

**Demographic and Socioeconomic Change**  
**in Appalachia**

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**EDUCATIONAL ATTAINMENT**  
**IN APPALACHIA**

by

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**Population Reference Bureau**

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## About This Series

“Demographic and Socioeconomic Change in Appalachia” is a series of reports that examine demographic, social, and economic levels and trends in the 13-state Appalachian region. Each report uses data from the decennial censuses of 1990 and 2000, plus supplemental information from other data sources.

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### **Population Reference Bureau**

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The Appalachian Regional Commission’s mission is to be an advocate for and partner with the people of Appalachia to create opportunities for self-sustaining economic development and improved quality of life.

Educational attainment of the adult population is probably the local characteristic that economic development officials most want to highlight in presentations to prospective investors and employers. This is partly a simple argument about the workforce. Workers who have persisted and succeeded in their academic career are more likely than others to have the specific skills, general knowledge, ability to acquire new skills, and other personal characteristics that employers value. The concern with educational attainment is also in part a concern for markets and local quality of life. Firms that sell detailed geographic data to those making decisions on facility location rely heavily in categorizing areas on data about educational attainment (and its close corollaries, incomes and occupation).

Trends and differences in educational attainment are of more than local concern, though. With some justice, Americans have always regarded the educational system as an engine of social mobility and a means for ensuring civic participation. Individual differences in academic success are always expected. But persistent differences in educational attainment among regions, like persistent differences among races and social classes, suggest that the engine is not working.

As Robert Mare pointed out in his analysis of educational attainment data from the 1980 and 1990 censuses, the twentieth century saw a steady narrowing of sex, racial, regional, and class differences in enrollment rates at the elementary and secondary levels, as well as a steady improvement in the educational attainment of the adult population.<sup>1</sup> While it is too soon to close the book on differences in dropout rates at these levels, this paper will focus on what Census 2000 data tell us about the persistence of regional

differences in high school completion and tertiary education, essential predictors of how populations will fare in a global, knowledge-based economy in the new century.

### **Regional and National Trends**

For Appalachia, the 1990s were a decade of progress in absolute but not relative terms. As Table 1 shows, the percentage of the adult population who are college graduates increased during the 1990s in Appalachia and in each sub-region, as it did in the country as a whole. But the gap between the Appalachian region and the US as a whole grew slightly, from 6.1 percentage points to 6.6 percentage points. The increase in Appalachia in the percentage of college graduates was somewhat greater in Southern Appalachia than in Central or Northern Appalachia. Central Appalachia in 2000 had less than half the national proportion of college graduates. This reflects a “rich get richer” trend: growth in the proportion of college graduates was fastest in the counties classified as “attainment” counties (using the 2000 classification), which were already above the national average in 1990. By contrast, the slowest growth in this proportion during the decade was in the distressed counties.

*Table 1*

#### **Percentage of Adult Population Who Are College Graduates, 1990 and 2000**

	<b>1990</b>	<b>2000</b>
U.S. Total	20.3	24.4
Appalachia	14.3	17.7
North	14.4	17.7
Central	8.8	10.7
South	15.4	19.2
Distressed	8.5	10.2
Transitional	13.1	16.1
Competitive	17.4	22.0
Attainment	23.1	29.1

Sources: 1990 Census, STF3 file and 2000 Census, SF3 file, PRB analysis.

The increases during the 1990s were a continuation of a long-term national trend. But in the last decade, the increase has slowed down. Between 1960 and 1980, the average number of years of schooling for workers nationwide grew by just under two years. This slowed to an increase of less than one year during the subsequent two decades, 1980-2000.<sup>2</sup>

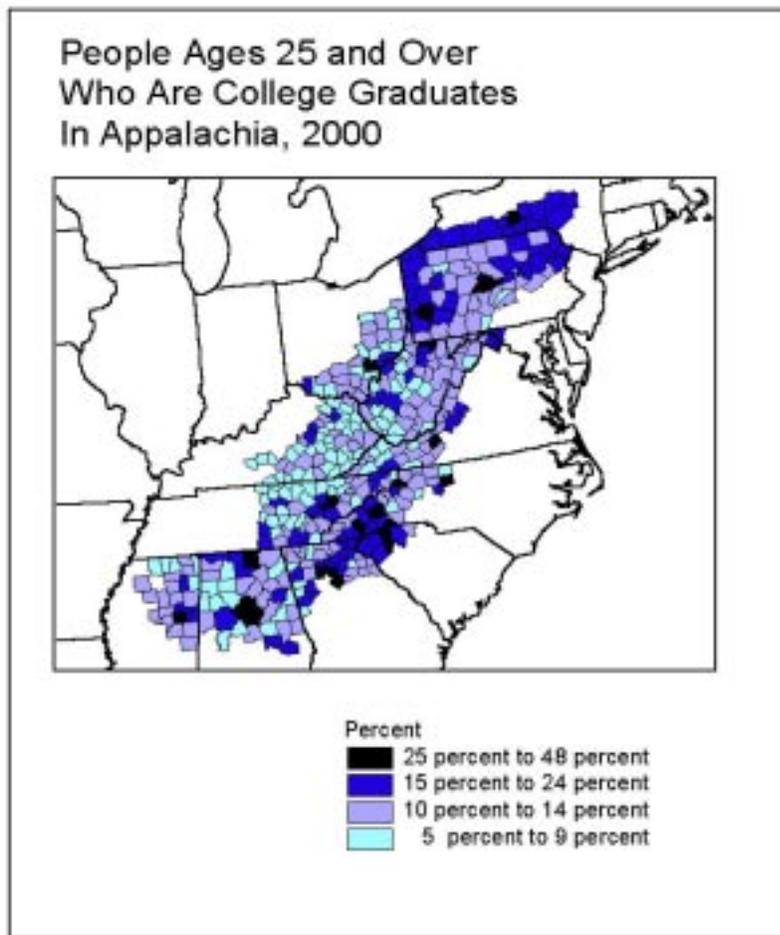
The college enrollment gap between upper-income and lower-income families grew during the 1980s and early 1990s: the percentage enrolling in college increased from 55 percent in 1980-82 to 66 percent in 1992 for recent high-school graduates from families in the upper fifth of the income distribution, while for all high-school graduates, the percentage rose from 39 percent to only 45 percent.<sup>3</sup> Once in college, students from poorer families are more likely to drop out. A recent analysis of attrition of Berea College students, mostly Appalachian residents, found that even with full tuition scholarships, almost no room and board costs, and a standardized work-study program, students from low-income families were at considerably greater risk of dropping out than students from more middle-class families. This difference remained even in an analysis that took into account their high-school grades, scores on college entrance tests, and academic achievement at their high schools.<sup>4</sup> The authors conclude “family environment” – limited expectations for educational success, not counteracted by encouragement from teachers and other early mentors – can be as great an impediment as the direct and opportunity costs of college attendance.<sup>5</sup>

### **Geographic Variation**

The map in Figure 1 shows the percentage of the adult population in each Appalachian county who were college graduates in 2000. The counties with the darkest

shading are those where the proportion of graduates was above the national average; those with the lightest shading had fewer than one in ten adults with college degrees. The counties with low educational attainment are concentrated in central Appalachia, especially in the mining regions. The counties with high educational attainment are scattered around the region, with concentrations around metropolitan Atlanta and along a belt leading from eastern Tennessee and Western North Carolina up Interstate 81. As Table 2 shows, only 18 of the 410 Appalachian counties had a higher percentage of college graduates among their adult population than the national average of 24.4 percent. Most of the counties in this list are homes to large universities: Cornell; Virginia Tech; Pennsylvania State University, the universities of Ohio, West Virginia and Tennessee, Appalachian State University, Wake Forest and Mississippi State University. This is not just an artifact of their high student populations, because the measure of educational attainment is only for the population aged 25 and above, which excludes all but a small fraction of the student population. Eight of these counties are estimated to be growing in population faster than the national average (3.3 percent), and all but four counties were growing faster than the average for the Appalachian region (2.2 percent), according to estimates published by the US Census Bureau for the years 2000-2003.

Figure 1



Source: U.S. Census Bureau, 2000 Census

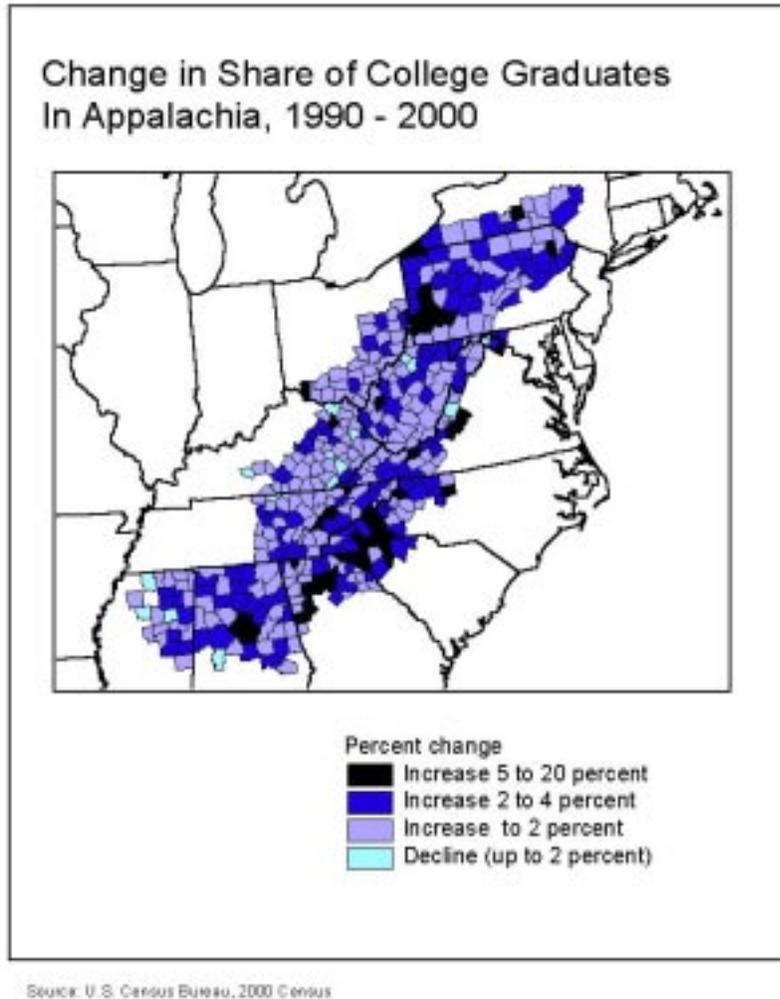
**Table 2**  
**Appalachian Counties with Proportions of College Graduates above U.S. Average, 2000**

<b>County</b>	<b>% College graduates, 2000</b>	<b>Population growth, 2000-2003</b>
Tompkins, NY	47.5	5.1
Shelby, TN	36.8	1.0
Centre, PA	36.2	4.3
Montgomery, VA	35.6	2.3
Oktibbeha, MS	34.8	-0.8
Madison, TN	34.2	2.2
Gwinnett, GA	34.1	14.4
Watauga, NC	33.2	0.3
Monongalia, WV	32.4	3.1
Knox, TN	29.0	2.9
Forsyth, NC	28.7	3.8
Cherokee, GA	27.0	17.4
Greenville, SC	26.2	4.1
Polk, NC	25.8	2.7
Athens, OH	25.7	3.5
Jackson, NC	25.5	3.6
Buncombe, NC	25.3	3.1
Jefferson, AL	24.6	-0.6
United States	24.6	3.3

Source: 2000 Census, SF3, PRB analysis, and US Census Bureau estimates, April 2004.

Figure 2 shows the change during the 1990s in the proportion of college graduates for counties in the region. Those shaded brown and red, depicting rapid increase in educational attainment, are largely the metropolitan or “metropolitan contiguous” counties around Pittsburgh, Atlanta, the edges of the New York metropolitan area, and some smaller cities like Asheville NC and Montgomery AL. As Richard Couto found in an analysis of data from the 1970, 1980, and 1990 Censuses, the metropolitan counties again in the 1990s set the pace in growth of the college-educated population.<sup>6</sup> The counties shaded dark blue, with declining proportions of college graduates in the adult population, are scattered around the region but with greatest concentration in Central Appalachia. These county-level maps confirm the “rich get richer” picture seen for the larger region and sub-regions in Table 1.

Figure 2



In every state except Alabama and South Carolina, the proportion of adults who are college graduates is lower in the Appalachian counties than in the rest of the state (Table 3). The gap is especially wide in Maryland (a state with an especially high proportion of college graduates), Virginia, Ohio, and Kentucky. In every state except Alabama, New York, and Pennsylvania, the Appalachian counties have higher proportions of the adult population without a high-school diploma or GED. Virginia and Kentucky are again among the states with the widest disparities. In Maryland, North

Carolina, and Virginia, the Appalachian counties had more adults with less than high-school education than college graduates, while the reverse was true for the rest of the state.

*Table 3*  
**Educational Attainment of Population aged 25 and over, by State, for Appalachian and non-Appalachian Counties, 2000**

	% Less than HS		% College graduates	
	Appalachia	Non-Appalachia	Appalachia	Non-Appalachia
Alabama	24.6	25.1	19.3	18.5
Georgia	23.3	20.7	21.0	25.5
Kentucky	37.5	21.3	10.5	19.8
Maryland	21.4	15.9	14.4	32.3
Mississippi	31.9	25.8	14.0	17.7
New York	16.9	21.2	20.8	27.8
North Carolina	24.2	21.3	19.1	23.3
Ohio	21.8	16.3	12.3	22.4
Pennsylvania	17.3	18.9	19.1	25.4
South Carolina	24.7	23.3	20.6	20.4
Tennessee	26.6	22.2	17.2	21.5
Virginia	30.2	17.3	14.8	31.0
West Virginia	24.8	NA	14.8	NA

Notes: "College graduates" includes those with post-baccalaureate degrees. All counties in West Virginia are included in Appalachia.

Source: PRB tabulations of Census 2000 data, SF3 release.

These intrastate differences are discouraging, because they persist after nearly three decades of reform intended to even out disparities in funding among school districts. Alabama, Tennessee, Kentucky and West Virginia are among the states where courts have ordered school finance equalization; in several other Appalachian states reform has been initiated by the legislatures.<sup>7</sup>

## **Migration**

The educational attainment of the adult population now resident in Appalachia reflects both the performance of the region's schools systems and the success of its graduates in higher education, and also the in- and out-migration of persons with different

levels of schooling. To the extent that Appalachian residents who complete higher education within the region stay, and both original residents and others completing higher education outside the region move in, then the working-age population with higher education grows. Appalachia will lose ground relative to the rest of the country if its “balance of trade” with the rest of the country is not positive, that is, to the extent that those moving into the region have lower levels of education than those moving out.

To analyze the effect of migration on the educational attainment of the working age population, we have selected five groupings of counties, to illustrate the range of conditions within the Appalachian region.<sup>8</sup> These groupings of counties include:

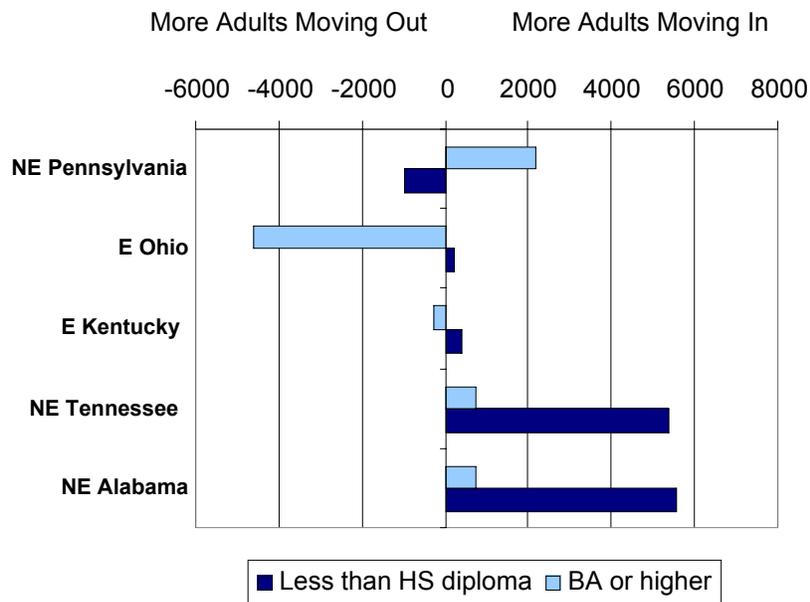
- Seven counties in north-central Alabama. In 2003, the Appalachian Regional Commission classified two of these as competitive counties, four as transitional, and one as distressed. Three of the seven gained population during the 1990s more rapidly than the nation as a whole, and none lost population.
- Twenty counties in northeastern Tennessee. Twelve of these are designated transitional, and seven distressed. All gained population during the 1990s; Cumberland county, grew much faster than the national average.
- Twenty-six counties in eastern Kentucky, stretching from Greenup in the north to Whitley along the Tennessee border. Two form part of metropolitan Huntington, four are “micropolitan” in the new classification, and the rest are outside micro- or metropolitan areas. All but two are distressed counties; and two counties are now designated transitional. All grew moderately in population during the 1990s.
- Thirteen counties of southeastern Ohio, including Athens, home of the University of Ohio. Eight were designated distressed in 2003, and five transitional. Noble and Vinton counties grew rapidly during the 1990s, while Monroe county (like other Ohio counties to its north and West Virginia counties to the east) lost population.
- Eight counties of north central and northeast Pennsylvania, including rapidly growing Monroe and Pike counties on the fringes of the New York metropolitan area and a tier of four counties along the border with upstate New York. These counties were all designated transitional in 2003.

None of these five sub-regions is a microcosm of Appalachia. But they do represent the variation found within the region in economic prosperity, migration and population growth, and distance from metropolitan areas.

The effect of migration on educational attainment among the adult population varies among these sub-regions. As Figure 3 shows, of the five sub-regions examined, three (Alabama, Kentucky, and Tennessee) had a net in-migration during 1995-2000 of adults with less than a high school education. In Ohio and Pennsylvania, the numbers of in-migrants and out-migrants without high-school diplomas balanced almost exactly. At the other end of the educational spectrum, those with college degrees or higher, three sub-regions also gained through migration (Alabama, Pennsylvania and Tennessee), Kentucky had a near balance in the flow of college graduates, and only Ohio lost a significant number of college graduates through migration in those years.

*Figure 3*

**Net Migration of Adults by Educational Attainment, Appalachian Sub-Regions, 1995-2000**



Source: PRB tabulations of 1% PUMS, Census 2000.

**Table 4**  
**Percentage of College Graduates aged 25-34 who Lived in a Different State in 1995**

U.S. Total	23.4
<hr/>	
Appalachian sub-regions	
N Alabama	17.0
NE Tennessee	11.3
E Kentucky	11.0
SE Ohio	23.2
NE Pennsylvania	21.4

Source: PRB tabulations of 1% PUMS, Census 2000

As is true for the rest of the country, Appalachian residents with less education tend not to move long distances. College graduates, who are more likely to participate in national labor markets, are most likely to move across state boundaries. Nearly a quarter of 25-34-year-olds with college degrees lived in a different state in 2000 than they had in 1995, compared with only one in ten of those with high-school diplomas only. But the more deprived Appalachian sub-regions appear not to be attracting their share of these mobile, well educated young adults. As Table 4 shows, Eastern Kentucky and Northeastern Tennessee had far lower percentages of in-migrants among their young adult residents with college degrees.

Using detailed county-by-county tables released after the 1990 Census, Obermiller and Howe showed that the Appalachian region had a favorable “balance of trade” in college students – those currently enrolled. Northern and Southern Appalachia had about 100,000 more college students coming into the region than residents enrolled elsewhere. Central Appalachia had a small net deficit, of around 4,000 students. But migration of people aged 25 and over during 1985-90 offset somewhat the flow of students, as about 20,000 more college graduates left than moved into the Appalachian region.<sup>9</sup>

The effect of international migration on educational attainment in the Appalachian region has so far been small, mainly because the region has a much lower percentage of residents who were born in other countries (3 percent of the Appalachian population, compared with 12 percent of the US population as a whole). As for the nation as a whole, the foreign-born in Appalachia are more likely than those born in the US to have less than a high-school education – but they are also more likely to have a college degree than are native-born adults. In other words, immigrants are disproportionately represented at the two ends of the educational distribution.

### **Age Patterns – Closing the Gap?**

The standard Census tables (SF3) for counties show educational attainment for the entire population over age 25. Though there are people who go back after a long absence and obtain a diploma or complete a degree, most Americans complete their formal education early in adulthood. For this reason, the educational attainment of the adult population as a whole changes fairly slowly, as younger, more educated cohorts reach age 25 and the older, less educated cohorts die off. The education gap between 50-year-olds in Appalachia and 50-year-olds in the rest of the U.S. tells us more about conditions two or three decades ago than about recent developments. If Appalachian regions are catching up to the national average in college graduation rates, we would expect to see this most clearly in the younger cohorts, even if the gap still remains large in the adult population as a whole.

Two separate stories emerge from an examination of educational attainment by age groups among adults. One is a picture of success for the Appalachian region, in

terms of high school completion rates. Table 5 shows that younger adults in Tennessee, Kentucky and Ohio are considerably more likely to be high school graduates than are older adults in the same places (unlike the nation as a whole, for which there is virtually no difference across ages 25 to 59.) For 45-59-year olds, for example, Eastern Kentucky is 22 percentage points below the national proportion of high-school graduates, while for 25-34 year-olds, the gap is 9 percentage points. Since those with less than high-school education are the workers who have suffered actual wage decreases, due to competition from workers overseas and immigrants,<sup>10</sup> closing this gap is very important for the region. Table 6 is similar to Table 5, but shows percentages of those who have graduated from college. In no region is there clear evidence of the college graduation gap narrowing.

**Table 5**  
**High School Completion by Age, U.S. Total and Appalachian Sub-Regions, 2000**

	<b>Ages 25-34</b>	<b>35-44</b>	<b>45-59</b>	<b>60+</b>
U.S. Total	83.9	85.0	84.9	68.0
Appalachian sub-regions				
N Alabama	82.8	83.4	82.0	60.4
NE Tennessee	75.0	73.9	70.9	44.1
E Kentucky	74.9	70.5	62.2	38.1
SE Ohio	85.7	86.6	79.7	65.5
NE Pennsylvania	86.6	88.0	86.1	67.8

Source: 2000 Census Public Use Microdata Sample, PRB analysis.

**Table 6**  
**College Graduation Rates by Age, U.S. Total and Appalachian Sub-Regions**

	<b>Ages 25-34</b>	<b>35-44</b>	<b>45-59</b>	<b>60+</b>
U.S. Total	27.5	26.0	27.7	16.5
Appalachian sub-regions				
N Alabama	22.6	27.8	24.8	12.4
NE Tennessee	12.4	10.8	12.2	6.9
E Kentucky	10.6	9.5	10.5	7.6
SE Ohio	14.6	15.0	14.6	9.3
NE Pennsylvania	18.3	16.7	20.6	11.9

Source: 2000 Census Public Use Microdata Sample, PRB analysis.

These cohort differences suggest that Appalachian school systems (and for that matter, Appalachian families) have improved in their ability to keep children in school through graduation, and narrowed the gap with the rest of the country. But the Appalachian region is not producing, retaining, or attracting college graduates fast enough to narrow the gap at the high end of the educational spectrum.

Table 7 focuses on the younger working age population, those aged 25-34 in 2000, most of whom completed their formal education in the late 1980s and early 1990s. In parentheses below the “some college” percentage are the percentage of persons in each

age group whose highest educational attainment is an Associates degree, most of which are awarded by community colleges. All of the Appalachian sub-regions lag behind the U.S total in college degrees in this age group, both for men and women. Of the five sub-regions, only Northeast Alabama (women and men) and Northeast Pennsylvania (women only) have more than a fifth of the population with college degrees. The picture is more mixed for Associates degrees: young women in three of the five Appalachian sub-regions are above the national average for their age group, as are young men in two of the sub-regions.

One trend revealed by Table 7 that Appalachia shares with the rest of the country is the reversal of the gender gap in college graduation rates. The proportion of new degrees awarded to women has been climbing ever since World War II, and ever since the mid-1970s, more young women than men have graduated from college.<sup>11</sup> More Associates degrees have been awarded to women than men nationwide since the late 1970s. Despite increases in the proportion of graduate and professional degrees awarded to women during the same decades, though, men still dominate in post-graduate education. The combined effect of these trends is seen in the higher educational attainment for women than for men in the 25-34 age group, in the nation as a whole and in Appalachian sub-regions. These are young people who completed their schooling in the 1990s. In each of the Appalachian sub-regions, women in this age groups are more likely than men to have college degrees or higher, and for those without college degrees, women are more likely to have Associates' degrees.

**Table 7**  
**Educational Attainment of Young Adults (ages 25-34), 2000**

	Less than HS	Some college (Associate's Degree)	College graduate
<u>Both Sexes</u>			
U.S. Total	16.1	30.7 (7.5)	27.5
Appalachian sub-regions			
N Alabama	17.2	32.9 (7.3)	22.6
NE Tennessee	25.0	20.8 (3.8)	12.4
E Kentucky	25.1	26.7 (5.8)	10.6
SE Ohio	14.3	32.0 (7.2)	14.6
NE Pennsylvania	13.4	27.9 (8.5)	18.3
<u>Women</u>			
U.S. Total	14.2	32.3 (8.5)	29.3
Appalachian sub-regions			
N Alabama	14.5	37.6 (7.6)	24.8
NE Tennessee	21.8	23.0 (5.2)	13.9
E Kentucky	24.0	30.7 (8.8)	11.0
SE Ohio	12.9	35.1 (9.1)	17.5
NE Pennsylvania	10.9	29.1 (9.5)	23.1
<u>Men</u>			
U.S. Total	18.0	28.6 (6.6)	25.8
Appalachian sub-regions			
N Alabama	19.8	28.3 (7.0)	20.4
NE Tennessee	28.0	18.8 (2.5)	11.0
E Kentucky	26.3	22.2 (5.3)	10.1
SE Ohio	15.7	29.0 (5.3)	11.8
NE Pennsylvania	15.7	26.8 (7.6)	13.9

Source: 2000 Census Public Use Microdata Sample, PRB analysis.

The educational attainment of the younger members of the work force is the most revealing indicator for the region's future, but it is also worth examining the educational attainment of those in prime earning ages, approaching retirement years. Education as a younger adult is the single most powerful predictor of health status at older ages.<sup>12</sup> So the educational attainment of the current pre-retirement population portends the future challenges of an aging population for the region.<sup>13</sup> Table 8 shows educational attainment

for persons aged 45-59 in 2000, for the US as a whole and for five sub-regions of Appalachia.

The picture is not encouraging. All five sub-regions have lower proportions of college graduates in this age group than the U.S. total, and only Northeast Pennsylvania has a lower percentage of persons with less than high-school education.

*Table 8*  
**Educational Attainment of Older Working-Age Adults (ages 45-59), 2000**

	<b>Less than HS</b>	<b>Some college</b>	<b>College graduate</b>
U.S. Total	15.1	29.1	27.7
Appalachian sub-regions			
N Alabama	18.0	29.2	24.8
NE Tennessee	29.1	19.7	12.1
E Kentucky	37.8	19.0	10.5
SE Ohio	20.2	23.5	14.6
NE Pennsylvania	13.8	24.7	20.6

Source: 2000 Census Public Use Microdata Sample, PRB analysis.

## **Implications**

The demand for educated workers has more than kept pace with the supply of educated workers in the U.S. economy in recent decades, so that “current economic returns to a college education are at least as high as they have been in sixty years.”<sup>14</sup> The widening during the 1990s of the gap in college graduation rates between Appalachia and the rest of the nation is not a good portent for efforts to close the income gap and develop the regional economy. The lagging of Central Appalachia, especially the distressed counties, is especially discouraging.

Against this background, though, some bright spots stand out: many university counties in Appalachia have higher proportions of college graduates than the national average, and some saw rapid increases in educational attainment during the 1990s. This

suggests that the universities are serving as growth poles for the knowledge economy of their regions, not just as sources of educated out-migrants benefiting the rest of the country. The increase in the proportion of the working-age adult population with some college attendance, particularly those with Associates degrees, is also a promising sign. Several studies have found that returns to each year of college education are high (about 5-8 percent increase in earnings) and that Associates degrees, particularly in technical fields, are valued by employers.<sup>15</sup>

During the next two decades, the “college-age” population of the Appalachian region is expected to grow very little.<sup>16</sup> This may provide a window of opportunity for institutions of higher education to concentrate on increasing the proportion of college-graduates in the working-age population, both by reducing attrition among those who start college and providing opportunities to finish for the large numbers of people with some college education, but no degree. Young people, especially college graduates, are highly mobile. The Appalachian sub-regions with especially low educational attainment among working adults are those that have failed to attract their share of educated in-migrants from other states.

Discussions of education policy usually focus on narrowly economic benefits. Increasing educational attainment should be valuable to individuals, whether they leave home or not, and, insofar as the educated young workforce stays near home, to the region trying to attract investment and maintain a strong tax base. But there are political and cultural benefits as well, again both for individuals and communities. These are harder to measure, indeed invisible in the Census data used here, but may be as important in the long run as the income effects. Cynthia Duncan, in a perceptive analysis of rural poverty

in three rural counties, including one in Eastern Kentucky, quotes extensively from residents now working as teachers or social workers. Higher education gave them personally a wider view of what was possible, and they see education as a key to community development as well. One of her sources described progress in another (pseudonymous) eastern Kentucky county, near an Interstate, where economic development, educational attainment, and an improved civic life are mutually reinforcing:

In [the pseudonymous] county the people who might have left, with an education, stayed when new jobs came in. And they started to do things differently. Mothers Against Drunk Driving organized to oppose the corrupt court that was letting drunk drivers go because they had large families that voted for these officials. People who cared about education started running for the school board. People started letting the county judge know what they wanted – not jobs for their cousins, but roads and litter control, garbage pickup.... But for any of this to happen, people got to have education, and they have got to have a job outside the reach of the power structure.<sup>17</sup>

This nicely illustrates the complementarity of investments in physical infrastructure (the Interstate) and human capital, and the payoff of both for seemingly unrelated areas like public health and the environment. People with higher education not only earn higher salaries and pay higher taxes, they expect more for themselves, their children, and their communities. “But for any of this to happen, people got to have education.”

## Appendix

A word of caution is needed about the quality of Census data on educational attainment. Data on education attainment were reported on the sample questionnaire (“long form”) of the Census, sent to about a sixth of households. Like all estimates based on samples rather than a complete enumeration, the long form data are subject to sampling error, which is worth noting especially for counties with small populations, and small changes in the estimated percentages of college graduates. But data on educational attainment are also subject to “non-sampling error”, which is difficult to quantify or to adjust for with statistical methods. Survey analysts describe a pattern of “degree creep,” a tendency of respondents to exaggerate past accomplishments. Between decennial censuses, the percentages of people in a particular cohort with college, graduate, or professional degrees tends to increase, out of proportion to what can be accounted for by actual adult education. Dan Black and his colleagues compared 1990 Census data with more detailed data collected in a face-to-face survey, and found evidence that the Census data overstate the prevalence of graduate degrees.<sup>18</sup> There is no reason to believe that “degree creep” is any greater a problem for data from Appalachia than anywhere else in the country, so geographic comparisons should not be affected. But comparisons over time (within cohorts) could be affected. Most of the increase in educational attainment over time, for Appalachia and the rest of the nation, is real, but part of the increase, especially for older people, is wishful thinking on the part of respondents.

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<sup>1</sup> Robert Mare, "Changes in Educational Attainment and School Enrollment," in *State of the Union: America in the 1990s*, vol. II, Reynolds Farley, ed. (New York: Russell Sage Foundation, 1995). 155-214.

<sup>2</sup> J. Bradford DeLong, Claudia Goldin, and Lawrence F. Katz, "Sustaining U.S. Economic Growth," in *Agenda for the Nation*, Henry J. Aaron, James M. Lindsay, and Pietro S. Nivola, ed. (Washington, DC: Brookings Institution Press, 2003).17-60. Table 2-1.

<sup>3</sup> David T. Ellwood and Thomas Kane, "Who Is Getting a College Education? Family Background and the Growing Gaps in Enrollment" in *Securing the Future: Investing in Children from Birth to College*, Sheldon Danziger and Judith Waldfogel, eds., Russell Sage: New York, 2000: 283-324.

<sup>4</sup> Ralph Stinebrickner and Todd R. Stinebrickner, "Understanding Educational Outcomes of Students from Low-Income Families: Evidence from a Liberal Arts College with a Full Tuition Subsidy Program" *Journal of Human Resources*, 38, Summer 2003: 591-617.

<sup>5</sup> This inference from a statistical study is echoed in more qualitative form by many of the Kentucky residents interviewed by Cynthia Duncan, 1999, ch. 1.

<sup>6</sup> Richard A. Couto. *An American Challenge: A Report on Economic Trends and Social Issues in Appalachia*. (Dubuque, IA: Kendall-Hunt, 1994). 181-82.

<sup>7</sup> William N. Evans, Sheila E. Murray, and Robert M. Schwab, "Schoolhouses, Courthouses, and Statehouses after *Serrano*," *Journal of Policy Analysis and Management*, 16(1997): 10-31.

<sup>8</sup> To protect the confidentiality of respondents, the Census Bureau does not release microdata at the county level. Thus for analyses that go beyond the tables released by the Bureau for every county in the nation, we cannot use data covering exactly the Appalachian region, or particular regional of economic grouping of counties. The five sub-regions used here are "Super-PUMAs" (Public Use Microsample Areas) designated by the Census Bureau: numbers 01100 (north central Alabama), 47030 (northeast Tennessee), 21300 (eastern Kentucky), 39120 (east-central Ohio) and 42030 (northeast Pennsylvania).

<sup>9</sup> Phillip J. Obermiller, Phillip J. and Steve R. Howe. *Appalachian Migration Patterns, 1975-1980 and 1985-1990*. (Lexington, KY: Appalachian Center, University of Kentucky, 2000). Table 9b.

<sup>10</sup> James P. Smith and Barry Edmonston, eds. *The New Americans: Economic, Demographic, and Fiscal Effects of Immigration*. Panel on the Demographic and Economic Impacts of Immigration, National Academy Press: Washington DC, 1997

<sup>11</sup> David Cotter, Joan Hermsen, and Reeve Vanneman. *Gender Inequality at Work*. (Washington, DC: Population Reference Bureau, 2004, forthcoming).

<sup>12</sup> Mark D. Hayward and Bridget K. Gorman. "The Long Arm of Childhood: The Influence of Early-Life Social Conditions on Men's Mortality", *Demography*, 41, 1, 2004: 87-108.

<sup>13</sup> Haaga, John. *Aging in Appalachia*. (Washington DC: Population Reference Bureau, 2004).

<sup>14</sup> DeLong, et al., p. 18.

<sup>15</sup>See Thomas J. Kane and Cecilia E. Rouse, "The Community College: Educating Students at the Margin between College and Work," *Journal of Economic Perspectives* 13 (1999): 63-84, for a review.

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<sup>16</sup> Regional Economic Models, Inc. Unpublished demographic projections (2004).

<sup>17</sup> Cynthia M. Duncan. *Worlds Apart: Why Poverty Persists in Rural America*. (New Haven, CT: Yale University Press, 1999) p. 71-72.

<sup>18</sup> Dan Black, Seth Sanders, and Lowell Taylor, "Measurement of Higher Education in the Census and CPS." Working paper, Maryland Population Research Center (2003).