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BETTER HEALTH, BETTER LEARNING

Research On Improving Student Health
And Academic Success



“There is an undeniable connection between education and health. That’s why now, more than ever, we need a public education system producing more high school graduates who are better prepared for a career or college, and life.”

– Former US Senate Majority Leader Bill Frist, MD, 2011

Across Tennessee, students have made important academic achievement gains compared to their peers nationally, outpacing averages on the Nation’s Report Card in math, science, and eighth-grade reading since 2011.¹ The state has set more rigorous academic standards for students, and thanks to the work of teachers, school and district leaders, and other educators—along with communities of support—more students are gaining the skills and knowledge they will need to prepare for success in college and their careers. Still, these gains have not benefited all students or narrowed many of the achievement gaps affecting students from low-income backgrounds or students of color. These gaps continue to challenge Tennessee’s efforts to remain the fastest-improving state for academic achievement and to reach the goal of ensuring all students are prepared for success beyond high school.

Even as more students are achieving at higher levels in Tennessee’s public schools, too many face physical, mental, and emotional well-being challenges. On average, young Tennesseans are in poorer health and engage in behaviors such as smoking at higher rates than their peers in other states. In Tennessee, and nationally, stark gaps also exist in youth access to health services. For example, research by the Robert Wood Johnson Foundation shows that students in a quarter of the nation’s public schools do not have access to a school nurse.² Historically underserved students, in particular, disproportionately experience inadequate access to quality health care and nutrition, which leads to disparate rates of certain health conditions for these populations.³

Youth health indicators show Tennessee students are at greater risk of chronic illness, obesity, and other health problems that, in turn, negatively affect their prospects for success in school. Partnerships across sectors including education, public health, and economic and workforce development hold promise to improve the overall well-being and academic achievement of Tennessee’s young people.

The State Collaborative on Reforming Education (SCORE), in partnership with NashvilleHealth, began in 2016 an initiative to broaden awareness of the connections between health and student achievement in Tennessee, as well as to deepen understanding across both the education and public health communities. With support from NashvilleHealth, SCORE has reviewed state and national research and data on student health and academic achievement. This research brief is a resource to inform a common conversation about how to better meet the needs of students in Tennessee schools and ensure they are healthy and ready to learn.



KEY FINDINGS:

Physical activity, nutrition, and overall well-being can have a profound effect on student achievement.

High-quality education and academic achievement are associated with improved health outcomes later in life.

Mental and emotional health are critical for student success.

Investing in student health leads to short- and long-term economic benefits.

Tennessee Context

According to the Tennessee Department of Education (TDOE) Office of Coordinated School Health, during the 2015-16 school year, 226,378 students in Tennessee public schools had a chronic illness or disability diagnosis. This number represents 23 percent of all Tennessee public school students statewide. The most common diagnoses of those students included asthma (30 percent), ADHD/ADD (24 percent), and severe allergies (15 percent).⁴ Between the 2004-05 and 2014-15 school years, chronic illness diagnoses increased 85 percent, including a 78 percent increase in asthma and 52 percent increase in diabetes diagnoses.⁵ Tennessee students trail their peers nationally across a wide variety of health outcomes and behaviors (Figure 1). Youth health data from Tennessee show the health-related challenges many students must overcome to achieve success in school and life beyond graduation.

FIGURE 1

HEALTH OUTCOMES AND BEHAVIORS IN TENNESSEE ⁶

	TENNESSEE	US AVERAGE
High School Students Who Eat Vegetables Three Or More Times Per Day	9.7%	14.8%
Teen Birthrate	33%	24%
Youth Smoking	11.5%	10.8%
Youth Obesity	18.6%	13.9%
Children With One Or More Emotional, Behavioral, Or Developmental Conditions	21%	17%
Low-Birthweight Babies	9.1%	8%
Children With Asthma	12%	9%

Sources: Centers for Disease Control and Prevention, 2015 and Annie E. Casey Foundation, 2017.

According to the Annie E. Casey Foundation, Tennessee ranks 35th among states in overall child well-being.⁷ In Tennessee, 16 percent of surveyed parents said their children are not in “excellent or very good health.”⁸ This finding means parents of nearly 240,000 young Tennesseans do not regard their children as in the top categories of well-being.⁹ As an indicator of the extent to which Tennessee students need consistent health services, in a state with nearly 1 million enrolled during the 2015-16 academic year, students visited school nurses 3,885,680 recorded times. Students receiving attention from an on-site nurse are able to return to class approximately 90 percent of the time, rather than miss additional time for off-site care.¹⁰ Still, time in a nurse’s office represents time away from instruction and the classroom learning environment.



Research and experience have shown unhealthy and hungry children face higher hurdles to achieving academic success; after school-aged years, adults with higher levels of education tend to live longer, healthier lives. Improving both the overall well-being and academic achievement of students, therefore, should be a priority of the highest concern for the future of Tennessee—and all Tennesseans.

Student Health And Academic Achievement

Volumes of research have identified the strong relationship between students' overall well-being and their academic achievement. Many factors in a student's everyday environment affect his or her health, just as they affect academic achievement. Recognizing the role of home environment, school conditions, and access to high-quality nutrition and health care, this section provides a brief overview of research findings on the strength of the connections between student health and academic performance.

Physical activity, nutrition, and overall well-being can have a profound effect on student achievement.

One study found an association with academic performance across a variety of indicators of dietary quality, adequacy, and variety.¹¹

Overall, students who are physically active tend to have better grades, school attendance, cognitive performance (e.g., memory), and classroom behavior. Researchers have found participation in extracurricular physical activities such as interscholastic sports can lead to higher grade point averages, lower dropout rates, and fewer disciplinary problems among students.¹²

In 2013, the *Journal of School Health* published findings of a team led by a University of Tennessee kinesiologist showing a strong relationship between muscular strength and endurance and academic achievement in all studied grades.¹³

Researchers also have found that elementary students in Georgia who participated in an exercise program had higher math achievement and longer attention spans than students who were not in an exercise program. Compared to students who did

DEFINING HEALTH AND WELL-BEING

The World Health Organization encourages a broad conception of health and well-being. Therefore, the WHO's Constitution defines health as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity." This brief reflects the WHO's broad concept of addressing physical, mental, and social needs.

not participate in a physical activity-oriented afterschool program, active students had improved brain function. Groups of students who participated in both moderate and vigorous physical activity experienced this enhanced mental functioning. Based on these findings, the study's authors determined, "Aerobic activity may prove to be an important method of enhancing aspects of children's mental functioning that are central to cognitive development."¹⁴

A study released in 2012 looked at students' obesity or physical fitness and academic achievement. Researchers followed 6,250 children from kindergarten through fifth grade and found that those who were obese throughout that period scored lower on math tests than non-obese children.¹⁵ This pattern held even after the researchers took into account factors that can influence both body size and test scores such as family income, race, and parental education level and job status.

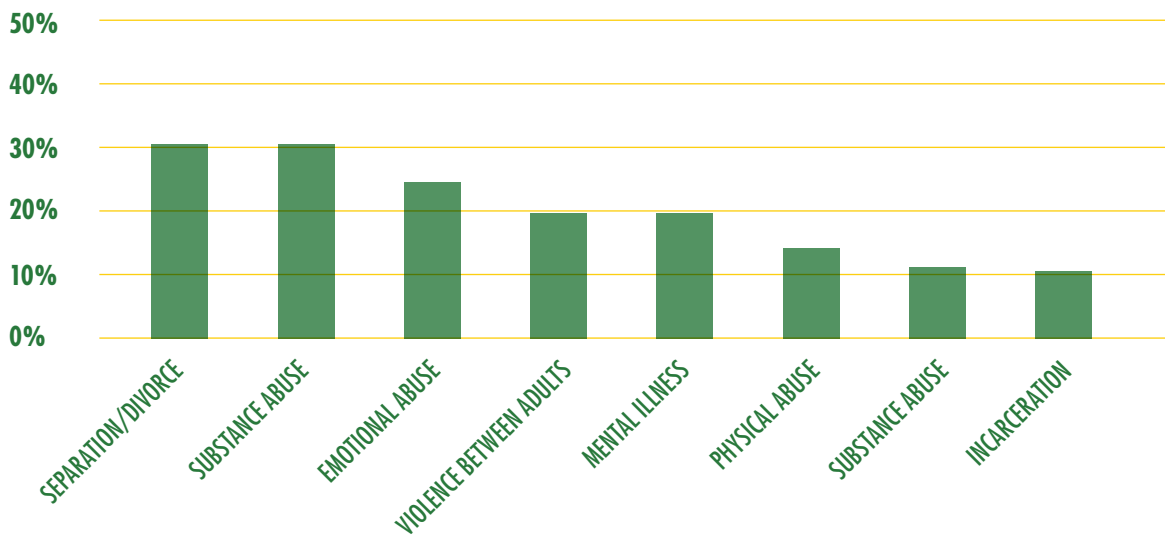
In addition to physical activity, students need quality nutrition to develop and achieve. For example, students who participate in free school breakfast programs are more likely to be on time to school, less likely to be absent, and more likely to have better attention, behavior, math grades, and standardized test scores than students from similar income backgrounds who do not regularly eat breakfast.¹⁶ A study that analyzed a healthy eating campaign that banned junk food from schools and introduced healthier, freshly prepared school meals found that participating students scored higher on English and science tests than students who did not take part in the campaign.¹⁷



Relatively poor health for students can lead to loss of instructional time resulting from illness or behavior challenges. Research has shown students with low nutrient intakes have more symptoms of hunger, more psychological and social adjustment challenges, and higher rates of absenteeism and tardiness than students with higher nutrient intakes.¹⁸

Many students also experience adverse childhood experiences (ACEs) that disrupt their development and can lead to a variety of negative physical, mental, and emotional health outcomes (Figure 2). ACEs can include both direct actions such as physical and verbal abuse, incarceration of a parent, and substance abuse in the home or physical, emotional, and educational neglect. As the number of ACEs experienced by a child increases, so too does the likelihood they engage in behaviors such as smoking, alcohol consumption, and drug use, as well as the likelihood they experience depression or perform poorly in school.¹⁹ Because ACEs can short-circuit brain function and emotional development, they can lead to lost class time resulting from absences, truancy, and disciplinary infractions. The more classroom time students miss, the greater the challenge they face in catching up and succeeding in their academic work.

FIGURE 2
STUDENTS EXPERIENCING ACEs IN TENNESSEE



Source: Tennessee Department of Health, 2015.



High-quality education and academic achievement are associated with improved outcomes later in life.

Attending a high-performing school can lead to improved math and English standardized test scores, decreased dropout rates, and lower rates of engaging in behaviors such as binge drinking and substance use at school. Researchers observing these relationships concluded that "...increasing performance of public schools in low-income communities may be a powerful mechanism to decrease very risky health behaviors among low-income adolescents and to decrease health disparities across the life span."²⁰ High-quality K-12 education also better prepares high school graduates to pursue postsecondary education and earn certifications or degrees that improve their earning potential and overall quality of life.

College graduates live an average of five years longer than people who do not graduate from high school.

The Robert Wood Johnson Foundation has noted that college graduates can expect to live five years longer than people who do not graduate high school. Further, people with four years of additional education beyond high school are less likely to be overweight, to smoke, or to have heart disease or diabetes.²¹ In contrast, researchers who conducted an extensive review of relevant research in 2004 noted patients with low literacy levels were generally 1.5 to 3 times more likely to experience poor health.²²

Economists have found that study participants with higher levels of educational attainment reported lower rates of common acute and chronic diseases—including heart conditions, stroke, hypertension, unhealthy cholesterol levels, emphysema, diabetes, asthma attacks, and ulcers. Physical and mental function is also better for people with higher levels of education. People with higher levels of education are also substantially less likely to report that they are in poor health or that they experience anxiety or depression.²³

In West Virginia, the effects of childhood obesity cost low-income school districts nearly \$1,400 more per student for instructional needs.

Source: GENYOUth Foundation, 2013

Mental and emotional health are critical for student success. Nationally, 20 percent of adolescents between the ages of 13 and 18 have a mental health issue severe enough to negatively affect their daily functioning, but nearly two-thirds of these adolescents do not receive mental health services.²⁴ In Tennessee, one in five children ages 2 to 17 has at least one emotional, behavioral, or developmental condition.²⁵ Students suffering from mental illness have a greater likelihood of failing across all subject areas.

Improving student health leads to short- and long-term economic benefits. Student illness may lead to parents needing to take time off work, which can result in lost wages and decreased productivity. Costs of care are paid by families, health care providers, and in some cases, public assistance programs. Nationally, among insured children, health care costs for those who are obese run three times that of their non-obese peers.²⁶ In Tennessee, according to the Governor's Foundation for Health and Wellness, treatment of preventable and chronic disease costs citizens \$6 billion a year.²⁷ Addressing these conditions at an early age would lead to improved wellness and productivity of Tennesseans, as well as reduce the financial burden of paying for treatments.







Student Health In Tennessee

Young Tennesseans' poor health outcomes and health behaviors show the importance of access to health services and resources. But such access remains out of reach for many students and communities. Rural communities face particular challenges in meeting the health needs of their residents. In Tennessee, nearly one-third of all students attend schools in rural districts. Compared to their urban peers, rural students have higher rates of obesity and slightly higher rates of mental health problems.²⁹ More than half of rural counties nationally do not have a practicing pediatrician.³⁰ The Great Recession of 2008-10 disproportionately affected rural communities, and job losses and persistent poverty continue to pose risks to child well-being in rural districts.³¹ Statewide, the proportion of children living in poverty increased in Tennessee from 13 percent to 16 percent between 2010 and 2014. In rural and urban communities alike, low-income students are more likely to have chronic health conditions.³²

FIGURE 3

PARENT PERCEPTIONS OF CHILDREN'S HEALTH (2012)²⁸

	PERCENTAGE NOT IN EXCELLENT OR VERY GOOD HEALTH
African American	25%
Hispanic	39%
White	11%

Source: Annie E. Casey Foundation, 2015. Kids Count data.

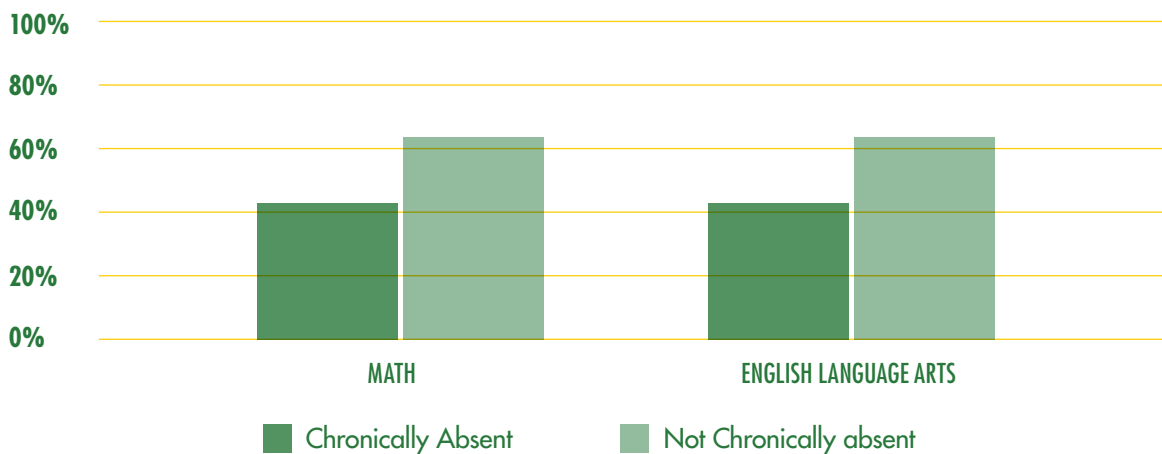
Racial and ethnic identity are also associated with disparities in overall child well-being. Parents of students in Tennessee who identify as African American or Hispanic are far more likely to report their children are in good, fair, or poor health—rather than very good or excellent health—compared to surveyed parents of white children (Figure 3).

Across racial and ethnic groups, however, residents of rural areas are at increased risk of obesity and other conditions that can result from lack of access to healthy foods, relying on fast food and other low-cost, high-calorie options over traveling long distances to purchase higher-priced, healthier foods.³³

In addition to affecting access to nutritious foods, low household incomes can lead to diminished health and greater likelihood of chronic absenteeism, meaning more low-income students fall behind in their schoolwork as a result of lost learning time. As evidence, low-income elementary students in Tennessee are chronically absent at three times the rate of their more-advantaged peers.³⁴ Lost learning time threatens the ability of chronically absent students to master foundational knowledge and skills—including literacy and numeracy.³⁵ Recent research by the TDOE found “almost 45,000, or 10 percent, of Tennessee K–3 students missed at least a month’s worth of school days during the 2014-15 school year.” Further, nearly every elementary school statewide had student chronic absenteeism rates of at least 5 percent. Chronically absent students are substantially less likely to achieve proficiency in math or English language arts than their peers who are not chronically absent (Figure 4). To promote local action on this statewide issue, Tennessee’s new school and district accountability system will, for the first time, include an indicator of chronic student absenteeism beginning in 2017-18.³⁶

FIGURE 4

TENNESSEE THIRD-GRADE MATH AND ENGLISH LANGUAGE ARTS PROFICIENCY LEVELS (2014-15)



Source: Tennessee Department of Education, 2016.

Additional resources in schools to expand access to health services could lead to gains in both student health and academic achievement. In Tennessee, health professional-to-student ratios in many areas lag behind national standards. The Association of School Nurses, for example, advises a ratio no greater than one nurse for every 750 students to maintain a safe school environment, compared to the funded ratio in Tennessee of 3,000:1. Fewer than half of Tennessee schools employ full-time nurses.³⁷ The School Social Work Association of America recommends a ratio of 250:1, while the National Association of School Psychologists advises a ratio of no more than 700:1.³⁸ Professionals from these fields in Tennessee generally face far larger student caseloads, making it difficult to provide the level of care many students need.

In Tennessee, videoconferencing technology has allowed greater access to health care in recent years. Both rural and urban districts in Tennessee use telemedicine to expand access to medical professionals for students. According to the TDOE's Office of Coordinated School Health, "Of the 155 schools that provided clinic services in 2015-16, 77 percent used telemedicine."³⁹ Videoconferencing technology allows doctors and nurses to visit with patients and provide a diagnosis without being on site. Continued expansion of this technology-based solution to health care access holds promise for students, but schools and districts continue to need added personnel to address the chronic conditions many students across Tennessee experience.



The **Niswonger Virtual Health Clinic** is available in 66 schools across the state. Through this service, health practitioners are able to help students with symptoms ranging from fever and sore throat to limb sprains and chronic illnesses.

Source: Elizabethton Star, May 2, 2017



Conclusion

“Childhood is brief. Communities of practice that do not typically engage one another, such as education and economic development and public health and the health care sector, need to develop models of working cooperatively to improve the determinants of health and health outcomes.”

- Probst, Barker, Enders, & Garinder, 2016

Research conducted in a wide variety of settings and examining a broad set of indicators has consistently shown strong ties between the overall well-being of students and their academic achievement. Too many students—particularly those of color, attending rural schools, and from low-income backgrounds—lack consistent access to high-quality nutrition and mental and physical health services. These gaps affect students in rural, suburban, and urban communities alike. Poor health conditions and nutrition, diminished physical activity, and lack of health care services can lead to increased rates of absenteeism. In turn, lost learning time holds students back from reaching their full academic potential. Lifelong effects on health and productivity can follow.



For students to achieve their full potential, leaders from the public health, education, nonprofit, philanthropic, and business sectors all have roles to play in advancing students' health and academic achievement. Policymakers, too, can deepen our state's commitment to ensuring all students have the supports they need to meet high expectations. Collaboration and intense focus on these needs will ensure a strong foundation for the future of Tennessee and the future of all Tennesseans.

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