

# CREATING A CULTURE OF HEALTH IN APPALACHIA

## DISPARITIES AND BRIGHT SPOTS



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# CREATING A CULTURE OF HEALTH IN APPALACHIA

## DISPARITIES AND BRIGHT SPOTS





*Creating a Culture of Health in Appalachia: Disparities and Bright Spots* is an innovative research initiative sponsored by the Robert Wood Johnson Foundation (RWJF) and the Appalachian Regional Commission (ARC) and administered by the Foundation for a Healthy Kentucky. This multi-part health research project will, in successive reports: measure population health and document disparities in health outcomes in the Appalachian Region compared to the United States as a whole, as well as disparities within the Appalachian Region; identify “Bright Spots,” or communities that exhibit better-than-expected health outcomes given their resources; and explore a sample of the Bright Spot communities through in-depth, field-based case studies. Taken together, these reports will provide a basis for understanding and addressing health issues in the Appalachian Region. This research initiative aims to identify factors that support a Culture of Health in Appalachian communities and explore replicable activities, programs, or policies that encourage better-than-expected health outcomes that could translate into actions that other communities can replicate.

**This first report, *Health Disparities in Appalachia*, measures population health in Appalachia and documents disparities between the Region and the nation as a whole, as well as disparities within the Appalachian Region.**

### ABOUT THE APPALACHIAN REGION

The current boundary of the Appalachian Region includes all of West Virginia and parts of 12 other states: Alabama, Georgia, Kentucky, Maryland, Mississippi, New York, North Carolina, Ohio, Pennsylvania, South Carolina, Tennessee, and Virginia (see Figure 1). The Region covers 205,000 square miles and 420 counties, and is home to more than 25 million people. Forty-two percent of the Region’s population is rural, compared with 20 percent of the nation’s.

The Appalachian Region's economy, which was once highly dependent on extractive industries, has become more diversified in recent times and now includes larger shares of manufacturing and professional services, among other industries. Appalachia has made significant progress over the past five decades: its poverty rate, which was 31 percent in 1960, had fallen to 17.2 percent over the 2010–2014 period. The number of high-poverty counties in the Region (those with poverty rates more than 1.5 times the U.S. average) declined from 295 in 1960 to 91 over the 2010–2014 period.

Despite the progress made in the Region, many challenges remain, with Appalachian incomes, poverty rates, unemployment rates, and postsecondary education levels still lagging behind performance at the national level. In addition to these socioeconomic deficits, for many of the health drivers and outcomes discussed in this report, the Region performs poorly when compared to the nation as a whole. Progress in the socioeconomic and health spheres are often interrelated, if not interdependent, and much work remains.

**Figure 1: Map of the Appalachian Region**



## MEASURING HEALTH DISPARITIES IN THE APPALACHIAN REGION

A range of indicators are used in this report to measure population health in Appalachia and document health disparities between the Region and the nation as a whole. This report includes 41 measures of population health, organized into 9 domains: Mortality, Morbidity, Behavioral Health, Child Health, Community Characteristics, Lifestyle, Health Care Systems, Quality of Care, and Social Determinants. The domains reflect:

- Current health status: Mortality, Morbidity, and Behavioral Health;
- Generational health and health care: Child Health, Health Care Systems, and Quality of Care; and
- Risk factors and determinants of health: Lifestyle, Community Characteristics, and Social Determinants.

The indicators provide an overview of population health and include both health outcomes—such as specific measures of mortality and morbidity—and factors that drive or influence health outcomes—such as smoking prevalence, physical inactivity, and the supply of healthcare providers.

The data in this report are broken down by national quintiles, which are groups of data points that have been divided into five equal parts consisting of approximately the same number of counties in each. The quintiles are calculated from national datasets and are thus based on the national distributions for each measure. The first quintile represents data points in the 20<sup>th</sup> percentile and below, the second quintile represents data points between the 20<sup>th</sup> and 40<sup>th</sup> percentiles, and so on. If the Appalachian Region’s distribution matched the national distribution, each quintile would contain 84 counties (20 percent of the

total counties in Appalachia). Organizing the data into quintiles provides insight into how county-level outcomes are distributed throughout the Region, and can also help answer the question as to whether outcomes in the Appalachian Region are proportional to the outcomes in the nation as a whole.

## KEY FINDINGS

Of the 41 indicators examined in this report, the Region performs better than the nation overall on 8: HIV prevalence, travel time to work, excessive drinking, student-teacher ratio, chlamydia prevalence, percentage of the population under age 65 that is uninsured, diabetes monitoring among Medicare patients, and the social association rate.

For the remaining 33 indicators in this report, the performance in the Appalachian Region is worse than the performance in the United States as a whole. This report includes 7 of the 10 leading causes of death in the United States: heart disease, cancer, chronic obstructive pulmonary disease (COPD), injury, stroke, diabetes, and suicide—and the Appalachian Region has higher mortality rates than the nation for each. Mortality due to poisoning—which includes drug overdoses—is markedly higher in the Region than the nation as a whole.

The Appalachian Region's number of physically unhealthy days, mentally unhealthy days, and prevalence of depression are all higher than the national averages for these measures. Obesity, smoking, and physical inactivity—risk factors for a number of health outcomes—are all higher in Appalachia than in the nation overall. The Region also has lower supplies of healthcare professionals when compared to the United States as a whole, including primary care physicians, mental health providers, specialty physicians, and dentists. Lower household incomes and higher poverty rates—both social determinants of health—reflect worse living conditions in the Region than in the nation as a whole.

This report also examines the *changes* over the last 20 years in eight measures: heart disease mortality, cancer mortality, stroke mortality, infant mortality, the supply of primary care physicians, poverty rates, education levels, and years of potential life lost. Over the past two decades, the Appalachian Region has experienced improvements in seven of the eight measures. However, the progress made by the Region often comes up short when compared to the progress made by the United States overall, and indicates a widening gap in overall health between Appalachia and the nation as a whole.

## Mortality

The measures in the Mortality domain examine cause-specific deaths within a population and also include a broad measure of premature mortality. There are seven measures of mortality included in this domain:

- Heart disease
- Cancer
- COPD
- Injury
- Stroke
- Diabetes
- Years of Potential Life Lost (YPLL)

**Each measure of mortality in this domain is higher (worse) in the Appalachian Region than in the nation as a whole.**

Every mortality indicator is higher in the Region than in the nation overall: heart disease is 17 percent higher; cancer is 10 percent higher; COPD is 27 percent higher; injury is 33 percent higher; stroke is 14 percent higher; and diabetes is 11 percent higher.

Considering death broadly, YPLL, a measure of premature mortality, is 25 percent higher in the Region than in the nation as a whole.

The Appalachian Region’s rural counties have higher mortality rates than the Region’s large metro counties for each of the indicators, signifying a stark rural-urban divide in the Region: heart disease is 27 percent higher; cancer is 15 percent higher; COPD is 55 percent higher; injury is 47 percent higher; stroke is 8 percent higher; and diabetes is 36 percent higher.

YPLL is 40 percent higher in rural Appalachian counties than in the Region’s large metro counties.

The distributions of the Mortality indicators among national quintiles for Appalachian counties are shown in Table 1. Of the 420 counties in the Appalachian Region, 163 counties (39 percent) have COPD mortality rates in the worst-performing national quintile, while only 27 counties in the Region (6 percent) are in the best-performing national quintile. There are 158 counties (38 percent) in the worst-performing national quintiles for both heart disease and cancer mortality. Only 13 counties (3 percent) are in the best-performing quintile for YPLL. These distributions show that mortality rates are disproportionately higher throughout the Appalachian Region when compared to the nation as a whole.

**Table 1: Distributions of Mortality Rates among National Quintiles for Appalachian Counties**

Indicator	Best Quintile		2nd Best Quintile		Middle Quintile		2nd Worst Quintile		Worst Quintile	
	#	Pct.	#	Pct.	#	Pct.	#	Pct.	#	Pct.
Heart disease deaths	15	4%	56	13%	76	18%	115	27%	158	38%
Cancer deaths	29	7%	49	12%	83	20%	101	24%	158	38%
COPD deaths	27	6%	54	13%	83	20%	93	22%	163	39%
Injury deaths	28	7%	59	14%	80	19%	106	25%	147	35%
Stroke deaths	40	10%	69	16%	90	21%	111	26%	110	26%
Diabetes deaths	60	14%	70	17%	91	22%	100	24%	99	24%
YPLL	13	3%	63	15%	81	19%	105	25%	156	37%

Data source for authors’ calculations shown above: Appalachian\_Health\_Disparities\_Data.xlsx. The number of counties across all five quintiles for each indicator may not sum to 420 due to missing or suppressed values.

## Morbidity

The indicators in the Morbidity domain explore the prevalence of disease and other health conditions. There are five indicators of morbidity in this report:

- Physically unhealthy days
- Mentally unhealthy days
- HIV prevalence
- Diabetes prevalence
- Obesity prevalence

**With the exception of HIV rates, the outcomes in Appalachia for each of these measures is higher (worse) than in the nation as a whole.**

Appalachian residents report 14 percent more physically unhealthy days and mentally unhealthy days than the nation as a whole. The diabetes prevalence rate in the Region (11.9 percent) is slightly higher than the nation overall (9.8 percent). Likewise, the prevalence of adult obesity is higher in Appalachia (31.0 percent) than in the United States as a whole (27.4 percent).

Residents of rural Appalachian counties have higher numbers of physically unhealthy days, higher numbers of mentally unhealthy days, higher diabetes prevalence, and a higher prevalence of obesity than residents of the Region’s large metro counties. Residents living in rural counties in the Region report 24 percent more physically unhealthy days than those living in large metro counties and 10 percent more mentally unhealthy days. Residents of rural Appalachian counties are also more likely to be obese than those living in large metro counties (33.1 percent compared to 29.5 percent).

The distributions of the Morbidity indicators among national quintiles for Appalachian counties are shown in Table 2. Considering mentally unhealthy days, 210 counties (50 percent) are in the worst-performing national quintile for this measure, while only 2 counties in the Region (less than 1 percent) are in the best-performing national quintile. Of the 420 counties in the Region, 180 are in the worst-performing national quintile for diabetes prevalence (43 percent), while only 12 counties (3 percent) are in the top-performing quintile. These results show that many health conditions are disproportionately worse throughout much of Appalachia when compared to the nation as a whole.

**Table 2: Distributions of Morbidity Indicators among National Quintiles for Appalachian Counties**

Indicator	Best Quintile		2nd Best Quintile		Middle Quintile		2nd Worst Quintile		Worst Quintile	
	#	Pct.	#	Pct.	#	Pct.	#	Pct.	#	Pct.
Physically unhealthy days	5	1%	39	9%	93	22%	106	25%	177	42%
Mentally unhealthy days	2	0%	19	5%	96	23%	93	22%	210	50%
HIV prevalence	89	21%	109	26%	104	25%	61	15%	20	5%
Diabetes prevalence	12	3%	32	8%	68	16%	128	30%	180	43%
Obesity prevalence	45	11%	69	16%	74	18%	106	25%	126	30%

Data source for authors’ calculations shown above: Appalachian\_Health\_Disparities\_Data.xlsx. The number of counties across all five quintiles for each indicator may not sum to 420 due to missing or suppressed values.

## Behavioral Health

The measures in the Behavioral Health domain examine issues related to both mental health and substance abuse. There are five measures in this domain:

- Depression prevalence among Medicare beneficiaries
- Suicide
- Excessive drinking
- Poisoning mortality
- Opioid prescriptions among Medicare beneficiaries

**While excessive drinking in the Appalachian Region is lower (better) than in the nation as a whole, the Region performs worse than the nation on each of the other measures in this domain.**

The poisoning mortality rate in Appalachia—which includes drug overdoses—is 37 percent higher than the national rate, and the suicide rate in the Region is 17 percent higher than the national rate. The prevalence of depression among Medicare beneficiaries is higher in the Region (16.7 percent) than in the nation as a whole (15.4 percent).

Residents of the Appalachian Region’s rural counties are 21 percent more likely to commit suicide than those living in the Region’s large metro counties, and the poisoning mortality rate is 40 percent higher in the Region’s rural counties than in its large metro counties. Depression prevalence among Medicare beneficiaries is also slightly higher in the Region’s rural counties (16.9 percent) than in its large metro counties (15.6 percent).

The distributions of the Behavioral Health indicators among national quintiles for Appalachian counties are shown in Table 3. For poisoning mortality, 195 of the 420 counties in the Appalachian Region (46 percent) are in the worst-performing national quintile, while only 24 counties (6 percent) are in the best-performing national quintile. For depression prevalence among Medicare beneficiaries, 161 counties (38 percent) are in the worst-performing national quintile, and only 22 counties (5 percent) are in the best-performing national quintile.

**Table 3: Distributions of Behavioral Health Indicators among National Quintiles for Appalachian Counties**

Indicator	Best Quintile		2nd Best Quintile		Middle Quintile		2nd Worst Quintile		Worst Quintile	
	#	Pct.	#	Pct.	#	Pct.	#	Pct.	#	Pct.
Depression prevalence	22	5%	54	13%	69	16%	114	27%	161	38%
Suicide incidence	46	11%	69	16%	108	26%	127	30%	70	17%
Excessive drinking	202	48%	92	22%	82	20%	41	10%	3	1%
Poisoning mortality	24	6%	31	7%	56	13%	114	27%	195	46%
Opioid prescriptions	51	12%	77	18%	91	22%	100	24%	101	24%

Data source for authors’ calculations shown above: Appalachian\_Health\_Disparities\_Data.xlsx. The number of counties across all five quintiles for each indicator may not sum to 420 due to missing or suppressed values.

### Child Health

Circumstances surrounding birth are explored in the Child Health domain. There are three measures in this domain:

- Infant mortality
- Low birth weight
- Teen births

**The Region performs worse than the nation on each of these measures.**

The infant mortality rate is 16 percent higher in the Appalachian Region than in the nation as a whole, and the percentage of low birth weight babies is higher in the Region (8.7 percent) than in the nation (8.1 percent).

The infant mortality rate in the Appalachian Region’s rural counties is 19 percent higher than the rate in the Region’s large metro counties and the teen birth rate in the Region’s rural counties is 72 percent higher than the rate in Appalachia’s large metro counties.

The distributions of the Child Health indicators among national quintiles for Appalachian counties are shown in Table 4. Of the 420 counties in the Appalachian Region, 127 (30 percent) are in the worst-performing national quintile for the incidence of low birth weight babies, while only 12 counties (3 percent) are in the best-performing quintile. The distribution of the infant mortality rate shows that only 24 Appalachian counties (6 percent) rank in the top-performing national quintile.

**Table 4: Distributions of Child Health Indicators among National Quintiles for Appalachian Counties**

Indicator	Best Quintile		2nd Best Quintile		Middle Quintile		2nd Worst Quintile		Worst Quintile	
	#	Pct.	#	Pct.	#	Pct.	#	Pct.	#	Pct.
Infant mortality	24	6%	73	17%	112	27%	124	30%	87	21%
Low birth weight	12	3%	58	14%	90	21%	132	31%	127	30%
Teen births	44	10%	66	16%	95	23%	131	31%	83	20%

Data source for authors’ calculations shown above: Appalachian\_Health\_Disparities\_Data.xlsx. The number of counties across all five quintiles for each indicator may not sum to 420 due to missing or suppressed values.

### Community Characteristics

The measures included in the Community Characteristics domain examine aspects of the external environment largely outside of residents’ control. Three measures are included in this domain:

- Travel time to work
- Grocery store availability
- Student-teacher ratio

**Appalachia performs better than the nation as a whole on two of these measures: travel time to work and the student-teacher ratio.**

The average travel time to work in the Region is 25 minutes, which is just slightly lower than the national average of 26 minutes. The student-teacher ratio in Appalachia is 14.3, which is a lower (better) ratio than the national average of 16.5. With grocery store availability, however, the Region performs worse than the United States as a whole, with 14 percent fewer grocery stores per 1,000 population.

Unlike many other indicators in this report, rural areas throughout Appalachia perform better than large metro areas in the Region for each of the three variables in this domain.

The distributions of the Community Characteristics indicators among national quintiles for Appalachian counties are shown in Table 5. Despite the Region’s slightly lower average travel time to work, 142 counties (34 percent) still rank in the worst-performing national quintile, and only 5 counties (1 percent) rank in the best-performing quintile.

**Table 5: Distributions of Community Characteristics Indicators among National Quintiles for Appalachian Counties**

Indicator	Best Quintile		2nd Best Quintile		Middle Quintile		2nd Worst Quintile		Worst Quintile	
	#	Pct.	#	Pct.	#	Pct.	#	Pct.	#	Pct.
Travel time to work	5	1%	62	15%	101	24%	110	26%	142	34%
Grocery store availability	39	9%	99	24%	116	28%	96	23%	70	17%
Student-teacher ratio	37	9%	85	20%	116	28%	115	27%	52	12%

Data source for authors' calculations shown above: Appalachian\_Health\_Disparities\_Data.xlsx. The number of counties across all five quintiles for each indicator may not sum to 420 due to missing or suppressed values.

## Lifestyle

Individual choices and habits that play an important role in the health of a population are explored in the Lifestyle domain. There are three measures in this domain:

- Physical inactivity
- Smoking prevalence
- Chlamydia prevalence

### **Appalachia performs worse than the nation as a whole on two of these indicators: physical inactivity and smoking.**

In the Appalachian Region, 28.4 percent of people report being physically inactive, a figure higher than the 23.1 percent reported for the United States as a whole. Nearly 20 percent of all adults in the Appalachian Region report being cigarette smokers, a figure higher than the 16.3 percent found at the national level.

In the Appalachian Region's rural counties, 31.8 percent of residents report being physically inactive, a figure much higher than the 25.2 percent in the Region's large metro areas. Residents in the Region's rural counties also report a higher smoking prevalence, with 22.5 percent of adults being cigarette smokers, compared to just 17.3 percent of those living in the Region's large metro areas.

The distributions of the Lifestyle indicators among national quintiles for Appalachian counties are shown in Table 6. Of the 420 counties in the Region, 179 (43 percent) rank in the worst-performing national quintile for physical inactivity. There are 189 counties in the Region (45 percent) that rank in the worst-performing national quintile for cigarette smoking, while only 17 counties (4 percent) rank in the best-performing national quintile.

**Table 6: Distributions of Lifestyle Indicators among National Quintiles for Appalachian Counties**

Indicator	Best Quintile		2nd Best Quintile		Middle Quintile		2nd Worst Quintile		Worst Quintile	
	#	Pct.	#	Pct.	#	Pct.	#	Pct.	#	Pct.
Physical inactivity	18	4%	60	14%	79	19%	84	20%	179	43%
Smoking prevalence	17	4%	27	6%	67	16%	120	29%	189	45%
Chlamydia incidence	132	31%	111	26%	84	20%	50	12%	36	9%

Data source for authors' calculations shown above: Appalachian\_Health\_Disparities\_Data.xlsx. The number of counties across all five quintiles for each indicator may not sum to 420 due to missing or suppressed values.

### Health Care Systems

The Health Care Systems domain includes measures related to the availability of, and access to, healthcare. There are seven measures in this domain:

- Primary care physicians
- Mental health professionals
- Specialty physicians
- Dentists
- Percentage of the population under age 65 that is uninsured
- Heart disease hospitalizations among Medicare beneficiaries
- COPD hospitalizations among Medicare beneficiaries

**The Appalachian Region performs worse than the United States as a whole on six of the seven measures. Only the percentage of the population under age 65 that is uninsured is slightly lower (better) in the Region than in the nation as a whole, although the data here largely predate the implementation of the Affordable Care Act.**

The supply of primary care physicians is 12 percent lower in the Appalachian Region than in the nation as a whole. The deficit between Appalachia and the United States overall is even larger for the supply of mental health providers (35 percent lower), specialty physicians (28 percent lower), and dentists (26 percent lower). Hospitalization rates among Medicare beneficiaries are much higher in the Region for both COPD (23 percent higher in the Appalachia than in the United States) and heart disease (17 percent higher).

The supply of primary care physicians in rural counties in Appalachia is 20 percent lower than the supply in the Region's large metro counties. The supply of both specialists (57 percent lower) and dentists (36 percent lower) are also lower in the Region's rural counties when compared to large metro counties. COPD hospitalization rates (39 percent higher) and heart disease hospitalization rates (13 percent) are also higher in Appalachia's rural counties. The uninsured rate for the population under age 65 is 18.2 percent in rural Appalachian counties compared to 14.7 percent in the Region's large metro counties.

The distributions of the Health Care Systems indicators among national quintiles for Appalachian counties are shown in Table 7. Of the 420 counties in the Region, 203 counties (48 percent) rank in the worst national quintile for COPD hospitalizations, while only 12 counties (3 percent) are in the best-performing national quintile. Likewise, 179 counties (43 percent) rank in the worst national quintile for heart disease hospitalizations while only 7 counties (2 percent) rank in the best-performing national quintile.

**Table 7: Distributions of Health Care Systems Indicators among National Quintiles for Appalachian Counties**

Indicator	Best Quintile		2nd Best Quintile		Middle Quintile		2nd Worst Quintile		Worst Quintile	
	#	Pct.	#	Pct.	#	Pct.	#	Pct.	#	Pct.
Primary care physicians	56	13%	84	20%	106	25%	95	23%	79	19%
Mental health providers	42	10%	81	19%	105	25%	116	28%	76	18%
Specialist physicians	67	16%	103	25%	94	22%	100	24%	56	13%
Dentists	35	8%	80	19%	99	24%	115	27%	91	22%
Uninsured population	53	13%	91	22%	117	28%	111	26%	48	11%
Heart disease hospitalizations	7	2%	43	10%	74	18%	117	28%	179	43%
COPD hospitalizations	12	3%	29	7%	75	18%	101	24%	203	48%

Data source for authors' calculations shown above: Appalachian\_Health\_Disparities\_Data.xlsx. The number of counties across all five quintiles for each indicator may not sum to 420 due to missing or suppressed values.

### Quality of Care

The types of care that are available to residents in a community are examined in the Quality of Care domain. There are three measures in this domain:

- Percentage of medical doctors that use electronic prescribing technology
- Percentage of Medicare beneficiaries ages 67 to 69 who have recently received a mammogram
- Diabetes monitoring among Medicare beneficiaries

**For each of these three measures, the values reported in Appalachia are similar to those reported in the United States as a whole.**

Medical doctors are somewhat less likely to use electronic prescribing in the Appalachian Region (63.8 percent of doctors) compared to the nation overall (65.8 percent). Mammogram screening percentages are comparable for the Region (61.4 percent) and the United States as a whole (62.1 percent), as are diabetes monitoring percentages, with Appalachia (85.9 percent) and the nation overall (84.7 percent) reporting similar figures.

Medical doctors in rural areas throughout the Region are less likely to use electronic prescribing (60.6 percent of doctors) than those in large metro areas (64.7 percent). Medicare-covered women ages 67 to 69 are less likely to have had a recent mammogram in rural areas (57.3 percent) than those in large metro areas (58.9 percent).

The distributions of the Quality of Care indicators among national quintiles for Appalachian counties are shown in Table 8. The indicators in this domain are relatively evenly distributed compared to many other indicators in this report.

**Table 8: Distributions of Quality of Care Indicators among National Quintiles for Appalachian Counties**

Indicator	Best Quintile		2nd Best Quintile		Middle Quintile		2nd Worst Quintile		Worst Quintile	
	#	Pct.	#	Pct.	#	Pct.	#	Pct.	#	Pct.
Electronic prescriptions	58	14%	74	18%	94	22%	107	25%	82	20%
Mammogram screenings	56	13%	69	16%	91	22%	99	24%	104	25%
Diabetes monitoring	74	18%	103	25%	120	29%	85	20%	38	9%

Data source for authors' calculations shown above: Appalachian\_Health\_Disparities\_Data.xlsx. The number of counties across all five quintiles for each indicator may not sum to 420 due to missing or suppressed values.

### Social Determinants

The measures in the Social Determinants domain examine the conditions in which people live and work. There are five measures in this domain:

- Median household income
- Household poverty rate
- Percentage of the population receiving disability benefits
- Percentage of the population with some level of college education
- Social association rate

**The Appalachian Region performs worse than the United States as a whole on four of the five measures—the social association rate is the only indicator with better performance in the Region.**

Median household income in the Appalachian Region is 19 percent lower than the national median, and adults ages 25 to 44 are less likely to have some type of post-secondary education in the Region (57.1 percent) than in the United States overall (63.3 percent). The household poverty rate in Appalachia is higher than the national rate (17.2 percent compared to 15.6 percent), and more people receive disability benefits in the Region (7.3 percent) than in the nation as a whole (5.1 percent).

Rural counties throughout Appalachia perform markedly worse on the four measures in which the Region as a whole already lags behind national performance. Median household income in rural Appalachia is 34 percent lower than the median income in large metro counties throughout the Region. Education levels (49.0 percent in rural Appalachian counties; 65.1 percent in large metro counties), household poverty rates (23.0 percent in Appalachia's rural counties; 13.6 percent in the Region's large metro counties), and the receipt of disability benefits (11.2 percent in rural Appalachian counties; 5.5 percent in Appalachia's large metro counties) all show a stark rural-urban divide.

The distributions of the Social Determinants indicators among national quintiles for Appalachian counties are shown in Table 9. There are 203 Appalachian counties (48 percent) that rank in the worst-performing national quintile on receipt of disability benefits, while only 9 counties (2 percent) rank in the best-performing quintile. For median household income, 159 counties (38 percent) rank in the worst-performing national quintile, while only 19 counties (5 percent) rank in the best-performing quintile. These results show that outcomes for many social determinants are disproportionately worse throughout much of the Appalachian Region when compared to the nation as a whole.

**Table 9: Distributions of Social Determinants Indicators among National Quintiles for Appalachian Counties**

Indicator	Best Quintile		2nd Best Quintile		Middle Quintile		2nd Worst Quintile		Worst Quintile	
	#	Pct.	#	Pct.	#	Pct.	#	Pct.	#	Pct.
Median household income	19	5%	33	8%	91	22%	118	28%	159	38%
Household poverty	17	4%	52	12%	95	23%	134	32%	122	29%
Disability	9	2%	19	5%	59	14%	130	31%	203	48%
Education: some college	20	5%	39	9%	83	20%	128	30%	150	36%
Social associations	45	11%	89	21%	102	24%	98	23%	86	20%

Data source for authors’ calculations shown above: Appalachian\_Health\_Disparities\_Data.xlsx. The number of counties across all five quintiles for each indicator may not sum to 420 due to missing or suppressed values.

## TRENDS

The trends section examines the changes in eight indicators over a period of approximately two decades. The changes in the Appalachian Region are compared to the United States as a whole for these measures examining premature death, causes of death, child and maternal health, healthcare access, and socioeconomic status.

**For seven of the eight indicators considered in this section, the Appalachian Region—along with the nation as a whole—experienced improvements over the past two decades. However, the improvements made by the nation overall generally outpaced those made by the Region, indicating increasing disparities between Appalachia and the United States as a whole.**

Table 10 shows the percentage changes over the past two decades in Appalachia and the United States for six of the eight variables included in this section. The Appalachian Region experienced a decrease (improvement) in all measures of mortality, but lagged the improvement experienced by the nation as a whole. Appalachia outperformed the rate of change for the nation overall in just one measure: the supply of primary care physicians.

**Table 10: Percentage change in selected measures, the United States and Appalachia**

Indicator	United States	Appalachia
<i>Change between 1989–1995 and 2008–2014:</i>		
YPLL	-24%	-8%
Stroke mortality	-40%	-35%
Cancer mortality	-21%	-14%
Heart disease mortality	-43%	-39%
Infant mortality	-28%	-19%
<i>Change between 1990 and 2013:</i>		
Primary care physicians	27%	31%

Data source for authors’ calculations shown above: Appalachian\_Health\_Disparities\_Data.xlsx. The number of counties across all five quintiles for each indicator may not sum to 420 due to missing or suppressed values.

Two indicators are not included in the table above: household poverty rates and the percentage of the population with a high school degree. Both Appalachia and the nation as a whole experienced an increase (worsening) in the household poverty rate between 1995 and 2014, with the Region's rate increasing from 14.2 percent to 17.2 percent, while the national rate increased at a slightly slower pace, going from 13.6 percent to 15.6 percent. Between 1990 and 2009–2013, Appalachia made great strides in the percentage of its population with a high school degree, improving from 68.4 percent to 84.6 percent. The nation as a whole also saw an increase in this measure, going from 75.7 percent in 1990 to 85.9 percent in 2009–2013.

## NEXT STEPS

This report—measuring population health and documenting health disparities in the Appalachian Region—is the first in a series exploring health issues in Appalachia.

The information documented in this report provides context for the subsequent reports in this series that will explore Bright Spots, or Appalachian communities with better-than-expected health outcomes given their resources. Resources here are interpreted broadly, and include the health system, the environment, and socioeconomic factors, among others. Much of the data presented in this report will be used to establish a statistical framework for identifying Bright Spots, including factors that reflect a Culture of Health. Once Appalachian counties performing better than expected have been statistically identified, a sample of these communities will be explored through in-depth, field-based case studies. Working with these communities, the case studies will identify replicable activities, programs, or policies that encourage better-than-expected health outcomes that could translate into actions that other communities can replicate.

