



Institute of Public Policy
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Boone County Issues Analysis

Reading the Fine Print:

Use of the U.S. Census and the American Community Survey in Describing Current Conditions in Boone County

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This report provides guidance to readers of the series of Issue Analyses prepared by the Institute of Public Policy (IPP) on the use and interpretation of two important sources of data. The U.S. Census includes data on total population, race, ethnicity, age and number and type of households. It is collected every 10 years and includes all U.S. residents (both citizens and non-citizens). The American Community Survey is a survey conducted by the U.S. Census Bureau every year and includes much more detailed information including poverty and income.

Table 1 presents the main demographic data from the U.S. Census for Boone County and Missouri comparing 2010 with 2000. The main theme to note is the tremendous growth in population in Boone County over the past ten years: an increase of 20 percent or 27,188 people between 2000 and 2010. It is also interesting to note that there are two segments of the Boone County population that are growing faster than other age cohorts: young adults, aged 18-24, and seniors, aged 65 and over. Compared to the state as a whole, Boone County has a much larger proportion of 18-24 year olds, which is due to the large student population. While the senior population is growing as a proportion of the total population in the county, however, Boone County still has a smaller proportion of people over 65 years than the state of Missouri as a whole.

TABLE 1: DEMOGRAPHICS

	2000		2010	
	Missouri	Boone	Missouri	Boone
Total Population	5,595,211	135,454	5,988,927	162,642
Race ¹				
Caucasian	84.9%	87.1%	82.8%	86.3%
Black	11.2%	9.4%	11.6%	8.6%
Ethnicity				
Hispanic	2.1%	1.8%	3.5%	3.0%
Age				
Under 18 years	25.5%	22.8%	23.8%	21.0%
18-24 years old	9.6%	19.9%	9.8%	21.8%
25-64 years old	51.4%	48.7%	52.3%	47.9%
65+ years old	13.5%	8.6%	14.0%	9.3%
75+ years old	6.5%	4.2%	6.5%	4.2%
Data source for 2000 Demographic, Social and Economic conditions is the Census 2000 Summary files				
Data source for 2010 Demographic, Social and Economic conditions is the Census 2010 Summary files				

The American Community Survey

The American Community Survey (ACS) is the primary data source to understand county-level conditions and trends. No other data set provides the detail with a sufficient sample size to analyze specific geographies. ACS data is available in three general formats:

- **1-year estimates:** data point estimated based on 12 months of collected data, available for geographies over 65,000 people. Less reliable than 3-year or 5-year estimates.

¹ Race alone or in combination with one or more races.

- **3-year estimates:** data point estimated based on 36 months of collected data, available for areas with over 20,000 people. Less reliable than 5-year estimates.
- **5-year estimates:** data point estimated based on 60 months of collected data, available for all geographies. The most reliable estimate.

IPP recommends the 5-year ACS estimates under most circumstances, because they are the most reliable data estimates available. However, there are times when the 1-year ACS estimates are the only data source available with the desired frequency. For example, when it is important to see trends over time, and estimates are needed for each year in a 5- to 10-year period, the ACS 1-year estimates are the best available data source. IPP uses 1-year ACS estimates in other sections of the Issues Analyses to report year-to-year trends. Each table is clearly labeled with the source of the data. To learn more about the differences between the data sets available from the American Community Survey, see http://www.census.gov/acs/www/guidance_for_data_users/estimates/.

To give more information on the difference between U.S. Census and American Community Survey data, Table 2 (below) compares 2010 ACS 5-year estimates with U.S. Census data for the total number of households and total family households. There is an important difference between the two. This can be attributed to the survey-based data collected by ACS, which, like all survey data, includes a margin of error. The margin of error, reported in parentheses, means that there is a 90 percent chance that the true number of total households in 2010 is between 62,796 and 64,044, and that the true number of family households in 2010 is between 35,496 and 37,050. In the case of total households, the actual number of households from the US Census (64,077) falls just outside the margin of error in the 5-year ACS estimate for 2010. This provides a word of caution about interpreting statistical data available through the American Community Survey, even when using the 5-year estimates.

TABLE 2: SOCIAL CONDITIONS FOR BOONE COUNTY

	2000	2010	Change	2010-ACS 5-yr*
Total Households	53,094	64,077	↑	63,420 (+/- 624)
Total Family Households	31,391	36,312	↑	36,273 (+/- 777)
Highest Degree Earned				
HS diploma	23.3%	23.3%	=	
Some college, no degree	19.5%	17.5%	↓	
Associate's degree	4.7%	5.9%	↑	
Bachelor's	23.1%	25.0%	↑	
Graduate or professional degree	18.6%	20.2%	↑	
Head of Household²				
Two parents	45.5%	42.1%	↓	
Female-single	10.4%	10.7%	↑	
Data source for 2000 Demographic, Social and Economic conditions is the Census 2000 Summary files. Data source for 2010 Demographic, Social and Economic conditions is the Census 2010 Summary files. Data source for 2010-ACS 5-yr Demographic, Social and Economic conditions is the American Community Survey, 5 year estimates.				

The 1-year estimates from the American Community Survey have even larger margins of error, and should be used with even more caution. Table 3 (below) shows how large the margins of error are for the 1-year ACS estimates for data on economic conditions in Boone County. There are clear trade-offs between using the most current information available (the 1-year estimates) and the most reliable information available (the 5-year estimates). This trade-off is particularly evident when looking at population subgroups.

Using seniors in poverty as an example, the 1-year ACS estimate in 2009 reported a senior poverty rate of just 2.9%, with a margin of error that states with 90% confidence that the actual rate of poverty among seniors in Boone County in 2009 was between 1.1% and 4.7%. Contrast this with the data collected for the 1-year ACS estimates for 2010: 10.6% poverty with a margin of error that indicates the actual rate of poverty for Boone County seniors in 2010 was between 4.9% and 16.3%. In terms of absolute numbers, the 2009 1-year ACS estimates reported approximately 408 (+/- 255) out of 14,077 (+/- 538) seniors in Boone County were poor. The 2010 1-year ACS estimates reported 1,567 (+/- 849) out of 14,744 (+/- 853) were poor. Given that change, it is reasonable to conclude that poverty among Boone County seniors increased between 2009 and 2010, but probably not to the extent reported in the ACS 1-year estimates.

Because of the volatility and large margins of error in 1-year ACS estimates, IPP recommends that Boone County focus on the 5-year ACS estimates as a more reliable source of information about demographic, social and economic conditions in Boone County.

² The 2008 ACS used a joint relationship/marital status edit and 2000 Census did not. Also, 2000 Census provided more response categories because of a write-in option that was not used in the ACS. Differences in weighting schemes between the census and the ACS could produce inconsistencies in comparisons.

TABLE 3: ECONOMIC CONDITIONS FOR BOONE COUNTY					
	2000 Census	2010 ACS 5-yr	Change	2009 ACS 1-yr	2010 ACS 1-yr
		MOST RELIABLE		LEAST RELIABLE	MOST CURRENT
Employment Status for Population 16 Years and Older	107,690	128,476 (+/- 207)	↑	126,640 (+/- 590)	132,536 (+/- 556)
In labor force	71.7%	70.1% (+/- 0.8%)	↓	71.8% (+/- 2.1)	67.2% (+/- 2.2%)
Employed	67.8%	65.7% (+/-1.0%)	↓	66.6% (+/- 2.3%)	62.5% (+/- 2.3%)
Unemployed	3.8%	4.2% (+/- 0.4%)	↑	4.6% (+/- 1.0%)	4.7% (+/- 4.7%)
Median Household Income	\$37,485	\$45,786 (+/- \$1,288)	↑	\$46,880 (+/- \$3,442)	\$41,006 (+/- \$2,095)
Median Family Income	\$51,210	\$64,616 (+/- \$2,065)	↑	\$65,411 (+/- \$3,800)	\$62,730 (+/- \$4,210)
Median cost of house	\$107,400	\$153,900 (+/- \$3,104)	↑	\$156,900 (+/- \$6,867)	\$158,500 (+/- \$5,813)
Poverty Guidelines-Family of 4 (See Table 4 for more information.)	\$17,050	\$22,050	\$23,052 (2012)	-	-
Below Poverty					
Children (Under 18)	-	16.6% (+/- 2.6%)		18.6% (+/- 5.9%)	16.0% (+/- 4.4%)
Adults (18 and older)	15.1%	18.9% (+/- 1.0%)	↑	19.2% (+/- 2.5%)	21.8% (+/- 2.4%)
Seniors (65 and older)	5.9%	5.2% (+/- 1.3%)	↓	2.9% (+/- 1.8%)	10.6% (+/- 5.7%)
Families with female headed household	26.0%	34.2% (+/-5.3%)	↑	40.8% (+/- 9.6%)	31.9% (+/- 11.9%)
Data source for 2000 Demographic, Social and Economic conditions is the Census 2000 Summary files					
Data source for 2010 Demographic, Social and Economic conditions is the American Community Survey, 5 year estimates. One year estimates from the American Community Survey are also provided for 2009 and 2010.					

Figure 1 and Table 4 (below) provide another example of the importance of carefully choosing data sources when reviewing historical conditions in Boone County. The American Community Survey is relatively new, having been fully implemented in 2005. Before then, the best yearly information on poverty was provided through the Small Area Income and Poverty Estimates (SAIPE). The SAIPE estimates used Census data and a variety of other sources in a “model” to generate an estimate for each year between the decennial Census. Figure 1 provides a visual representation of the poverty estimates from 1999-2010, using SAIPE data for 1999-2004, and 1- year ACS estimates for 2005-2010. There appears to be something wrong in the data with

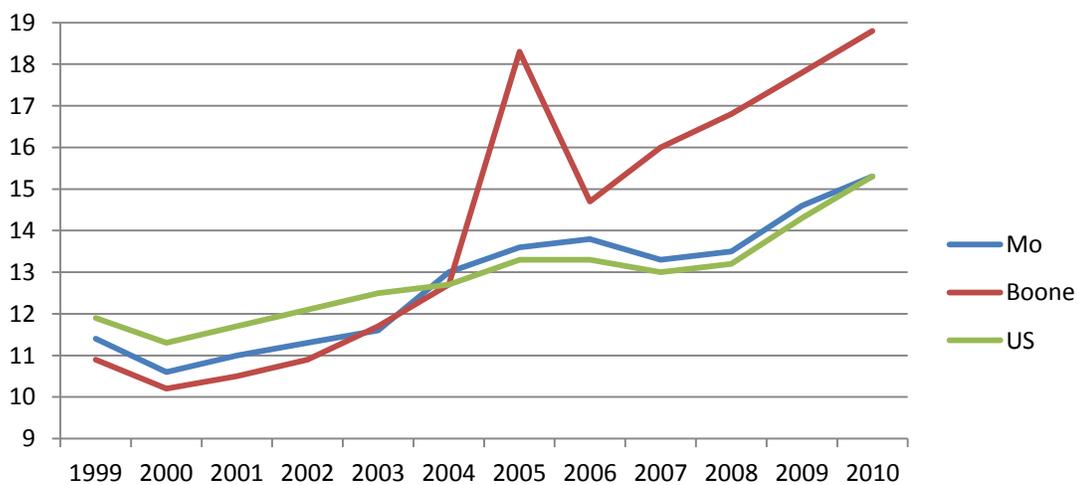
the transition from one source of data to the other, particularly in 2005. The Missouri Census Data Center reports that ACS income statistics are collected with a different method than the former decennial Census long-form figures, and that ACS income statistics are consistently lower than the Census figures, which results in higher poverty rates. See http://mcadc2.missouri.edu/pub/data/acs2005/Ten_things_to_know.shtml for more information about the difference between Census and ACS data. Number five specifically addresses income statistics.

Despite the changes in data collection for income, however, it is reasonable to conclude from Figure 1 that poverty has been increasing in Boone County over time, especially during the recession. Part of this change can be attributed to the nationwide economic downturn. However, starting in 2005 the data indicate that Boone County has a higher poverty rate than the rest of Missouri and the United States. There are two main reasons for the shape of the Boone County poverty line in Figure 1 (below):

1. The change in the way yearly poverty rates are reported (i.e. the difference between SAIPE and the American Community Survey); and
2. Demographic shifts in Boone County over the past five years.

Focusing on demographic shifts, the student population for Boone County is growing and students have a higher rate of poverty than other demographic groups. Poverty rates are determined by income, and do not include other sources of money like student loans or financial support from parents. Likewise, the income reported in ACS does not include the savings that seniors may be spending in retirement (although income statistics DO include Social Security, pensions and investment income). Boone County is not alone in this poverty rate pattern. A similar pattern (including the data glitch in 2005) has been observed in other Midwestern “college towns” like Johnson County, Iowa, home to the University of Iowa. Table 4 provides the data points on poverty and margins of error for Boone County, Missouri and the US.

FIGURE 1: POVERTY RATE



Source: Small Area Income and Poverty Estimates (SAIPE-1999-2004) & ACS 1 year estimates (2005-2010)

TABLE 4: POVERTY RATE

	Mo		Boone		U.S.	
	<i>Rate</i>	<i>Margin of Error +/-</i>	<i>Rate</i>	<i>Margin of Error +/-</i>	<i>Rate</i>	<i>Margin of Error +/-</i>
1999	11.4	0.85	10.9	2.55	11.9	0.35
2000	10.6	1.3	10.2	2.15	11.3	0.3
2001	11	0.65	10.5	2.3	11.7	0.2
2002	11.3	0.7	10.9	2.4	12.1	0.02
2003	11.6	0.7	11.7	2.55	12.5	0.25
2004	13	0.95	12.7	2.9	12.7	0.25
2005	13.6	0.3	18.3	2	13.3	0.1
2006	13.8	0.3	14.7	1.95	13.3	0.1
2007	13.3	0.3	16	1.8	13	0.05
2008	13.5	0.3	16.8	1.9	13.2	0.1
2009	14.6	0.3	17.8	2	14.3	0.05
2010	15.3	0.3	18.8	1.7	15.3	0.1

Source: Small Area Income and Poverty Estimates (SAPIE), U.S. Census & ACS Data
 * 90% Confidence

In conclusion, the U.S. Census and the American Community Survey provide important information about the demographic, social and economic conditions in Boone County, and provide an instrument to track changes over time. It is, however, important to consider the “fine print” when examining Census and ACS data—especially margins of error for statistics about population subgroups like seniors or children living in poverty. In general, the smaller the population group of interest, the more the margin of error must be considered.