Classification System: 2007. Washington: U. S. Department of Agriculture, National Agricultural Statistics Service. Retrieved July 25, 2013 from http://www.agcensus.usda.gov/Publications/2007/Full_Report/Volume_1,_Chapter_2_US_State_Level/st99_2_045_045.pdf

U.S. Department of Health and Human Services (HHS). (2012). Preventing Tobacco Use Among Youth and Young Adults: A Report of the Surgeon General. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention,

National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2012. Retrieved June 18, 2013 from http://www.surgeongeneral.gov/library/reports/preventing-youth-tobacco-use/full-report.pdf

U.S. Department of Health and Human Services (HHS). (2004). The Health Consequences of Smoking: A Report of the Surgeon General. Atlanta: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2004.

U.S. Department of Health and Human Services (HHS). (2001). Women and Smoking: A Report of the Surgeon General. Rockville (MD): U.S. Department of Health and Human Services, Public Health Service, Office of the Surgeon General, 2001.

U.S. Department of Health and Human Services (HHS). (1994). Preventing Tobacco Use Among Young People: A Report of the Surgeon General. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 1994.

Vallone, D., Allen, J.A., Clayton, R.R., & Xiao, H. (2007). How Reliable and Valid is the Brief Sensation Seeking Scale (BSSS–4) for Youth of Various Racial/Ethnic Groups? *Addiction, 102*(Suppl 2), 71–78.

Von Gernet, A. (2000). Nicotine and Public Health. Ferrence, R., Slade, J., Room, R., & Pope, M. (eds). Washington, DC: American Public Health Association.

Wakefield, M., Germain, D., Henriksen, L. (2008). The effect of retail cigarette pack displays on impulse purchase. *Addiction,103*:322–328.

Wallace, J.M., Bachman, J.G., O'Malley, O.M., Johnston, L.D., Schulenberg, J.E., & Cooper, S.M. (2002). Tobacco, alcohol, and illicit drug use: Racial and ethnic differences among U.S. high school seniors. *Public Health Reports, 117*(Suppl 1), S67–S75.

Warner, K.E. (1986). Selling Smoke: Cigarette Advertising and Public Health. American Public Health Association; Washington, DC, USA.

Weg, M., Cunningham, C., Howren, M., & Cai, X. (2011). Tobacco Use and Exposure in Rural Areas: Findings from the Behavioral Risk Factor Survey Surveillance System. *Addictive Behaviors, 36*:3:231–236.

White, V.M., White, M.M., Freeman, K., Gilpin, E.A., & Pierce, J.P. (2006). Cigarette Promotional Offers who Takes Advantage? *American Journal of Preventive Medicine, 30*(3):225–231.

Wiehe, S.E., Aalsma, M.C., Liu, G.C., & Fortenberry, J D. (2010). Gender Differences in the Association Between Perceived Discrimination and Adolescent Smoking. *American Journal of Public Health, 100*(3):510–516.

Wingo, P.A., Tucker, T.C., Jamison, P.M., Martin, H., McLaughlin, C., Bayakly, R., … Richards, T.B. Cancer in Appalachia, 2001-2003. *Cancer, 112:*181-192.

World Bank. (1999). Curbing the epidemic: Governments and the economics of tobacco control. Washington DC: The World Bank.

World Health Organization (WHO). (n.d.) Tobacco Free Initiative. Retrieved June 18, 2013 from http://www.who.int/tobacco/en/

World Health Organization (WHO). (2011). WHO Report on the Global Tobacco Epidemic, 2011: Country Profile: United States of America. World Health Organization,

International Agency for Research on Cancer, 2007. Retrieved June 24, 2013 from http://who.int/tobacco/surveillance/policy/country_profile/usa.pdf

World Health Organization (WHO). (2008). Report on the Global Tobacco Epidemic, 2008: The MPOWER Package. Geneva: World Health Organization, 2008.

World Health Organization (WHO). (2007). Smokeless Tobacco and Some Tobacco-Specific N-Nitrosamines Exit Notification. International Agency for Research on Cancer Monographs on the Evaluation of Carcinogenic Risks to Humans Vol. 89. Lyon, (France): World Health Organization, International Agency for Research on Cancer, 2007. Retrieved June 19, 2013 from http://monographs.iarc.fr/ENG/Monographs/vol89/mono89.pdf

Yeung, J.W., Chan, Y.C., & Lee, B.L. (2009). Youth Religiosity and Substance Use: A Metaanalysis from 1995 to 2007. *Psychological Reports, 105*(1):255–266.

York, N. Rayens, M., Zhang, M., Jones, L., Casey, B., & Hahn, E. (2010). Strength of Tobacco Control in Rural Communities. *Journal of Rural Health, 26*:120-127.

Yu, D., Peterson, N.A., Sheffer, M.A., Reid, R.J., & Schnieder, J.E. (2010). Tobacco Outlet Density and Demographics: Analysing the Relationships with a Spatial Regression Approach. *Public Health, 124*(7):412–416.