

- There has been a 43.4% reduction from 2011 to 2016 among 8th graders who reported smoking one or more cigarettes based upon survey results from 55 Tennessee counties.
- Tobacco Settlement funding supported projects and partnerships between school and public health, and funds encouraged almost 2,000 youth in leadership teams to begin new peer-to-peer education activities.

Background

Tennessee has suffered poor national rankings for adult smoking, pregnancy smoking and youth smoking for many years. Targeted prevention resources had been largely limited to Federal categorical grants, leveraged time of busy public health educators and unreimbursed efforts of other health systems providers. In 2013 the Tennessee General Assembly approved Governor Haslam's request to use \$15 million over three years of unexpected excess Master Tobacco Settlement payments to support county-based tobacco use prevention activities. The Tennessee Department of Health (TDH) developed a program for three prevention Topics to: reduce pregnancy smoking and related low birth weight births; reduce second hand smoke exposure around preschoolers and related use of hospital emergency departments for tobacco-induced asthma; and help young children to choose not to begin to use tobacco. Each county completed its own assessments, determined its own numeric goals for change, selected county-appropriate strategies, and chose intervention projects for investment of its Tobacco Settlement funding. For evaluating the effectiveness of interventions for the Topic Helping Youth, the standard measure was reduction of the percent of 8th graders who reported smoking. This report summarizes results and findings of the three-year effort.

Methods

Ninety-five counties were allocated Tobacco Settlement funding over three years based upon population size and tobacco use statistics. County-specific plans were developed to address youth smoking using evidence based practices. In total over three years, counties implemented 470 projects targeting youth smoking. These projects fell into two broad strategies including a variety of intervention projects:

- **School-based Strategy.** (Total county three year expenditures: Health departments collaborated with schools to enhance curricula on the dangers of smoking. By 2016, 96% of counties identified at least one school tobacco use prevention program associated with the Tobacco Settlement. In 51 counties, funding was shared to purchase and use the nationally recognized Michigan Model curriculum. Available instructional time and educational processes are changing in schools and new efficient methods to address smoking prevention and student refusal skills were needed. Projects demonstrated many innovations, include but are not limited to the use of iPads loaded with new instructional materials and methods, student poster contests, links with student club activities, and intra- and inter-school no smoking pledges competitions. New peer mentoring activities helped regularize annual school-based events and activities and accustom students to choosing not to smoke as part of student culture.
- **Peer-to-Peer Strategy.** Youth feedback indicated peer education has more impact with students than traditional instructional methods. Student behaviors are influenced by peers who are powerful advocates not to smoke. Counties invested in youth development projects, recruiting and educating 320 teams with a diverse mix of 1,976 youth. Local teams were provided extra training, then selected activities, used their new knowledge, and developed creative age/culturally appropriate messages to help form a culture of no smoking attitudes and

beliefs. Teams conducted 853 school-based and 498 community-based tobacco use prevention activities reaching 107,895 students across the state.

- **County specific youth smoking prevention projects.** 31 county health departments and county school systems cooperated in conducting national best practice and county designed projects. Educational activities touched 70,531 students. Learning activities used superheroes, animals, technologies, poster contests and carnivals to engage youth.

Media was found to be an important supporting strategy. Youth are constantly exposed to industry advertising. The Tobacco Settlement was seen as an opportunity for local advocates to design local messaging and campaigns to counteract the industry. Students demonstrated social media approaches to increase access and involving youth. County peer-to-peer team projects led to the 2016 FACT Summit which attracted 400+ youth organized in teams from 56 counties. Students were armed with health facts, planned local activities including a statewide social media counter-marketing approach to help county teams to prevent tobacco use among youth.

A total of \$3,347,000 was invested by the state's 95 county health departments from 2014-2016 to help children to choose not to smoke. This included \$735,000 with schools for the Michigan Model, \$1,106,000 for Peer-to-Peer team training and activities, and \$1,506,000 for other county prevention projects in cooperation with schools.

A statewide youth tobacco use survey was conducted in Fall 2016 to evaluate the effectiveness of the Tobacco Settlement project interventions conducted by 95 counties. The survey was jointly prepared by TDH's Office of Performance Management and Department of Education's Coordinated School Health Program. Questions were drawn from the 2011 statewide Middle School Youth Tobacco Survey. Coordinated School Health coordinators from each county were requested to facilitate administration of the survey to current 8th graders. Schools were offered two options, paper surveys or on-line surveys (81% of all student responses reported online). Results were analyzed by the TDH Office of Policy and Data Management. A total of 23,650 students completed the survey, representing a response rate of 58% of 95 counties. 2016 tobacco use percentages were compared to 2011 Middle School survey percentages to determine change. In addition to calculating county percentages, data from counties were first pooled together and re-grouped according to TDH region classification, and statistics were then calculated for each region. To address a statewide estimate additional analyses of 2015 TN Population Estimate data was conducted and found that among TN residents aged 12-14 years (comparable to the age range of the Tobacco Survey data), 77.5% reside in Urban counties and 22.5% in Rural counties. In contrast, among the 8th graders who completed the Tobacco Survey, 68.3% live in Urban counties and 31.7% Rural counties (Table 1). As shown in Table 1, the prevalence of tobacco use in 8th graders is higher in Rural than Urban counties, suggesting that the current survey sample might have led to an overestimate of the statewide prevalence of tobacco use.

Results

Health Outcome Changes

- Based upon a comparison of the 2016 to 2011 smoking prevalence surveys:
 - o Statewide, 6.4% of 8th graders reported ever smoking one or more cigarettes in 2016. This compares favorably with national middle school students reports of smoking cigarettes in 2015 of 7.4% (from: https://www.cdc.gov/tobacco/data_statistics/fact_sheets/youth_data/tobacco_use/index.htm).
 - o The 6.4% 8th grade prevalence compares favorably with the 2011 Tennessee Middle School Youth Tobacco Survey of 11.3% (smoked one or more cigarettes in past 30 days). This represents 43.4% fewer smokers in 2016 than 2011.
 - o 91% of the 49 counties with surveys completed in both 2011 and 2016 demonstrated reduction in 8th graders smoking cigarettes.

- Several counties conducted additional surveys that included different questions and grade levels. These county results are not included in the statewide results, limiting the generalizability of state results.
- The survey provides a contemporary picture of Tennessee youth smoking issues (see Table 1):
 - Smoking cigarettes among 8th graders vary from a low of 3.3% in Shelby County to 9.0% in Northeast.
 - Cigarettes, smokeless tobacco and electronic cigarettes are the most frequently used tobacco products in Tennessee. Growth in use of electronic cigarettes parallels national patterns, but Tennessee exceeds national rates for e-cigarettes (TN 7.0%, US 5.3%) and smokeless tobacco (TN 8.4%, US 1.8%).
 - More male than female 8th graders use tobacco products in all categories, similar to US reports. The largest statistical difference among populations is between male and female users.
 - More rural than urban youth use tobacco products in all categories.
 - One-third fewer Black youth use any tobacco product than the statewide average for all youth.
 - Over half of those youth who use any tobacco product use more than one product, and one-third use 3 or more products (6.6%), twice the national finding (3.3%).

Process Outcomes

- Overall in three years, education and advocacy projects directly reached 285,800 students: Michigan Model curriculum, 107,400 students; peer-to-peer team projects, 107,900 children; and other school based projects, 70,500 children. These figures do not include youth-directed media efforts.
- Cooperation with schools is evident as a critical success factor, particularly facilitated by health departments' relationship with Tennessee's unique and strong local Coordinated School Health programs. Many prevention project activities in schools were supported by Tobacco Settlement resources willingly shared by health departments with schools. Over three years this totaled to over \$780,000 in funding, material, and equipment in addition to shared health department staff time.
- Multiple county-selected best practice models were coordinated in and with schools: Michigan Model school-based curriculum; Health Horizons Program; Kick Butts Day classes and schoolwide carnivals; Health Rocks educational activities; unSmokeable social media-linked activities; and Smoke-free Generation competitions.
- Existing student/youth groups like HOSA, student health councils, SADD chapters, teen health boards, and athletic teams adopted and conducted tobacco use education and smoke-free advocacy activities.
- Peer to peer youth team training processes evolved over the three-year period, moving from a general national curriculum to training sessions designed by a statewide work group of health educators. Participation also became an effective model for youth leadership development: 86% of youth teams made tobacco-related presentations to schools, community leaders and organizations.
- The FACT Summit was an effective complementary intervention. Counties with FACT Summit teams recorded a 45% reduction in 8th grade smoking prevalence compared to a 25% reduction for counties with no attendees.

Discussion

Youth smoking is decreasing nationally. The CDC Youth Risk Behavior Survey reported 40% reduction from 2011-2015 for 9th-12th graders. The Tennessee study focused on 8th graders (middle school) and report a 43.4% reduction, similar to national results. The goal of the Tobacco Settlement Program targeted earlier primary prevention – educational projects aimed at helping middle school students to choose not even to try smoking. County projects focused on not just awareness and knowledge of the dangers of tobacco, but also in forming attitudes and beliefs among youth, schools and communities against tobacco advertising and use. The 8th graders reduction from 11.3% in 2011 to 6.1% in 2016 should result in reduced smoking prevalence in high schooler and adults.

Program management for the Tennessee Tobacco Settlement Program was built on performance improvement principles. Counties created their own plans after assessing youth tobacco use issues. Each county identified acceptable and effective intervention projects. Each county set its own quantifiable population health outcome goal for change. Counties used performance improvement tools to adapt interventions over the three year period.

Community-wide partnerships and coalitions were created and strengthened. Health departments involved a wide variety of organizations and groups in new primary prevention initiatives for youth. Partnerships enabled schools to strengthen curricula, find greater support for smoke-free policies across their campuses and for school-affiliated activities like athletic events, and recognize the need for age-appropriate resources to help children who already smoke.

The impact of other Tobacco Settlement Program efforts in counties on youth smoking was not measured but should be recognized. Figure 1 displays the interactive nature of the youth-oriented strategies with other projects which focused on broad media messages (e.g., billboards, public space signs and benches, athletic team logos and jerseys, etc.) and reducing second hand smoke exposure (targeting child care facilities, multi-unit housing and public spaces through local initiatives, resolutions and ordinances to prohibit smoking). The statewide youth summit added credibility and visibility to local youth peer team activities taking them to scale across the state. County plans recognized the need to identify a community general acceptance of smoking or lack of concern about how smoking impacts youth attitudes and behaviors. Plans enabled active youth teams to promote community education local smoke free policy ordinances.

Counties largely chose and adopted national best practices, but not exclusively. Tremendous creativity was demonstrated in locally designed interventions. A prospective logic model was required for each county-designed project, and Plan-Do-Check-Act cycles of learning forms encouraged counties to identify opportunities for improvement so other counties could build upon, modify and incorporate successful projects. Youth teams and schools developed creative campaign slogans; attention-getting graphics used for public media products, and created theatrical, audio and visual products. Students used non-traditional senders for prevention messages: comic superheroes, animals in the zoo, and local athletes. School groups submitted and won state and national competitions for their efforts.

The Tobacco Settlement provided counties resources, a clear statewide framework, and freedom to choose and innovate interventions based on local assessments. Success in exceeding the statewide goal of a 20% reduction in 8th grade tobacco use is due largely to counties' concern, creativity, partnering and patience. Counties discovered the importance of complementary policy interventions and have recommended further statewide action that would limit access to tobacco products including e-cigarettes and encourage localities to further restrict smoking in public areas.

Figure 1: Strategic model for helping children no to choose to use tobacco

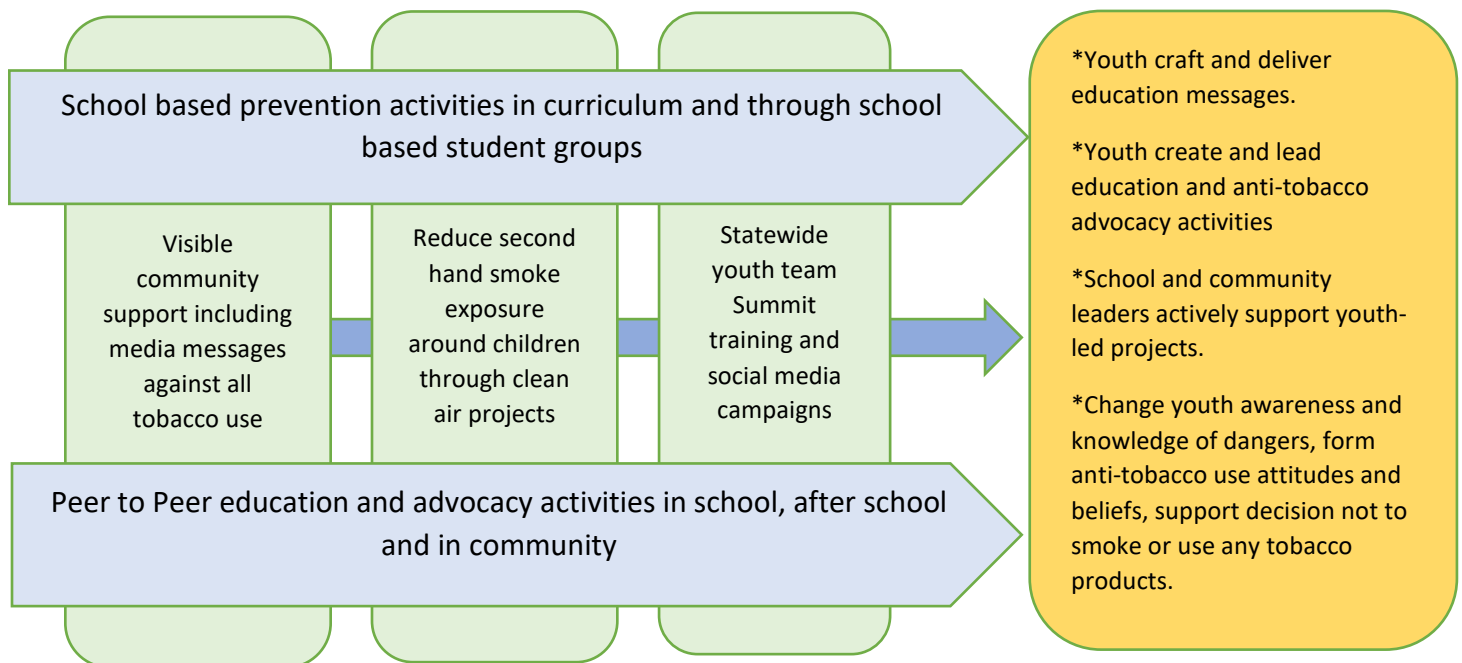
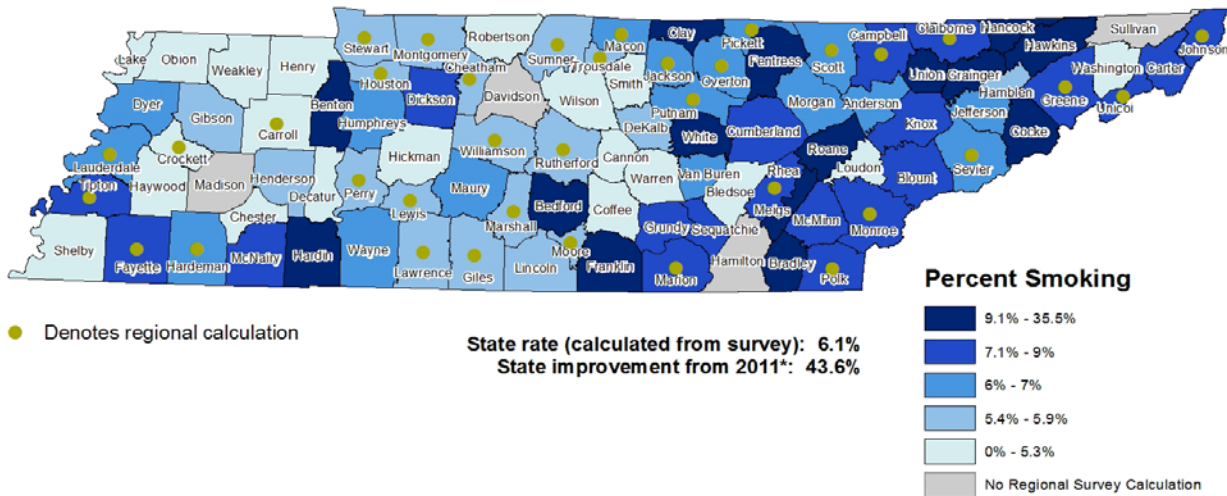


Figure 2: Regional differences in 8th grade smoking in Tennessee, 2016

Percent of Tennessee 8th Graders Who Report Smoking* by County, 2016



*2016 Schools 8th Grade Survey
** 2011 Middle School Youth Risk Behavior Survey

Map produced by Office of Healthcare Statistics; Division of Policy, Planning and Assessment; Tennessee Department of Health

Table 1: Descriptive characteristics of 8th grade users of tobacco products, 2016 Survey

Tobacco product	Total Percent	Male	Female	White, non-Hispanic	Black, non-Hispanic	Other or multiple races, non-Hispanic	Hispanic	Urban	Rural
Cigarettes	11.4	12.6	10.2	11.9	7.8	13.2	13.0	10.8	13.2
Smokeless tobacco	8.4	11.8	5.0	9.6	2.6	9.5	9.5	7.3	11.2
Electronic cigarettes	7.0	7.7	6.2	7.4	3.5	8.4	8.5	6.5	8.3
Roll-your-own cigarettes	3.2	3.5	2.7	3.0	3.0	3.8	34.1	3.1	3.3
Flavored cigarettes	3.2	3.7	2.7	3.4	1.4	4.0	4.4	3.0	3.6
Clove cigars or flavored little cigars	3.0	3.9	2.1	2.1	3.0	3.5	4.4	3.0	2.9
Hookahs or water pipes	2.2	2.5	1.8	1.8	2.0	3.5	4.1	2.2	2.0
Other new tobacco products	3.1	3.9	2.3	3.0	2.0	3.9	4.7	2.8	3.7
Any tobacco product	17.0	20.1	13.9	17.4	12.7	18.7	19.7	15.8	20.0
2 or more tobacco products	11.1	12.9	9.2	11.6	6.9	12.8	12.9	10.2	13.2
3 or more tobacco products	6.3	7.7	5.0	6.9	2.8	7.6	7.7	5.9	7.5

Table 2: Percent of Tennessee 8th graders who report smoking by county, 2011-2016

Source	2011 Middle School Youth Risk Behavior Survey	2016 Schools 8th Grade Survey			Percent improvement from 2011 to 2016 survey results
County	Percent who smoked 1 or more cigarette during past 30 days	Percent who smoked 1 or more cigarettes	Data calculation method	Number 8th graders surveyed	(Positive represents % improvement; negative is % worsening)
Tennessee	11.3%	6.1%	State calculation	21,096	46.0%
Anderson	15.9	6.2	Survey Results	827	61.0%
Bedford	16.6	11.3	Survey Results	115	31.9%
Benton	8.6	10.6	Survey Results	123	-23.3%
Bledsoe	8.5	0	Survey Results	33	100.0%
Blount	15.0	7.1	Survey Results	1,197	52.7%
Bradley	11.7	9.4	Survey Results	672	19.7%
Campbell	N.A.	7.1	Regional calculation	N.A.	NCC
Cannon	N.A.	3.6	Survey Results	110	NCC
Carroll	8.5	5.3	Regional calculation	N.A.	37.6%
Carter	17.7	8	Survey results	500	54.8%
Cheatham	N.A.	5.8	Regional calculation	N.A.	NCC
Chester	12.6	1.4	Survey Results	71	88.9%
Claiborne	14.6	7.1	Regional calculation	N.A.	51.4%
Clay	17.3	9.4	Survey Results	64	45.7%
Cocke	18.1	11.7	Survey Results	309	35.4%
Coffee	14.1	3.2	Survey Results	154	77.3%
Crockett	12.2	5.3	Regional calculation	N.A.	56.6%
Cumberland	N.A.	7.2	Survey Results	415	NCC
Davidson	5.3		No calculation	N.A.	NCC
Decatur	5.0	3.5	Survey Results	113	30.0%
DeKalb	13.3	5.6	Survey Results	161	57.9%
Dickson	N.A.	8.7	Survey Results	461	NCC
Dyer	12.7	6.4	Survey Results	235	49.6%
Fayette	15.2	7.2	Regional calculation	N.A.	52.6%
Fentress	17.7	9.6	Survey Results	156	45.8%
Franklin	16.7	10.2	Survey Results	383	38.9%
Gibson	12.0	5.8	Survey Results	572	51.7%
Giles	20.6	5.9	Regional calculation	N.A.	71.4%
Grainger	21.9	9.8	Survey Results	204	55.3%
Greene	7.3	9	Regional calculation		-23.3%
Grundy	15.4	8.8	Survey Results	148	42.9%
Hamblen	19.5	5.7	Survey Results	662	70.8%

Hamilton	9.7		No calculation	N.A.	NCC
Hancock	28.6	35.5	Survey Results	62	-24.1%
Hardeman	17.6	7	<i>Regional calculation</i>	N.A.	60.2%
Hardin	N.A.	11.7	Survey Results	223	NCC
Hawkins	11.2	11.1	Survey Results	424	0.9%
Haywood	12.8	5.3	Survey Results	133	58.6%
Henderson	8.0	5.7	Survey Results	246	28.8%
Henry	14.0	3.2	Survey Results	252	77.1%
Hickman	14.7	4.7	Survey Results	214	68.0%
Houston	22.0	5.8	<i>Regional calculation</i>	N.A.	73.6%
Humphreys	11.0	6.7	Survey Results	179	39.1%
Jackson	12.0	6.9	<i>Regional calculation</i>	N.A.	42.5%
Jefferson	12.5	6.8	Survey Results	468	45.6%
Johnson	22.5	9	<i>Regional calculation</i>	N.A.	60.0%
Knox	N.A.	8.7	Survey Results	2,554	NCC
Lake	2.0	2.1	Survey Results	47	-5.0%
Lauderdale	8.9	7	<i>Regional calculation</i>	N.A.	21.3%
Lawrence	17.4	5.9	<i>Regional calculation</i>	N.A.	66.1%
Lewis	4.6	5.9	<i>Regional calculation</i>	N.A.	-28.3%
Lincoln	13.7	5.7	Survey Results	384	58.4%
Loudon	12.8	2.9	Survey Results	421	77.3%
McMinn	11.9	7.8	Survey Results	551	34.5%
McNairy	10.4	8	Survey Results	299	23.1%
Macon	6.3	6.9	<i>Regional calculation</i>	N.A.	-9.5%
Madison	11.6		No calculation	N.A.	100.0%
Marion	14.6	8.9	<i>Regional calculation</i>	N.A.	39.0%
Marshall	9.4	5.9	<i>Regional calculation</i>	N.A.	37.2%
Maury	8.3	6	Survey Results	778	27.7%
Meigs	16.1	11.3	Survey Results	115	29.8%
Monroe	18.0	7.1	<i>Regional calculation</i>	N.A.	60.6%
Montgomery	N.A.	5.8	<i>Regional calculation</i>	N.A.	NCC
Moore	13.2	5.9	<i>Regional calculation</i>	N.A.	55.3%
Morgan	17.4	6.9	Survey Results	175	60.3%
Obion	20.2	4.3	Survey Results	324	78.7%
Overton	9.2	6.9	<i>Regional calculation</i>	N.A.	25.0%
Perry	12.3	5.9	<i>Regional calculation</i>	N.A.	52.0%
Pickett	6.8	6.9	<i>Regional</i>	N.A.	-1.5%

			<i>calculation</i>		
Polk	19.2	8.9	<i>Regional calculation</i>	N.A.	53.6%
Putnam	9.3	6.9	<i>Regional calculation</i>	N.A.	25.8%
Rhea	14.9	8.9	<i>Regional calculation</i>	N.A.	40.3%
Roane	13.7	9.1	Survey Results	320	33.6%
Robertson	11.2	4.5	Survey Results	820	59.8%
Rutherford	7.5	5.8	<i>Regional calculation</i>	N.A.	22.7%
Scott	12.4	6.9	<i>Regional calculation</i>	N.A.	44.4%
Sequatchie	11.0	7.9	Survey Results	189	28.2%
Sevier	9.9	6.9	<i>Regional calculation</i>	N.A.	30.3%
Shelby	N.A.	3.3	Survey Results	5,049	NCC
Smith	10.1	5	Survey Results	181	50.5%
Stewart	7.7	5.8	<i>Regional calculation</i>	N.A.	24.7%
Sullivan	12.0		<i>No calculation</i>	N.A.	100.0%
Sumner	9.7	5.8	<i>Regional calculation</i>	N.A.	40.2%
Tipton	10.9	7.2	<i>Regional calculation</i>	N.A.	33.9%
Trousdale	19.4	5.8	<i>Regional calculation</i>	N.A.	70.1%
Unicoi	20.6	9	<i>Regional calculation</i>	N.A.	56.3%
Union	1.8	9.6	Survey Results	73	-433.3%
Van Buren	15.1	6.8	Survey Results	44	55.0%
Warren	13.2	3	Survey Results	330	77.3%
Washington	11.0	3.9	Survey Results	388	64.5%
Wayne	9.8	6	Survey Results	134	38.8%
Weakley	8.9	2.9	Survey Results	103	67.4%
White	14.9	12.3	Survey Results	276	17.4%
Williamson	5.0	5.8	<i>Regional calculation</i>	N.A.	-16.0%
Wilson	9.1	3.3	Survey Results	209	63.7%

NA - Data Not Available

NCC - No comparison able to be calculated