

WHY ARE DEATH RATES RISING IN VIRGINIA'S WHITE POPULATION?

The Role of Stress-Related Conditions



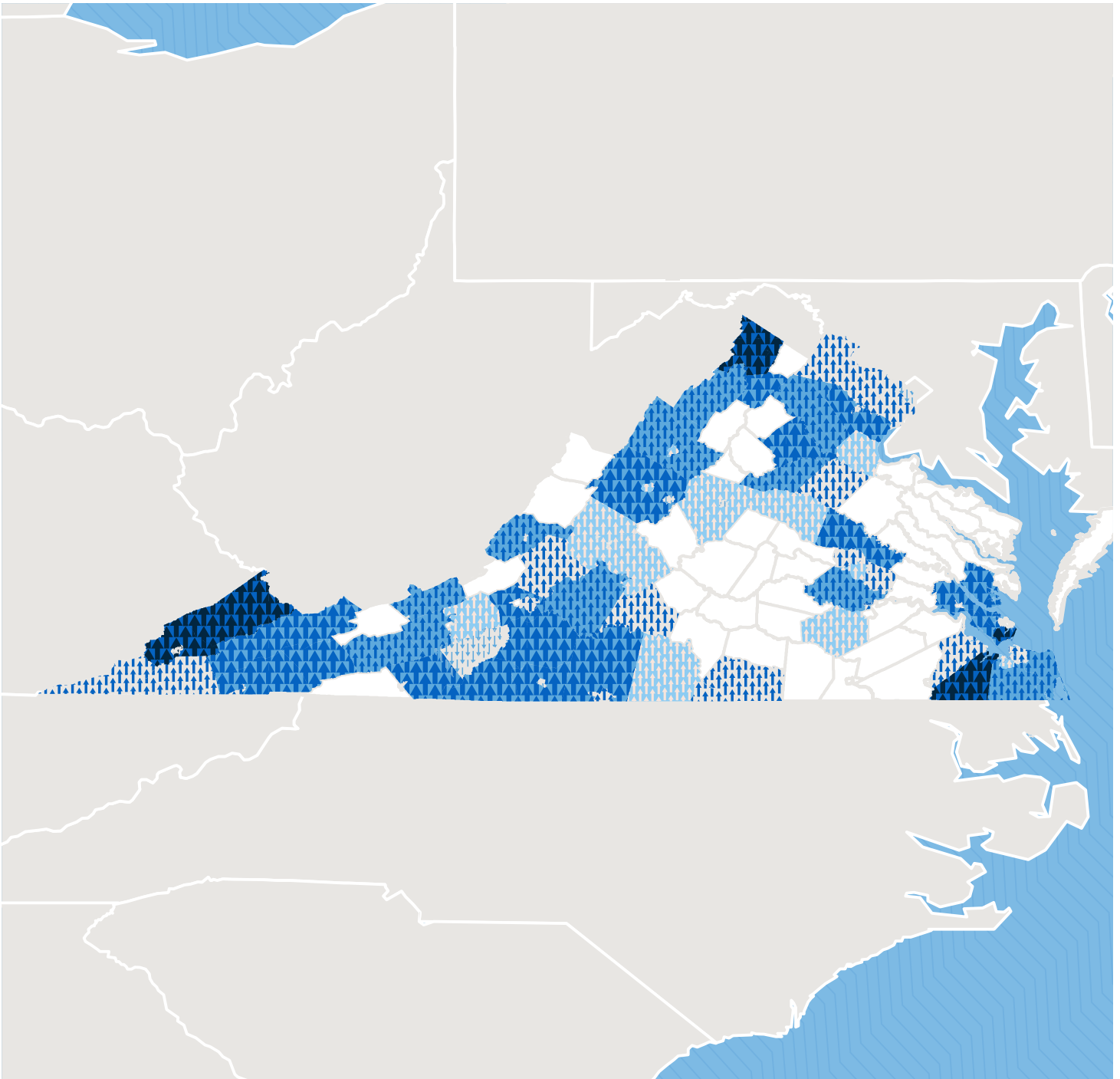
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RACE AND THE SOCIAL DETERMINANTS OF HEALTH

a. For simplicity, this report uses “whites” as shorthand to refer to non-Hispanic whites (those who were coded as Hispanic). The study focuses on non-Hispanic whites, with the expectation that understanding the causes of this phenomenon among whites could be relevant to all racial and ethnic groups, who may be vulnerable to increases in death rates from the same causes.

Research shows that improved socioeconomic and environmental conditions are key factors for improving health and increasing life expectancy—across all populations. The persistently higher death rates that exist among blacks, American Indians and Alaskan Natives, and some Asians reflect the influence of exclusion and longstanding inequities in areas such as education, housing, and economic opportunity. Although death rates in Virginia have declined across racial and ethnic groups (see Technical Supplement), troubling disparities remain. For example, in 2010–2014 the death rate among blacks in Virginia was still 1.2 times higher than that of the white population.

The subject of this study—whether Virginia’s white population^a is experiencing a rise in death rates from certain causes—does not, and should not, distract attention from addressing the causes, historic and otherwise, of the inequities that have undermined the health of other racial groups. However, understanding the factors responsible for recent mortality trends in the white population is also important—not only to address the public health crisis in that population but also to signal disturbing health trends that could be affecting other groups. This report helps underscore the importance of addressing the root causes of poor health—including social, economic, and environmental conditions—and of adopting policy solutions that can ensure opportunities for optimal health among Virginians of all backgrounds.

BACKGROUND FOR STUDY

Death rates have generally been decreasing in the United States and other industrialized countries for the past century. However, several studies have reported rising death rates among certain groups of whites in the United States, especially those who are middle-aged.^{1–3}

This issue brief presents an examination of Virginia’s vital statistics from 1995 to 2014 to help understand whether, where,

b. Independent cities in Virginia are considered county equivalents for census purposes.

and why mortality rates are rising among Virginia’s white population. The report includes a summary of findings as well as detailed comparison of trends across eight regions of the Commonwealth and across its 95 counties and 38 independent cities,^b referred to collectively as localities in this report. The study was funded by the California Endowment and involved a partnership between the Center on Society and Health at Virginia Commonwealth University and the Graduate School of Public Health at the University of Pittsburgh.

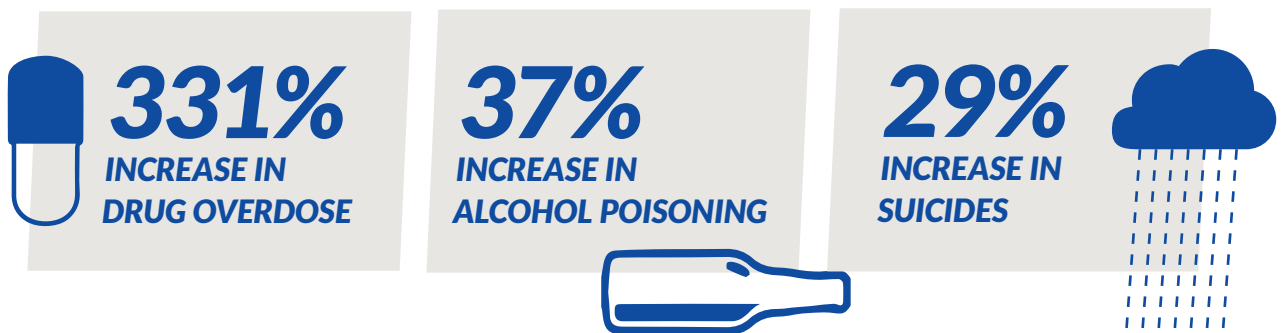
WHAT CAUSES OF DEATH ARE RESPONSIBLE FOR CHANGING DEATH RATES IN THE WHITE POPULATION?

c. Trends in death rates in this report generally refer to age-adjusted rates, in which the “crude” mortality rate was recalculated to account for changes in the age distribution of the population over time.

We found that overall death rates^c in Virginia’s white population decreased by 16% between 1995 and 2014, but death rates from 20 specific causes increased dramatically, especially among those ages 25–54 years. More than half (55%) of these excess deaths were due to unintentional drug overdoses, suicides, and alcoholic liver disease. The alarming rise in drug and alcohol abuse and suicides has been reported elsewhere in the United States—what some have called “deaths of despair.”⁴

We created a composite measure for these “stress-related conditions” (SRC). The SRC mortality rate combined all deaths

The rise in drug and alcohol abuse and suicides is striking—what some have called “deaths of despair”



from four causes: drug overdoses, alcohol poisoning, alcoholic liver disease, and suicides. In Virginia, the rate of SRC deaths among whites ages 25–54 years increased by 83% between 1995 and 2014, claiming almost 2,300 lives in excess deaths in this population. Two-thirds of these excess deaths were caused by unintentional drug overdoses.

The rise in death rates from drug and alcohol abuse and suicides among whites in Virginia ages 25–54 years was striking:

Drugs: Death rates from unintentional drug overdoses increased by 331% between 1995 and 2014 among young and middle-aged whites (ages 25–54 years), accounting for more than 1,500 excess deaths between 1995 and 2014. In 2010–2014 alone, approximately 2,000 whites ages 25–54 years died from unintentional drug overdoses.

- Fatal drug overdoses also became more pronounced at even younger ages after 1995. Age-specific death rates increased by 285% among whites ages 15–19 years and 312% among those ages 20–24 years.
- Whites ages 50–59 years experienced the largest relative increase in fatal drug overdoses after 1995.

Alcohol: Death rates from alcoholic liver diseases increased by 37% after 1995 among whites ages 25–54 years, and the death rate from cirrhosis increased by 53%. Deaths from alcoholic liver disease were concentrated among those ages 40–69 years.

Suicide: The suicide rate among whites ages 25–54 years increased by 29% after 1995.

- Suicides in this age group involving firearms increased in frequency by 15%, whereas suicides not involving firearms increased by 48% after 1995. The largest relative increases in non-firearm suicides occurred among those ages 55–64 years.

- Hanging, strangulation, or suffocation were the most common forms of non-firearm suicide, increasing in frequency by 92% after 1995. The rate of suicides involving jumping from high places increased by 229%.

Deaths among young adult whites: The increase in deaths in Virginia was especially pronounced among young adult whites (ages 25–34 years). Between 1995 and 2014, the rate of fatal drug overdoses in this age group increased by 419%, and the suicide rate increased by 39% after 2000. The rate of suicides involving firearms increased by 28% after 2000 and that of non-firearm suicides increased by 53% (including an 80% increase in the rate of deaths by hanging, strangulation, or asphyxiation).^d

d. These increases were enough to produce a 9% increase in the all-cause mortality rate among whites ages 25–34 years.

Although other studies have also reported that white Americans have experienced higher death rates from drug overdoses, alcoholism, and suicide, our detailed analysis also found dramatic increases in deaths from organ diseases. Out of 20 causes responsible for the increase in mortality after 1995 in Virginia among whites ages 25–54 years, organ diseases accounted for 44% of the excess deaths. The medical disorders responsible for these deaths included viral hepatitis, liver cancer, heart disease, and other organ diseases, many having potential links to substance abuse and trauma (e.g., unintentional injuries), among other risk factors. Examples are shown in Figure 1.

Chronic lung disease: Smoking is a leading cause of chronic lower respiratory disease. Mortality from this disease among whites in Virginia ages 25–54 years increased by 26% after 1995. Although most deaths occurred at older ages and increased significantly among those ages 85 and older, an increase in the death rate was also observed among whites ages 40–54 years.

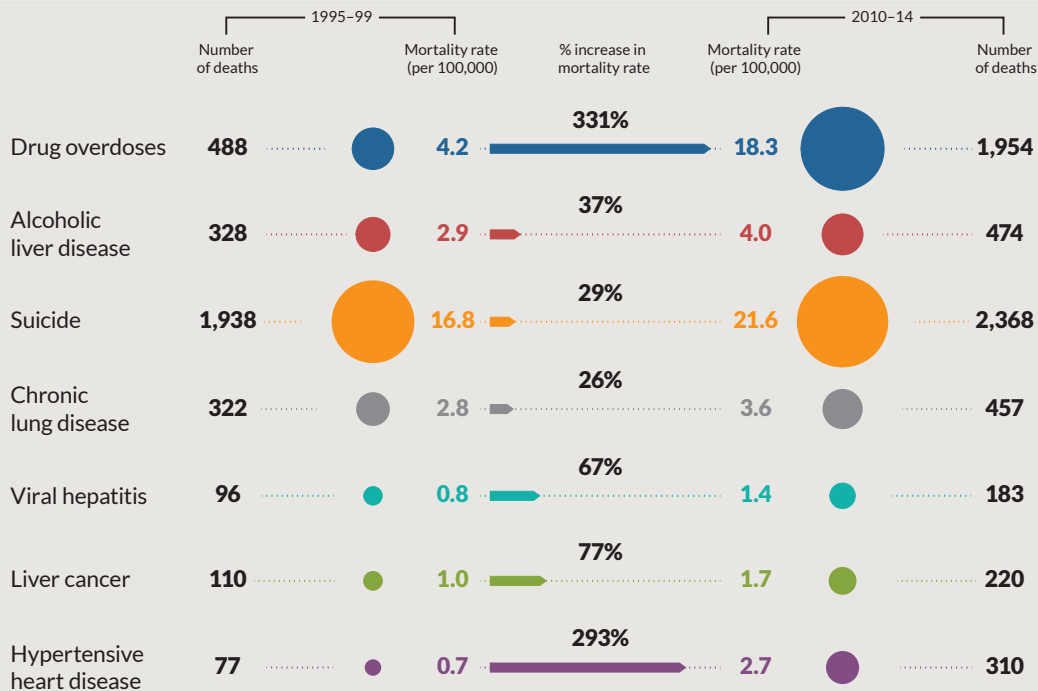
Viral hepatitis: The use of injectable drugs increases the risk of certain viral infections of the liver, such as hepatitis C, a chronic liver disease that can be fatal. Death rates from viral hepatitis among whites in Virginia ages 25–54 years increased by 67% between 1995 and 2014 but also increased significantly up to age 64 years.

Liver cancer: Hepatitis C and other kinds of viral hepatitis increase the risk of liver cancer. Death rates from liver cancer increased by 77% among whites ages 25–54 years between 1995 and 2014. Age-specific death rates among those ages 55–64 years also increased significantly.

Heart disease: Alcohol consumption is among the risk factors for a variety of cardiovascular disorders. For example, the death rate from hypertensive heart disease in Virginia increased by 293% after 1995 among whites ages 25–54 years.

White adults in Virginia also experienced significant increases in death rates from other causes, such as obesity, diabetes, kidney failure, sepsis, aspiration pneumonia, neurologic disorders (including anoxic brain damage), and maternal deaths related to child birth. A variety of factors could be responsible for

Figure 1. Increases in deaths among whites ages 25–54 years in Virginia, 1995–2014



Size of colored circles is proportional to the absolute number of whites ages 25–54 years in Virginia who died from specific causes. Percentages in the center of the diagram refer to the proportional increase in the adjusted death rate from specific causes. Deaths from drug and alcohol poisoning refer to unintentional overdoses; deaths from hypertension refer to deaths from essential hypertension.

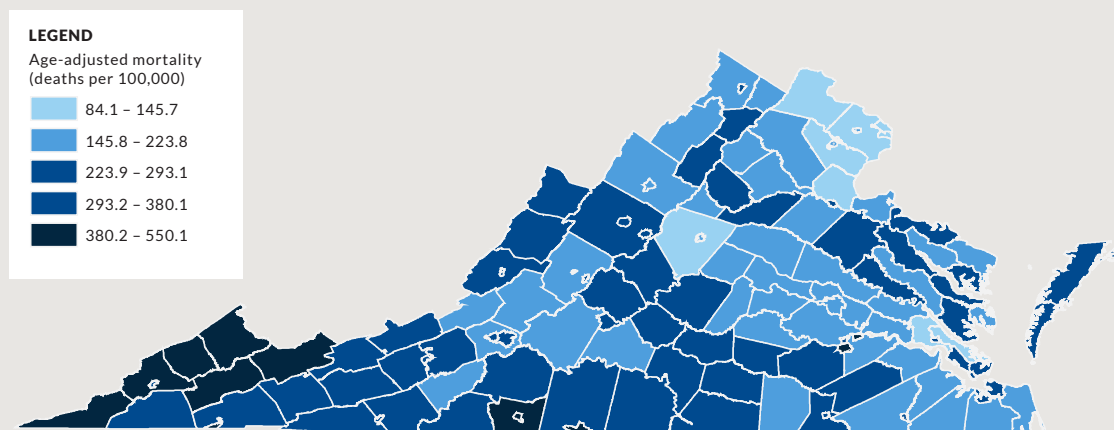
these trends, but common contributors could include increased smoking, overeating, drug and alcohol use, oversedation, and catastrophic damage to vital organs.

We also observed trends in deaths from unintentional injuries. Although the risk of dying in car crashes decreased in Virginia after 2007,⁵ fatality rates increased for other forms of transportation. For example, between 2000 and 2014, the rate of motorcycle fatalities involving whites ages 25–54 years increased by 40% after 2000. Some of these deaths are potentially associated with intoxication, although other factors may be to blame. More details on specific cause of death increases are available in the accompanying Technical Supplement.

WHERE AND WHY IS THIS HAPPENING?

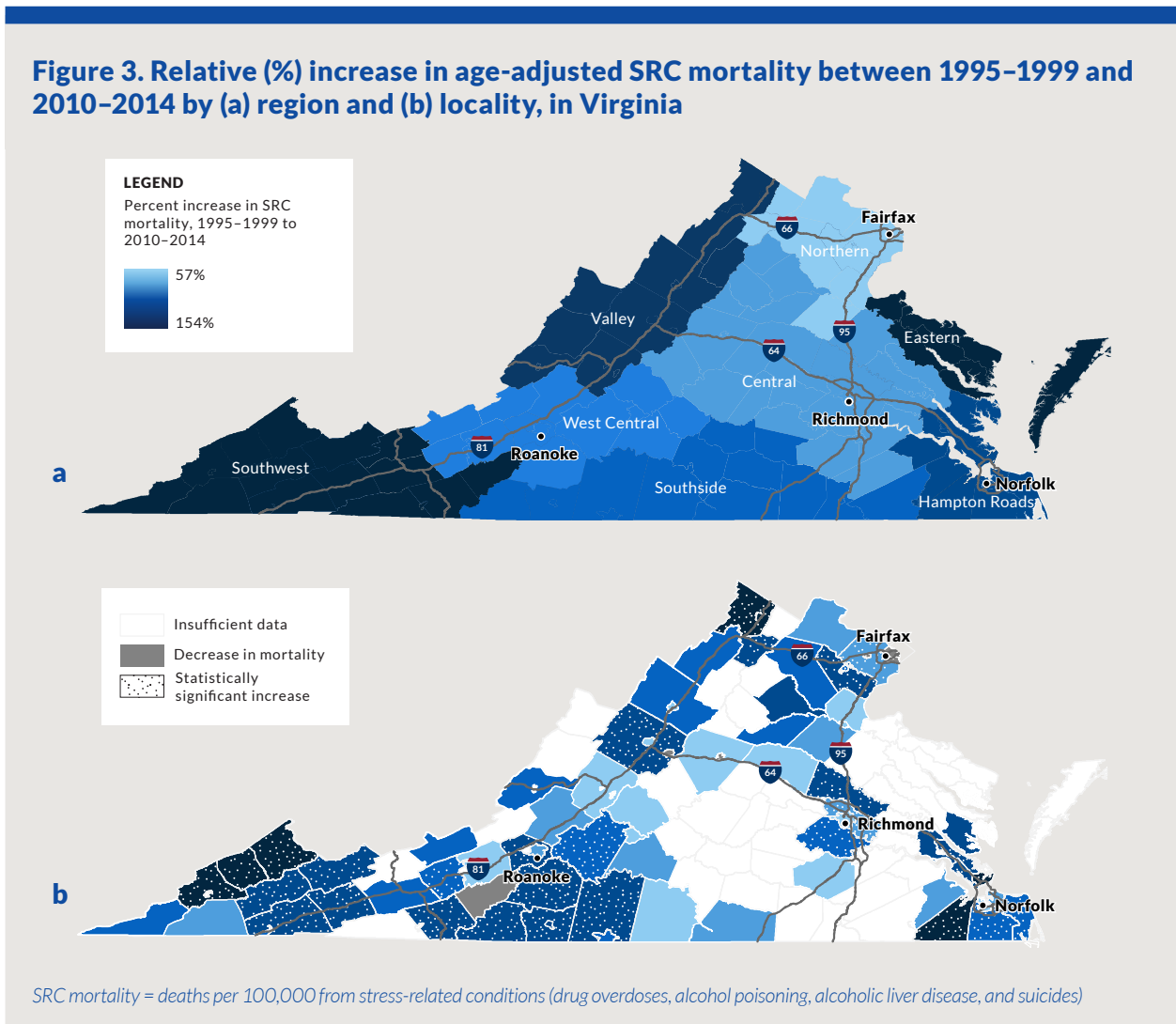
SRC mortality among whites ages 25–54 years increased after 1995 in every region of Virginia. Although death rates from all causes tend to be highest in Southwest, Southside, and Eastern Virginia (Figure 2), the largest relative increases in SRC mortality after 1995 among whites ages 25–54 years occurred in the Eastern (154%), Southwest (142%), and Shenandoah

Figure 2. Age-adjusted all-cause mortality, non-Hispanic whites ages 25–54 years, by locality, Virginia, 2010–2014



Valley (116%) regions (Figure 3a). Analysis at more local, sub-regional levels was hampered by small population counts; data in 58 localities in Virginia were insufficient to calculate relative changes in death rates after 1995. Figure 3b shows the trends for the remaining 75 localities for which data were available; jurisdictions with a dot pattern had statistically significant trends. The localities with the largest relative increases in SRC mortality were in Southwest Virginia.

To better understand the context in which the mortality rates are increasing, we examined the population size, rurality, and more than 30 other place-based characteristics of every region,



county, and city in Virginia. The 30 variables spanned seven domains, including demographic characteristics, educational attainment, income and employment, housing, transportation, environment, and access to health care. We then examined how strongly these factors correlated with the relative increase in SRC mortality rates between 1995 and 2014.

We found that the largest relative increases in SRC mortality among whites in Virginia ages 25–54 years occurred in more rural and less populated areas; in places with less diversity and fewer foreign-born residents; and where the local population had less educational attainment, lower household incomes, greater income inequality, more child poverty, older housing, less health insurance, and greater shortages of health care professionals. Three regional factors had the highest correlation coefficients (absolute values exceeding 0.70): rurality, the percentage of adults without a Bachelor’s degree, and shortages of mental health professionals. Among localities with significant increases in SRC mortality, the unemployment rate had the highest correlation with the degree of increase. More details about this analysis are provided in the accompanying Technical Supplement.

Southwest, West Central, and Southside Virginia: The highest SRC mortality rates were in the Southwest and West Central regions, which border Kentucky and West Virginia, and Southside Virginia, which borders North Carolina. The rural, largely white populations of Southwest and Southside Virginia had, respectively, the lowest and second lowest median household income in the state and the highest unemployment rate; more than one out of four children lived in poverty.

SRC mortality increased across these regions after 1995–1999. The increases in West Central Virginia were greatest in Roanoke County and Franklin County, south of Roanoke. The largest, statistically significant increases in Southside Virginia were in three adjacent counties along the North Carolina border: Patrick County, Henry County, and Pittsylvania County. In Henry County—home to Martinsville—15% of the population was

uninsured and there was only one mental health professional for every 52,000 people.

Southwest Virginia had the state's second largest surge in SRC mortality (142%). The increases were even sharper in its westernmost counties, where increases of 262%, 245%, and 215% occurred in Wise County, Buchanan County, and Dickenson County, respectively. In Wise County, only 49% of adults had graduated from high school. In Buchanan County—which borders West Virginia and Kentucky—only 9% of adults had a Bachelor's degree, the median income was \$32,000 per year, the child poverty rate was 31%, and 40% of households had single parents.

The rise in SRC mortality in these rural communities was fueled by dramatic increases in fatal drug overdoses. The death rate from drug overdoses increased by 697% and 681%, respectively, in Southwest and Southside Virginia. Death rates from alcoholic cirrhosis of the liver more than doubled in West Central Virginia between 2000 and 2014. Although the suicide rate did not increase significantly in this region, suicides involving hanging, strangulation, or suffocation doubled in Southwest and Southside Virginia after 1995.^e

e. Whites ages 25–54 years in Southwest Virginia also experienced a significant increase in deaths from chronic lower respiratory diseases (61%), diabetes (88%), and renal failure (227%) between 1995 and 2014. Deaths from diabetes and renal failure also increased in West Central Virginia.

Eastern Virginia: Eastern Virginia registered the largest proportional increase in SRC mortality (154%) among whites ages 25–54 years. In this sparsely populated rural area alongside the Chesapeake Bay, population counts were too small to quantify the specific causes of death driving this trend. The Eastern region had the lowest percentage of high school graduates for any region, the second highest unemployment and uninsured rates, and the largest shortage of mental health professionals.

Shenandoah Valley: In the largely rural Shenandoah Valley, SRC mortality among whites ages 25–54 years increased by 116% after 1995. The largest relative increases occurred in the city of Winchester and surrounding Frederick County (the state's northernmost county), and the largely rural Augusta County, which is home to Staunton and Waynesboro. In the

city of Winchester, 39% of households had single parents, 22% of children lived in poverty, 17% of the population was uninsured, and 11% of residents were foreign-born. The Valley region experienced the state's largest relative increase in the regional death rate from drug overdoses (955%). This region also experienced a 188% increase in the death rate from alcoholic cirrhosis of the liver and a 41% increase in the suicide rate.

Northern Virginia: The increase in SRC mortality was not restricted to rural areas. It impacted Northern Virginia, the most populated and affluent region of the state, located in the suburbs of Washington, DC. SRC mortality among whites ages 25–54 years in Northern Virginia was the lowest of any region in the state, but it still increased significantly (by 57%) after 1995. The rate of fatal drug overdoses rose by 213%, and the suicide rate increased by 40%. The most significant increases in SRC mortality occurred in rural Warren County, at the western edge of Northern Virginia, where the population had the lowest educational attainment in the region and household incomes were the second lowest.

Increases also occurred in affluent areas of Northern Virginia. In Loudoun County, the state's most affluent county (median income over \$122,000), SRC mortality increased by 91% after 2000. In Fairfax County, the state's most populated county, SRC mortality increased by 76% after 1995. Fairfax County experienced a 168% increase in the fatal drug overdose rate, as well as the region's most significant increase in suicide rates (including a 132% increase in hanging, strangulation, or suffocation). Prince William County, a suburban county with greater socioeconomic challenges, experienced the region's most significant increase in fatal drug overdoses (483% increase).

Richmond and Central Virginia: Central Virginia experienced the state's second lowest relative increase in SRC mortality among whites ages 25–54 years, much of it driven by increases in counties near the state capital, Richmond, including Hanover County (167%), Henrico County (56%), and Chesterfield County (103%). SRC rates did not increase significantly among whites

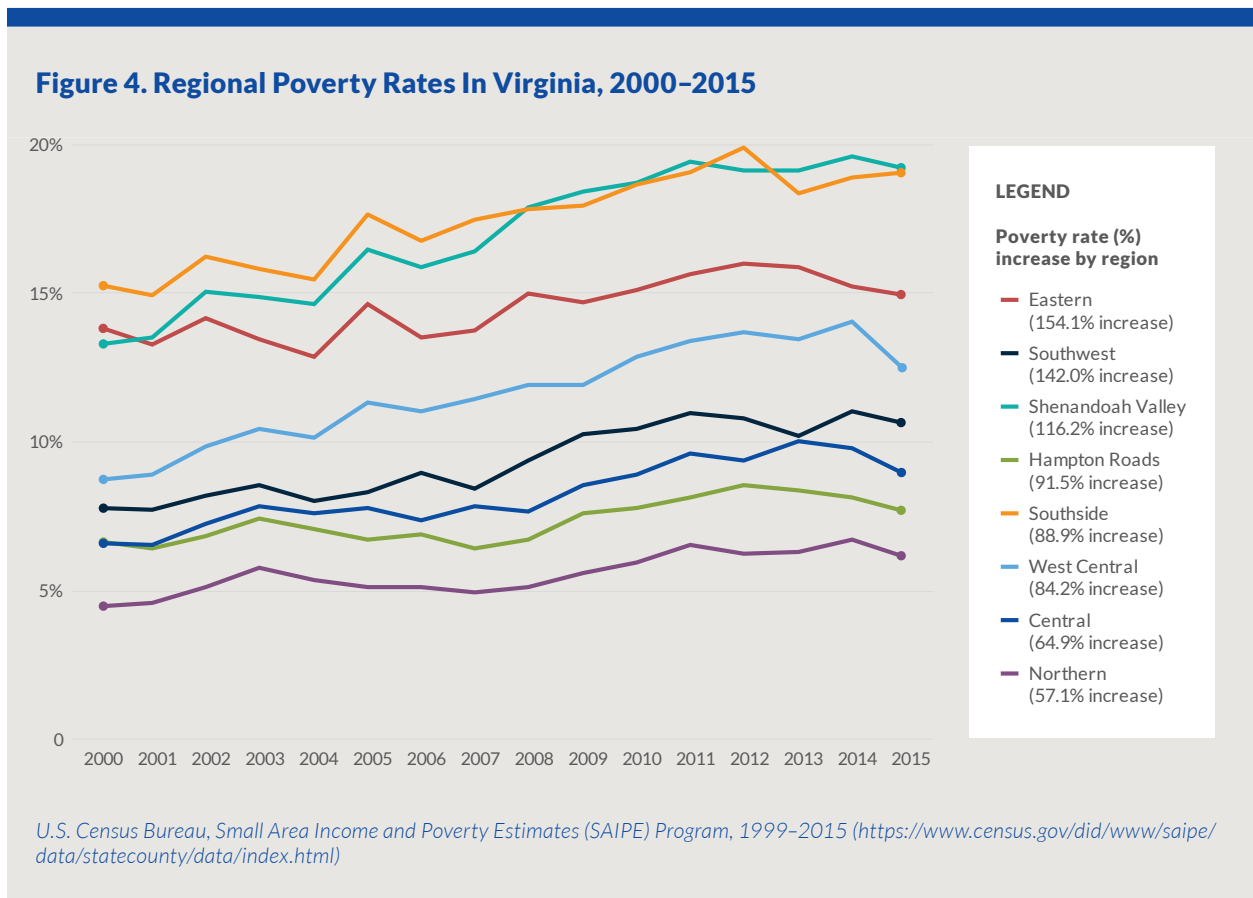
in Richmond City but did increase in its suburbs, which had higher socioeconomic status than much of Central Virginia. Central Virginia experienced a 214% increase in the death rate from drug overdoses, much of it fueled by increases in suburban Chesterfield County and Henrico County (319% and 134%, respectively). Fueled by significant trends in Hanover County, the region's suicide rate for whites ages 25–54 years increased by 24% after 1995, including a 55% increase in non-firearm suicides and a 160% increase in hanging, strangulation, or suffocation.

Hampton Roads: SRC mortality also rose dramatically in Hampton Roads, a largely metropolitan area in southeastern Virginia known for its large military presence and the port city of Norfolk. SRC mortality among whites ages 25–54 years increased significantly after 1995 in York County and the nearby cities of Newport News, Hampton, Norfolk, Virginia Beach, Suffolk, and Chesapeake. Between 1995 and 2014, the death rate from drug overdoses in this population increased dramatically in Newport News (509%), Chesapeake (215%), Virginia Beach (201%), and Norfolk (128%). Alcohol-related deaths also increased in Hampton Roads, the only region in the state to experience a statistically significant increase in the death rate from alcoholic liver disease. This region also had the state's largest surge in the suicide rate (48% increase after 1995, 54% after 2000). Firearm-related suicides increased by 35%, and non-firearm suicides increased by 63%—including a 122% increase in hanging, strangulation, or suffocation. The suicide rate increased significantly after 2000 in Chesapeake and Virginia Beach, and the non-firearm suicide rate tripled in Newport News. In Virginia Beach, suicides by hanging, strangulation, or suffocation increased by 127% after 2000.

We also examined socioeconomic trends in these regions between 1990 and 2014. Although household income, unemployment, and poverty rates fluctuated during these years throughout Virginia, especially after the 2007 recession, the regions with the largest relative increases in SRC mortality (e.g., Southside, Southwest, Eastern regions) consistently experienced greater economic distress. For example, although poverty rates in each

region increased after 2000, poverty rates were consistently higher in Southside, Southwest, and Eastern Virginia (Figure 4).

We know from research that a complex set of factors influences the health of individuals as well as communities. These influences include not only health care and individual behaviors, but also socioeconomic conditions and the environment in which we live. For example, physical activity, diet, and obesity are influenced by access to healthy food and the built environment (e.g., the presence of sidewalks, cycling paths, green space, and other amenities for physical activity). Health is also affected by access to education, employment, housing, and transportation, as well as to social conditions that shape health, such as community cohesion, resilience, and cultural norms. Prior research identified low educational attainment as an important predictor of rising mortality rates in the US white population.¹ These factors are



especially important in understanding the inequities in health outcomes and mortality rates that exist among populations of color, and they may also explain rising mortality rates among whites.

The rise in SRC mortality in Virginia’s white population, and the startling spike in deaths from substance abuse and suicides, could be a direct response to economic stresses, but the phenomenon is probably more complex. Although the largest spikes in mortality occurred in impoverished regions of Virginia, smaller increases also occurred in affluent areas with highly educated populations. Hardships exist not only in rural Virginia⁶ but, increasingly, in pockets of disadvantage in metropolitan areas.⁷ More nuanced explanations for health trends among whites must also be considered, such as changes in the social cohesion of communities and difficulties whites may be facing in achieving the stability their parents once enjoyed. The influx of opioids is a major factor. People in pain have greater access to prescription opioids (e.g., oxycodone, hydrocodone) and illicit street drugs (e.g., fentanyl, heroin). Addiction often begins with prescription agents, and victims then turn to heroin as a cheaper, more readily available substitute.

Over time, chronic stress, despair, and the pain they produce can induce harmful coping behaviors.

Further research is needed to fully understand the complex web of factors that caused SRC mortality rates to climb more dramatically in certain regions of Virginia. The history and economy of the regions are important.⁶ The investigation must also explore why middle-aged whites in particular were disproportionately impacted. One theory is that this age group is experiencing life conditions that differ starkly from past expectations and may lack the resilience to endure the cumulative stress that comes with prolonged social and economic hardships. During the two decades this report studied (1995–2014), young and middle-class whites—the age group

examined here—experienced economic and social instability unlike that of their parents and grandparents. In the post-World War II generation, loyal workers could often count on a job for life, with health insurance, a pension, and other benefits—and earnings were generally stable enough to finance a home, put children through college, and plan for retirement.^{8–13} Middle-class white households were largely protected from the social disadvantage and economic insecurity that are common today, and that people of color have experienced for generations.

Frustration and hopelessness over these conditions would be expected to increase anxiety and depression. Over time, chronic stress, despair, and the pain they produce can induce harmful coping behaviors. Some people turn to food, resulting in over-eating and the consumption of calorie-dense fast foods. Some people cope with stress by smoking, which increases the risk of tobacco-related diseases (e.g., emphysema). Some people are overcome by anxiety or depression; feelings of hopelessness can lead desperate individuals to commit suicide. Some people self-medicate with alcohol or drugs to relieve their psychic pain. And some people act out in violence, causing injury to others. It is a mistake to focus on (or blame) the behaviors that individuals adopt to cope with these stresses and ignore the policies and living conditions in communities that fuel these behaviors.

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These stresses may be greater in rural areas, where access to resources is more remote and jobs are scarcer. In rural America, entire regions—not just individuals—have lost opportunities for employment due to the collapse of major industries. Rural Virginia is no exception. As in the nearby coal country of West

Virginia and Kentucky, communities in Southwest and West Central Virginia have been devastated by the fate of the coal industry, a decades-long trend that has been accelerated by the nation's move to clean energy and reduced reliance on fossil fuels.⁵ As more coal plants closed, families that had worked for generations in the mines struggled to find employment. Other industries have avoided the region, discouraged by its unskilled (and often unhealthy) workforce and its frail infrastructure and resources (e.g., lack of broadband access). A similar challenge has affected the communities in Southside Virginia, where the region's historic dependence on tobacco farming, textile mills, and furniture manufacturing created vulnerabilities as these industries declined.⁶

WHAT SHOULD BE DONE?

Virginia has focused efforts on addressing health inequities among disadvantaged groups and populations of color. Health disparities persist, however, for many of these populations. The increase in death rates in the white population requires further investigation—to learn what is causing this trend and how it is threatening other groups. This crisis underscores the urgent need for policy action to reduce health inequities for all Virginians. Health outcomes, from stress-related conditions to chronic diseases, will benefit from Federal, state, and local efforts to improve education and economic opportunity and to invest in communities—including those in urban, suburban, and rural settings. Particular attention is needed to address local conditions or exclusionary policies that close doors to social mobility, cut people off from their systems of support, and drive families into deeper despair. All populations in Virginia deserve the opportunity to be healthy and thrive within their families and communities.

This crisis underscores the urgent need for policy action to reduce health inequities for all Virginians.



TABLE 1: POLICY STRATEGIES TO ADDRESS RISING MORTALITY RATES

Address root causes by improving economic and social conditions for populations in need

Policy action by government and the private sector to improve job opportunities, increase wages, reduce poverty, and promote economic mobility

Reforms and investments to improve the quality of education—from preschool through high school—and to improve the affordability of college, vocational training, and professional education

Invest in communities

Economic development by business, investors, and philanthropy, and the promotion of new industry in marginalized and resource-poor rural counties

Civic engagement and cross-sector partnerships to leverage and target resources and expand opportunities to break the cycle of poverty

Cross-racial alliance building to understand and address common causes of health threats facing different racial and ethnic groups

Strengthen behavioral health services

Prevention, detection, and early treatment of drug and alcohol abuse—including the opioid epidemic

Strategies for suicide prevention, including better access to treatment for depression and other risk factors for suicide

Prepare the health care system for expanding caseloads

Affordable health care and insurance coverage, and strategies to address shortages in clinicians and facilities

Resources to address expanding caseloads among clinicians, practices, hospitals, emergency medical services for care at the scene, intensive care in the hospital, long-term care in rehabilitation facilities, and psychological counseling for mental illness and addiction

Conduct research on underlying causes

Investigation of the causal links responsible for rising death rates

Research by social scientists and economists to better understand the unique challenges facing young and middle-aged whites, the explanations for deteriorating health in this population while health improves in other racial and ethnic groups, and the economic and social conditions in impacted communities, such as rural counties

This health crisis requires action by decision-makers in sectors outside of health to help boost the economy, increase wages, create jobs, reform education, strengthen social supports, and revitalize communities for all Virginians. The most promising solutions cut across sectors: investments in communities that improve the material wellbeing and health of families can also benefit education, workforce productivity, social cohesion, and the infrastructure and economic vitality of communities. Conversely, the neglect of disadvantaged communities—especially cutbacks that reduce access to health care, safety net programs, and community investments—can contribute not only to increased disease rates but also higher health care costs for employers and government and sicker workforces that weaken corporate competitiveness. Health care reforms that result in weakened coverage will, in the face of rising death rates, escalate the death toll.

CONCLUSIONS

The dramatic rise in opioid addiction and fatal overdoses have rightfully alarmed the public and policymakers. But *the opioid crisis is the tip of an iceberg*: many people are dying from the use of other drugs, alcohol abuse, the injuries and diseases they cause, and suicides. The death toll will not stop by attending only to drug abuse. Focusing upstream is an urgent priority: the root causes that are driving people to their deaths must be addressed. Addressing the economy and alleviating the hardships responsible for the chronic stress experienced by children and adults may do more to alleviate desperation and may save more lives than focusing exclusively on symptoms.

These upstream conditions are not solved by doctors and addiction specialists, but by policies that create the social and economic conditions necessary for each person, family and community to be healthy and thrive—including strong schools, affordable housing, transportation options, and more. The increasing death rates, and the apparent anguish that families are experiencing, are poignant reminders of how much is at stake for everyone across the state: not just the length of our lives but the health of our children, the stability of our economy, and the future of our communities.

NOTES

This project was funded by The California Endowment. The methods used for this analysis, as well as detailed data, tables, and maps on which this report was based, are in an online Technical Supplement available at societyhealth.vcu.edu.

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