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Readiness for Smoke-free Policy and Overall Strength of Tobacco Control in Rural Tobacco-growing Communities

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Abstract

Rural, tobacco-growing areas are disproportionately affected by tobacco use, secondhand smoke, and weak policies. The study determined whether overall strength of Resources, Capacity and Efforts in tobacco control predicts readiness for smoke-free policy in rural communities, controlling for county population size and pounds of tobacco produced. This was a correlational, cross-sectional analysis of data from key informants (n = 148) and elected officials (n = 83) from 30 rural counties who participated in telephone interviews examining smoke-free policy. Six dimensions of community readiness (knowledge, leadership, resources, community climate, existing smoke-free policies, and political climate) were identified and summed to assess overall readiness for smoke-free policy. General strength of overall Resources, Capacity and Efforts in tobacco control at the county level was measured. Readiness for smoke-free policy was lower in communities with higher smoking rates, higher tobacco production, and smaller population. Efforts related to general tobacco control (i.e., media advocacy, training and technical assistance) predicted readiness for local smoke-free policy development (standardized β=.35, p=.05), controlling for county population size and pounds of tobacco produced. Given that small, rural tobacco-growing communities are least ready for smoke-free policy change, tailoring and testing culturally sensitive approaches that account for this tobacco-growing heritage are warranted.

Keywords

public policy; environmental tobacco smoke; advocacy; community readiness

INTRODUCTION

While 29 U.S. states and 46 countries around the world have enacted smoke-free legislation in restaurants and bars, over half (51%) of individuals living in the U.S. are not fully protected from secondhand smoke (SHS) at work and in public places (Americans for Nonsmokers' Rights, 2011; Americans for Nonsmokers' Rights Foundation, 2011). Rural, tobacco-producing states lag behind other states in enacting progressive tobacco control policies (Chaloupka, Hahn, & Emery, 2002; Polednak, 2009). Further, rural residents are more likely to be exposed to secondhand smoke than those living in urban areas, reflecting a major rural-urban disparity in smoke-free laws (McMillen, Breen, & Cosby, 2004).

The purpose was to determine whether local Strength of Tobacco Control (SoTC), a general measure of overall efforts, capacity and resources for tobacco control, predicts readiness for smoke-free policy in rural tobacco-growing communities, controlling for county population

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size and pounds of tobacco produced. Smoke-free policy is defined as community-wide legislation or regulation to prohibit smoking in workplaces, restaurants, bars, and other public places. The original SoTC measure was developed by Stillman et al. (1999) to evaluate state-level tobacco control including three constructs: Resources, Capacity and Efforts. York and colleagues (2010) revised the SoTC measure to measure county-level strength of tobacco control. We hypothesized that rural communities with strong efforts, capacity, and resources for local tobacco control would be more ready to enact smoke-free policies.

BACKGROUND

Enacting and implementing effective smoke-free laws typically depends on the readiness of local people (i.e., health advocates, elected officials) who have the greatest and most sustainable impact in solving local problems (Edwards, Jumper-Thurman, Plested, Oetting, & Swanson, 2000). A variety of factors are associated with local smoke-free policy change including the presence of and leadership from community coalitions, print media, health advocacy, tobacco control funding, town size, smoking prevalence, and population demographics. Feinberg et al. (2004) found that community readiness for substance abuse policy change was linked to the presence of a community coalition. Further, effective leadership from organizations and key influentials (e.g., state lawmakers, technical assistance providers) are critical to the adoption of tobacco-free school policies (Summerlin-Long & Goldstein, 2008). One Canadian study found that for each print media article published, there was a 5% increase in the rate of local smoke-free policy adoption (Asbridge, 2004). Likewise, health advocacy as measured by the historic release of the 1986 U.S. Surgeon General's report on SHS was perceived as a legitimate voice for public health and it acted as a call to action for policymakers to pass smoke-free legislation. Grassroots organizing and effective communication strategies are health advocacy techniques known to influence tobacco policy development (Summerlin-Long & Goldstein, 2008). Other studies have found that communities with local board of health funding for tobacco control and the presence of smoke-free laws in bordering towns are predictors of strong local smoke-free restaurant ordinances (Skeer, George, Hamilton, Cheng, & Siegel, 2004). Town size also is an important predictor; smaller towns were less likely than larger towns to adopt policies. Similarly, population size is associated with strength of tobacco control in rural communities when controlling for tobacco production, smoking prevalence, and other demographics (York, et al., 2010). A longitudinal North Carolina study (1997–2005) reported that tobacco farmers have become increasingly more supportive of a wide range of tobacco control policies over time (Crankshaw, Beach, Austin, Altman, & Jones, 2009). In a study of 15 Wisconsin communities, slightly higher smoking prevalence rates, higher adjusted gross income, and a greater percentage of Democratic voters predicted enactment of smoke-free policies (Ahrens, Uebelher, & Remmington, 2005).

The Community Readiness Model (CRM) provides the theoretical basis for understanding policy change, though the model was originally created to evaluate a community's ability to develop and implement drug treatment and prevention programs (Edwards, et al., 2000; Oetting et al., 1995). The CRM was selected as it asserts communities will advance through a series of nine stages as they develop, implement and evaluate programs (Jumper-Thurman, Plested, Edwards, Helm, & Oetting, 2001). Using the model to guide community interventions, once the stage of readiness is identified, appropriate stage-specific strategies can be implemented to move the community forward to policy change.

There are four underlying assumptions of the CRM: (a) stages of readiness can be accurately identified; (b) a community will likely be in a different stage of readiness for different problems; (c) communities can advance through readiness stages; and (d) stage-specific

tailored interventions can advance a community's readiness (Edwards, et al., 2000). The CRM builds on several research traditions including the transtheoretical model of behavior change (DiClemente & Prochaska, 1998), diffusion of innovations (Rogers, 1962), and the social action approach to group processes (Warren, 1978). The original CRM describes six dimensions of readiness including a community's: knowledge of the problem; existing efforts to deal with the problem, knowledge of existing efforts; leadership dedicated to change, available resources to promote change, and climate related to the problem. York et al. (2008) adapted the dimensions to evaluate readiness for policy change by collapsing the two knowledge dimensions into one and adding a new dimension, political climate, and they collapsed the original nine readiness stages into six: unawareness; vague awareness; preplanning, preparation; initiation; and endorsement.

METHODS

Design and Sample

The data were collected during baseline (June–August 2007) of a randomized, controlled community trial to promote smoke-free policy in rural Kentucky. Medical Institutional Review Board approval at the University of Kentucky was obtained and a waiver of documentation of informed consent was granted. Counties were eligible to be selected if they were rural, defined as outside the Metropolitan Statistical Areas (U.S. Census Bureau, 2000). For multi-county health department districts, one county was randomly chosen; this omitted 27 of the 99 rural counties from further consideration. From the remaining pool of 72 rural counties, 30 were randomly selected. At the time of baseline data collection, 3 of the 30 counties had a smoke-free ordinance in their largest city, and none had county-wide smoke-free laws. Two of the city laws covered all public places including bars and restaurants and one covered all workplaces including bars and restaurants. County-level characteristics including smoking prevalence, number of tobacco control staff per 10,000 population, tobacco produced, percent minority, median household income, and population size, were collected as potential control variables prior to the baseline data collection.

On average, five key informants and three elected officials per county participated in structured telephone interviews. Key informants were community stakeholders who were recruited by contacting the tobacco control specialist at the local health department and then using snowball sampling to identify individuals with knowledge and involvement in local smoke-free initiatives. Elected officials included the county judge executive (leader of county government) and the mayors of each city within the county. Most key informants were female (86%) with an average age of 47.1 years (SD=11.1), while the majority of elected officials were male (83%) with a mean age of 56.1 (SD=11.6). Consistent with the state population, nearly all participants in both groups were Caucasian (100% of key informants; 93% of elected officials). The average length of key informant interviews was 48.1 minutes (SD=16.1); elected officials' interviews averaged 15.2 minutes (SD=5.0). The tobacco control specialist also participated in a separate 30-minute phone interview averaging 37.8 minutes (SD=10.4) assessing overall Resources, Capacity and Efforts in tobacco control.

Measures

The readiness measure is specific to smoke-free policy development and the SoTC provides a more general measure of the Resources, Capacity, and Efforts in all aspects of tobacco control, including tobacco cessation, youth prevention, eliminating disparities, and reducing exposure to secondhand smoke (Centers for Disease Control and Prevention, 2007). The individual items that make up the readiness and SoTC instruments were designed to elicit objective answers (e.g., yes/no options). In addition, interviewers were trained to use a

protocol to minimize bias and maximize objective data collection, and they were monitored to ensure fidelity of data collection. Although the number of participants was relatively small in each county, those who completed the surveys were the most knowledgeable of smoke-free and tobacco control efforts in their community.

Readiness for Smoke-free Policy—The community readiness measure used in this study consists of six dimensions related to smoke-free policy development: (1) community activities to increase knowledge about the negative effects of SHS; (2) community leadership; (3) community resources; (4) community climate; (5) existing voluntary smoke-free policies; and (6) community political climate (see Table 1). Overall stage of readiness ranges from Unawareness (issue not recognized as a problem by community members and/or leaders) to Endorsement (policies enacted and implemented). The tool was developed based on the Community Readiness Model (Edwards, et al., 2000; Oetting, et al., 1995), pilot tested with 64 Kentucky communities, and found to be a valid and useful measure of community readiness for smoke-free policy development (York et al., 2008).

A community score for five of the six dimensions is determined by averaging the key informants' ratings across items. A community score for the political climate dimension is determined by averaging elected officials' responses to a 19-item survey and one item from the key informants' survey. All six community dimension raw scores are then rescaled to range from 0 to 1, with 1 denoting the maximum possible score, ensuring all dimensions have equal weight in determining the overall stage of community readiness. The six rescaled dimension scores are summed to determine the overall stage of readiness for smoke-free policy score for each community, ranging from 0 to 6.

Strength of Local Tobacco Control—The adapted SoTC measure (York, et al., 2010), originally developed and tested to evaluate state-level tobacco control efforts (Stillman, et al., 1999; Stillman, et al., 2003), assessed three key constructs related to all aspects of county-level tobacco control: Resources committed to tobacco control (i.e., staff) in general, Capacity to implement all tobacco control activities (i.e., leadership, numbers of personnel committed to tobacco control as well as linkages between key agencies and advocacy groups), and Efforts (i.e., time spent on media advocacy, training and technical assistance, policy advocacy for all aspects of tobacco control; see Table 2) (Stillman, et al., 1999; Stillman, et al., 2003). The SoTC constructs are associated with establishing tobacco control norms (Stillman, et al., 1999).The adapted county-level SoTC measure has been shown to be valid and useful in measuring commitment to local tobacco control efforts (York, et al., 2010). Items were first combined to form sub-domains, then pooled to form domains, which were combined to form constructs. At each stage of combination, the scores were standardized by subtracting the mean and dividing by the standard deviation resulting in a rescaled variable with a mean of 0 and a standard deviation of 1 (York, et al., 2010).

County-level demographics included smoking prevalence (Rayens & Zhang, 2008) number of tobacco staff per 10,000 population (Hahn & Rayens, 2010), pounds of tobacco produced (U.S. Department of Agriculture, 2007), percent minority, median annual household income, and population size (U.S. Census Bureau, 2000).

Data analysis

Means and standard deviations were used to summarize the data. Associations among variables were determined using Pearson's product moment correlation. Predictors of community readiness were determined using multiple linear regression; variance inflation factors (VIFs) were assessed to gauge the presence of multicollinearity. Regression models were summarized using the adjusted R-square. Given the requirement for a minimum of 10

cases per predictor in a regression model to ensure the stability of parameter estimates (Babyak, 2004), the regression analysis was limited to at most 3 predictors per model; an alpha level of .05 was used throughout.

RESULTS

On average, adult smoking prevalence in the 30 rural counties was nearly 30%, typical of rural Kentucky counties. The number of tobacco control staff per 10,000 population size ranged from 0.04 to 3.9, with a mean of 0.3. Tobacco production averaged approximately one million pounds per year and the mean population size was approximately 25,000. The percent minority was typical of populations in rural Kentucky, with an average of 3.6%. Median annual household income was slightly higher than $30,000.

County-level demographic characteristics, SoTC constructs, and overall readiness are summarized in Table 3. Tests of association among the six county-level demographic factors revealed that the smoking rate was negatively associated with median income ($r = -.47$, $p = .008$) and population size ($r = -.46$, $p = .01$). Number of tobacco control staff per 10,000 was negatively associated with population size ($r = -.40$, $p = .03$). Percent minority was positively associated with income ($r = .47$, $p = .009$) and with population size ($r = .64$, $p = .002$), but negatively correlated with smoking rate ($r = -.51$, $p = .004$). Adult smoking rate, pounds of tobacco produced, population size, and percent minority were correlated with community readiness for smoke-free policy development in the 30 rural counties. The higher the adult smoking rate and the more tobacco produced, the less ready a community was for smoke-free policy ($r = -.51$, $p = .004$; $r = -.54$, $p = .002$, respectively). There was a positive association between county population and readiness score, indicating that larger rural communities were more likely than smaller ones to have high scores on the community readiness measure ($r = .49$, $p = .01$). Consistent with this finding, communities with larger minority percentages (which tend to be larger counties) had higher readiness scores ($r = .38$, $p = .04$). Since population size was significantly associated with strength of tobacco control Efforts and Capacity, while smoking and tobacco production were not, population size was included as a covariate in all regression models. Percent minority was not considered as a control variable given the strong correlation between this and population size. Tobacco production was included as a second covariate since this variable was more strongly correlated with readiness than adult smoking rate. Further, pounds of tobacco produced has been associated with views on tobacco control policies (Hahn, Toumey, Rayens, & McCoy, 1999). The rationale for including these two demographic characteristics as covariates was to determine if SoTC constructs of Resources, Capacity, and Efforts predicted community readiness, controlling for differences in county demographic characteristics.

Each of the three models contained one of the SoTC constructs in addition to the two control variables, with overall readiness for smoke-free policy as the dependent variable (see Table 4). Controlling for county population size and tobacco production, SoTC Efforts predicted community readiness, but Resources and Capacity did not. Tobacco production was inversely related to overall readiness in all three models, while county population size was the only significant predictor in the model containing Resources. Capacity and Efforts had similar standardized betas and the corresponding p-values were nearly the same (.06 and .05, respectively); the p-value for Resources was not close to the alpha level ($p = .8$). The three variables together (two demographics and one SoTC variable) explained a large percentage of the variability in all models, with adjusted R-square values ranging from 0.37 to 0.50. The VIFs for all three models were at most 1.5, suggesting that none of the model parameters were likely to have been distorted by multicollinearity.

DISCUSSION

Efforts (i.e., time spent on media advocacy, training and technical assistance, policy advocacy) in overall tobacco control predicted community readiness for smoke-free policy development, controlling for county population size and tobacco production. This supports previous findings that media positively influences policy change (Asbridge, 2004; Smith et al., 2008). Interestingly, Capacity in overall tobacco control (i.e., leadership, numbers of personnel committed to tobacco control as well as linkages between key agencies and advocacy groups) was not associated with community readiness for smoke-free policy development when controlling for county population size and tobacco production. This runs counter to previous findings that capacity building for tobacco control (i.e., strengthening coalitions) influences policy change (Feinberg, et al., 2004; Greathouse, Hahn, Okoli, Warnick, & Riker, 2005; Stillman, et al., 2003). This finding may be due to the sample size of 30 counties, noting that the p-value for Capacity was .06. Though the sample size was selected to have 80% power to detect a model R^2 as small as 0.3 (i.e., without regard to the significance of individual predictors), a slightly larger sample size may have been able to detect a significant effect of Capacity on community readiness. Similar to Capacity, the Resources construct, which included only staff resources for overall tobacco control, did not predict community readiness for smoke-free policy development when controlling for population size and tobacco production. This differs from previous studies reporting that tobacco control funding positively correlates with smoke-free policy development (Skeer, et al., 2004). The fact that the Resources measure had so few items and reflected only personnel resources and not financial or other assets may have contributed to this finding. Further research is needed to investigate the role of the full range of resources on community readiness for smoke-free policy.

The greater the pounds of tobacco produced, the lower the community readiness for smoke-free policy regardless of overall strength of tobacco control at the local level. Although the data for this study were collected after the federal buyout of tobacco and after 2004 when tobacco production in Kentucky was on the decline (U.S. Department of Agriculture, 2010), there was a strong association between tobacco production and readiness for smoke-free policy development in rural, tobacco-growing communities regardless of the strength of Resources, Capacity, and Efforts in overall tobacco control. The impact of strong historical and sociocultural ties to tobacco cannot be underestimated in rural, tobacco-growing communities where dependence on tobacco is a way of life (Chaloupka, et al., 2002; Denham & Rathbun, 2005) and farmers are struggling with diversification of crops (Smith, Altman, & Strunk, 2000). Goldstein and colleagues (2003) reported that school districts that adopted comprehensive tobacco-free school policies were not located in heavy tobacco-growing areas of North Carolina, consistent with our finding that tobacco production is an important factor when considering community readiness for smoke-free policy. In contrast, one longitudinal study in North Carolina reported that tobacco farmers may be more amenable to tobacco control policies (i.e., clean air policies, FDA regulation, and tobacco taxes) in recent years (Crankshaw, et al., 2009), despite the strong historical and sociocultural ties to tobacco in rural, tobacco-growing communities. However, Crankshaw et al. (2009) reported no change over time in farmers' perceived risk from clean indoor air restrictions. Given the fact that farmers may be more favorable toward tobacco control in general, there may be opportunities to advance smoke-free policy in rural, tobacco-growing communities as economic dependence on the crop declines and gaps in protection against secondhand smoke exposure widen. Indeed, Rayens and colleagues (2008) reported that public opinion toward smoke-free laws was more favorable in rural vs. urban communities in Kentucky, perhaps due to the dearth of smoke-free legislation in rural areas. Future research is needed to test culturally sensitive approaches to tobacco control advocacy in rural, tobacco-growing communities.

Smaller rural communities were less likely than larger ones to be ready for smoke-free policy, consistent with previous literature (Skeer, et al., 2004; York, et al., 2010). Small farming communities, in particular, have unique contexts and they experience rural isolation, local attitudes and beliefs related to smoke-free policy, lack of diversity, and limited financial and human resources (Ferketich et al., 2010; Mahon & Taylor-Powell, 2007). Rural community advocates and policymakers need targeted training and technical assistance to promote readiness for smoke-free policy (York, et al., 2010). Mahon et al. recommend that small, rural communities be paired using distance technologies to facilitate training and support (i.e., technical, emotional, financial), and that local leaders who are dedicated and passionate about smoke-free policy be identified and supported. Our findings would suggest that this training and support of local leaders in rural, tobacco-growing communities emphasize direct policy and media advocacy efforts.

A finding from the correlation analysis was that higher adult smoking rates were associated with lower the community readiness for smoke-free policy, consistent with previous research showing a negative association between smoking prevalence and strength of smoke-free policies (Heloma & Jaakkola, 2003). Due to the small number of counties in the sample, we were unable to control for smoking prevalence in addition to the other important county demographic variables of population size and tobacco production. In a related paper with most of the same counties included in this sample, York et al. reported no association between adult smoking prevalence and strength of overall tobacco control (York, et al., 2010).

One limitation is the use of the community readiness model, as its concepts, dimensions, and stages of overall readiness have rarely been used to study public policy development. Further, there are few measures of local strength of tobacco control. Response bias is another potential limitation given that participants may have unintentionally answered from a personal viewpoint, rather than provide an accurate representation of their community's readiness for smoke-free policy change. With an average of only five key informants and three elected officials per county, the data may not have been representative of the entire community. A third potential limitation is the small sample size given the number of independent variables being evaluated. A larger sample of counties would improve statistical power and allow for the addition of more predictor variables such as adult smoking prevalence and demographic variables in addition to population size and pounds of tobacco produced. Another potential limitation is lack of consideration of state and federal events that may have affected the results. For example, access to data on overall funding for public health and, specifically, tobacco control would have improved the analysis; instead, we only had access to the number of tobacco control staff per 10,000 population as an indicator of financial resources. Lastly, Kentucky law does not preempt local governments from enacting smoke-free policy; our findings may only be relevant to local communities in states without preemption.

This study used the SoTC measure to predict rural communities' readiness for smoke-free policy at one time point. Additional research could determine the effectiveness of using the SoTC over time to predict readiness for policy development. In addition, future research might use the SoTC measure to predict strength of policy adoption and policy implementation effectiveness. This study focused on predictors of smoke-free policy adoption and did not examine strength of the policy. A larger sample size of rural communities that adopt various strengths of smoke-free laws would provide additional information to policy advocates and coalitions on how to tailor overall tobacco control and smoke-free policy efforts.

CONCLUSIONS

Rural communities lag behind in readiness to develop and implement smoke-free policy change. This study suggests that only one of the three strength of tobacco control constructs, Efforts, may influence community readiness for smoke-free policy in rural tobacco-growing communities when considering population size and tobacco production. Policy advocates can use this information when tailoring strategies to promote policy change in rural, tobacco-growing communities. Given that small rural communities are least ready for smoke-free policy change, future research is needed to tailor and test culturally sensitive approaches that account for this tobacco-growing heritage. In this time of dwindling resources for health promotion, technical assistance organizations may want to pay particular attention to assisting small, rural tobacco-growing communities with direct evidence-based policy and media advocacy strategies.

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Table 1

Description of the community readiness measure by dimension

Dimension	Number of Items	Sample item
Community's **Knowledge** includes the activities and approaches to educate the community about the negative effects of SHS exposure	13	In the past year, has your group or coalition aired radio commercials about secondhand smoke? (yes/no response)
Community's **Leadership** is the support of appointed leaders and influential community members	12	On a scale of 1–5, how much leadership for smoke-free policy development does the local health department director provide? (ordinal response)
Community's **Resources** are the people, money, time, equipment and space dedicated to smoke-free policy development	14	Has your group or coalition contacted the American Cancer Society? [for possible partnerships] (yes/no response)
Community's Climate are the community's norms that influence smoke-free policy development	12	On a scale of 1 to 5 with 1 indicating unfavorable and 5 very favorable, how do your local media portray secondhand smoke and smoke-free issues? (e.g., newspaper; 1–5 response)
Existing smoke-free policies include the voluntary policies currently existing in the community	11	Within your community, which of the following have voluntarily implemented indoor smoke-free policies? (e.g., city government buildings; yes/no response)
Political climate is the influence of the political process and politics on smoke-free policy development	20	What is the position of each of the following local leaders on enacting a smoke-free law (e.g., Mayor of each city within county; for, against, uncommitted; health advocate survey)
		Is there at least one elected official in X County or City who has *voiced public support* for enactment of a smoke-free law? (yes/no response; elected official survey)

Note. Dimension score items are summed across key informants by county to create an overall stage of readiness score reflecting: Unawareness, Vague Awareness, Pre-planning, Preparation, Initiation, or Endorsement.

Table 2

Description of the Strength of Tobacco Control (SoTC) measure

Construct	Number of Items	Sample item
Resources	3	Considering only those staff members who dedicate 100% of their work hours to tobacco control activities, how many full-time equivalents do you have on your staff? (numeric response)
Capacity	47	I would like your opinion about how supportive each of the following has been regarding your tobacco control agenda over the past year. (entities rated include: county judge executive, fiscal court magistrates, city mayors, the media, county and city attorneys, public health director; ordinal scale used to rate each)
Efforts	111	In the past year, has your organization purchased mass media, or had in-kind donations of mass media, to inform the public about tobacco-related issues? (yes/no response)

Table 3

Descriptive statistics for county-level demographic characteristics, Strength of Tobacco Control (SoTC) constructs, and overall readiness ($N = 30$).

Variable	Mean	SD	Range
Smoking prevalence	29.3%	5.7%	15.7–46.7%
Tobacco production (pounds)	978,917	1,171,348	0–4,394,700
Population	25,494	15,483	2,202–64,765
Tobacco staff ratio (number per 10,000 population)	0.3	0.7	0.04–3.9
Minority	3.6%	3.4%	0.5–13.1%
Median annual income	$31,638	$6,993	$19,728–45,691
Resources (SoTC)	0.0	1.0	−2.6–2.5
Capacity (SoTC)	0.0	1.0	−1.8–2.1
Efforts (SoTC)	0.0	1.0	−1.9–1.6
Overall readiness	2.8	0.5	2.1–3.8

Table 4

Prediction models for community readiness in rural counties ($N = 30$).

Predictor	Standardized β	VIF
Population size	0.38 *	1.1
Tobacco production (pounds)	−0.45 **	1.1
Resources	0.04	1.0
$F_{3,26}=6.6$ **; Adjusted $R^2=0.37$		
Population size	0.24	1.3
Tobacco production (pounds)	−0.38 *	1.1
Capacity	0.32	1.4
$F_{3,26}=8.9$ ***; Adjusted $R^2=0.45$		
Population size	0.19	1.5
Tobacco production (pounds)	−0.40 **	1.1
Efforts	0.35 *	1.4
$F_{3,26}=10.7$ ***; Adjusted $R^2=0.50$		

* $p \leq .05$;

** $p \leq .01$;

*** $p \leq .001$.