Child Health

KEY FINDINGS | Infant Mortality Rates

- The infant mortality rate is 16 percent higher in the Appalachian Region than in the nation as a whole.
- With identical infant mortality rates of 7.4 per 1,000 births, the North Central, Central, and Southern Appalachian subregions have rates 21 percent higher than the national rate.
- There is an urban-rural divide in infant mortality, with the Appalachian Region's rural counties reporting an infant mortality rate 19 percent higher than the rate found in the Region's large metro areas.
- Economic status is also an indicator of infant mortality. The rate in the Appalachian Region's distressed counties is 19 percent higher than the rate found in the Region's non-distressed counties.

Background

Infant mortality is the number of deaths of infants under age one per 1,000 live births, per year. Data for this indicator come from the Compressed Mortality File provided by the National Center for Health Statistics and cover the 2008–2014 period. Infant mortality is one of the most commonly used population health indicators for communities. Past studies have shown that factors leading to increased infant deaths are also correlated with negative outcomes for the entire population (Matteson, W., Burra, & Marshall, 1998).

There are a number of factors that contribute to infant mortality, including: preterm birth, low birthweight, birth defects, maternal pregnancy complications, sudden infant death syndrome (SIDS), and accidents (Centers for Disease Control and Prevention, Infant Mortality, 2016). Although some infant deaths may be attributed to birth defects and congenital abnormalities, many remain preventable. Prenatal care can help reduce prenatal injuries and preterm birth, both of which are large contributors to infant mortality rates. Likewise, many unhealthy maternal behaviors, such as smoking, drinking alcohol, and being physically inactive are also risk factors, and modifying these behaviors can reduce the risk of infant mortality (Centers for Disease Control and Prevention, Infant Mortality, 2016).

Overview: Infant Mortality in the Appalachian Region

With a rate of 7.1 infant deaths per 1,000 live births, the infant mortality rate is 16 percent higher in the Appalachian Region than the national rate of 6.1 per 1,000. All five subregions perform worse than the nation as a whole, with the three worst-performing subregions—North Central, Southern, and Central Appalachia—all reporting identical rates of 7.4 per 1,000.

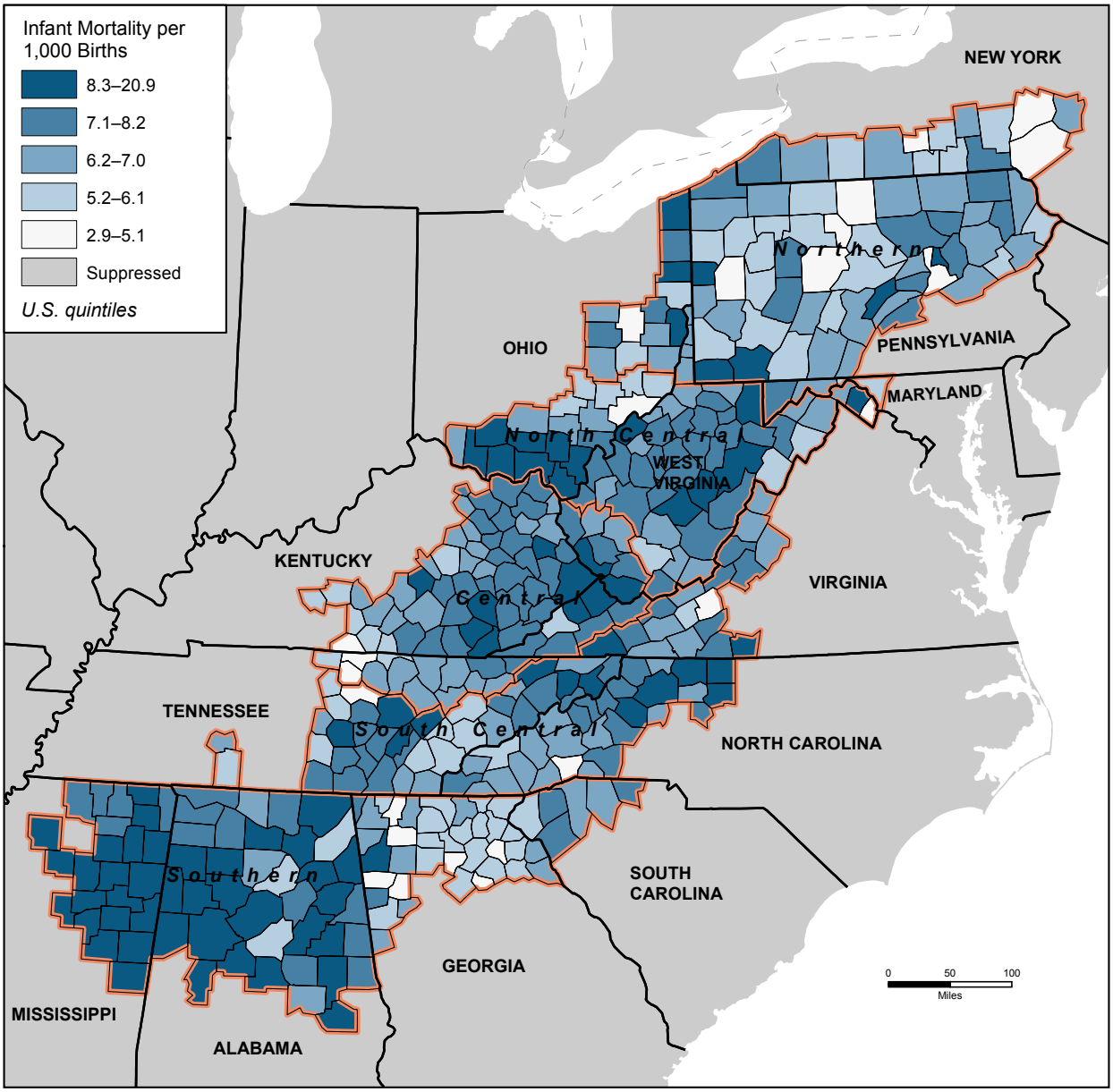
There is an urban-rural divide in infant mortality rates, with those living in rural areas throughout the Region experiencing a rate 19 percent higher than those in the Region's large metro areas (8.0 per 1,000 births compared to 6.7 per 1,000). The infant mortality rates for the remaining three urban-rural classifications are all closer to the large metro figure of 6.7 per 1,000 births than the 8.0 per 1,000 experienced in rural areas. There is also a divide based on a county's economic status: the infant mortality rate in distressed counties throughout Appalachia is 8.3 per 1,000 births, a rate 19 percent higher than the rate of 7.0 per 1,000 found in the Region's non-distressed counties.

The majority of counties in the western half of Southern Appalachia are in the worst-performing national quintile, and the Appalachian portions of Mississippi (9.4 per 1,000 births) and Alabama (8.9 per 1,000) report the highest rates among Appalachian portions of the Region's thirteen states. While infant mortality rates elsewhere aren't quite as high as in these two areas of the Southern subregion, other Appalachian portions of states report figures much higher than the national rate, including: Appalachian North Carolina (7.6 per 1,000 births), West Virginia (7.5), Appalachian Ohio (7.4), and Appalachian Kentucky (7.4).

Figure 77 shows the variation in infant mortality across the Appalachian Region. Darker blue indicates a higher infant mortality rate. There are several pockets of poor performance throughout Appalachia, and each subregion has multiple counties ranking in the worst-performing national quintile. A significant concentration of these poorly-performing counties are found in the western half of the Southern Appalachian subregion.

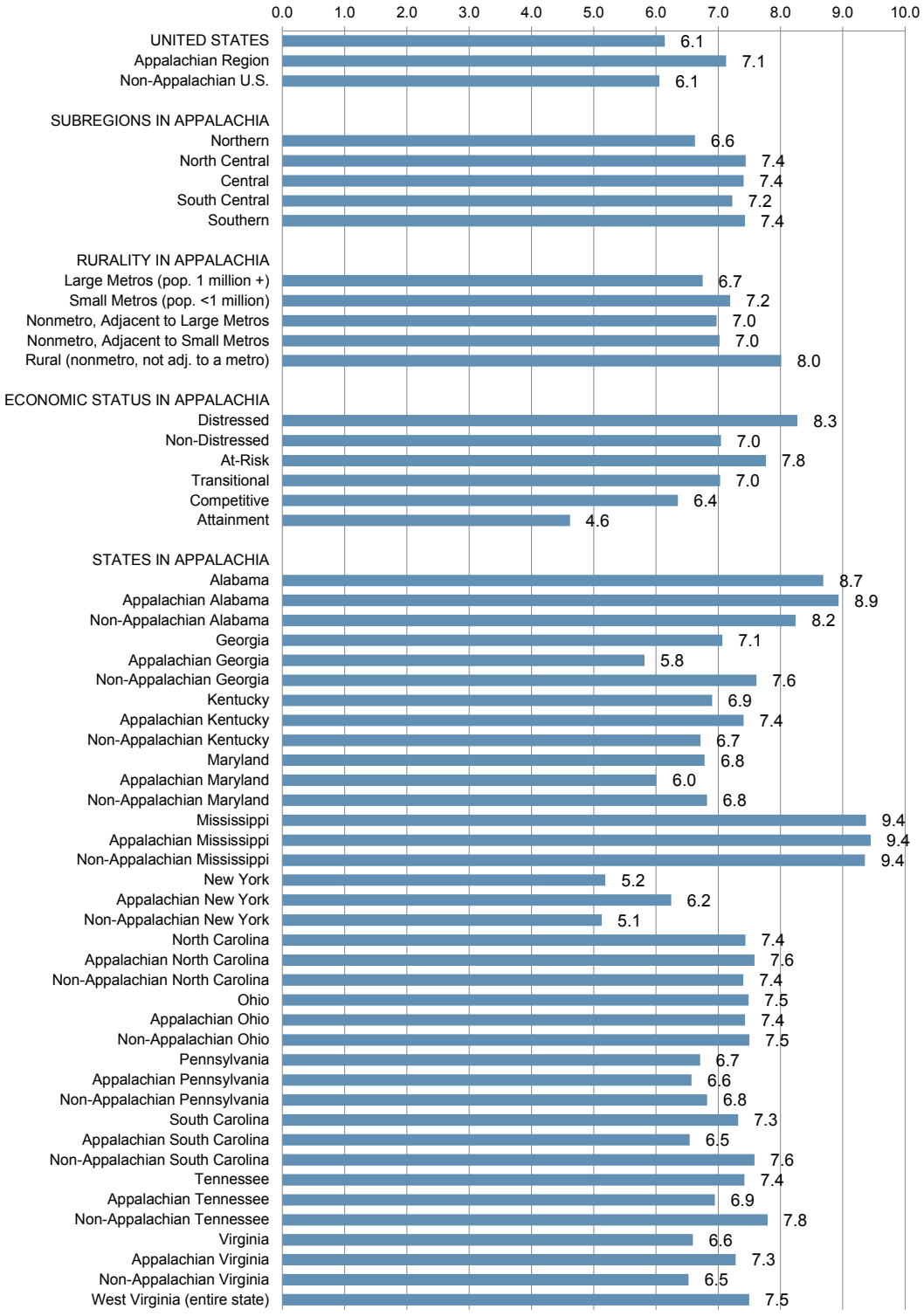
Figure 78 aggregates the data for a variety of geographies useful for comparison: the Region compared to both the U.S. as a whole and the non-Appalachian portion of the country, subregions throughout Appalachia, levels of rurality in Appalachia, and economic status in Appalachia. State-level aggregation is done at three levels: the entire state, and then both the Appalachian and non-Appalachian portions of each state.

Figure 77: Map of Infant Mortality Rates in the Appalachian Region, 2008–2014



Data source: National Center for Health Statistics. Compressed Mortality File, 1999–2014 (machine-readable data file and documentation, CD ROM Series 20, No. 2T) as compiled from data provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program. Hyattsville, Maryland. 2015. http://www.cdc.gov/nchs/data_access/cmf.htm

Figure 78: Chart of Infant Mortality Rates, 2008–2014

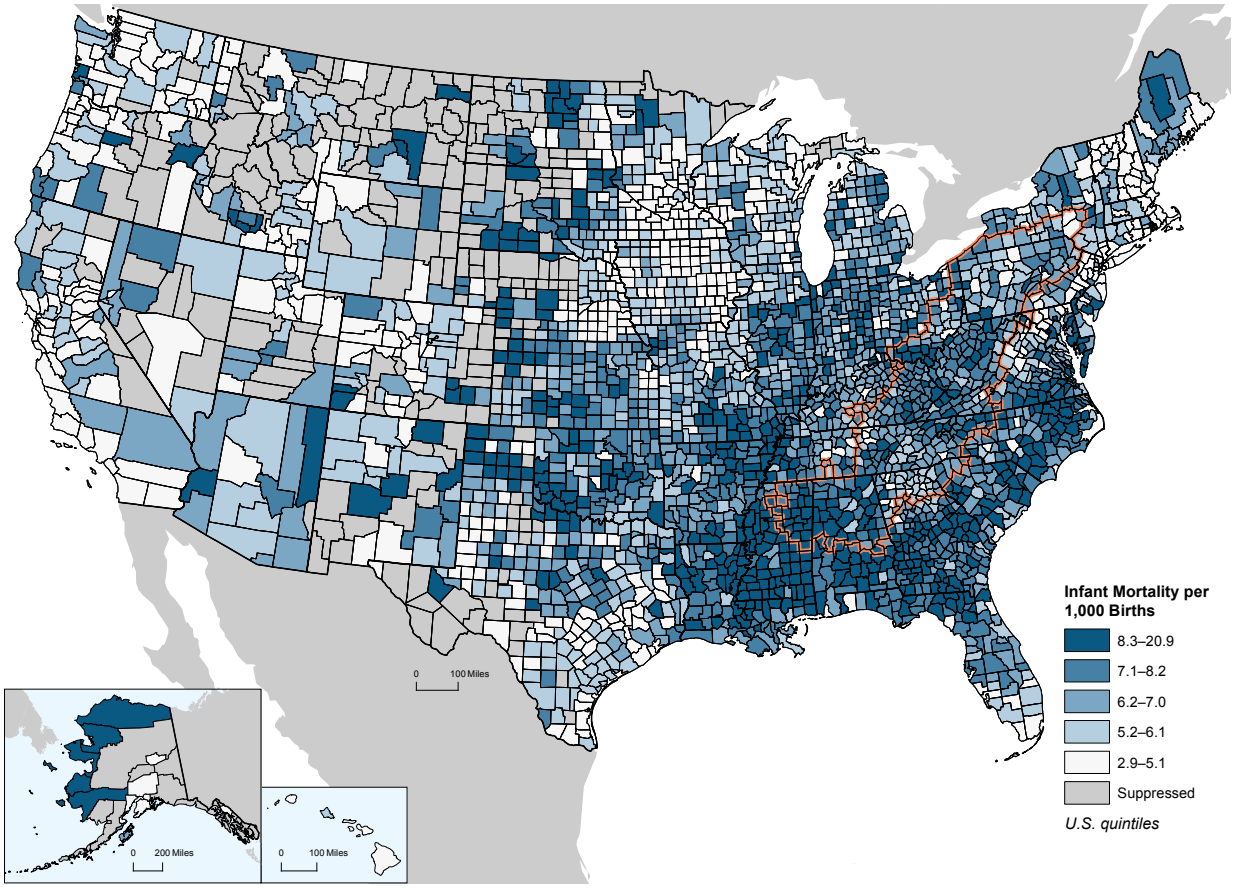


Data source: National Center for Health Statistics. Compressed Mortality File, 1999–2014 (machine-readable data file and documentation, CD□ROM Series 20, No. 2T) as compiled from data provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program. Hyattsville, Maryland. 2015. http://www.cdc.gov/nchs/data_access/cmf.htm

Overview: Infant Mortality in the United States

Figure 79 shows the variation in infant mortality rates across the United States. Infant mortality rates are high throughout much of the eastern half of the country, with high rates particularly pronounced throughout the coastal Southeast and Mississippi Delta. These high rates extend into the Midwest and central part of the country. Although counties ranking in the worst-performing quintile are found in the Upper Midwest, a large number of counties there rank in the top-performing national quintile. The Pacific Coast and Northeast also generally report low infant mortality rates. Due to data suppression, it is difficult to obtain a complete picture of infant mortality throughout much of the western half of the United States.

Figure 79: Map of Infant Mortality Rates in the United States, 2008–2014

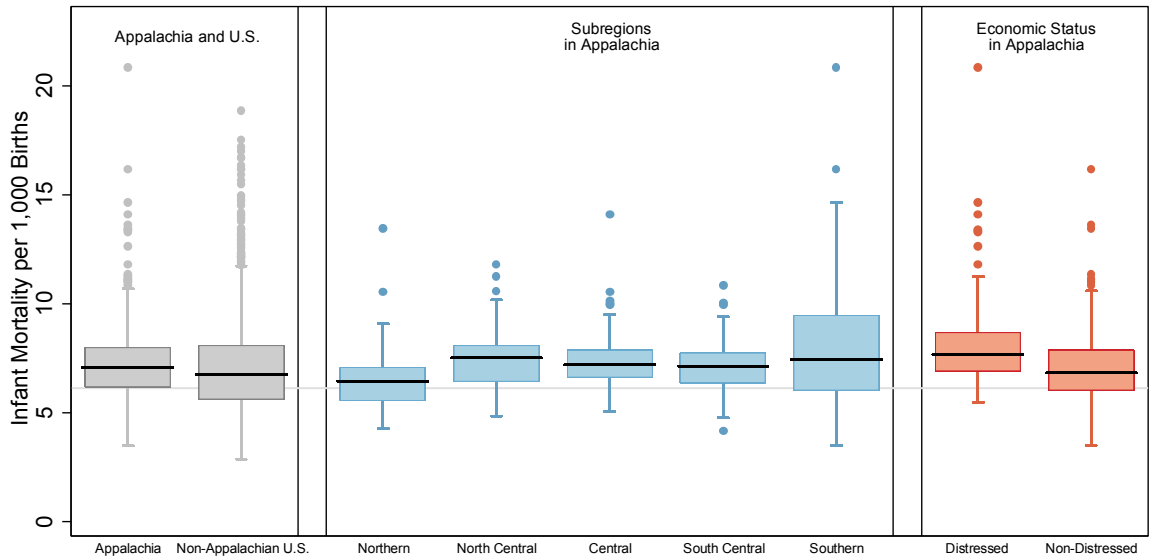


Data source: National Center for Health Statistics. Compressed Mortality File, 1999–2014 (machine-readable data file and documentation, CD-ROM Series 20, No. 2T) as compiled from data provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program. Hyattsville, Maryland. 2015. http://www.cdc.gov/nchs/data_access/cmf.htm

Distribution of Infant Mortality Rates

Figure 80 shows the distribution of infant mortality rates by geography and economic status. The shaded boxes show the middle 50 percent of values for each group, with dots representing unusually high or low values. The gray line stretching across the width of the graph indicates the national average, and the black lines inside the shaded boxes indicate the median for each respective group. Of all 3,113 counties in the nation, 243 have a missing value for this indicator.

Figure 80: Box Plot of Infant Mortality Rates by Geography and Economic Status, 2008–2014



Data source: National Center for Health Statistics. Compressed Mortality File, 1999–2014 (machine-readable data file and documentation, CD ROM Series 20, No. 2T) as compiled from data provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program. Hyattsville, Maryland. 2015. http://www.cdc.gov/nchs/data_access/cmf.htm

The distribution of infant mortality rates among national quintiles for Appalachian counties is shown in Table 31. Of the 420 counties in the Region, 87 (21 percent) rank in the worst-performing national quintile, while 24 (6 percent) are in the best-performing national quintile.

Table 31: Distribution of Infant 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.*
Infant mortality	24	*6%*	73	*17%*	112	*27%*	124	*30%*	87	*21%*

Data source for authors' calculations shown above: Appalachian_Health_Disparities_Data.xlsx. The number of counties across all five quintiles for this indicator may not sum to 420 due to missing or suppressed values.

KEY FINDINGS | Low Birth Weight Incidence

- The incidence of low birth weight in Appalachia is 8.7 percent of all newborns, a percentage higher than the national average of 8.1 percent.
- Northern Appalachia, with a 7.8 percent incidence of low birth weight, performs better than the nation as a whole on this measure. The other four subregions all report percentages above the national average, with performance in Central Appalachia especially poor at 9.9 percent, a figure much higher than the national average of 8.1 percent.
- There is an urban-rural divide in low birth weight incidence, with the Appalachian Region's rural counties reporting a higher incidence (9.4 percent) than that found in the Region's large metro areas (8.2 percent).
- Distressed Appalachian counties report a low birth weight incidence of 10.2 percent, compared to the 8.6 percent in the Region's non-distressed counties.

Background

Low birth weight incidence is the percentage of newborns that weigh less than 2,500 grams (or 5.5 pounds) at birth. The data for this measure come from County Health Rankings and are based on data provided by CDC's National Center for Health Statistics and National Vital Statistics System covering the 2007–2013 period. Because low birth weights have both immediate and lifetime consequences, disparities in this indicator may lead to disparities in other health measures that persist for generations.

Low birth weights are associated with poor health outcomes throughout both childhood and later into adulthood, as low birth weights have repeatedly been shown to increase the likelihood of developmental delays, respiratory problems, and even premature death (McCormick, 1985). Insufficient prenatal care, smoking, drinking alcohol, and poor maternal health are among the many risk factors linked to a higher incidence of low birth weight (Centers for Disease Control and Prevention, Reproductive and Birth Outcomes, 2016).

Despite advances in prenatal and maternal health, the national incidence of low birth weight has actually increased from 6.8 percent in 1980 to 8.0 percent in 2013 (Child Trends, 2016). Improvements in neonatal care may have led to an increase in this rate, as low birth weight infants are now more likely to survive due to these improvements.

Overview: Low Birth Weight Incidence in the Appalachian Region

With 8.7 percent of babies born in Appalachia classified as having a low birth weight, the chances of a baby being born with a low birth weight are greater in the Region than in the nation as a whole, where this figure is 8.1 percent. Northern Appalachia is the best-performing subregion, and with an incidence of 7.8 percent, is lower than the national mark. The other four Appalachian subregions all perform worse than the U.S. and Central Appalachia has the highest incidence (9.9 percent) among the subregions.

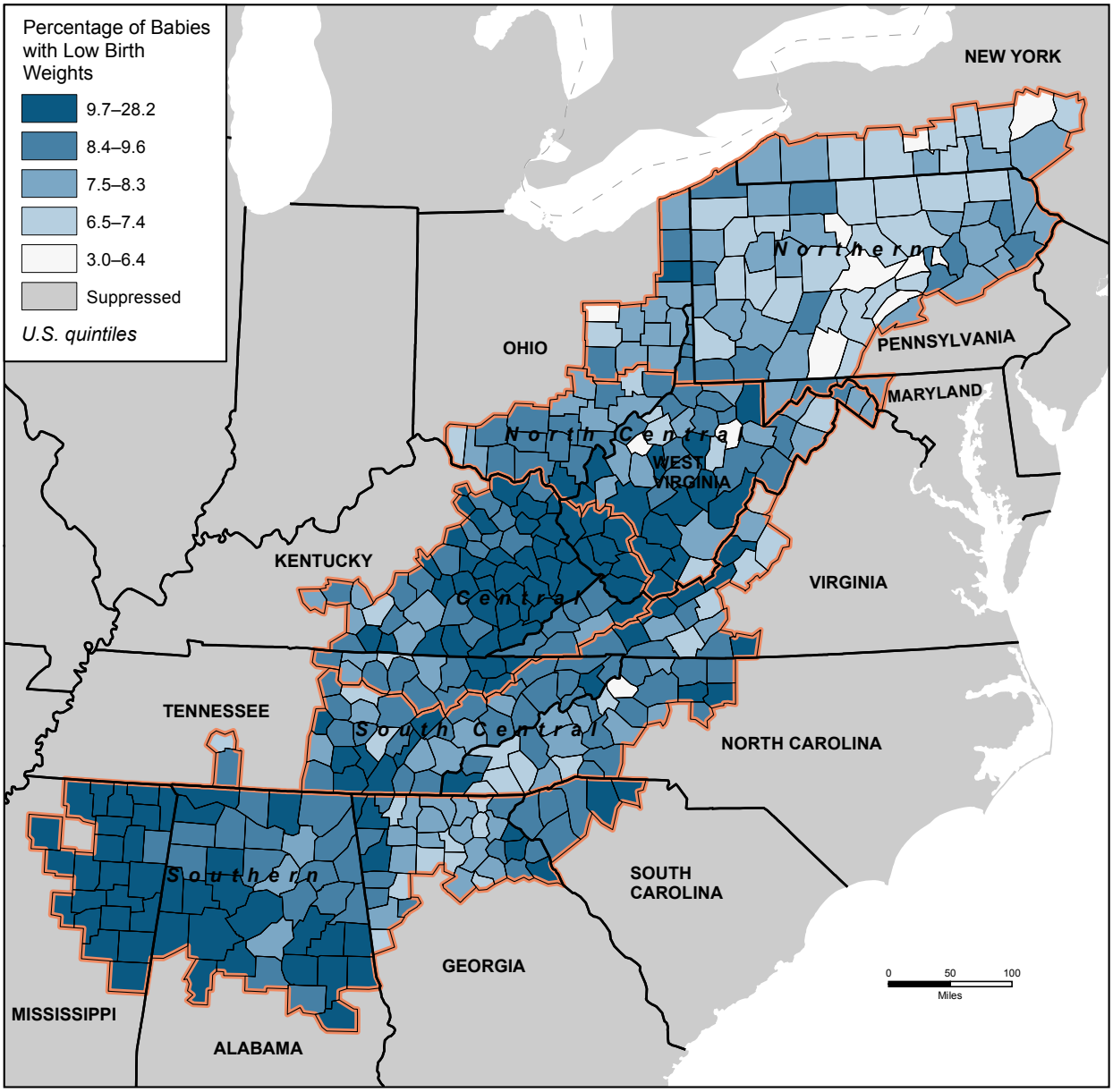
There is an urban-rural divide in the incidence of low birth weight, with rural counties in the Region reporting a higher incidence than that found in the Region's large metro areas (9.4 percent compared to 8.2 percent). There is an additional divide based on a county's economic status. The Appalachian Region's distressed counties report a low birth weight incidence of 10.2 percent, a figure higher than the 8.6 percent reported by the Region's non-distressed counties.

The Appalachian portions of Mississippi (11.5 percent) and Alabama (10.0 percent) have the highest incidence of low birth weight among the states in the Region. However, the percentages for the Appalachian portions are actually lower than those found in the non-Appalachian portions of those states. This also occurs—Appalachian portions outperforming non-Appalachian portions—in the following states: Georgia, Maryland, New York, North Carolina, Ohio, Pennsylvania, South Carolina, and Tennessee. Although the incidence of low birth weight for the Appalachian portions of these states are largely well above the national average, they are, at the same time, better-performing than the states' non-Appalachian portions.

Figure 81 shows the variation in low birth weight incidence across the Appalachian Region. Darker blue indicates a higher incidence; for this measure, higher values are associated with worse health. There are several pockets of poor performance throughout Appalachia— particularly in the central and southern areas—where a large number of counties rank in the two worst-performing quintiles.

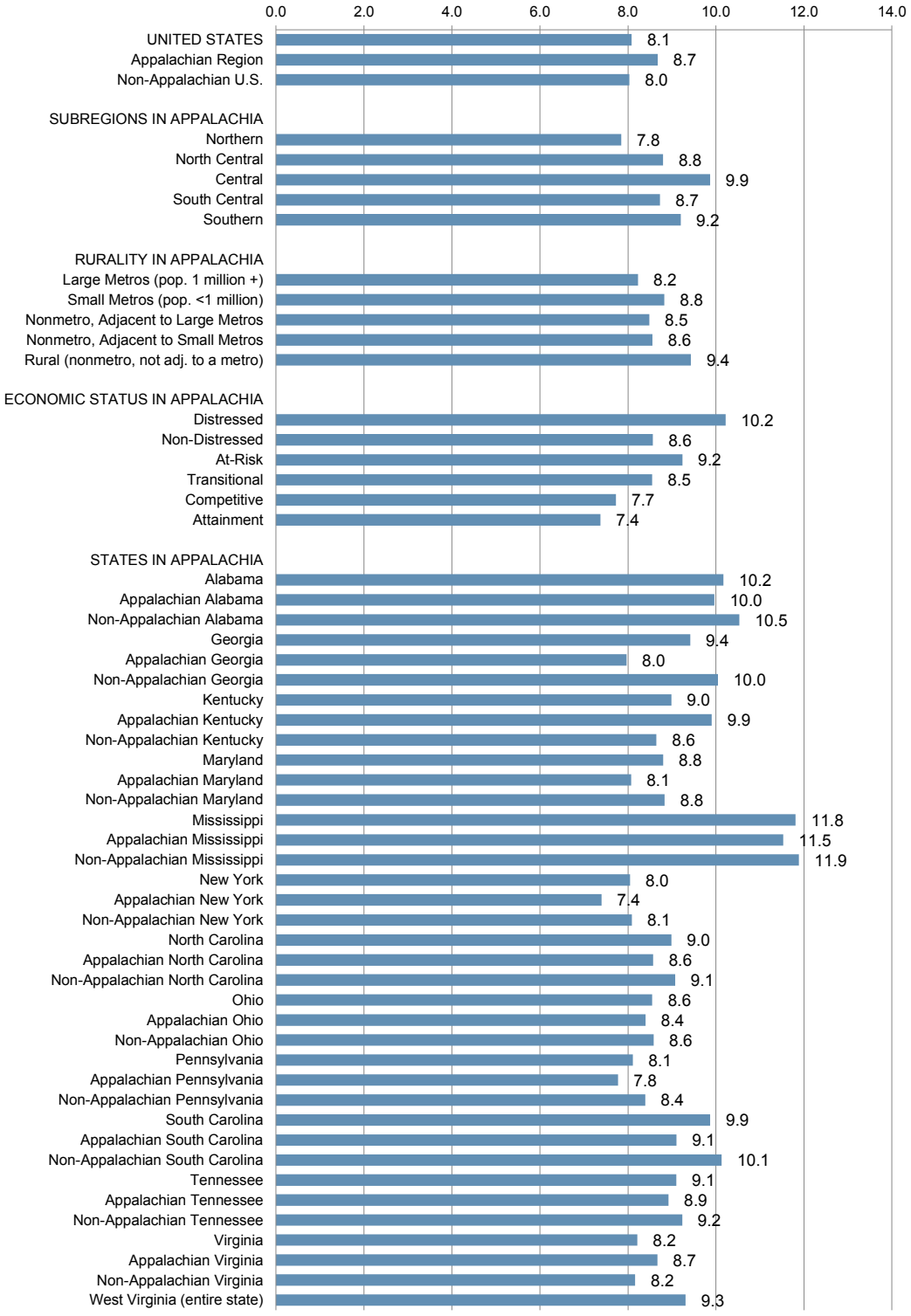
Figure 82 aggregates the data for a variety of geographies useful for comparison: the Region compared to both the U.S. as a whole and the non-Appalachian portion of the country, subregions throughout Appalachia, levels of rurality in Appalachia, and economic status in Appalachia. State-level aggregation is done at three levels: the entire state, and then both the Appalachian and non-Appalachian portions of each state.

Figure 81: Map of Percentage of Babies born with a Low Birth Weight in the Appalachian Region, 2007–2013



Data source: County Health Rankings & Roadmaps, 2016 edition. University of Wisconsin Population Health Institute supported by Robert Wood Johnson Foundation http://www.countyhealthrankings.org/rankings/data.

Figure 82: Chart of Percentage of Babies born with a Low Birth Weight, 2007–2013

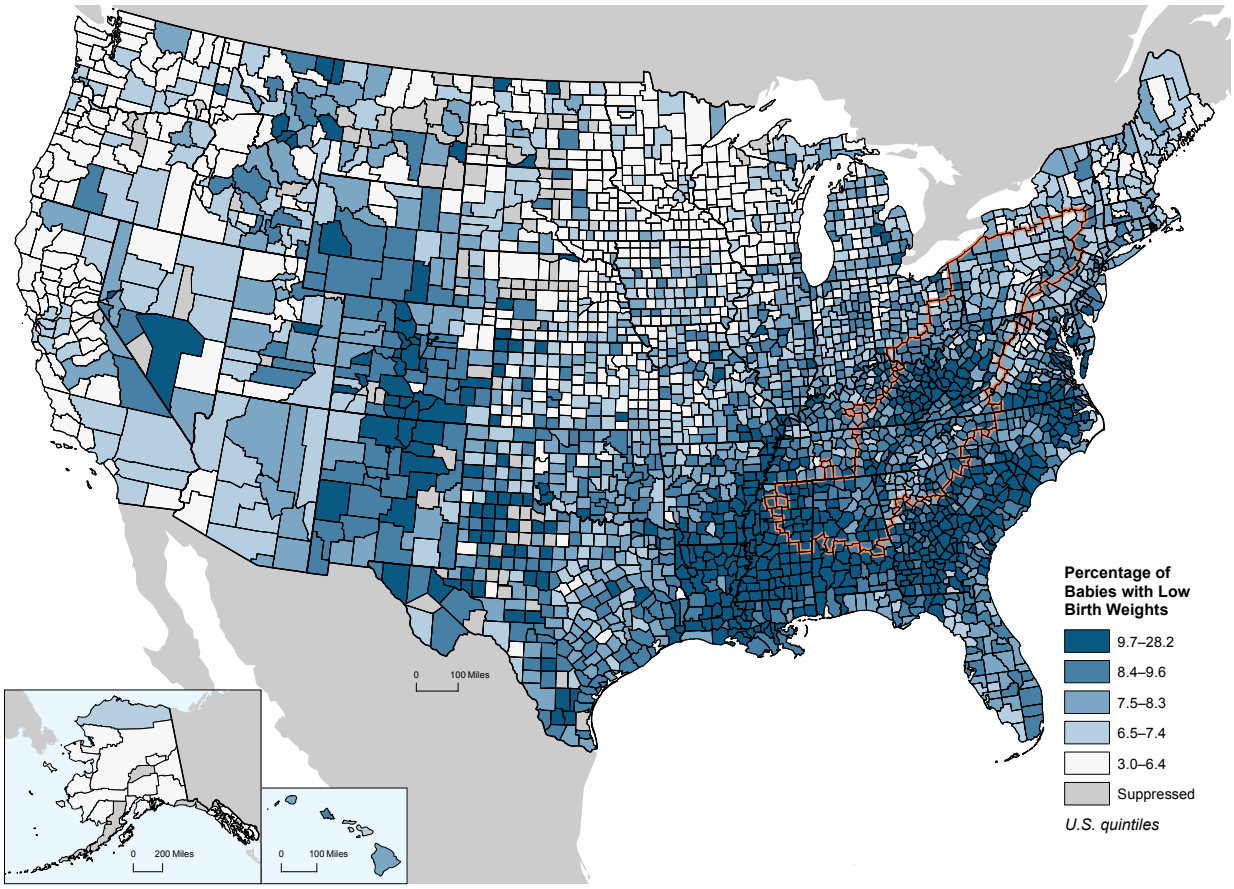


Data source: County Health Rankings & Roadmaps, 2016 edition. University of Wisconsin Population Health Institute supported by Robert Wood Johnson Foundation http://www.countyhealthrankings.org/rankings/data.

Overview: Low Birth Weight Incidence in the United States

Figure 83 shows the variation in low birth weight incidence across the United States. Much of the Southeast ranks in the two worst-performing quintiles, with poor rates particularly noticeable in the Mississippi Delta region, as well as along coastal areas stretching from Virginia to Georgia. There are also some pockets of poor performance elsewhere in the country, including many counties in both New Mexico and Colorado. Many counties west of the Rocky Mountains, as well as those in the upper Midwest, report percentages among the lowest in the nation.

Figure 83: Map of Percentage of Babies born with a Low Birth Weight in the United States, 2007–2013

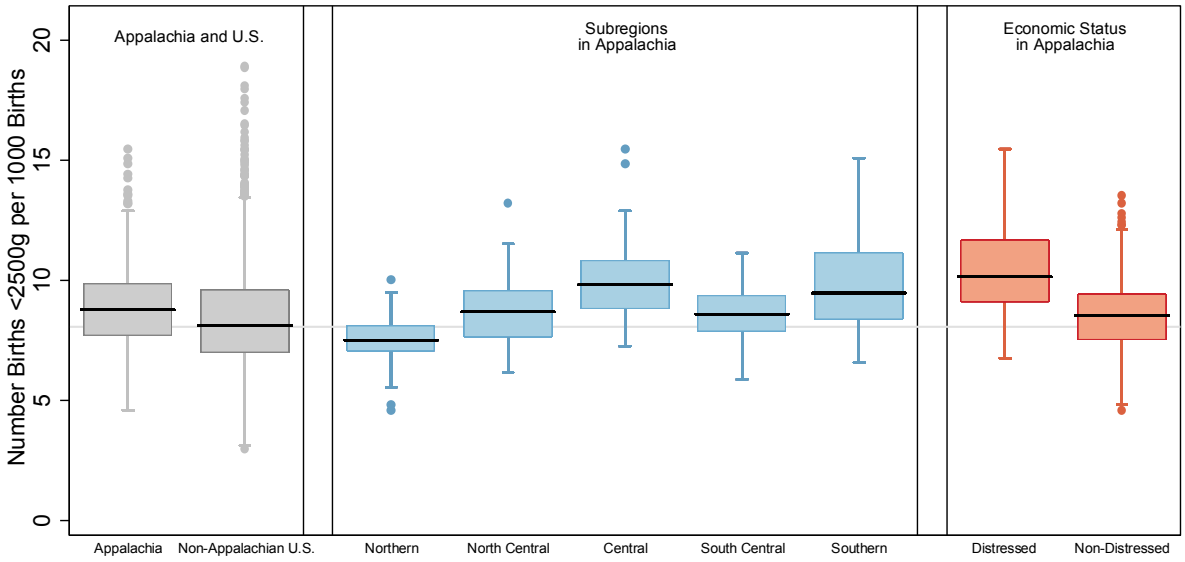


Data source: County Health Rankings & Roadmaps, 2016 edition. University of Wisconsin Population Health Institute supported by Robert Wood Johnson Foundation http://www.countyhealthrankings.org/rankings/data.

Distribution of Low Birth Weight Incidence

Figure 84 shows the distribution of low birth weight rates by geography and economic status. The shaded boxes show the middle 50 percent of values for each group, with dots representing unusually high or low values. The gray line stretching across the width of the graph indicates the national average, and the black lines inside the shaded boxes indicate the median for each respective group. Of all 3,113 counties in the nation, 99 have a missing value for this indicator, and one county with a value greater than 20 percent was not included in the box plot.

Figure 84: Box Plot of Percentage of Babies born with a Low Birth Weight by Geography and Economic Status, 2007–2013



Data source: County Health Rankings & Roadmaps, 2016 edition. University of Wisconsin Population Health Institute supported by Robert Wood Johnson Foundation http://www.countyhealthrankings.org/rankings/data.

The distribution of the percentage of babies born with low birth weight among national quintiles for Appalachian counties is shown in Table 32. Of the 420 counties in the Region, 127 (30 percent) rank in the worst-performing national quintile, while 12 (3 percent) rank in the best-performing national quintile.

Table 32: Distribution of Low Birth Weight Incidence among National Quintiles for Appalachian Counties

Indicator	Best Quintile		2nd Best Quintile		Middle Quintile		2nd Worst Quintile		Worst Quintile	
	#	*Pct.*	#	*Pct.*	#	*Pct.*	#	*Pct.*	#	*Pct.*
Low birth weight	12	*3%*	58	*14%*	90	*21%*	132	*31%*	127	*30%*

Data source for authors' calculations shown above: Appalachian_Health_Disparities_Data.xlsx. The number of counties across all five quintiles for this indicator may not sum to 420 due to missing or suppressed values.

KEY FINDINGS | Teen Birth Rates

- The teen birth rate in the Appalachian Region is 10 percent higher than the national rate.
- Central Appalachia has a teen birth rate 63 percent higher than the national rate.
- The Appalachian Region's rural counties have a teen birth rate 72 percent higher than the rate found in the Region's large metro areas.
- The Appalachian Region's distressed counties report a teen birth rate 61 percent higher than the Region's non-distressed counties.

Background

The teen birth rate is the number of live births per 1,000 females ages 15–19, per year. The data for this measure come from County Health Rankings and are based on data provided by CDC's National Center for Health Statistics and National Vital Statistics System covering the 2007–2013 period. According to CDC, a number of social determinants—including high unemployment, low income, and low education—are associated with higher teen birth rates (Centers for Disease Control and Prevention, Social Determinants and Eliminating Disparities in Teen Pregnancy, 2017).

Teen births are more likely to be unintended and lead to poor outcomes for both teenage mothers and their children. The children of teenage mothers are more likely to have lower school achievement, drop out of high school, have more health problems, be incarcerated at some time during adolescence, give birth as a teenager, and face unemployment as a young adult (Centers for Disease Control and Prevention, About Teen Pregnancy, 2017). According to one summary of available research, pregnant teens are more likely than older women to receive late prenatal care, if any, and also experience gestational hypertension, anemia, and inadequate maternal weight gain (Kentucky Department for Public Health, 2013). In addition to the direct health problems related to both child and mother, high teen birth rates are also associated with unsafe sexual activity and its inherent risks. There are also economic impacts, as nearly one-fifth of teen mothers will have two children before age 20, which can limit both academic and workforce opportunities for young parents (Stewart & Kaye, 2013).

While the teen birth rate in the United States has declined over the past 20 years, the rate remains higher than in many other developed countries (Office of Adolescent Health, 2016). The variation found within the United States has a number of potential causes, including the policies affecting adolescents' access to health care and variation in school-based sexual education curricula. The Children's Health Insurance Programs (CHIP), Medicaid family planning waiver programs, federally funded family planning clinics (Title X), and programs that expand access to contraception are among the many strategies utilized to reduce teen pregnancy (Centers for Disease Control and Prevention, Reproductive Health: About Teen Pregnancy, 2016).

Overview: Teen Birth Rates in the Appalachian Region

With a rate of 38.2 births per 1,000 females ages 15–19, the incidence of teen births is 10 percent higher in the Appalachian Region than in the nation as a whole (34.6 per 1,000). Northern Appalachia reports a teen birth rate of 26.6 per 1,000, which is 23 percent lower than the national rate. Teen birth rates in the other four subregions are all well above the national rate, however, Central Appalachia has the highest rate at 56.3 per 1,000, a rate 63 percent higher than the national mark.

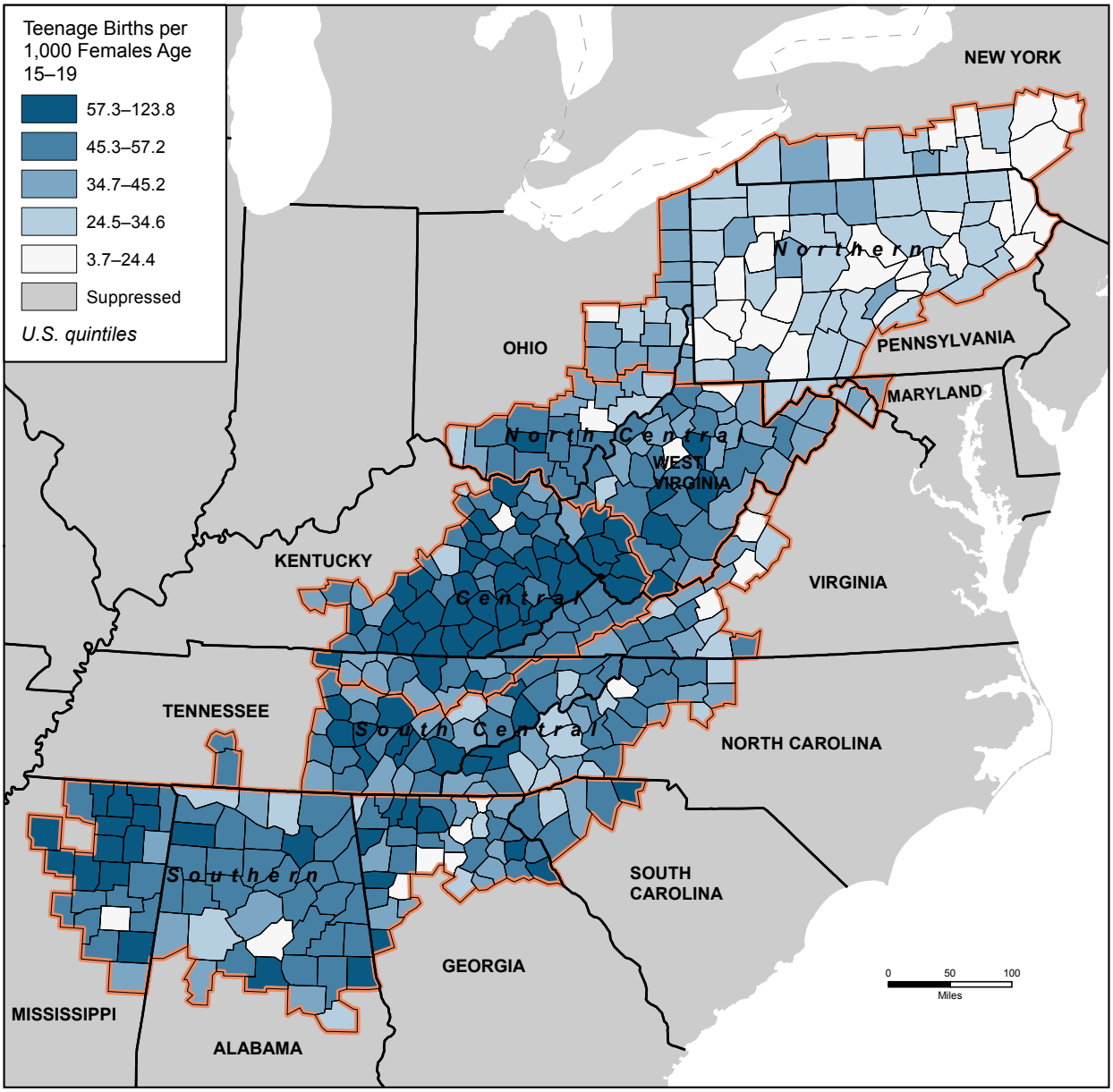
There is an urban-rural divide in the incidence of teen births. As one travels from metro to rural areas throughout the Region, these rates gradually increase. In the Appalachian Region's large metro areas, the teen birth rate is 29.6 per 1,000, a figure well below the 51.0 per 1,000 reported in the Region's rural areas. There is also a divide based on economic status, with distressed Appalachian counties reporting a much higher rate than the Region's non-distressed counties (59.1 births per 1,000 females ages 15–19, compared to 36.7).

Many of the counties in Appalachian Kentucky report teen birth rates in the worst-performing national quintile. The rate for Appalachian Kentucky is 58.1 per 1,000 females ages 15–19, a figure 34 percent higher than the non-Appalachian portion of the state (43.5 per 1,000). Appalachian Mississippi, with an overall rate of 58.3 per 1,000 females ages 15–19, also has many counties reporting teen birth rates in the worst-performing national quintile. This high figure, however, is not much different than the rate found in non-Appalachian Mississippi (56.0 per 1,000). Appalachian New York (24.4 per 1,000) and Appalachian Pennsylvania (24.5 per 1,000) report the lowest rates in the Region.

Figure 85 shows the variation in teen birth rates across the Appalachian Region. Darker blue indicates higher rates of teen births, and for this measure, higher values are associated with worse health. Northern Appalachia stands out from the other subregions due to its low rates. Central Appalachia, and Kentucky in particular, has the largest concentration of counties with high teen birth rates.

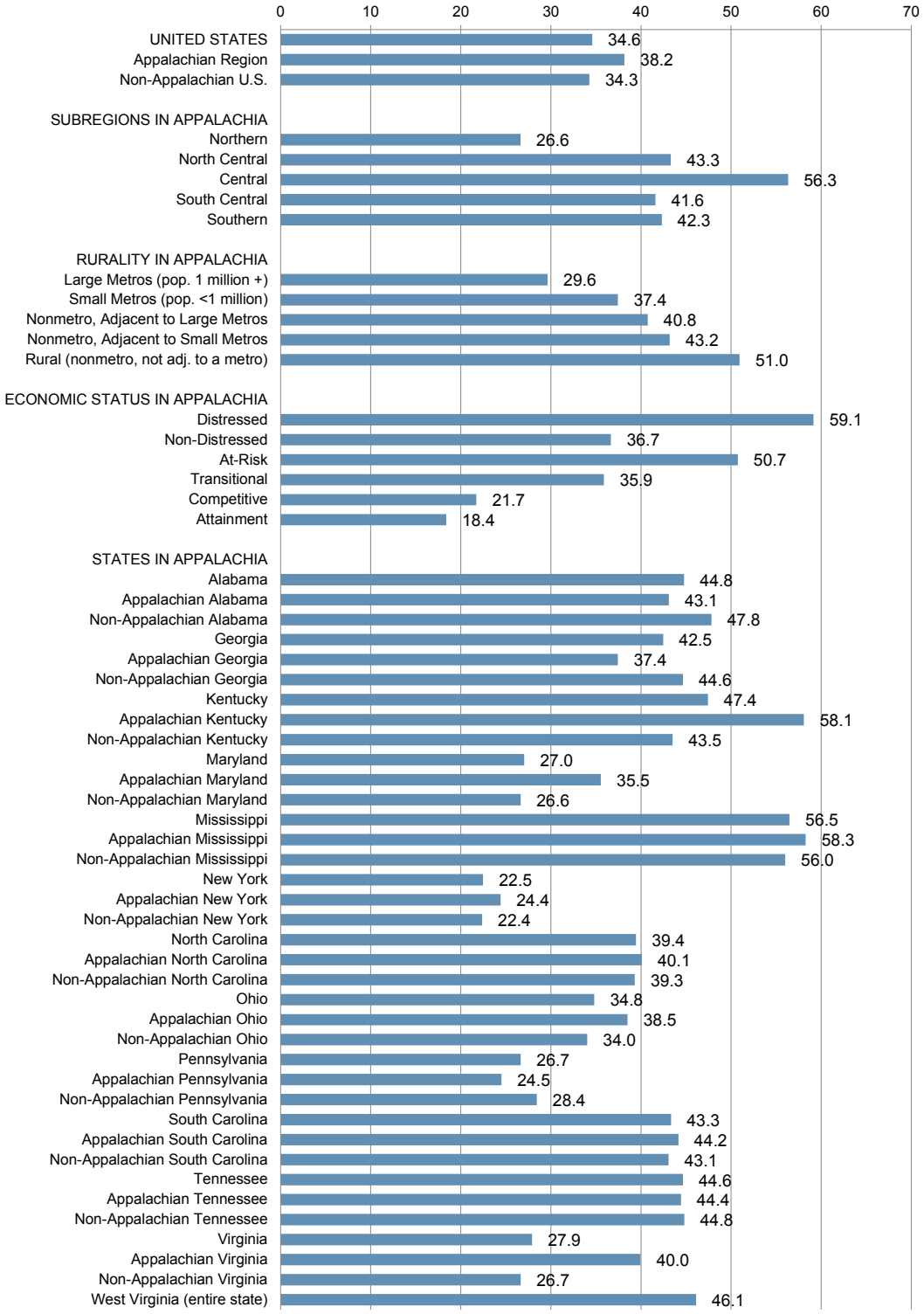
Figure 86 aggregates the data for a variety of geographies useful for comparison: the Region compared to both the U.S. as a whole and the non-Appalachian portion of the country, subregions throughout Appalachia, levels of rurality in Appalachia, and economic status in Appalachia. State-level aggregation is done at three levels: the entire state, and then both the Appalachian and non-Appalachian portions of each state.

Figure 85: Map of Teen Birth Rates in the Appalachian Region, 2007–2013



Data source: County Health Rankings & Roadmaps, 2016 edition. University of Wisconsin Population Health Institute supported by Robert Wood Johnson Foundation http://www.countyhealthrankings.org/rankings/data.

Figure 86: Chart of Births per 1,000 Females ages 15–19, 2007–2013

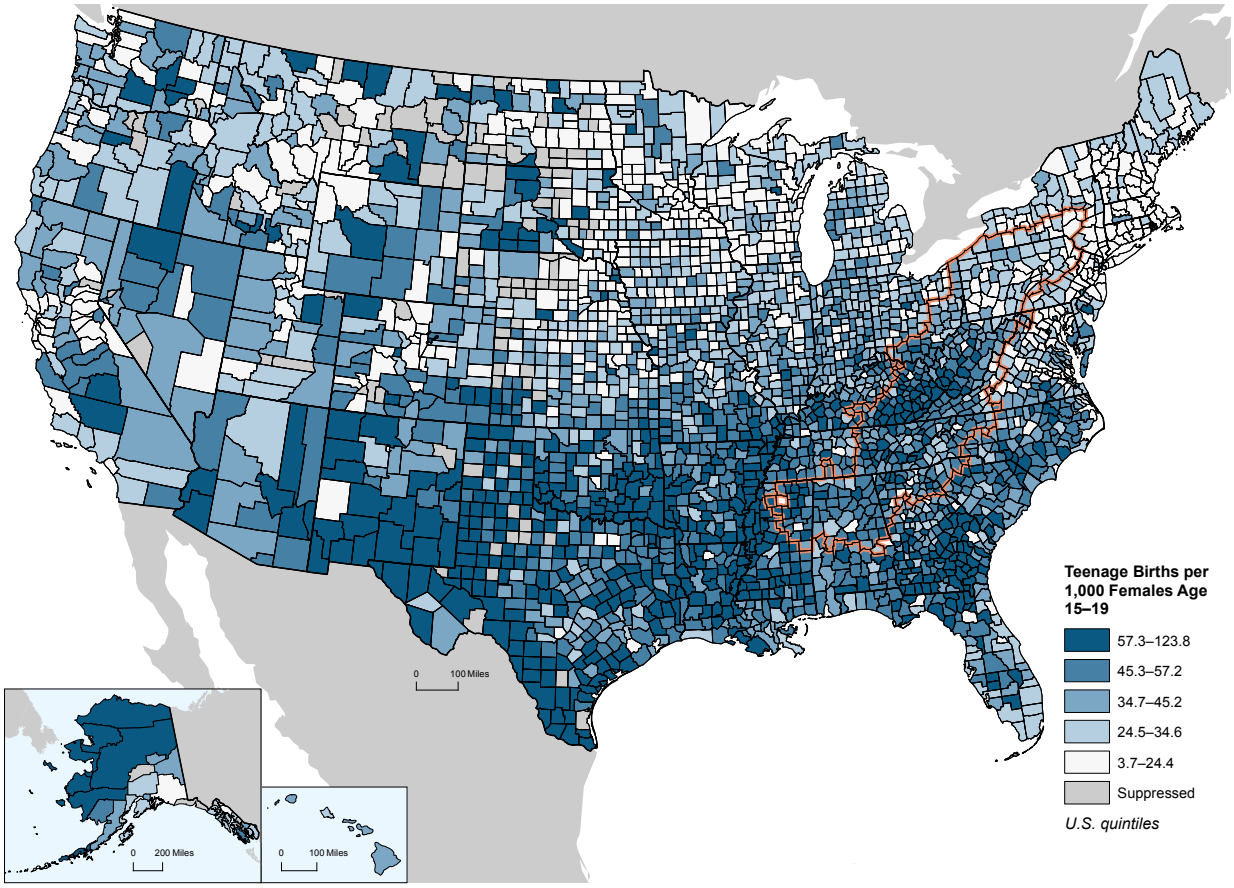


Data source: County Health Rankings & Roadmaps, 2016 edition. University of Wisconsin Population Health Institute supported by Robert Wood Johnson Foundation http://www.countyhealthrankings.org/rankings/data.

Overview: Teen Birth Rates in the United States

Figure 87 shows the variation in teen birth rates across the United States. Much of the southern half of the country reports high teen birth rates. These poorly performing counties are found in the coastal Southeast and Mississippi Delta regions, as well as into Texas and the Southwest. Both the Northeast and Upper Midwest report low teen birth rates, with few counties in these two regions ranking outside of the two top-performing national quintiles.

Figure 87: Map of Teen Birth Rates in the United States, 2007–2013

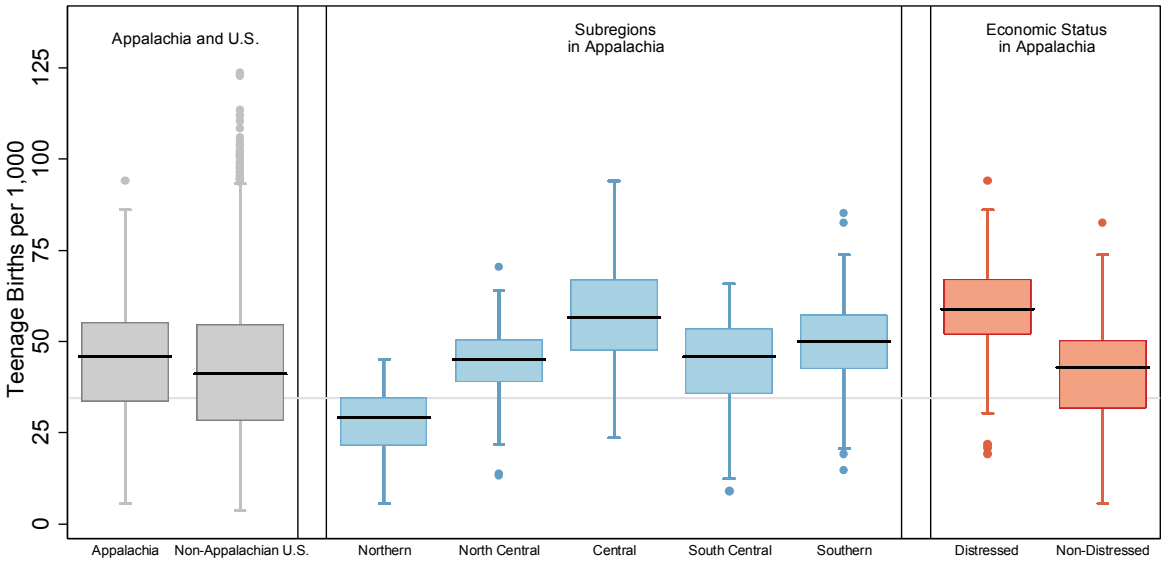


Data source: County Health Rankings & Roadmaps, 2016 edition. University of Wisconsin Population Health Institute supported by Robert Wood Johnson Foundation http://www.countyhealthrankings.org/rankings/data.

Distribution of Teen Birth Rates

Figure 88 shows the distribution of teen birth rates by geography and economic status. The shaded boxes show the middle 50 percent of values for each group, with dots representing unusually high or low values. The gray line stretching across the width of the graph indicates the national average, and the black lines inside the shaded boxes indicate the median for each respective group. Of all 3,113 counties in the nation, 99 have a missing value for this indicator.

Figure 88: Box Plot of Teen Birth Rates by Geography and Economic Status, 2007–2013



Data source: County Health Rankings & Roadmaps, 2016 edition. University of Wisconsin Population Health Institute supported by Robert Wood Johnson Foundation http://www.countyhealthrankings.org/rankings/data.

The distribution of teen birth rates among national quintiles for Appalachian counties is shown in Table 33. Of the 420 counties in the Region, 83 (20 percent) rank in the worst-performing national quintile, while 44 (10 percent) rank in the best-performing.

Table 33: Distribution of Teen Birth 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.*
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 this indicator may not sum to 420 due to missing or suppressed values.

Infant Mortality

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County Health Rankings. Low Birthweight. http://www.countyhealthrankings.org/measure/low-birthweight

Teen Births

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Stewart Ng, A, & Kaye K. (2013). Why It Matters: Teen Childbearing and Child Welfare. Retrieved July 22, 2016, from https://thenationalcampaign.org/resource/why-it-matters-teen-childbearing-and-child-welfare.

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