The Importance of Location for Tobacco Cessation: Rural–Urban Disparities in Quit Success in Underserved West Virginia Counties

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ABSTRACT: ***Context:*** *Adults who live in rural areas of the United States have among the highest smoking rates in the country. Rural populations, including Appalachian adults, have been historically underserved by tobacco control programs and policies and little is known about their effectiveness.* ***Purpose:*** *To examine the end-of-class quit success of participants in A Tobacco Cessation Project for Disadvantaged West Virginia Communities by place of residence (rural West Virginia and the urban area of Greater Charleston).* ***Methods:*** *This collaborative program was implemented in 5 underserved rural counties in West Virginia and consisted of 4 intervention approaches: (1) a medical examination; (2) an 8-session educational and behavioral modification program; (3) an 8-week supply of pharmacotherapy; and (4) follow-up support group meetings.* ***Findings:*** *Of the 725 program participants, 385 (53.1%) had successfully quit using tobacco at the last group cessation class they attended. Participants who lived in rural West Virginia counties had a lower end-of-class quit success rate than those who lived in the urban area of Greater Charleston (unadjusted odds ratio [OR] = 0.69, 95% confidence interval [CI] = 0.48, 0.99), even after taking into account other characteristics known to influence quit success (adjusted OR = 0.58, 95% CI = 0.35, 0.94).* ***Conclusions:*** *Tobacco control programs in rural West Virginia would do well to build upon the positive aspects of rural life while addressing the infrastructure and economic needs of the region. End-of-class quit success may usefully be viewed as a stage on the continuum of change toward long-term quit success.*

Adults who live in rural areas of the United States have among the highest self-reported smoking rates in the country.[1,2] Rural Appalachians, in particular, have been identified as having higher tobacco use compared to their counterparts living in neighboring regions within the same states.[3,4] Death rates from coronary heart disease, for which smoking is an established cause, are higher among adult Appalachians than for US adults overall, and the

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highest rates are consistently reported for rural and poor Appalachians.[3,5] Note that the Appalachian region includes all of West Virginia as well as parts of Alabama, Georgia, Kentucky, Maryland, Mississippi, New York, North Carolina, Ohio, Pennsylvania, South Carolina, Tennessee, and Virginia.[6]

In 2004, 27% of West Virginia adults were self-reported current smokers, far in excess of the 21% self-reported adult current smoking prevalence for the United States overall.[7] Indeed, West Virginia ranked second highest in adult tobacco use among the 49 states with suitable data for aggregate analysis in the 2004 Behavioral Risk Factor Surveillance System[8] (data from Hawaii were not included, as only 3 of 12 months of interviews were completed in Hawaii that year).[8]

The peer-reviewed literature on tobacco control policies and programs in rural Appalachia is extremely limited. The sparse findings that have been reported to date are largely focused on schools and adolescents. For instance, a collaborative partnership to enhance school-based tobacco control policies in West Virginia identified enforcement procedures and access to cessation programs as particularly lacking when compared to the tobacco guidelines recommended by the Centers for Disease Control and Prevention (CDC).[9,10] A high school smoking cessation program for Appalachian teenagers modeled after the 10-session Not-On-Tobacco (N-O-T) program of the American Lung Association found lower quit rates than those obtained in urban N-O-T programs, suggesting that cessation programs need to be specially tailored for rural youth living in tobacco-growing regions with economic and political climates that foster high tobacco use.[11,12]

Other factors contributing to increased tobacco use in rural versus urban areas include delayed or limited access to medical facilities and fewer media resources for tobacco control educational campaigns, as well as lower educational attainment.[1,13] In addition, the Appalachian people maintain a culture distinct from that of mainstream US society which has been shaped by both their geographic isolation and their tendency to function socially within their own kin group.[14] Appalachians have been described as having a strong sense of individualism and solid family ties, in addition to being independent and self-reliant,[15] which has been found to influence their attitudes toward tobacco use and cessation.[4] Further, a resignation toward their own plight or lot in life ("fatalism") may also affect their willingness to change their health behaviors.[4,14]

The Appalachian region, which was defined as a political entity in 1965 by the Appalachian Regional Development Act, has a history of economic underdevelopment that has contributed to high rates of poverty, disability, and unemployment, as well as low adult educational attainment.[4,16] Moreover, the Appalachian economy still relies on tobacco,[17] albeit less so than in the past. Hence, its use may not necessarily be viewed as a determinant of poor health, but rather as an economic necessity for those living in the region.[4] Other barriers to tobacco control in Appalachia include restricted access to health resources, low health literacy levels, lack of viable transportation options, low prevalence of health insurance coverage, minimal access to medical services for smoking cessation assistance and treatment, and limited access to health care providers.[18,19]

Here we report on the quit success of participants in *A Tobacco Cessation Project for Disadvantaged West Virginia Communities*, 1 of 9 projects funded through the American Legacy Foundation (Legacy) to complement the existing Community Voices initiative in supporting tobacco cessation for populations with high reported tobacco use.[20] Working closely with program staff, the Legacy/Community Voices evaluation team sought to hone in on reasons for disparities in quit success between participants living in rural West Virginia and those living in the urban area of Greater Charleston.

Methods

Program Description. *A Tobacco Cessation Project for Disadvantaged West Virginia Communities* was funded in 2001 by the American Legacy Foundation as a collaborative initiative among West Virginia Community Voices, Inc., the Charleston Area Medical Center (CAMC) Health Education and Research Institute, and health care clinics in each of 5 West Virginia counties (Boone, Clay, Jackson, Kanawha, and Putnam). Institutional Review Board (IRB) approval was obtained from the CAMC/West Virginia University IRB.

The CAMC Health Education and Research Institute coordinated the 8-week sessions and follow-up support (see "Intervention Approaches" section below). Staff members and volunteers from 7 partnering health care clinics completed the "Freedom from Smoking" facilitator training offered by the American Lung Association of West Virginia.[21] Over the 4-year project period (October 2001 through August 2005), the number of partnering health care clinics increased from 5 to 10 and the number of involved sites offering tobacco cessation services expanded from 5 to 11, due to recruitment efforts by program staff and additional funding opportunities that fostered project expansion.

In all, 725 tobacco users participated in the program, 25 of whom completed the program more

than once. Further, the program sought to change the behavior of health care providers in the partnering clinics where the intervention was conducted. By the end of the project period, staff reported that it had become part of the professional behavior of the involved health care providers to talk with their clients about tobacco use and encourage cessation.

Intervention Approaches. The program consisted of 4 intervention approaches, all of which were offered to every participant: (1) a free medical examination performed by a certified health care professional (physician, physician assistant, or nurse practitioner); (2) an 8-session educational and behavioral modification program titled "Freedom from Tobacco" and modeled after the "Freedom from Smoking" program of the American Lung Association[21] to include smokeless tobacco cessation support; (3) an 8-week supply of pharmacotherapy, either bupropion (also known by the brand names Zyban and Wellbutrin) or nicotine replacement therapy (NRT) at no cost to program participants; and (4) follow-up support group meetings.

The medical examination provided an opportunity to screen potential participants for serious physical and mental health conditions. Support groups proved difficult to implement and participation was low. (Recommendations for future tobacco cessation programs based on these 2 approaches are provided in the "Discussion" section.)

Key Measures. The Census 2000 Urban and Rural Classification of the US Census was used to classify participants by place of residence (rural or urban).[22] According to this classification scheme, only those participants who lived within the 7 ZIP codes for the Greater Charleston Area were considered urban dwellers; the remaining participants were classified as rural dwellers.[23]

For the purposes of this paper, quit success was defined as having quit using tobacco at the end of the last program class attended (end-of-class quit success). This measure was self-reported by participants and recorded by program staff at every class session. In order to determine longer-term quit success, program evaluators randomly sampled 61 participants for telephone follow-up. Among this select subgroup, 75% reported being tobacco-free at 2 months, yet only 17% reported being tobacco-free at 1 year. Nonetheless, among those who relapsed, 49% reported that they were smoking less than they had before they attended the program.

Statistical Analysis. Data were analyzed using Stata statistical software, version 9.1 (StataCorp LP, College Station, Tex).[24] Frequencies and end-of-class quit success both overall and according to place of residence (rural and urban, separately) were calculated for characteristics of program participants and their engagement in program activities in the following 4 broad categories: (1) demographic characteristics (race, gender, and marital status); (2) socioeconomic characteristics (educational level, annual household income, full-time employment level, and health insurance); (3) tobacco use history (type of tobacco used, age at cigarette/cigar initiation, and whether or not participant had previously tried to quit smoking); and (4) program components (last group cessation session attended, NRT given, and bupropion given).

After comparing participants who successfully quit with those who did not according to the characteristics listed above, using chi-square tests for categorical factors and trend analyses for ordinal factors, as well as rural versus urban participants according to these same characteristics using chi-square tests, we sought to examine whether or not the rural–urban disparity in quit success could be explained by other available characteristics. Multivariate logistic regression was used with end-of-class quit success as the outcome variable and location as the main independent variable. Other independent variables were included to control for the effects of characteristics known to be associated with location and possibly related to quit success.

The final multivariate logistic regression model included location as the predictor of interest, along with gender, educational level, age at cigarette/cigar smoking initiation, last group cessation attended, and bupropion as other predictors of quit success. In selecting this final model, we included characteristics where less than 5% of the data were missing and ensured that a demographic (gender), socioeconomic (educational level), tobacco use history (age at cigarette/cigar initiation), and 2 program components (last group cessation attended and bupropion) were used to adjust for the effect of location on quit success. The final model included a subset of 571 of the 725 participants (78.8%) on whom there were complete data for all included variables.

Results

Of the 725 total participants, 385 (53.1%) had successfully quit using tobacco at the last group cessation class they attended. About 1 in 5 participants resided in the urban area of Greater Charleston (155 of 702 with available data for location, or 22.1%), but the overwhelming majority of participants resided in rural

areas of West Virginia (547 of 702 with available data for location, or 77.9%). Of particular interest is that rural residents were less likely to quit than their urban counterparts (51.4% end-of-class quit success vs 60.6% end-of-class quit success).

The percentages of program participants with selected demographic and socioeconomic characteristics along with the associated end-of-class quit success for each subgroup examined are provided in Table 1, both overall and by rural and urban residence, separately.

Most (90.9%) of the program participants were white, even as special efforts were made to recruit African-American participants through the Partnership of African American Churches (PAAC). Fully 70.0% of the participants were women and nearly 3 in 5 participants (58.5%) were married.

African-American participants were more likely to quit using tobacco than white participants (76.9% end-of-class quit success vs 52.4% end-of-class quit success). While there were no important differences in quit success by gender, married participants were more likely to quit than were divorced, single, or widowed participants.

Even though smoking cessation resources were provided at no cost to participants, there were marked

Table 1. Participant Demographic and Socioeconomic Characteristics and End-of-Class Quit Success

	Overall (n = 725*)		Rural (n = 547*)		Urban (n = 155*)	
Characteristic	%	End-of-Class Quit Success (%)	%	End-of-Class Quit Success (%)	%	End-of-Class Quit Success (%)
Race						
African American	5.4	76.9	1.5	75.0	20.0	77.4
White	90.9	52.4	97.8	51.4	78.1	57.0
Other†	3.7	37.0	0.7	0.0	1.9	33.3
Gender						
Female	70.0	54.3	71.5	51.6	64.9	67.4
Male	30.0	51.2	28.5	51.6	35.1	50.9
Marital status						
Married	58.5	56.6	63.4	54.5	39.7	70.0
Divorced	20.3	52.1	17.6	51.0	30.5	54.4
Single	15.5	47.2	14.0	43.4	21.2	56.3
Widowed	5.7	45.0	5.0	37.0	8.6	61.5
Educational level						
Less than high school graduate	23.9	48.4	24.9	45.0	20.8	63.3
High school graduate/GED‡/vocational/ technical school	49.5	54.7	51.8	53.5	41.0	59.3
Some college or higher	26.6	57.1	23.3	53.7	38.2	65.5
Annual household income§‖						
$0–$14,630	51.8	47.1	50.5	46.2	57.2	50.0
$14,631–$23,690	24.7	59.6	27.2	58.5	15.7	69.6
More than $23,690	23.5	63.9	22.4	59.0	27.2	77.5
Full-time employment§						
Yes	37.0	62.1	36.3	58.3	39.5	75.9
No	63.0	48.4	63.7	47.7	60.5	51.7
Health insurance§¶						
No insurance	49.7	53.2	48.4	51.2	53.9	59.8
Medicaid/QMB	8.3	43.6	8.8	40.0	6.6	60.0
Medicare/Medigap/Veterans	14.1	58.5	14.6	57.3	12.5	63.2
Private/PEIA/PEIA-HMO	29.7	54.3	28.1	51.4	27.0	63.4

*Totals may differ due to missing values.
†Other includes Asian/Pacific Islander, Hispanic, American Indian, and self-reported other race.
‡GED = General Education Development Certificate.
§More than 5% of the data are missing.
‖Yearly income categories were calculated from self-reported monthly household income categories.
¶Health insurance categories include QMB = Qualified Medicare Beneficiary, PEIA = Public Employees Insurance Agency, PEIA-HMO = Public Employees Insurance Agency-Health Maintenance Organization.

differences in quit success by all socioeconomic measures available to us. That is, participants who earned higher educational degrees, reported more household income, and were employed full-time had higher end-of-session quit success than their more disadvantaged counterparts. This was evident across the range of education and income, as well as meaningfully different for those employed full-time (62.1% end-of-class quit success) versus those participants who were not employed full-time (48.4% end-of-class quit success).

The percentages of program participants with selected tobacco use histories and involvement in program activities along with the associated end-of-class quit success for each subgroup examined are provided in Table 2, both overall and by rural and urban residence, separately.

In terms of tobacco use history, those participants reporting both cigarette/cigar use *and* smokeless tobacco use had more difficultly quitting (42.9% end-of-class quit success) than those who reported only cigarette/cigar use (52.7% end-of-class quit success) or smokeless tobacco use (53.9% end-of-class quit success), although numbers were few in both categories for smokeless tobacco use (n = 26 for smokeless tobacco use only and n = 14 for both cigarette/cigar use *and* smokeless tobacco use). Those who started smoking at 16 years or younger had more difficulty quitting (48.5% end-of-class quit success) than those who started smoking after 16 years of age (60.6% end-of-class quit success).

Next, in terms of program components, there was attrition throughout the course of the program as evidenced by the last group session attended. For

Table 2. End-of-Class Quit Success by Participant Tobacco Use History and Program Activity Involvement

	Total (n = 725*)		Rural (n = 547*)		Urban (n = 155*)	
Characteristic	%	End-of-Class Quit Success (%)	%	End-of-Class Quit Success (%)	%	End-of-Class Quit Success (%)
Type of tobacco used						
Cigarettes/cigars	97.6	52.7	97.0	50.7	99.3	60.3
Smokeless tobacco†	4.1	53.9	4.8	54.2	1.5	50.0
Both cigarette/cigar and smokeless tobacco	2.0	42.9	2.4	46.2	0.7	0.0
Age at cigarette/cigar smoking initiation						
16 years or younger	61.4	48.5	63.4	47.5	54.7	51.9
Older than 16 years	38.6	60.6	36.6	57.0	45.3	71.6
Previously tried to quit smoking†						
Yes	84.1	55.4	83.4	53.7	86.5	61.5
No	15.9	47.6	16.6	47.2	13.5	63.2
Last group cessation session attended						
Orientation: Thinking about Quitting	2.3	6.3	1.9	0.0	1.3	50.0
Class 1: On the Road to Freedom	7.6	5.6	7.5	5.0	6.7	10.0
Class 2: Wanting to Quit	6.5	21.7	5.4	20.7	10.7	25.0
Class 3: Quit Day	8.9	23.8	9.4	22.0	7.3	27.3
Class 4: Winning Strategies	6.1	34.9	7.1	31.6	3.3	60.0
Class 5: The New You	9.6	47.1	8.1	51.2	12.0	22.2
Class 6: Staying Off	12.9	48.4	12.4	40.9	15.3	69.6
Class 7: Celebration	46.1	80.4	48.3	77.9	43.3	50.8
Nicotine replacement therapy (NRT) given‡						
Yes	91.1	58.5	90.3	56.4	97.3	70.8
No	8.9	20.0	9.7	19.5	2.7	50.0
Bupropion (Zyban/Wellbutrin) given						
Yes	68.5	60.8	71.8	58.8	56.7	70.8
No	31.5	42.2	21.2	39.9	43.3	49.1

*Totals may differ due to missing values.
†More than 5% of the data are missing.
‡NRTs (nicotine replacement therapies) include nicotine patches, nicotine gum, nicotine inhalers, nicotine nasal spray, and nicotine lozenges.

nearly half of the program participants (46.1%), the last class held (*Celebration*) was also the last class they attended. More than 9 in 10 (91.1%) participants were given NRT and nearly 7 in 10 (68.5%) were given bupropion.

Notably, all of the program components (attending more and later group cessation sessions, being given NRT, and being given bupropion) were especially predictive of high quit success. This underscores the effectiveness of *A Tobacco Cessation Project for Disadvantaged West Virginia Communities* staff in meeting the needs of their clients who were motivated to quit and able to effectively access program resources.

Unadjusted and adjusted odds ratios from bivariate and multivariate logistic regression models of characteristics associated with end-of-class quit success are provided in Table 3.

Participants who lived in rural West Virginia counties had a lower end-of class quit success than those who lived in the urban area of Greater Charleston (unadjusted odds ratio [OR] = 0.69, 95% confidence interval [CI] = 0.48, 0.99), even after taking into account other characteristics known to influence quit success, notably gender, educational level, age at cigarette/cigar smoking initiation, attending group cessation classes up through later sessions held (Class 4 – Class 7 as the last group cessation attended vs Orientation – Class 3 as the last group cessation attended) and bupropion given (adjusted OR = 0.58, 95% CI = 0.35, 0.94). Men were less successful in quitting than women, but this was not statistically significant both before and after adjustment for the other independent variables in the model. There was an expected trend evident of higher end-of-class quit success with higher educational level, even after adjustment for potential confounders. Finally, age at cigarette/cigar use (unadjusted OR = 1.06, 95% CI = 1.03, 1.10 and adjusted OR = 1.06, 95% CI = 1.02, 1.11 for each additional year older), attending up to Class 4 to Class 7 versus only attending up to Orientation to Class 3 (unadjusted OR = 10.43, 95% CI = 6.74, 16.15 and adjusted OR = 7.98, 95% CI = 4.87, 13.08), and bupropion given (unadjusted OR = 2.12, 95% CI = 1.53, 2.96 and adjusted OR = 1.58, 95% CI = 1.05, 2.39) were important predictors of end-of-class quit success in both the bivariate and multivariate models.

Discussion

The findings presented here contribute to the sparse literature on the effectiveness of tobacco control programs for adults residing in underserved counties

Table 3. Bivariate and Multivariate Logistic Regression Models of Characteristics Associated With End-of-Class Quit Success

	Bivariate Analysis (n = 725*)		Multivariate Analysis (n = 571*)	
	Unadjusted Odds Ratio	95% CI†	Adjusted Odds Ratio	95% CI†
Place of residence				
Rural	0.69	0.48, 0.99	0.58	0.35, 0.94
Urban	Referent		Referent	
Gender				
Male	0.88	0.64, 1.21	0.93	0.62, 1.41
Female	Referent		Referent	
Educational level				
Less than high school graduate	Referent		Referent	
High school graduate/GED/vocational/ technical school	1.29	0.88, 1.88	0.96	0.60, 1.54
Some college or higher	1.42	0.92, 2.18	1.13	0.66, 1.94
Age at cigarette/cigar smoking initiation (each additional year older)	1.06	1.03, 1.10	1.06	1.02, 1.11
Last group cessation session attended				
Orientation - Class 3	Referent		Referent	
Class 4 – Class 7	10.43	6.74, 16.15	7.98	4.87, 13.08
Bupropion (Zyban/Wellbutrin) given				
Yes	2.12	1.53, 2.96	1.58	1.05, 2.39
No	Referent		Referent	

*Totals may differ due to missing values.
†CI = confidence interval.

in West Virginia, and further point to the existence of a rural–urban disparity in quit success. Two major threats to the validity of these findings are: (1) the reliance on self-report of the outcome measure (ie, end-of-class quit success), and (2) the lack of long-term follow-up of quit success, except in a subset of the sample (as noted earlier, of 61 participants randomly selected for a telephone follow-up, only 17% reported being tobacco-free at 1 year, but 49% of those who relapsed reported smoking less than they had before the program).

Given these limitations, we nonetheless believe that end-of-class quit success may be usefully interpreted as a marker on the continuum of tobacco cessation program success between "no change" in tobacco use to "completely free" from tobacco use.[25] Further, since only 4.3% of the participants in *A Tobacco Cessation Project for Disadvantaged West Virginia Communities* reported prior attendance at any smoking cessation classes (data available upon request), this program was rather unique for the area. Despite the challenges in implementing the 4 intervention approaches across program sites, those participants who were better able to take advantage of the resources offered through this project may have been helped in moving to later stages of change even if they did not successfully quit, in accordance with the transtheoretical model originally conceptualized by Prochaska[26,27] and adapted by the Legacy/Community Voices Initiative sites.[20]

Notwithstanding the relatively low educational attainment, abject poverty, pervasive lack of health insurance coverage, and early age of smoking initiation among program participants overall, important differences were apparent in end-of-class quit success when results were examined by demographic and socioeconomic subgroups. For instance, while relatively few African Americans enrolled in the program (note that only 3.2% of the population of West Virginia is Black/African American compared to 12.8% of the US population[28]), they were much more likely than white participants to be successful in quitting. Program staff attributed this unexpected and positive result to the effectiveness of the PAAC in promoting smoking cessation to its member churches. The PAAC insisted on becoming a provider site for medical oversight and pharmacotherapy distribution, actively participated in the training of its program facilitators, and offered the program "in-house" to its member churches rather than having the program "done to" or "done for" them.[25] As a result, the PAAC was able to make arrangements to have cessation resources available to its member churches even after the Legacy grant funding ended.

The finding of marked differences in end-of-class quit success by all socioeconomic measures available to us speaks to the importance of multiple levels of influence on health behaviors and how essential resources are in supporting individuals to institute positive change. Nearly a decade ago, a strong trend was reported of fewer current smokers with increased educational attainment for both men and women in Harlem, New York City.[29] Thus, even in poor communities and poor areas overall, there are steep gradients in tobacco use and quit success according to socioeconomic position. These results are consistent with findings from the 2000 NHIS, which demonstrated that for the US population overall, attempts to quit showed no socioeconomic gradient, while success in quitting was greatest among those with the most socioeconomic resources.[30] Supports at various levels (individual, family, community, area, state, regional, and national) are essential in bolstering tobacco control efforts and sustaining quit attempts for the long term.[31,32]

The key finding concerning place of residence (rural vs urban) is of special interest but should be interpreted with caution. First, ZIP codes may introduce bias due to spatiotemporal mismatches between ZIP codes and US Census-defined geographic areas.[33] Second, these are program data, and different methods of recruitment were used at various program sites. Nonetheless, the lower end-of-class quit success of rural versus urban residents suggests the need to develop tobacco cessation programs that are better targeted to the challenges and opportunities of rural areas.

Of the 4 intervention approaches initially endorsed by *A Tobacco Cessation Project for Disadvantaged West Virginia Communities*, 2 proved difficult to implement. First, the free medical examination provided to program participants, many of whom were without health insurance coverage and lacked access to medical care, uncovered health conditions that demanded treatment. This required instituting mechanisms for follow-up care at participating sites and ensuing logistical difficulties for clients in obtaining needed services, especially those in remote rural areas. For program participants who were not established clients at program partner sites, most qualified for sliding scale fee payment arrangements. Second, the social support component needed to be reformulated for the underserved rural communities targeted by the program. While the support group meetings as originally envisioned were sparsely attended, a "2-week check-back" hosted by the cessation class facilitator was more acceptable to participants and remained a viable option for future tobacco control programs in the area.[25] The remaining 2 program components—an 8-session educational and behavioral modification program and an 8-week supply of

pharmacotherapy—were both widely utilized by program participants and especially predictive of end-of-class quit success.

As is true for cessation programs tailored to rural youths,[12] West Virginia cessation programs tailored to rural adults may need to consider topics such as favorable norms about use, geographic isolation and lack of access to services, cultural and traditional values and customs, and stress and coping. In addition, tobacco-related economic and political climates still ought to be addressed, even as the Appalachian region is less dependent upon tobacco growing than it was in the past.[34]

McMillen et al. contrasted the social climate surrounding secondhand smoke (SHS) exposure among US residents who resided in 5 levels of county urbanization.[35] Logistic regression models indicated that none of the rural–urban differences in knowledge and attitudes persisted after controlling for region, smoking status, gender, race, age, and education. In the authors' view, the policy implications of this research point to a greater need in rural America for programs focusing on the restriction and elimination of SHS.[35] Song and Fish investigated the demographic and psychosocial characteristics of women who smoked during pregnancy and those who did not in low socioeconomic status, rural Appalachian 2-parent families.[36] Compared to nonsmokers, prenatal smokers were found less likely to have completed high school and were less extroverted. In addition, smokers had lower self-esteem, less intimate support, and poorer marital relationships than their nonsmoking peers.[36] Together, these 2 studies underscore the need for both policy interventions to address structural barriers such as enactment and enforcement of SHS laws in public and private workplaces and program interventions to address interpersonal barriers such as effective stress management and coping skills to better ensure that rural adults are successful in their quit attempts.

In 2000, Legacy identified low socioeconomic individuals as 1 of its 6 priority populations to target toward eliminating disparities in tobacco use and its documented health effects.[37] Unlike the other 5 priority populations defined on the basis of race/ethnicity or sexuality/gender (African Americans, American Indians/Alaska Natives, Asian Americans, Hispanics, and Lesbian, Gay, Bisexual, and Transgender Communities), impoverished adults such as those living in rural Appalachia maintain a relatively low visibility because they are not a single racial/ethnic group, are frequently isolated from mainstream US society, and have historically functioned socially within their own kin group.[4,14] Nonetheless, as demonstrated by the results presented here, proven tobacco control strategies may usefully be adapted for Appalachian adults to move them further along in the stages of change required for long-term quit success.

As cautioned by Phillips and McLeroy:

> "The delivery of public health services in rural areas faces daunting challenges, including low population density, transportation issues, lack of access to grant funding, lower public funding levels for rural services and programs, difficulties in recruiting staff, and potential fragmentation of scarce resources. This suggests that we cannot simply rescale public health programs and services from urban areas and expect them to be successful in rural areas. Rather, we need to consider alternative models for program delivery."[38(p1663)]

For instance, Deskins et al conducted focus groups with community leaders, parents, and fifth-grade children from 6 West Virginia counties with predominantly rural populations to identify barriers to participation in cholesterol screenings.[39] They concluded that attitudinal, social normative, and environmental barriers to health screenings may be characteristic of impoverished rural Appalachians, and are targeting interventions to address belief barriers and improve preventive care.[39]

On the other hand, Phillips and McLeroy argue:

> "Rural areas frequently have many strengths, including dense social networks, social ties of long duration, shared life experiences, high quality of life, and norms of neighborliness, self-help, and reciprocity. Addressing the needs of rural areas, then, requires building upon the positive aspects of rural life while addressing the health, public health, infrastructure, and economic needs of rural areas,"[(1663)]

The importance of the results of *A Tobacco Cessation Project for Disadvantaged West Virginia Communities* lies in the importance of designing programs in culturally safe manners[40] to address the health needs of disadvantaged rural populations throughout the country. There may even be transferable best principles from this program—including offering the "Freedom from Tobacco" program, which includes smokeless-tobacco cessation support in addition to smoking cessation support and actively involving the PAAC in training staff and offering the program to its member churches, thereby promoting sustainability in African-American churches—that may be usefully applied in other rural communities toward eliminating disparities in tobacco use for those who suffer from its

documented ravages of premature death and preventable disability.[20,41]

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